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RMC-8357

INSTALLATION GUIDE
RMC-8357

This guide includes installation information for the RMC-8357. For more information about configuring, using, and maintaining the RMC-8357, refer to the *RMC-8357 User Manual*. You can download the user manual in PDF format at `ni.com/manuals`.

Contents

NATIONAL INSTRUMENTS™

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 Electromagnetic Compatibility*, National Instruments

Unpacking

Carefully inspect the shipping container and the RMC-8357 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 RMC-8357 kit contains the following items:

☐   RMC-8357 rack mount controller

☐   *RMC-8357 Installation Guide*

☐   *RMC-8357 User Manual* (available at `ni.com/support`)

☐   Windows recovery media (not included in diskless versions)

☐   23 to 36 VDC 3-pin cable (ships with the DC option)

A power cable is not included with the RMC-8357 kit. Contact National Instruments if you need help finding a power cable.

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

Key Features

The RMC-8357 offers the performance of a high-end PC in a compact 1U rack-mountable form factor for controlling a PXI or PXI Express system using a National Instruments remote controller.

Mainboard Features

CPU

•   Intel Xeon E5-2620 v4 Eight Core Processor, LGA 2011

Memory

•   32 GB DDR4 RAM

Slots

- One PCI Express 3.0 x16 slot, full height
- One PCI Express 3.0 x16 slot (requires a custom PCI Express bracket)

📝 **Note** The x16 bottom slot requires a custom bracket and supports only half-height cards.

Video

- PCIe video graphics card

HDD

- One 1 TB 2.5 in. SSD
- Supports up to four 2.5 in. drives

Blu-ray

- Slim DVD-R/W Blu-ray drive

Onboard LAN

- Two Gigabit Ethernet ports

Onboard I/O

- Two Serial ports
- One DisplayPort
- One DVI port
- One VGA port (disabled by default)
- Two USB 2.0 ports (rear)
- Two USB 3.0 ports (front)
- Two USB 3.0 ports (rear)

Power Supply

- Supports redundant AC and DC power supplies

Power Management Features

- ACPI/ACPM power management
- Wake-On-LAN (WOL) header
- Power-on mode from AC power recovery

Front Panel LEDs

- Power indicator
- Power shuttle indicators
- LAN status indicators
- HDD indicator
- System temp (overheat) and fan (fail) warning indicator

System Management

- Monitoring for CPU and chassis environment
- CPU thermal trip support
- +5 V standby alert LED
- Fan speed control

RMC-8357 Description

Figures 1 and 2 show key features of the RMC-8357 front and rear panel. For detailed information about the RMC-8357 front and rear panel, refer to Chapter 3, *I/O Information*, in the *RMC-8357 User Manual*.

Figure 1. Front View of the RMC-8357
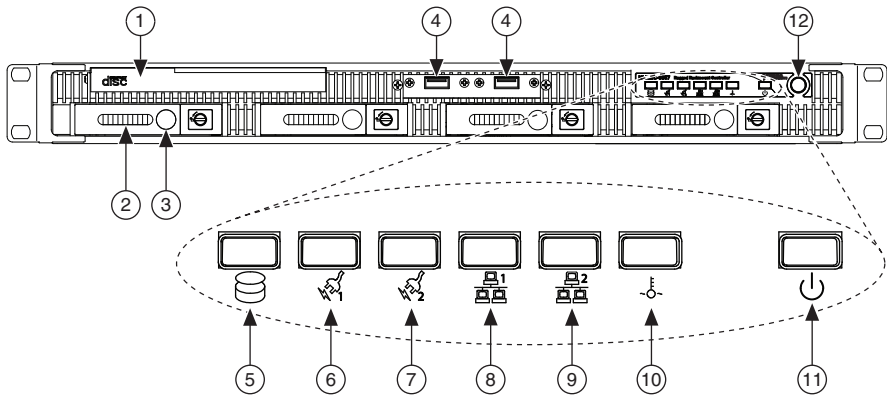
1	DVD-R/W Blu-ray Drive	7	Power Shuttle 2 Indicator
2	Hard Drives	8	LAN1 Status Indicator
3	Hard Drive Ejector Buttons	9	LAN2 Status Indicator
4	USB Ports	10	System Temp and Fan Warning Indicator
5	Hard Drive Activity Indicator	11	Power Indicator
6	Power Shuttle 1 Indicator	12	Power Switch

The front panel includes the following LEDs:

- **Hard drive activity indicator**—glows when there is hard drive activity.
- **Power shuttle indicators**—glow when power shuttles are powered on.

- **LAN status indicators**—flash when there is activity on LAN1 or LAN2.
- **Overheat/fan fail indicator**
  - Off—Normal
  - On—Overheat
  - Flashing—Fan failure warning
- **Power indicator**—glows when the RMC-8357 is powered on.

Figure 2. Rear View of the RMC-8357
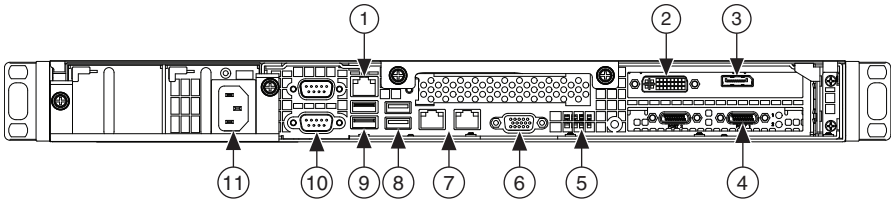
1	IPMI Management Port	7	LAN Ports
2	DVI Port	8	USB 3.0 Ports
3	DisplayPort	9	USB 2.0 Ports
4	MXI x1 Ports	10	Serial Ports
5	UID Switch	11	Power Connector
6	VGA Port (Disabled By Default)		

RMC-8357 Overview

The RMC-8357 is a rugged 1U PC-based controller for remote control of PXI chassis. The controller provides leading-edge processing power with Intel Xeon E5-2620 v4 processors, high disk bandwidth with software RAID support, high I/O bandwidth with two PCI Express 3.0 x16 slots, and up to 32 GB of memory.

Safety Information

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

⚠ **Caution** Product functionality can be disrupted if the knurled thumbscrews on the back of the top cover are subjected to Electrostatic Discharge (ESD). To prevent damage, you must employ industry-standard ESD prevention measures during installation, maintenance, and operation.

⚠ **Caution** Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

✎ **Note** Tighten the thumbscrew for the top panel cover with a tool after both initial installation and subsequent access.

⚠ **Caution** To avoid risk of explosion, do not replace the battery (JBAT1) with an incorrect battery type. Dispose of used batteries according to the battery instructions.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

- **Chassis Grounding**—The RMC-8357 requires a connection from the premise wire safety ground to the RMC-8357 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.

- **Mechanical Loading**—To avoid a hazardous load condition, be sure the mechanical load is even when rack mounting the equipment.

- **Live Circuits**—Operating personnel and service personnel must *not* remove protective covers when operating or servicing the RMC-8357. 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**—Service this equipment only 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 RMC-8357 from its original condition. Unsuitable modifications may result in safety hazards.

Chassis Cooling Considerations

The RMC-8357 is designed to operate on a bench or in an instrument rack. Determine how you want to use the RMC-8357 and follow the appropriate installation instructions.

⚠ **Caution** If installed in a closed or multiunit rack assembly, the rack environment operating ambient temperature may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient operating temperature (Tma) specified in Appendix A, *Specifications*, in the *RMC-8357 User Manual*.

Providing Adequate Clearance

Apertures in the front and rear of the chassis facilitate power supply and motherboard cooling. Air enters through the front of the chassis and exits through the fans on the rear of the chassis. Place the RMC-8357 on a bench top or in an instrument rack so that the fans (air outlets) and the air inlet apertures in the front and rear 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 RMC-8357:

1. Connect a keyboard and mouse to the appropriate connectors on the RMC-8357 rear panel.

2. Connect the DVI or DisplayPort monitor video cable to the DVI or DisplayPort connector on the rear panel.

3. Connect the USB and serial devices as necessary to the RMC-8357 front and rear panel ports.

⚠ **Caution** To minimize shock hazard, make sure the electrical power outlet you use to power the RMC-8357 has an appropriate earth safety ground. Refer to the *Connecting Safety Ground* section for more information.

⚠ **Caution** Use the DC power cable provided with DC power supplies for VDC input.

4. Connect the AC power cable to the AC inlet on the rear panel and to an AC power outlet. For more information, refer to the *Connecting to Power Source* section.

5. For the DC option, connect the DC positronic connector to the DC inlet on the rear panel and wire to a DC power source.

6. Power on the RMC-8357.

7. Verify that the RMC-8357 boots. If it does not boot, refer to the *What if the RMC-8357 does not boot?* section of Chapter 5, *Troubleshooting*, in the *RMC-8357 User Manual*.

Cable Retention Bracket

The RMC-8357 includes a cable retention bracket. Install the bracket with the retaining screws, as shown in Figure 3.

Figure 3. Cable Retention Bracket
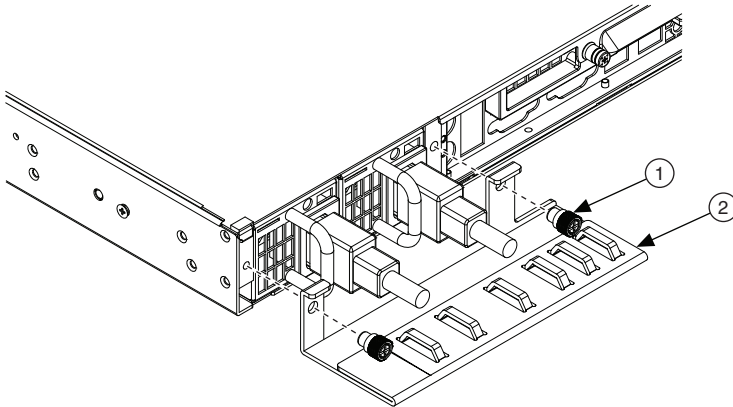
1	Retaining Screw (x2)	2	Cable Retention Bracket

Connecting Safety Ground

The RMC-8357 is designed with a three-position IEC C14 style plug 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.

Note The RMC-8357 also includes a grounding screw (8-32 thread size nut) on the back of the chassis. (The nut is not supplied with the RMC-8357.)

Connecting to Power Source

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

Caution Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

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

Caution For a DC power supply, provide a 30 A or higher overcurrent protection device external to the equipment.

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

⚠️ **Caution**   When mounting the equipment in the rack, do not create a hazardous condition due to uneven mechanical loading.

The RMC-8357 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 brackets (4 in. and 12 in.) for attaching the outer slides to racks of different depths.

• Bag of assorted fasteners.

Installing the Inner Slides

Install the inner slides to the RMC-8357 as shown in Figure 4.

📝 **Note**   The following figure shows an example controller that may differ from your product.

Figure 4. Installing Inner Slides
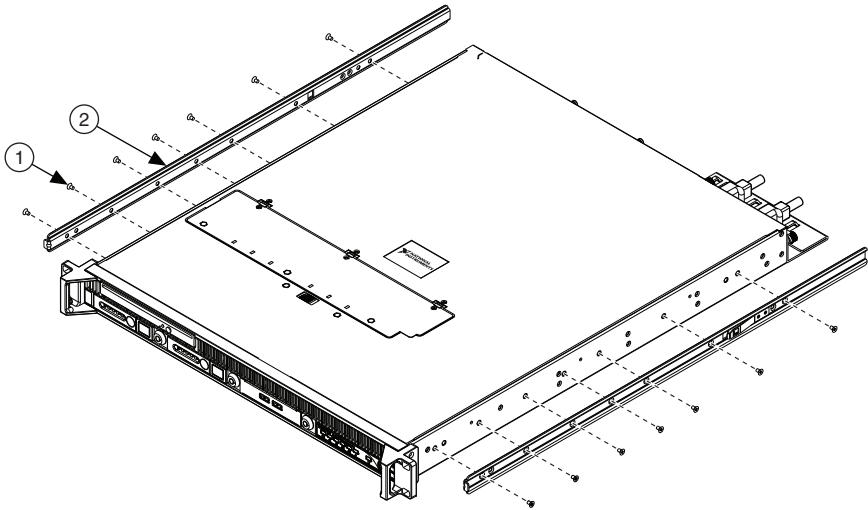
| 1 | Retaining Screw (x14) | 2 | Inner Slide |

Installing the Slide Mounting Brackets in the Rack

Install the slide mounting brackets in the rack as shown in Figure 5.

Figure 5. Installing Slide Mounting Brackets in Rack
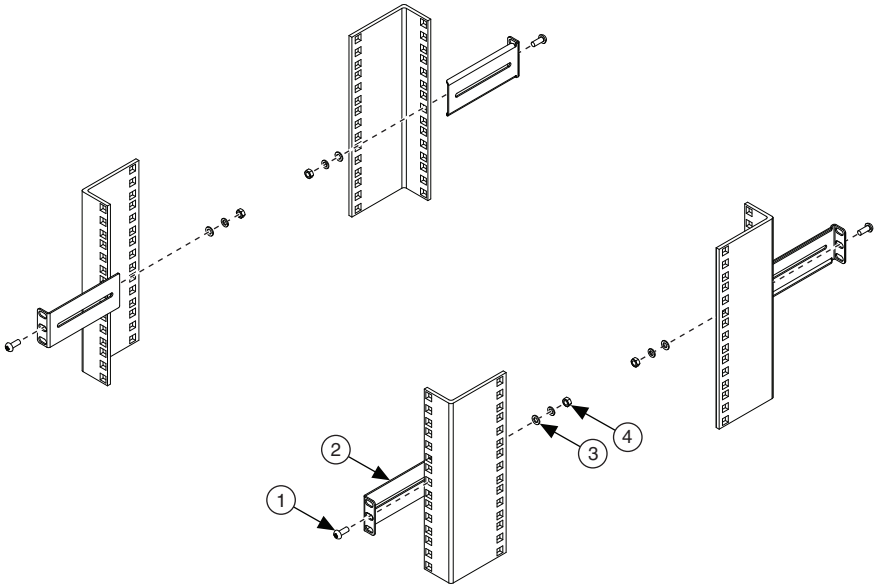
1	Retaining Screw (x4)	3	Washer (x8)
2	Slide Mounting Bracket (x4)	4	Nut (x4)

Installing the Outer Slides in the Rack

Install the outer slides in the rack as shown in Figure 6.

Figure 6. Installing Outer Slides in Rack
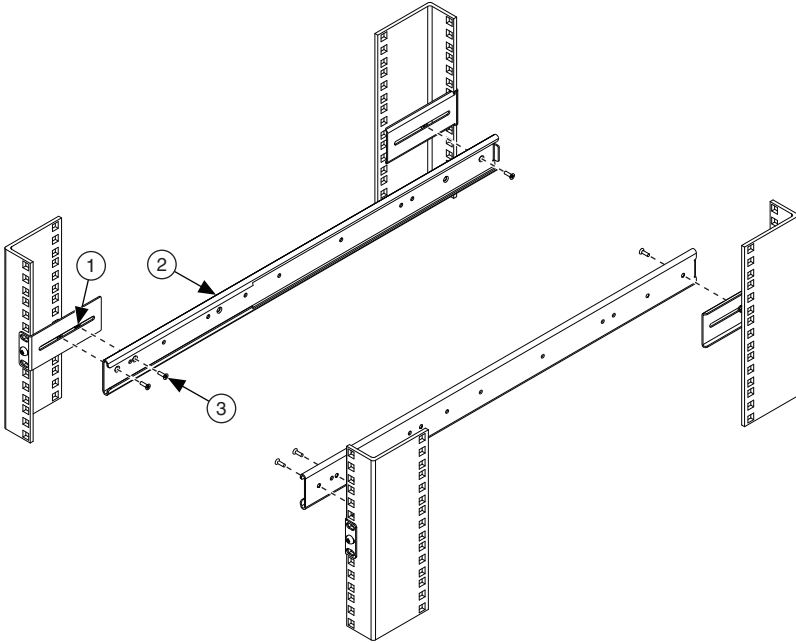
1	Nut (x6)	2	Outer Slide	3	Retaining Screw (x6)

Installing the Chassis into the Rack

Push the inner slides, attached to the chassis, into the grooves of the outer slides in the rack and slide the RMC-8357 into the rack, as shown in Figure 7.

Note The following figure shows an example controller that may differ from your product.

Figure 7. Installing RMC-8357 in Rack

OS Reinstallation and Recovery

⚠️ **Caution** Recovering the OS using the hard drive-based recovery or the OS recovery media erases the contents of your hard disk. Before recovering the OS, back up any files you want to keep.

The RMC-8357 includes a preinstalled OS from the factory. The RMC-8357 also includes two methods of restoring/reinstalling the OS to your system.

- Hard drive-based recovery stores a factory backup on a separate portion of your hard drive, allowing you to restore your server without additional media.
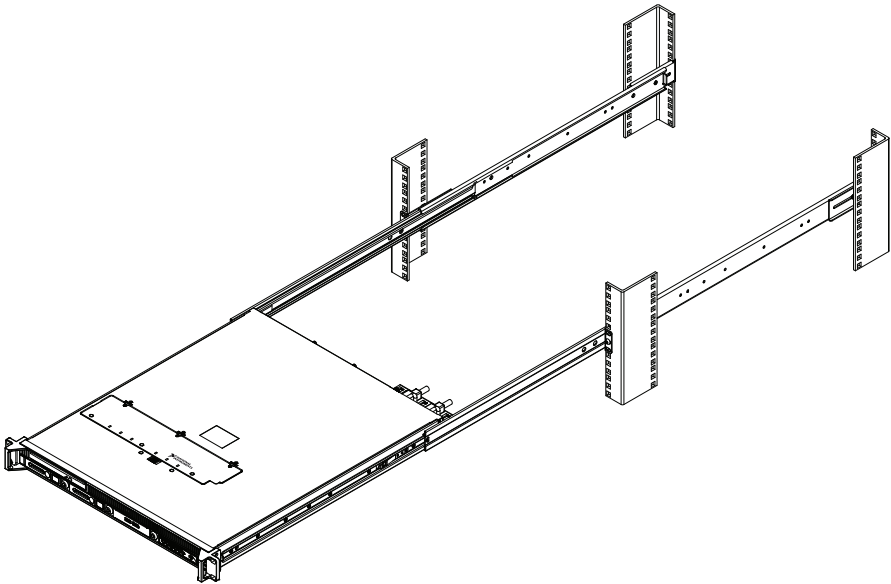 - This option is not available on systems with Windows Server operating systems preinstalled.

📝 **Note** The hard drive recovery hot key is <F4>. To access the hard drive-based recovery tool, press and hold <F4> when video first appears during the boot process.

- The RMC-8357 also ships with an OS recovery media you can use to reinstall your operating system onto your hard drive.

  If you need to reinstall your operating system, you can use the included OS recovery media. Boot the RMC-8357 using the OS recovery media to recover the OS.

Note You also may need to update or reinstall software after using the OS reinstallation media to recover your OS. The OS reinstallation media may contain drivers that are older or newer than the factory-installed version of the OS and may not contain the latest RAID drivers. To ensure you have the latest drivers, go to `www.intel.com` and install the Intel Rapid Storage Technology (Intel RST) RAID software package.

Cleaning

⚠️ **Caution** *Always* disconnect the AC/DC 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 RMC-8357 electrical, mechanical, and environmental specifications.

Electrical

AC Input

Input voltage range	100 to 240 VAC
Operating voltage range	90 to 264 VAC
Input frequency	50 to 60 Hz
Operating frequency range	47 to 63 Hz
Current rating	12 to 6 A max (750 W max single power supply)
Power disconnect	The AC power cable provides main power disconnect. Depressing the front panel power switch enables or inhibits the internal power supply.

DC Input

Input .... 23 to 36 V, 16 to 8 A ±10% per supply, 30 to
18 A total

📝 **Note** The connection to a DC mains supply is considered an energy hazard and must not be in an operator access area. The DC product must be located in a Restricted Access Location.

⚠ **Caution** Use the DC power cable provided with DC power supplies for VDC input.

⚠ **Caution** Using the RMC-8357 in a manner not described in this document may impair the protection the RMC-8357 provides.

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

Mainboard

Socket .... LGA 2011

Chipset .... Xeon E5-2620 v4

Memory slots .... Eight 240-pin DIMM DDR4 slots

PCI Express .... One PCI Express 3.0 x16 slot and
one PCI Express 3.0 x16 slot (half height)

SATA .... Four SATA III ports

USB ports .... Four USB 3.0 ports, Two USB 2.0 ports

Video .... VGA port (disabled by default), DVI,
DisplayPort, PCIe video graphics card

Serial .... Two RS-232 serial port

LAN .... Two RJ45 LAN jacks

CPU

CPU .... Xeon E5-2620 v4 Eight Core

Clock speed .... 2.10 GHz

Max turbo frequency .... 3.0 GHz

Intel Smart Cache .... 20 MB

Package .... LGA 2011

Hard Disk Drive

Capacity ....Up to four front removeable 2.5 in. drives

Interface ....SATA III

Drive options...1 TB 2.5 in. SSD

Memory

Standard memory configuration ....32 GB (4 × 8 GB), DDR4 SDRAM

Notes 8 × 288-pin DDR4 DIMM slots.

Up to 256 GB ECC RDIMM.

RDIMM size: 32 GB, 16 GB, 8 GB, 4 GB.

Mechanical

Overall dimensions (standard chassis)

　　Height..1U

　　Width...432 mm (17.0 in.)

　　Depth...538.5 mm (21.2 in.)

　　　　Depth (including handles).................563.9 mm (22.2 in.)

Weight ....8.1 kg (17.8 lbs)

Shock and Vibration

Mechanical Shock	
Operating	30 g, 11 ms

Test Procedures	Standard
Operating	IEC 68-2-27

Operational Random

Frequency (Hz)	Vibration Level
5 to 350	0.0002 g^2/Hz
350 to 500	-3 dB/octave
500	0.00014 g^2/Hz
Total g_{rms} = 0.31	

Non-Operational Random

Frequency (Hz)	Vibration Level
5 to 100	0.02 g^2/Hz
100 to 200	-3 dB/octave
200 to 350	0.01 g^2/Hz
350 to 500	-3 dB/octave
500	0.007 g^2/Hz
Total g_{rms} = 2.46	

Random Vibration Test Procedures

Test	Standard
Operating	IEC 68-2-64
Non-operating	IEC 68-2-64

Environmental

⚠ **Caution** If installed in a closed or multiunit rack assembly, the rack environment operating ambient temperature may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma) the manufacturer specifies.

Operating temperature .... 0 to 50 °C (CPU turbo mode off)
(Tested in accordance with IEC 60068-2-1, IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

Storage temperature .... -40 to 70 °C
(Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 temperature limits.)

Relative humidity (tested in accordance with IEC 60068-2-56)
    Operating .... 10 to 90% noncondensing
    Nonoperational (storage) .... 5 to 95% noncondensing

Operating location .... Indoor use only

Maximum altitude .... 2,000 m

Acoustic Emissions

Sound pressure level (at operator position) ......<70 dBA

Safety

This product is designed to meet the requirements of the following standards of safety for test and measurement equipment:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

⚠ **Caution** Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

📝 **Note** For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

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   At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste and Electronic Equipment, visit `ni.com/environment/weee`.

Battery Replacement and Disposal

Battery Directive   This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit `ni.com/environment/batterydirective`.

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 National Instruments 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 National Instruments product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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