



Hewlett Packard
Enterprise

HPE FlexNetwork MSR2000 Routers

Installation Guide

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Preparing for installation

The HPE MSR2000 Router Series includes the models in [Table 1](#).

Table 1 HPE MSR2000 Router Series models

Router model	Product code	HPE description	RMN
MSR2003	JG411A	HPE MSR2003 Router	BJNGA-BB0009
MSR2004-24	JG734A	HPE MSR2004-24 Router	BJNGA-BB0031
MSR2004-48	JG735A	HPE MSR2004-48 Router	BJNGA-BB0032

⚠ IMPORTANT:

For regulatory identification purposes, every MSR2000 router is assigned a regulatory model number (RMN). These regulatory model numbers should not be confused with the marketing name HPE MSR200X or the product codes.

Safety recommendations

Safety symbols

When reading this document, note the following symbols:

⚠ WARNING means an alert that calls attention to important information that if not understood or followed can result in personal injury.

⚠ CAUTION means an alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.

General safety recommendations

- Keep the chassis and installation tools away from walk areas.
- Make sure the ground is dry and flat and anti-slip measures are in place.
- Unplug all the external cables (including power cords) before moving the chassis.

Electricity safety

- Locate the emergency power-off switch in the room before installation. Shut the power off at once in case accident occurs. Disconnect the power cord of the router if necessary.
- Make sure the router is correctly grounded.
- Do not open or close the chassis cover when the router is powered on.
- Correctly connect the interface cables of the router.
- Use an uninterrupted power supply (UPS).
- Do not work alone when the router has power.
- Always make sure the power has been disconnected during the installation and replacement procedures.

Examining the installation site

The routers can only be used indoors. To make sure the router operates correctly and to prolong its service lifetime, the installation site must meet the following requirements.

Temperature and humidity

You must maintain the temperature and humidity in the equipment room at an acceptable level.

- Lasting high relative humidity tends to cause poor insulation, electricity creepage, mechanical property change of materials, and corrosion of metal parts.
- Lasting low relative humidity is likely to result in loose screws due to washer contraction, and even ESD, which causes the circuits to fail.
- A high temperature is the most undesirable condition, because it accelerates the aging of insulation materials and significantly lowers reliability and service life of the router.

For the temperature and humidity requirements of the MSR2000 router, see [Table 2](#).

Table 2 Temperature and humidity requirements

Temperature	Humidity
0°C to 45°C (32°F to 113°F)	5% to 90% (noncondensing)

Cleanness

Dust buildup on the chassis might result in electrostatic adsorption, which causes poor contact of metal components and contact points, especially when indoor relative humidity is low. In the worst case, electrostatic adsorption can cause communication failure.

Table 3 Dust concentration limit in the equipment room

Substance	Concentration limit (particles/m ³)
Dust particles	$\leq 3 \times 10^4$ (No visible dust on desk in three days.)
NOTE: Dust particle diameter $\geq 5 \mu\text{m}$	

The equipment room must also meet strict limits on salts, acids, and sulfides to eliminate corrosion and premature aging of components, as shown in [Table 4](#).

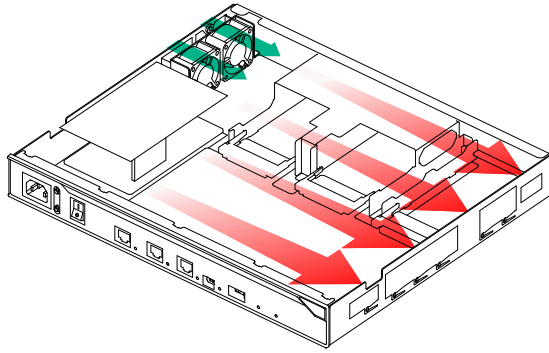
Table 4 Harmful gas limits in the equipment room

Gas	Max. (mg/m ³)
SO ₂	0.2
H ₂ S	0.006
NH ₃	0.05
Cl ₂	0.01

Cooling system

The MSR2000 router adopts left to right airflow for heat dissipation.

Figure 1 Airflow through the MSR2000 chassis



To ensure good ventilation, the following requirements must be met:

- The inlet and outlet air vents are not blocked, and leave at least 10 cm (3.94 in) of clearance.
- The installation site has a good cooling system.

ESD prevention

To prevent electrostatic discharge (ESD), follow these guidelines:

- Make sure the router and the floor are well grounded.
- Take dust-proof measures for the equipment room.
- Maintain the humidity and temperature at an acceptable level.
- Always wear an ESD wrist strap and ESD cloth when touching a circuit board or transceiver module.

An MSR2000 router does not supply an ESD wrist wrap. Prepare an ESD wrist wrap yourself.

- Place the removed interface module on an antistatic workbench, with the face upward, or put it into an antistatic bag.
- Touch only the edges, instead of electronic components when you observe or move a removed interface module.

To attach an ESD wrist strap:

1. Wear the wrist strap on your wrist.
2. Lock the wrist strap tight around your wrist to keep good contact with the skin.
3. Insert the ESD plug into the ESD socket.
4. Make sure the rack is well grounded.

△ CAUTION:

Check the resistance of the ESD wrist strap for safety. The resistance reading should be in the range of 1 to 10 megohm (Mohm) between human body and the ground.

EMI

All electromagnetic interference (EMI) sources, from outside or inside of the router and application system, adversely affect the router in a conduction pattern of capacitance coupling, inductance coupling, electromagnetic wave radiation, or common impedance (including grounding system) coupling. To prevent EMI, follow these guidelines:

- Take measures against interference from the power grid.

- Do not use the router together with the grounding equipment or lightning-prevention equipment of power equipment, and keep the router far away from them.
- Keep the router far away from high-power radio launchers, radars, and equipment with high frequency or high current.
- Use electromagnetic shielding when necessary.

Lightning protection

To better protect the MSR2000 router from lightning, do as follows:

- Make sure the grounding cable of the chassis is well grounded.
- Make sure the grounding terminal of the AC power receptacle is well grounded.
- Install a lightning arrester at the input end of the power supply to enhance the lightning protection capability of the power supply.
- Install a special lightning arrester at the input end of outdoor signal lines (for example, E1/T1 line) to which interface modules of the router are connected to enhance the lightning protection capability.

Rack-mounting

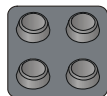
Before mounting the router in a rack, adhere to the following requirements:

- The rack is equipped with a good ventilation system.
- The rack is sturdy enough to support the router and its accessories.
- For heat dissipation and device maintenance, make sure the front and rear of the rack are at least 0.8 m (2.62 ft) away from walls or other devices, and the headroom in the equipment room is no less than 3 m (9.84 ft).

Installation accessories



Grounding cable
(provided)



Rubber pads
(provided)



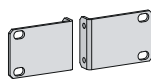
Cage nut
(user supplied)



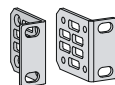
M6 screw
(user supplied)



M4 screw (provided)



MSR2003



MSR2004

Mounting bracket (provided)

Pre-installation checklist

Table 5 Pre-installation checklist

Item		Requirements	Result
Installation site	Ventilation	<ul style="list-style-type: none"> There is a minimum clearance of 10 cm (3.94 in) around the inlet and outlet air vents for heat dissipation of the router chassis. A good ventilation system is available at the installation site. 	
	Temperature	0°C to 45°C (32°F to 113°F).	
	Relative humidity	5% to 90% (noncondensing).	
	Cleanness	<ul style="list-style-type: none"> Dust concentration $\leq 3 \times 10^4$ particles/m³. No visible dust on desk within three days. 	
	ESD prevention	<ul style="list-style-type: none"> The equipment and floor are well grounded. The equipment room is dust-proof. The humidity and temperature are at an acceptable level. Wear an ESD wrist strap and uniform when touching a circuit board. Place the removed interface module on an antistatic workbench, with the face upward, or put it into an antistatic bag. Touch only the edges, instead of electronic components when observing or moving a removed interface module. 	
	EMI prevention	<ul style="list-style-type: none"> Take effective measures to protect the power system from the power grid system. Separate the protection ground of the router from the grounding device or lightning protection grounding device as far as possible. Keep the router far away from radio stations, radar and high-frequency devices working in high current. Use electromagnetic shielding when necessary. 	
	Lightning protection	<ul style="list-style-type: none"> The grounding cable of the chassis is well grounded. The grounding terminal of the AC power receptacle is well grounded. A port lightning arrester is installed. (Optional.) A power lightning arrester is installed. (Optional.) A signal lightning arrester is installed at the input end of an external signal cable. (Optional.) 	
	Electricity safety	<ul style="list-style-type: none"> Equip an uninterrupted power supply (UPS). In case of emergency during operation, switch off the external power switch. 	
	Workbench	<ul style="list-style-type: none"> The workbench is stable enough. The workbench is well grounded. 	
Rack-mounting requirements	<ul style="list-style-type: none"> The rack is equipped with a good ventilation system. The rack is sturdy enough to support the weight of the router and installation accessories. The size of the rack is appropriate for the router. The front and rear of the rack are at least 0.8 m (2.62 ft) away from walls or other devices. 		

Item	Requirements	Result
Safety precautions	<ul style="list-style-type: none"> • The router is far away from any moist area and heat source. • The emergency power switch in the equipment room is located. 	
Tools	<ul style="list-style-type: none"> • Installation accessories supplied with the router. • User supplied tools. 	
Reference	<ul style="list-style-type: none"> • Documents shipped with the router. • Online documents. 	

Installing the router



WARNING!

To avoid injury, do not touch bare wires, terminals, or parts with high-voltage hazard signs.



IMPORTANT:

- The barcode on the router chassis contains product information that must be provided to local sales agent before you return a faulty router for service.
 - Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Hewlett Packard Enterprise for permission. Otherwise, Hewlett Packard Enterprise shall not be liable for any consequence.
-

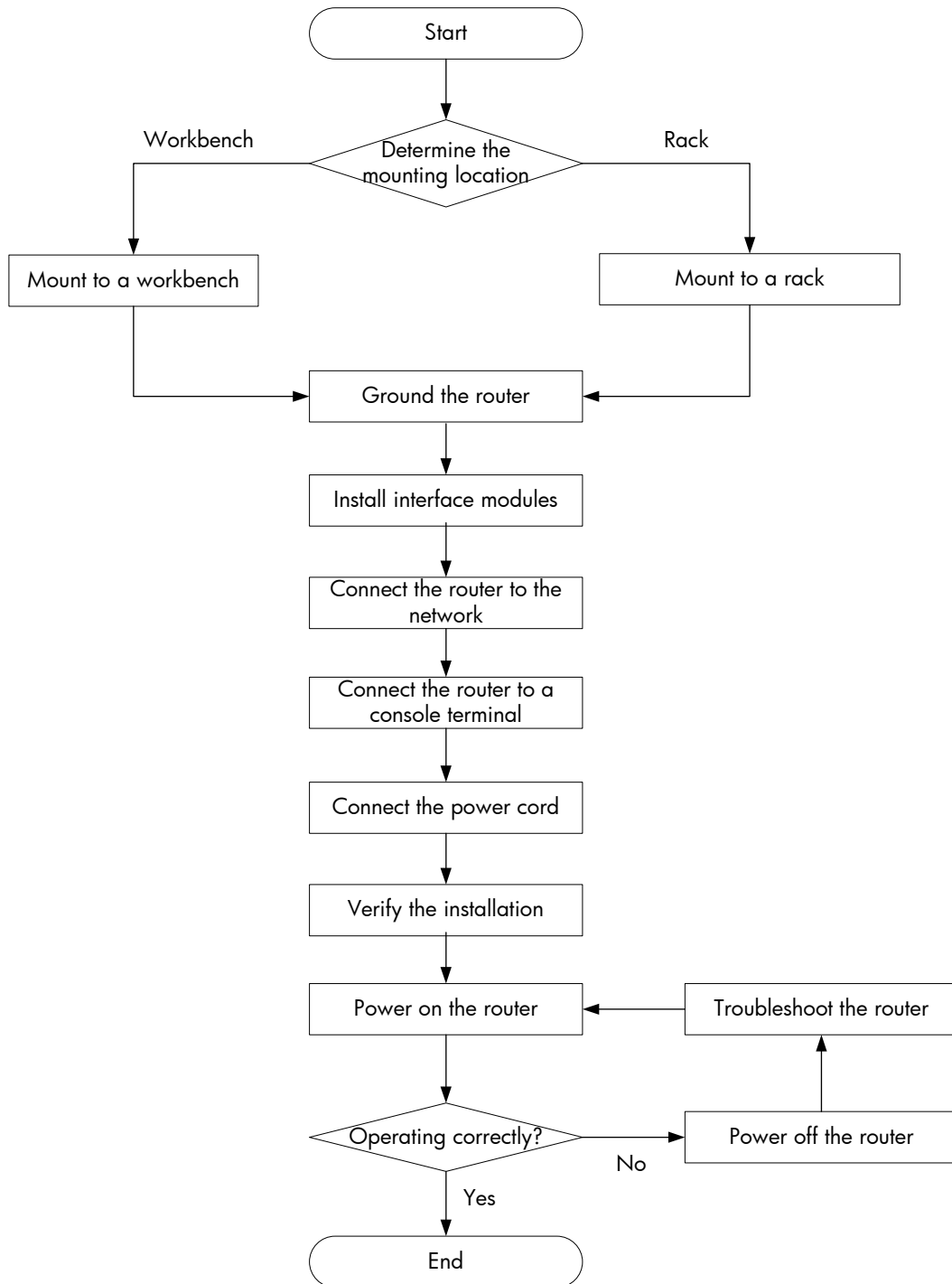
Installation prerequisites

- You have read "Preparing for installation" carefully.
- All requirements in "Preparing for installation" are met.

Installation flowchart

You can install the router on a workbench or on a rack. Select an installation method according to the installation environment, and follow the installation flowchart shown in [Figure 2](#).

Figure 2 Installation flowchart



Installing the router

Mounting the router on a workbench

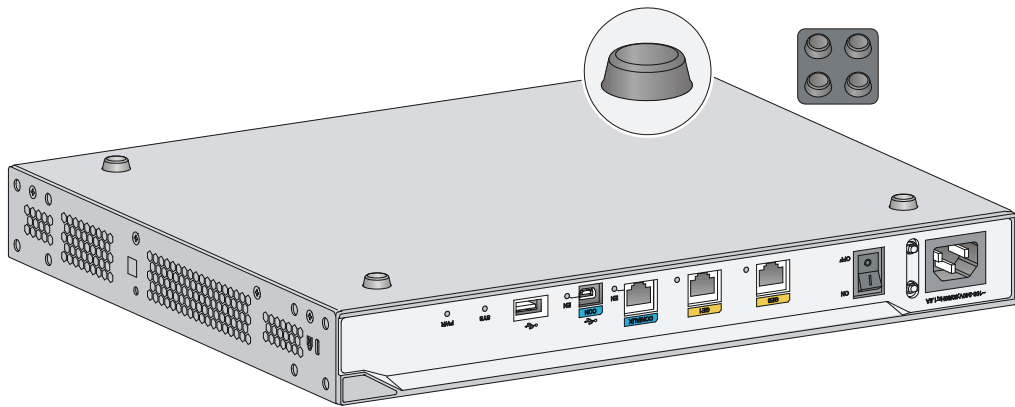
! IMPORTANT:

- Ensure good ventilation and 10 cm (3.94 in) of clearance around the chassis for heat dissipation.
 - Avoid placing heavy objects on the router.
-

To mount the router on a workbench:

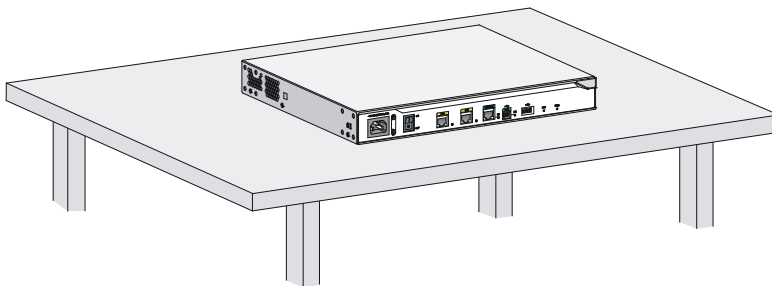
1. Make sure the workbench is clean, stable, and correctly grounded.
2. Place the router upside down on the workbench and attach the rubber feet to the four round holes in the chassis bottom.

Figure 3 Attaching the rubber feet



3. Place the router on the workbench with the upside up.

Figure 4 Mounting the router on a workbench



Mounting the router to a rack

Rack-mounting clearance requirements

Figure 5 MSR2003 rack-mounting clearance requirement

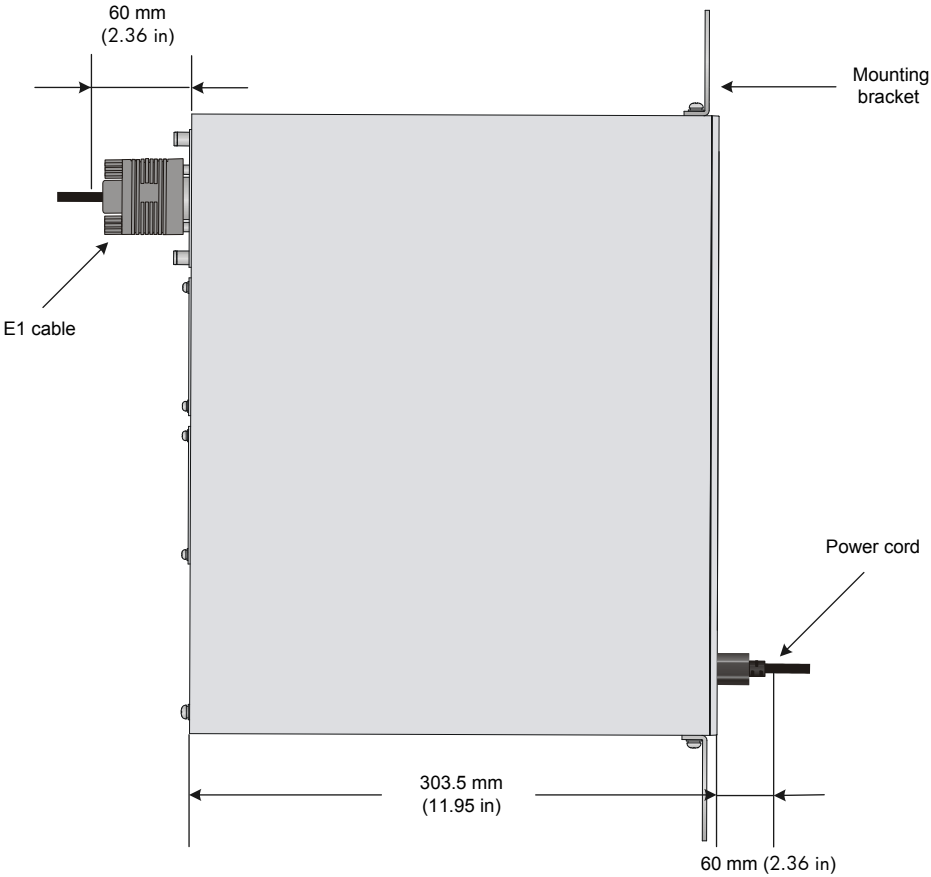


Figure 6 MSR2004-24 rack-mounting clearance requirement

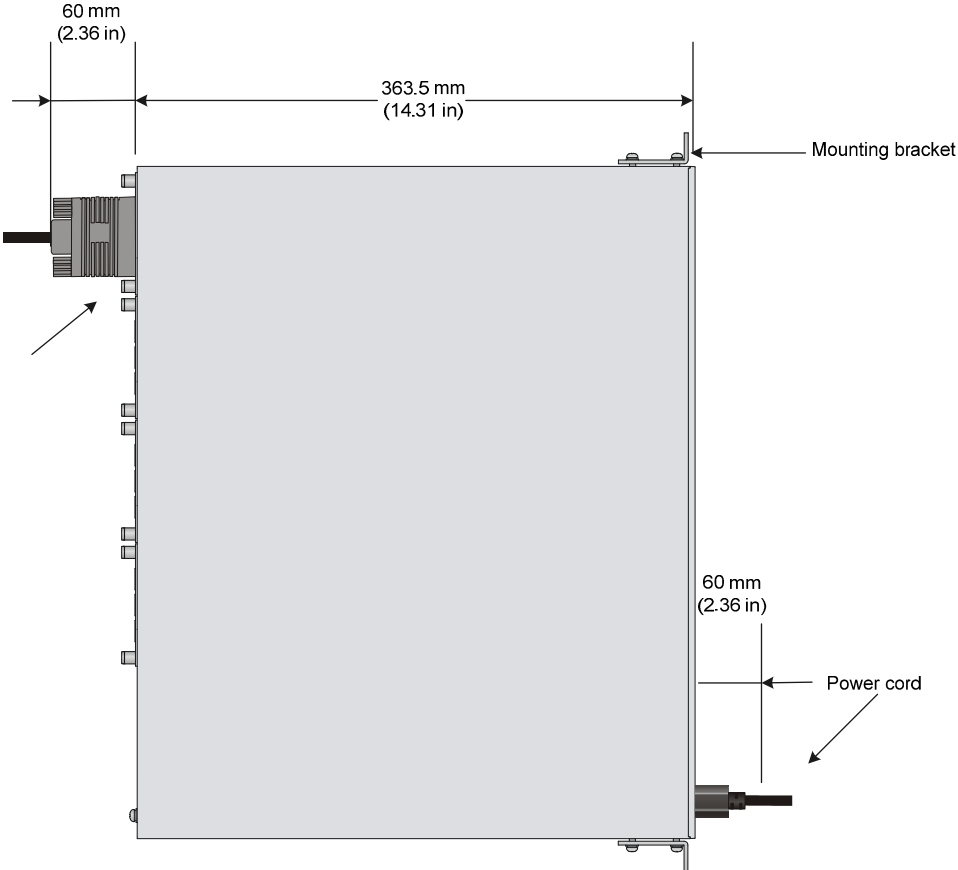


Figure 7 MSR2004-48 rack-mounting clearance requirement

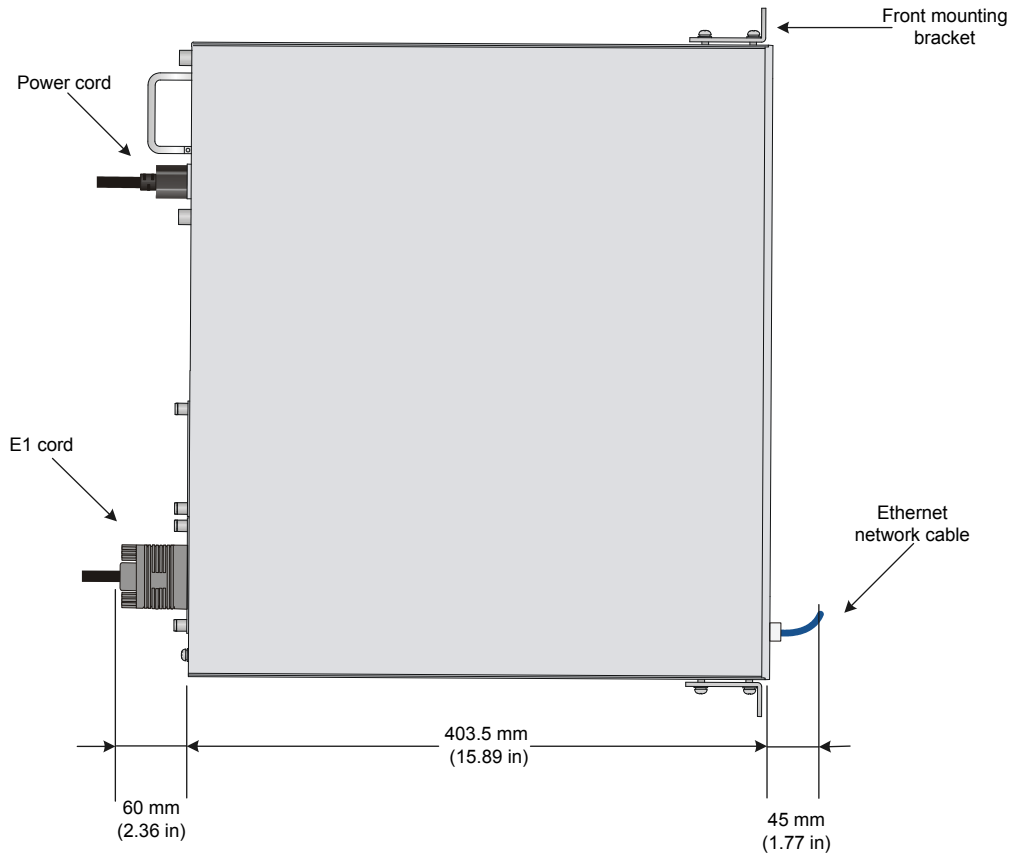


Table 6 Rack-mounting clearance requirements

Model	Router dimensions	Requirements for the rack
MSR2003	<ul style="list-style-type: none"> • Height—44.2 mm (1.74 in) (1 RU) • Width—360 mm (14.17 in) • Total depth—423.5 mm (16.67 in) <ul style="list-style-type: none"> ○ 303.5 mm (11.95 in) for the chassis ○ 60 mm (2.36 in) for connecting an AC power cord ○ 60 mm (2.36 in) for connecting an E1 cable 	<ul style="list-style-type: none"> • Depth—A minimum of 0.5 m (1.64 ft) • Distance from the front post to the front door—A minimum of 80 mm (3.15 in) • Distance from the front post to the rear door—A minimum of 370 mm (14.57 in)
MSR2004-24	<ul style="list-style-type: none"> • Height—44.2 mm (1.74 in), 1 RU • Width—440 mm (17.32 in) • Total depth—483.5 mm (19.04 in) <ul style="list-style-type: none"> ○ 363.5 mm (14.31 in) for the chassis ○ 60 mm (2.36 in) for connecting an AC power cord ○ 60 mm (2.36 in) for connecting an E1 cable 	<ul style="list-style-type: none"> • Depth—A minimum of 0.6 m (1.97 ft) • Distance from the front post to the front door—A minimum of 80 mm (3.15 in) • Distance from the front post to the rear door—A minimum of 420 mm (16.54 in)

Model	Router dimensions	Requirements for the rack
MSR2004-48	<ul style="list-style-type: none"> • Height—44.2 mm (1.74 in), 1 RU • Width—440 mm (17.32 in) • Total depth—508.5 mm (20.02 in) <ul style="list-style-type: none"> ○ 403.5 mm (15.89 in) for the chassis ○ 45 mm (1.77 in) for connecting an Ethernet network cable ○ 60 mm (2.36 in) for connecting an E1 cable 	<ul style="list-style-type: none"> • Depth—A minimum of 0.6 m (1.97 ft) • Distance from the front post to the front door—A minimum of 80 mm (3.15 in) • Distance from the front post to the rear door—A minimum of 460 mm (18.11 in)

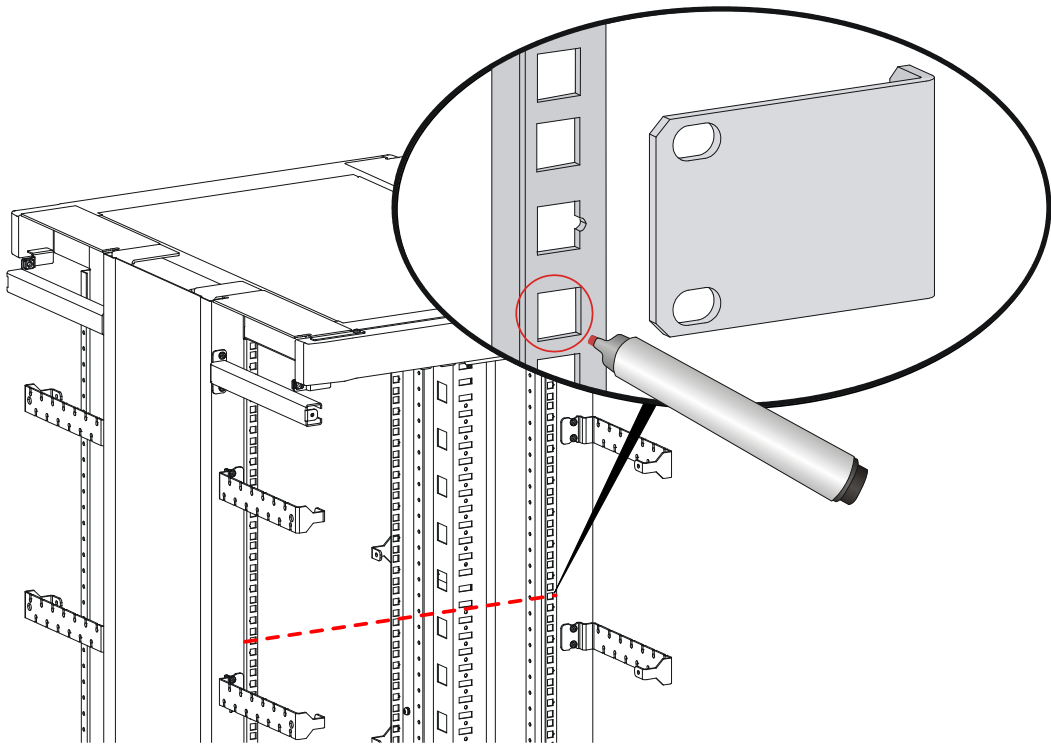
Mounting the router to a rack

WARNING!

The mounting brackets can only support the weight of the router. To avoid damage to the router, do not place any objects on the router.

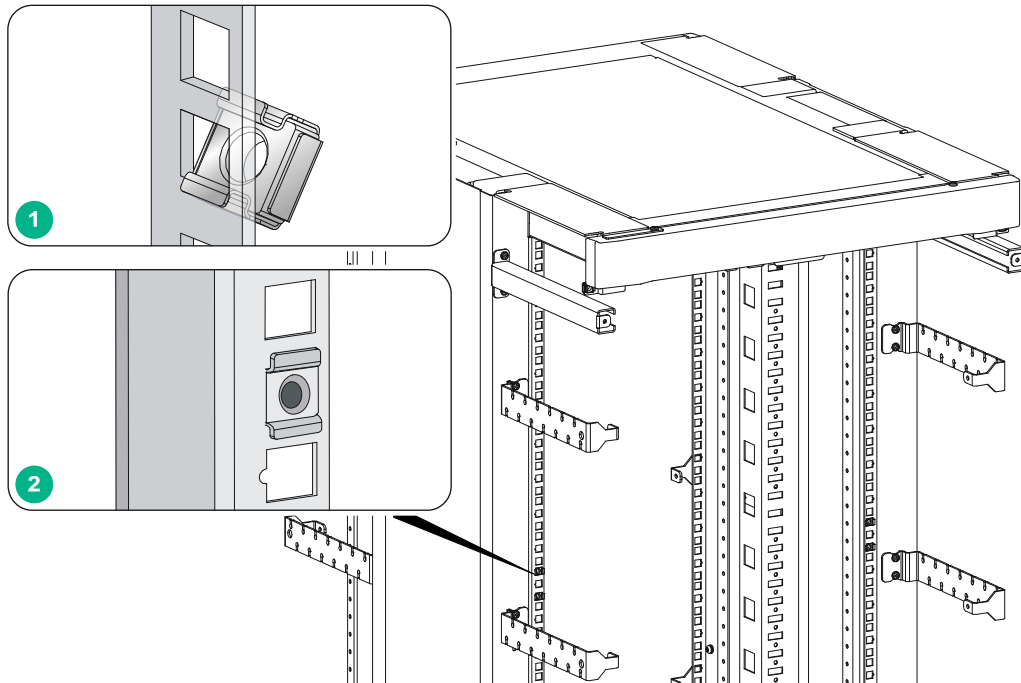
1. Use a mounting bracket to mark the positions of cage nuts on the front rack posts, making sure they are at the same level.

Figure 8 Marking the positions of cage nuts



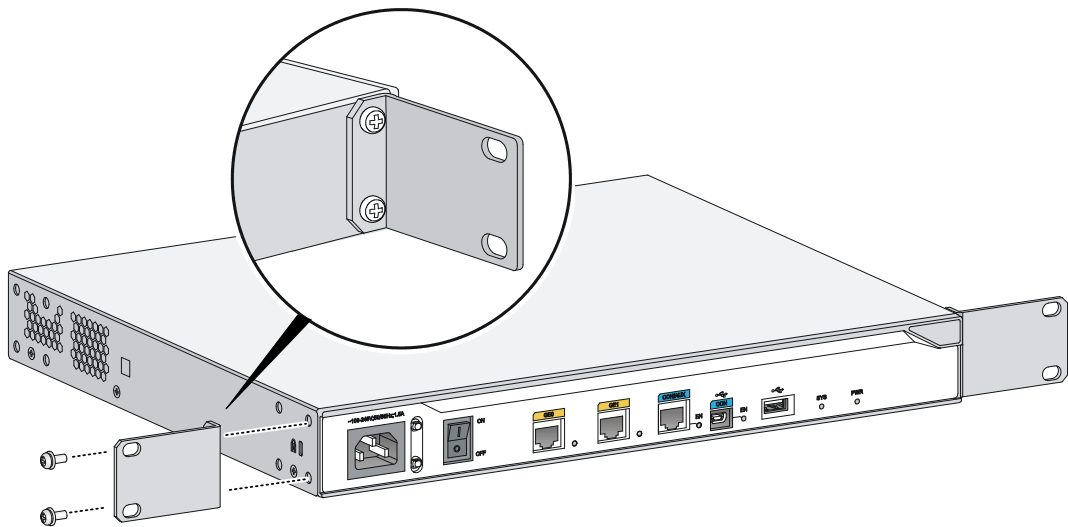
2. Insert one edge of a cage nut into the hole. Use a flat-blade screwdriver to compress the other edge of the cage nut, and then push the cage nut fully into the hole.

Figure 9 Installing cage nuts



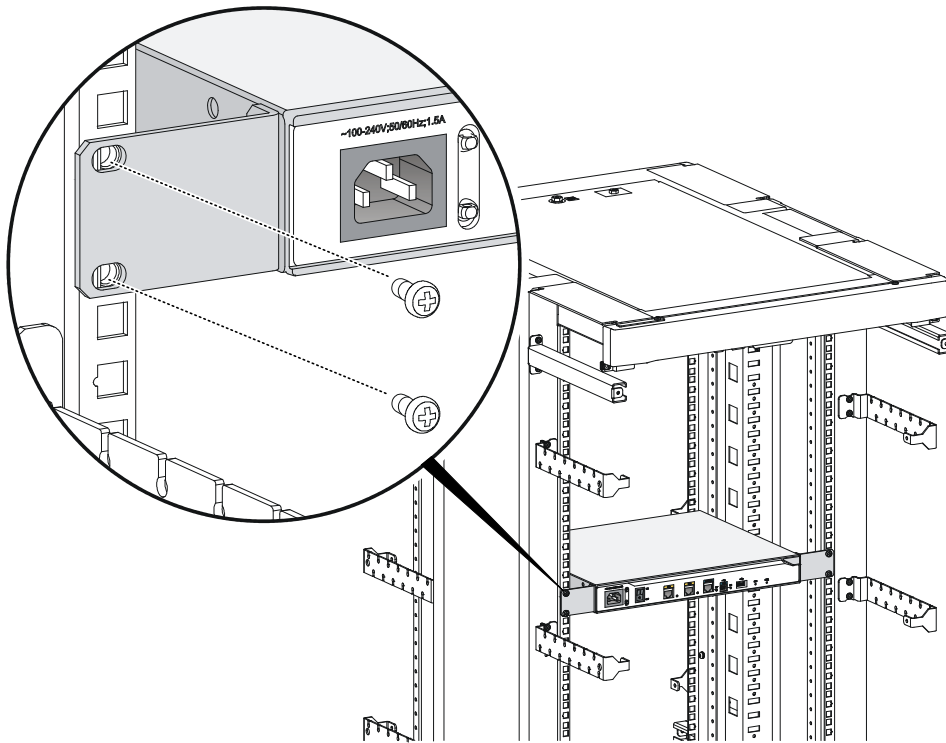
3. Repeat step 3 to install other cage nuts to all the marked positions on the rack posts.
4. Attach the mounting brackets to the two sides of the chassis and fasten the screws..

Figure 10 Attaching the front mounting brackets



5. Place the chassis on the rack and use M6 screws to attach the mounting brackets to the rack posts..

Figure 11 Securing the router to the rack



Grounding the router

⚠ WARNING!

Correctly connecting the router grounding cable is crucial to lightning protection and EMI protection.

ⓘ IMPORTANT:

The resistance reading should be smaller than 5 ohms between the chassis and the ground.

Grounding the router through the rack

ⓘ IMPORTANT:

Make sure the rack is correctly grounded before grounding the router.

To connect the grounding cable:

1. Remove the two grounding screws from the rear panel of the chassis.
2. Attach the grounding screw to the ring terminal of the grounding cable. See [Figure 12](#).
3. Use a Phillips screwdriver to fasten the grounding screw into the grounding screw hole.
4. Remove the grounding screw from the grounding point on the rack.
5. Use a needle-nose pliers to bend a hook at the other end of the grounding cable, attach it to the grounding point, and secure it with a screw. See [Figure 13](#).

Figure 12 Connecting the grounding cable to the grounding hole of the router

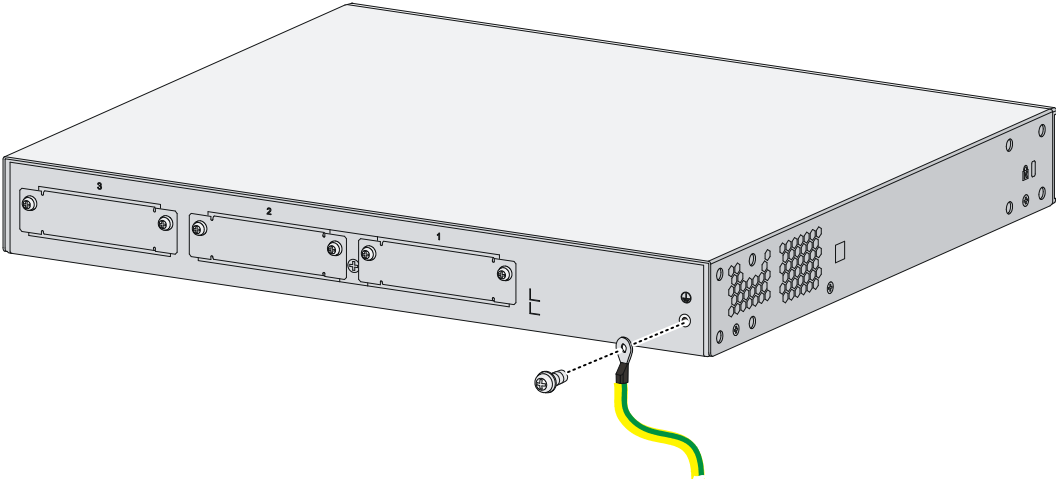


Figure 13 Grounding the router through the rack (1)

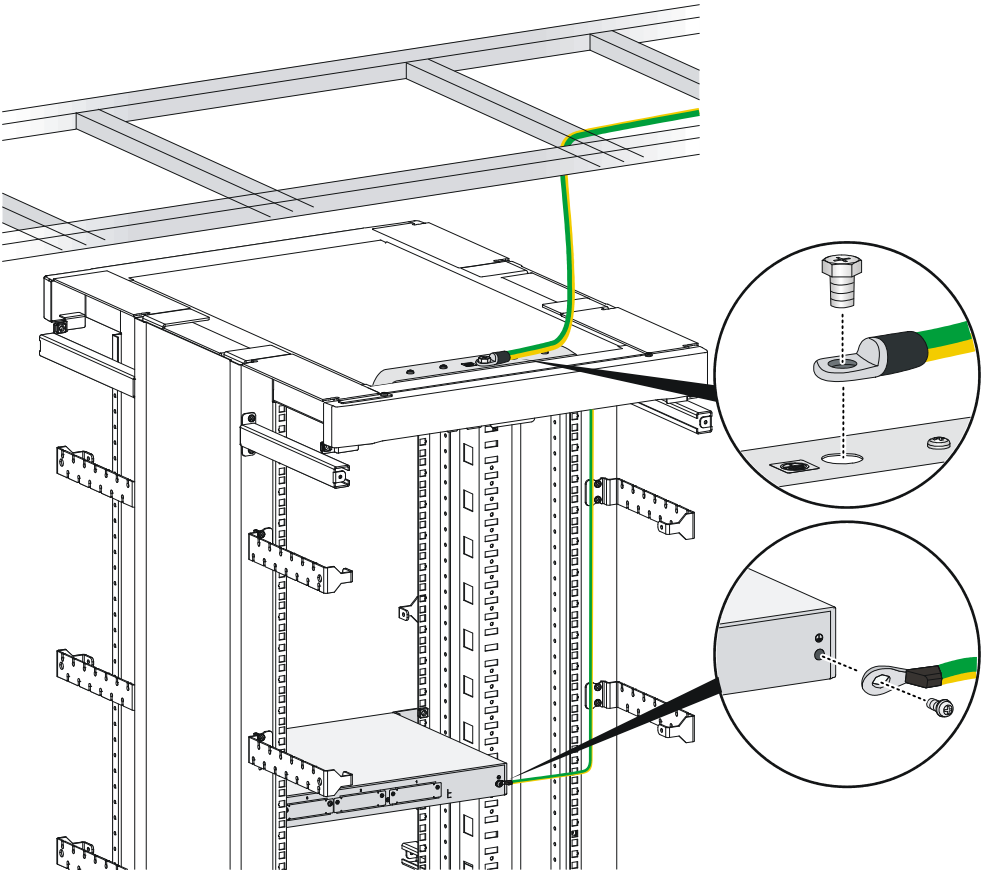
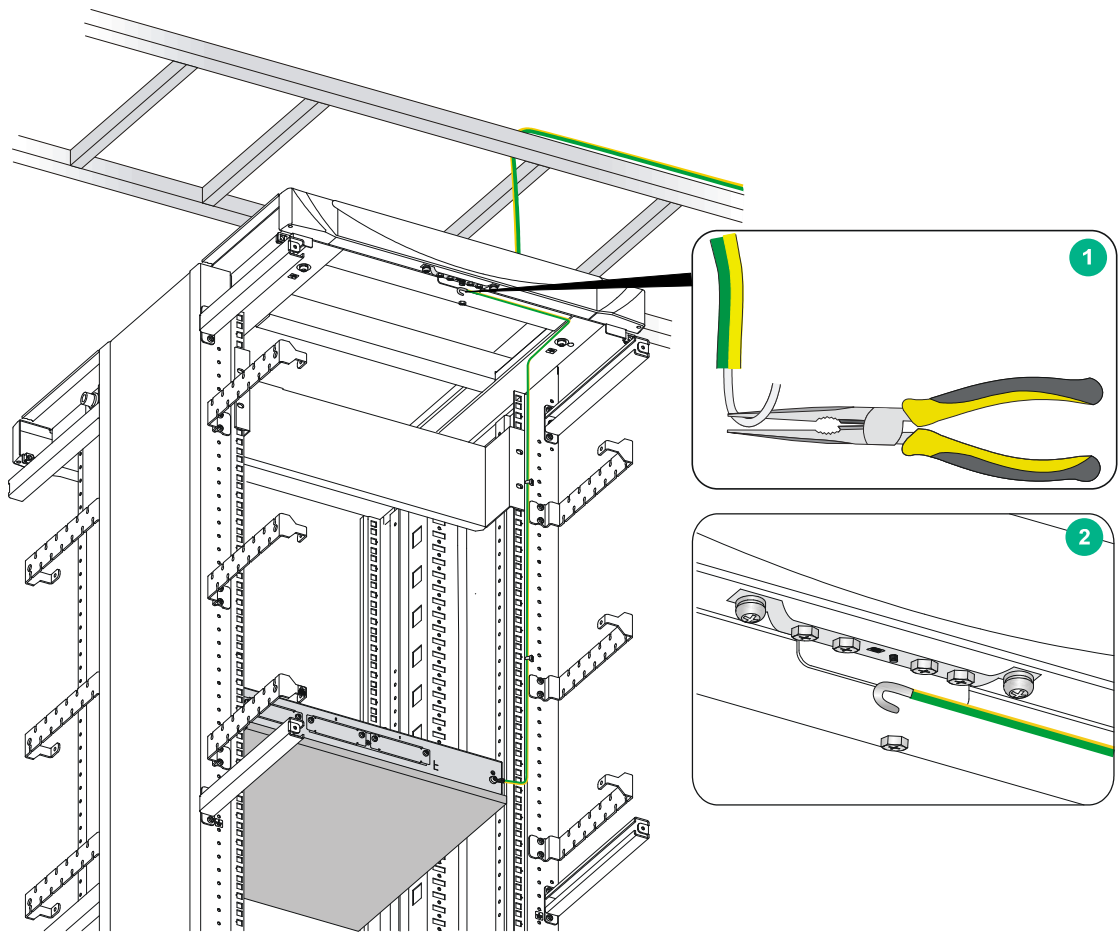


Figure 14 Grounding the router through the rack (2)

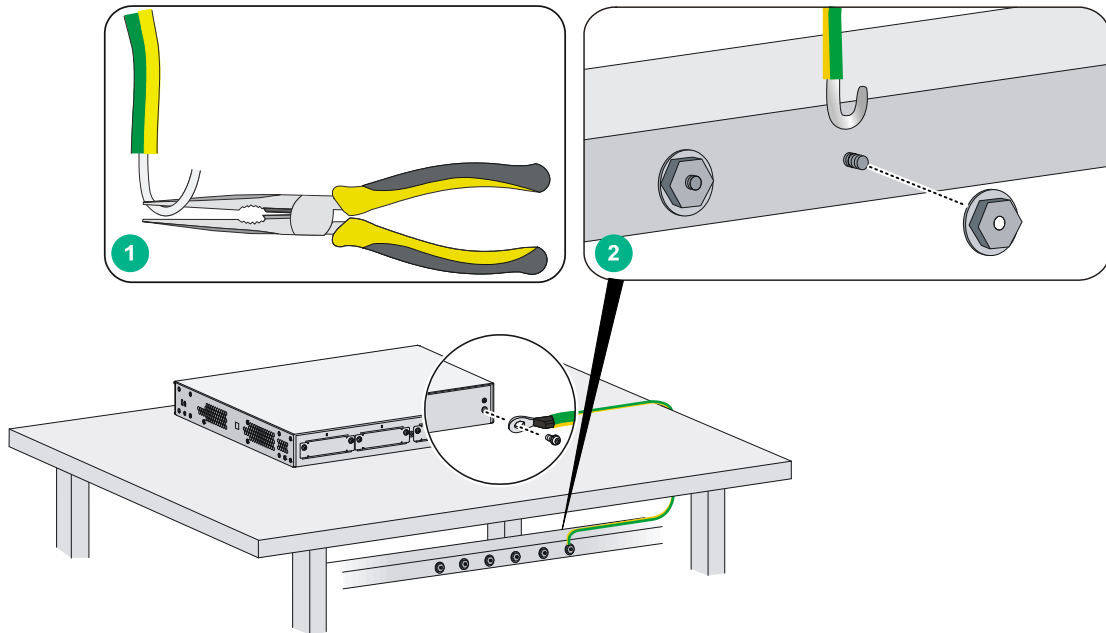


Grounding the router with a grounding strip

If a grounding strip is available at the installation site, connect the grounding cable to the grounding strip.

Follow the same procedures in "[Grounding the router through the rack](#)" to connect the grounding cable.

Figure 15 Grounding the router with a grounding strip



Grounding the router with a grounding conductor buried in the earth ground

If the installation site has no grounding strips, but earth ground is available, hammer a 0.5 m (1.64 ft) or longer angle iron or steel tube into the earth ground to serve as a grounding conductor. The steel tube must be zinc-coated. Weld the yellow-green grounding cable to the angle iron or steel tube and treat the joint for corrosion protection.

Installing an interface module

Installing a SIC

△ CAUTION:

SICs are not hot swappable. Make sure the router is powered off before installing a SIC.

To install a SIC:

1. Remove the fastening screws with a Phillips screwdriver to remove the filler panel. Keep the removed filler panel for future use.
2. Push the SIC slowly along the slide rails into the slot until it makes close contact with the backplane of the router.
3. Use a Phillips screwdriver to fasten the captive screws on the SIC.

Figure 16 Removing the filler panel

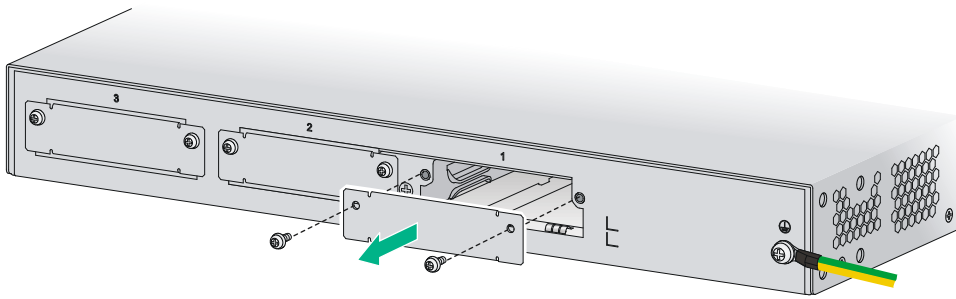
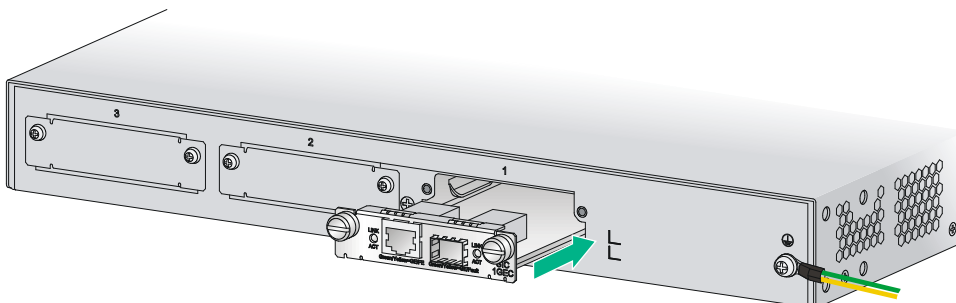


Figure 17 Installing a SIC



Installing a DSIC

⚠ CAUTION:

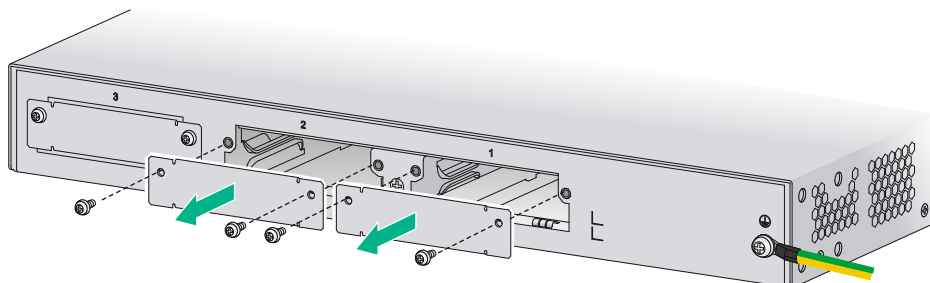
DSICs are not hot swappable. Make sure the router is powered off before installing a DSIC.

The MSR2004 router does not support DSICs.

To install a DSIC:

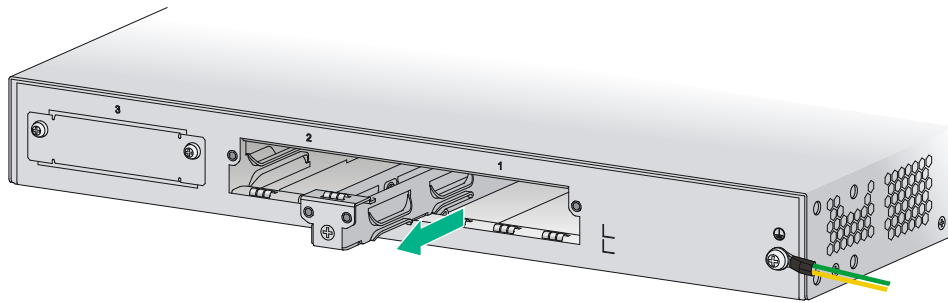
1. Remove the screws on the filler panel on slot 1 and slot 2 of the router to remove the filler panel.

Figure 18 Removing the filler panel



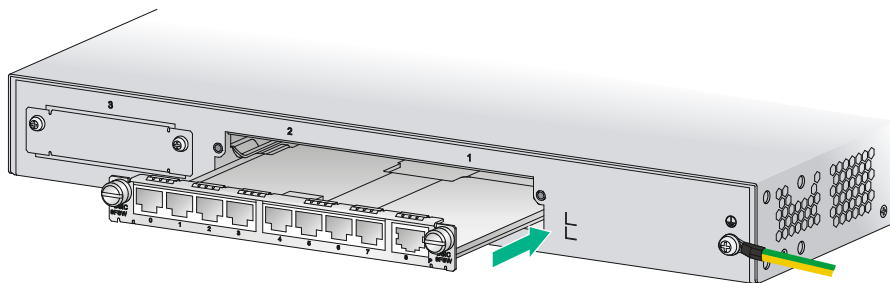
2. Loosen the captive screws on the slot divider and pull out the slot divider.

Figure 19 Removing the slot divider



3. Insert the DSIC into the slot and push it along the slide rails until it makes close contact with the backplane of the router.

Figure 20 Installing a DSIC



4. Fasten the captive screws to secure the DSIC.

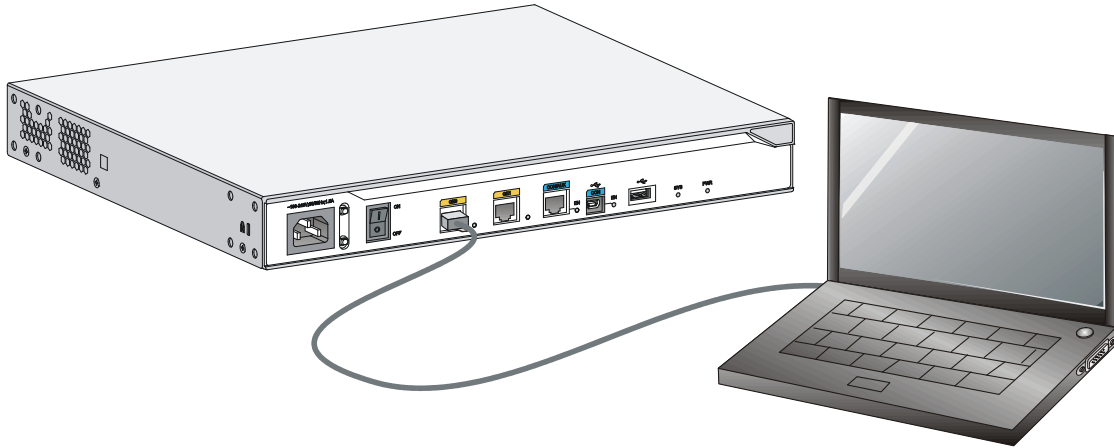
Connecting the router to the network

Connect the router to the network before powering on the router. This section describes how to connect the router to the network through Ethernet cables. For other connection methods, see *HPE MSR Router Series Interface Module Guide*.

To connect an Ethernet cable:

1. Plug one end of an Ethernet twisted pair cable into the copper Ethernet port (RJ-45 port) to be connected on the router.
2. Plug the other end of the cable into the RJ-45 port of the peer device.

Figure 21 Connecting the router to a PC



Logging in to the router

At the first login, you can access an MSR2003 router through the console port by using a console cable or through the USB console port by using a USB cable. You can only access an MSR2004 router through the console port by using a console cable.

Connecting a console cable

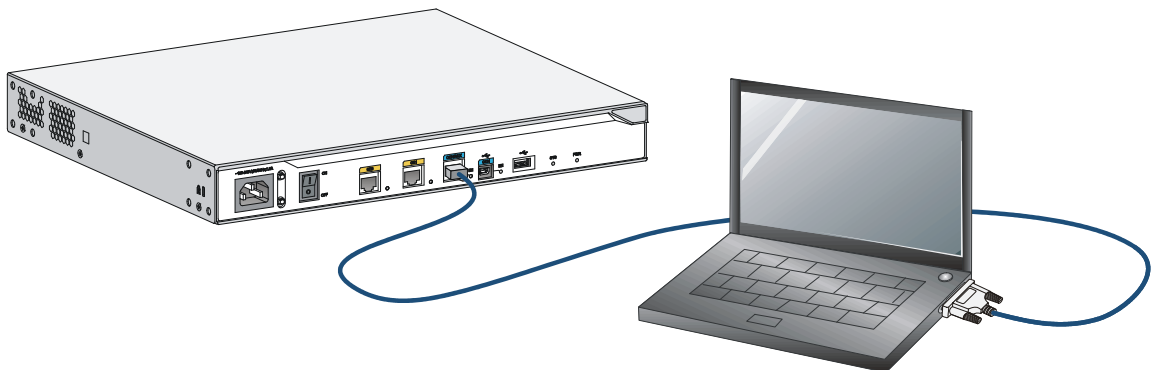
! **IMPORTANT:**

When you connect a PC to a powered-on router, connect the RJ-45 connector to the router after connecting the DB-9 connector of the console cable to the PC.

To connect a console cable:

1. Plug the DB-9 female connector to the serial port of the configuration terminal.
2. Connect the RJ-45 connector to the console port of the router.

Figure 22 Connecting a console cable



Connecting a USB cable

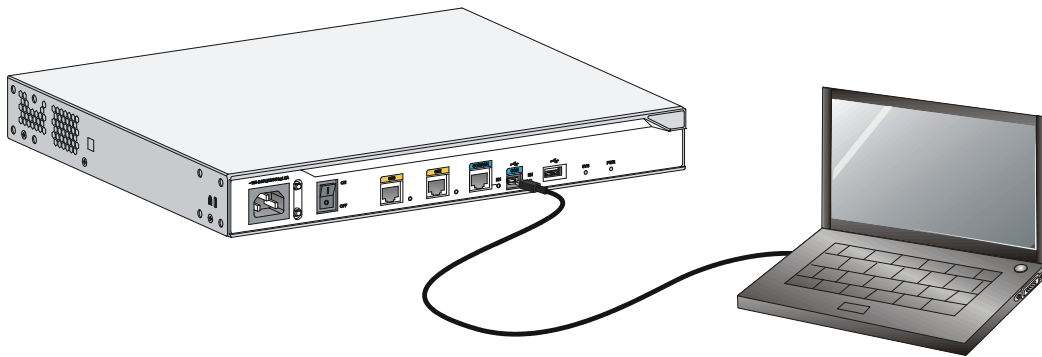
! **IMPORTANT:**

Download and install the USB console driver program before configuring the device when you connect the device through a USB console cable.

To connect a USB cable:

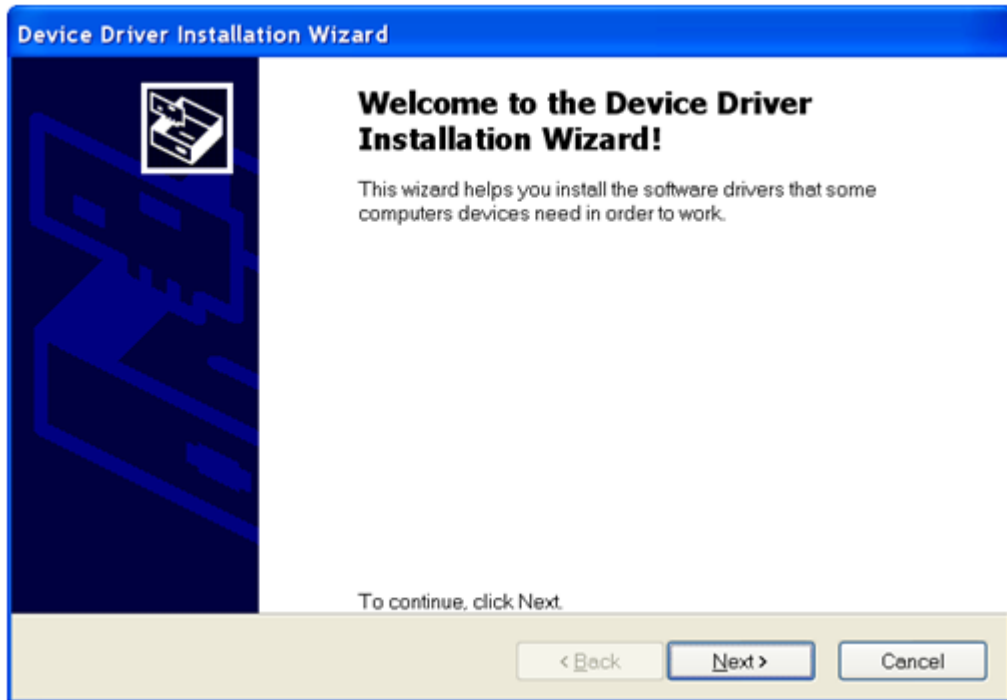
1. Connect the USB port to the PC.
2. Connect the other end to the USB console port of the router.

Figure 23 Connecting a USB cable



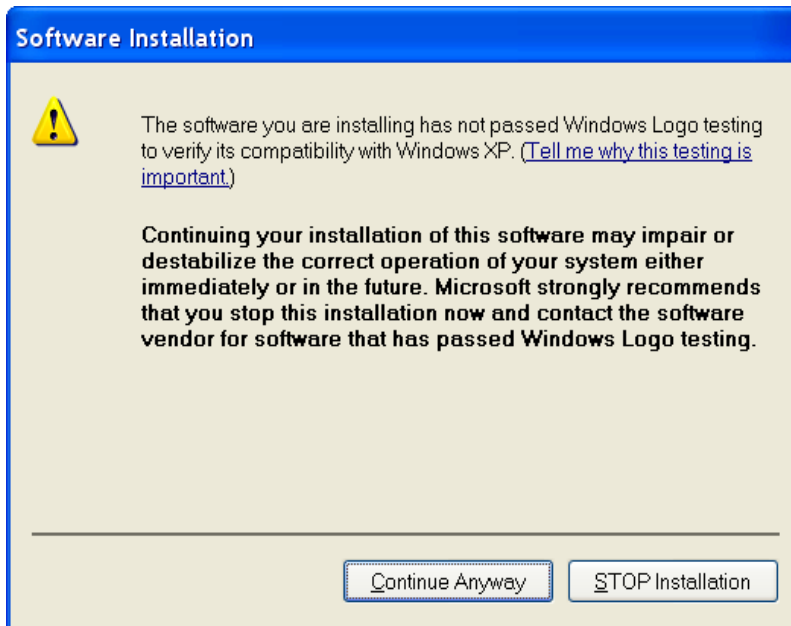
3. Click the following link, or copy it to the address bar on the browser to log in to download page of the USB console driver, and download the driver.
<http://www.exar.com/connectivity/uart-and-bridging-solutions/usb-uart/xr21v1410>
4. Select a driver program according to the operating system you use:
 - **XR21V1410_XR21B1411_Windows_Ver1840_x86_Installer.EXE**—Applicable to 32-bit operating systems.
 - **XR21V1410_XR21B1411_Windows_Ver1840_x64_Installer.EXE**—Applicable to 32-bit operating systems.
5. Click **Next** on the installation wizard.

Figure 24 Device driver installation wizard



6. Click **Continue Anyway** if the following dialog box appears.

Figure 25 Software installation



7. Click **Finish**.

Figure 26 Completing the device driver installation wizard



Setting terminal parameters

To access the device through the console port, you must run a terminal emulator program (HyperTerminal, PuTTY, or Tera Term) on the configuration terminal. For information about using a terminal emulator program, see the program's user guide.

The following are the required terminal settings:

- **Baud rate**—9600.
- **Data bits**—8.
- **Stop bits**—1.
- **Parity**—none.
- **Flow control**—none.

Installing power supplies

△ CAUTION:

Do not install AC and DC power supplies on the same router.

The MSR2004-48 router supports both AC and DC power supplies. The power supplies are hot swappable on the MSR2004-48 router.

To install a power supply:

1. Loosen the captive screws on the filler panel in the target slot with a Phillips screwdriver to remove the filler panel from the slot.
Keep the removed filler panel for future use.
Skip this step if the router is shipped with this slot empty.

2. Holding the handle of the power supply with one hand and supporting the bottom of the power supply with the other hand, insert the power supply slowly along the slide rails until it makes close contact with the backplane.
3. Use a Phillips screwdriver to fasten the captive screws on the two sides of the power supply.

Figure 27 Installing an AC power supply for the MSR2004-48 router

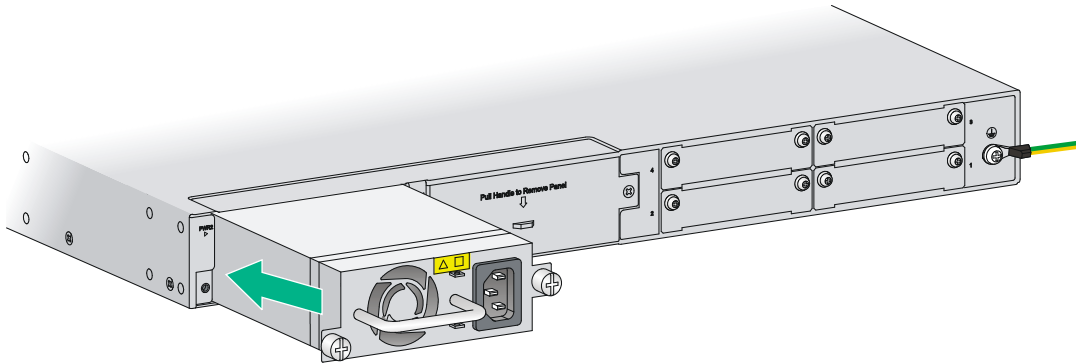
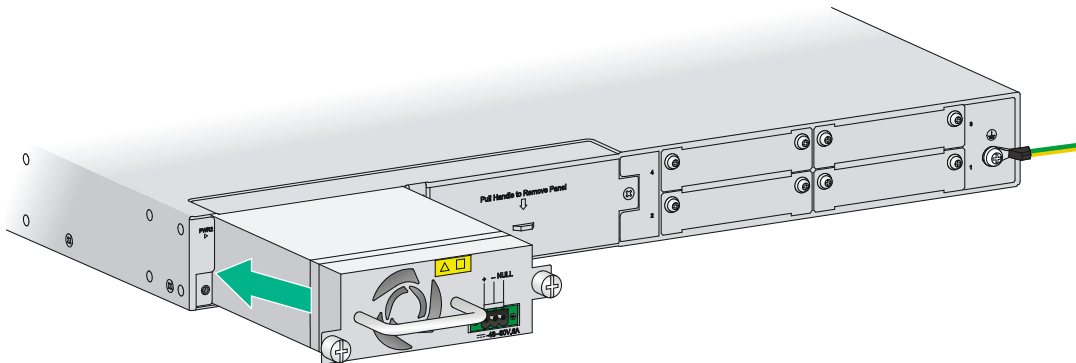


Figure 28 Install a DC power supply for the MSR2004-48 router



Connecting a power cord

The power cords in the figures are for illustration only.

Connecting an AC power cord

1. Make sure the router is correctly grounded, and the power switch on the router is in the OFF position.
2. Connect one end of the AC power cord to the AC receptacle on the router, and use a cable tie to secure the power cord.
3. Connect the other end of the power cord to the AC power source.

Figure 29 Connecting an AC power cord to the MSR2003 router

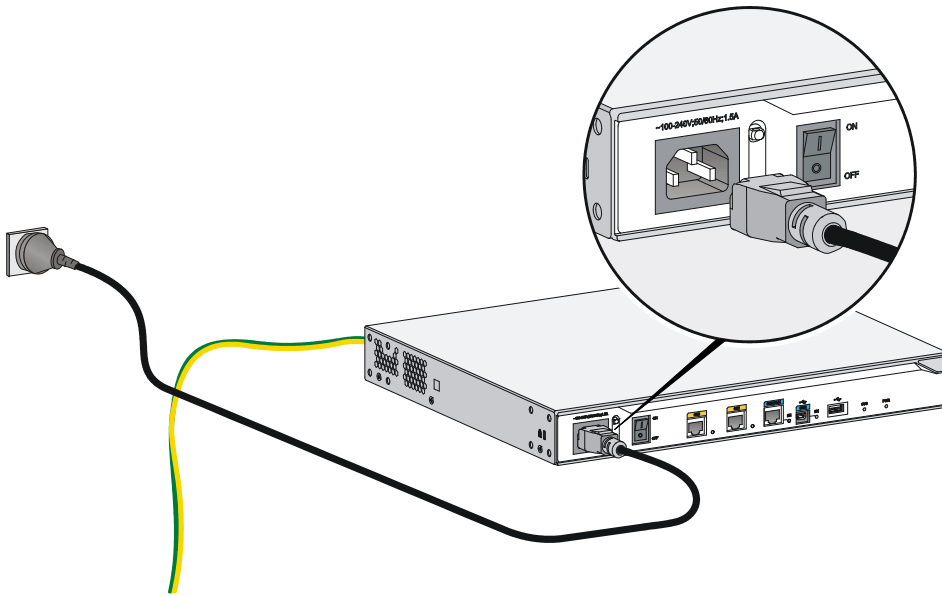
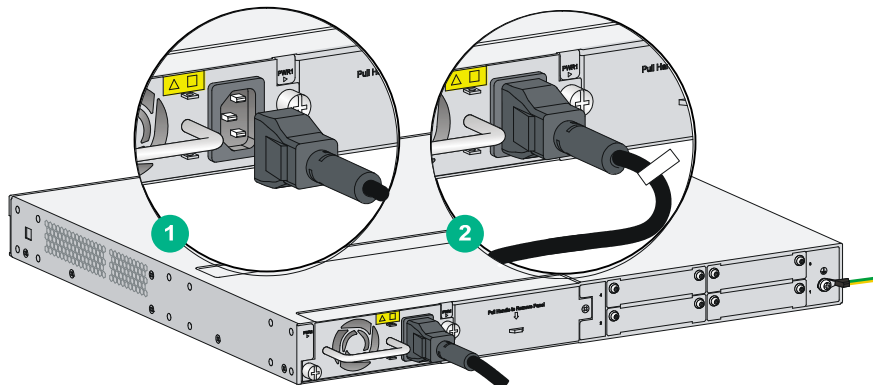


Figure 30 Connecting an AC power cord to the MSR2004 router



Connecting a DC power cord

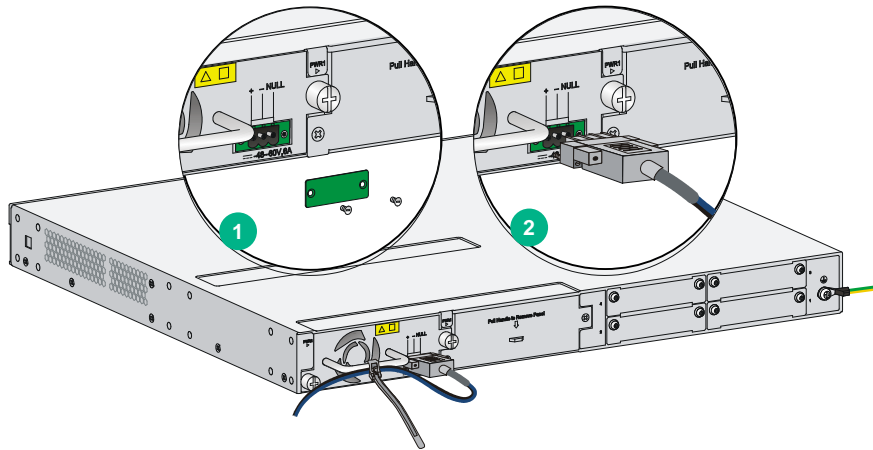
△ CAUTION:
Pay attention to the mark on a DC power cord to avoid connection errors.

You can connect a DC power cord to only the MSR2004-48 router.

To connect a DC power cord:

1. Make sure the router is correctly grounded, and the power switch on the router is in the OFF position.
2. Loosen the captive screws on the power supply with a Phillips screwdriver to remove the protective cover from the power supply.
3. Connect one end of the DC power cord supplied with the router to the DC receptacle on the router, and the other end to the DC power source.

Figure 31 Connecting a DC power cord to the MSR2004-48 router



Verifying the installation

After you complete the installation, verify that:

- There is enough space for heat dissipation around the router, and the rack or workbench is stable.
- Interface modules are correctly installed.
- The router, rack, and power cord are correctly grounded.
- The correct power source is used.

Powering on the router

Verifying before power-on

Before powering on the router, verify the following items:

- The power supplies are correctly installed.
- The power cord and grounding cable are correctly connected.
- The power source voltage meets the requirement of the router.
- The console cable is correctly connected, the terminal or PC used for configuration has started, and the configuration parameters have been set.
- If a CF card is used, verify that the CF card is in position.
- Make sure the installed HMIMs/MIMs are in position.

Powering on the router

1. Turn on the switch of the power supply system for the router.
2. Turn on the switch of the AC or DC power supplies.

Displaying boot information

Power on the router, and you can see the following information:

```
System is starting...
```

Press Ctrl+D to access BASIC-BOOTWARE MENU...

Booting Normal Extended BootWare

The Extended BootWare is self-decompressing...Done.

```
*****
*
*           HPE MSR2003 BootWare, Version 1.50           *
*
*****
Copyright (c) 2010-2015 Hewlett Packard Enterprise Development LP.
```

```
Compiled Date      : Feb 17 2013
CPU ID            : 0x1
Memory Type       : DDR3 SDRAM
Memory Size       : 1024MB
Flash Size        : 2MB
Nand Flash size   : 256MB
CPLD Version      : 2.0
PCB Version       : 3.0
```

BootWare Validating...

Press Ctrl+B to access EXTENDED-BOOTWARE MENU...

Loading the main image files...

Loading file flash:/msr2000-cmw710-system-e000603.bin.....
..Done.

Loading file flash:/msr2000-cmw710-security-e000603.bin...Done.

Loading file flash:/msr2000-cmw710-voice-e000603.bin....Done.

Loading file flash:/msr2000-cmw710-data-e000603.bin....Done.

Loading file flash:/msr2000-cmw710-boot-e000603.bin.....Done.

Image file flash:/msr2000-cmw710-boot-e000603.bin is self-decompressing.....
.....Done.

System image is starting...

Line aux0 is available.

Press ENTER to get started.

Press **Enter**, and the following prompt appears:

<HPE>

You can now configure the router.

Examining the router after power-on

After the router is powered on, verify that:

- The LEDs on the front panel are operating correctly:

LED	Status	Description
PWR	Steady green	The power supply is supplying power correctly.
SYS	Slow flashing green	The router is operating correctly.

- The configuration terminal displays information correctly. For local configuration, the configuration terminal displays the boot information (see "[Displaying boot information](#)").
- If you press **Enter** as prompted after system bootup, the router is ready to configure.

Configuring basic settings for the router

After the router is powered on for the first time, configure the basic settings for the router. For more information, see *HPE MSR Routers Fundamentals Configuration Guide (V7)* and *HPE MSR Routers Fundamentals Command Reference (V7)*.

Replacement procedure

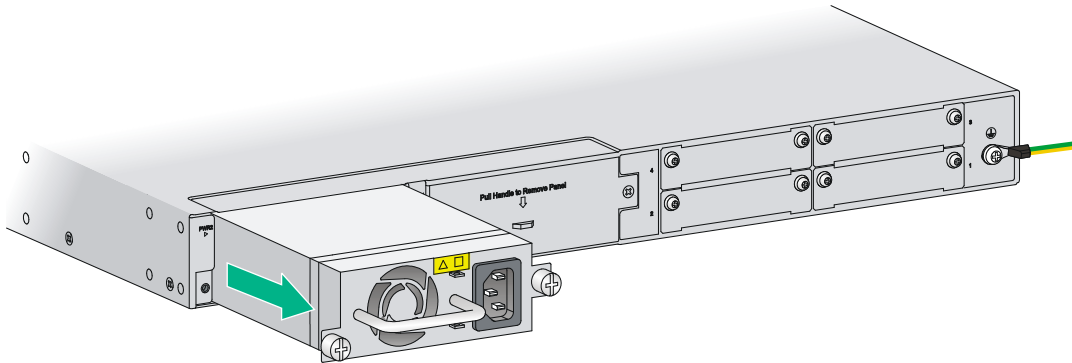
Replacing a power supply

The power supplies are hot swappable.

To replace a power supply:

1. Use a Phillips screwdriver to remove the captive screws on the power supply.
2. Holding the power supply handle with one hand and supporting the bottom of the power supply with the other, gently pull the power supply out from the slot.
3. Put the removed power supply on a workbench or in an anti-static bag.
4. Install a new power supply. For information about installing a power supply, see "Installing the router."
If no power supply is installed, install a filler panel into the slot.

Figure 32 Removing a power supply



Replacing a SIC

1. Completely loosen the captive screws of the SIC.
2. Gently pull the SIC out along the slide rails.
3. Install a new SIC. For the installation procedure, see "Installing the router."
If you do not install a SIC, install a filler panel and tighten the screws.

Figure 33 Removing the SIC

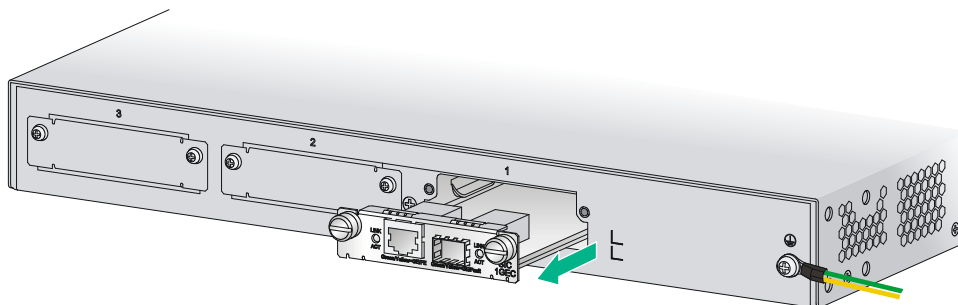
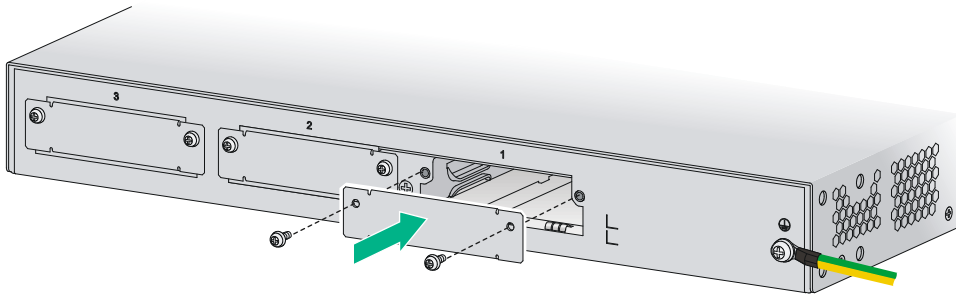


Figure 34 Installing a filler panel



Replacing a DSIC

1. Completely loosen the captive screws of the DSIC.
2. Gently pull the DSIC out along the slide rails.
If you need to install a DSIC or SICs, see "Installing the router" for the installation procedure.
To install filler panels, proceed to steps 3 and 4.
3. Gently push the slot divider into the DSIC slot along the slide rails and tighten the screws.
4. Install the filler panels and tighten the screws.

Figure 35 Removing a DSIC

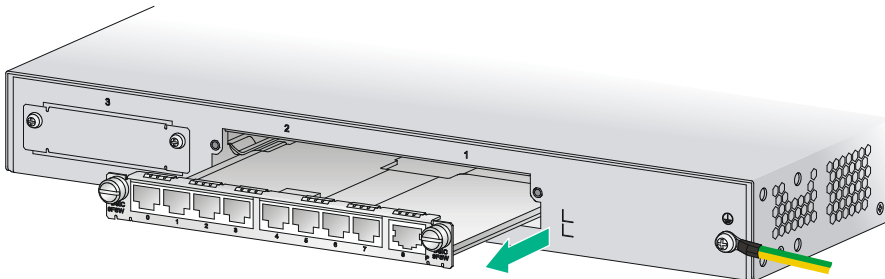


Figure 36 Installing the slot divider

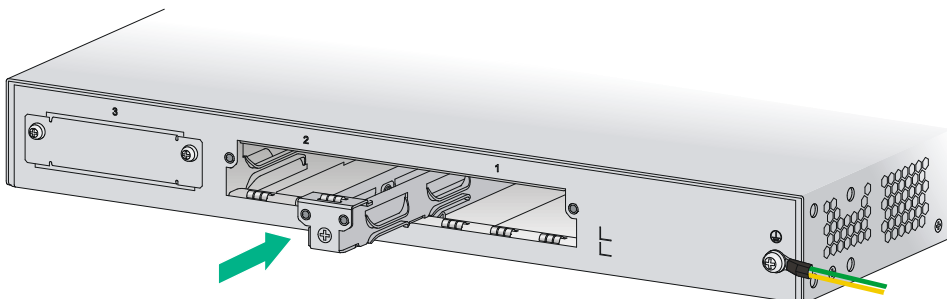
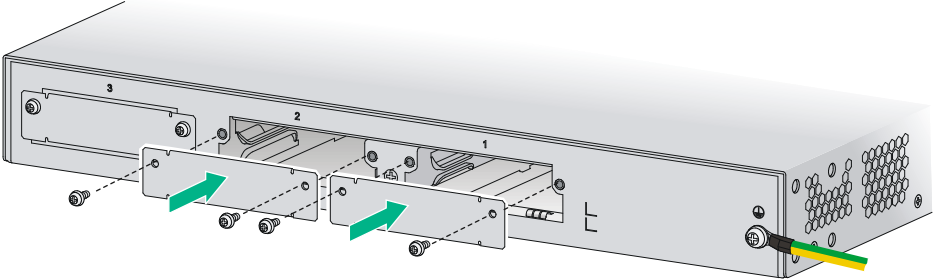


Figure 37 Installing filler panels



Troubleshooting

ⓘ IMPORTANT:

- The barcode on the router chassis contains product information that must be provided to local sales agent before you return a faulty router for service.
 - Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Hewlett Packard Enterprise for permission. Otherwise, Hewlett Packard Enterprise shall not be liable for any consequence.
-

Troubleshooting the power supply system failure

Symptom

The router cannot be powered on. The power LED on the front panel is off.

Solution

1. Turn off the power switch of the power source.
2. Verify that the power cord of the router is correctly connected to the router and the power source.
3. Verify that the power source is operating correctly.
4. Verify that the power cord is in good condition.
5. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting fan failures

Symptom

After the router starts up, the following error message appears on the configuration terminal:

```
%Jun 22 16:11:37:485 2010 HPE DEV/4/FAN FAILED:  
Fan 1 failed.
```

Solution

1. Verify that the fans are in position.
2. Examine whether any obstacle enters the chassis and blocks the fans.
3. Examine whether any fan stops rotating.
4. Turn off the power switch.
5. If a fan has stopped rotating without being blocked, contact Hewlett Packard Enterprise Support to have the fan replaced.
6. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting the configuration system failures

If the router operates properly after being powered on, the boot information is displayed on the configuration terminal. If the configuration system is faulty, the configuration terminal displays garbled characters or does not display anything.

No display on the configuration terminal

Symptom

After the router is powered on, the console terminal does not display anything.

Solution

Follow these steps to troubleshoot the configuration system failures first:

1. Verify that the power supply system is operating correctly.
2. Verify that the console cable is properly connected.

If the cause cannot be located in the steps above, the possible reasons are as follows:

- The console cable is connected to an incorrect serial port (the serial port in use is not the one set on the configuration terminal).
- The properties of the configuration terminal are incorrect. You must configure the configuration terminal as follows: set **Bits per second** to **9600**, **Data bits** to **8**, **Parity** to **None**, **Stop bits** to **1**, **Flow control** to **None**, and **Terminal Emulation** to **VT100**.
- The console cable is broken.

Garbled characters on the configuration terminal

Symptom

After the router is powered on, the configuration terminal displays garbled characters.

Solution

Verify that the **Data bits** field is set to **8** for the configuration terminal. If the **Data bits** field is set to **5** or **6**, the configuration terminal displays garbled characters.

No response from the serial port

Symptom

No boot information is displayed on the configuration terminal when the router starts up or restarts up.

Solution

Verify that the serial cable is in good condition and the serial port properties are correct.

Troubleshooting interface module, cable, and connection failure

Symptom

After an interface module is installed and the router is powered on, the LEDs on the interface module panel indicate that the interface module is operating improperly.

Solution

1. Verify that the interface module makes good contact with the rear panel of the router slot.
2. Verify that the router supports the interface module.
3. Verify that the interface module is installed in the specified router slot.
4. Verify that a correct cable is used.

5. Verify that the cable is correctly connected.

Restoring the factory settings

Scenario 1

Symptom

When you replace the router, the router password is lost. As a result, you cannot log in to the router and do not know the router configuration.

Solution

Because the router is replaced, you do not need to save the configuration of the router. In this case, you can press the **Reset** button for more than 4 seconds to reboot the router and restore the factory settings. Then, you can use the username and password shipped with the router to log in to the router.

When the router configuration must be saved and you have a console cable, you can log in to the router through the BootWare menu.

Scenario 2

Symptom

After the configuration is modified, the network connectivity is lost. When you check the configuration, the configuration is very complicated and it is hard to locate the errors. In this case, you must configure the router again.

Solution

If you have not saved any configuration, you can reboot the router by pressing the **Reset** button for a short time or power off the router.

If you have saved some configurations, you can use the CLI to delete the configuration file.

Then, you can press the **Reset** button to restore the factory settings.

Scenario 3

Symptom

The router crashes.

Solution

Press the **Reset** button for a short time to reboot the router.

Reset button usage guidelines

An MSR2004 router provides the **Reset** button. You can use the button to reboot the system or restore the factory settings.

- Press the **Reset** button for a short time to reboot the router.
- Press the **Reset** button for more than 4 seconds to reboot the router and restore the factory settings.

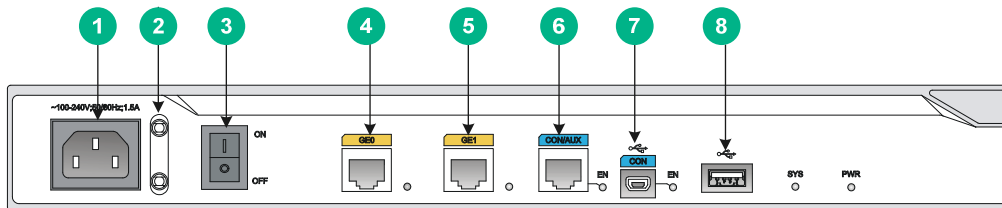
Appendix A Chassis views and technical specifications

Chassis views

The following figures are for illustration only.

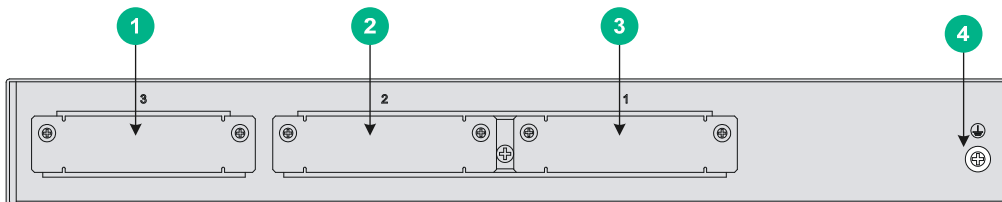
MSR2003

Figure 38 Front view



-
- | | | |
|---------------------------------|---------------------------------|--------------------------------|
| (1) AC-input power receptacle | (2) Power cord bail latch | (3) Power switch |
| (4) Gigabit Ethernet port (GE0) | (5) Gigabit Ethernet port (GE1) | (6) Console/AUX port (CON/AUX) |
| (7) USB console port (CON) | (8) USB port | |
-

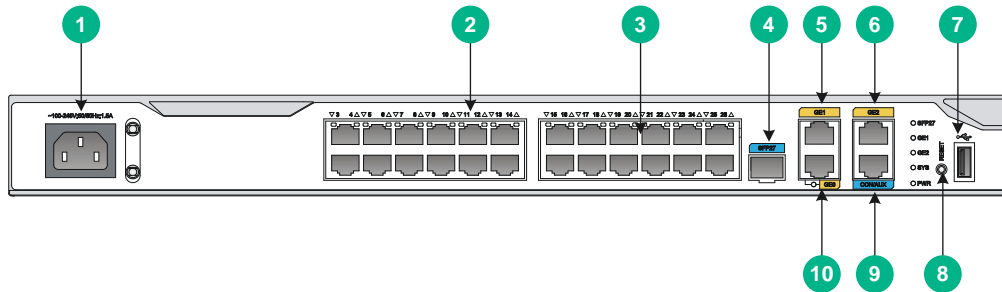
Figure 39 Rear view



-
- | | |
|-----------------------|------------------------|
| (1) SIC slot (slot 3) | (2) SIC slot (slot 2) |
| (3) SIC slot (slot 1) | (4) Grounding terminal |
-

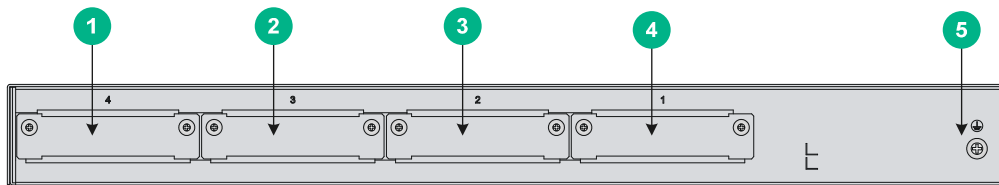
MSR2004-24

Figure 40 Front view



(1) AC-input power receptacle	(2) Gigabit Ethernet port (GE3 to GE14)	(3) Gigabit Ethernet port (GE15 to GE26)
(4) SFP port (SFP27)	(5) Gigabit Ethernet port (GE1)	(6) Gigabit Ethernet port (GE2)
(7) USB port	(8) Reset button (RESET)	(9) Console/AUX port (CON/AUX)
(10) Gigabit Ethernet port (GE0)		

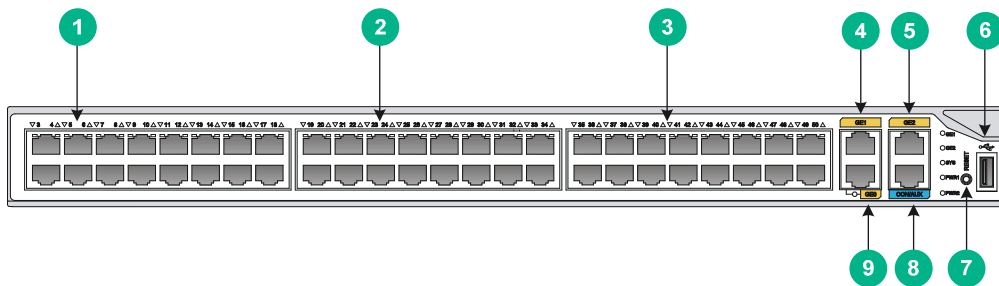
Figure 41 Rear view



(1) SIC slot (Slot 4)	(2) SIC slot (Slot 3)	(3) SIC slot (Slot 2)
(4) SIC slot (Slot 1)	(5) Grounding terminal	

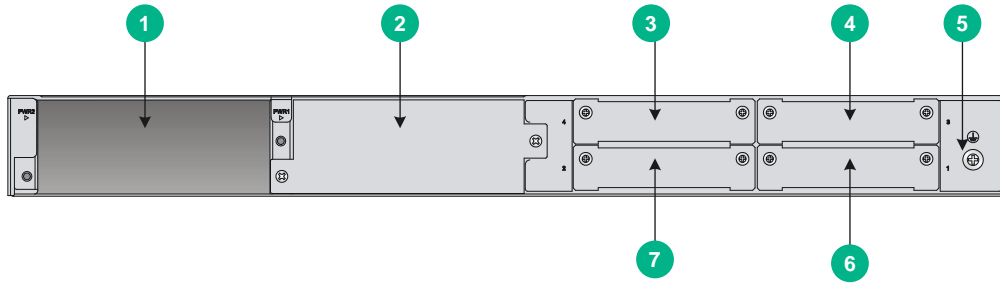
MSR2004-48

Figure 42 Front view



(1) Gigabit Ethernet port (GE3 to GE18)	(2) Gigabit Ethernet port (GE19 to GE34)	(3) Gigabit Ethernet port (GE35 to GE50)
(4) Gigabit Ethernet port (GE1)	(5) Gigabit Ethernet port (GE2)	(6) USB port
(7) Reset button (RESET)	(8) Console/AUX port (CON/AUX)	(9) Gigabit Ethernet port (GE0)

Figure 43 Rear view



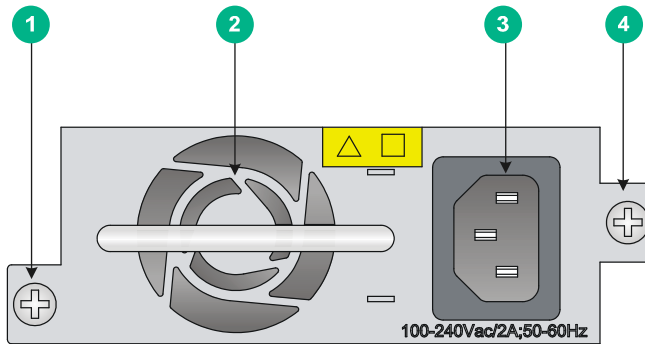
(1) Power supply slot (PWR2)	(2) Power supply slot (PWR1)	(3) SIC slot (Slot 4)
(4) SIC slot (Slot 3)	(5) Grounding terminal	(6) SIC slot (Slot 1)
(7) SIC slot (Slot 2)		

Power supplies

One power supply can meet the power requirement of the router. You can install two power supplies for redundancy.

AC power supply

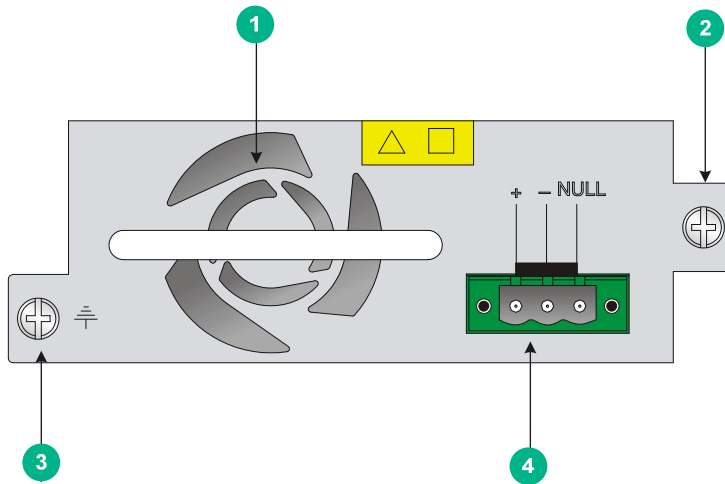
Figure 44 AC power supply for the MSR2004-48 router



(1) Captive screw	(2) Fan
(3) Power receptacle	(4) Captive screw

DC power supply

Figure 45 DC power supply for the MSR2004-48 router



- | | |
|-------------------|----------------------|
| (1) Fan | (2) Captive screw |
| (3) Captive screw | (4) Power receptacle |

Technical specifications

Table 7 Technical specifications

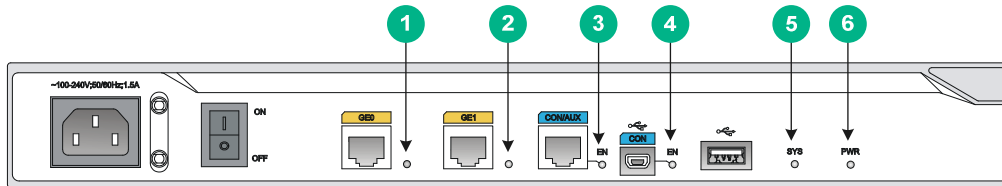
Item	MSR2003	MSR2004-24	MSR2004-48
Console/AUX port	1	1	1
USB console port	1	N/A	N/A
USB port	1	1	1
GE WAN port	2	3	3
GE LAN port	N/A	24	48
SFP port	N/A	1	N/A
Memory	1 GB DDR3	1 GB DDR3	1 GB DDR3
Flash/CF	256 MB flash	256 MB CF card	256 MB CF card
SIC/DSIC slot	3 SIC slots (1 DSIC slot.)	4 SIC slots	4 SIC slots
Dimensions (H × W × D) (excluding rubber feet and mounting brackets)	44.2 × 360 × 305.3 mm (1.74 × 14.17 × 12.02 in)	44.2 × 440 × 363.5 mm (1.74 × 17.32 × 14.31 in)	44.2 × 440 × 403.5 mm (1.74 × 17.32 × 15.89 in)
AC power supply	<ul style="list-style-type: none"> • Rated voltage range—100 VAC to 240 VAC @ 50 Hz/60 Hz • Rated power—54 W 	<ul style="list-style-type: none"> • Rated voltage range—100 VAC to 240 VAC @ 50 Hz/60 Hz • Rated power—54 W 	<ul style="list-style-type: none"> • Rated voltage range—100 VAC to 240 VAC @ 50 Hz/60 Hz • Rated power—150 W

Item	MSR2003	MSR2004-24	MSR2004-48
DC power supply	N/A	N/A	<ul style="list-style-type: none"> • Rated voltage range—48 VDC to -60 VDC • Rated power—150 W
Operating temperature	0°C to 45°C (32°F to 113°F)		
Relative humidity (noncondensing)	5% to 90%		

Appendix B LEDs

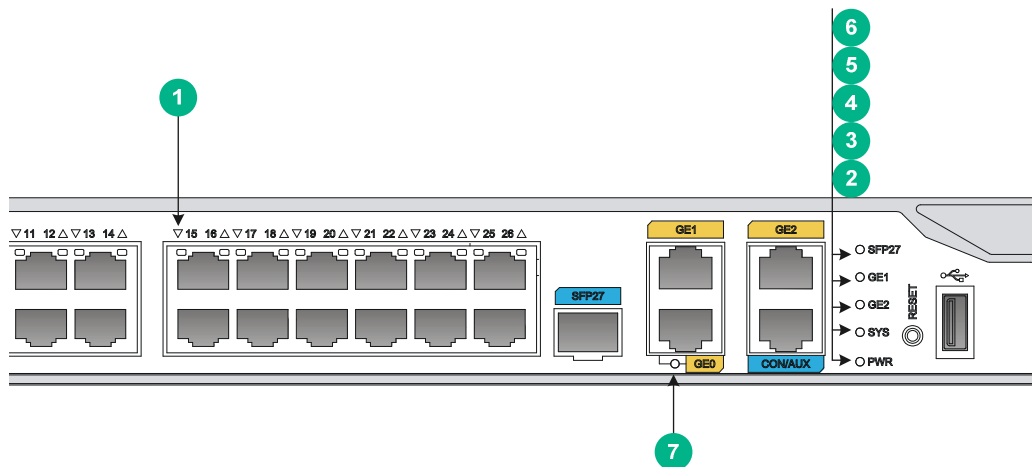
Panel LEDs

Figure 46 MSR2003 LEDs



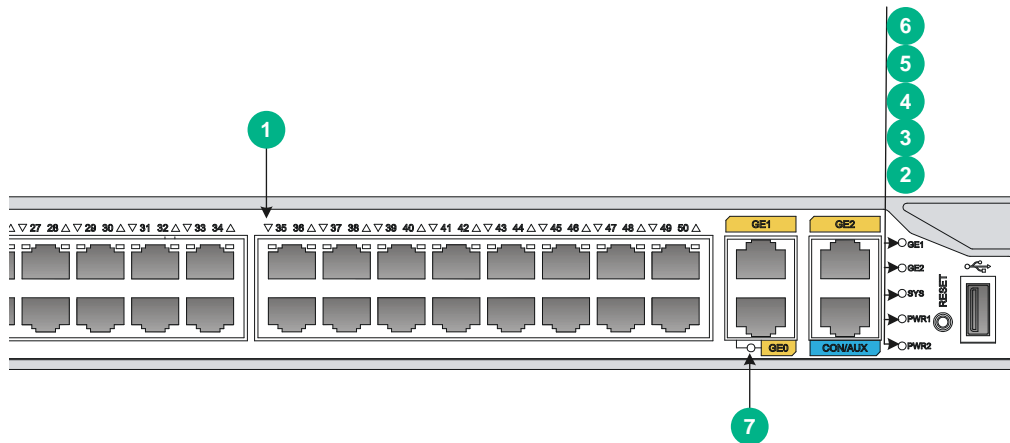
- | | | |
|-------------------------------------|-------------------------------------|----------------------------|
| (1) Gigabit Ethernet port LED (GE0) | (2) Gigabit Ethernet port LED (GE1) | (3) Console port LED |
| (4) USB console port LED | (5) System status LED (SYS) | (6) Power supply LED (PWR) |

Figure 47 MSR2004-24 LEDs



- | | | |
|---|-------------------------------------|-----------------------------|
| (1) Gigabit Ethernet port LED (GE3 to GE26) | (2) Power supply LED (PWR) | (3) System status LED (SYS) |
| (4) Gigabit Ethernet port LED (GE2) | (5) Gigabit Ethernet port LED (GE1) | (6) SFP port LED (SFP27) |
| (7) Gigabit Ethernet port LED (GE0) | | |

Figure 48 MSR2004-48 LEDs



-
- (1) Gigabit Ethernet port LED (GE3 to GE50) (2) Power supply LED (PWR2) (3) Power supply LED (PWR1)
-
- (4) System status LED (SYS) (5) Gigabit Ethernet port LED (GE2) (6) Gigabit Ethernet port LED (GE1)
-
- (7) Gigabit Ethernet port LED (GE0)
-

LED description

LED	State	Description
System status LED (SYS)	Flashing green (1 Hz)	Comware has started with the configuration file and the router has booted up.
	Flashing green (8 Hz)	The BootWare runs.
	Steady green	The SDRAM is performing self-test.
	Flashing yellow (1 Hz)	The DDR3 SDRAM has failed the self-test.
	Flashing yellow (8 Hz)	The extended segment does not exist.
	Steady yellow	The boot image does not exist.
	Off	No power input, or exceptions have occurred.
Power supply LED (PWR1)	Steady green	The power supply is operating correctly.
	Off	No power input.
USB console port LED	Steady on	The router is using the USB console port for configuration.
	Off	The router is not using the USB console port.
CON/AUX port LED	Steady on	The router is using the console port for configuration.
	Off	The router is not using the console port.

LED	State	Description
SFP port LED (SFP27)	Steady green	A 1000 Mbps link is present.
	Flashing green	Data is being received or transmitted at 1000 Mbps.
	Steady yellow	A 10/100 Mbps link is present.
	Flashing yellow	Data is being received or transmitted at 10/100 Mbps.
	Off	No link is present.
Gigabit Ethernet port LED (GE)	Steady green	A 1000 Mbps link is present.
	Flashing green	Data is being received or transmitted at 1000 Mbps.
	Steady yellow	A 10/100 Mbps link is present.
	Flashing yellow	Data is being received or transmitted at 10/100 Mbps.
	Off	No link is present.

Appendix C Slot arrangement

The routers provide slots for SICs. A DSIC can be installed if you remove the slot divider between two SIC slots..

The slot number of fixed ports on the router is 0.

Table 8 Slot arrangement on the router

Router	Slot arrangement
MSR2003	
MSR2004-24	
MSR2004-48	
	<p> : SIC slot : DSIC slot </p>

Document conventions and icons

Conventions

This section describes the conventions used in the documentation.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.





Command conventions

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
<i>Italic</i>	<i>Italic</i> text represents arguments that you replace with actual values.
[]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x y ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x y ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x y ... }*	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
[x y ...]*	Asterisk marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.













GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in Boldface. For example, the New User window appears; click OK .
>	Multi-level menus are separated by angle brackets. For example, File > Create > Folder .

Symbols

Convention	Description
 WARNING!	An alert that calls attention to important information that if not understood or followed can result in personal injury.
 CAUTION:	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
 IMPORTANT:	An alert that calls attention to essential information.
NOTE:	An alert that contains additional or supplementary information.
 TIP:	An alert that provides helpful information.

Network topology icons

Convention	Description
	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security card, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG card.

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
www.hpe.com/assistance
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
 - Hewlett Packard Enterprise Support Center **Get connected with updates** page:
www.hpe.com/support/e-updates
 - Software Depot website:
www.hpe.com/support/softwaredepot
- To view and update your entitlements, and to link your contracts, Care Packs, and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:
www.hpe.com/support/AccessToSupportMaterials

ⓘ **IMPORTANT:**

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Website	Link
Networking websites	
Hewlett Packard Enterprise Information Library for Networking	www.hpe.com/networking/resourcefinder
Hewlett Packard Enterprise Networking website	www.hpe.com/info/networking
Hewlett Packard Enterprise My Networking website	www.hpe.com/networking/support
Hewlett Packard Enterprise My Networking Portal	www.hpe.com/networking/mynetworking
Hewlett Packard Enterprise Networking Warranty	www.hpe.com/networking/warranty
General websites	
Hewlett Packard Enterprise Information Library	www.hpe.com/info/enterprise/docs
Hewlett Packard Enterprise Support Center	www.hpe.com/support/hpesc
Hewlett Packard Enterprise Support Services Central	ssc.hpe.com/portal/site/ssc/
Contact Hewlett Packard Enterprise Worldwide	www.hpe.com/assistance
Subscription Service/Support Alerts	www.hpe.com/support/e-updates
Software Depot	www.hpe.com/support/softwaredepot
Customer Self Repair (not applicable to all devices)	www.hpe.com/support/selfrepair
Insight Remote Support (not applicable to all devices)	www.hpe.com/info/insightremotesupport/docs

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty, Care Pack Service, or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title,

part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.

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