INSTALLATION GUIDE

NI 9919

Shielded Rack-Mount Enclosure for CompactRIO and CompactDAQ

This document explains how to set up and install the NI 9919 rack-mount enclosure.

Caution NI makes no product safety or CE marking compliance claims for the NI 9919. The end user is responsible for conformity to any and all compliance requirements.

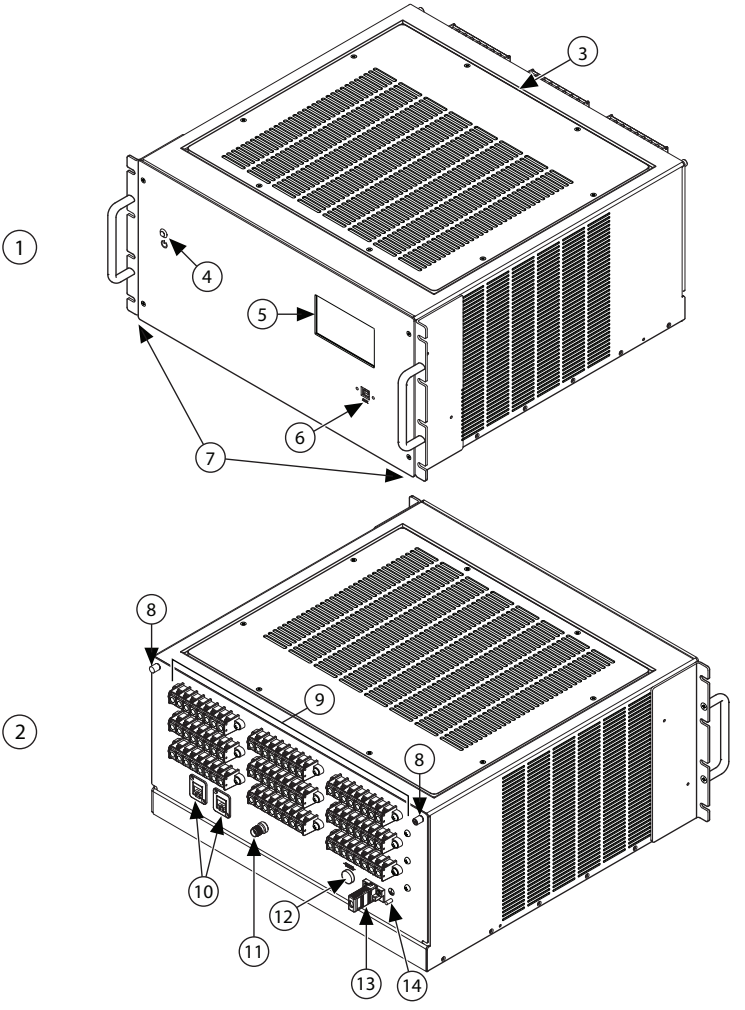
Caution Do not operate or install the NI 9919 in a manner not specified in this guide. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Caution The safety guidelines and specifications in this document are specific to the NI 9919. The other components in the system might not meet the same specifications. Refer to the documentation for each component in the system to determine the safety ratings and specifications for the entire system.

Caution The NI 9919 requires a connection from the premise wire safety ground to the earth ground terminal (protective earth). 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.

Before You Begin Refer to the documentation for your chassis and power supply to find installation and grounding instructions specific to your devices.

Figure 1. NI 9919 Parts Locator Diagram

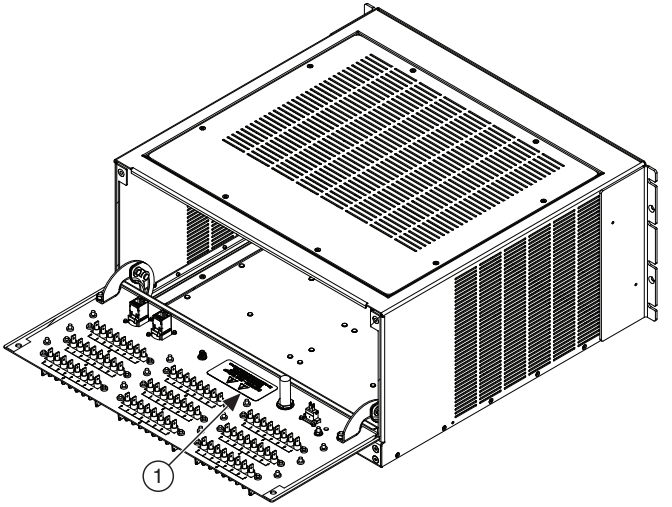


1	NI 9919 Front View	8	Rear Panel Captive Screws
2	NI 9919 Rear View	9	I/O Connectors
3	Removable Top Panel	10	Ethernet Ports
4	Power Indicator LED	11	GPS Connector (TNC Style)
5	Optional Touchscreen Display	12	Fuse Holder
6	USB Port	13	Power Connector with Backshell
7	Rack Mount Rails	14	Earth Ground Terminal (Protective Earth)

Safety Guidelines for High Voltage

If you are installing high-voltage devices in the NI 9919, take the following precautions. The NI 9919 has a high-voltage label on the inside of the back panel as shown in Figure 2.

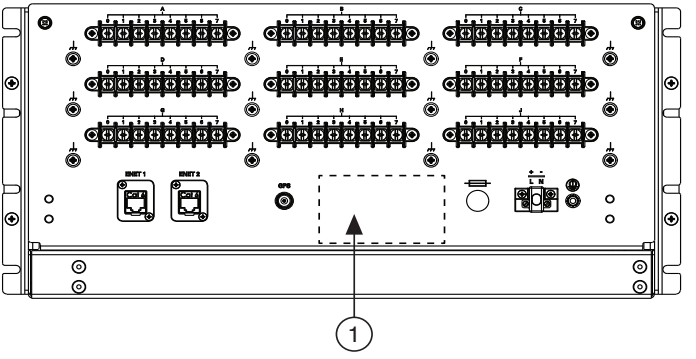
Figure 2. NI 9919 High-Voltage Label



1 High-voltage label on the inside of the back panel

NI recommends you place an additional high-voltage label on the outside of the back panel in the 2.0 in. × 3.5 in. area shown in Figure 3.

Figure 3. User-Placed High-Voltage Label



1 User-placed high-voltage label on the outside of the back panel

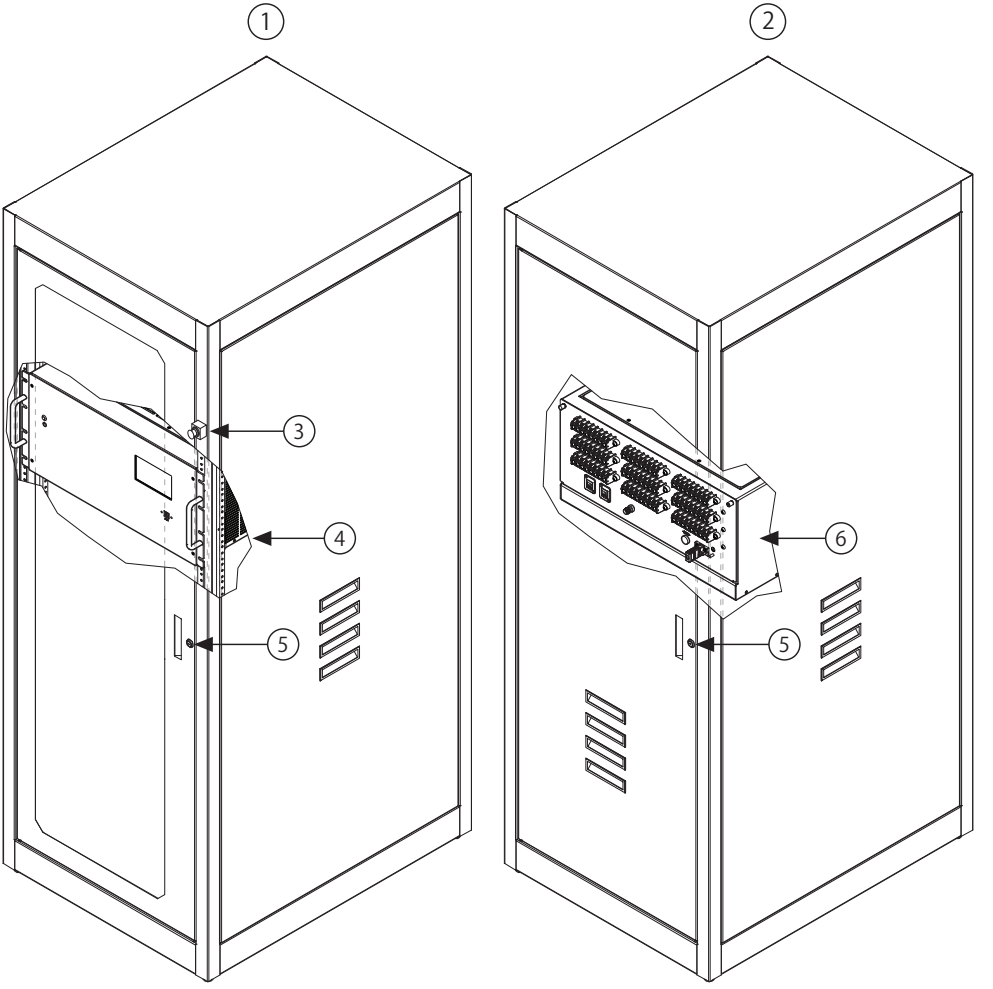
Caution Ensure that installation is performed only by qualified personnel.

Warning This icon denotes a warning advising you to take precautions to avoid electrical shock.

Caution The NI 9919 must be installed in a secure enclosure or a rack which is accessible only by the use of a tool, as shown in Figure 4.

Caution A main input power switch or circuit-breaker must be included in the installation as shown in Figure 4. The switch/circuit-breaker must be suitably located and easily reached, and clearly marked as the power disconnect device for this product.

Figure 4. Secure Rack



1	Front view of secure rack	4	NI 9919 inside a secure rack (front view)
2	Rear view of secure rack	5	Lock securing the rack
3	Main input power switch	6	NI 9919 inside a secure rack (rear view)

Accessing the NI 9919

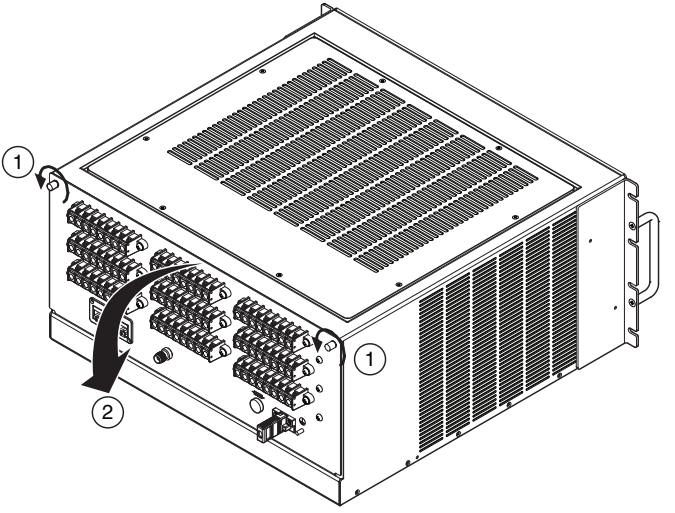
The NI 9919 has a back panel that opens and removable top and bottom panels for accessibility.

Caution Ensure that installation and maintenance are performed only by qualified personnel.

Opening the Back Panel

Complete the following steps to open the back panel of the NI 9919.

Figure 5. Opening the Back Panel

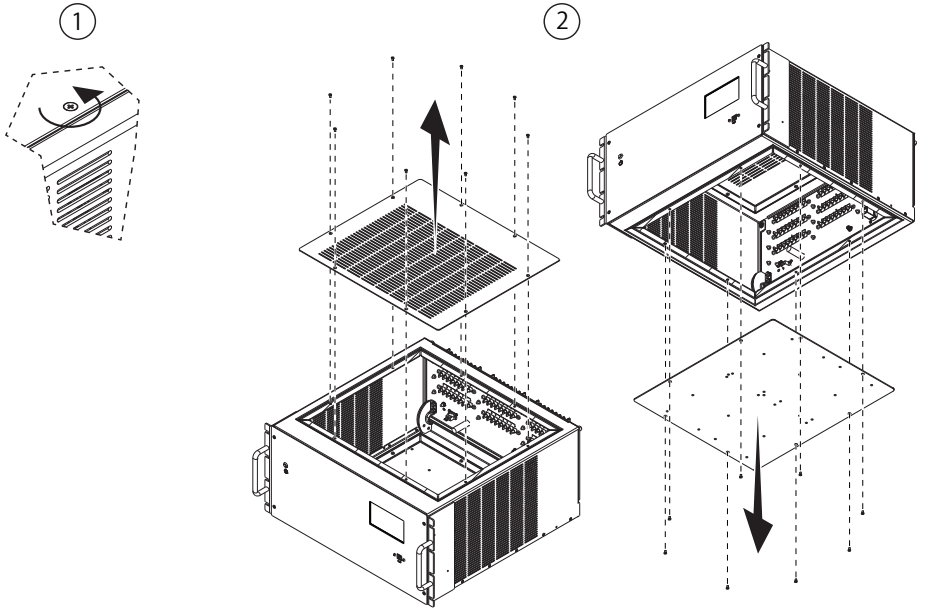


1	Unscrew the rear panel captive screws.	2	Pull the back panel down.

Removing the Top or Bottom Panel

Complete the following steps to remove the top or bottom panel.

Figure 6. Removing the Top and Bottom Panels



1 Unscrew the 8 mounting screws for the panel. 2 Remove the panel from the NI 9919 enclosure.

NI 9919 Assembly Screws

The NI 9919 comes with 17 screws for assembly. Refer to Table 1 for screw descriptions.

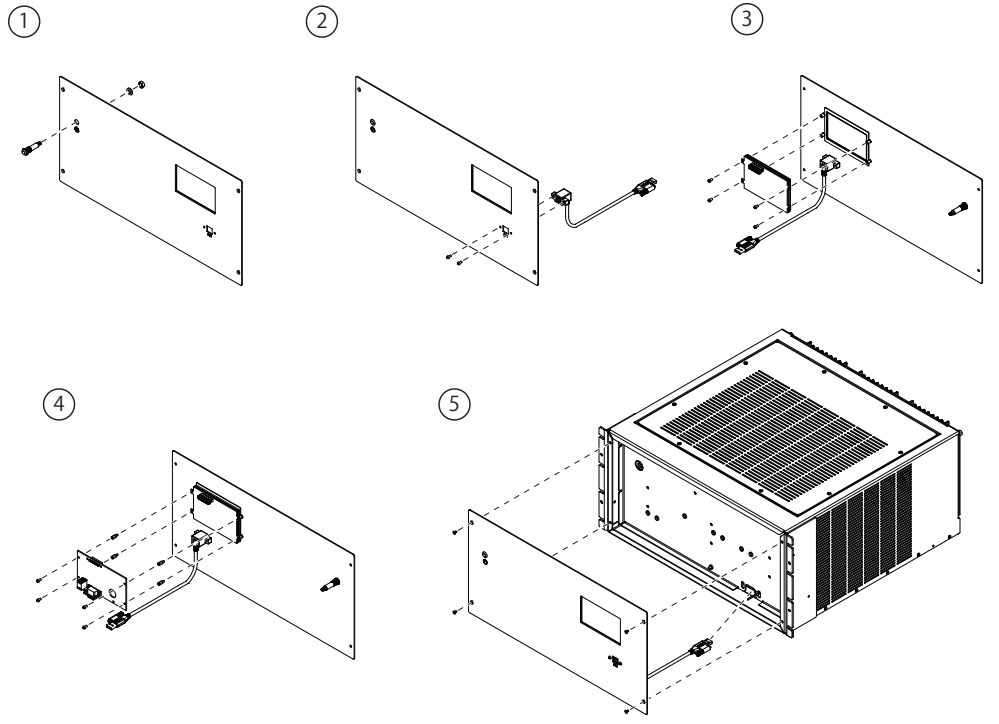
Table 1. NI 9919 Screw Descriptions

Screw Use	Quantity	Description
USB Cable Mounting Screws	2	Screw, M3X6, PHIL, PNHD, SS, Nylon Patch
Front Panel Mounting Screws	4	Screw, M3X5, PHIL, FLHD, SS, Nylon Patch
Handle Mounting Screws	4	Screw, M4X10, PHIL, FLHD, SS, Nylon Patch
Power Supply Mounting Screws	4	Screw, M4X6, PHIL, PNHD, SS, Nylon Patch
Chassis Mounting Screws	3	Screw, M4X25, PHIL, FLHD, SS

Installing the Front Panel

Complete the following steps to install the NI 9919 front panel.

Figure 7. Installing the Front Panel

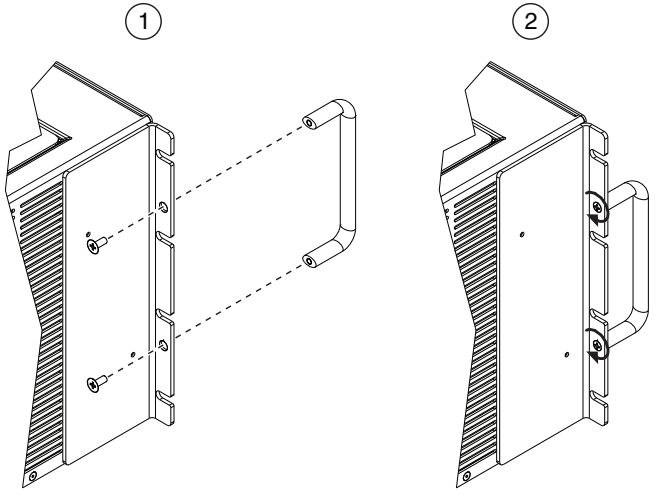


1 Install the power LED using a washer and nut.
2 Install the USB cable using two USB cable mounting screws.
3 Install the optional touchscreen display using the four screws included.
4 Install the optional touchscreen display power board using the four screws and four standoffs included.
5 Install the front panel using the four front panel mounting screws.

Installing the NI 9919 Rack Mount Handles

Complete the following steps to install the NI 9919 rack mount handles.

Figure 8. Installing the Rack Mount Handles



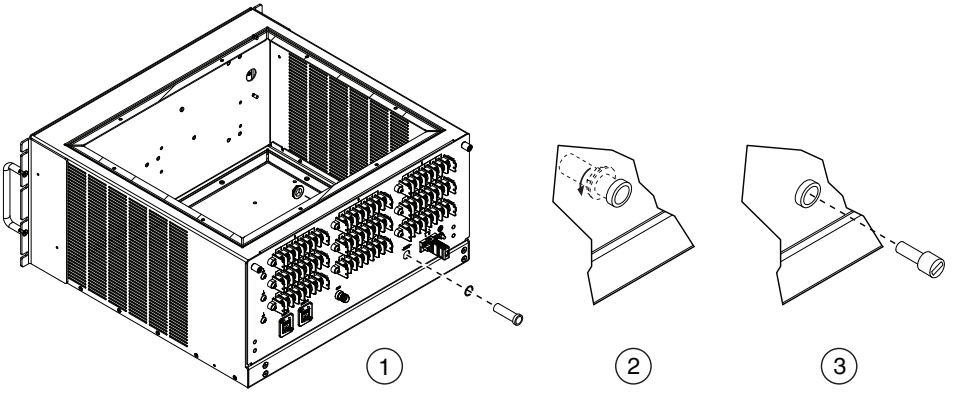
1 Align the handle and handle mounting screws.

2 Tighten the handle into place.

Installing the Fuse Holder in the NI 9919

Complete the following steps to install the fuse holder in the NI 9919.

Figure 9. Installing the Fuse Holder



1 Align the fuse holder, gasket, and nut.
2 Tighten the fuse holder in place using the nut.
3 Install the fuse insert in the fuse holder.

The NI 9919 fuse holder supports two different fuse sizes. Use the appropriate fuse insert listed in Table 2 for the size of fuse you want to use. Use the fuse size that is appropriate for your application.

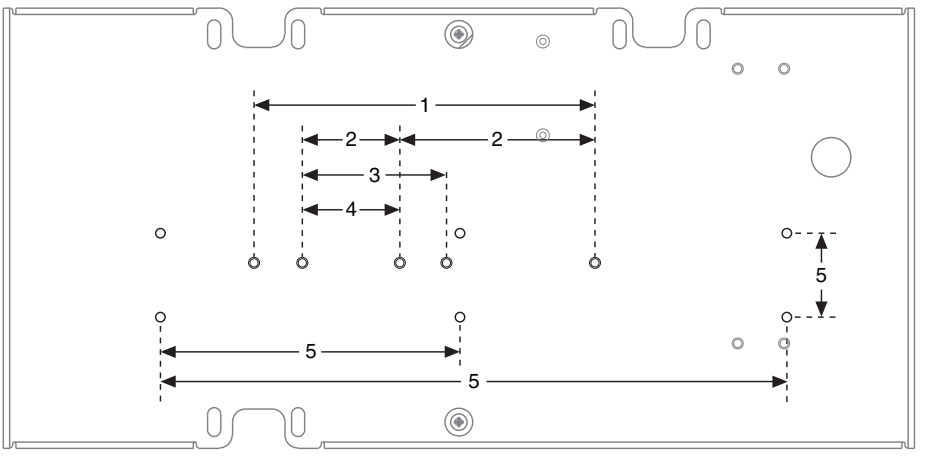
Table 2. Fuse Inserts

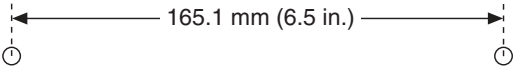
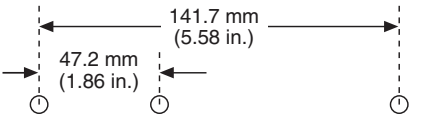
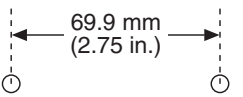
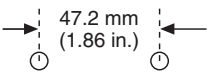
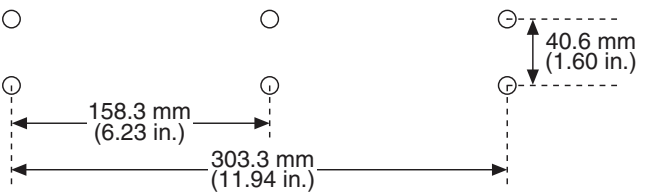
Fuse Insert Color	Fuse Size
Gray	1/4 in. × 1-1/4 in. (3AG)
Black	5 mm × 20 mm

Mounting the Chassis Directly to the NI 9919

The NI 9919 supports five mounting hole configurations that correspond to various NI chassis. Table 3 shows the dimensions of the five mounting hole configurations. Visit `ni.com/info` and enter `9919chassis` or `9919cdaqchassis` for lists of CompactRIO and CompactDAQ products the NI 9919 supports.

Table 3. NI 9919 Mounting Hole Configurations

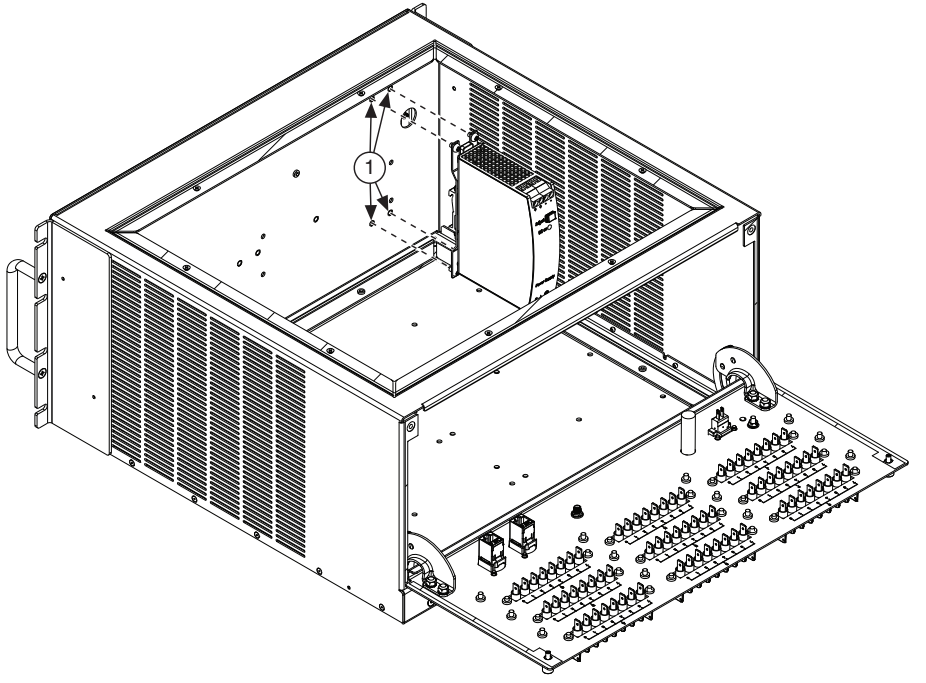


Configuration	Chassis Mounting Hole Dimensions
1	
2	
3	
4	
5	

Mounting a Power Supply in the NI 9919

The NI 9919 supports the panel mount method for an NI PS-14/15 power supply. Use the mounting holes shown in Figure 10 and the four power supply mounting screws to panel mount your power supply.

Figure 10. NI 9919 Power Supply Mounting Holes



1 Power Supply Mounting Holes

Note NI does not recommend tapping the mounting plate.

Mounting Equipment on the Bottom Panel

The NI 9919 supports mounting of equipment and DIN rails using the mounting holes on the bottom panel. Visit `ni.com/dimensions` for dimensions for the mounting holes on the bottom panel.

Grounding the NI 9919

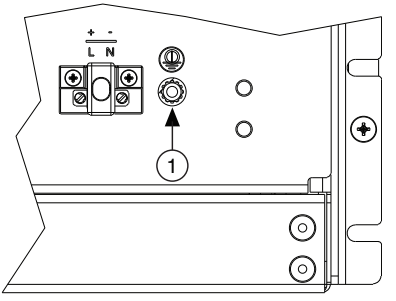
NI requires that you connect the NI 9919 to earth ground (protective earth) and ground the chassis and power supply.

Connecting Safety Ground

NI requires that you connect the NI 9919 to earth ground (protective earth) using the following steps:

Safety Ground Caution **Connecting Safety Ground (Protective Earth)** The NI 9919 must have a safety ground (protective earth), which is connected by the installer to the premise safety ground system for safe operation. The installer must use a green or green/yellow wire for this purpose. The safety ground method shall be reliable and meet applicable safety codes.

Figure 11. Safety Ground Terminal



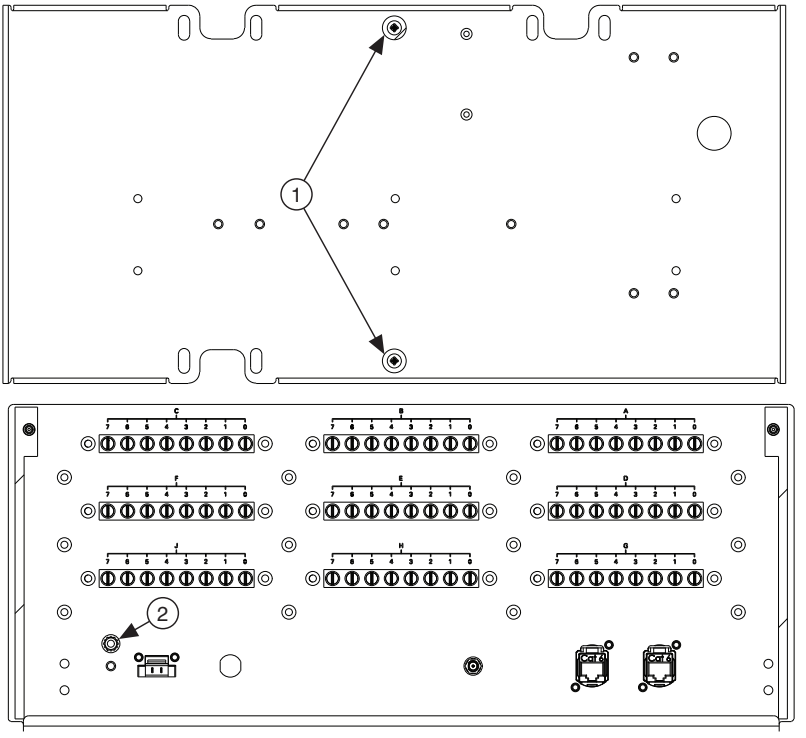
1 Safety ground terminal

1. Attach a ring lug to a green or green/yellow wire that is 2.58 mm^2 (10 AWG) or larger.
2. Remove the grounding nut from the safety ground terminal on the rear panel of the NI 9919.
3. Attach the ring lug to the safety ground terminal.
4. Tighten the grounding nut to 1.3 N · m (11.5 lb · in.) of torque.
5. Attach the other end of the green or green/yellow wire to the grounding electrode system of your facility using a method appropriate for the application.

Grounding the Chassis and Power Supply

NI requires that you connect the chassis and power supply in the NI 9919 to the internal ground screws shown in Figure 12. You can use any internal ground screw to ground the power supply and chassis.

Figure 12. Internal Grounding Terminals on the NI 9919

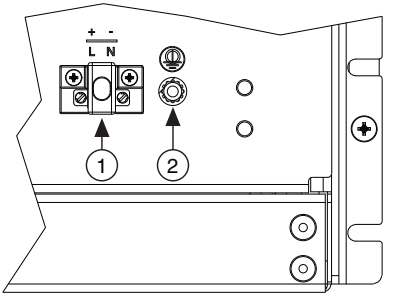


1	Internal grounding screws on the front panel	2	Internal grounding screw on the back panel

Wiring Power Connections to the NI 9919

The NI 9919 provides a power connector with backshell and a safety ground terminal, as shown in Figure 13. Connect neutral and line to the N and L terminals on the power connector and the ground to the safety ground terminal.

Figure 13. Power Connector and Ground Terminal



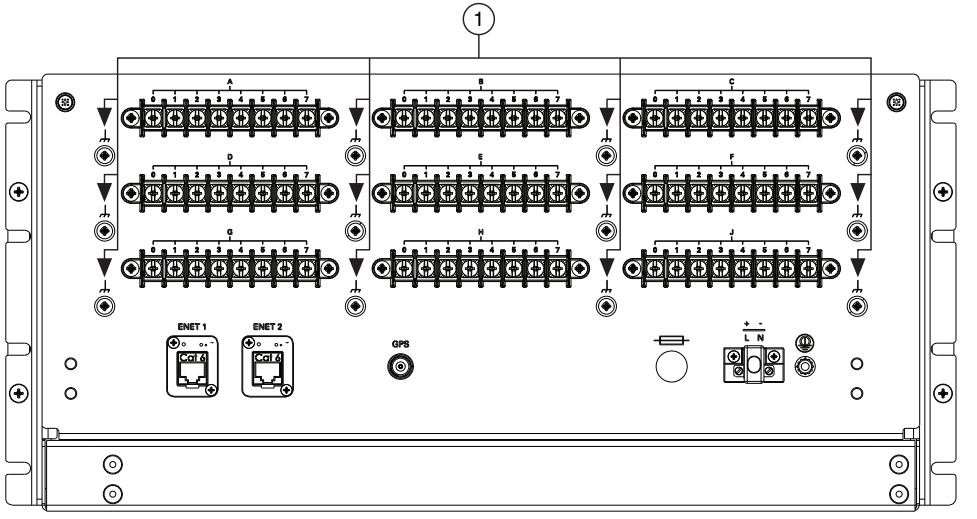
1	Power connector with backshell	2	Safety ground terminal

Connecting Custom Cables to the NI 9919

The NI 9919 has nine, eight-position barrier strip connectors on the rear panel for I/O connections.

When connecting cables to the barrier strips, use ring or spade lugs to connect to the #8 stud for outside connections and 0.25 in. wide female quick connects for the inside connections. Terminate the cable shields to the chassis ground terminal adjacent to the barrier strip connector. The NI 9919 includes 12 chassis ground terminals, as shown in Figure 14.

Figure 14. NI 9919 Chassis Grounding Screws



1 Chassis ground terminals

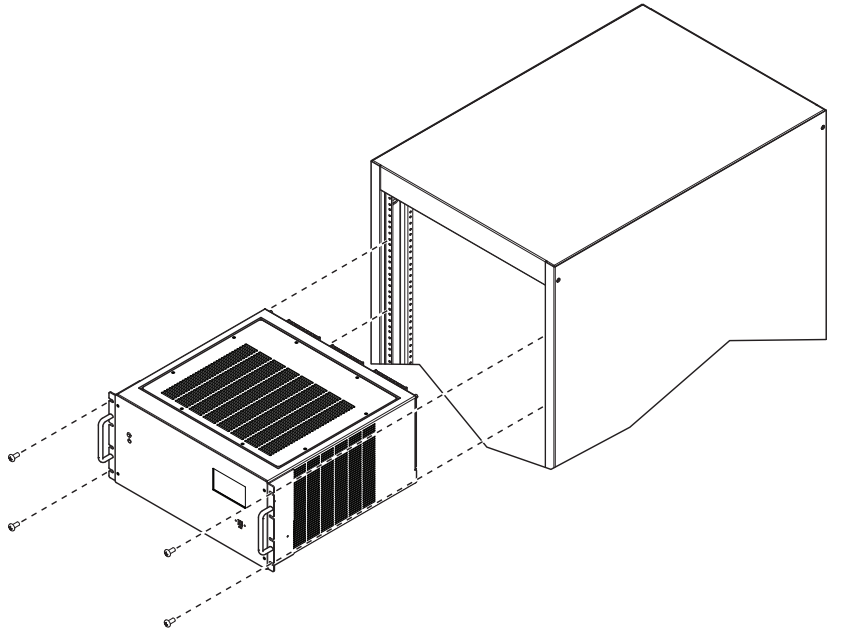
Rack Mounting the NI 9919

The NI 9919 supports rack mounting. Secure the NI 9919 to the rack posts using four mounting screws appropriate for your rack and the top and bottom mounting positions on the rack mount rails as shown in Figure 15. Using the middle mounting positions on the rack mount rails is optional.

When placing the NI 9919 in a rack, avoid placing the enclosure above a heat source, as rising heat can affect the operating temperature.

Caution You must install the NI 9919 in a rack prior to use.

Figure 15. Rack Mounting the NI 9919



Specifications

This section provides specifications for the NI 9919.

Physical Characteristics

If you need to clean the NI 9919, wipe it with a dry towel or a soft-bristle brush.

Weight	12.27 kg (27.05 lb)
NI 9919 material	Cold rolled steel
Finish	Electroplated zinc on cold rolled steel
Dimensions	481.08 mm × 513.37 mm × 221.23 mm (18.940 in. × 20.211 in. × 8.710 in.)

Note Visit `ni.com/dimensions` to find two-dimensional drawings and three-dimensional models for the NI 9919.

I/O Connector Characteristics

Bare wire	2.588 mm cross-section diameter (10 AWG) to 0.644 mm cross-section diameter (22 AWG) copper conductor wire with 8 mm (0.31 in.) of insulation stripped from the end
Ring/spade terminals	
Stud size	4 mm (#8)
Maximum width	9.4 mm (0.370 in.)
Torque for barrier strips	1.4 N · m (12 lb · in.)
Torque for ground lug	1.4 N · m (12 lb · in.)

Power Connector Characteristics

Maximum current rating	10 A
Voltage rating[1]	0 V to 250 V AC/DC
Input frequency	50/60 Hz
Screw-terminal wiring	2.053 mm diameter (12 AWG) to 1.024 mm diameter (18 AWG) copper conductor wire with 7 mm (0.28 in.) of insulation stripped from the end
Torque for screw terminals	0.5 N · m to 0.6 N · m (4.4 lb · in. to 5.3 lb · in.)
Ferrules	0.25 mm^2 to 2.5 mm^2

Barrier Strip Connector Characteristics

Maximum current rating	30 A
Voltage rating	0 V to 300 V

[1] Refer to the *Safety Guidelines for High Voltage* section for additional information about installing high-voltage devices in the NI 9919.

Environmental

Operating temperature[1]	-40 °C to 55 °C
Storage temperature	-40 °C to 85 °C
Ingress protection	IP 30
Operating humidity	10% to 90% RH, noncondensing
Storage humidity	5% to 95% RH, noncondensing
Pollution Degree (IEC 60664)	2
Maximum altitude	2,000 m

Indoor use only.

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, NI WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste and Electronic Equipment, visit `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`.)

[1] The NI 9919 operating temperature assumes the NI 9919 is housing a CompactRIO cRIO-9068 with eight C Series modules installed and an NI PS-15 power supply. NI recommends that you verify the operating temperature of the NI 9919 when using other hardware configurations.

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 information about the services NI offers.

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

NI corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504, USA. For up-to-date contact information for your location, visit `ni.com/contact`.

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