

HP FlexFabric 12500E Routing Switch Series Installation Guide

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Preparing for installation

Safety recommendations

To avoid any equipment damage or bodily injury caused by improper use, read the following safety recommendations before installation. Note that the recommendations do not cover every possible hazardous condition.

General safety recommendations

- Take adequate safety measures to avoid injury and switch damage. For example, wear an ESD wrist strap.
- Make sure the ground is dry and flat and anti-slip measures are in place.
- Keep the chassis clean and dust-free.
- Do not place the switch on a moist area and avoid liquid surrounding the switch.
- Keep the chassis and installation tools away from walk areas.
- Move the switch and heavy components (such as the power supplies or chassis) with other people rather than doing that alone.

Electricity safety

- Clear the work area of possible hazards, such as ungrounded power extension cables, missing safety grounds, and wet floors.
- Locate the emergency power-off switch in the room before installation. Shut the power off at once in case accident occurs.
- Unplug all the external cables (including power cords) before moving the chassis.
- Do not work alone when the switch has power.
- Always check that the power has been disconnected.

ESD prevention

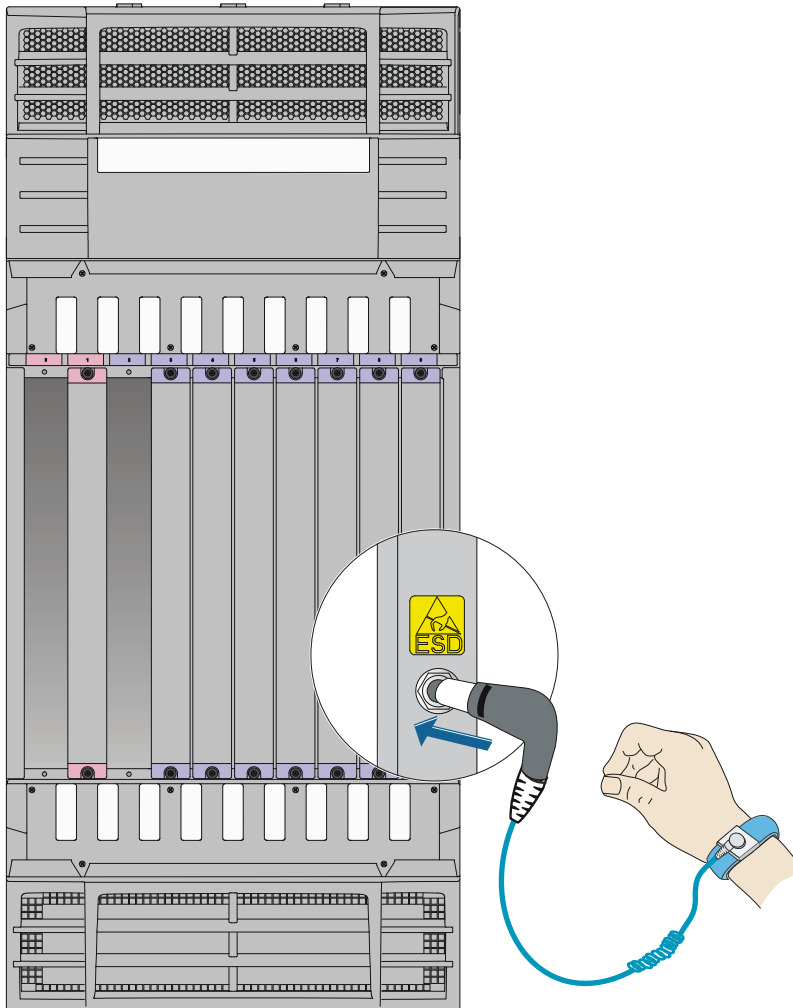
To prevent the electronic components from being damaged by the electrostatic discharge (ESD), follow these guidelines:

- Ground the switch correctly. For how to ground your switch, see "Installing the switch."
- Always wear an ESD wrist strap when installing components, especially the electronic printed circuit boards.
- Hold a PCB by its edges. Do not touch any electronic components or printed circuit.
- 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.

To attach the 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 wrist strap into the ESD socket on the switch chassis.
Make sure the ESD wrist strap is correctly grounded.

Figure 1 Attaching an ESD wrist strap to a 12508E



Switch moving

! **IMPORTANT:**

For personal safety, at least four people are required to move a 12518E switch.

When you move an HP 12500E switch, follow these guidelines:

- Remove all the external cables (including the power cords) before moving the chassis.
- For personal safety, have several people to move the switch carefully.
- When moving the switch, hold the handles at both sides of the chassis. Do not hold the plastic panel of the chassis, the handle of the fan tray, the handle of the back cover of the chassis, or the air vents

of chassis. Any attempt to carry the switch with these parts might cause equipment damage or even bodily injury.

Laser safety

⚠ WARNING!

Do not stare into any fiber port when the switch has power. The laser light emitted from the optical fiber might hurt your eyes.

Examining the installation site

The HP 12500E Routing Switch Series can only be used indoors. To ensure that the switch works correctly and to prolong its service lifetime, the installation site must meet the following requirements:

Weight support

Make sure the floor can support the total weight of the rack, chassis, cards, power supplies, and all other components. Additionally, the floor loading plan must also consider system expansion, such as adding more cards.

Temperature

⚠ CAUTION:

If condensation appears on the switch when you move it to a high-temperature environment, dry the switch before powering it on to avoid short circuits.

To ensure the normal operation of the switch, make sure the room temperature meets the requirements described in [Table 1](#).

Table 1 Temperature requirements

Temperature	Range
Operating temperature	<ul style="list-style-type: none">• Long term: 0°C to 40°C (32°F to 104°F)• Short term: -10°C to +50°C (14°F to 122°F) (no more than 96 hours of continuous operation in less than 15 days in one year)
Storage temperature	-40°C to +70°C (-40°F to +158°F)

Humidity

- Lasting high relative humidity can cause poor insulation, electricity creepage, mechanical property change of materials, and metal corrosion.
- Lasting low relative humidity can cause washer contraction and ESD and bring problems including loose captive screws and circuit failure.

Maintain appropriate humidity in your equipment room, as described in [Table 2](#).

Table 2 Humidity requirements

Item	Specifications
Operating humidity (noncondensing)	5% to 95%
Storage humidity (noncondensing)	5% to 95%

Operating altitude

Table 3 Operating altitude requirements

Item	Specifications
Operating altitude	≤ 4000 m (13123.36 ft) (available altitude)
	≤ 3000 m (9842.52 ft) (certificated altitude)

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 4 Dust concentration limit in the equipment room

Substance	Concentration limit (particles/m ³)
Dust particles	≤ 3 × 10 ⁴ (no visible dust on the tabletop over three days)

NOTE:

Dust particle diameter ≥ 5 μm

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 5](#).

Table 5 Harmful gas limits in the equipment room

Gas	Average (mg/m ³)	Max. (mg/m ³)
SO ₂	0.3	1.0
H ₂ S	0.1	0.5
NO ₂	0.004	0.15
NH ₃	1.0	3
Cl ₂	0.1	0.3

EMI

All electromagnetic interference (EMI) sources, from outside or inside of the switch and application system, adversely affect the switch in a conduction pattern of capacitance coupling, inductance coupling,

electromagnetic wave radiation, or common impedance (including the grounding system) coupling. To prevent EMI, take the following actions:

- If AC power is used, use a single-phase three-wire power receptacle with protection earth (PE) to filter interference from the power grid.
- Keep the switch far away from radio transmitting stations, radar stations, and high-frequency devices.
- Use electromagnetic shielding, for example, shielded interface cables, when necessary.
- Route interface cables only indoors to prevent signal ports from getting damaged by overvoltage or overcurrent caused by lightning strikes.

Grounding

Using a good grounding system to protect your switch against lightning shocks, interferences, and ESD is essential to the operating reliability of your switch.

Make sure the resistance between the chassis and the ground is less than 1 ohm.

Power supply

To meet the power supply requirements:

1. Calculate the system power consumption.
2. Select power modules according to the system power consumption and power supply mode.
To ensure normal operation of the switch, make sure the maximum output power of the power modules is greater than the system power consumption of the switch (reserve certain power for redundancy). After determining the system power consumption and power supply mode (AC or DC power supply), you can select power modules as needed.
3. Verify that the power source on the installation site meets the requirements of the power modules.
Make sure the power source of the installation site is steady and can meet the requirements of the power modules, including the input method and rated input voltage.

For the power consumption and power module specifications of the switch, see "Appendix A Technical specifications."

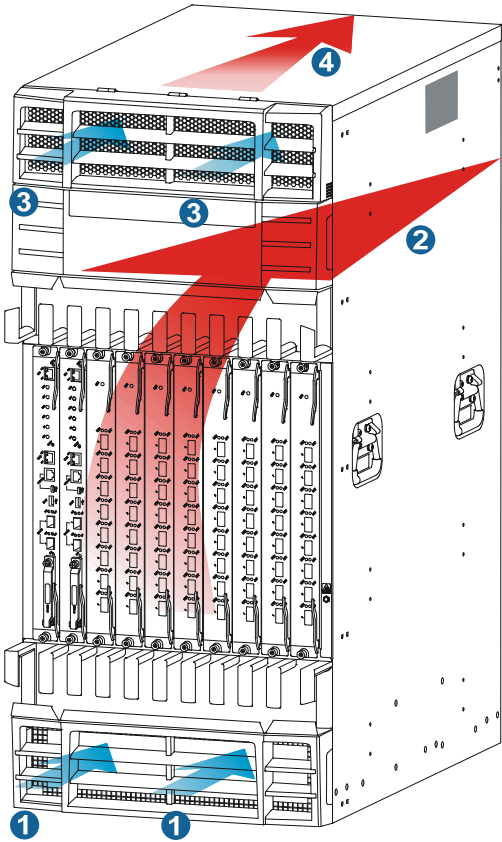
Cooling

Plan the installation site for adequate ventilation.

- Leave at least 10 cm (3.94 in) of clearance around the air intake vents and exhaust vents.
- Equip a good cooling system for the cabinet to install the switch.
- Equip a good cooling system for the installation site.

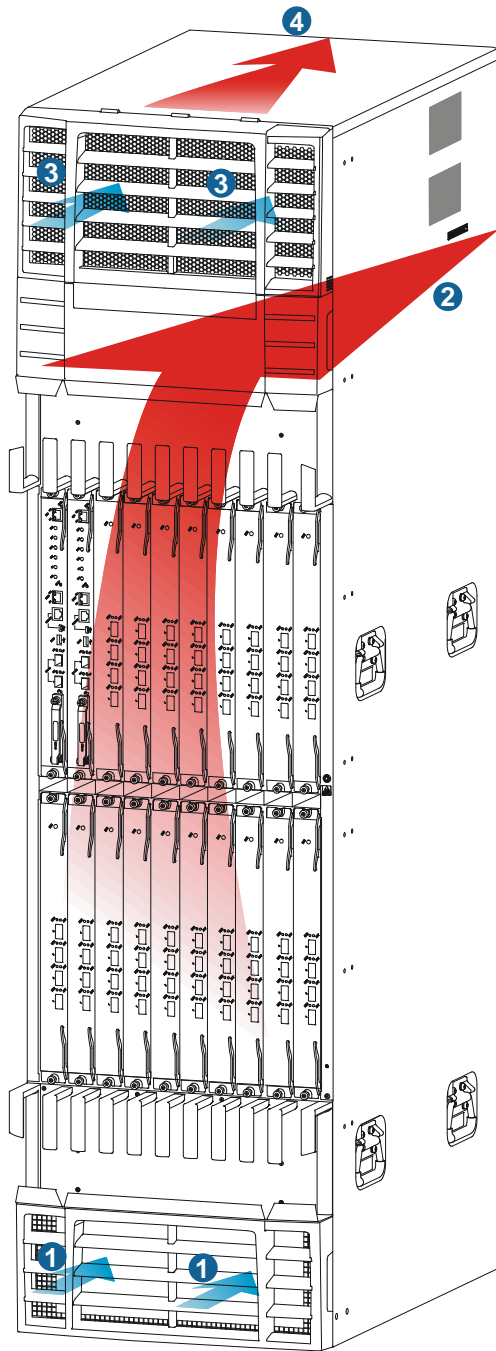
Figure 2, and Figure 3 show the ventilation of the 12508E, and 12518E.

Figure 2 Airflow through a 12508E chassis



-
- | | |
|--|---|
| (1) Air intake direction of the chassis | (2) Air exhaust direction of the chassis |
| (3) Air intake direction of the power supplies | (4) Air exhaust direction of the power supplies |
-

Figure 3 Airflow through a 12518E chassis



(1) Air intake direction of the chassis

(2) Air exhaust direction of the chassis

(3) Air intake direction of the power supplies

(4) Air exhaust direction of the power supplies

Space

For easy maintenance, follow these guidelines:

Installation method	Space requirements
Workbench-mounting	<ul style="list-style-type: none"> • Width of the aisle: ≥ 0.8 m (2.62 ft) • Clearance between the rack and walls or other devices: ≥ 0.8 m (2.62 ft)
Rack-mounting	<ul style="list-style-type: none"> • Clearance between the rack and walls or other devices: ≥ 1.0 m (3.28 ft) • Equipment room height: ≥ 3 m (9.84 ft)

! **IMPORTANT:**

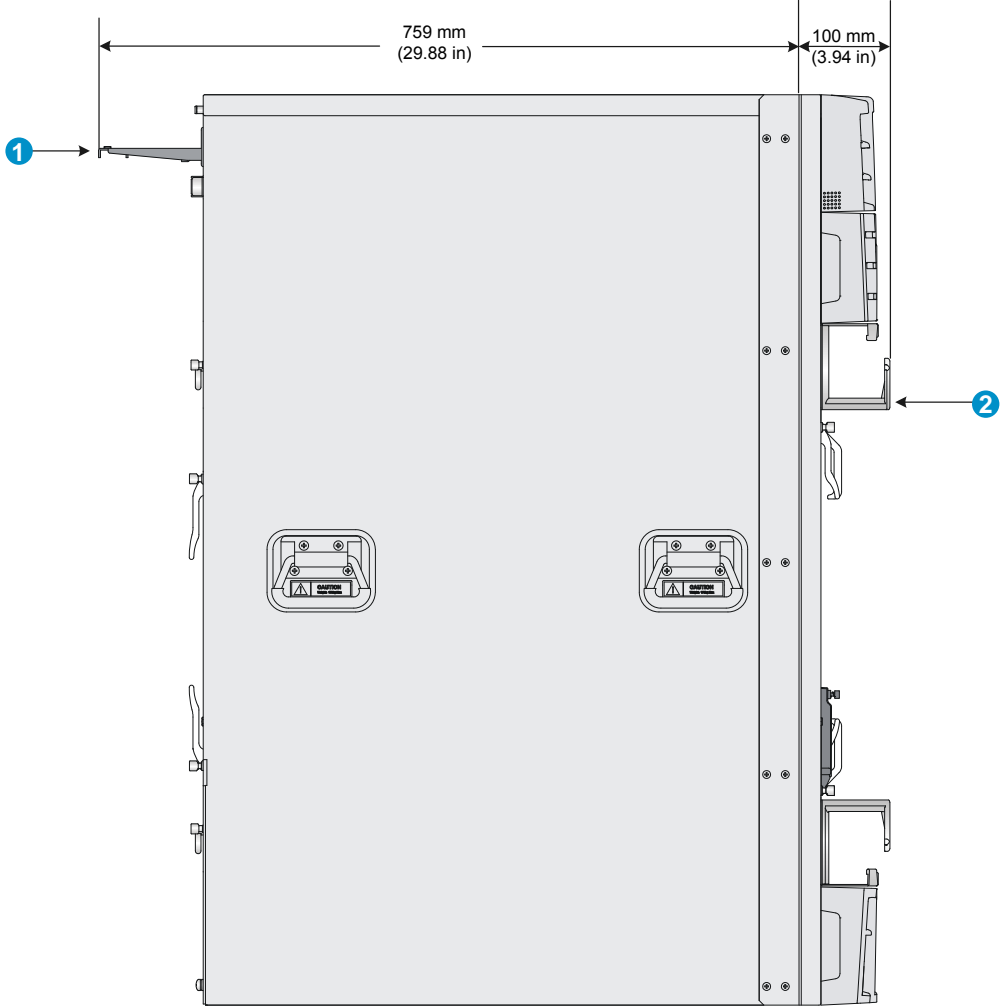
Follow the rack clearance requirements to make sure the switch does not block the rack doors.

HP recommends that you use a rack with a depth of 1.2 m (3.94 ft) for rack-mounting the switch. For the chassis space requirements and rack clearance requirements, see [Table 6](#), [Figure 5](#), [Figure 6](#), and [Figure 7](#). For more information about switch dimensions, see "Appendix A Chassis views and technical specifications."

Table 6 Rack mounting space requirements

Model	Chassis space requirements	Minimum rack clearance requirements
12508E/12518E AC	<ul style="list-style-type: none"> • Height: <ul style="list-style-type: none"> ○ 12508E: 975 mm (38.39 in)/22 RU ○ 12518E: 1686 mm (66.38 in)/38 RU • Width: 442 mm (17.40 in) • Depth: <ul style="list-style-type: none"> ○ 859 mm (33.82 in) on switches installed with cable management brackets ○ 913 mm (35.94 in) on switches installed with expansion cable management brackets 	<ul style="list-style-type: none"> • Distance between the front rack post and the inner side of the front door: <ul style="list-style-type: none"> ○ 100 mm (3.94 in) on switches installed with cable management brackets ○ 154 mm (6.06 in) on switches installed with expansion cable management brackets • Distance between the front rack post and inner side of the rear door: 769 mm (30.28 in) (Including the space for cabling power cords.)
12508E/12518E DC	<ul style="list-style-type: none"> • Height: <ul style="list-style-type: none"> ○ 12508E: 975 mm (38.39 in)/22 RU ○ 12518E: 1686 mm (66.38 in)/38 RU • Width: 442 mm (17.40 in) • Depth: <ul style="list-style-type: none"> ○ 759 mm (29.88 in) on switches installed with cable management brackets ○ 813 mm (32.01 in) on switches installed with expansion cable management brackets 	<ul style="list-style-type: none"> • Distance between the front rack post and the inner side of the front door: <ul style="list-style-type: none"> ○ 100 mm (3.94 in) on switches installed with cable management brackets ○ 154 mm (6.06 in) on switches installed with expansion cable management brackets • Distance between the front rack post and inner side of the rear door: 709 mm (27.91 in) (Including the space for cabling power cords.)

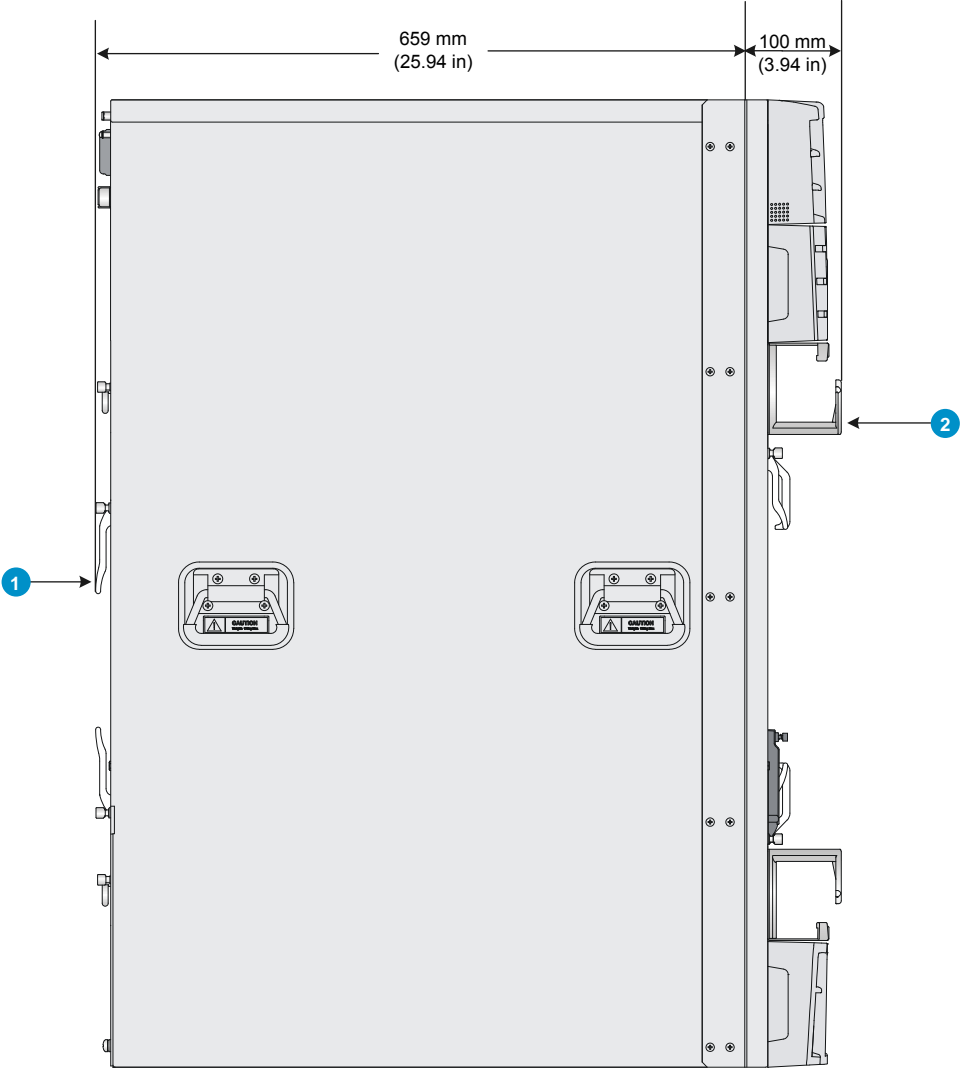
Figure 4 Depth for the 12508E/12518E AC chassis with cable management brackets



(1) Power cabling rack

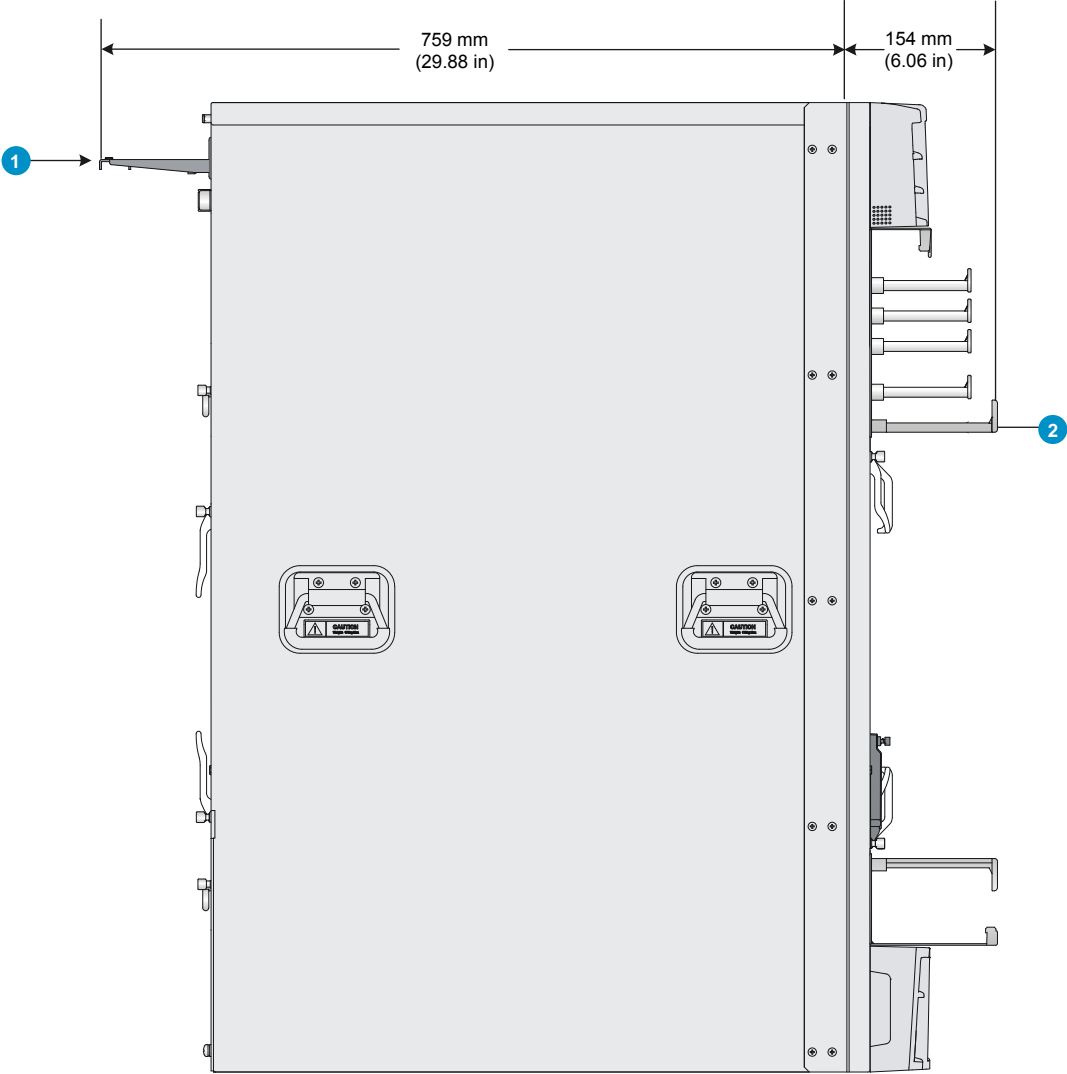
(2) Cable management bracket

Figure 5 Depth for the 12508E/12518E DC chassis with cable management brackets



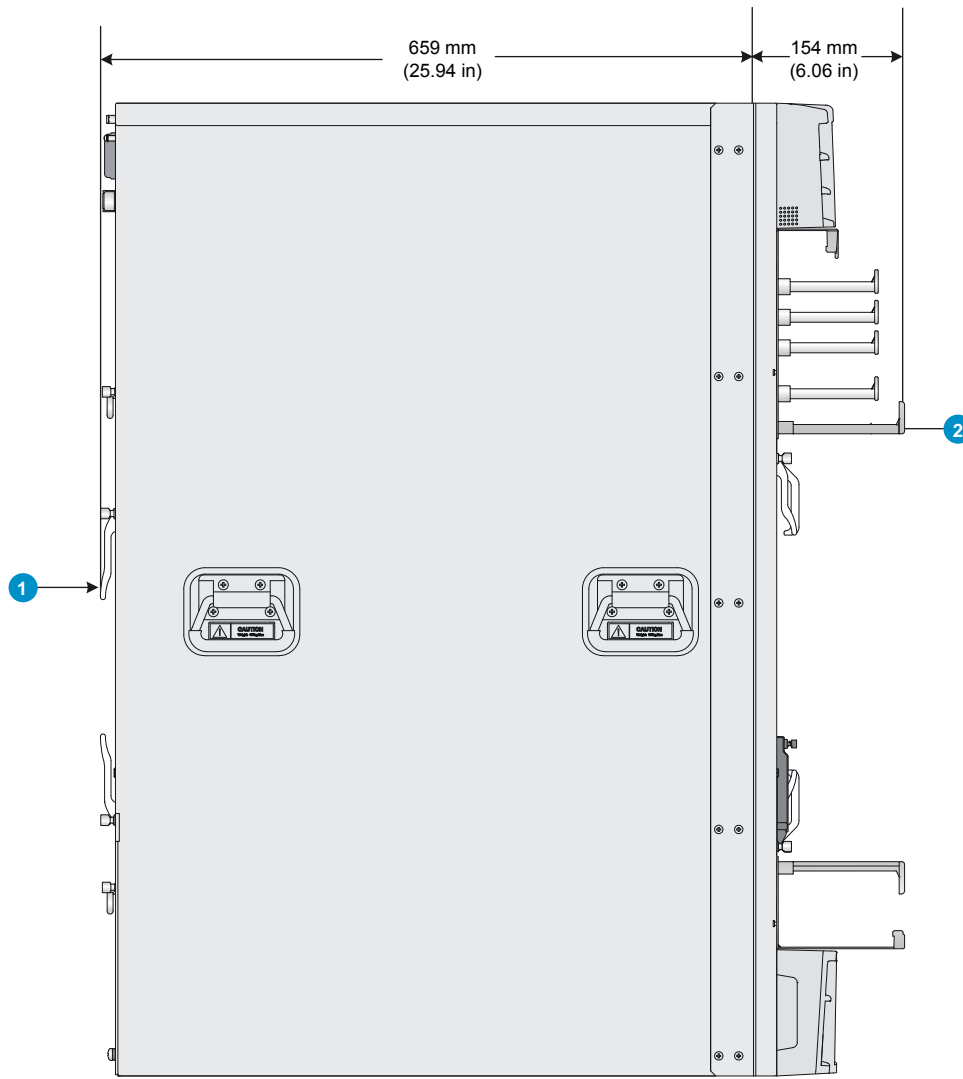
-
- (1) Ejector lever on the switching fabric module
 - (2) Cable management bracket
-

Figure 6 Depth for the 12508E/12518E AC chassis with expansion cable management brackets



(1) Power cabling rack (2) Expansion cable management bracket

Figure 7 Depth for the 12508E/12518E DC chassis with expansion cable management brackets



(1) Ejector lever on the switching fabric module

(2) Expansion cable management bracket

Installation tools

You can use the following tools for installation.

Accessories supplied by the switch

Item	Quantity	Purpose
Console cable	1	Connects the console port and the configuration terminal for switch login.
Grounding cable	1	Grounds the switch.
M6*12 screw	1 set	Secures the switch to the rack.
M6 cage nut	1 set	
ESD wrist strap	2	ESD prevention.

Item	Quantity	Purpose
AC/DC power cord	Same as the number of power modules	Transmits the power
Cable tie	Several	Organizes and secures AC power cords. Supplied with the 12508E and 12518E switches.

NOTE:

The number of screws, nuts, and cable ties supplied with the switch depends on those shipped from the factory.

User-supplied tools and equipment

- Mechanical lift
- Phillips screwdriver P1 – 100 mm, P2 – 150 mm, and P3 – 250 mm
- Flat screwdriver P4 – 75 mm
- Marker
- Tape
- Diagonal pliers, wire-stripping pliers, and wire clippers
- Socket wrench
- Cables such as network cables and fiber cables
- Meters and equipment, such as hub and multimeter
- Configuration terminal, such as PC

NOTE:

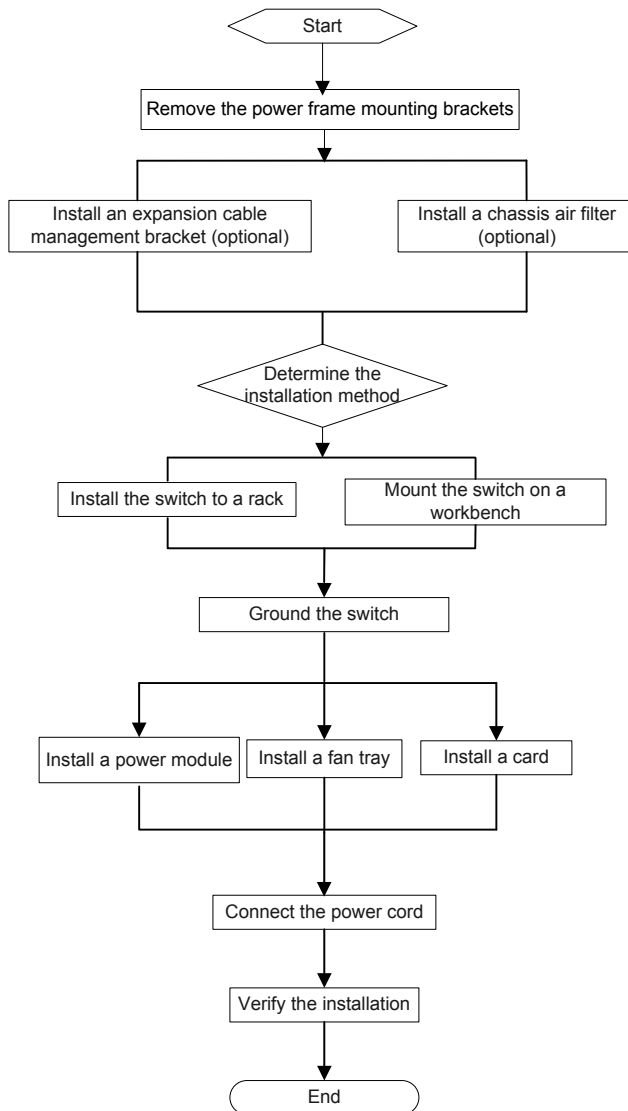
The rack accessories and installation tools are not included in this section. They might vary depending on the rack model. For more information, see the installation guide of the corresponding rack.

Installing the switch

⚠ WARNING!

To avoid bodily injury, do not touch any wire, terminal, or part marked with a high-voltage hazard sign.

Figure 8 Switch installation procedure



Confirming installation preparations

Before installing an HP 12500E switch, verify that:

- You have read "Preparing for installation" carefully and the installation site meets all the requirements.

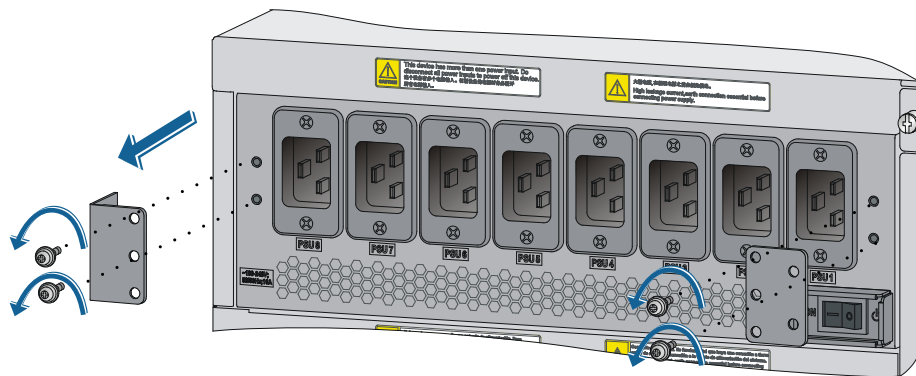
- You have all the items listed in the packing list, and the switch was not damaged during shipment. If anything is damaged or missing, contact the sales agent or customer representative immediately.

For regulatory compliance and safety information, see "Regulatory compliance and safety information."

Removing the power frame mounting brackets

The mounting brackets are used to fix the power frame and to protect the frame during transportation. To ensure smooth installation, remove the mounting brackets from the power frame with a Phillips screwdriver before you install the switch in the rack. A switch cannot be installed in a rack if the mounting brackets are not removed.

Figure 9 Removing the power frame mounting brackets



Installing an expansion cable management bracket (optional)

Each 12508E and 12518E switch provides two types of chassis cable management brackets. You can select either type as needed.

- Cable management brackets**—Shipped with the switch. For more information, see "Chassis views and technical specifications."
- Expansion cable management brackets**—Upper cable management bracket with a mark, and lower cable management bracket with no mark. They are installed in the same positions as the cable management brackets shipped with the switch except that they can route more cables.

To install expansion cable management brackets, remove the cable management brackets shipped with the switch first.

Installation preparation

1. Wear an ESD wrist strap and make sure the wrist strap is well grounded.
2. Unpack the expansion cable management brackets.

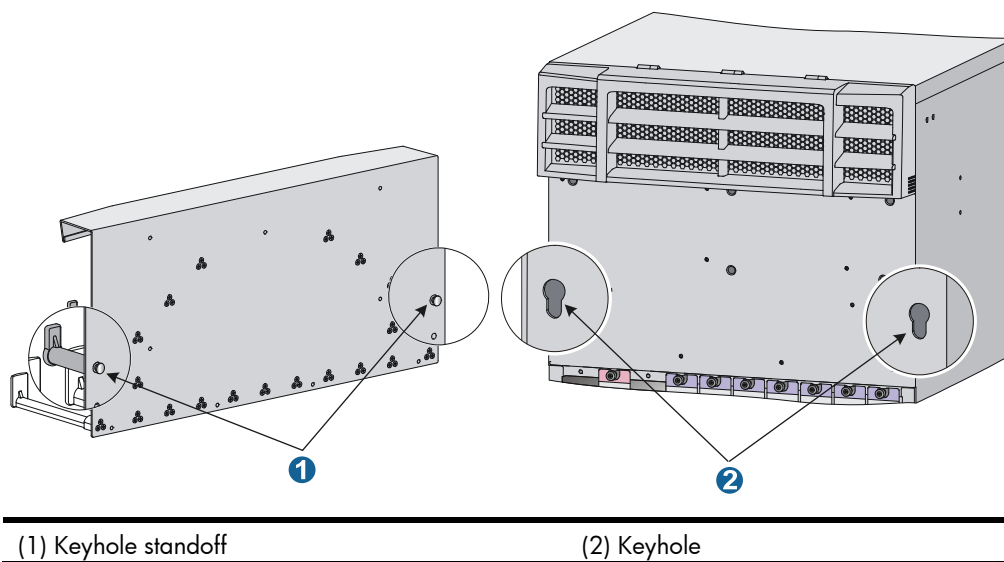
! **IMPORTANT:**

- Make sure no filler panel or card is installed on the front panel of the switch before you remove or install a lower cable management bracket.
 - Keep the removed chassis panel and cable management brackets for future use.
-

Installation procedure

Each 12500E switch has keyhole standoffs on its cable management bracket and keyholes on the chassis for securing the cable management bracket to the chassis. See [Figure 10](#).

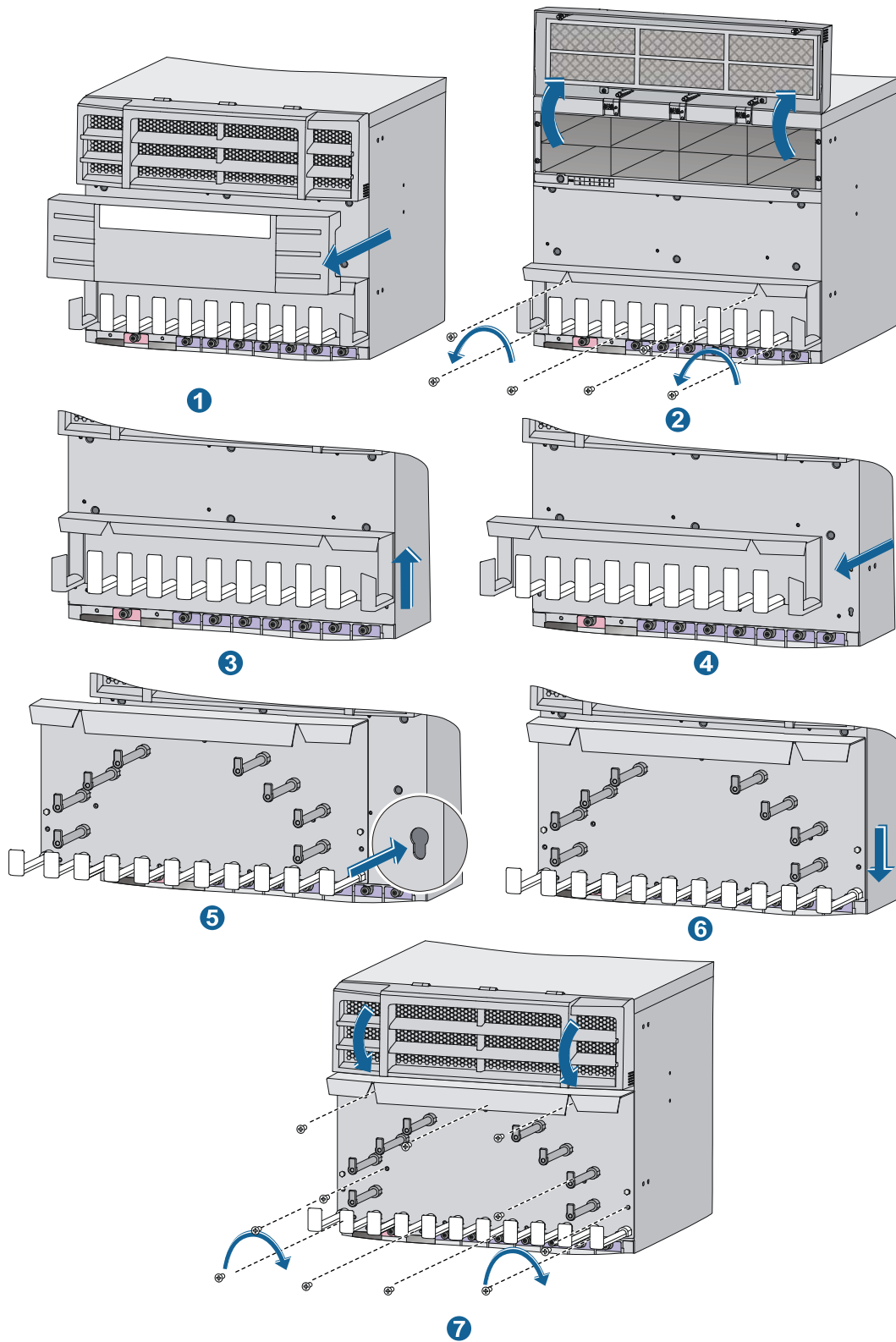
Figure 10 Keyhole standoff and keyhole



Installing an upper expansion cable management bracket

1. Holding the notches on both sides of the chassis panel above the upper cable management bracket, gently remove the panel.
2. Pressing the two sides of the front panel, pivot the power frame front panel upward.
3. Loosen the fastening screws on the upper cable management bracket with a Phillips screwdriver.
4. Align the keyhole standoffs on the rear of the cable management bracket with the keyholes on the chassis and remove the cable management bracket.
5. Align the keyhole standoffs on the upper expansion cable management bracket (with a mark) with the keyholes on the chassis.
6. Push the expansion cable management bracket forward until it makes close contact with the chassis. Then pull the expansion cable management bracket downwards a little until the keyhole standoff fits into the keyhole on the chassis.
7. Unpack the screws come with the expansion cable management bracket and fasten them with a Phillips screwdriver to secure the expansion cable management bracket to the chassis.
8. Close the power frame front panel.

Figure 11 Installing an upper expansion cable management bracket



Installing a lower expansion cable management bracket

1. Remove the filler panel or card on the front panel. For how to remove them, see "Replacement procedures."

2. Loosen the fastening screws on the lower cable management bracket with a Phillips screwdriver.
3. Align the keyhole standoffs on the rear of the lower cable management bracket with the keyholes on the chassis and remove the cable management bracket.
4. Align the keyhole standoffs on the lower expansion cable management bracket (with no mark) with the keyholes on the chassis.
5. Push the expansion cable management bracket forward until it makes close contact with the chassis. Then pull the expansion cable management bracket downwards until the keyhole standoff fits into the keyhole on the chassis.
6. Unpack the screws come with the expansion cable management bracket and fasten them with a Phillips screwdriver to secure the expansion cable management bracket to the chassis.
7. Install the removed filler panel or card. For more information, see "[Installing a card.](#)"

For illustration of the installation procedure for a lower cable management bracket, see callouts 2 to 7 in [Figure 11](#).

Installing a chassis air filter (optional)

Chassis air filters are installed at the air intake vents to prevent dust from entering the chassis. Chassis air filters of the 12500E switches are optional. You can order them as needed.

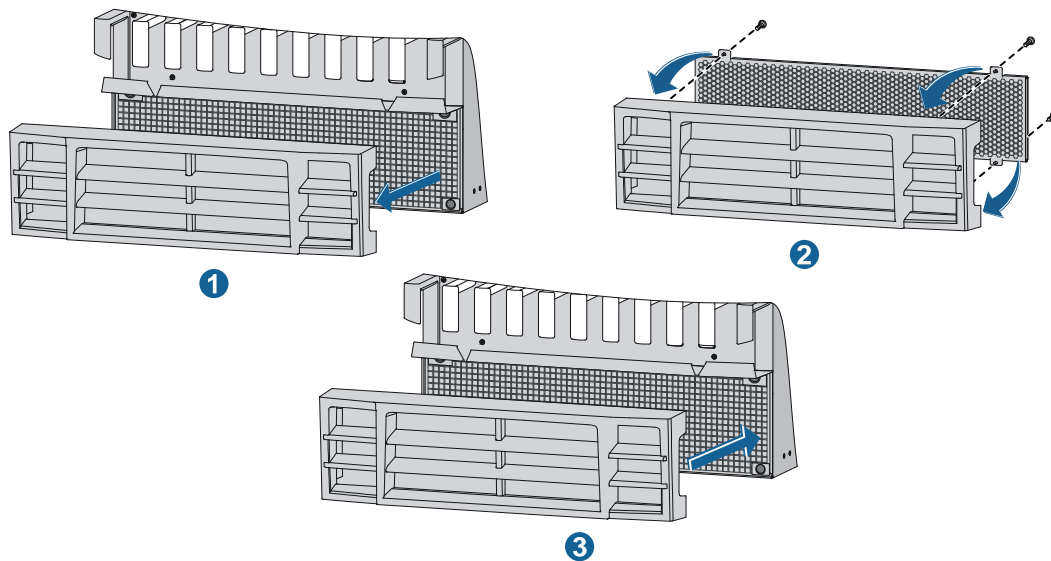
If you have ordered chassis air filters, HP recommends you to install the air filters before mounting the switch to the rack.

- **12508E**—The air filter is located at the front of the chassis. For the installation procedures, see "[Installing an air filter on a 12508E.](#)"
- **12518E**—The air filter is located at the rear of the chassis. For the installation procedures, see "[Installing an air filter on a 12518E.](#)"

Installing an air filter on a 12508E

1. Hold the notches of the front plastic panel at the bottom part of the chassis, and gently pull the plastic panel out.
2. Unpack the air filter, attach it to rear of the plastic panel, align installation holes on the air filter with the screw holes on the plastic panel, and secure the air filter to the plastic panel with screws.
3. Mount the plastic panel back to the chassis.

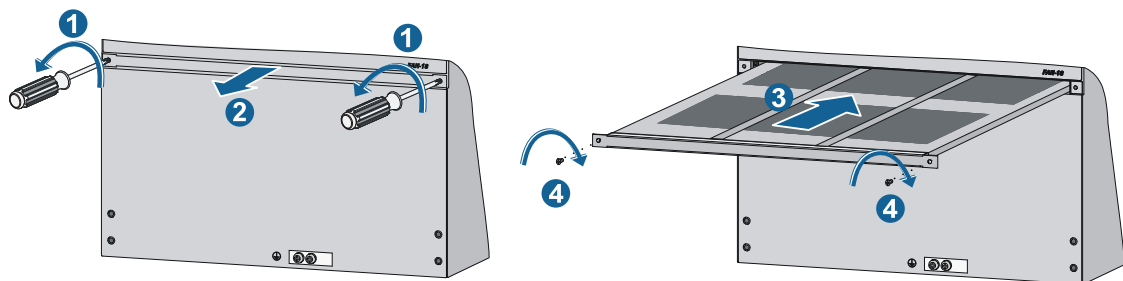
Figure 12 Installing an air filter



Installing an air filter on a 12518E

1. Use a Phillips screwdriver to loosen the screws at both sides of the plastic panel and remove the panel.
2. Insert the air filter into the rear of the chassis along the slide rails, and then fasten the screws at both sides of the air filter.

Figure 13 Installing an air filter



Installing the switch in a rack

CAUTION:

When moving the switch, hold the handles at both sides of the chassis. Do not hold the plastic panel of the chassis, the handle of the fan tray, the handle of the back cover of the chassis, or the air vents of chassis. Any attempt to carry the switch with these parts might cause equipment damage or even bodily injury.

Installation preparation

Confirm the following preparations before starting installation:

- The rack is sturdy and securely grounded.
- There is sufficient clearance of 0.8 m (2.62 ft) around the rack for heat dissipation and installation.
- There is no debris inside or around the rack.
- The total height of the switches to be installed is no higher than the height of the rack and enough clearance is reserved for cable routing.
- Make sure the clearance above the slide rail is sufficient for the switch and the slide rails can support the weight of the switch. For the dimensions and weight of the 12500E switch, and the weight of the hardware components, see "Appendix A Technical specifications."

Installing slide rails and cage nuts to the rack

Before installing the switch in the rack, secure slide rails to the rack. Besides slide rails, you can use a rack shelf to support the switch. This document describes how to install slide rails only.

To ensure correct installation, use industry-standard slide rails or rack shelves. Slide rails or rack shelves are not provided with the switch. HP recommends that you order HP slide rail LSTM2KSGD0. The slide rail can be used in racks where the distance between the front and rear rack posts is in the range of 500 mm to 800 mm (19.69 in to 31.50 in).

Installing slide rails

If the rack has slide rails, skip this section.

The appearance and installation methods of slide rails depend on the slide rail types.

This section uses a 19-inch rack as an example to describe the installation procedures. The rack unit (RU) (44.45 mm, or 1.75 in) measures the height of rack posts. As shown in [Figure 14](#), each 1 RU has three mounting holes with center-to-center separations of 15.88 mm (0.63 in), 15.88 mm (0.63 in), and 12.70 mm (0.5 in). When installing the slide rails, make sure the bottom edge of the slide rails aligns with the middle of the narrowest separation between mounting holes.

To install the slide rails:

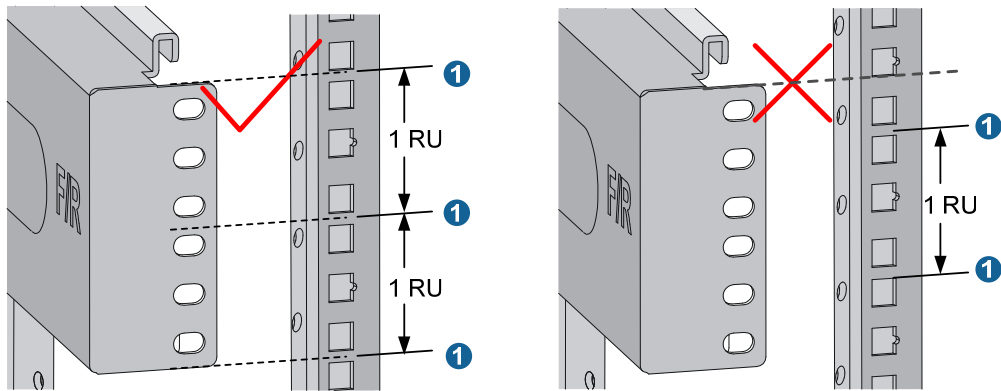
1. Mark the position of the slide rail on the rack posts. Make sure the bottom edge of the slide rails or rack shelf aligns with the middle of the narrower metal area between holes as shown in [Figure 14](#).



TIP:

A total of six screws are required within the 2 RU of installation space for each side of the slide rail. You can mark the position for the top cage nut only.

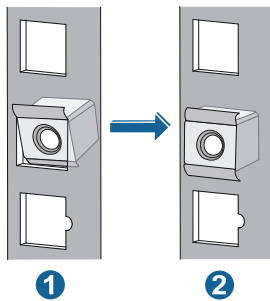
Figure 14 Locating the installation position of the slide rails



(1) Middle of the narrower metal area between holes

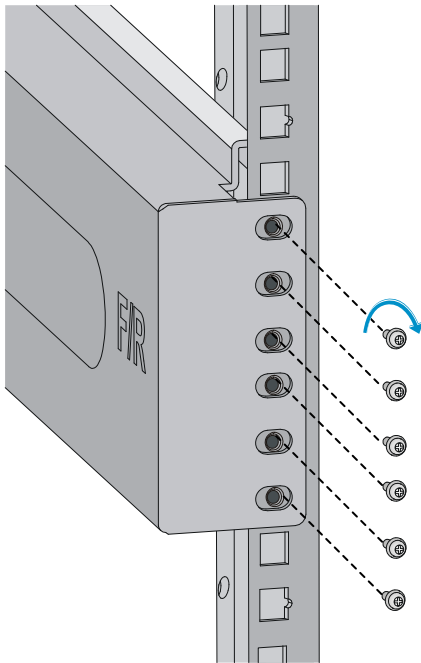
2. Install the cage nuts on the rack posts.
 - a. Insert the upper ear (callout 1 in Figure 15) of a cage nut into the corresponding installation hole.
 - b. Push the cage nut to lead its lower ear (callout 2 in Figure 15) into the same hole.
 - c. Repeat steps a and b to complete installation of 24 cage nuts on the rack post. (Six cage nuts for each rack post.)

Figure 15 Installing the cage nuts



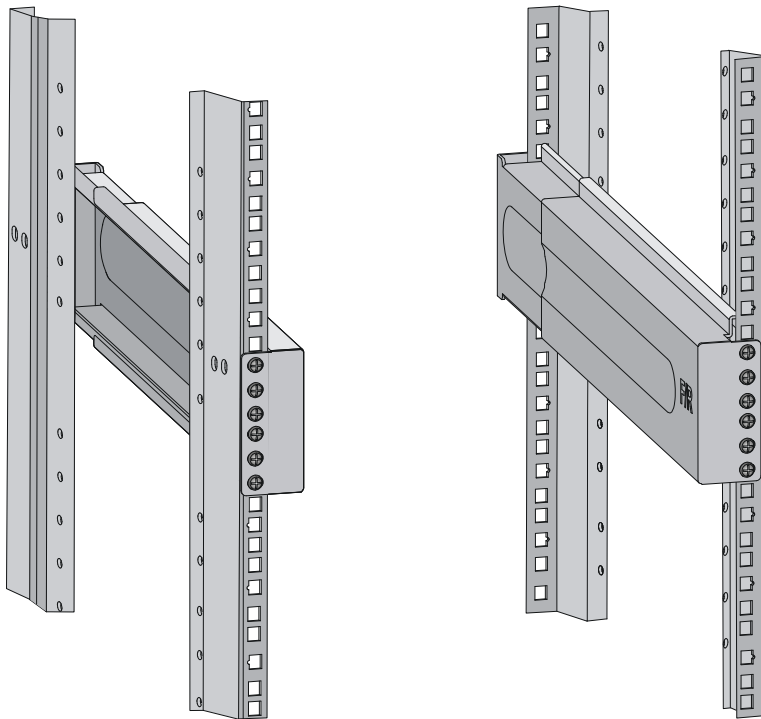
3. Align the screw holes on the two sides of the right slide rail (marked with **F/R**) with the marked holes on the right rack posts, and then fasten the screws.

Figure 16 Fastening the screws



4. Use the same method described in step 3 to install the left slide rail to the left rack posts. Keep the two slide rails at the same height so that the switch can be placed evenly.

Figure 17 Slide rails installed correctly



Installing cage nuts

Before mounting the chassis to the rack, install cage nuts to the front square-holed brackets of the rack.

To install cage nuts to the rack:

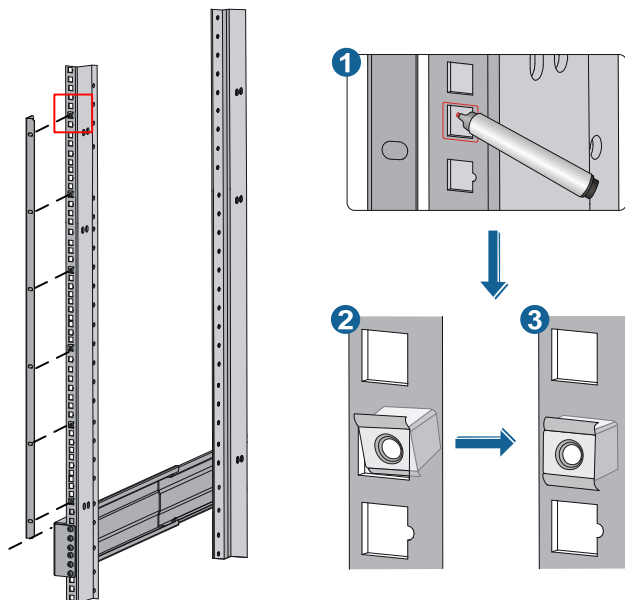
1. Align the mounting bracket with the left rack post, making sure its bottom edge and the slide rail are level. Mark the positions of the cage nuts on the rack post according to the mounting holes on the mounting bracket. (Each mounting hole on the mounting bracket corresponds to one cage nut.)

NOTE:

The mounting brackets are fixed on the chassis of the 12508E and 12518E before delivery from the factory. To determine the installation holes for cage nuts, you can remove a mounting bracket from the chassis and mark the nut holes, or use a pattern tool to record the installation holes of the mounting brackets and mark the nut holes accordingly.

2. Install cage nuts to the rack posts using the method described in relevant steps in "Installing slide rails."

Figure 18 Installing the cage nuts



Mounting the switch in the rack

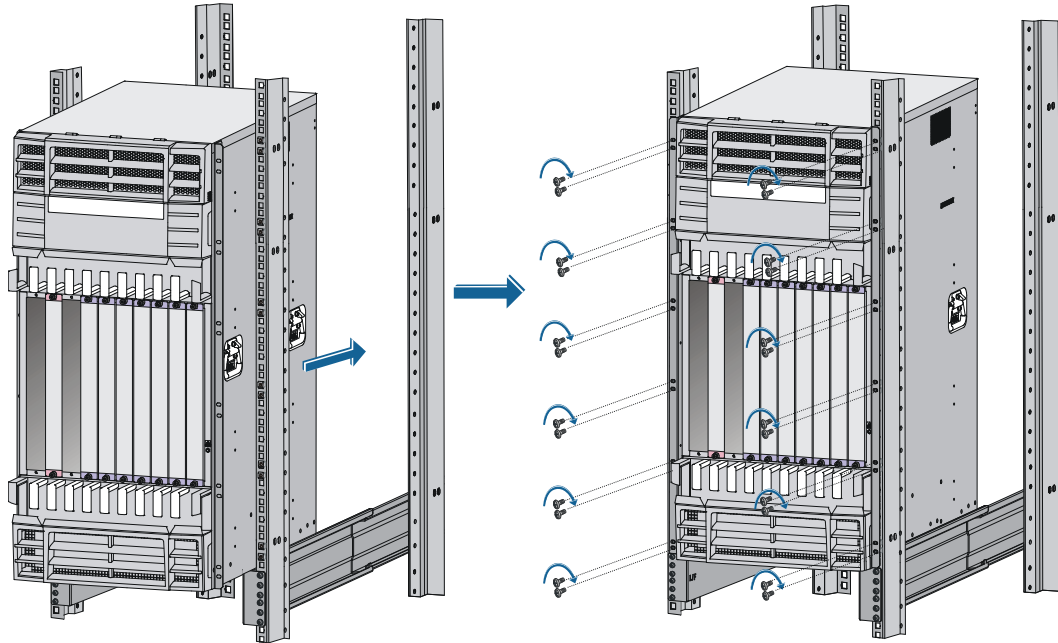
Before you mount the switch in the rack, make sure you have installed slide rails or a rack shelf on the rack for supporting the switch.

To maximize the stability of the rack, mount the heaviest switch at the bottom of the rack when you install multiple switches on the rack.

To mount the switch in the rack:

1. Cooperate with several people to place the switch on the slide rails or rack shelf and slide the switch into the rack until the mounting brackets on the switch touch the front rack posts.
2. Attach the mounting brackets to the rack posts with mounting screws. See [Figure 19](#).

Figure 19 Installing the switch in a standard 19-inch rack (for the 12508E)



NOTE:

If the screw holes on the mounting brackets cannot align with the cage nuts on the rack, verify that the bottom edge of the slide rail aligns with the middle of the narrowest metal area between mounting holes and that the cage nuts are installed in the correct holes.

Verifying the installation

After the installation is completed, check the installation against the following checklist. Make sure all check results are positive.

Table 7 Installation checklist

Item	Result		Remarks
	Yes	No	
The mounting brackets are firmly attached to the switch.			
The switch is sturdy and installed in the right position.			
The mounting brackets on the switch are firmly attached to the rack.			

Installing the switch on a workbench

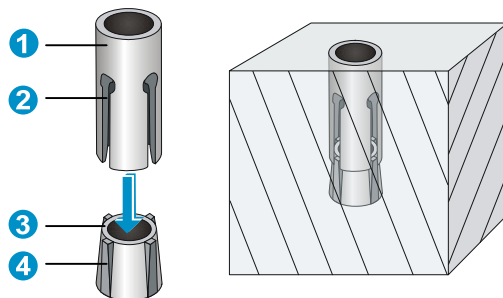
You can install the switch on a clean, sturdy workbench or on the floor if no rack is available for switch installation at the site.

Installation preparation

Before placing the switch on a workbench or on the floor, confirm the following preparations:

- The workbench or floor is sturdy enough to support the weight of the chassis and its accessories.
- The workbench or floor is correctly grounded.
- The wall anchors are installed.
 - a. Position the installation holes and drill holes.
Make sure each hole is exact in diameter and depth for the anchor.
 - b. Assemble each wall anchor by inserting the spade-shaped wedges on the plug into the grooves on the shank.
 - c. Put the assembled wall anchors into installation holes and hammer them into the ground.

Figure 20 Installing the wall anchor



(1) Shank

(2) Groove

(3) Plug

(4) Spade-shaped wedge

Installation procedures

⚠ IMPORTANT:

Allow 0.8 m (2.62 ft) of clearance around the switch for heat dissipation.

To install the switch:

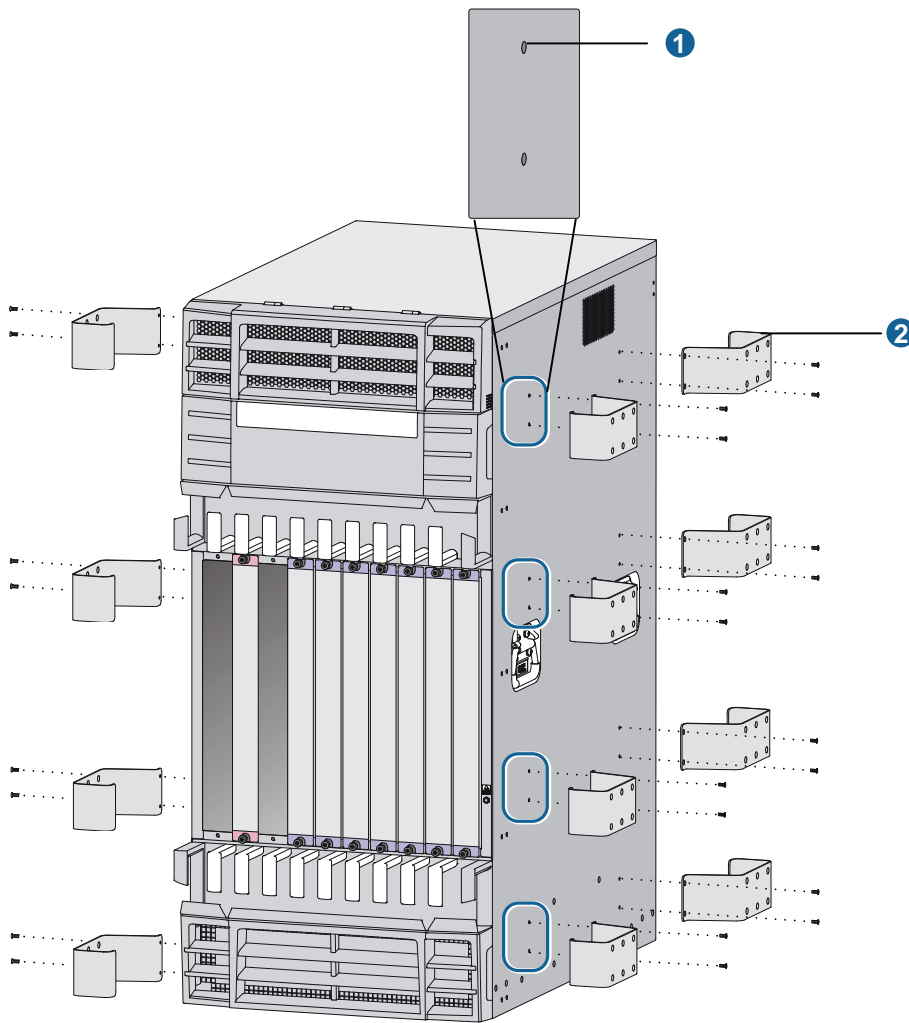
1. Hold the two sides of the switch and steadily move the switch to the workbench.
2. Lift the switch a little higher than the workbench and put it on the workbench.
3. (Optional.) Install the cable management brackets on both sides of the switch and fasten the screws, as shown in [Figure 21](#).

NOTE:

The circled areas in [Figure 21](#) are the cable management bracket installation holes.

A 12508E or 12518E switch has one column of installation holes.

Figure 21 Installing cable management brackets on both sides of the switch

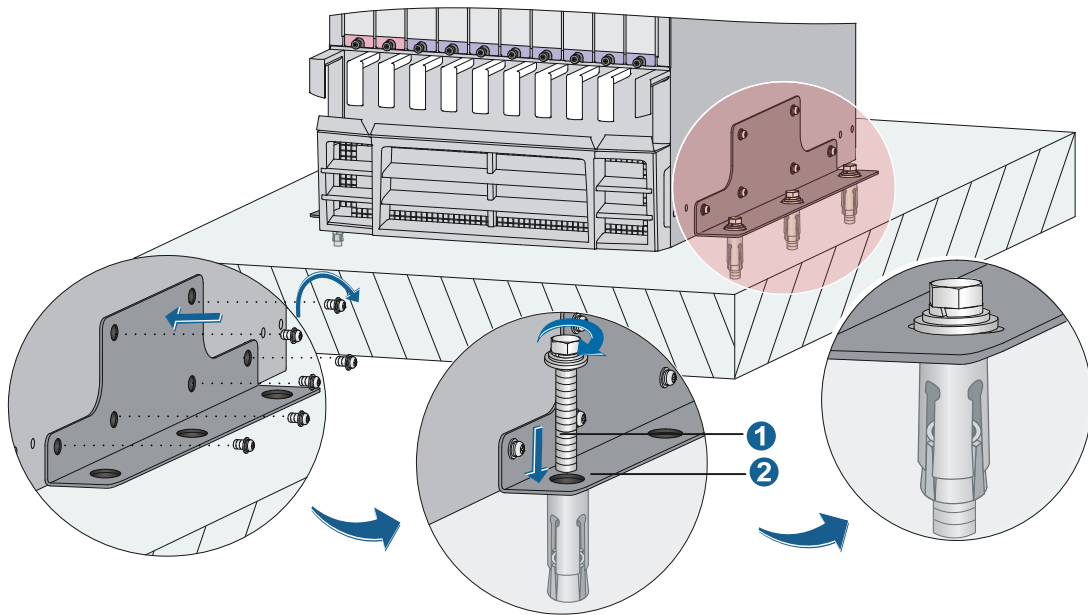


(1) Installation holes

(2) Cable management brackets

4. Secure the L-shaped bracket to the switch.
5. Move the switch to make sure holes in the L-shaped bracket align with wall anchor holes in the ground.
6. Insert the anchor bolts in the holes, and use a wrench to fasten the bolts.

Figure 22 Installing L-shaped brackets



(1) Anchor bolt

(2) L-shaped bracket

Grounding the switch

⚠ WARNING!

For the safety of operators and equipment, securely ground the switch. Make sure the resistance reading between the switch chassis and the ground is less than 1 ohm.

Most racks are equipped with a grounding strip. You can connect the yellow-green grounding cable of the switch to the grounding strip.

⚠ CAUTION:

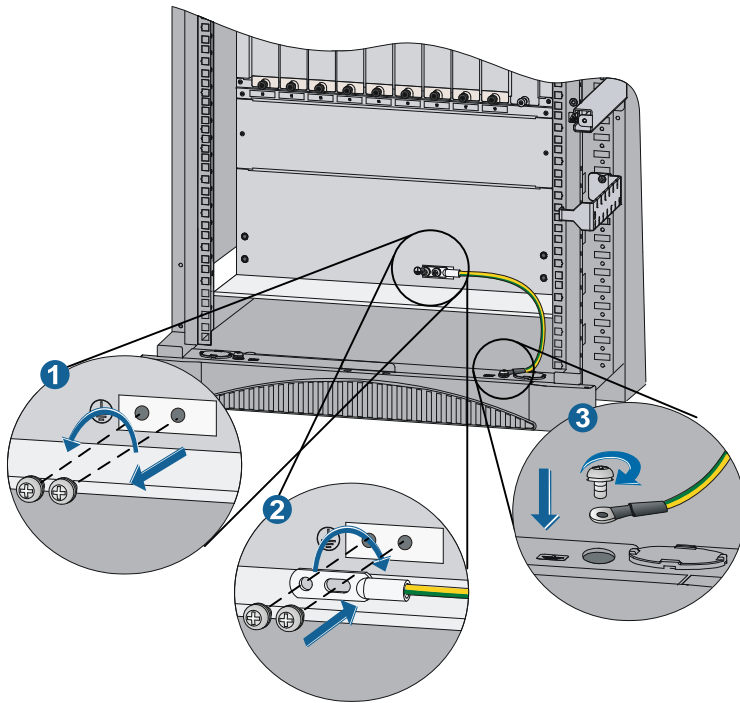
Connect the grounding cable to the earthing system in the equipment room. Do not connect it to a fire main or lightning rod.

Use the supplied grounding cable (CAT 6 cable with dual-hole ring terminals).

To connect the grounding cable:

1. Remove the two grounding screws from the switch chassis.
2. Use the grounding screws to attach one end of the grounding cable to the chassis.
3. Connect the other end of the grounding cable to the grounding strip of the rack in the same way.

Figure 23 Connecting the grounding cable for the 12508E



If there is no grounding point on the rack, you can attach the grounding cable to a grounding strip. The installation procedures are similar.

Installing a power supply

The 12500E switches supports both AC and DC power supply. You can select either AC or DC power supplies as needed. For how to connect power cords, see "[Connecting power cords.](#)"

Installation preparation

⚠ CAUTION:

- Hold power module by the bottom when moving it. Never attempt to lift a power module with its handle because the handle is not designed to support weight. Doing so might result in bodily injury or damage to the module.
- When inserting or removing a power module, verify that the switch is sturdy. To prevent bodily injury, avoid tipping the switch chassis.
- When hot-plugging power modules, make sure the insertion interval is no less than 30 seconds.

To prepare for installation:

1. Wear an ESD wrist strap and make sure it is correctly grounded.
2. Remove the blank panel (if any) from the slot to be used.

Installing an AC power supply

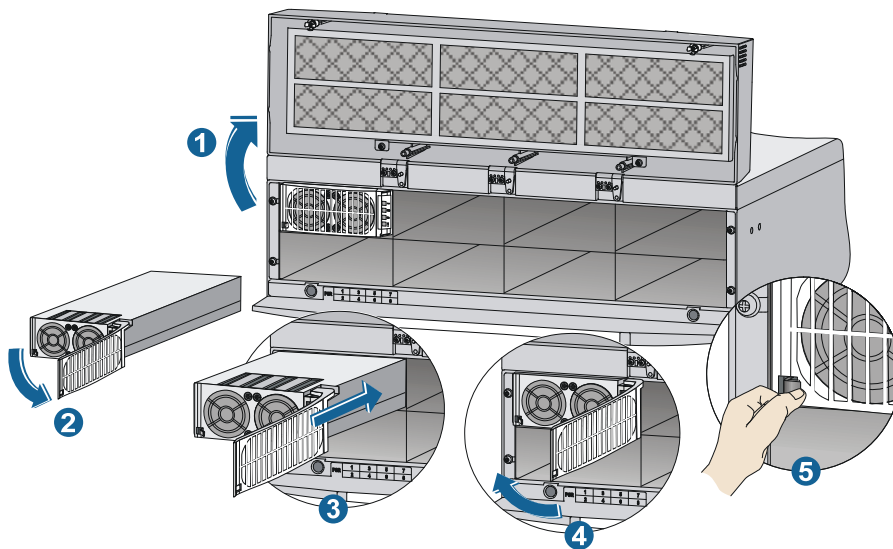
Installing an AC power module

⚠ **IMPORTANT:**

- Make sure the number of power modules is sufficient for the switch to operate correctly.
- Each receptacle on the rear of the power frame corresponds to a power module slot. To enable an AC power module to operate correctly, provide power supply to the relevant receptacle.
- Distribute power modules in the upper and lower frames evenly on the 12508E.

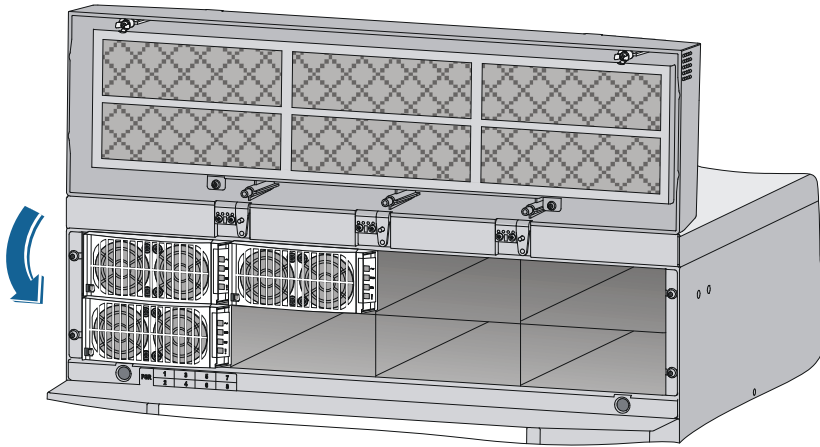
1. Rotate the power frame panel out with both hands to open the panel.
2. Pull the clip at the bottom left corner of the power module to the left to open the power module cover.
3. Insert the power module slowly into the slot until it fits in completely.
4. Close the power module cover and press the clip at the bottom left corner of the power module.
5. Push in the power module cover to ensure secure installation of the power module.

Figure 24 Installing a power module for the 12508E



6. Repeat steps 1 to 5 to install other power modules and then close the power frame panel.

Figure 25 Closing the power frame panel for the 12508E



Installing a DC power supply

The procedure for installing a DC power module is similar to installing an AC power module. For more information, see "[Installing an AC power module](#)."

Installing a fan tray

⚠ CAUTION:

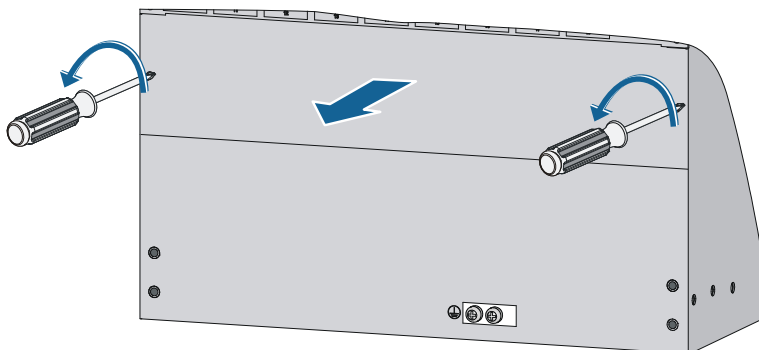
- The fan trays are heavy. Do not try to move a fan tray by yourself.
 - Hold a fan tray by the bottom when moving it. Never attempt to lift a fan tray with its handle because the handle is not designed to support weight. Doing so might result in bodily injury or damage to the module.
-

Each of the 12508E and the 12518E has two fan trays. They are installed in the same way.

To install a fan tray:

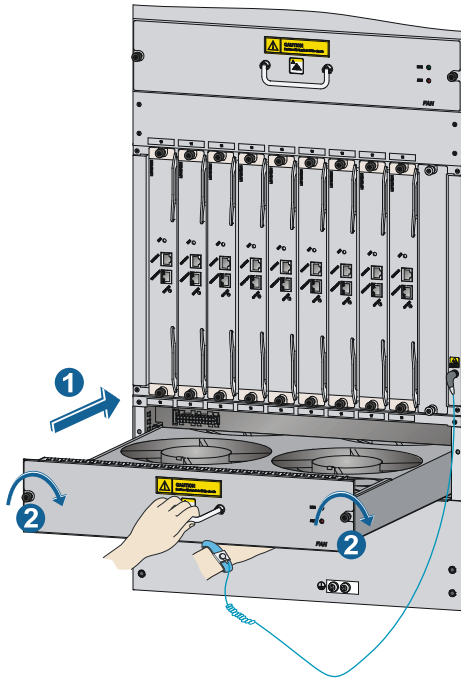
1. Wear an ESD wrist strap and make sure it is correctly grounded.
2. Unpack the fan tray.
3. Remove the blank panel from the slot to be used.

Figure 26 Removing the blank panel from the fan tray slot of the 12508E



4. Lift the fan tray and push it into the slot until it is firmly seated in the slot.
5. Fasten the captive screws on the front panel of the fan tray.

Figure 27 Installing a fan tray



Installing a card

On a 12508E or 12518E, install at least one MPU, one LPU, and seven switching fabric modules.

The 12500E does not support intermixing of the MPU, LPU, and switching fabric modules.

Use one of the following positions to install the card:

- Install MPUs, Ethernet interface cards, and OAA cards at the front of the switch chassis. Slot 0 and Slot 1 are for MPUs and other slots (slots 2 to 9 for the 12508E, and slots 2 to 19 for the 12508E) are for Ethernet interface cards and OAA cards.
- Install switching fabric modules in the switching fabric module slots (slots 10 to 18 for the 12518E, and slots 20 to 28 for the 12518E) at the rear of the chassis.

You can install MPUs, LPUs, and switching fabric modules in a similar way. This section describes how to install an MPU as an example.

Installation preparation

1. Wear an ESD wrist strap and make sure it is correctly grounded.
2. Remove the blank panel (if any) from the slot to be used.
3. Unpack the card to be installed.

NOTE:

- Keep the removed the blank panel and protection cover for future use.
 - All the cards for the 12500E are hot-swappable.
-

Installation procedure

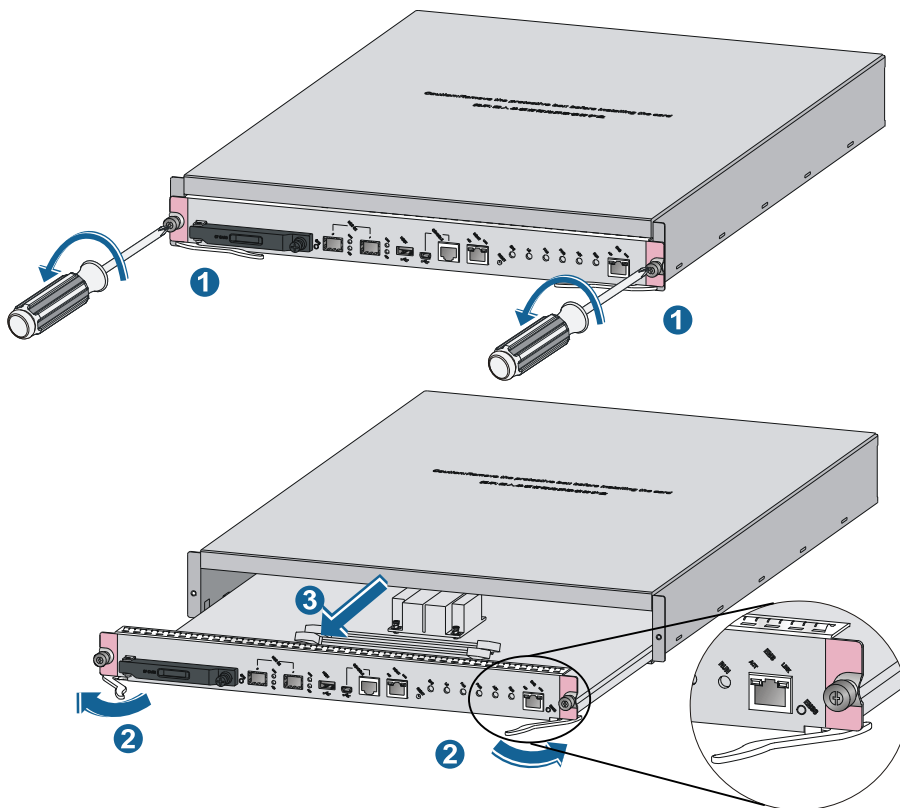
! IMPORTANT:

- Fasten the screws of each card right after you insert it.
 - To avoid damage to a card, do not use excessive force when installing and removing the card.
 - You can remove a protective cover of any model by using the same way illustrated in this document.
-

To install a card:

1. Remove the protection cover before installing an MPU or an LPU. Skip this step if the card does not have a protection cover:
 - a. Wear an ESD wrist strap and then loosen the captive screws that attach the MPU or the LPU to the protection cover with a Philips screwdriver.
 - b. Pull the MPU or the LPU out of the protection cover gently.

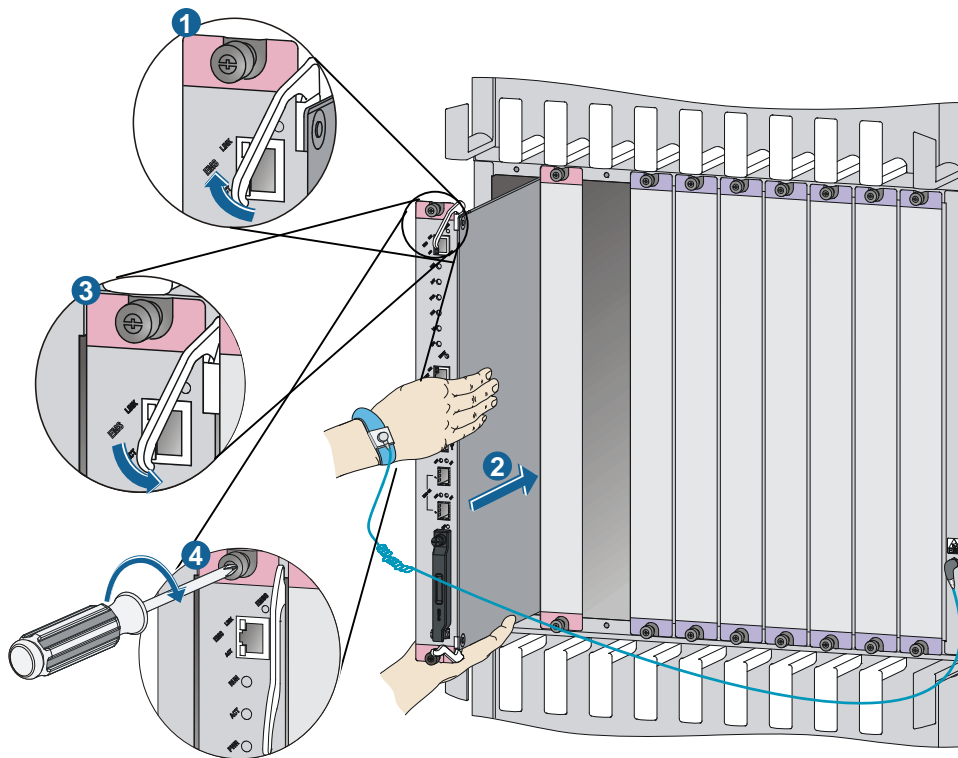
Figure 28 Removing the protection cover



2. Move the ejector levers on the front panel of the MPU outwards, hold up the MPU by one hand without touching any electronic components on the MPU, and hold the front panel by the other hand to push the MPU into the slot along the slide rails slowly.

3. Push the ejector levers inward to ensure close contact between the MPU and the backplane.
4. Position the screws into the holes and fasten them with a screwdriver to attach the MPU.

Figure 29 Installing an MPU



Connecting power cords

Follow these guidelines before connecting power cords:

- For lightning protection, the AC power should be led through an external lightning device into a 12500E switch. For more information, see "Appendix D Lightning protection."
- Make sure the power switch on the power frame is in the OFF position.
- For personal and switch safety, do not connect the power cords with the power. Power off the grounding strip, connect the power cords, power on the grounding strip, and then power on the switch.

Connecting an AC power cord

Each Power receptacle corresponds to a power module slot. For example, if slot 1 is installed with a power module, the number 1 Power receptacle must be connected to a power source with an AC power cord to make the power module operate correctly.

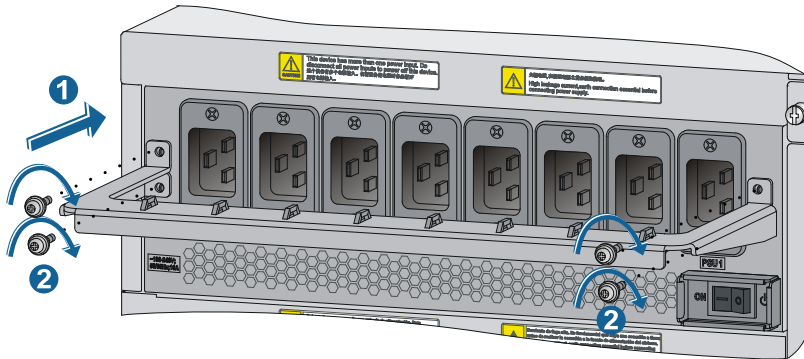
The AC power system for the 12500E requires 16A AC power cords. You need to prepare 16A power strips, and make sure the AC power supply system can provide enough power. For AC power cords used in different countries or regions, see "Appendix A Technical specifications."

The 12508E-AC and 12518E-AC models adopt the PSE20KA1 AC power system.

To connect the PSE20KA1 AC power cords:

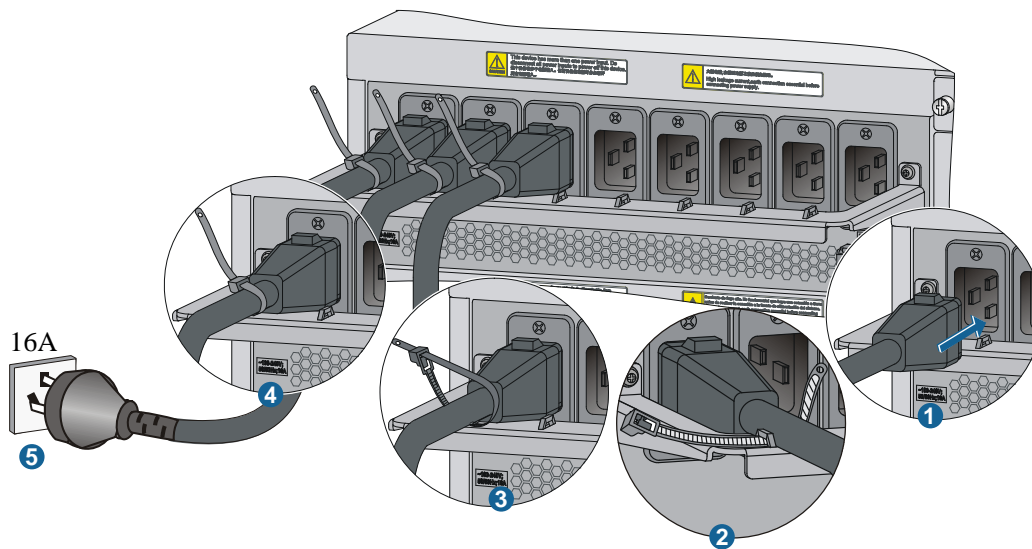
1. Secure the power cabling rack to the power frame using screws with spring washers and flat washers.

Figure 30 Installing the power cabling rack



2. Insert the connector of an AC power cord into the power receptacle.
3. Secure the AC power cord to the cabling rack with cable ties.
4. Repeat steps 2 and 3 to organize and secure other AC power cords.
5. Connect the other end of the AC power cords to the power source.

Figure 31 Connecting AC power cords



Connecting a DC power cord

⚠ CAUTION:

A plastic protection cover is installed in front of the terminal block to protect operators from being shocked. Remove the protection cover before connecting power cords and then install the protection cover promptly.

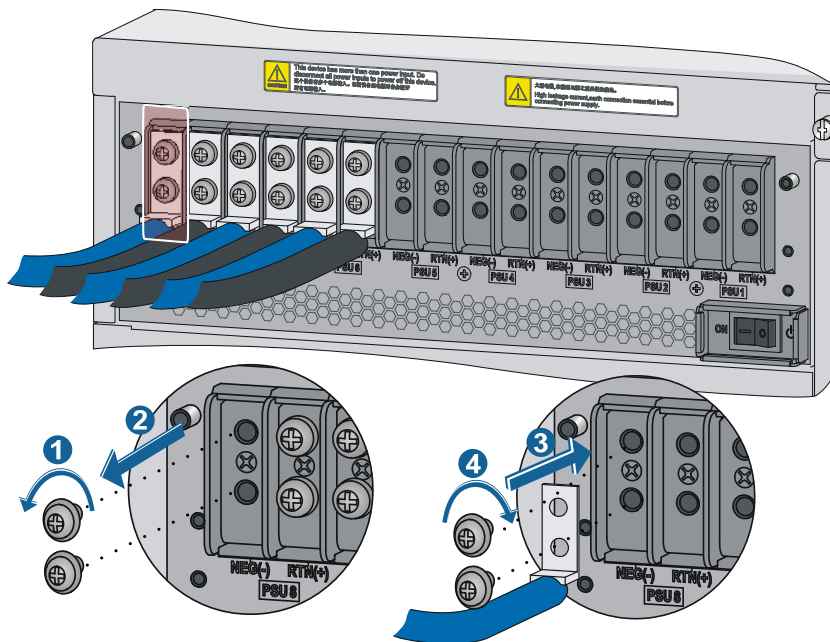
Eight pairs of wiring terminals (marked PSU1 through PSU8) are available on the DC terminal block of the 12508E/12518E. The wiring terminals correspond to the power modules. The power source provides power to the switch through the wiring terminals. If slot 1 is installed with a power module, the wiring terminals marked **PSR1** or **PSU1** must be connected to the power source with a DC power cord to make the power module operate correctly.

The 12508E-DC and 12518E-DC models adopt the PSE20KD1 DC power system.

To connect the PSE20KD1 DC power cords:

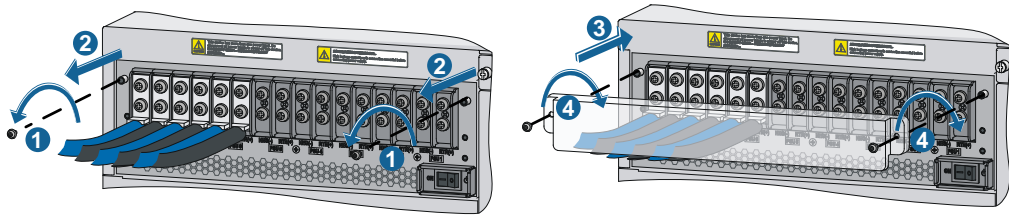
1. Remove the screws from the power frame.
2. Secure the blue DC power cord to the NEG (-) terminal on the terminal block with screws using a Phillips screwdriver.
3. Secure the ring terminal of the black power cord to the RTN (+) terminal on the terminal block with screws using a Phillips screwdriver.

Figure 32 Connecting the DC power cords to terminals on the power supply



4. Connect the other end of the DC power cord to the power source:
 - Connect the other end of the black DC power cord to the RTN (+) terminal that provides power to the switch.
 - Connect the other end of the blue DC power cord to the - 48V terminal that provides a power supply to the switch.
5. Install the protection cover:
 - a. Remove the screws on the DC power frame.
 - b. Install the protection cover on the wiring terminals.
 - c. Fasten the screws using a Phillips screwdriver.

Figure 33 Installing the protection cover



Verifying the installation

⚠ WARNING!

A 12508E has one power switch, and a 12518E has two power switches. Make sure you have turned off the power before checking the installation to avoid bodily injury and switch damage.

After the installation is completed, verify the installation against the following list. Be sure that all check results are positive.

Table 8 Installation checklist

Item	Result		Remarks
	Yes	No	
The grounding cable is correctly grounded.			
Fan trays are correctly installed and make close contact with the backplane.			
Power modules are correctly installed and have close contact with the frames.			
The power switch is off (the power switch is at the OFF position).			
Power cords are correctly connected.			
MPUs are correctly installed and have close contact with the backplane.			
LPUs are correctly installed and have close contact with the backplane.			
Switching fabric modules are correctly installed and have close contact with the backplane.			

Connecting the switch to the network

Cable routing recommendations

Interface cables and power cords should be separately routed. Reasonable cable routing can improve efficiency by facilitating installation and removal of fan trays and some other components. Follow these guidelines when you route the cables:

- Interface cables of a 12508E and 12518E are routed through the upper and lower cable management brackets on the chassis and bound at cabling racks on chassis sides, depending on the available equipment room condition.
- Put all the data signal cable adapters neatly under the chassis (instead of any places outside the chassis in case of unexpected damages).
- The power cords run along the left-rear of the chassis and out of the chassis either from the chassis top or the raised floor depending on the equipment room conditions (power distribution rack, lightning protection box, and connector strip, etc.) of the exchange office.
- Attach cables as near the switch as possible. The cables between the fixing point and switch interfaces must be bound loosely.
- Long cables can be bound with cable ties. Do not bind cables at the air exhaust vent to prevent the cables from aging too fast. For more information, see "Appendix E Cable management."
- To identify cables, you can stick labels on them. For more information, see "Appendix F Engineering labels for cables."

Logging in to the switch

Console port login or USB console port login, which is most commonly used, is the only method for initial login to the switch. It is the prerequisite to configuring other login methods.

Connecting the console cable

Before login through the console port or USB console port, connect the PC (or terminal) and the switch using the following methods accordingly:

- **Console port**—Use the console cable to connect the serial port on the PC (or terminal) to the console port on the switch.
- **USB console port**—Use the console cable to connect the USB port on the PC (or terminal) to the USB console port on the switch.

Introduction to console cables

- Console cables connecting the console port on a switch and serial port on a PC or terminal
The console cable is an 8-core shielded cable, with a crimped RJ-45 connector for connecting to the console port of the switch, and a DB-9 female connector for connecting to the serial port on the console terminal.

Figure 34 shows the console cable and Table 9 shows its pinouts.

Figure 34 Console cable connecting the serial port and the console port

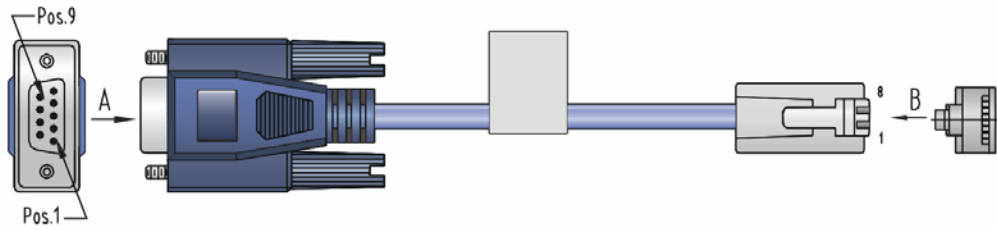


Table 9 Pinouts for the console cable connecting the serial port and the console port

RJ-45 pin	Signal	DB-9 pin	Signal
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	CD	5	SG
5	GND	5	SG
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

- Console cables connecting the USB console port on a switch and the USB port on a PC or terminal. The console cable consists of one mini-USB A/B connector for connecting to the USB console port on the switch and one USB A connector for connecting to the USB port on the PC or terminal.

Figure 35 shows the console cable and Table 10 shows its pinouts.

Figure 35 Console cable connecting the USB port and the USB console port

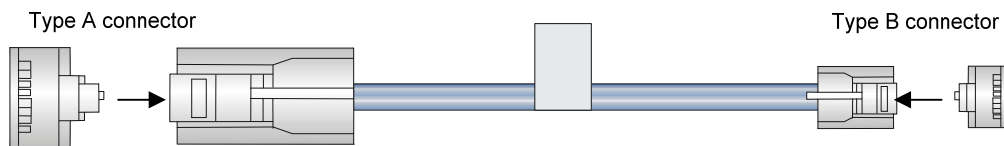
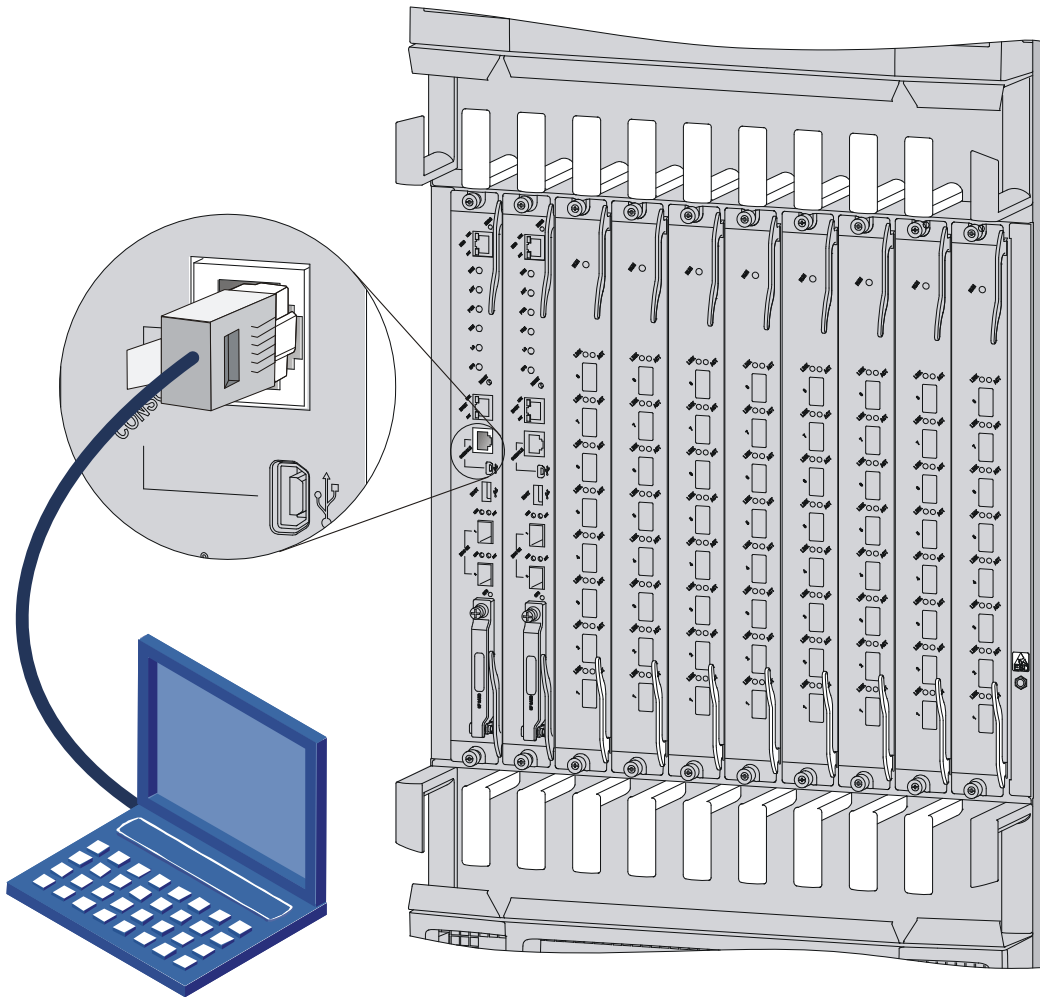


Table 10 Pinouts for the console cable connecting the USB port and the USB console port

USB A pin	Signal	mini-USB A/B pin	Signal
1	VBUS	1	VBUS
2	D-	2	D-
3	D+	3	D+
		4	ID(NC)
4	GND	5	GND

Connection procedure

Figure 36 Connecting through the console port and the serial port



To connect the console cable through the console port:

1. Connect the DB-9 connector of the console cable to the serial port on a PC or terminal.
2. Connect the RJ-45 connector of the console cable to the console port on the MPU of the switch.

To connect the console cable through the USB console port:

3. Connect the USB-A connector of the console cable to the USB port on a PC or terminal.
4. Connect the mini-USB A/B connector of the console cable to the USB console port on the MPU of the switch.

NOTE:

- If two MPUs are installed on the switch, log in through the console port or USB console port on the active MPU (typically with a smaller slot number) for the first login.
 - When you remove the console cable, first disconnect the switch end, and then disconnect the PC end.
-

Setting up a configuration environment

If you use the Windows 2003 Server operating system on your PC, add a HyperTerminal, and then log in to and manage the switch as described in this document. If you use Windows 2008 Server, Windows 7, Windows Vista, or any other operating system on your PC, use the third party terminal software. For how to use the third party terminal software, see the user guide or online help of that software.

Windows 2000 and Windows XP operating systems have the HyperTerminal. This section takes Windows XP as an example.

To set up a configuration environment:

1. Select **Start > All Programs > Accessories > Communications > HyperTerminal**.

The **Connection Description** dialog box appears.

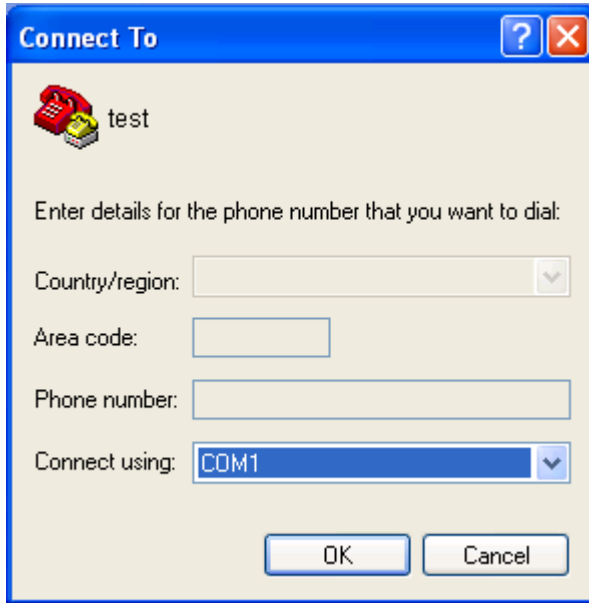
2. Enter the name of the new connection in the **Name** field and click **OK**.

Figure 37 Connection description



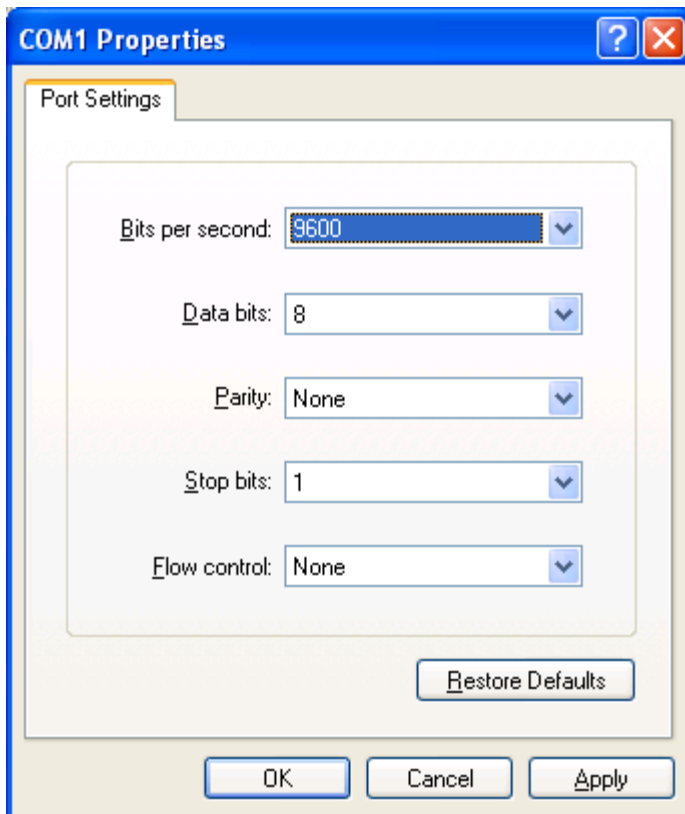
3. Select the serial port to be used from the **Connect using** list, and click **OK**.

Figure 38 Setting the serial port used by the HyperTerminal connection



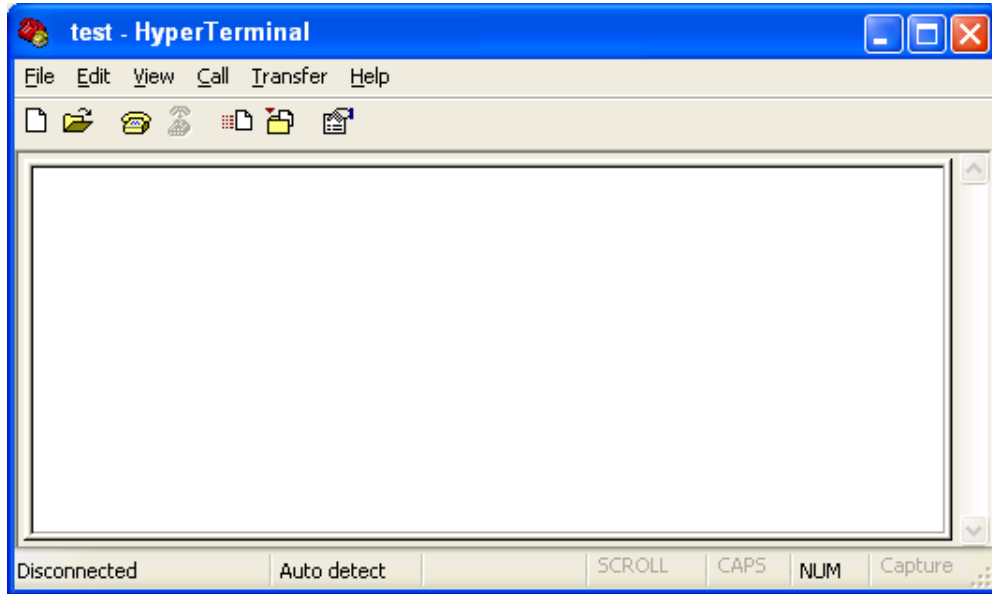
4. Set **Bits per second** to **9600**, **Data bits** to **8**, **Parity** to **None**, **Stop bits** to **1**, and **Flow control** to **None**, and click **OK**.

Figure 39 Setting the serial port parameters



5. Select **File > Properties** in the HyperTerminal window.

Figure 40 HyperTerminal window

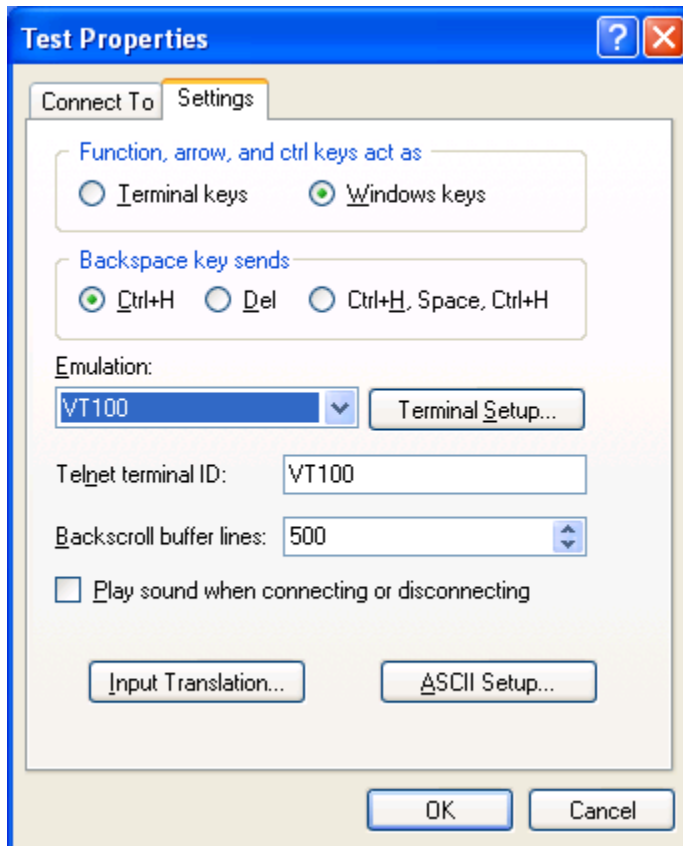


6. On the **Settings** tab, set the emulation to **VT100** and click **OK**.

NOTE:

HP recommends that you select the **Windows keys** option.

Figure 41 Setting the terminal emulation in Test Properties dialog box



Powering on the switch

! **IMPORTANT:**

Before powering on the switch, identify the power switch in the equipment room so that you can disconnect the power module promptly in case of an emergency.

Before powering on the switch, verify that:

- The interface cables, power cords, and the grounding cable are correctly connected.
- The input power voltage meets the requirement of the switch.
- The console cable is correctly connected, the terminal or PC used for configuration has started, and the configuration parameters have been set.

Powering on the switch

1. Turn on the power switch of the power source.
2. Turn on the power switch on the switch.

After the switch is powered on, the basic manufacturing information about the switch is displayed:

```
DDR2 SDRAM test successful.
System is starting...
Booting Normal Extend BootWare
The Extend BootWare is self-decompressing
Done!
*****
*
*          HP 12500 BootWare, Version 2.20          *
*
*****
Copyright (c) 2010-2013 Hewlett-Packard Development Company, L.P.

Compiled Date       : Sep  4 2013
CPU Type           : P5040
CPU L1 Cache       : 32KB
CPU L2 Cache       : 1024KB
CPU Clock Speed    : 1800MHz
Memory Type        : DDR3 SDRAM
Memory Size        : 8192MB
Memory Speed       : 1200MHz
BootWare Size      : 8MB
Flash Size         : 512MB
cfa0 Size          : 4002MB
NVRAM Size         : 1024KB
BASIC CPLD Version : 001
EXTENDED CPLD Version : 001
PCB Version        : Ver.A
```

The switch initiates the power-on self-test (POST) and the results are displayed at the console terminal.

<Sysname>

NOTE:

- The 12500E routing switches provide a command line interface (CLI). For more information about the CLI, see *HP FlexFabric 12500 and 12500E Routing Switch Series Fundamentals Configuration Guide*.
 - The output depends on your switch model.
-

Verification after power-on

HP recommends that you check the following conditions after the switch is powered on:

- The cooling system is operating. You should be able to hear fan rotation noise and feel air being blown out.
- All the system LEDs on the MPUs are functioning correctly.

Table 11 LED status when the 12508E/12518E operates correctly

Module	LED	Status
MPU	SFC (red and green)	Flashing green
	LC (red and green)	Flashing green
	FAN (red and green)	Flashing green
	PWR (red and green)	Flashing green
	ACT (green)	Steady on
	RUN (red and green)	Flashing green
LPU	RUN (red and green)	Flashing green
Switching fabric module	RUN (red and green)	Flashing green
Power monitoring module	RUN (green)	Flashing
	ALM (red)	Off
Fan	RUN (green)	Flashing
	ALM (red)	Off

Connecting the switch to the network



TIP:

After connecting the switch to the network, you can use the **ping** or **tracert** command to check the interoperability between the switch and network. For more information, see *HP FlexFabric 12500 and 12500E Routing Switch Series Network Management and Monitoring Configuration Guide*.

Connecting the switch to the network through the AUX port

You need an AUX cable when configuring a switch with the remote modem dial-up approach.

Introduction

An AUX cable is an 8-core shielded cable. At one end of the cable is an RJ-45 connector and at the other end is a DB-9 (male) connector. Plug the RJ-45 connector into the AUX port of the switch and the DB-9 (male) connector into the DB-9 (female) port of the modem. An AUX cable is the same as a console cable. For more information, see [Figure 34](#) and [Table 9](#).

Connection procedure

To connect the AUX port:

1. Plug the RJ-45 connector of the AUX cable into the AUX port of the switch.
2. Plug the DB-9 (male) connector at the other end into the serial port of the modem.

Connecting the switch to the network through a copper Ethernet port

The 10/100/1000Base-T copper ports of the switch support MDI/MDI-X auto-sensing. They are connected to the network through category-5 or above twisted pairs that are equipped with RJ-45 connectors.

NOTE:

No Ethernet twisted pair cables are shipped with the switch. Prepare them by yourself.

Connection procedure

To connect a 10/100/1000Base-T port:

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

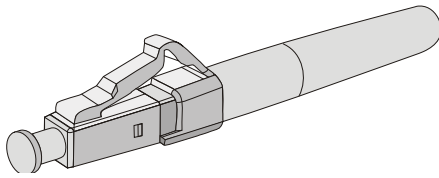
Connecting the switch to the network through a fiber Ethernet port

Use an optical fiber to connect an XFP, SFP, CFP, SFP+, or QSFP+ port on the switch to the network. You must install a transceiver module to the switch, and then insert the fiber connector to the module.

Introduction to fiber connector

Fiber connectors are indispensable passive components in an optical fiber communication system. They allow the removable connection between optical channels, which makes the optical system debugging and maintenance more convenient and the transit dispatching of the system more flexible. Among various fiber connectors, only the LC connector is described here.

Figure 42 LC connector



Precautions

Follow these precautionary steps:

- When selecting a fiber network facility, make sure the type of the connector and the fiber matches the adopted fiber port.
- Be sure to install the dust cover if the fiber port is not connected to a fiber connector.
- Some invisible rays might be emitted from the fiber port if the fiber port is not connected to a fiber connector or the dust cover is removed. Therefore, never stare at the fiber port directly.
- Never bend or curve a fiber when connecting it.

Installing the XFP, SFP, SFP+, and QSFP+ modules

△ CAUTION:

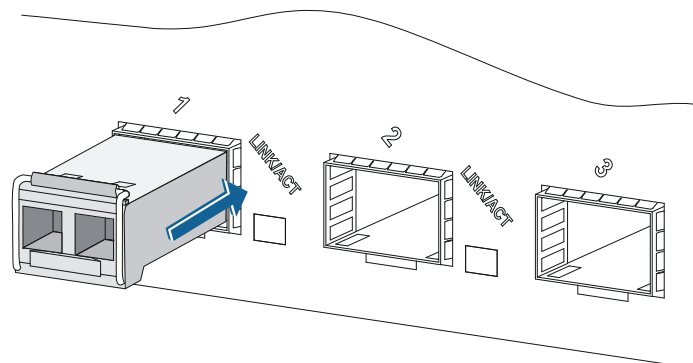
Do not touch the golden finger of a transceiver module during installation.

The installation of the XFP, SFP, SFP+, and QSFP+ modules is similar. This section uses an SFP+ module as an example.

To install an SFP+ module:

1. Remove the optical fiber if the SFP+ module is installed with an optical fiber.
2. Put on an ESD wrist strap, and make sure it has close skin contact, and is correctly grounded.
3. Unpack the SFP+ module and make sure the clasp is closed.
4. Gently insert the SFP+ module into the port until it fits in completely, as shown in [Figure 43](#).

Figure 43 Installing an SFP+ module



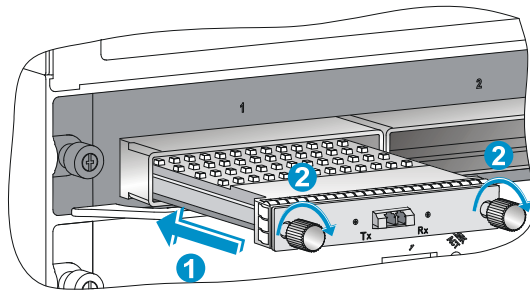
! IMPORTANT:

Do not remove the dust plug of the SFP+ module port before installing an optical fiber.

Installing the CFP module

1. Put on an ESD wrist strap. Make sure it has close skin contact and is correctly grounded.
2. Unpack the CFP module.
3. Insert the CFP module gently into the port until it fits in completely.
4. Fasten the captive screws on the CFP module.

Figure 44 Installing a 40-Gbps CFP transceiver module



NOTE:

- Unsmooth installation for the 40-Gbps CFP module is likely to occur due to the bump design on its top.
 - The appearance of 100-Gbps CFP module differs from that of the 40-Gbps CFP module.
-

Connecting an optical fiber

1. Put on an ESD wrist strap, and make sure it has close skin contact, and is correctly grounded.
2. Remove the dust plug from the fiber connector, and use dust free paper and absolute alcohol to clean the end face of the fiber connector.

Figure 45 LC fiber connector

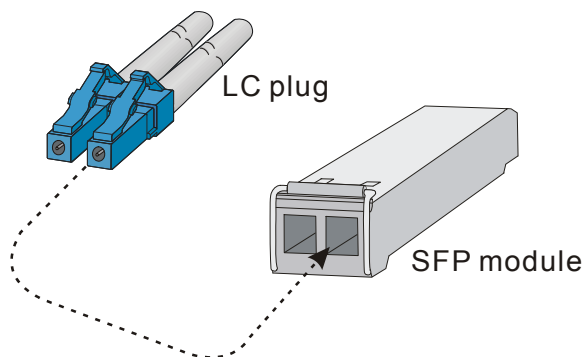
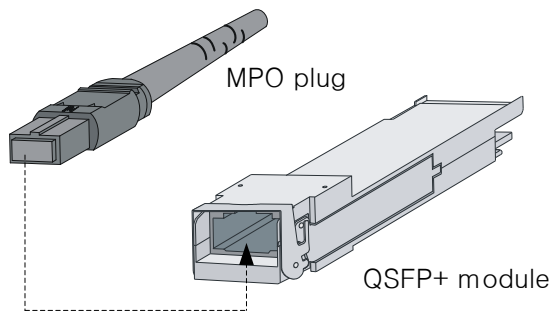


Figure 46 MPO fiber connector



3. Connect one end of the fiber to the SFP module of the 12500E switch.
4. Connect the other end of the fiber to the peer device.

Connecting an SFP+ cable and a QSFP+ cable (optional)

The installation of the SFP+ cable and QSFP+ cable is similar. This section uses an SFP+ cable as an example.

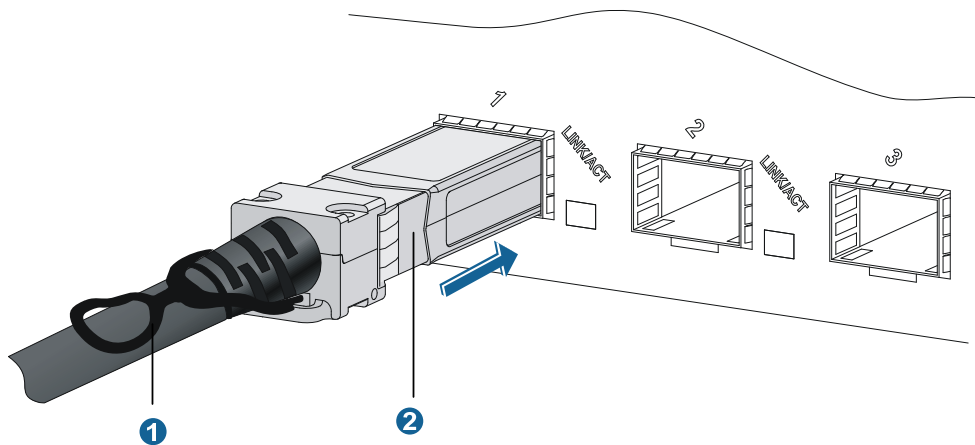
NOTE:

- SFP+ cables are hot swappable.
 - When connecting an SFP+ cable, make sure the bend radius of the cable is no less than eight times of the diameter of the cable.
-

To connect an SFP+ cable:

1. Wear an ESD wrist strap and make sure the strap has a good skin contact and is correctly grounded.
2. Unpack the SFP+ cable.
3. Insert one end of the plug of the SFP+ cable horizontally into the SFP+ slot on the switch and the other end of the plug into the SFP+ slot of the peer device.

Figure 47 Connecting the SFP+ cable



(1) Pull latch

(2) Connector

Hardware management

This chapter describes the hardware management functions that the switch provides. With these functions, you can conveniently view the operating status of your switch, and manage and routinely maintain the hardware modules of your switch.

NOTE:

- The CLIs and examples in this chapter are based on software version R7328.
 - The output depends on your switch model.
-

Displaying the electrical label data for your switch

Electrical label data is also called permanent configuration data or archive information, which is written to the storage component of a card during device debugging or testing.

Use the **display device manuinfo** command to display the electronic label data for your switch, including the card name, serial number, MAC address, manufacturing date, and vendor name.

Display the electrical label information about the card in slot 0 on your switch.

- In standalone mode:

```
<Sysname> display device manuinfo slot 0
Slot 0:
DEVICE_NAME           : HP FF 12500E MPU JG802A
DEVICE_SERIAL_NUMBER  : CN41GC8002
MAC_ADDRESS           : B8AF-6730-3200
MANUFACTURING_DATE    : 2014-01-20
VENDOR_NAME           : HP
```

- In Intelligent Resilient Framework (IRF) mode:

```
<Sysname> display device manuinfo chassis 1 slot 0
chassis 1
slot 0:
DEVICE_NAME           : HP FF 12500E MPU JG802A
DEVICE_SERIAL_NUMBER  : CN41GC8002
MAC_ADDRESS           : B8AF-6730-3200
MANUFACTURING_DATE    : 2014-01-20
VENDOR_NAME           : HP
```

Table 12 Command output

Field	Description
Slot 0	Slot number of a card.
Chassis 1	ID of the member switch where the card resides.

Displaying the card information for your switch

Use the **display device** command to display card information for your switch, including the slot number, card type, card status, and software version.

Display brief information about all cards on your switch.

```
<Sysname> display device
```

- In standalone mode:

Slot No.	Brd Type	Brd Status	Software Version
0	NONE	Absent	NONE
1	LST1MRPNE1	Master	12500-CMW710-R7328
2	NONE	Absent	NONE
3	NONE	Absent	NONE
4	NONE	Absent	NONE
5	LST1XP48LFD1	Normal	12500-CMW710-R7328
6	NONE	Absent	NONE
7	NONE	Absent	NONE
8	NONE	Absent	NONE
9	NONE	Absent	NONE
10	NONE	Absent	NONE
11	NONE	Absent	NONE
12	LST1SF08E1	Normal	12500-CMW710-R7328
13	LST1SF08E1	Normal	12500-CMW710-R7328
14	LST1SF08E1	Normal	12500-CMW710-R7328
15	LST1SF08E1	Normal	12500-CMW710-R7328
16	LST1SF08E1	Normal	12500-CMW710-R7328
17	LST1SF08E1	Normal	12500-CMW710-R7328
18	LST1SF08E1	Normal	12500-CMW710-R7328

- In IRF mode:

Slot No.	Brd Type	Brd Status	Software Version
1/0	NONE	Absent	NONE
1/1	LST1MRPNE1	Master	12500-CMW710-R7328
1/2	NONE	Absent	NONE
1/3	NONE	Absent	NONE
1/4	NONE	Absent	NONE
1/5	LST1XP48LFD1	Normal	12500-CMW710-R7328
1/6	NONE	Absent	NONE
1/7	NONE	Absent	NONE
1/8	NONE	Absent	NONE
1/9	NONE	Absent	NONE
1/10	NONE	Absent	NONE
1/11	NONE	Absent	NONE
1/12	LST1SF08E1	Normal	12500-CMW710-R7328
1/13	LST1SF08E1	Normal	12500-CMW710-R7328
1/14	LST1SF08E1	Normal	12500-CMW710-R7328
1/15	LST1SF08E1	Normal	12500-CMW710-R7328
1/16	LST1SF08E1	Normal	12500-CMW710-R7328
1/17	LST1SF08E1	Normal	12500-CMW710-R7328

Table 13 Command output

Field	Description
Slot No.	<ul style="list-style-type: none"> In standalone mode: Slot No.—Slot number of a card. In IRF mode: Slot No.—Slot number of a card on the specified member switch in the format of member ID/slot number.
Brd Type	<p>Hardware type of a card, which can be:</p> <ul style="list-style-type: none"> Specific card model—Type of a card (such as LST1MRPNE1), which is the same as the silkscreen. NONE—No card is in the slot. UNKNOWN—The card is not supported by the software version and thus cannot start properly.
Brd Status	<p>Card status, which can be:</p> <ul style="list-style-type: none"> Absent—No card is in the slot. Master—The card is an active main processing unit (MPU). Standby—The card is a standby MPU. Normal—The card is operating properly. Fault—The card in the slot has not started up or has failed. Off—The card is not powered on. Illegal—The card is not supported by the software version and thus cannot start properly.
Software Version	<p>Software version of the current card, which can be:</p> <ul style="list-style-type: none"> Specific software version. NONE—No card is in the slot. Mismatched—The software version does not support the card and thus cannot be uploaded.

In standalone mode, display information about the card in slot 5.

```
<Sysname> display device slot 5
Status      : Normal
Type        : LST1XP48LFD1
Software    : 12500-CMW710-R7328
PCB         : Ver.A
Board Cpu:
  Number of Cpld: 2
  Cpld 0:
    Software   : 001C
  Cpld 1:
    Software   : 001C
CpuCard
  Type        : LSR1CPA
  PCB         : Ver.C
  Number of Cpld: 1
  Cpld 0:
    Software   : 001
```

```

BootRom      : 2.12
Base Boot    : 2.10
Mbus card
  Type       : LSR1MBCB
  Software   : 115
  PCB        : Ver.B
Chip 0:
  Learning Mode : IVL
Chip 1:
  Learning Mode : IVL
Chip 2:
  Learning Mode : IVL
Chip 3:
  Learning Mode : IVL

```

Table 14 Command output

Field	Description
Status	Card status: <ul style="list-style-type: none"> • Standby—The card is the standby MPU. • Master—The card is the active MPU. • Absent—The slot is not installed with a card. • Fault—The card is rebooting, or is faulty and cannot start up. • Normal—The card is an LPU and is operating correctly. • Off—The card is not powered on. • Illegal—The software does not support the card, and the card cannot operate correctly. • Offline—The card is isolated from the system.
Board Cpu	Information about the CPU on the mother board.
Number of Cpld	Number of programmable logic components.
CpuCard	Information about the CPU daughter card.
SoftWare	Software version.
BootRom	Version of the extended BootWare segment.
Base Boot	Version of the basic BootWare segment.
Learning Mode	MAC address learning mode. If a MAC address table is maintained for each VLAN, the value of this field is IVL (Independent VLAN Learning).

Rebooting your switch

⚠ CAUTION:

Rebooting the switch interrupts network services.

To avoid configuration loss, use the **save** command to save the running configuration before a reboot.

Before a reboot, use the **display startup** and **display boot-loader** commands to verify whether you have specified the correct startup configuration file and startup software images.

You can reboot the switch in one of the following ways:

- Power off and then power on the switch. This method might cause data loss, and is the least-preferred method.
Immediately reboot the switch at the CLI.
- Schedule a reboot at the CLI, so the switch automatically reboots at the specified time or after the specified period of time.

The first method is called "cold reboot" or "cold startup". The second and third methods are called "warm reboot" or "warm startup", and can be used remotely.

For data security, if you reboot the switch while the switch is performing file operations, the switch does not reboot.

The precision of the rebooting timer is 1 minute. One minute before the rebooting time, the switch prompts "REBOOT IN ONE MINUTE" and reboots in one minute.

To reboot cards or switches immediately at the CLI, execute one of the following tasks as needed in user view:

Task	Command	Remarks
In standalone mode, reboot a card, or the switch immediately.	reboot [slot <i>slot-number</i>] [force]	If you reboot the active MPU or do not specify the slot keyword, the reboot command reboots the switch.
In IRF mode, reboot an IRF member switch, a card on the switch, or all IRF member switches.	reboot [chassis <i>chassis-number</i> [slot <i>slot-number</i>]] [force]	If you reboot the active MPU or do not specify the slot keyword, the reboot command reboots the member switch.

To schedule a reboot, execute either of the following commands in user view:

Task	Command	Remarks
Specify the reboot date and time.	schedule reboot at <i>time</i> [<i>date</i>]	By default, the reboot date and time is not specified.
Specify the reboot delay time.	schedule reboot delay <i>time</i>	By default, the reboot delay time is not specified.

Managing the power supply system

You can use the following **display** commands and proper configuration commands to manage the power supply system of your switch.

Displaying the electrical label data for the power monitor module

Use the **display device manuinfo power-monitor** command to display the electrical label data for the specified power monitor module, including the module name, serial number, manufacturing date, and vendor name.

- In standalone mode:


```
# Display the electrical label information about power monitor module 2.
<Sysname> display device manuinfo power-monitor 2
PowerMonitor 2:
DEVICE_NAME           : HP FF 12500E Spare Pwr Monitor Mod JG804A
DEVICE_SERIAL_NUMBER  : CN41GCB002
MAC_ADDRESS           : NONE
MANUFACTURING_DATE    : 2014-01-20
VENDOR_NAME           : HP
```

- In IRF mode:

```
# Display the electrical label information about power monitor module 2 on member switch 1.
<Sysname> display device manuinfo chassis 1 power-monitor 2
Chassis 1:
PowerMonitor 2:
DEVICE_NAME           : HP FF 12500E Spare Pwr Monitor Mod JG804A
DEVICE_SERIAL_NUMBER  : CN41GCB002
MAC_ADDRESS           : NONE
MANUFACTURING_DATE    : 2014-01-20
VENDOR_NAME           : HP
```

Enabling power supply management

- If power supply management is not enabled when you add a new card by inserting it into the slot or starting power supply to the card by using the **power-supply** command, the system directly powers on the card, and the power supply may become unstable or the system may restart because of overloading.
- If power supply management is enabled when you add a new card by inserting it into the slot or starting power supply to the card by using the **power-supply** command, the system compares the maximum power consumption of the card against the available power (including the redundant power supply). If the former is not greater than the latter, the system supplies power to the card, otherwise, the system does not supply power to the card.

To enable power supply management:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Enable power supply management.	<ul style="list-style-type: none"> • In standalone mode: power-supply policy enable • In IRF mode: power-supply policy enable chassis chassis-number 	Enabled by default.

Configuring the number of redundant power supplies

Redundant power supplies are reserved for power supply backup and power supply threshold alarming. With multiple redundant power supplies configured in the system, if a power supply fails or the system power supply is overloaded, the system automatically enables a redundant power supply. As a result, the number of redundant power supplies decreases by one.

If power supply management is disabled, the system does not reserve any redundant power supply. In this case, you can also use the **power-supply policy redundant** command to configure the number of redundant power supplies, and this configuration will take effect after power supply management is enabled.

To configure the number of redundant power supplies:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Enable power supply management.	<ul style="list-style-type: none"> In standalone mode: power-supply policy enable In IRF mode: power-supply policy enable chassis chassis-number 	By default, power supply management is enabled.
3. Configure the number of redundant power supplies.	<ul style="list-style-type: none"> In standalone mode: power-supply policy redundant module-count In IRF mode: power-supply policy chassis chassis-number redundant module-count 	By default, the number of redundant power supplies depends on the reserved power, which you can display with the display power-supply command.

Manually starting or stopping power supply to a card

When the switch is operating, you can start or stop power supply to a card to adjust the system available power as needed.

Configuration guidelines

Before starting power supply to a card, confirm whether the power supply is overloaded after supplying power to the new card. If the maximum power consumption of the system is greater than the available power after supplying power to the new card, the system performs one of the following options:

- With power supply management enabled, the system does not supply power to this card because of the self protection mechanism.
- With power supply management disabled, the system becomes unstable or the switch reboots because of power supply overload.

For more information about power supply management, see "[Enabling power supply management.](#)"

Configuration procedure

To start or stop power supply to a card, execute one of the following commands as needed in user view:

Task	Command	Remarks
Start or stop power supply to the specified card.	<ul style="list-style-type: none"> In standalone mode: power-supply { on off } slot slot-number In IRF mode: power-supply { on off } chassis chassis-number slot slot-number 	The specified card cannot be an MPU or a switching fabric module.

Displaying the power supply system information about your switch

Use the **display power-supply** command to display power supply system information about your switch, including whether power management is enabled, the number of configured redundant power supplies, power, output voltage and current, and whether each card is powered on.

```
# Display detailed information about the power supply system.
```

```
<Sysname> display power-supply verbose
```

```
Power info on chassis 0:
```

```
System power-supply policy: enable
```

```
System power-module redundant(configured): 1
```

```
System power usable: 4000 Watts
```

```
System power redundant(actual): 0 Watts
```

```
System power allocated: 3620 Watts
```

```
System power available: 380 Watts
```

```
System power used(current): 1070.00 Watts
```

```
System power monitoring unit 1:
```

```
    Software version: 200
```

Type	In/Out	Rated-Vol(V)	Existing	Usable	Redundant(actual)
PSE9000-A	AC/DC	220(default)	2	2	0

```
DC output voltage information:
```

Tray	Value(V)	Upper-Threshold(V)	Lower-Threshold(V)	Status
1	50.00	52.00	48.00	Normal

```
DC output current information:
```

```
Total current(A): 21.40
```

```
Branch    Value(A)
```

1/1	11.80
1/2	9.60
1/3	N/A
1/4	N/A
1/5	N/A
1/6	N/A
1/7	N/A
1/8	N/A

```
PSU Status:
```

ID	Status	Input-Err	Output-Err	High-Temperature	Fan-Err	Closed	Current-Limit
1/1	Normal						
1/2	Normal						

```

1/3 Absent
1/4 Absent
1/5 Absent
1/6 Absent
1/7 Absent
1/8 Absent

```

Line-card power status:

Slot	Board-Type	Watts	Status
2	None	--	Absent
3	LST1GT48LEC1	190	On
4	None	--	Absent
5	LST0XP40RFD1	435	On
6	Unknown	500	On
7	None	--	Absent
8	None	--	Absent
9	None	--	Absent

PMU 1: normal

```

Protocol: 21
Type: LST1PMUB
Vendor: HP
Current Ver: 200
Boot Ver: 205
Low-Area Ver: 200
High-Area Ver: Unknown
Current-Area: Low
PCB Ver: Ver.A
Backplane PCB Ver: Ver.A
Backplane Type: LST19KA2PSB
PMU Temperature: 30 °C
PSU Count: 2
PSU Actual Output: 50V

```

ID	Temperature	Fan 0 Speed	Fan 1 Speed	Actual Current
Run1	43	139	140	12
Run2	42	138	139	10

ID	Inp-Vol	RatedPower	Type	Hardware	SN
Info1	220	2000	CP2000AC54PE	1:18	12CS39016731
Info2	220	2000	CP2000AC54PE	1:18	12CS39016230

Configuring temperature thresholds for a card

You can set temperature thresholds for a card. When the temperature reaches the threshold, the switch generates alarms.

Configuring temperature thresholds for a card

Step	Command
1. Enter system view.	system-view
2. Configure temperature alarm thresholds for a card.	<ul style="list-style-type: none"> In standalone mode: temperature-limit slot <i>slot-number</i> { inflow hotspot outflow } <i>sensor-num lowerlimit warninglimit [alarmlimit]</i> In IRF mode: temperature-limit chassis <i>chassis-number</i> slot <i>slot-number</i> { inflow hotspot outflow } <i>sensor-num lowerlimit warninglimit [alarmlimit]</i>

Displaying the temperature information on your switch

Use the **display environment** command to display the temperature information of the sensors on the cards, including the current temperature and temperature thresholds.

Display the temperature information of the cards on the switch.

```
<Sysname> display environment
```

- In standalone mode:

```
System temperature information (degree centigrade):
```

```
-----
```

Slot	Sensor	Temperature	LowerLimit	WarningLimit	AlarmLimit	ShutdownLimit
1	inflow 1	21	-25	70	80	N/A
1	outflow 1	24	-15	70	85	N/A
1	hotspot 1	27	-15	75	85	N/A
5	inflow 1	27	-20	65	85	N/A
5	outflow 1	27	0	70	85	N/A
5	hotspot 1	30	-10	70	80	N/A
12	inflow 1	23	-10	55	80	N/A
12	outflow 1	42	5	85	95	N/A

- In IRF mode:

```
System temperature information (degree centigrade):
```

```
-----
```

Slot	Sensor	Temperature	LowerLimit	WarningLimit	AlarmLimit	ShutdownLimit
1/1	inflow 1	21	-25	70	80	N/A
1/1	outflow 1	24	-15	70	85	N/A
1/1	hotspot 1	27	-15	75	85	N/A
1/5	inflow 1	27	-20	65	85	N/A
1/5	outflow 1	27	0	70	85	N/A
1/5	hotspot 1	30	-10	70	80	N/A
1/12	inflow 1	23	-10	55	80	N/A
1/12	outflow 1	42	5	85	95	N/A

Table 15 Command output

Field	Description
Slot	<ul style="list-style-type: none">In standalone mode: Slot—A number in this field indicates a card.In IRF mode: Slot—The <i>chassis-number/slot-number</i> in this field indicates a card on an IRF member switch.
Sensor	Temperature sensor: <ul style="list-style-type: none">hotspot—Hotspot sensor.inflow—Air inlet sensor.outflow—Air outlet sensor.
Temperature	Current temperature.
Lower limit	Lower temperature threshold.
WarningLimit	Warning temperature threshold.
AlarmLimit	Alarming temperature threshold.
ShutdownLimit	Shut-down temperature threshold (currently not supported).

Isolating a card

When the switch detects a card failure or upgrades a logic of the CPU daughter card on a card, you can isolate the faulty card or the CPU daughter card to prevent it from forwarding data packets while causing no interference on the operation of the system and services of other cards.

Configuration restrictions and guidelines

- The active MPU cannot be isolated.
- If only one switching fabric module is working on the switch, it cannot be isolated.
- Before upgrading a logic of the LPU, keep the LPU offline.
- To minimize the interference on the system operation, force a switching fabric module that is operating normally offline before you unplug it.
- You can use the **display device** command to view whether a card is isolated, or, whether the card is in the offline state.
- Do not perform other configurations on the isolated card.

Configuration procedure

To isolate a card:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Isolate the specified card.	<ul style="list-style-type: none"> In standalone mode: board-offline slot <i>slot-number</i> In IRF mode: board-offline chassis <i>chassis-number slot slot-number</i> 	No card is isolated by default.

Configuring hardware failure detection and protection

Specifying the actions to be taken for hardware failures

The device automatically detects hardware failures on components, cards, and the forwarding plane. You can specify the actions to be taken in response to detected failures.

To specify the actions to be taken in response to hardware failures:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Specify the action to be taken in response to a type of hardware failures.	hardware-failure-detection { board chip forwarding } { off isolate reset warning }	By default, the system takes the action of warning (sending traps) in response to hardware failures.

Enabling hardware failure protection for interfaces

After you enable hardware failure protection on an interface, the system automatically shuts down the interface when it detects a hardware failure on the interface. An interface shut down this way is in **Protect Down** state.

Before enabling hardware failure protection on an interface, make sure a backup link is available for uninterrupted services.

After the failure on an interface is removed, bring the interface up using the **undo shutdown** command.

To enable hardware failure protection for an interface:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Set the action to be taken in response to failures on the forwarding plane to isolate .	hardware-failure-detection forwarding isolate	By default, the system takes the action of warning (sending traps) in response to forwarding-plane failures.
3. Enter Ethernet interface view.	interface <i>interface-type</i> <i>interface-number</i>	N/A
4. Enable hardware failure protection for the interface.	hardware-failure-protection auto-down	By default, hardware failure protection is enabled.

Enabling hardware failure protection for aggregation groups

After you enable hardware failure protection for aggregation groups, the system follows the following rules when it detects a hardware failure on a member interface of an aggregation group:

- If the member interface is not the last member in up state in the group, the system shuts down the interface.
- If the member interface is the last member in up state in the group, the system does not shut down the interface.

To enable hardware failure protection for aggregation groups:

Step	Command	Remarks
1. Enter system view.	system-view	N/A
2. Set the action to be taken in response to failures on the forwarding plane to isolate .	hardware-failure-detection forwarding isolate	By default, the system takes the action of warning (sending traps) in response to forwarding-plane failures.
3. Enter Ethernet interface view.	interface <i>interface-type</i> <i>interface-number</i>	N/A
4. Disable hardware failure protection for the interface.	undo hardware-failure-protection auto-down	By default, hardware failure protection is enabled. Configure this command on every member interface in the aggregation group. If you do not configure this command on a member device, the system shuts down the interface when it detects a hardware failure on the interface, whether or not the interface is the last member in up state in the group.
5. Exit to system view.	quit	N/A
6. Enable hardware failure protection for aggregation groups.	hardware-failure-protection aggregation	By default, hardware failure protection is disabled for aggregation groups.

The **hardware-failure-protection aggregation** and **hardware-failure-protection auto-down** commands do not take effect on an interface in the following cases:

- Loopback testing is enabled (using the **loopback { external | internal }** command).
- The interface is forcibly brought up (using the **port up-mode** command).
- The interface is a physical IRF port. For more information about physical IRF ports, see *HP FlexFabric 12500 and 12500E Routing Switch Series Virtualization Configuration Guide*.

An interface shut down for hardware failure protection is in Protect DOWN state. You can use the **display interface** command to view the status. To restore the interface to UP state, execute the **undo shutdown** command.

For a card that is isolated or forbidden to load software for hardware failure protection, you can remove it and then reinstall it to restore it to operating state.

To view hardware failure detection and protection information, use the **display hardware-failure-detection** command.

Displaying the operating state of fans

Use the **display fan** command to display the operating state of fans on your switch.

Display detailed information about all fans on the switch.

```
<Sysname> display fan
```

```
Fan-tray state on chassis 0:
```

```
Fan-tray 1    state: Normal
```

```
Fan-tray 2    state: Normal
```

```
<Sysname> display fan verbose
```

```
Fan-tray verbose state on chassis 0:
```

```
Fan-tray 1:
```

```
Software version: 300
```

```
Hardware version: Ver.A
```

```
Fan number: 7
```

```
Temperature: 28 °C
```

```
High temperature alarm threshold: 60 °C
```

```
Low speed alarm threshold: 30 %
```

```
Fan  Status      Speed(%)
```

```
---  -
```

```
1   normal      30 %
```

```
2   normal      30 %
```

```
3   normal      65 %
```

```
4   normal      65 %
```

```
5   normal      40 %
```

```
6   normal      40 %
```

```
7   normal      40 %
```

```
Fan-tray 2:
```

```
Software version: 300
```

```
Hardware version: Ver.A
```

```
Fan number: 7
```

```

Temperature: 28 °C
High temperature alarm threshold: 60 °C
Low speed alarm threshold: 30 %
Fan  Status      Speed(%)
----  -
1   normal      30 %
2   normal      30 %
3   normal      65 %
4   normal      65 %
5   normal      40 %
6   normal      40 %
7   normal      40 %

```

Table 16 Command output

Field	Description
Fan-tray 1:	Indicates that the following information is for the fan in tray number 1.
Speed(rpm)	Rotate speed of the fan
Fan-tray verbose state on chassis 1:	Indicates that the following information is for the fan on member switch 1

Displaying alarms present on your switch

Use the **display alarm** command to display the alarming information about your switch.

- In standalone mode:

```

<Sysname> display alarm
Slot  Level   Info
6     ERROR   Fan 2 is absent.
6     ERROR   Power 2 is absent.
6     ERROR   The board in slot 10 is faulty.
3     WARNING The temperature of sensor 3 exceeds the lower limit.

```

Table 17 Command output

Field	Description
Slot	Slot number of the alarmed card. If the value is a hyphen (-), the alarm is generated by the chassis.
Level	Alarm severity. Possible values include ERROR, WARNING, NOTICE, and INFO, In the descending order.
Info	Detailed alarm information.
faulty	The card is starting up or faulty.

- In IRF mode:

```

<Sysname> display alarm
Chassis Slot  Level   Info
1       6     ERROR   Fan 2 is absent.

```

1	6	ERROR	Power 2 is absent.
1	6	ERROR	The board in slot 10 is faulty.
2	3	WARNING	The temperature of sensor 3 exceeds the lower limit.

Table 18 Command output

Field	Description
Chassis	ID of the IRF member switch with an alarm. If the value is a hyphen (-), the alarm was generated by the chassis.
Slot	Number of the slot where the card resides.
Level	Alarm severity. Possible values include ERROR, WARNING, NOTICE, and INFO, in descending order.
Info	Detailed alarm information.
The board in slot <i>n</i> is faulty.	The card in slot <i>n</i> is starting up or faulty.

Verifying and diagnosing transceiver modules

At present, there are three types of commonly used transceivers, as shown in Table 19. They can be further divided into optical transceivers and electrical transceivers based on transmission medium.

Table 19 Commonly used transceivers

Transceiver type	Application scenarios	Whether can be an optical transceiver	Whether can be an electrical transceiver
SFP (Small Form-factor Pluggable)	Generally used for 100M/1000M Ethernet interfaces or POS 155M/622M/2.5G interfaces	Yes	Yes
SFP+ (Enhanced 8.5 and 10 Gigabit Small Form-factor Pluggable)	Generally used for 10G Ethernet interfaces	Yes	Yes
XFP (10-Gigabit small Form-factor Pluggable)	Generally used for 10G Ethernet interfaces	Yes	No

Verifying transceiver modules

You can verify the genuineness of a transceiver module in the following ways:

- Display the key parameters of a transceiver module, including its transceiver type, connector type, central wavelength of the transmit laser, transfer distance and vendor name.
- Display its electronic label. The electronic label is a profile of the transceiver module and contains the permanent configuration including the serial number, manufacturing date, and vendor name. The data is written to the storage component during debugging or testing.

To verify transceiver modules, execute the following command in any view:

Task	Command
Display key parameters of the transceiver in a specified interface	display transceiver interface [<i>interface-type interface-number</i>]
Display part of the electrical label information of transceiver in a specified interface	display transceiver manuinfo interface [<i>interface-type interface-number</i>]

Display the main parameters of the transceiver plugged in interface GigabitEthernet 3/0/3.

```
<Sysname> display transceiver interface gigabitethernet 3/0/3
```

```
GigabitEthernet3/0/3 transceiver information:
```

```
Transceiver Type           : 1000_BASE_SX_SFP
Connector Type             : LC
Wavelength(nm)            : 850
Transfer Distance(m)       : 550(50um) , 270(62.5um)
Digital Diagnostic Monitoring : YES
Vendor Name                : HP
Ordering Name              : JD118B
```

Table 20 Command output

Field	Description
Connector Type	Type of the connectors of the transceiver: <ul style="list-style-type: none"> • SC—Fiber connector, developed by NTT • LC—1.25 mm/RJ-45 optical connector developed by Lucent. • RJ-45 • CX 4
Wavelength(nm)	<ul style="list-style-type: none"> • Fiber transceiver—Central wavelength (in nm) of the laser sent. If the transceiver supports multiple wavelengths, every two wavelength values are separated by a comma. • Copper cable—Displayed as N/A.
Transfer distance(xx)	Transfer distance, where "xx" represents the distance unit: km (kilometers) for single-mode transceivers and m (meters) for other transceivers. If the transceiver supports multiple transfer medium, every two values of the transfer distance are separated by a comma. The transfer medium is included in the bracket following the transfer distance value. The following are the transfer media: <ul style="list-style-type: none"> • 9 um—9/125 μm single-mode optical fiber • 50 um—50/125 μm multi-mode optical fiber • 62.5 um—62.5/125 μm multi-mode optical fiber • TP—Twisted pair • CX4—CX4 cable
Digital Diagnostic Monitoring	Support for the digital diagnosis function: <ul style="list-style-type: none"> • YES—Supported • NO—Not supported
Ordering Name	Product code.

Display the electrical label information about the transceiver plugged in interface GigabitEthernet 3/0/4.

```
<Sysname> display transceiver manuinfo interface gigabitethernet 3/0/4
GigabitEthernet3/0/4 transceiver manufacture information:
  Manu. Serial Number   : MY13D41001
  Manufacturing Date    : 2014-01-20
  Vendor Name          : HP
```

Table 21 Command output

Field	Description
Manu. Serial Number	Serial number generated during commissioning and testing of the transceiver module.
Manufacturing Date	Commissioning date.

Diagnosing transceiver modules

The switch provides the alarm function and digital diagnosis function for transceiver modules. When a transceiver module fails or is not operating normally, you can check the alarms present on the transceiver module to identify the fault source or examine the key parameters monitored by the digital diagnosis function, including the temperature, voltage, laser bias current, TX power, and RX power.

To diagnose transceiver modules, execute the following command in any view:

Task	Command	Remarks
Display alarms present on the transceiver in a specified interface	display transceiver alarm interface [<i>interface-type interface-number</i>]	Available for all transceivers If no error occurs, None is displayed.
Display the present measured values of the digital diagnosis parameters for the transceiver in a specified interface	display transceiver diagnosis interface [<i>interface-type interface-number</i>]	Available for all transceivers.

Display the alarm information about the transceiver plugged in GigabitEthernet 3/0/1.

```
<Sysname> display transceiver alarm interface GigabitEthernet 3/0/1
GigabitEthernet3/0/1 transceiver current alarm information:
  RX loss of signal
  RX power low
```

Table 22 shows the alarm information that may occur to the commonly used transceivers.

Table 22 Command output

Field	Remarks
transceiver current alarm information	Alarms present on the transceiver module.
SFP/SFP+:	
RX loss of signal	Received signals are lost.
TX fault	Transmission error.
RX power high	The received optical power is high.

Field	Remarks
RX power low	The received optical power is low.
TX power high	The transmitted optical power is high.
TX power low	The transmitted optical power is low.
TX bias high	The transmitted bias current is high.
TX bias low	The transmitted bias current is low.
Temp high	The temperature is high.
Temp low	The temperature is low.
Voltage high	The voltage is high.
Voltage low	The voltage is low.
Transceiver info I/O error	Transceiver information read and write error
Transceiver info checksum error	Transceiver information checksum error
Transceiver type and port configuration mismatch	The type of the transceiver module does not match the port configuration.
Transceiver type not supported by port hardware	The port does not support this type of transceiver modules.
XFP	
RX loss of signal	Received signals are lost.
RX not ready	The receiving status is not ready
RX CDR loss of lock	Receiving CDR loss of lock.
TX fault	Transmission error.
TX not ready	The transmission status is ready.
TX CDR loss of lock	Transmission CDR loss of lock.
Module not ready	The module is not ready.
APD supply fault	Avalanche Photo Diode (APD) supply error.
TEC fault	Thermoelectric Cooler (TEC) error.
Wavelength unlocked	Wavelength loss of lock.
RX power high	The received optical power is high.
RX power low	The received optical power is low.
TX power high	The transmitted optical power is high.
TX power low	The transmitted optical power is low.
TX bias high	The transmitted bias current is high.
TX bias low	The transmitted bias current is low.
Temp high	The temperature is high.
Temp low	The temperature is low.
Voltage high	The voltage is high.
Voltage low	The voltage is low.

Field	Remarks
Transceiver info I/O error	Transceiver information read and write error
Transceiver info checksum error	Transceiver information checksum error
Transceiver type and port configuration mismatch	The type of the transceiver module does not match the port configuration.
Transceiver type not supported by port hardware	The port does not support this type of transceiver modules.

Display the currently measured values of the fault detection parameters of the transceiver plugged in interface GigabitEthernet 3/0/2.

```
<Sysname> display transceiver diagnosis interface gigabitethernet 3/0/2
GigabitEthernet3/0/2 transceiver diagnostic information:
  Current diagnostic parameters:
    Temp(°C)  Voltage(V)  Bias(mA)  RX power(dBm)  TX power(dBm)
    36        3.31         6.13     -35.64         -5.19
```

Table 23 Command output

Field	Description
transceiver diagnostic information	Digital diagnosis information of the transceiver module on the interface.
Temp.(°C)	Digital diagnosis parameter—Temperature, in °C, accurate to 1°C.
Voltage(V)	Digital diagnosis parameter—Voltage, in V, accurate to 0.01 V.
Bias(mA)	Digital diagnosis parameter—Bias current, in mA, accurate to 0.01 mA.
RX power(dBm)	Digital diagnosis parameter—RX power, in dBm, accurate to 0.01 dBm.
TX power(dBm)	Digital diagnosis parameter—TX power, in dBm, accurate to 0.01 dBm.

Replacement procedures



IMPORTANT:

Place a removed module in an antistatic bag or its original shipping materials.

Cleaning the air filters

The air filters of a 12500E switch fall into the following types:

- **Chassis air filter**—No chassis air filter is shipped with the 12500E chassis by default. You can order one as needed.
- **Power supply air filter**—A 12500E chassis is installed with a power supply air filter when shipped by default.

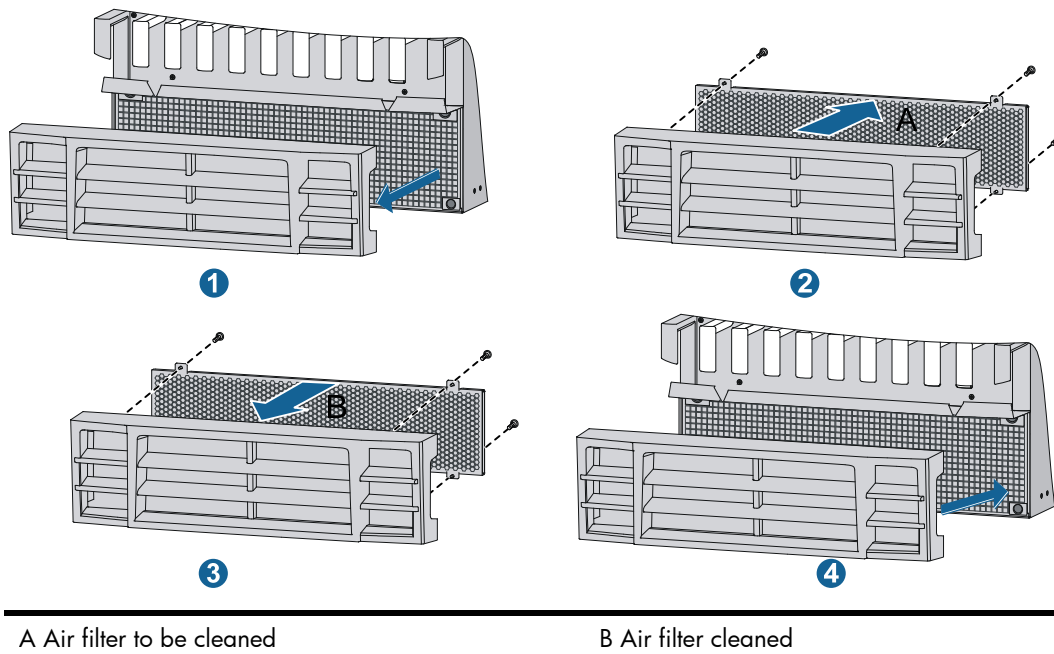
To guarantee good ventilation of the switch and power supplies, HP recommends that you clear the air filters monthly. You must clean the air filter every three months at least.

Cleaning the chassis air filters

For a 12508E

1. Holding the notches of the front plastic panel at the bottom part of the chassis, and gently pull the plastic panel out.
2. Loosen the screws that fix the chassis air filter to the rear of the plastic panel, and remove the chassis air filter from the plastic panel.
3. Use clean water to wash the chassis air filter, and air-dry it.
4. Install the chassis air filter to the correct position. For more information, see "Installing the switch."

Figure 48 Replacing the chassis air filter



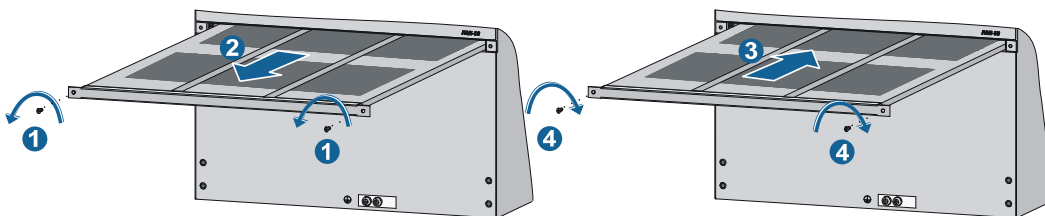
For a 12518E

A 12518E has only one chassis air filter, which is horizontally inserted.

To clean the chassis air filter:

1. Use a Phillips screwdriver to loosen the screws at both sides of the air filter, and slowly pull the air filter out along the slide rails.
2. Use clean water to wash the air filter, and air-dry the air filter.
3. Install the air filter to the chassis, and fasten the screws at both sides of the air filter.

Figure 49 Replacing the air filter from the 12518E



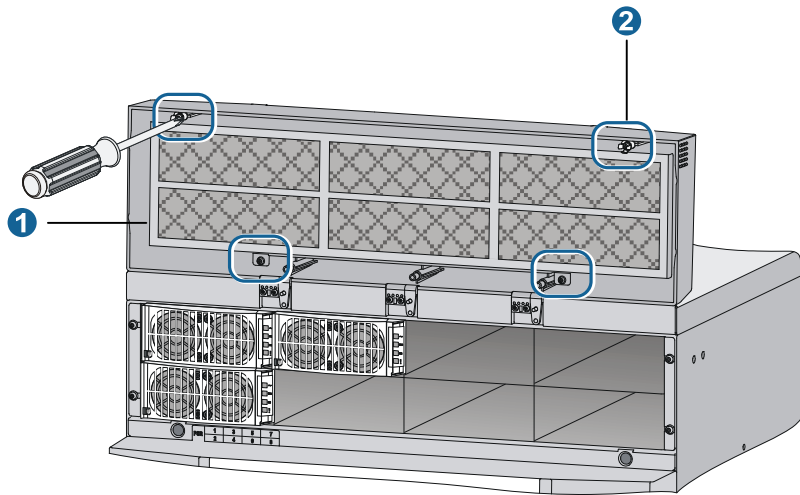
Cleaning a power frame air filter

The power frame air filter of a 12500E switch is right behind the front panel of the power frame to prevent dust from entering the power frame.

To clean the power frame air filter:

1. Loosen the fastening screws on the air filter and remove the air filter from the power frame.

Figure 50 Removing the power supply air filter



(1) Power frame air filter

(2) Screws

2. Wash the air filter by using clean water, and then air-dry the air filter.
3. Position the air filter to the right place, and fasten the fastening screws on the air filter.

Replacing a power component

⚠ WARNING!

Power modules for the 12500E are hot-swappable. When installing and replacing a power module with the switch powered on, pay attention to the operation procedures and electricity safety issues. To avoid injury, do not touch any wires, terminals, or parts with a high-voltage hazard sign.

Preparing for the replacement

1. Put on an ESD wrist strap, and make sure the wrist strap makes good skin contact and is correctly grounded.
2. Unpack the power component to be installed.
3. Remove the cables connected to the switch and turn off the power switch on the power frame before replacing the power components.

Replacing a power module

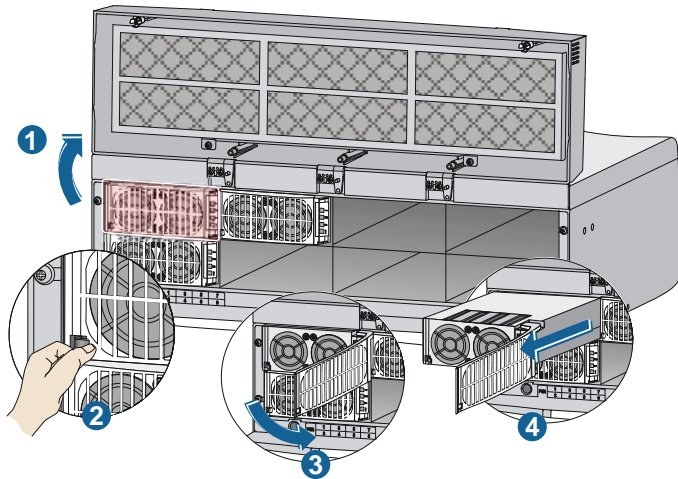
⚠ CAUTION:

- When hot-plugging power modules, make sure the insertion interval is no less than 30 seconds.
- When installing or removing a power module, check that the switch is sturdy. To prevent bodily injury, avoid tipping the switch chassis.
- Do not touch the rotating fans on a removed power module.

To replace a power module:

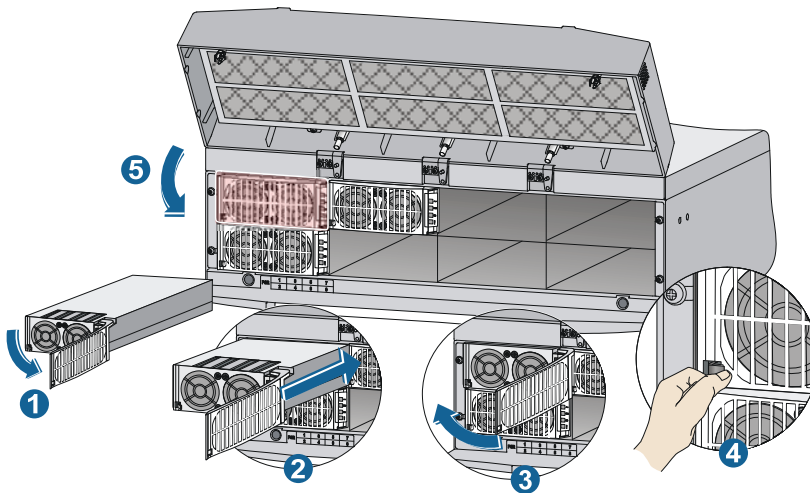
1. Rotate the power frame panel out with both hands to open the panel.
2. Gently pull the clip at the bottom left corner of the power module to the left to open the power module cover.
3. Supporting the bottom of the power module with your left hand and holding the power module cover with your right hand, gently pull the power module out of the power frame.

Figure 51 Removing a power module



4. Pull the clip at the bottom left corner of the new power module to the left to open the power module cover.
5. Slowly insert the power module into the power frame slot until it fits in completely.
6. Close the power module cover and press the clip at the bottom left corner of the power module.
7. Push in the power module cover and close the power frame panel.

Figure 52 Installing a power module



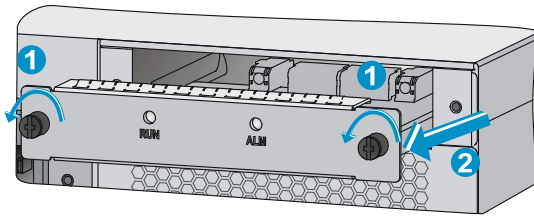
Replacing a power monitoring module

To replace the power monitoring module:

1. Remove the power monitoring module.

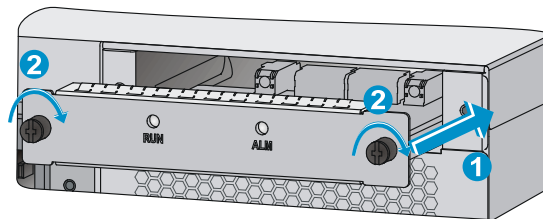
- a. Loosen the captive screws on the power monitoring module.
- b. Pull out the power monitoring module slowly along the slide rails.

Figure 53 Removing a power monitoring module



2. Put the removed power monitoring module in an antistatic bag or in its original shipping materials.
3. Install the new power monitoring module.
 - a. Unpack a new power monitoring module.
 - b. Insert the power monitoring module slowly along the slide rails until it fits in completely.
 - c. Fasten the captive screws on the power monitoring module.

Figure 54 Installing the power monitoring module



Replacing a card

All cards of the 12500E are hot-swappable.

Preparing for the replacement

1. Put on an ESD wrist strap, and make sure the wrist strap makes good skin contact and is correctly grounded.
2. Unpack the card to be installed. If the card has a protection cover, remove the protection cover. Keep the removed protection cover for future use.
For more information about how to remove the protection cover, see "Installing the switch."
3. Remove the network cables and power cords from the card to be removed.

Replacement procedure

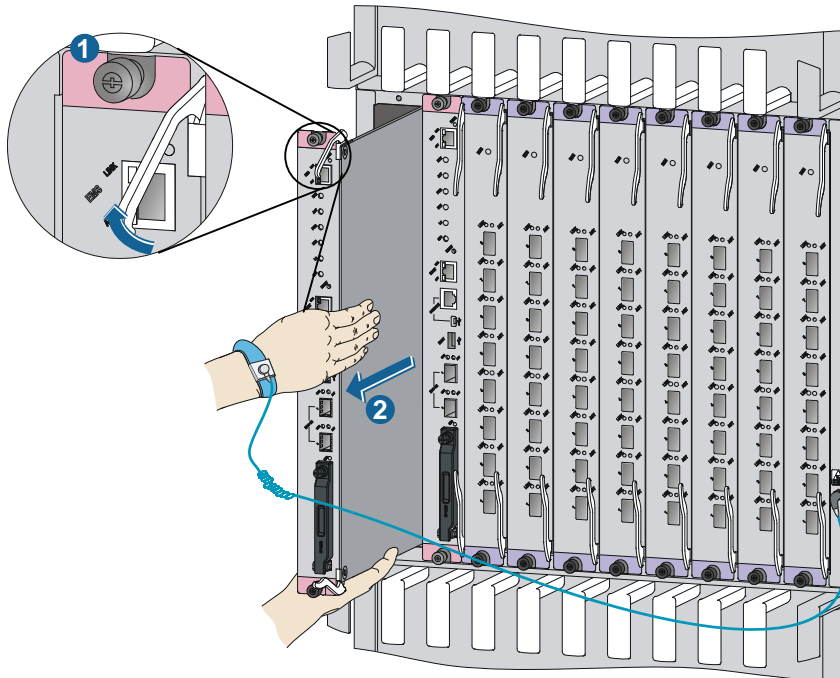
⚠ CAUTION:

Before you remove an active MPU when the router is operating, you must use the **reboot** command to reboot the active MPU to change its status to standby. You can use the **display device** command or view the LEDs to verify the status of the active MPU. For more information about the MPU LED description, see "Appendix B LEDs." For more information about the **reboot** and **display device** commands, see *HP FlexFabric 12500 and 12500E Routing Switch Series Fundamentals Command Reference Guide*.

To replace a card:

1. Loosen the captive screws on the card.
2. Move the ejector levers outwards to separate the card from the backplane.
3. Slowly pull out the card along the slide rails. Put the removed card in an antistatic bag or in its original shipping materials.

Figure 55 Removing a card

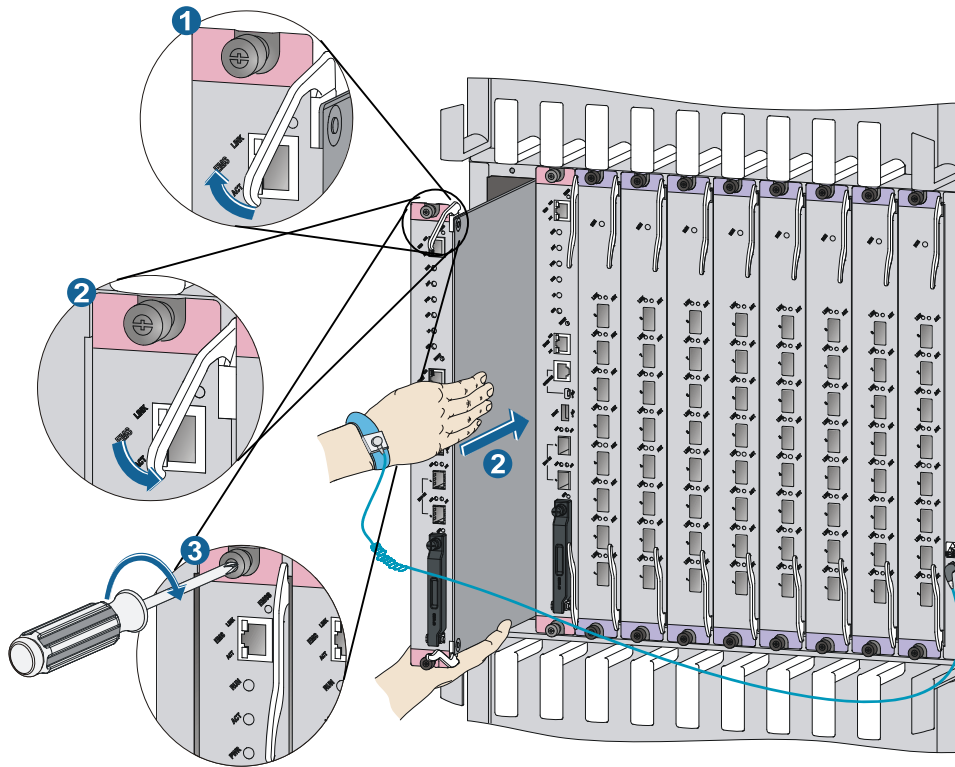


4. Move the ejector levers on the front panel of the new card outward. Hold up the card by one hand without touching any electronic components on the card, and hold the front panel by the other hand to slowly push the card into the slot along the slide rails.
5. Push the ejector levers inward to ensure a firm contact between the card and the backplane.
6. Finger-tighten the screws into the holes and fasten them with a screwdriver to fix the card.

⚠ IMPORTANT:

- Fasten the screws of each card (as shown in step 6) right after you have inserted it.
- To avoid any damage to the card, gently pull and insert the card.

Figure 56 Installing a card



Replacing a fan tray

⚠ CAUTION:

- To avoid injury, do not touch any wires, terminals, and parts with a high-voltage hazard sign.
- Fan trays are hot-swappable. To replace a fan tray when the switch is operating, pull out the fan tray after it stops rotating. Keep your hands away from the spinning fan blades when removing the fan tray.
- To ensure normal operation of the switch, do not keep the switch working without a fan tray for a long time.
- When removing a fan tray, hold the bottom of the fan tray to pull it out thoroughly.

Preparing for the replacement

1. Put on an ESD wrist strap, and make sure the wrist strap makes good skin contact and is correctly grounded.
2. Unpack the fan tray to be installed.

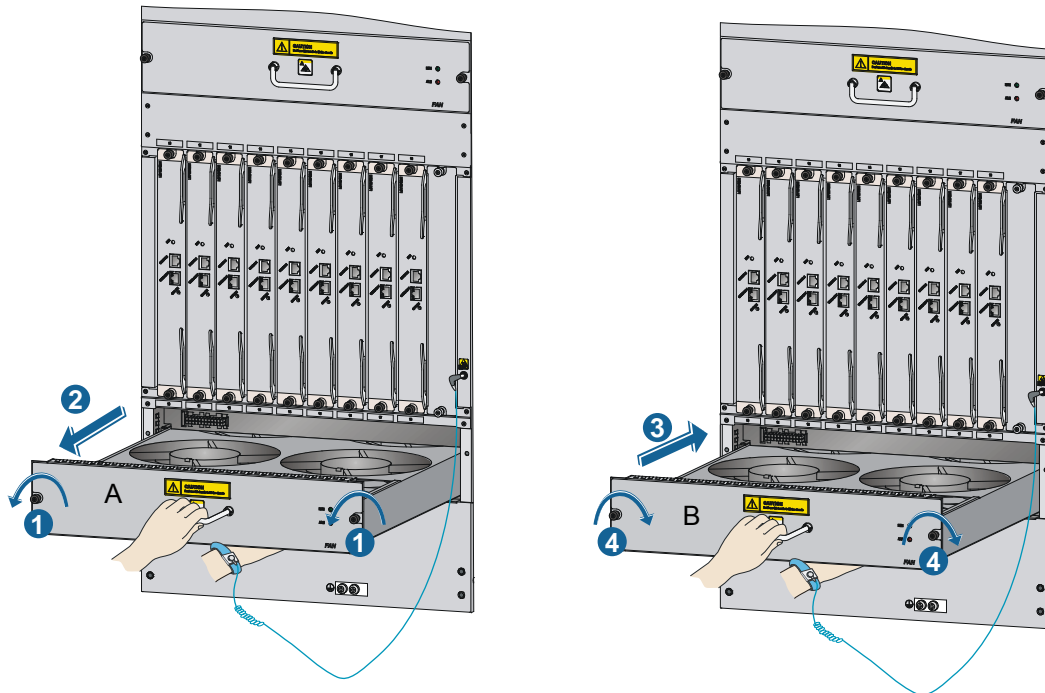
Replacement procedure

To replace a fan tray:

1. Loosen the captive screws on the fan tray.

2. Pull out the fan tray along the slide rails. Put the removed fan tray in an antistatic bag or in its original shipping materials.
3. Insert the new fan tray into the fan tray slot along the slide rails. Push the fan tray in the slot until it makes close contact with the backplane of the chassis.
4. Finger-tighten the captive screws and then use a screwdriver to fasten the screws to make sure the fan tray is firmly fastened.

Figure 57 Replacing a fan tray



A: Fan tray to be removed

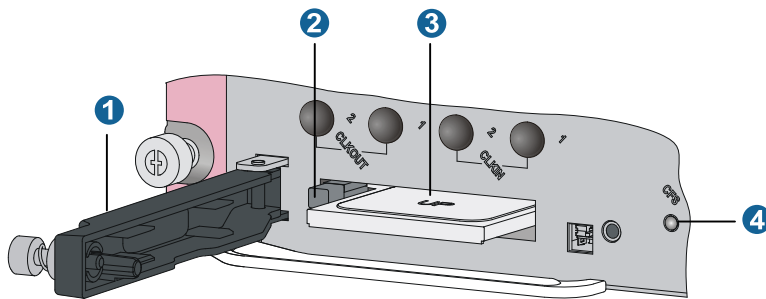
B: Fan tray to be installed

Replacing a CF card

CAUTION:

- Do not remove the CF card when the switch is booting or the CF card LED is flashing. Otherwise, the file system on the hardware or the CF card might be damaged.
- Before inserting the CF card, make sure the CF card eject button is all the way into the slot and does not project from the panel.

Figure 58 CF card slot



(1) CF card cover	(2) CF card eject button
(3) CF card	(4) CF card LED

The Compact Flash (CF) card is installed on the MPU of a 12500E.

To replace the CF card when the CF card memory is insufficient or the CF card is damaged:

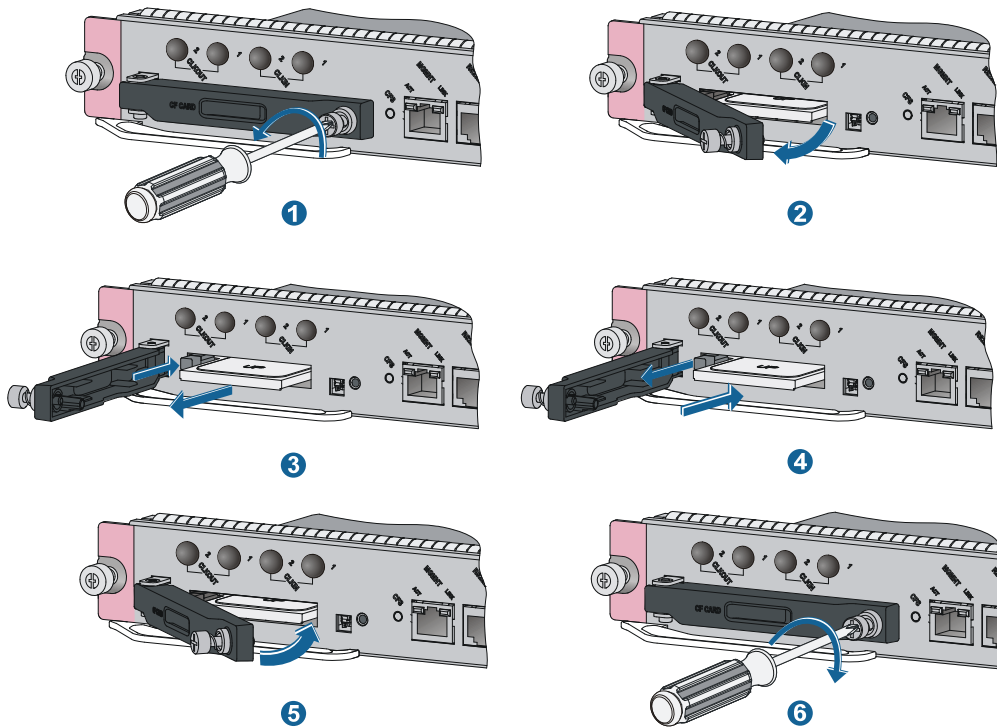
1. Check the CF card LED status.
 - If the LED is on, you cannot remove the CF card. You must unmount the CF card at the command line interface (CLI) and wait until the CF card LED is off before removing the CF card.
`<Sysname> unmount cfa0:`
 - If the LED is flashing, it means that the CF card is reading and writing data. In this case, you cannot remove the CF card. Wait until the CF card LED stops flashing before removing it.
 - If the LED is off, it means that the CF card has been unmounted, and you can remove it.

NOTE:

After you execute the **unmount cf** command, if you want to continue to use the CF card, execute the **mount cf** command in user view to mount the CF card again. For more information about the **unmount** and **mount cf** commands, see *HP FlexFabric 12500 and 12500E Routing Switch Series Fundamentals Command Reference Guide*.

2. Use a Phillips screwdriver to loosen the screw at the right side of the CF card cover, and pull the CF card cover outward.
3. Press the eject button of the CF card reader. The reader ejects the card part way out of the slot. Remove the CF card from the reader, and put the removed CF card in an antistatic bag or its original shipping materials.
4. Push the new CF card all the way into the CF card slot so that it does not automatically project. At the same time, the eject button projects.
5. Push the CF card cover inward.
6. Use a Phillips screwdriver to fasten the screw at the right side of the CF card cover.

Figure 59 Replacing a CF card



Replacing a transceiver module

Replacing the XFP, SFP+, SFP, and QSFP+ modules

⚠ CAUTION:

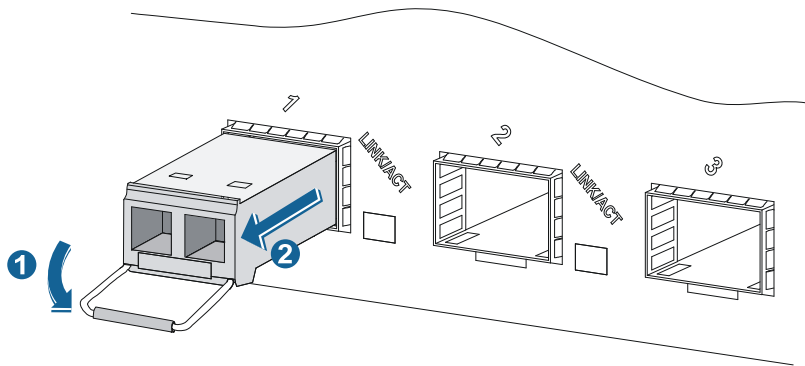
Do not touch the golden finger of a transceiver module during replacement.

The replacement procedures for the XFP, SFP, SFP+, and QSFP+ modules are similar. This section uses an SFP+ module as an example.

To replace a transceiver module:

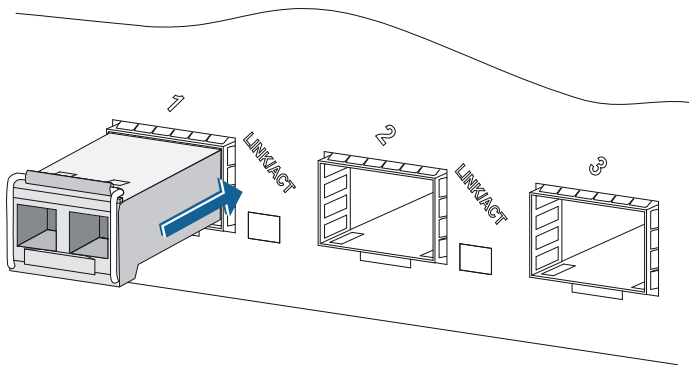
1. Put on an ESD wrist strap, making sure that the strap makes good skin contact and is correctly grounded.
2. Remove the optical fibers from the SFP+ module, pivot the clasp down to the horizontal position, and then pull the SFP+ module out of the port, as shown in [Figure 60](#).

Figure 60 Removing the SFP+ module



3. Put the removed SFP+ module in an antistatic bag or its original shipping materials.
4. Unpack the SFP+ module to be installed and make sure the clasp is closed.
5. Remove the optical fiber, if any, from the SFP+ module before installing it.
6. Gently insert the SFP+ module into the port until it fits in completely, as shown in [Figure 61](#).
7. Connect the optical fibers to the new SFP+ module.

Figure 61 Installing an SFP+ module



Replacing the CFP transceiver module

1. Put on an ESD wrist strap. Make sure it has close skin contact and is correctly grounded.
2. Remove the CFP transceiver module.
 - a. Loosen the captive screws on the CFP transceiver module.
 - b. Pull out the CFP transceiver module slowly along the slide rails.
3. Put the removed CFP transceiver module in an antistatic bag or in its original shipping materials.
4. Install the new CFP transceiver module.
 - a. Unpack a new CFP transceiver module.
 - b. Insert the CFP transceiver module slowly along the slide rails until it fits in completely.
 - c. Fasten the captive screws on the CFP transceiver module.

Figure 62 Removing a 40G CFP transceiver module

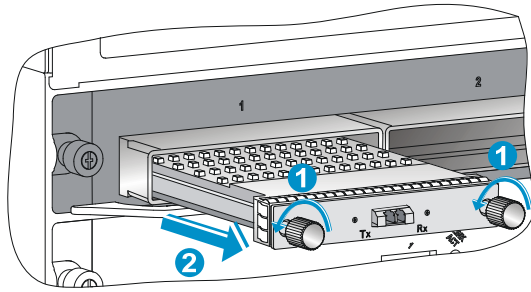
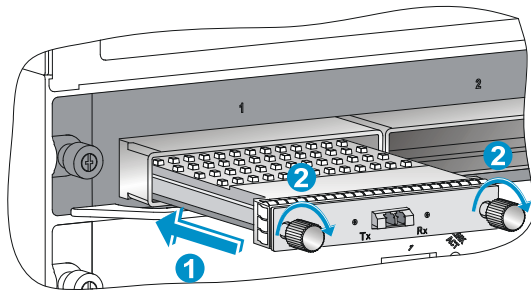


Figure 63 Installing a 40G CFP transceiver module



NOTE:

- Unsmooth installation for the 40G CFP transceiver module is likely to occur due to the bump design on its top.
- The appearance of 100G CFP transceiver module differs from that of the 40G CFP transceiver module.

Replacing the SFP+ cable and QSFP+ cable

The replacement procedures for the SFP+ and QSFP+ cables are similar. This section uses an SFP+ cable as an example.

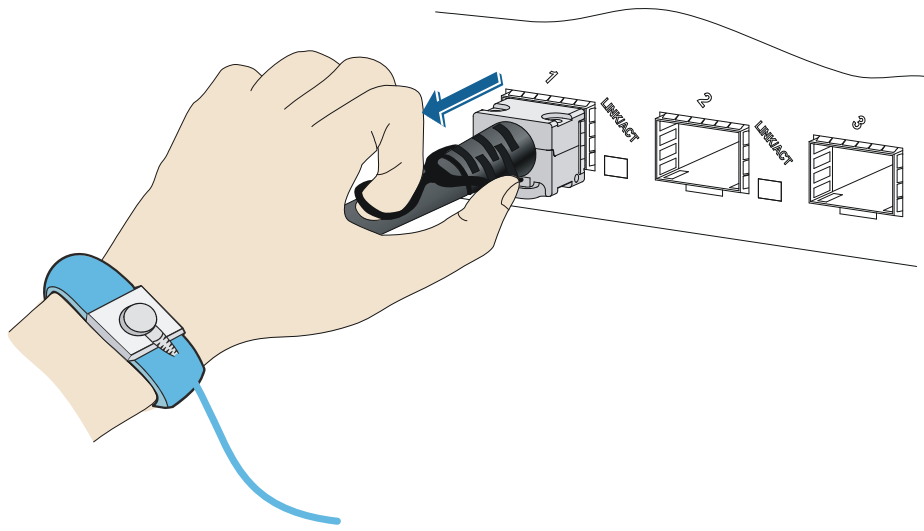
When you replace an SFP+/QSFP+/QSFP+ to SFP+ cable, follow these guidelines:

- The bend radius of the cable must be at least eight times the cable diameter.
- If the cable cannot be removed or installed, verify that the removal or installation procedures are correct.
- When you remove a cable, pull the pull latch horizontally. Otherwise, the cable cannot be removed smoothly, or even the module or slot could be damaged.

To replace an SFP+ cable:

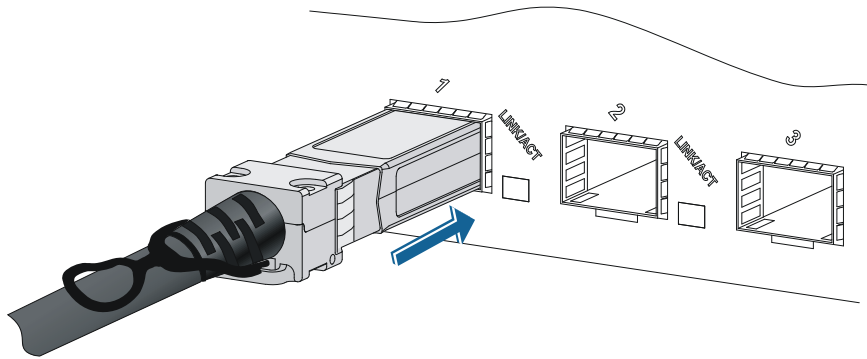
1. Put on an ESD wrist strap, and make sure it has close skin contact and is correctly grounded.
2. Gently press the cable connector in, and then pull the pull latch on the cable outward to pull out the cable connector.

Figure 64 Removing the SFP+ cable



3. Unpack the SFP+ cable to be installed.
4. Gently insert the cable connector into the SFP+ port. Install the connector at the other end of the SFP+ cable into the SFP+ port on the peer device in the same way.

Figure 65 Installing the SFP+ cable



Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

<http://www.hp.com/go/wwalerts>

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

Related information

Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

<http://www.hp.com/support/manuals>

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms*.

Websites

- HP.com <http://www.hp.com>
- HP Networking <http://www.hp.com/go/networking>
- HP manuals <http://www.hp.com/support/manuals>
- HP download drivers and software <http://www.hp.com/support/downloads>
- HP software depot <http://www.software.hp.com>
- HP Education <http://www.hp.com/learn>

Conventions

This section describes the conventions used in this documentation set.





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 bold text. 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

	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 switching engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.
	Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.

Port numbering in examples

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

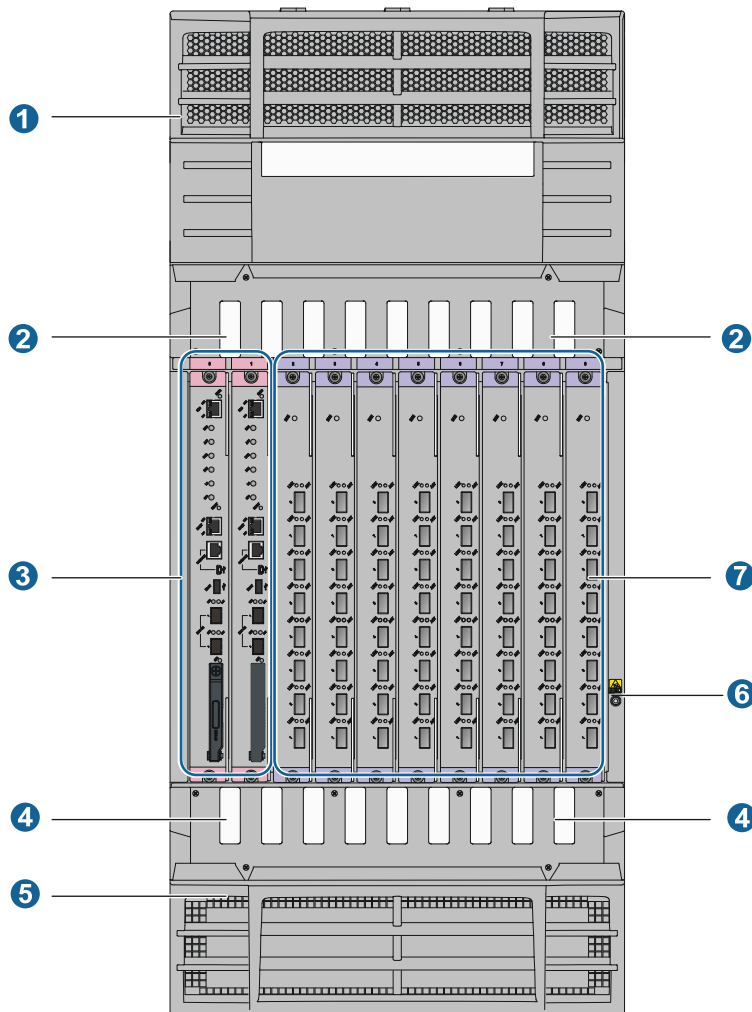
Appendix A Chassis views and technical specifications

Chassis views

The chassis views for the AC and DC models are similar. The figures in this chapter are for illustration only.

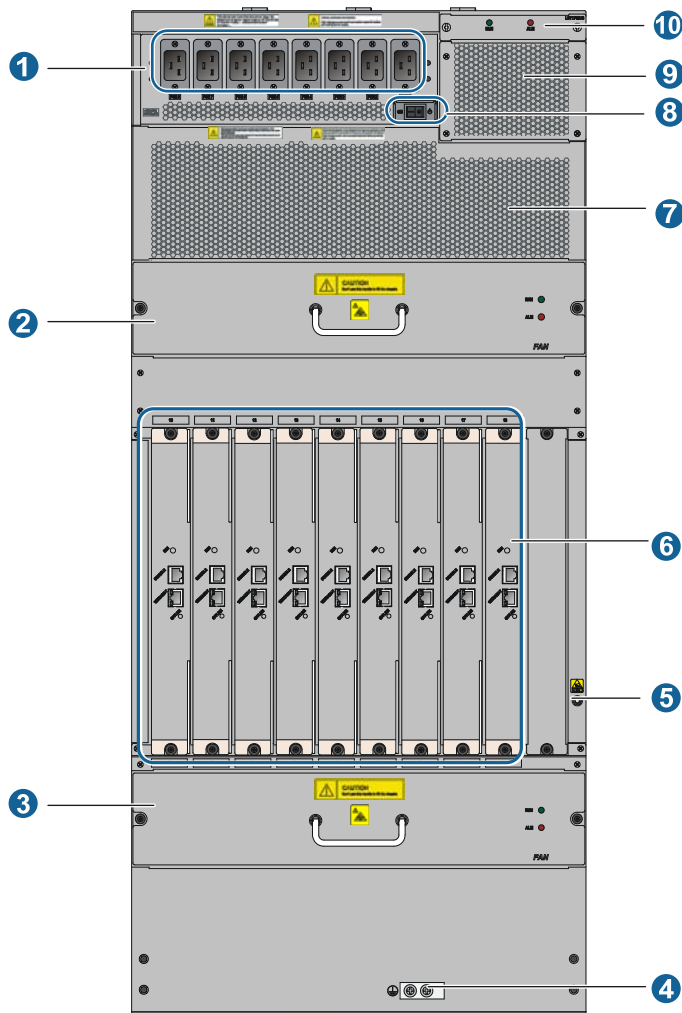
12508E

Figure 66 12508E front view



- | | | |
|------------------------------|------------------------------|-------------------------------|
| (1) Power frame cover | (2) Upper cabling rack | (3) MPU slots (slots 0 and 1) |
| (4) Lower cabling rack | (5) Chassis air intake vents | (6) ESD wrist strap port |
| (7) LPU slots (slots 2 to 9) | | |

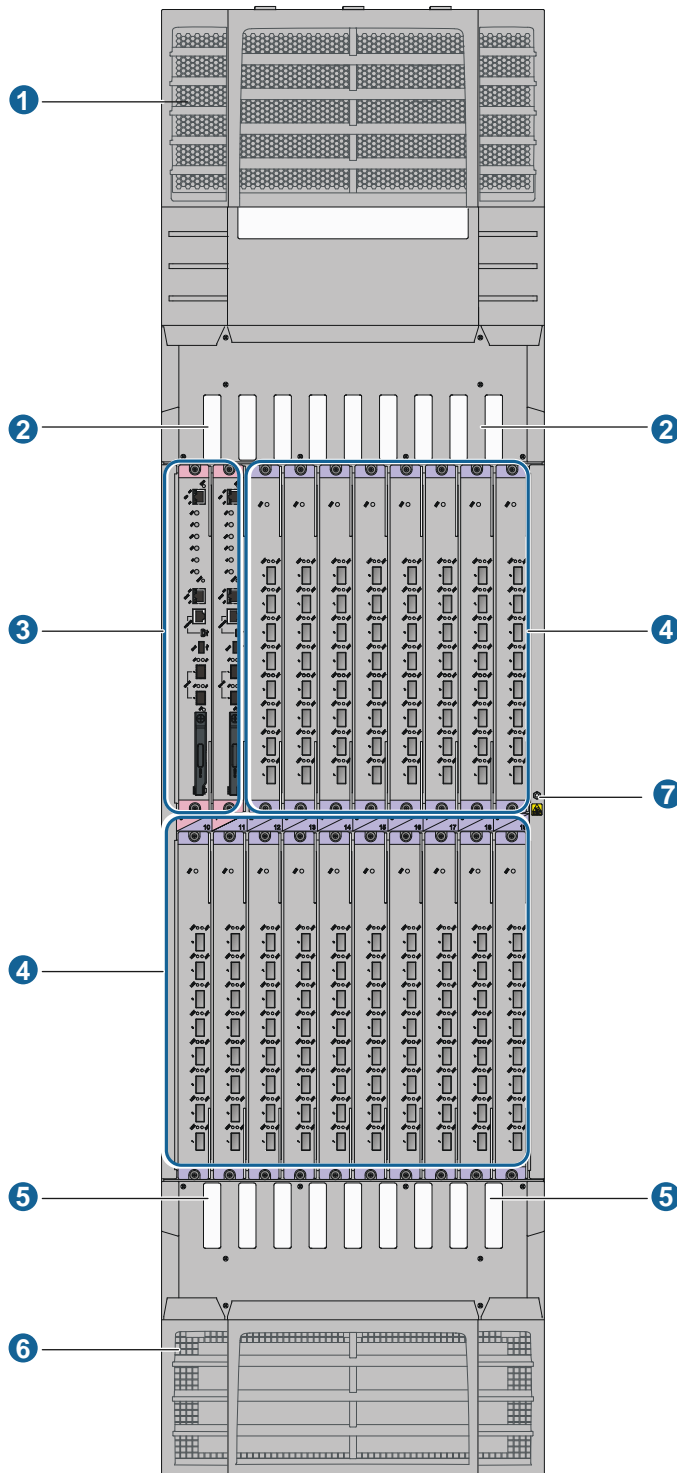
Figure 67 12508E rear view



(1) Power receptacles	(2) Upper fan tray
(3) Lower fan tray	(4) Grounding screw
(5) ESD wrist strap port	(6) Switching fabric module slots (slots 10 to 18)
(7) Chassis air exhaust vents	(8) Power switch
(9) Power supply air exhaust vents	(10) Power monitoring module

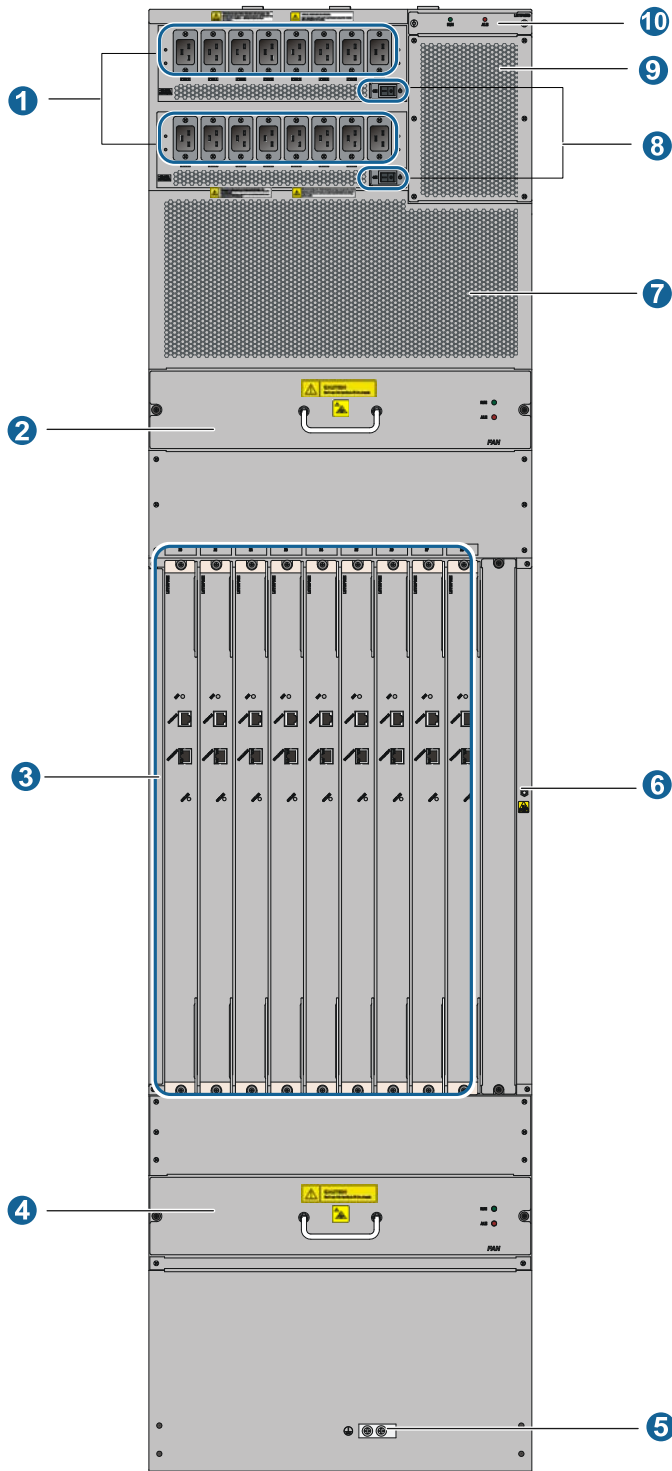
12518E

Figure 68 12518E front view



- | | | |
|-------------------------------|------------------------|-------------------------------|
| (1) Power frame cover | (2) Upper cabling rack | (3) MPU slots (slots 0 and 1) |
| (4) LPU slots (slots 2 to 19) | (5) Lower cabling rack | (6) Chassis air intake vents |
| (7) ESD wrist strap port | | |

Figure 69 12518E rear view



- | | |
|--|------------------------------|
| (1) Power receptacles | (2) Upper fan tray |
| (3) Switching fabric module slots (slots 20 to 28) | (4) Lower fan tray |
| (5) Grounding screw | (6) ESD wrist strap port |
| (7) Chassis air exhaust vents | (8) Power switch |
| (9) Power supply air exhaust vents | (10) Power monitoring module |

Technical specifications

Chassis

Table 24 Chassis list

Switch model	Product code	HP description	RMN
12508E-AC	JG782A	HP FF 12508E AC Switch Chassis	HNGZA-AA0001
	JG834A	HP FF 12508E AC Switch TAA Chassis	HNGZA-AA0001
12508E-DC	JG783A	HP FF 12508E DC Switch Chassis	HNGZA-AA0001
	JG835A	HP FF 12508E DC Switch TAA Chassis	HNGZA-AA0001
12518E-AC	JG784A	HP FF 12518E AC Switch Chassis	HNGZA-AA0002
	JG836A	HP FF 12518E AC Switch TAA Chassis	HNGZA-AA0002
12518E-DC	JG785A	HP FF 12518E DC Switch Chassis	HNGZA-AA0002
	JG837A	HP FF 12518E DC Switch TAA Chassis	HNGZA-AA0002

! IMPORTANT:

For regulatory identification purposes, every 12500E serial switch is assigned a regulatory model number (RMN). These regulatory numbers should not be confused with the marketing name HP 12500E, or product codes.

Table 25 Chassis specifications

Switch model	Max system input power consumption	Max power consumption for cards and fans	Heat dissipation	Max input current	Weight	Dimensions (H × W × D)	Height (RU)
12508E-AC	9110 W	8206 W	28002 BTU/H	41.4 A @ 220 VAC	Net weight: 110 kg (242.50 lb) Full configuration: ≤ 200 kg (440.92 lb)	975 × 442 × 740 mm (38.39 × 17.40 × 29.13 in)	22 RU
12508E-DC	9210 W	8206 W	28002 BTU/H	191.9 A @ 48 VDC	Net weight: 111.4 kg (245.59 lb) Full configuration: ≤ 200 kg (440.92 lb)	975 × 442 × 740 mm (38.39 × 17.40 × 29.13 in)	22 RU

Switch model	Max system input power consumption	Max power consumption for cards and fans	Heat dissipation	Max input current	Weight	Dimensions (H × W × D)	Height (RU)
12518E-AC	17190 W	15486 W	52844 BTU/H	78.1 A @ 220 VAC	Net weight: 176.8 kg (389.77 lb) Full configuration: ≤ 335 kg (738.54 lb)	1686 × 442 × 740 mm (66.38 × 17.40 × 29.13 in)	38 RU
12518E-DC	17380 W	15486 W	52844 BTU/H	362.1 A @ 48 VDC	Net weight: 179.6 kg (395.94 lb) Full configuration: ≤ 335 kg (738.54 lb)	1686 × 442 × 740 mm (66.38 × 17.40 × 29.13 in)	38 RU

Max system input power consumption refers to the maximum input power consumption of the chassis when the chassis is fully configured with cards that have the maximum power consumption.

Max power consumption for cards and fans refers to the maximum power consumption of all cards and fans that have the maximum power consumption in the fully configured chassis.

Heat dissipation refers to the dissipated energy in the input power in the form of heat. 1 W = 3.4121 BTU/H.

Net weight refers to the weight of the chassis (with filler panels installed), excluding fan trays, cards, and power modules.

Full configuration refers to the maximum weight of the switch when all cards and power modules are installed to the switch.

Rack Unit (RU) refers to the height of the chassis in the rack. 1 RU = 44.45 mm/1.75 in.

Cards

Power consumption/weight/dimensions

Table 26 Card list

Card	Product code	HP description
LST2MRPNC1	JC072B	HP 12500 Main Processing Unit
	JC808A	HP 12500 TAA-compliant Main Processing Unit
LST1MRPNE1	JG802A	HP FlexFabric 12500E Main Processing Unit
	JG803A	HP 12500 TAA-compliant Main Processing Unit
LST1SF08E1	JG798A	HP FlexFabric 12508E Fabric Module
	JG799A	HP FlexFabric 12508E TAA-compliant Fabric Module

Card	Product code	HP description
LST1SF18E1	JG800A	HP FlexFabric 12518E Fabric Module
	JG801A	HP FlexFabric 12518E TAA-compliant Fabric Module
LST1CP4RFD1	JG786A	HP FlexFabric 12500 4-port 100GbE CFP FD Module
	JG787A	HP FlexFabric 12500 4-port 100GbE CFP FD TAA-compliant Module
LST1CP4RFG1	JG788A	HP FlexFabric 12500 4-port 100GbE CFP FG Module
	JG789A	HP FlexFabric 12500 4-port 100GbE CFP FG TAA-compliant Module
LST1XLP16RFD1	JG790A	HP FlexFabric 12500 16-port 40GbE QSFP+ FD Module
	JG791A	HP FlexFabric 12500 16-port 40GbE QSFP+ FD TAA-compliant Module
LST1XP40RFD1	JG792A	HP FlexFabric 12500 40-port 1/10GbE SFP+ FD Module
	JG793A	HP FlexFabric 12500 40-port 1/10GbE SFP+ FD TAA-compliant Module
LST1XP40RFG1	JG794A	HP FlexFabric 12500 40-port 1/10GbE SFP+ FG Module
	JG795A	HP FlexFabric 12500 40-port 1/10GbE SFP+ FG TAA-compliant Module
LST1XP48LFD1	JG796A	HP FlexFabric 12500 48-port 1/10GbE SFP+ FD Module
	JG797A	HP FlexFabric 12500 48-port 1/10GbE SFP+ FD TAA-compliant Module
LST2XP32REB1	JC064B	HP 12500 32-port 10GbE SFP+ REB Module
LST2XP32REC1	JC476B	HP 12500 32-port 10GbE SFP+ REC Module
	JC812A	HP 12500 32-port 10GbE SFP+ REC TAA-compliant Module
LST1XP16LEB1	JC782A	HP 12500 16-port 10GbE SFP+ LEB Module
LST1XP16LEC1	JC783A	HP 12500 16-port 10GbE SFP+ LEC Module
	JC814A	HP 12500 16-port 10GbE SFP+ LEC TAA-compliant Module
LST2XP8LEB1	JC780A	HP 12500 8-port 10GbE SFP+ LEB Module
LST2XP8LEC1	JC781A	HP 12500 8-port 10GbE SFP+ LEC Module
	JC813A	HP 12500 8-port 10GbE SFP+ LEC TAA-compliant Module
LST2XP8LEF1	JC659A	HP 12500 8-port 10GbE SFP+ LEF Module
	JC817A	HP 12500 8-port 10GbE SFP+ LEF TAA-compliant Module
LST1XP8LEB1	JC073B	HP 12500 8-port 10GbE XFP LEB Module
LST1XP8LEC1	JC068B	HP 12500 8-port 10GbE XFP LEC Module

Card	Product code	HP description
	JC810A	HP 12500 8-port 10GbE XFP LEC TAA-compliant Module
LST1GP48LEB1	JC075B	HP 12500 48-port GbE SFP LEB Module
LST1GP48LEC1	JC069B	HP 12500 48-port GbE SFP LEC Module
	JC811A	HP 12500 48-port GbE SFP LEC TAA-compliant Module
LST1GP48LEF1	JC660A	HP 12500 48-port GbE SFP LEF Module
	JC818A	HP 12500 48-port GbE SFP LEF TAA-compliant Module
LST1GT48LEB1	JC074B	HP 12500 48-port Gig-T LEB Module
LST1GT48LEC1	JC065B	HP 12500 48-port Gig-T LEC Module
	JC809A	HP 12500 48-port Gig-T LEC TAA-compliant Module
LST1FW2A1	JC635A	HP A12500 VPN Firewall Module
LST1FW3A1	JG371A	HP 12500 20Gbps VPN Firewall Module

Table 27 Card specifications

Card	Power consumption	Net weight	Dimensions (H × W × D)
LST2MRPNC1	45 W to 70 W	3.85 kg (8.49 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1MRPNE1	51 W to 75 W	3.75 kg (8.27 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1SF08E1	47 W to 60 W	1.30 kg (2.87 lb)	40 × 318 × 167 mm (1.57 × 12.52 × 6.57 in)
LST1SF18E1	165 W to 200 W	2.85 kg (6.28 lb)	40 × 618 × 167 mm (1.57 × 24.33 × 6.57 in)
LST1CP4RFD1	208 W to 357 W	5.75 kg (12.68 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1CP4RFG1	240 W to 431 W	5.95 kg (13.12 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XLP16RFD1	372 W to 584 W	5.60 kg (12.35 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP40RFD1	287 W to 435 W	5.40 kg (11.90 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP40RFG1	390 W to 529 W	5.70 kg (12.57 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP48LFD1	371 W to 602 W	5.70 kg (12.57 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST2XP32REB1	247 W to 375 W	6.17 kg (13.60 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST2XP32REC1	259 W to 400 W	6.28 kg (13.84 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP16LEB1	296 W to 420 W	5.95 kg (13.12 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)

Card	Power consumption	Net weight	Dimensions (H × W × D)
LST1XP16LEC1	321 W to 470 W	6.25 kg (13.78 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST2XP8LEB1	177 W to 240 W	4.73 kg (10.43 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST2XP8LEC1	183 W to 280 W	4.87 kg (10.74 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST2XP8LEF1	185 W to 300 W	4.87 kg (10.74 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP8LEB1	210 W to 280 W	4.61 kg (10.16 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1XP8LEC1	233 W to 300 W	4.73 kg (10.43 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1GP48LEB1	105 W to 170 W	4.52 kg (9.96 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1GP48LEC1	115 W to 180 W	4.55 kg (10.03 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1GP48LEF1	120 W to 195 W	4.55 kg (10.03 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1GT48LEB1	110 W to 175 W	4.25 kg (9.37 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1GT48LEC1	115 W to 190 W	4.44 kg (9.79 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1FW2A1	90 W to 120 W	4.36 kg (9.61 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)
LST1FW3A1	128 W to 168 W	4.80 kg (10.58 lb)	40 × 400 × 467 mm (1.57 × 15.75 × 18.39 in)

For more information about the 12500E cards, see the relevant datasheet of the cards.

MPUs

CAUTION:

- HP recommends that you install two MPUs on a switch for redundancy. If two MPUs are installed, their model must be the same. Otherwise, the standby MPU cannot start up.
- The USB ports on the MPU can be used only to connect to storage media such as USB disk, and cannot be used to charge external equipment. Otherwise, the MPU might fail.
- The length of the USB cable used for the LST1MRPNE1 must be less than 4 m (13.12 ft).

Table 28 MPU specifications

Item	Specifications	
Model	LST2MRPNC1	LST1MRPNE1
Flash	128 MB	512 MB
BootWare	4 MB	8 MB

Item	Specifications
NVRAM	1 MB
SDRAM	4 GB
CF card	1 GB
Interfaces	<ul style="list-style-type: none"> • 1 console port • 1 AUX port • 1 network management port • 1 CF card slot • 2 USB ports—HOST and DEV (DEV is not supported) • 2 MCC GE ports

NOTE:

The MCC GE port is supported only in Release 73xx or later.

Switching fabric modules

! **IMPORTANT:**

Use the switching fabric modules of the same model on a 12500E.

A 12508E/12518E needs to be configured with seven to nine switching fabric modules. Install all switching fabric modules to your switch.

Table 29 Switching fabric module specifications

Model	BootWare	SDRAM	Compatible switch
LST1SF08E1	8 MB	512 MB	12508E
LST1SF18E1	8 MB	512 MB	12518E

Ethernet interface cards

Table 30 Ethernet interface card specifications

Model	SDRAM	Number of ports	Port type	Supported modules and cables
LST1CP4RFD1	4 GB	4	100GBASE-R CFP fiber ports	CFP modules
LST1CP4RFG1	4 GB	4	100GBASE-R CFP fiber ports	CFP modules
LST1XLP16RFD1	4 GB	16	40GBASE-R QSFP+ fiber ports	<ul style="list-style-type: none"> • QSFP+ modules • QSFP+ cables
LST1XP40RFD1	4 GB	40	10GBASE -R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables • FE/GE SFP modules

Model	SDRAM	Number of ports	Port type	Supported modules and cables
LST1XP40RFG1	4 GB	40	10GBASE-R/W SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables • FE/GE SFP modules
LST1XP48LFD1	4 GB	48	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • FE/GE SFP modules
LST2XP32REB1	1 GB	32	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST2XP32REC1	1 GB	32	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST1XP16LEB1	1 GB	16	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST1XP16LEC1	1 GB	16	10G BASE -R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST2XP8LEB1	1 GB	8	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST2XP8LEC1	1 GB	8	10GBASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST2XP8LEF1	1 GB	8	10G BASE-R SFP+/LC fiber ports	<ul style="list-style-type: none"> • 10-GE SFP+ modules • 10-GE SFP+ cables
LST1XP8LEB1	1 GB	8	10GBASE -R/W XFP/LC fiber ports	10-GE XFP modules
LST1XP8LEC1	1 GB	8	10GBAS -R/W XFP/LC fiber ports	10-GE XFP modules
LST1GP48LEB1	1 GB	48	1000BASE-X-SFP/LC fiber ports	FE/GE SFP modules
LST1GP48LEC1	1 GB	48	1000BASE-X-SFP/LC fiber ports	FE/GE SFP modules
LST1GP48LEF1	1 GB	48	1000BASE-X-SFP/LC fiber ports	FE/GE SFP modules
LST1GT48LEB1	1 GB	48	10/100/1000BASE-T-RJ45 copper ports	RJ-45 cables
LST1GT48LEC1	1 GB	48	10/100/1000BASE-T-RJ45 copper ports	RJ-45 cables

NOTE:

- HP recommends that you set the operating mode of a 12508E or 12518E to grand mode by using the **system-working-mode grand** command if it uses only the FD-suffixed LPUs, FG-suffixed LPUs, or their combination.
- For more information about transceiver modules, see "Appendix C Transceiver modules."

OAA modules

CAUTION:

The software upgrade of OAA modules must be performed through console ports or Ethernet ports on the OAA modules, rather than on the MPU.

Table 31 OAA module specifications

Model	Descriptions	Interfaces	Supported modules and cables
LST1FW2A1	Firewall module	<ul style="list-style-type: none">• 1 console port• 2 USB ports• 2 × 10/100/1000BASE-T copper ports• 2 GE combo interfaces	<ul style="list-style-type: none">• GE SFP modules• RJ-45 cables
LST1FW3A1	Firewall module	<ul style="list-style-type: none">• 1 console port• 2 USB ports (reserved for hardware, not supported by software)• 2 GE combo interfaces	<ul style="list-style-type: none">• GE SFP modules• RJ-45 cables

Fan trays

Figure 70 Fan tray views

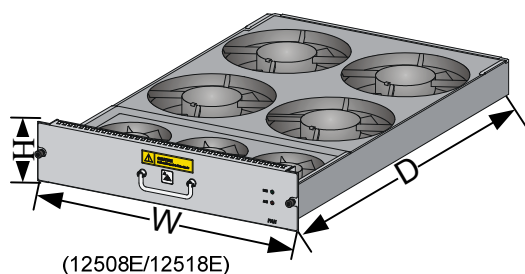


Table 32 Fan tray specifications

Fan tray	Power consumption of a single fan tray	Net weight	Dimensions (H × W × D)
12508E/12518E fan tray	103 W to 1350 W	10.75 kg (23.70 lb)	92 × 442 × 661 mm (3.62 × 17.40 × 26.02 in)

NOTE:

The fan trays for the 12508E and 12518E are horizontally oriented.

Power supply system

The 12500E switches provide both AC powered chassis and DC powered chassis. You can select the type of power supply system as needed.

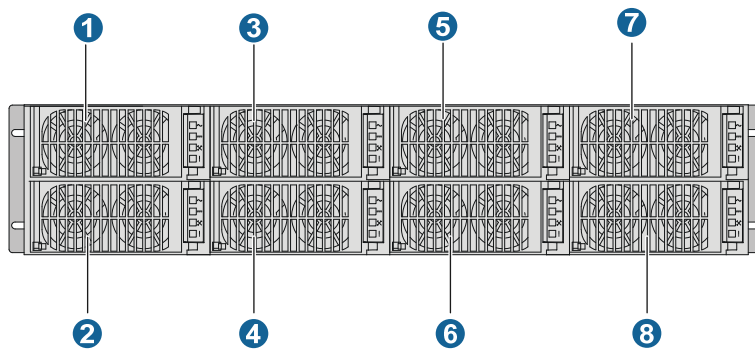
12508E/12518E AC power supply

PSE20KA1 AC power supply system

PSE20KA1 AC power supply comprises an AC power frame (integrated with power receptacles) and AC power modules.

Each 12508E/12518E AC power frame can have up to eight AC power modules.

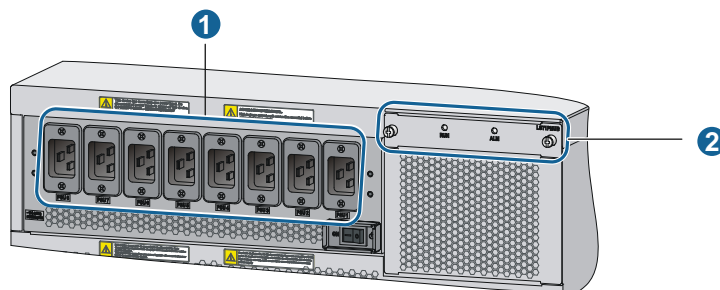
Figure 71 Front view of an AC power frame



(1) to (8) AC power modules

The power receptacles (callout 1 in [Figure 72](#)), which is used for power supply entry, is installed at the rear of the 12508E/12518E AC power frame.

Figure 72 Power receptacles and power monitoring module



(1) Power receptacles

(2) Power monitoring module

Power monitoring module

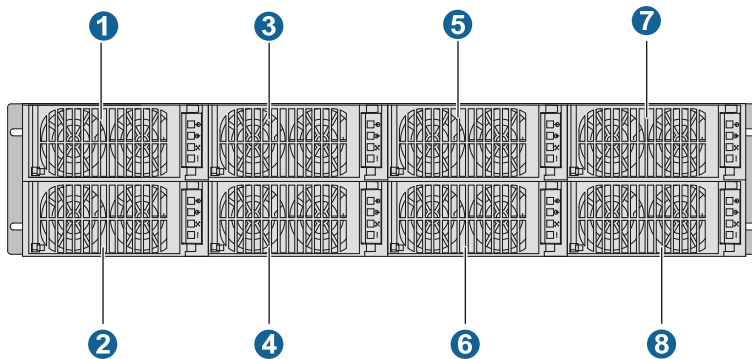
The power monitoring module (callout 2 in Figure 72) monitors the alarm status, in-position status, and operating status of the power modules in real time. It is located at the rear right of the 12508E or 12518E chassis.

12508E/12518E DC power supply

PSE20KD1 DC power supply system

PSE20KD1 DC power supply system comprises a DC power frame and DC power modules.

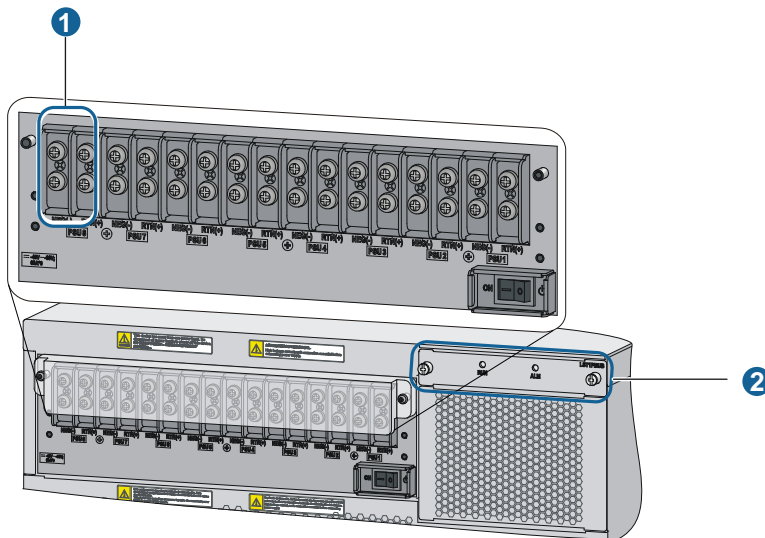
Figure 73 DC power frame front view



(1) to (8) DC power modules

The 12508E or 12518E DC power frame has eight pairs of wire posts corresponding to DC power modules 1 to 8. The external DC power system supplies power through the eight pairs of wire posts.

Figure 74 DC power frame rear view



(1) A pair of wire posts

(2) Power monitoring module

Power monitoring module

The 12508E or 12518E power monitoring module (callout 2 in [Figure 74](#)) monitors the alarm status, in-position status, and operating status of the power modules in real time. It is located at the rear right of the 12508E or 12518E chassis.

Power component specifications

The AC power frames, power receptacles, and power monitoring modules are integrated to the 12508E/12518E AC chassis. You need to order the AC power modules as required.

The DC power frames and power monitoring modules are integrated to the 12500E DC chassis. You need to order the DC power modules as required.

Table 33 Weight of the 12508E/12518E power components

Power supply	Weight
Power monitoring module	0.3 kg (0.66 lb)
AC power module-2000 W	2.19 kg (4.83 lb)
DC power module-1800 W	1.96 kg (4.32 lb)

Table 34 AC power module specifications

Item	Specifications
Rated input voltage	100 VAC to 120 VAC @ 50 Hz/60 Hz
	200 VAC to 240 VAC @ 50 Hz/60 Hz
Max input voltage	90 VAC to 264 VAC @ 47 Hz to 63 Hz
Max input current	13.3 A
Max output power	1200 W (100 VAC to 120 VAC)
	2000 W (200 VAC to 240 VAC)
Number	<ul style="list-style-type: none">• 12508E: ≤8• 12518E: ≤16

Table 35 DC power module specifications

Item	Specifications
Rated input voltage	-48 VDC to -60 VDC
Max input voltage	-42 VDC to -72 VDC
Boot voltage	-44 VDC to -72 VDC
Max input current	60 A
Max output power	1800 W
Number	<ul style="list-style-type: none">• 12508E: ≤8• 12518E: ≤16

Power cords

DC power cords

DC power cords connect the DC power modules of the switch with the external DC power source. [Table 36](#) shows the DC power cords supported by the 12500E switches.

Table 36 DC power cord specifications

Model	Length
0404A0CE	3 m (9.84 ft)
0404A0CF	10 m (32.91 ft)

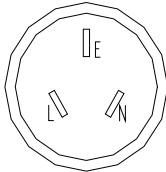
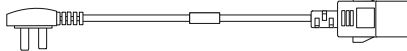
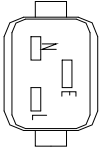
AC power cords

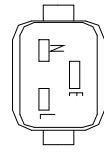
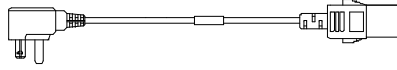
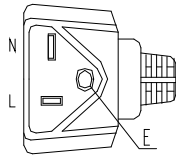
AC power cords connect the AC power modules of the switch with the external AC power source.

You need to choose AC power cords based on the power of the power modules.

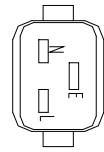
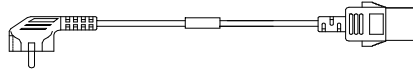
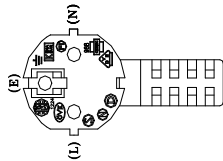
The 12500E adopts the 16A AC power cords. Connectors vary among different countries and regions. For 16A AC power cords used in different countries or regions and the outline of a C19 straight connector, see [Table 37](#).

Table 37 16A AC power cords used in different countries or regions

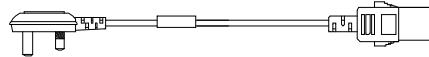
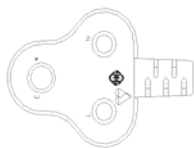
Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
1 I type	04043396 (3 m/9.84 ft)	Mainland China		
Connector outline	Power cable outline	Connector outline		
				
Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
2 B type	0404A063 (3 m/9.84 ft)	Canada and U.S.A	Mexico, Argentina, Brazil, Columbia, Venezuela, Thailand, Peru and Philippines	
Connector outline	Power cable outline	Connector outline		



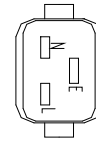
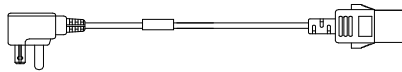
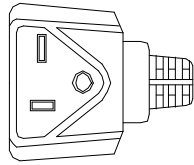
Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
3	F type 0404A061 (3 m/9.84 ft)	Holland, Denmark, Sweden, Finland, Norway, Germany, France, Austria, Belgium, and Italy	Indonesia, Turkey, Russia, and CIS	
Connector outline		Power cable outline		Connector outline



Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
4	G type 0404A060 (3 m/9.84 ft)	U.K.	Malaysia, Singapore, Hong Kong, and Egypt	
Connector outline		Power cable outline		Connector outline



Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
5	B type 0404A062 (3 m/9.84 ft)	Japan		
Connector outline		Power cable outline		Connector outline



Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
6 I type	0404A01A (3 m/9.84 ft)	Australia		
Connector outline		Power cable outline		Connector outline

Connector type	Code (Length)	Countries or regions where the type of power cords conforms to local safety regulations and can be used legally	Other countries or regions using this type of power cords	Countries or regions seldom using this type of power cords
7 C20	0404A0C2 (3 m/9.84 ft)	Mainland China		
Connector outline		Power cable outline		Connector outline

Expansion cable management brackets

Table 38 Expansion cable management bracket specifications

Expansion cable management bracket		Dimensions (H × W × D)
12508E expansion cable management bracket	Upper	210 × 442 × 128 mm (8.27 × 17.40 × 5.04 in)
	Lower	92 × 442 × 128 mm (3.62 × 17.40 × 5.04 in)
12518E expansion cable management bracket	Upper	292 × 442 × 128 mm (11.50 × 17.40 × 5.04 in)
	Lower	157 × 442 × 128 mm (6.18 × 17.40 × 5.04 in)

Appendix B LEDs

Power system LEDs

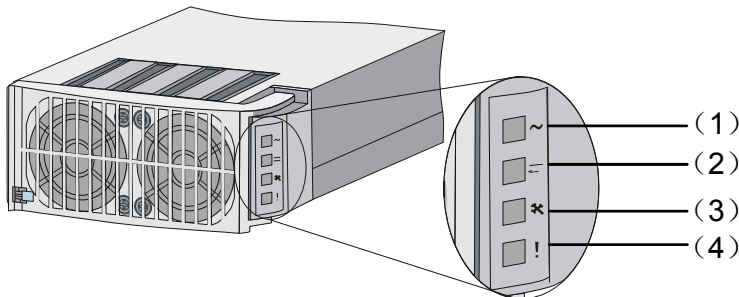
Power monitoring module LEDs

Table 39 Power monitoring module LED description

LED	Status	Description
RUN	Flashing	The power monitoring module is operating correctly.
	Off	The power monitoring module is faulty.
ALM	Steady on	<ul style="list-style-type: none"> At least one power module is faulty. The switch of the power frame is off.
	Flashing	<ul style="list-style-type: none"> A power module is present, but no AC power supply is provided. All power modules are removed.
	Off	The power modules are operating correctly.

Power module LEDs

Figure 75 Power module LEDs



- (1) Power input LED (2) Power output LED (3) Over-temperature alarm LED
 (4) Power module fault LED

Table 40 Power module LED description

LED	Status	Description
Input	Steady on	The power is being input correctly.
	Off	No power is being input.
	Flashing	The input power has exceeded the threshold.
Output	Steady on	The power is being output correctly.

LED	Status	Description
	Off	No power is being output.
	Flashing	The power output is overloaded.
	Steady on	The AC power module is experiencing an over-temperature condition.
Service	Off	The AC power module is operating correctly.
Fault	Steady on	The AC power module is faulty.
	Off	The AC power module is operating correctly.

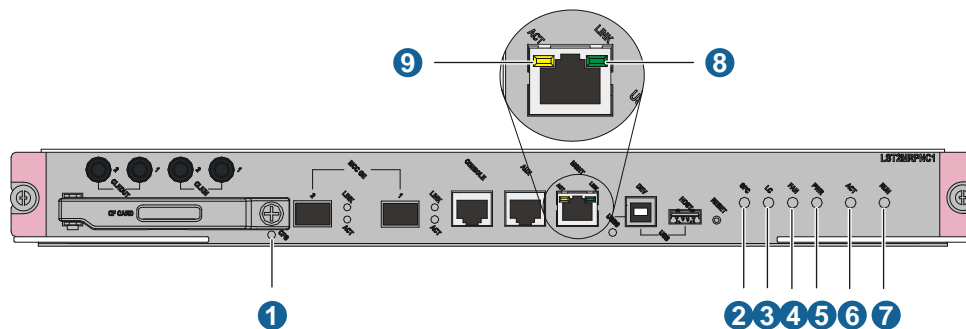
Fan tray LEDs

Table 41 Fan tray LED description

LED	Status	Description
RUN	Off	The fan tray has failed.
	Flashing	The fan tray is operating correctly.
ALM	Off	The fan tray is in a normal state.
	Flashing	The fan tray is faulty.
	Steady on	The fan tray is faulty.

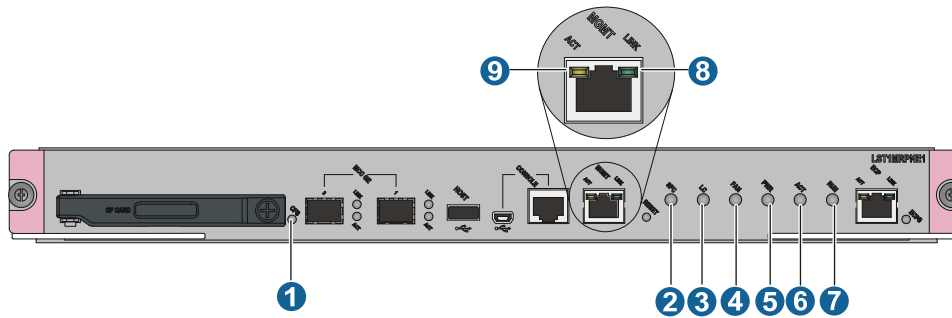
MPU LEDs

Figure 76 LST2MRPNC1 LEDs



(1) CF card status LED (CFS)	(2) Switching fabric module LED (SFC)	(3) LPU status LED (LC)
(4) Fan status LED (FAN)	(5) Power status LED (PWR)	(6) MPU status LED (ACT)
(7) MPU status LED (RUN)	(8) Network management port LED (LINK)	(9) Network management port LED (ACT)

Figure 77 LST1MRPNE1 LEDs



(1) CF card status LED (CFS)	(2) Switching fabric module LED (SFC)	(3) LPU status LED (LC)
(4) Fan status LED (FAN)	(5) Power status LED (PWR)	(6) MPU status LED (ACT)
(7) MPU status LED (RUN)	(8) Network management port LED (LINK)	(9) Network management port LED (ACT)

CF card status LED

Table 42 CF card status LED description

LED	Status	Description
CFS	Steady on	The CF card is present and idle.
	Flashing	The CF card is present and performing read/write operations. Do not unplug it.
	Off	The CF card is out of position or offline. You can plug in or unplug it.

NOTE:

When the CF card LED is on, do not unplug the CF card. To unplug it, execute the **umount** command in user view to uninstall the CF card, and then unplug the CF card when the CF card LED is off.

Network management port LEDs

Table 43 Network management port LED description

LED	Status	Description
LINK	Off	No link is present.
	Steady on	A link is present.
ACT	Off	No data is being transmitted or received.
	Flashing	Data is being transmitted and/or received.

Switching fabric module LED

Table 44 Switching fabric module LED description

LED	Status	Description
SFC (green-red)	Flashing green	All the switching fabric modules are operating correctly.
	Flashing red	At least one switching fabric module is faulty or no switching fabric modules are present.
	Steady on	The MPU is faulty.
	Off	The MPU is faulty.

LPU status LED

Table 45 LPU status LED description

LED	Status	Description
LC (green-red)	Flashing green	All the LPUs are operating correctly.
	Flashing red	At least one LPU is faulty.
	Steady on	The MPU is faulty.
	Off	The MPU is faulty.

Fan status LED

Table 46 Fan status LED description

LED	Status	Description
FAN (green-red)	Flashing green	All the fan trays are operating correctly.
	Flashing red	One or two fan trays are faulty.
	Steady on	The MPU is faulty.
	Off	The MPU is faulty.

Power status LED

Table 47 Power status LED description

MPU LED	Status	Description
PWR (green-red)	Flashing green	All the power frames are operating correctly.
	Flashing red	One or two power frames are faulty.
	Steady on	The MPU is faulty.
	Off	The MPU is faulty.

MPU LEDs

Table 48 MPU LED description

MPU LED	Status	Description
ACT (green)	Steady on	The MPU is in active state.
	Off	The MPU is in standby state.
RUN (green-red)	Flashing green	The MPU is operating correctly.
	Flashing red	The MPU is faulty.
	Steady on	The MPU is faulty.
	Off	The MPU is faulty or not present.

LPU LEDs

An LPU has two types of LEDs: interface LEDs and RUN LEDs.

Interface LEDs

LINK and ACT LEDs

Each interface on the following LPUs has a LINK LED and an ACT LED:

- LST1XP8LEB1
- LST1XP8LEC1

Table 49 Interface LED description

LED	Status	Description
LINK	Off	No link is present.
	Steady on	A link is present.
ACT	Off	No data is being transmitted or received.
	Flashing	Data is being transmitted and/or received.

LINK/ACT LED

Each interface on the following LPUs has a LINK/ACT LED:

- LST1GP48LEB1
- LST1GP48LEC1
- LST1GP48LEF1
- LST1GT48LEB1
- LST1GT48LEC1
- LST1XP16LEB1
- LST1XP16LEC1
- LST2XP8LEB1

- LST2XP8LEC1
- LST2XP8LEF1
- LST2XP32REB1
- LST2XP32REC1
- LST1CP4RFD1
- LST1CP4RFG1
- LST1XLP16RFD1
- LST1XP40RFD1
- LST1XP40RFG1
- LST1XP48LFD1

Table 50 Interface LED description

LED	Status	Description
LINK/ACT	Steady on	A link is present.
	Off	No link is present.
	Flashing	Data is being transmitted and/or received on the interface.

RUN LED

The RUN LED description of different 12500E LPU models is the same.

Table 51 RUN LED description

LED	Status	Description
RUN (green-red)	Flashing green	The LPU is operating correctly.
	Flashing red	The LPU is faulty.
	Steady on	The LPU is faulty.
	Off	The LPU is faulty or not present.

Switching fabric module LEDs

The LED description of different 12500E switching fabric modules is the same.

Table 52 Interface LED description

LED	Status	Description
LINK	Off	No link is present.
	Steady on	A link is present.
ACT	Off	No data is being transmitted or received.
	Flashing	Data is being transmitted and/or received.

Table 53 RUN LED description

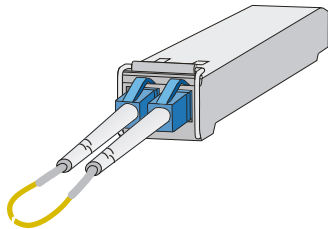
LED	Status	Description
RUN (green-red)	Flashing green	The switching fabric module is operating correctly.
	Flashing red	The switching fabric module is faulty.
	Steady on	The switching fabric module is faulty.
	Off	The switching fabric module is faulty or not present.

Appendix C Transceiver modules

⚠ CAUTION:

To avoid damages to the transceiver, a compatible optical attenuation must be used if a short-haul optical fiber is connected to a long-haul transceiver (40 km/24.86 miles or above). A loopback occurs if you connect the receive optical bore to the transmit optical bore with a short-haul optical fiber, as shown in Figure 78.

Figure 78 Loopback operation on an optical transceiver



The 12500E Routing Switch Series supports the following transceiver modules and cables:

- 100-GE CFP transceiver modules
- 40-GE QSFP+ transceiver modules
- 10-GE XFP transceiver modules
- 10-GE SFP+ transceiver modules
- 10-GE SFP+ cables
- FE/GE SFP transceiver modules

100-GE CFP transceiver modules

Table 54 100-GE CFP transceiver module specifications

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JG829A	HP X150 100G CFP LC LR4 10km SM Transceiver	1295.56 nm	LC	9/125 μ m single-mode fiber	10 km (6.21 miles)
		1300.05 nm			
		1304.58 nm			
		1309.14 nm			
JG829B	HP X150 100G CFP LC LR4 10km SM Transceiver	1295.56 nm	LC	9/125 μ m single-mode fiber	10 km (6.21 miles)
		1300.05 nm			
		1304.58 nm			
		1309.14 nm			

40-GE QSFP+ transceiver modules

Table 55 40-GE QSFP+ transceiver module specifications

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JG325A	HP X140 40G QSFP+ MPO SR4 Transceiver	850 nm	MPO	50/125 μ m multi-mode fiber	100 m (328.08 ft), OM3 150 m (492.13 ft), OM4
JG325B	HP X140 40G QSFP+ MPO SR4 Transceiver	850 nm	MPO	50/125 μ m multi-mode fiber	100 m (328.08 ft), OM3 150 m (492.13 ft), OM4
JG709A	HP X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	850 nm	MPO	50/125 μ m multi-mode fiber	300 m (984.25 ft)
JG661A	HP X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	1271 nm 1291 nm 1311 nm 1331 nm	LC	9/125 μ m single-mode fiber	10 km (6.21 miles)

NOTE:

The JG325A and JG661A modules cannot be connected to the 10-Gbps SFP+ module.

10-GE XFP transceiver modules

Table 56 10-GE XFP transceiver module specifications

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JD117B	HP X130 10G XFP LC SR Transceiver	850 nm	LC	62.5/125 μ m multi-mode optical fiber	33 m (108.27 ft)
		850 nm	LC	50/125 μ m multi-mode optical fiber	300 m (984.25 ft)
JD108B	HP X130 10G XFP LC LR Single Mode 10km 1310nm Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)
JD121A	HP X135 10G XFP LC ER Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	40 km (24.86 miles)
JD107A	HP X130 10G XFP LC ZR Single Mode 80km 1550nm Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JG226A	HP X180 10G XFP LC LH 80km 1538.98nm DWDM Transceiver	1538.98 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG227A	HP X180 10G XFP LC LH 80km 1539.77nm DWDM Transceiver	1539.77 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG228A	HP X180 10G XFP LC LH 80km 1540.56nm DWDM Transceiver	1540.56 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG229A	HP X180 10G XFP LC LH 80km 1542.14nm DWDM Transceiver	1542.14 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG230A	HP X180 10G XFP LC LH 80km 1542.94nm DWDM Transceiver	1542.94 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG231A	HP X180 10G XFP LC LH 80km 1558.98nm DWDM Transceiver	1558.98 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG232A	HP X180 10G XFP LC LH 80km 1559.79nm DWDM Transceiver	1559.79 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JG233A	HP X180 10G XFP LC LH 80km 1560.61nm DWDM Transceiver	1560.61 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)
JD088A	HP X135 10G XFP LC LR Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)

10-GE SFP+ transceiver modules

Table 57 10-GE SFP+ transceiver module specifications

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JD092B	HP X130 10G SFP+ LC SR Transceiver	850 nm	LC	62.5/125 μ m multi-mode optical fiber	33 m (108.27 ft)
		850 nm	LC	50/125 μ m multi-mode optical fiber	300 m (984.25 ft)
JD093B	HP X130 10G SFP+ LC LRM Transceiver	1310 nm	LC	62.5/125 μ m multi-mode optical fiber	220 m (721.78 ft)
		1310 nm	LC	50/125 μ m multi-mode optical fiber	220 m (721.78 ft)

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JD094B	HP X130 10G SFP+ LC LR Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)
JG234A	HP X130 10G SFP+ LC ER 40km Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	40 km (24.86 miles)
JG915A	HP X130 10G SFP+ LC LH 80km Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	80 km (49.71 miles)

NOTE:

The LST1XP48LFD1 and LST1XP40RFD1 do not support the HP X130 10G SFP+ LC LRM Transceiver.

10-GE SFP+ cables

Table 58 10-GE SFP+ cable specifications

Product code	Description	Connector	Max transmission distance
JD097C	HP X240 10G SFP+ SFP+ 3m DA Cable	SFP+	3 m (9.84 ft)
JG081C	HP X240 SFP+ SFP+ 5m Direct Attach Copper Cable	SFP+	5 m (16.40 ft)
JC784C	HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	SFP+	7 m (22.97 ft)

NOTE:

The LST1XP48LFD1 do not support the 10-GE SFP+ cables.

FE/GE SFP transceiver modules

Table 59 FE/GE SFP transceiver module specifications

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JD118B	HP X120 1G SFP LC SX Transceiver	850 nm	LC	50/125 μ m multi-mode optical fiber	550 m (1804.46 ft)
		850 nm	LC	62.5/125 μ m multi-mode optical fiber	275 m (902.23 ft)
JD119B	HP X120 1G SFP LC LX Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)

Product code	Description	Central wavelength	Connector	Fiber	Max transmission distance
JD061A	HP X125 1G SFP LC LH40 1310nm Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	40 km (24.86 miles)
JD062A	HP X120 1G SFP LC LH40 1550nm Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	40 km (24.86 miles)
JD063B	HP X125 1G SFP LC LH70 Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD103A	HP X120 1G SFP LC LH100 Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	100 km (62.14 miles)
JD098B	HP X120 1G SFP LC BX 10-U Transceiver	1490 nm (Rx)/1310 nm (Tx)	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)
JD099B	HP X120 1G SFP LC BX 10-D Transceiver	1490 nm (Tx)/1310 nm (Rx)	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)
JD113A	HP X170 1G SFP LC LH70 1470 Transceiver	1470 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD114A	HP X170 1G SFP LC LH70 1490 Transceiver	1490 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD115A	HP X170 1G SFP LC LH70 1510 Transceiver	1510 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD116A	HP X170 1G SFP LC LH70 1530 Transceiver	1530 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD109A	HP X170 1G SFP LC LH70 1550 Transceiver	1550 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD110A	HP X170 1G SFP LC LH70 1570 Transceiver	1570 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD111A	HP X170 1G SFP LC LH70 1590 Transceiver	1590 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JD112A	HP X170 1G SFP LC LH70 1610 Transceiver	1610 nm	LC	9/125 μ m single-mode optical fiber	70 km (43.50 miles)
JF833A	HP X114 100M SFP LC FX Transceiver	1310 nm	LC	50/125 μ m multi-mode optical fiber	2 km (1.24 miles)
		1310 nm	LC	62.5/125 μ m multi-mode optical fiber	2 km (1.24 miles)
JF832A	HP X120 100M/1G SFP LC LX Transceiver	1310 nm	LC	9/125 μ m single-mode optical fiber	10 km (6.21 miles)
JD089B	HP X120 1G SFP RJ45 T Transceiver	N/A	RJ-45	Category 5 or higher twisted pair cable	100 m (328.08 ft)

NOTE:

- The HP X114 100M SFP LC FX Transceiver supports only 100-Mbps fiber ports.
 - The HP X120 100M/1G SFP LC LX Transceiver supports 100/1000-Mbps fiber ports.
-

Appendix D Lightning protection

Connecting the AC power supply to a power strip with lightning protection

If part of the AC power line is routed outdoors, use a power strip with lightning protection to connect the AC power cord of the switch to the AC power line to protect the switch from being damaged by lightning strikes.

You can attach the power strip to the rack, workbench, or wall of equipment room.

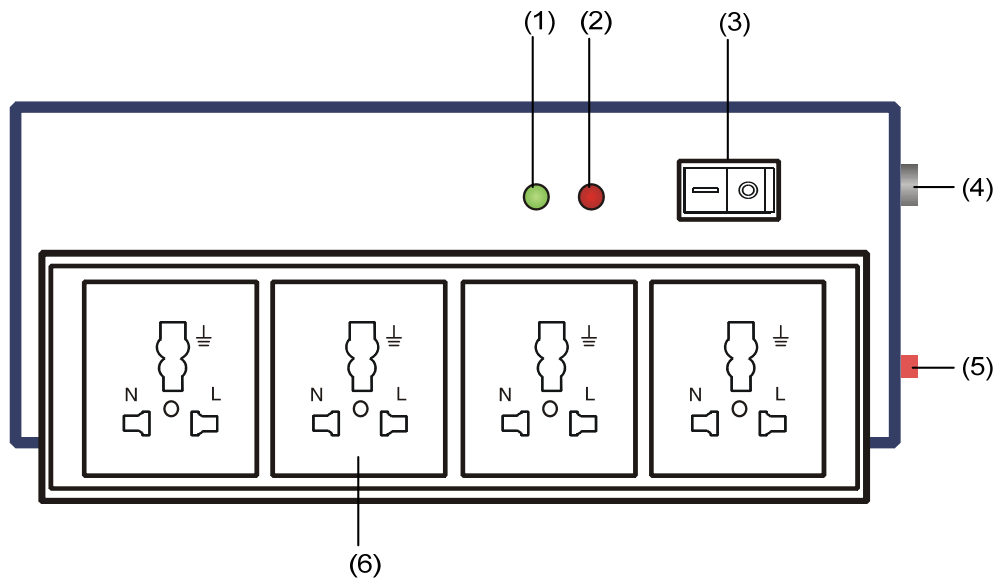
△ CAUTION:

Make sure the PE terminal of the power socket has been securely grounded.

After you connect the AC power cord from the switch to a socket on the power strip, verify that the green RUN LED on the strip is on and the red LED is off.

If the red LED is on, use a multimeter to check the polarity of the wires in the power socket for wrong connections. If the zero wire (left) and the live wire (right) are correctly connected, check for missing grounding connection.

Figure 79 Power strip with lightning protection



(1) Operating LED (green)	On means the circuit is operating correctly. Off means the circuit is damaged.
(2) Grounding/pole detection LED (red)	On indicates a wrong wire connection (the wire is not grounded or the live line and null line are reversely connected), and you need to check the power supply line.
(3) Power switch	

(4) IEC standard socket	It is used to connect to the power supply in the equipment room through a power cord.
(5) Overload automatic protector	The protector automatically opens the electric circuit when the current exceeds the threshold and closes the electric circuit when the current drops below the threshold.
(6) Multifunctional socket	It is used to connect the power supply of the switch.

Installing a lightning protector for a network port

⚠ IMPORTANT:

Read the instructions for the lightning protector carefully before you install it.

If part of the network cable of a 10/100/1000 Mbps RJ-45 copper Ethernet port must be routed outdoors, connect a lightning protector to the cable before you plug the cable into the port.

HP recommends that you install a lightning protector for 10/100/1000 Mbps RJ-45 copper Ethernet ports.

The switch does not come with any lightning protector.

Required tools

- Phillips or flat-blade screwdriver
- Multimeter
- Tilted wire cutter

Installation procedure

To install a lightning protector:

1. Use a double-faced adhesive tape to stick the lightning protector onto the switch chassis, and make sure it is as close to the grounding screw of the switch as possible.
2. Measure the distance between the protector and the grounding screw of the switch, cut the ground wire of the protector as appropriate, and securely tighten the ground wire to the grounding screw of the switch.
3. Use the multimeter to measure whether the ground wire of the protector contacts correctly with the grounding screw of chassis.
4. Insert the outdoor network cable into the protector's IN end, and the cable connected to the switch into the OUT end, and look at the indicators on the lightning protector to verify that the connection is correct.
5. Use nylon ties to bundle the cables neatly.

Installation precautions

The performance of the port lightning protector might be affected in the following cases:

- The port lightning protector is installed in reverse direction. Connect the IN end to the outdoor network cable and the OUT end to the network port on the switch.
- The port lightning protector is not correctly grounded. After the connection, use the multimeter to confirm that the ground wire for the protector is as short as possible to ensure its good contact with the grounding screw of the switch.

- The installed port lightning protectors are not sufficient. If the switch has more than one network port connected with other devices through cables outdoor, install a lightning protector for each network port.

Appendix E Engineering labels

Engineering labels are used to identify cables and devices for easy maintenance after installation.

There are two types of engineering labels, labels for cables and labels for devices.

Labels for cables

Cables include signal cables such as network cables and fibers, and power cords such as AC power cords and DC power cords. Labels for cables fall into labels for signal cables, labels for power cords, and generic labels.

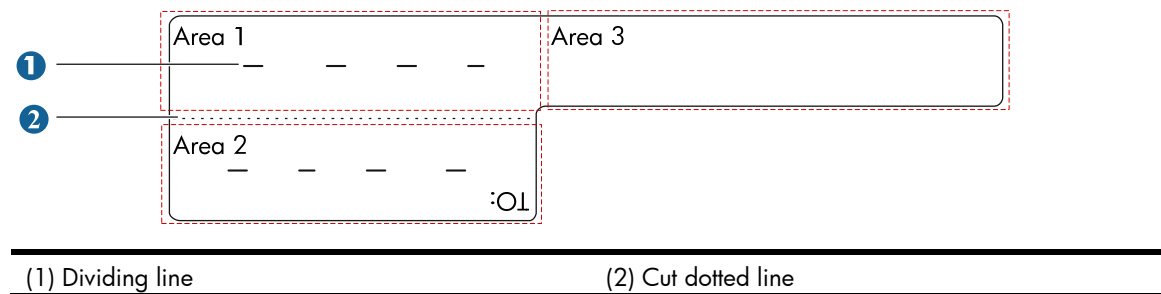
Labels for signal cables

A label for signal cables is L-shaped with fixed dimensions. The light-blue dividing lines on the label help to specify more clearly the position of the cable. For example, there is one dividing line between the rack number and the chassis number and another one between the chassis number and the slot number. The cut dotted line helps to fold the label when you affix it to the cable. A mark "TO:" is located at the lower right corner of the label to identify the peer end of the cable on which the label is affixed.

As shown in [Figure 80](#), write a signal cable label as follows:

- Write the position of the cable in Area 1.
- Write the position of the cable on the peer end in Area 2.
- Area 3 is the part that is folded up inside the label when the label is affixed to the cable.

Figure 80 Label for signal cables

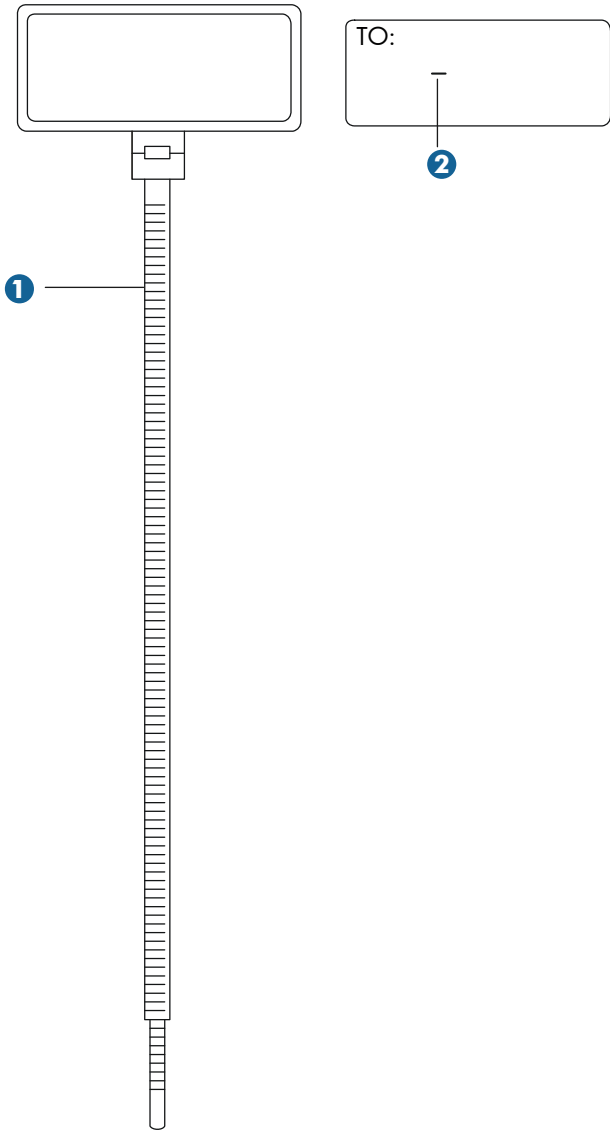


Labels for power cords

A label for power cords should be attached to the identification plate on a cable tie that binds the power cords. The identification plate has an embossment of 0.2×0.6 mm (0.008×0.02 in) around (symmetric on both sides), and the area in the middle is for affixing the label.

A mark "TO:" is located at the upper left corner of the label to identify the peer end of the cord on which the label is affixed. You can write the position of the peer device, control cabinet, distribution box, or power socket. The meaning of the dividing lines is the same as labels for signal cables.

Figure 81 Label for power cords

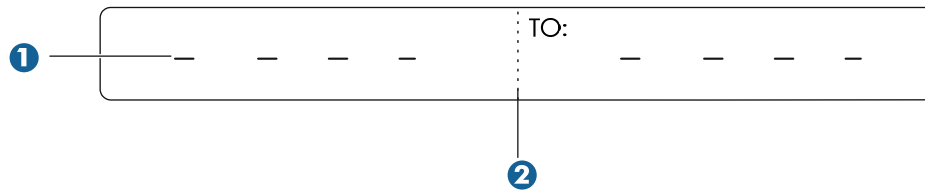


(1) Cable tie (2) Dividing line on the label

Generic labels

A generic label is bar-shaped with fixed dimensions. It is applicable to both signal cables and power cords. A mark "TO:" is located at the upper left corner in the right area of the label to identify the peer end of the cable on which the label is affixed. The meaning of the dividing lines is the same as labels for signal cables.

Figure 82 Generic label



(1) Dividing line on the label

(2) Cut dotted line

Labels for devices

A device label is used to identify the device name, model, address, installation date, and so on.

Filling in labels

You can print or write desired contents on labels. HP recommends that you print labels.

To print labels, select a label printer and a proper label template as needed. For more information about using a label printer, see the user guide of the printer.

To write labels, use black markers. A marker has two nibs. Be sure to use the smaller nib to write labels.

Affixing labels

After printing or writing a label, remove the label from the bottom page and affix it to the signal cable, or the identification plate of the power cord.

Affixing a label to a signal cable

Typically, a label is affixed 2 cm (0.79 in) away from the connector on a signal cable. You can affix the label to other positions as needed. [Figure 83](#) shows how to affix a label when a cable is laid vertically.

Figure 83 Affixing a label

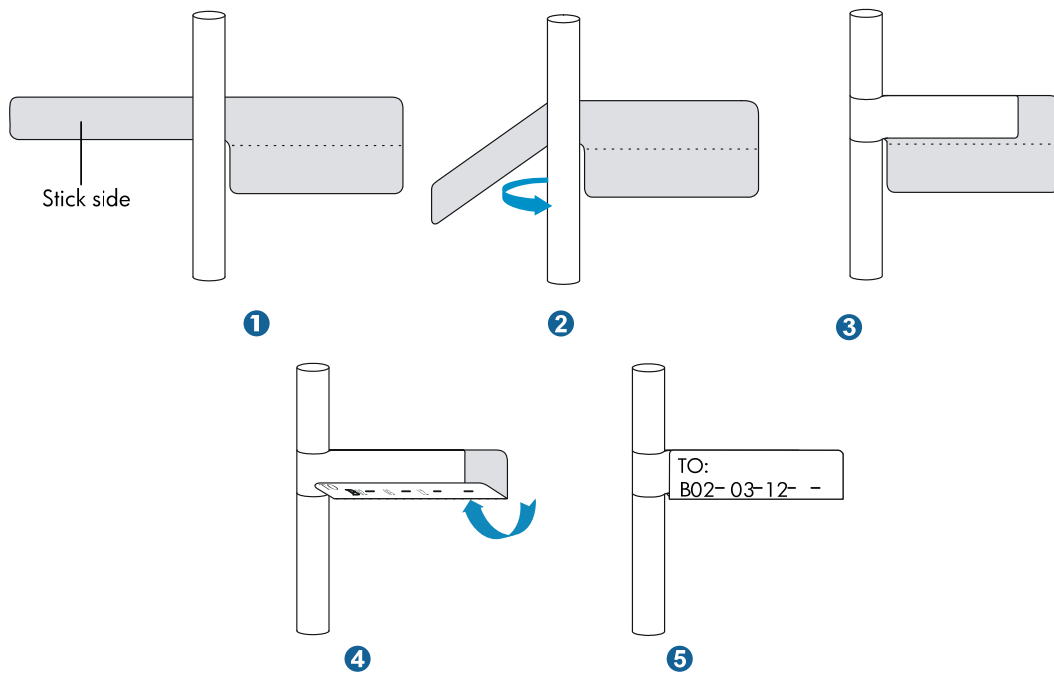
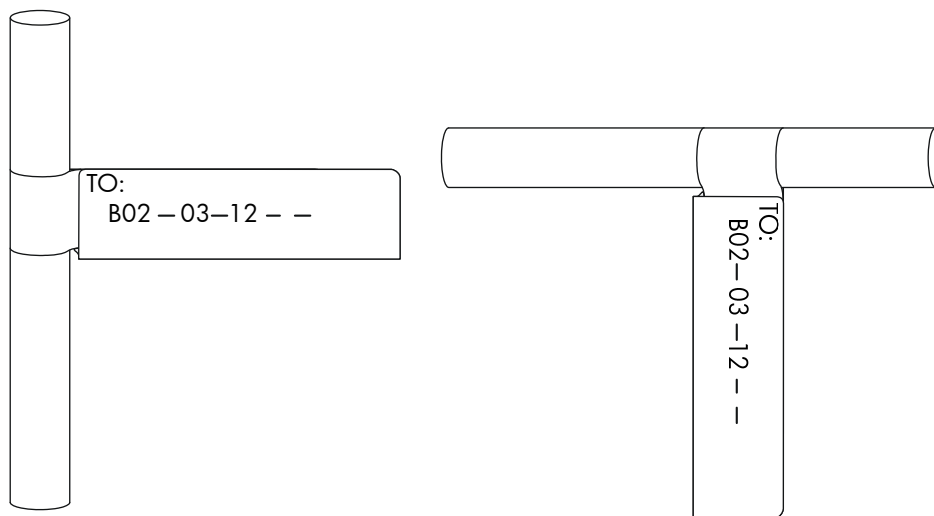


Figure 84 shows the affixed labels when the cable is laid vertically and horizontally.

Figure 84 Affixed labels

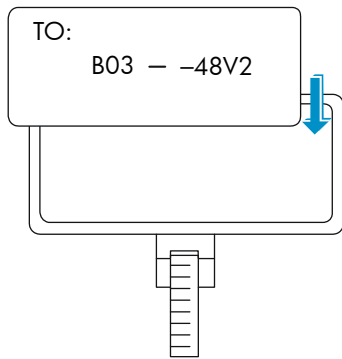


Affixing a label to a power cord

Stick the label to the recessed rectangular area on the identification plate. You can stick the label to either side of the identification plate. Be sure to affix the labels on the same side of the identification plates.

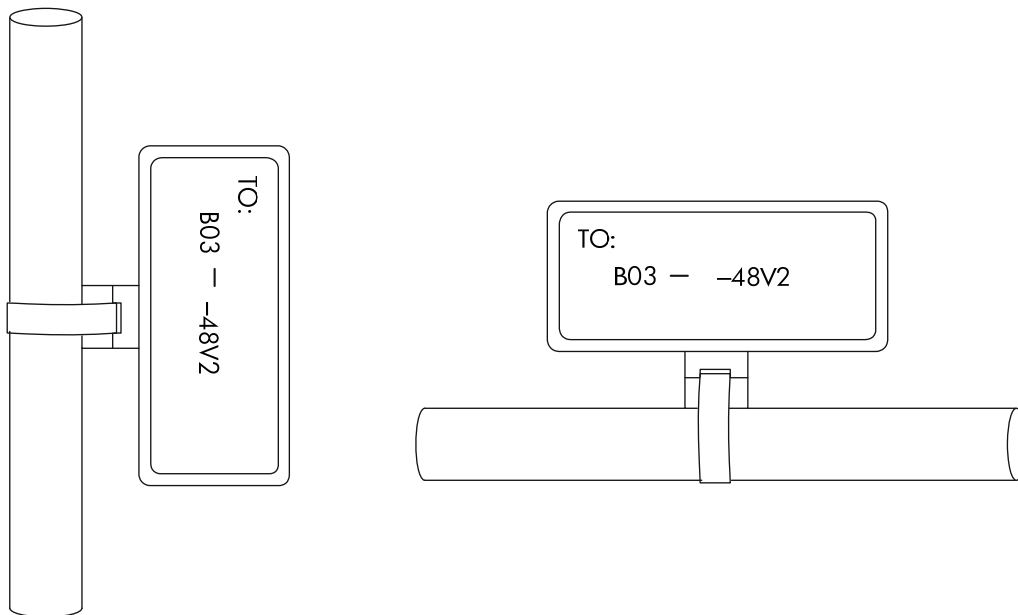
A cable tie is bundled 2 cm (0.79 in) away from the connector. You can affix the label to other positions as needed. Figure 83 shows how to affix a label when a cable is laid horizontally.

Figure 85 Affixing a label



Bind cable ties on both ends of a cable. After the bundling, the finished identification plate should be on top of the cable in horizontal cabling, or on the right side of the cable in vertical cabling. Make sure the label is facing out, as shown in [Figure 86](#).

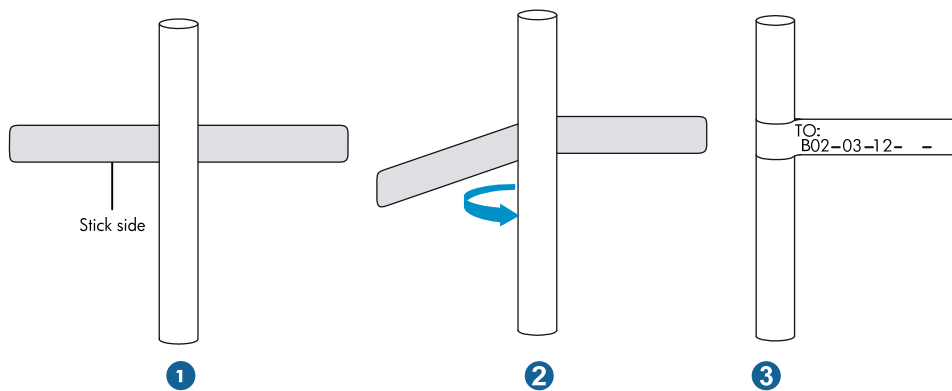
Figure 86 Affixed labels



Affixing a generic label

The requirements for affixing a generic label are the same as affixing a label on a signal cable. For more information, see "[Affixing a label to a signal cable](#)." For the example of affixed labels, see [Figure 84](#).

Figure 87 Affixing a generic label



Affixing a label to a device

Remove the device label and stick it to the device. You can stick a device label to any desired position on the device.

Guidelines

- When you print, write, or affix labels, keep the labels clean.
- Do not use ink-jet printers and ink pens.
- Affix labels with good order in alignment.
- Avoid cable bents or other positions that might affect cable installation when you stick a label or bundle a cable tie with a power cord identification plate.
- Bundle cable ties at the same positions of power cords, with identification plates on the same side.
- The positions of "up", "down", "right" or "left" are all based on the viewpoint of the engineering person who is working on the label.

Examples

The label examples in this document are for reference only.

Engineering labels for network cables

These labels are affixed to Ethernet cables that connect cards in a chassis.

Table 60 Information on a label affixed to an Ethernet cable

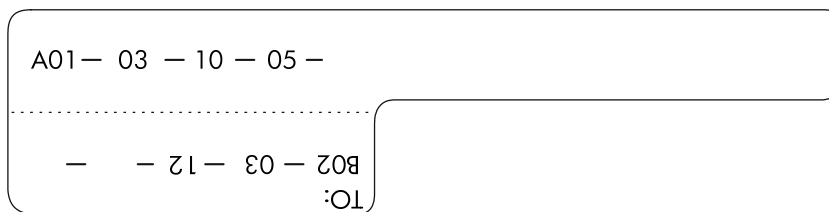
Content	Meaning	Example
MN-B-C-D	MN —Rack number	<ul style="list-style-type: none"> • M—Row number of the rack in the equipment room, in the range of A to Z. • N—Column number of the rack in the equipment room, in the range of 01 to 99. <p>For example, A01.</p>

Content	Meaning	Example
	B —Chassis number	Numbered in top-down order with two digits, for example, 01.
	C —Slot number	Numbered in top-down and left-right order with two digits, for example, 01.
	D —Ethernet port number	Numbered in top-down and left-right order with two digits, for example, 01.
MN-Z	MN —Rack number	<ul style="list-style-type: none"> M—Row number of the rack in the equipment room, in the range of A to Z. N—Column number of the rack in the equipment room, in the range of 01 to 99. For example, B02.
	Z —Location number	Location number of the terminal or device onsite. If you connect the cable to a router in a rack, specify the rack number, chassis number, and Ethernet port number, for example, B02-03-12. If you connect the cable to a terminal or an NMS, specify the location number of the terminal or the NMS.

The information provided on the following labels is different, subject to different devices that the Ethernet cables are connecting. For example:

- On a label for the Ethernet cable that connects a switch and a server:
 - For the switch end**—Rack number, chassis number, and Ethernet port number on the switch.
 - For the server end**—Rack number and chassis number, or the specific location of the server if the server is laid separately.
- On a label for the Ethernet cable that connects the switch and a terminal:
 - For the switch end**—Rack number, chassis number, and Ethernet port number, or the specific location of the switch if the switch is laid separately. The definitions of the rack number and chassis number are the same as those described in [Table 60](#).
 - For the terminal end**—Ethernet port number of the terminal.

Figure 88 Example of a label on an Ethernet cable



- A01-03-10-05**—The local end of the Ethernet cable is connected to Ethernet Port 05, Slot 10, Chassis 03 of the rack on Row A, Column 01 in the equipment room.
- B02-03-12**—The peer end of the Ethernet cable is connected to Ethernet Port 12, Chassis 03 of the rack on Row B, Column 02 in the equipment room.

Engineering labels for optical fibers

These labels are affixed to optical fibers that connect the fiber ports on the cards in a chassis, or connect fiber ports on box-type devices. There are two types of labels for optical fibers: labels for a fiber that connects the fiber ports on two devices, labels for a fiber that connects the device and the optical distribution frame (ODF).

- Labels for the fiber that connects two devices

Table 61 Information on labels affixed to the fiber between two devices

Content	Meaning	Example
MN-B-C-D-R/T	MN —Rack number	<ul style="list-style-type: none"> • M—Row number of the rack in the equipment room, in the range of A to Z. • N—Column number of the rack in the equipment room, in the range of 01 to 99. For example, A01.
	B —Chassis number	Numbered in top-down order with two digits, for example, 01
	C —Slot number	Numbered in top-down and left-right order with two digits, for example, 01.
	D —Fiber port number	Numbered in top-down and left-right order with two digits, for example, 05.
	R —Optical receiving interface T —Optical transmitting interface	N/A
MN-B-C-D-R/T	MN —Rack number	The meanings are the same as above. If the local device and the peer device are not in the same equipment room, MN can be the name of the equipment room.
	B —Chassis number	
	C —Slot number	
	D —Fiber port number	
	R —Optical receiving interface T —Optical transmitting interface	N/A

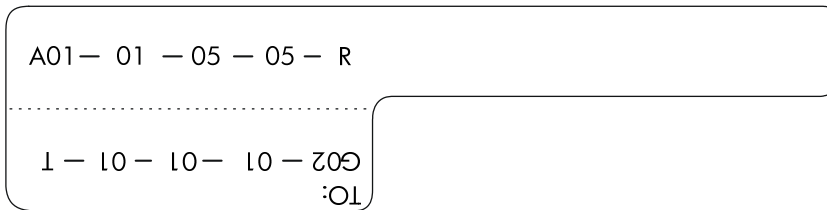
- Labels for the fiber that connects the device and the ODF

Table 62 Information on labels affixed to the fiber between the device and the ODF

Content	Meaning	Example
MN-B-C-D-R/T	MN —Rack number	<ul style="list-style-type: none"> • M—Row number of the rack in the equipment room, in the range of A to Z. • N—Column number of the rack in the equipment room, in the range of 01 to 99. For example, A01.
	B —Chassis number	Numbered in bottom-up order with two digits, for example, 01.
	C —Slot number	Numbered in top-down and left-right order with two digits, for example, 01.

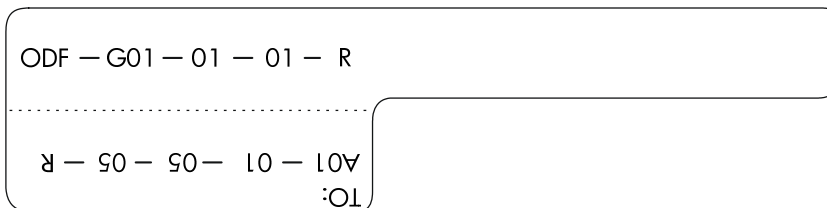
Content	Meaning	Example
	D —Fiber port number	Numbered in top-down and left-right order with two digits, for example, 05.
	R —Optical receiving interface	N/A
	T —Optical transmitting interface	N/A
	MN —Row number and column number of ODF	<ul style="list-style-type: none"> M—Row number of the rack in the equipment room, in the range of A to Z. N—Column number of the rack in the equipment room, in the range of 01 to 99. For example, G01 is the ODF of Row G and Column 01.
ODF-MN-B-C-R/T	B —Row number of the terminal device	In the range of 01 to 99, for example, 01-01.
	C —Column number of the terminal device	
	R —Optical receiving interface	N/A
	T —Optical transmitting interface	

Figure 89 Example of a label on an optical fiber between two devices



- **A01-01-05-05-R**—The local end of the optical fiber is connected to Optical Receiving Interface 05 on Slot 5, Chassis 01 in the rack on Row A, Column 01 in the equipment room.
- **G01-01-01-01-T**—The peer end of the optical fiber is connected to Optical Transmitting Interface 01 on Slot 01, Chassis 01 in the rack on Row G, Column 01 in the equipment room

Figure 90 Example of a label on an optical fiber between the device and the ODF



- **ODF-G01-01-01-R**—The local end of the optical fiber is connected to the optical receiving terminal on Row 01, Column 01 of the ODF in Row G Column 01 in the equipment room.
- **A01-01-05-05-R**—The peer end of the optical fiber is connected to Optical Receiving Interface 5 on Slot 05, Chassis 01 in the cabinet on Row A, Column 01 in the equipment room.

Engineering labels for DC power cords

These labels are affixed to DC cords that provide power for racks, and the protection grounding cables including the –48V, PGND, and BGND cables. The labels for DC power cords are affixed to one side of the identification plates on cable ties.

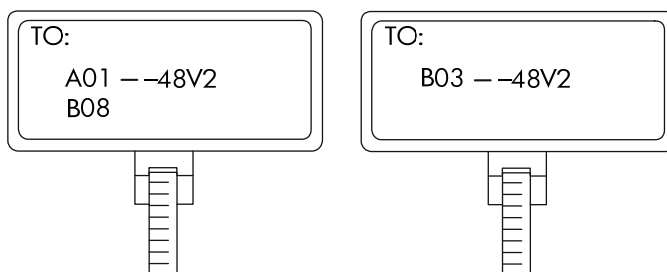
Table 63 Information on labels affixed to DC power cords

Content	Meaning
MN(BC)–48Vn	<ul style="list-style-type: none"> • Loaded cabinet side—Only MN is used to identify the cabinet number (row number and column number in the equipment room).
MN(BC)-RTN	<ul style="list-style-type: none"> • Power cabinet side—MN identifies the row and column number of the power distribution equipment like the control cabinet and distribution box. BC identifies the row and column number of the –48V connector (if there is no row number or column number, or the connector can be identified without them, BC can be omitted). RTN and PGND have no row and column number for identification.
MN(BC)-PGND	<ul style="list-style-type: none"> • n—Power port number in down-top and left-right order, in the range of 1 to 3.

The label only carries location information about the peer equipment, control cabinet, or distribution box, while the information of the local end is not necessary. Table 63 lists the information of two –48V power supplies on the label. The information for other DC voltages (such as 24V, 60V) should be given in similar methods.

Make sure labels are affixed in the correct direction. After the cable ties are bundled onto the cable, the identification plates with the labels should face up, and the text on the labels in the same cabinet should be in the same direction, as shown in Figure 91.

Figure 91 Example of labels on a DC power cord



- **A01/B08—48V2 (loaded cabinet side)**—The power cord is –48V2 DC supply, which is from the 8th connector on the second row of –48V bus bar in the cabinet on Row A, and Column 1 in the equipment room.
- **B03—48V2 (distribution box side)**—The power cord is –48V2 DC supply, which is from the loaded cabinet on Row B, Column 03 in the equipment room.

In the power distribution box (or the first power cabinet of a row in the transmission equipment room), every terminal block on the –48V connector bar has a numeric identification. For example, in the above label of "A01/B08–48V2", "08" (or sometimes "8") is the numeric identification of the terminal block.

PGND and RTN are two copper bars, on which the terminal blocks are short-circuited, so which terminal is connected makes no difference. You only need to give the row and column numbers of the power distribution box, instead of giving the specific serial number of the terminal block on the copper bar. For

example, if the label on the loaded cabinet side is "A01-RTN", it means that the power cord is an RTN that connects RTN copper bar in the power distribution box on Row A, Column 01 in the equipment room. Information on the labels for PGND cables should be given in the similar way.

Engineering labels for AC power cords

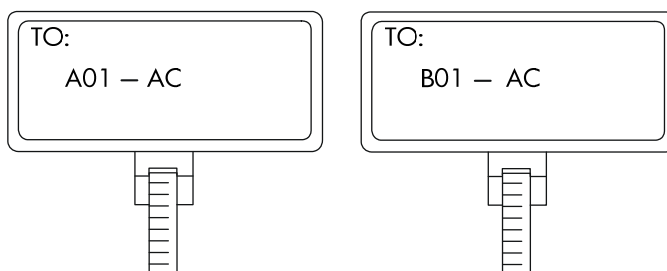
These labels are affixed to the AC cords that provide power for cabinets and protection grounding cables, including POWER, RTN, and PGND cables. The 220 VAC cables and related PGND and RTN cables are covered with insulating sheath, so the labels only need to contain "AC" and the cabinet number. The labels for AC power cords are affixed to one side of the identification plates on cable ties.

Table 64 Information on labels affixed to AC power cords

Content	Meaning
MN-AC	MN: Rack number (row number and column number in the equipment room) or the location of the socket where the power is led in. The location of the socket is marked according to onsite situation. If the sockets can be identified by row number and column number, they can be numbered following the same rule for the rack number. Otherwise, specify the detailed locations to avoid confusing with other sockets.

The label only carries location information about the peer equipment and the power socket, while information of the local end is not necessary. Make sure labels are affixed in the correct direction. That is, after the cable ties are bundled onto the cable, the identification plates with the labels should face up, and the text on the labels in the same cabinet must be in the same direction, as shown in [Figure 92](#):

Figure 92 Example of labels on an AC power cord



- **A01-AC (loaded cabinet side)**—The power cord is connected to the socket of Row A and Column 01 in the equipment room.
- **B01-AC (power socket side)**—The power cord is connected to the loaded cabinet of Row B, Column 01 in the equipment room.

Engineering labels for devices

These labels can be affixed to any device.

You can fill in the device name, model, IP address, serial number, installation address, and installation date on a device label.

Figure 93 Example of a device label



Name: [blurred]	Model: [blurred]
IP Address: [blurred]	Serial Number: [blurred]
Installation Address: [blurred]	Installation Date: [blurred]

Appendix F Cable management

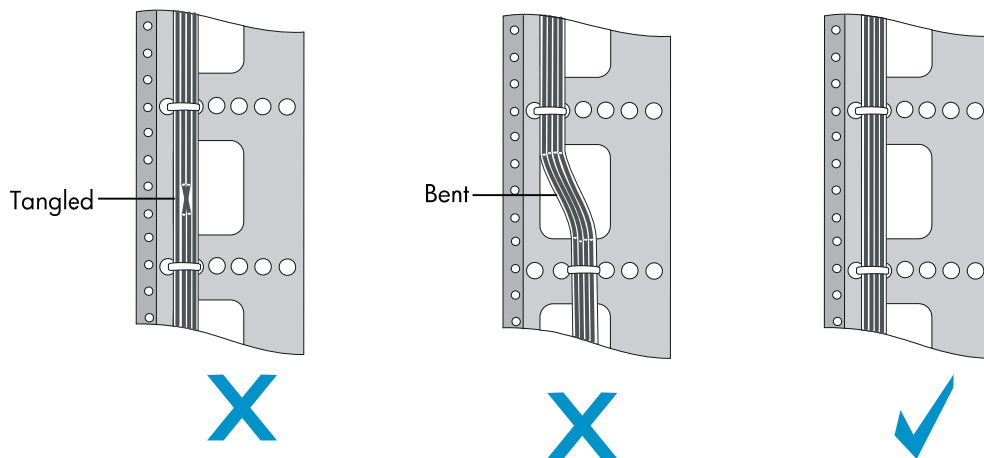
Label cables before you route or bundle them. For more information about labeling cables, see "Appendix E Engineering labels for cables."

Cable management guidelines

When you route and bundle up cables, follow these guidelines:

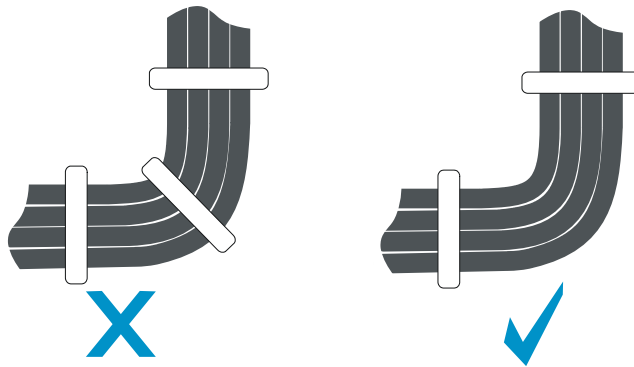
- Bind cables neatly for easy maintenance and expansion.
- The cable management brackets and cable routing slots, inside or outside the rack, are smooth and have no sharp edges or tips.
- Route different types of cables (for example, power cords and signal cables) separately. If they are close to one another, cross them over one another. If you route them in parallel, make sure the space between a power cord bundle and a signal cable bundle is at least 30 mm (1.18 in).
- Use the correct ties to bind the cables. Do not bind cables with joined ties.
- The distances between cable ties must be three to four times the cable diameter.
- Bind and route the cables neatly inside the rack, and make sure the cables are not kinked or bent. Do not tie cables or bundles in a knot.

Figure 94 Correct and incorrect cable binding



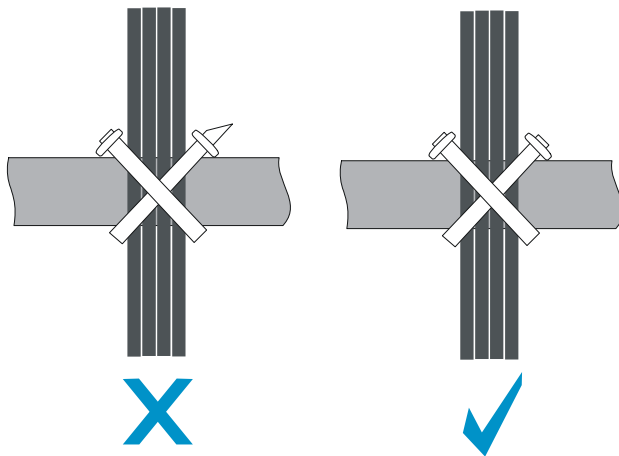
- When you bend cables, bind cables as shown in [Figure 95](#). To avoid cable core break due to excessive stress, do not tie up the cables in the bending area. The cable bend radius at connectors must be at least 5 times the cable diameter, and must be at least twice the cable diameter away from the connectors.

Figure 95 Binding the cables



- When you route cables through sharp sheet metal penetration points or along sharp edges of mechanical parts, use bushings or take any other action to protect the cables from being cut or abraded. The sheet metal penetration points must be smooth and fully rounded.
- When optical fibers are inserted into a protective tube, wrap tapes around the edges of the protective tube to protect optical fibers from being cut.
- After binding the cables, cut the excess from the ties, leaving no sharp or angular tips. See [Figure 96](#).

Figure 96 Cutting the cable ties



- Route, bind, and attach excess cables for easy, safe maintenance activities and proper operations.
- Do not tie the power cords to the slide rails.
- When you connect a cable to an articulated part, for example, when you connect a grounding cable to a rack door, leave enough slack in cables and make sure they are not stressed from any movement of the part.
- Cables must be protected at points where they might rub or come in contact with sharp edges or heated areas. Use high temperature cables near heat sources.
- Fasten heavy or rigid power cords at the connectors to relief stress.

Cable management examples

The devices in the following figures are for illustration only.

Figure 97 Network cable management

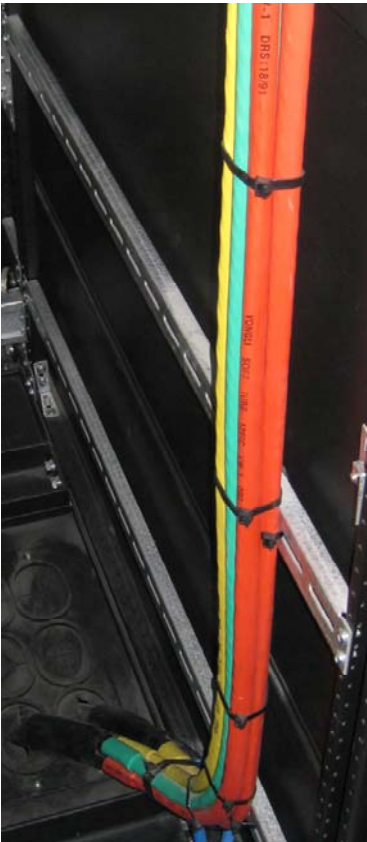


Figure 98 Optical fiber management



Use strapping tapes to carefully bind optical fibers. Avoid excessive force. For more information, see the instructions shipped with the strapping tapes.

Figure 99 Power cord management



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