

HP 1950 Switch Series

Getting Started Guide

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Preparing for installation

The HP 1950 Switch Series includes the models listed in [Table 1](#).

Table 1 HP 1950 Switch Series models

Product code	HP description	Alias
JG960A	HP 1950-24G-2SFP+-2XGT Switch	HP 1950-24G-2SFP+-2XGT
JG961A	HP 1950-48G-2SFP+-2XGT Switch	HP 1950-48G-2SFP+-2XGT
JG962A	HP 1950-24G-2SFP+-2XGT-PoE+(370W) Switch	HP 1950-24G-2SFP+-2XGT-PoE+(370W)
JG963A	HP 1950-48G-2SFP+-2XGT-PoE+(370W) Switch	HP 1950-48G-2SFP+-2XGT-PoE+(370W)

Safety recommendations

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

- Before cleaning the switch, remove all power cords from the switch. Do not clean the switch with a wet cloth or liquid.
- Do not place the switch near water or in a damp environment. Prevent water or moisture from entering the switch chassis.
- Do not place the switch on an unstable case or desk.
- Ensure good ventilation at the installation site and keep the air inlet and outlet vents of the switch free of obstruction.
- Connect the yellow-green protection grounding cable before the switch is powered on.
- Make sure the power source voltage is as required.
- To avoid electrical shocks, do not open the chassis while the switch is operating or immediately after the switch is powered off.
- To avoid ESD damage, wear an ESD wrist strap when hot-swapping a power supply.

Examining the installation site

The HP 1950 switches must be used indoors. You can mount your switch in a rack or on a workbench, but make sure the following conditions exist:

- Adequate clearance is reserved at the air inlet and exhaust vents for ventilation.
- The rack or workbench has a good ventilation system.
- The rack is sturdy enough to support the switch and its accessories.
- The rack or workbench is reliably grounded.

To ensure correct operation and a long service life of your switch, install it in an environment that meets the requirements described in the following subsections.

Temperature/humidity

Maintain temperature and humidity in the equipment room as described in "[Technical specifications](#)."

- 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 introduce problems such as loose captive screws or circuit failure.
- High temperature can accelerate the aging of insulation materials and significantly lower the reliability and lifespan of the switch.

For the temperature and humidity requirements of different switch models, see "[Appendix A Chassis views and technical specifications](#)."

Cleanliness

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 2 Dust concentration limit in the equipment room

Substance	Concentration limit (particles/m ³)
Dust	$\leq 3 \times 10^4$ (no visible dust on the tabletop over three days)

NOTE:
Dust diameter $\geq 5 \mu\text{m}$

The equipment room must also meet limits on salts, acids, and sulfides to eliminate corrosion and premature aging of components, as shown in [Table 3](#).

Table 3 Harmful gas limits in the equipment room

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

EMI

All electromagnetic interference (EMI) sources from outside or inside of the switch and application system adversely affect the switch in the following ways:

- A conduction pattern of capacitance coupling.
- Inductance coupling.
- Electromagnetic wave radiation.
- Common impedance (including the grounding system) coupling.

To prevent EMI, use the following guidelines:

- If AC power is used, use a single-phase three-wire power receptacle with protective earth (PE) to filter interference from the power grid.
- Keep the switch far away from radio transmitting stations, radar stations, and high-frequency devices to make sure the EMI levels do not exceed the compliant range.
- Use electromagnetic shielding when necessary. For example, use shielded interface cables.

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.

The HP 1950 switches are Class 1 laser devices.

Installation tools

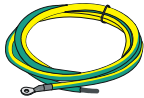
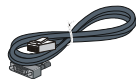
The following installation tools are user supplied:

- Flat-blade screwdriver
- Phillips screwdriver
- ESD wrist strap

Installation accessories

Table 4 Installation accessories

Product code	Description	Quantity	Applicable models
5066-0850	1 U four-hole mounting bracket kit (including one pair of mounting brackets and eight M4 countersunk screws) (provided) 	1 kit	• HP 1950-48G-2SFP+2XGT • HP 1950-24G-2SFP+2XGT-PoE+(370W) • HP 1950-48G-2SFP+2XGT-PoE+(370W)
5184-6978	1 U two-hole mounting bracket kit (including one pair of mounting brackets and four M4 countersunk screws) (provided) 	1 kit	HP 1950-24G-2SFP+2XGT
N/A	M6 screw and floating nut (user supplied) 	N/A	All HP 1950 switches

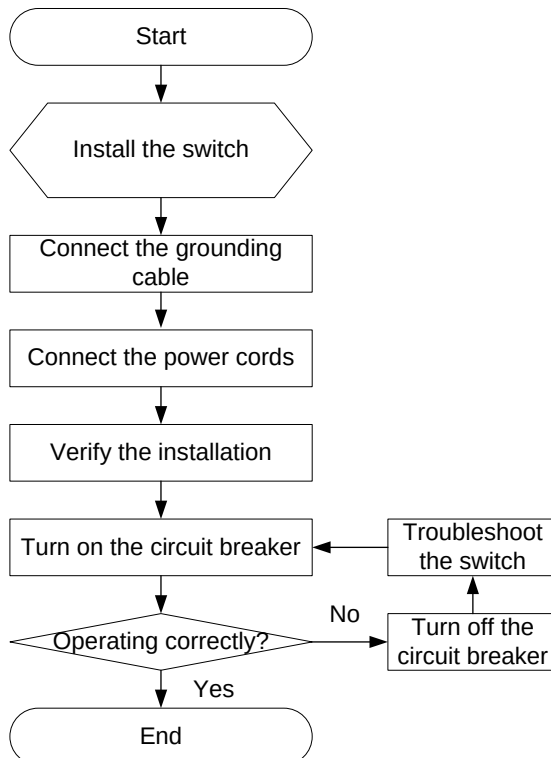
Product code	Description	Quantity	Applicable models
5185-9292	Grounding cable (provided) 	1	• HP 1950-24G-2SFP+-2XGT • HP 1950-48G-2SFP+-2XGT
5184-6729	Grounding cable (provided) 	1	• HP 1950-24G-2SFP+-2XGT-PoE+(370W) • HP 1950-48G-2SFP+-2XGT-PoE+(370W)
5184-6719	Console cable (provided) 	1	All HP 1950 switches
5184-7298	Rubber feet (provided) 	4	All HP 1950 switches

Installing the switch

⚠ CAUTION:

Keep the tamperproof seal on a mounting screw on the chassis cover intact. If you want to open the chassis, contact HP for permission. Otherwise, HP shall not be liable for any consequences.

Figure 1 Hardware installation flow



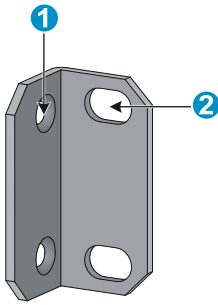
Installing the switch in a 19-inch rack

Mounting brackets

Table 5 Mounting brackets

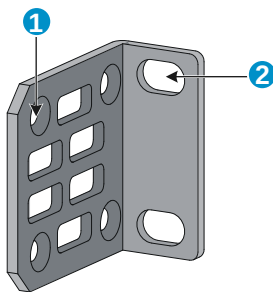
Switch model	Mounting brackets	Views
HP 1950-24G-2SFP+2XGT	One pair of 1U two-hole mounting brackets	See Figure 2 .
- HP 1950-48G-2SFP+2XGT - HP 1950-24G-2SFP+2XGT-PoE+(370W) - HP 1950-48G-2SFP+2XGT-PoE+(370W)	One pair of 1U four-hole mounting brackets	See Figure 3 .

Figure 2 1U two-hole mounting bracket



(1) Screw hole for attaching the bracket to the switch (2) Screw hole for attaching the bracket to the rack post

Figure 3 1U four-hole mounting bracket



(1) Screw hole for attaching the bracket to the switch (2) Screw hole for attaching the bracket to the rack post

Attaching the mounting brackets to the switch

The HP 1950-24G-2SFP+2XGT and HP 1950-48G-2SFP+2XGT switches provide one front mounting position (near the network ports) and one rear mounting position (near the power supplies).

The HP 1950-24G-2SFP+2XGT-PoE+(370W) and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches provide one front mounting position (near the network ports), one mid-mounting position, and one rear mounting position (near the power supplies).

To attach the mounting brackets to the switch:

1. Determine the mounting position.
2. Align one mounting bracket with the screw holes at the mounting position. Use M4 screws provided with the switch to attach the mounting bracket to the chassis.
3. Repeat step 2 to attach the other mounting bracket to the chassis.

Figure 4 Attaching a two-hole mounting bracket to the front mounting position on an HP 1950-24G-2SFP+2XGT switch

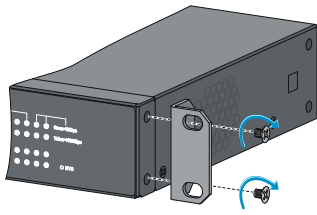


Figure 5 Attaching a two-hole mounting bracket to the rear mounting position on an HP 1950-24G-2SFP+2XGT switch

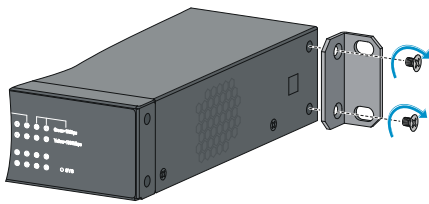


Figure 6 Attaching a four-hole mounting bracket to the front mounting position on an HP 1950-24G-2SFP+2XGT-PoE+(370W)_switch

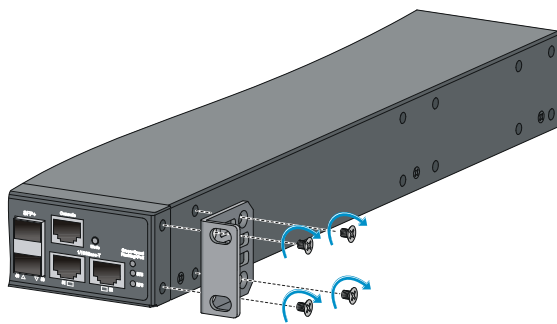


Figure 7 Attaching a four-hole mounting bracket to the rear mounting position on an HP 1950-24G-2SFP+2XGT-PoE+(370W)_switch

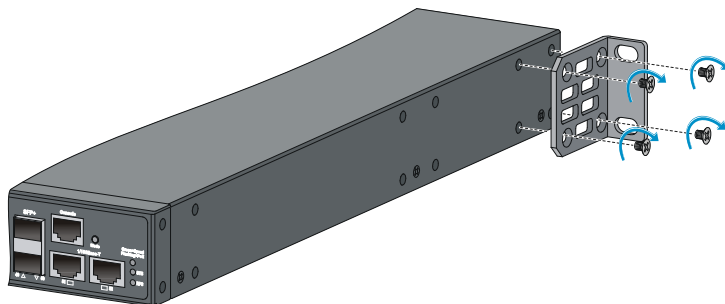
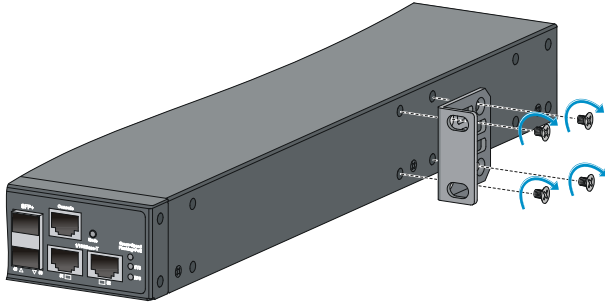


Figure 8 Attaching a four-hole mounting bracket to the mid-mounting position on an HP 1950-24G-2SFP+-2XGT-PoE+(370W) switch



Rack-mounting the switch

This task requires two people. To mount the switch in the rack:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Verify that the mounting brackets have been securely attached to the switch chassis.
3. Install cage nuts in the mounting holes in the rack posts.
4. One person holds the switch chassis and aligns the mounting brackets with the mounting holes in the rack posts, and the other person attaches the mounting brackets with screws to the rack.
5. Verify that the switch chassis is horizontal and secure.

Figure 9 Mounting an HP 1950-24G-2SFP+-2XGT-PoE+(370W) switch by the front mounting position

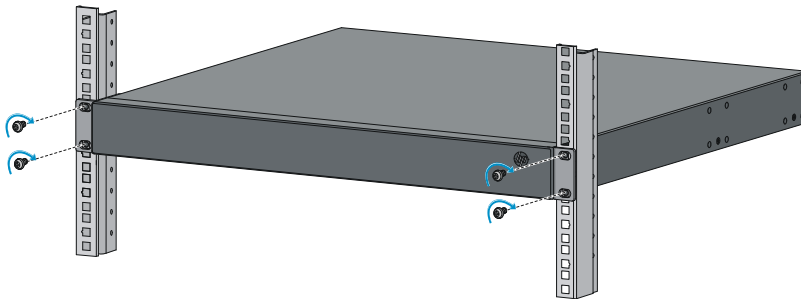


Figure 10 Mounting an HP 1950-24G-2SFP+-2XGT-PoE+(370W) switch by the rear mounting position

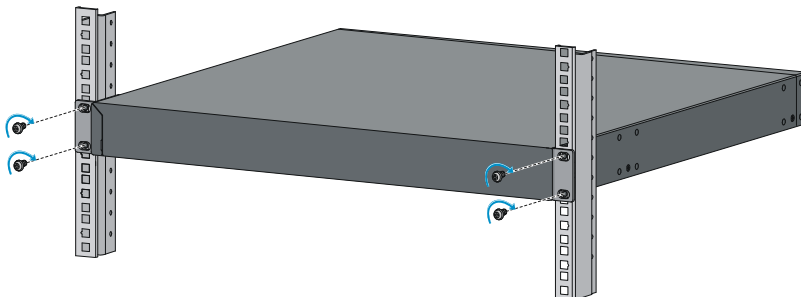
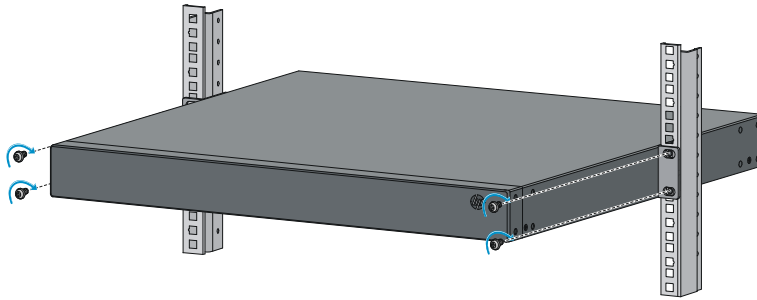


Figure 11 Mounting an HP 1950-24G-2SFP+-2XGT-PoE+(370W) switch by the mid-mounting position



Mounting the switch on a workbench

⚠ IMPORTANT:

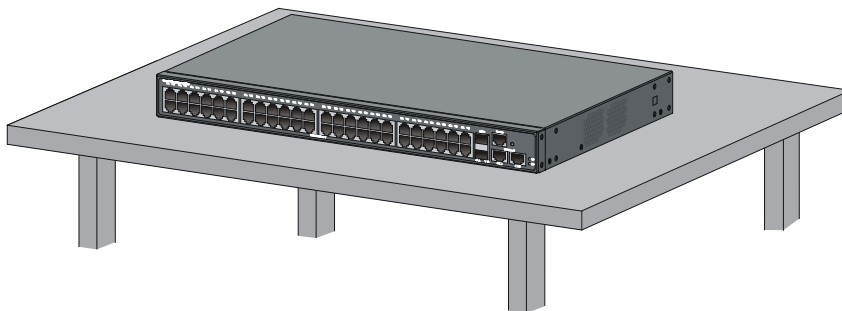
- Ensure 10 cm (3.9 in) of clearance around the chassis for heat dissipation.
- Do not place heavy objects on the switch.

If a standard 19-inch rack is not available, you can place the switch on a workbench.

To mount the switch on a workbench:

1. Verify that the workbench is sturdy and reliably grounded.
2. Place the switch bottom up, and clean the round holes in the chassis bottom with a dry cloth.
3. Attach the rubber feet to the four round holes in the chassis bottom.
4. Place the switch upside up on the workbench.

Figure 12 Mounting the switch on a workbench



Grounding the switch

⚠ WARNING!

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

The power input end of the switch has a noise filter, whose central ground is directly connected to the chassis to form the chassis ground (commonly known as PGND). You must securely connect this chassis ground to the earth to minimize the potential for system damage, maximize safety at the site, and minimize EMI susceptibility of the system.

You can ground the switch in one of the following ways, depending on the grounding conditions available at the installation site:

- Grounding the switch with a grounding strip
- Grounding the switch with a grounding conductor buried in the earth ground

NOTE:

The power and grounding terminals in this section are for illustration only.

Grounding the switch with a grounding strip

⚠ WARNING!

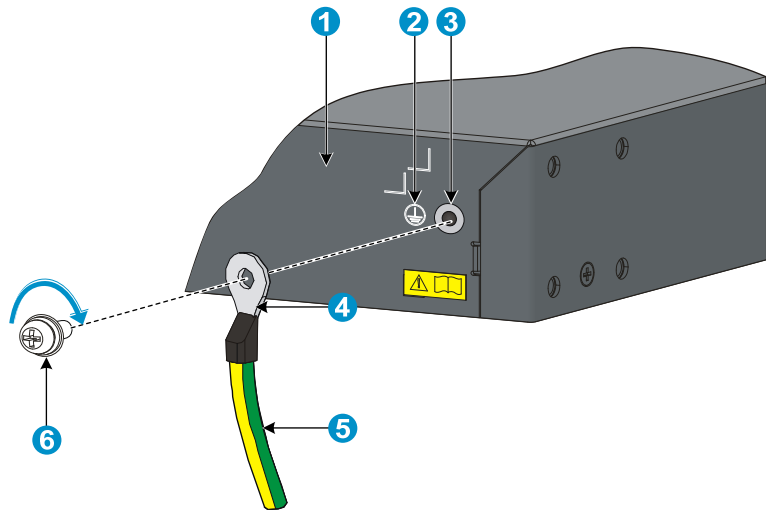
Connect the grounding cable to the grounding system in the equipment room. Do not connect it to a fire main or lightning rod.

If a grounding strip is available at the installation site, use the grounding strip to ground the switch.

To ground the switch by using a grounding strip:

1. Connect one end of the grounding cable to the grounding screw on the switch.
 - a. Remove the grounding screw from the rear panel of the switch chassis.
 - b. Attach the grounding screw to the ring terminal of the grounding cable.
 - c. Use a screwdriver to fasten the grounding screw into the grounding screw hole.

Figure 13 Connecting the grounding cable to the grounding hole of the switch

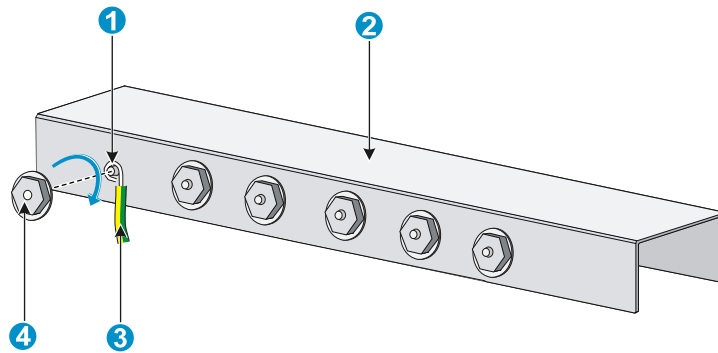


(1) Chassis rear panel	(2) Grounding sign
(3) Grounding hole	(4) Ring terminal
(5) Grounding cable	(6) Grounding screw

2. Connect the other end of the grounding cable to the grounding strip.
 - a. Cut the grounding cable to a length according to the distance between the switch and the grounding strip.
 - b. Peel 20 mm (0.79 in) of insulation sheath by using a wire stripper.
 - c. Use the needle-nose pliers to bend the bare wire.

- d. Hook the grounding cable to the post on the grounding strip, and use the hex nut to secure the cable to the post.

Figure 14 Connecting the grounding cable to a grounding strip



(1) Grounding post

(2) Grounding strip

(3) Grounding cable

(4) Hex nut

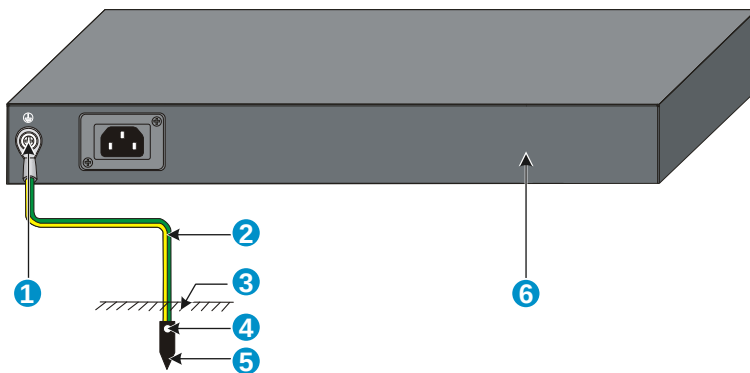
Grounding the switch with a grounding conductor buried in the earth ground

If the installation site has no grounding strips, but earth ground is available, hammer a 0.5 m (1.64 ft) or longer angle iron or steel tube into the earth ground to serve as a grounding conductor.

The dimensions of the angle iron must be at least 50 × 50 × 5 mm (1.97 × 1.97 × 0.20 in). The steel tube must be zinc-coated and its wall thickness must be at least 3.5 mm (0.14 in).

Weld the yellow-green grounding cable to the angle iron or steel tube and use cathodic protection to protect the joint from corrosion.

Figure 15 Grounding the switch by burying the grounding conductor into the earth ground



(1) Grounding screw

(2) Grounding cable

(3) Earth

(4) Joint

(5) Grounding conductor

(6) Chassis rear panel

Connecting the power cord

⚠ CAUTION:

- Provide a circuit breaker for each power cord.
- Before connecting the power cord, make sure the circuit breaker on the power cord is turned off.

Table 6 Power cord connection procedures at a glance

Switch model	Available power source	Connection procedure reference
• HP 1950-24G-2SFP+2XGT • HP 1950-48G-2SFP+2XGT	AC power source	Connecting the switch to an AC power source
• HP 1950-24G-2SFP+2XGT-PoE+(370W) • HP 1950-48G-2SFP+2XGT-PoE+(370W)	AC power source	Connecting the switch to an AC power source
	HP A-RPS1600	Connecting the switch to an RPS

For RPS power input, HP recommends that you use HP RPS and cables.

Connecting the switch to an AC power source

Securing the AC power cord for a built-in power supply

1. Insert the cable tie through the cable bridge.
2. Use the cable tie to secure the AC power cord to the cable bridge.

Figure 16 Inserting the cable tie through the cable bridge

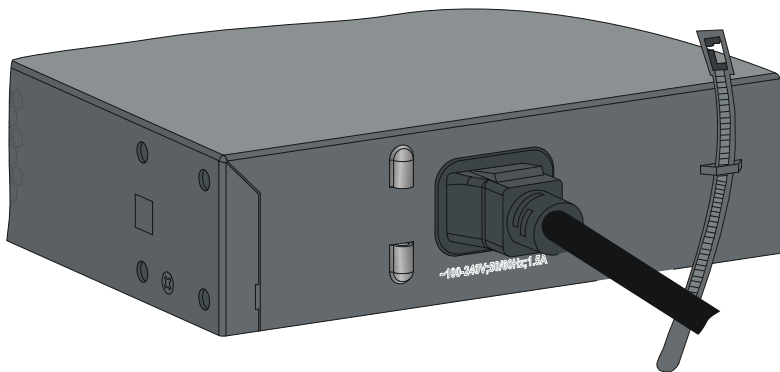
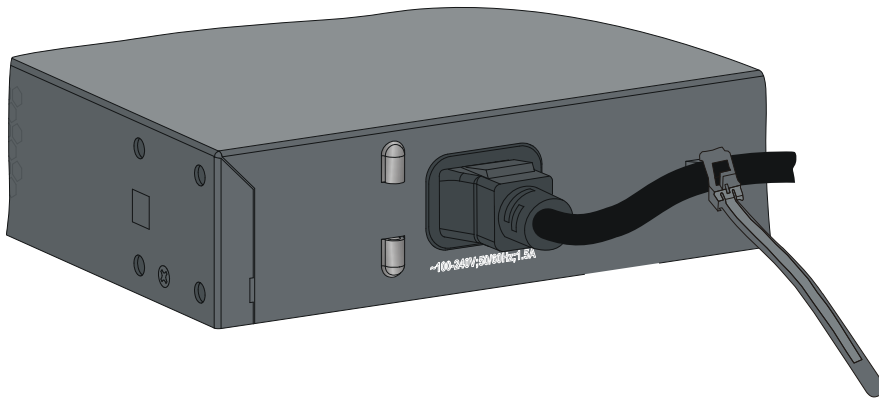


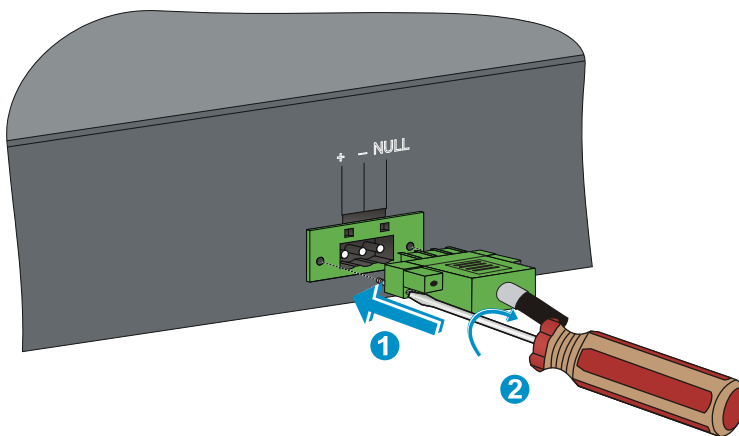
Figure 17 Using the cable tie to secure the AC power cord



Connecting the switch to an RPS

1. Orient the plug with the power receptacle on the power supply, and insert the plug into the receptacle (See callout 1 in [Figure 18](#)).
If you cannot insert the plug into the receptacle, re-orient the plug rather than use excessive force to push it in.
2. Tighten the screws on the plug with a flat-blade screwdriver to secure the plug in the RPS receptacle. See callout 2 in [Figure 18](#).
3. Connect the other end of the power cord to the RPS.

Figure 18 Connecting an RPS cord to an HP 1950-24G-2SFP+-2XGT-PoE+(370W) switch



Verifying the installation

After you complete the installation, verify the following items:

- There is enough space for heat dissipation around the switch.
- The rack or workbench is stable.
- The grounding cable is securely connected.

- The correct power source is used.
- The power cords are correctly connected.
- All the interface cables are cabled indoors. If any cable is routed outdoors, verify that the socket strip with lightning protection and lightning arresters for network ports have been correctly connected.

Accessing the switch for the first time

You can use one of the following default methods to access the switch:

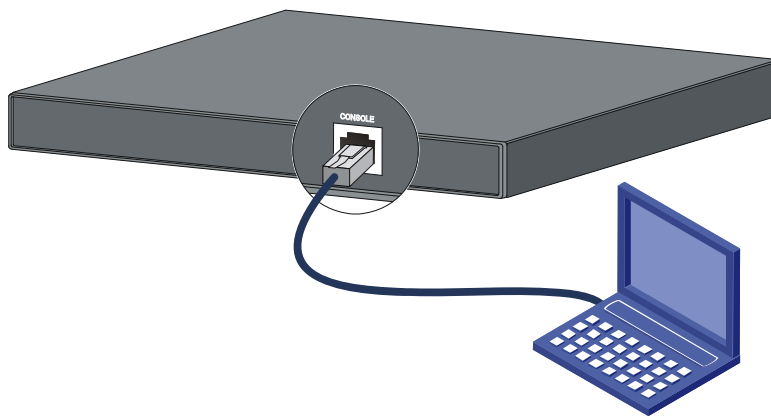
- Logging in to the CLI
- Logging in to the Web interface

Logging in to the CLI

Setting up the configuration environment

The first time you access the switch you must use a console cable to connect a configuration terminal, for example, a PC, to the console port on the switch, as shown in Figure 19.

Figure 19 Connecting the console port to a terminal



Connecting the console cable

A console cable is an 8-core shielded cable. It has a crimped RJ-45 connector at one end for connecting to the console port of the switch, and a DB-9 female connector at the other end for connecting to the serial port on the configuration terminal.

Figure 20 Console cable

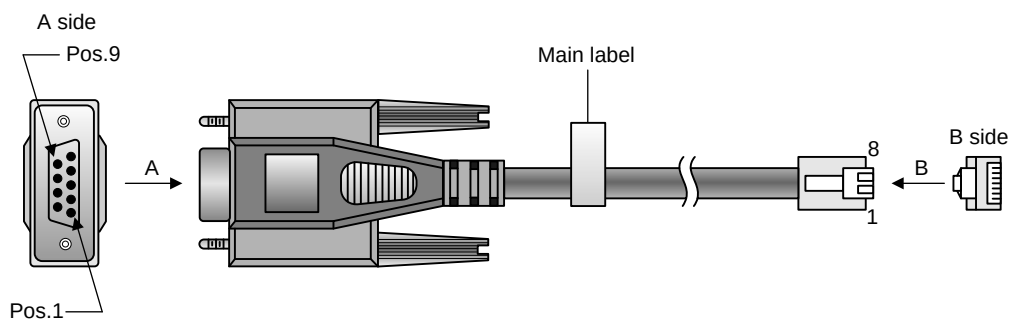


Table 7 Console cable pinouts

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

To connect a terminal (for example, a PC) to the switch:

1. Connect the DB-9 female connector of the console cable to the serial port of the PC.
2. Identify the mark on the console port. Make sure you are connecting to the correct port.
3. Connect the RJ-45 connector to the console port of the switch.

NOTE:

The serial ports on PCs do not support hot swapping. To connect a PC to an operating switch, first connect the PC end. To disconnect a PC from an operating switch, first disconnect the switch end.

Setting terminal parameters

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

The following are the required terminal settings:

- **Bits per second**—38400.
- **Data bits**—8.
- **Stop bits**—1.
- **Parity**—None.
- **Flow control**—None.

Powering on the switch

Before powering on the switch, verify that the following requirements are met:

- The power cord is correctly connected.
- The input power voltage meets the requirement of the switch.
- The console cable is correctly connected.
- The configuration terminal (a PC, for example) has started, and its serial port settings are consistent with the console port settings on the switch.

Power on the switch. During the startup process, you can access Boot ROM menus to perform tasks such as software upgrade and file management. The Boot ROM interface and menu options differ with software versions. For more information about Boot ROM menu options, see the release notes for the specific software version.

After the startup completes, you can access the CLI to configure the switch.

For more information about the configuration commands and CLI, see *HP 1950 Switch Series User Guide*.

Logging in to the Web interface

Log in to the Web interface through HTTP or HTTPS.

Setting up the configuration environment

Before you log in to the Web interface, use a twisted pair cable to connect the switch to the network, or to the NIC of a PC.

Restrictions and guidelines

To ensure a successful login, verify that your operating system and Web browser meet the requirements, and follow the guidelines in this section.

Web browser requirements

The following Web browsers are supported:

- Internet Explorer 8 or higher.
- Google Chrome 10 or higher.
- Mozilla Firefox 4 or higher.
- Opera 11.11 or higher.
- Safari 5.1 or higher.

To access the Web interface, you must use the following browser settings:

- Accept the first-party cookies (cookies from the site you are accessing).
- To ensure correct display of webpage contents after software upgrade or downgrade, clear data cached by the browser before you log in.
- Enable active scripting or JavaScript, depending on your Web browser.
- If you are using a Microsoft Internet Explorer browser, you must enable the following security settings:
 - Run ActiveX controls and plug-ins.
 - Script ActiveX controls marked safe for scripting.

Default login settings

Use the settings in [Table 8](#) for the first login.

Table 8 Default login settings

Item	Setting
Device IP (VLAN-interface 1)	See "Logging in to the Web interface for the first time."
IP address mask	
Username	admin
Password	None
User role	network-admin

NOTE:

If the network has a DHCP server, you must use the DHCP assigned IP address to access the device. For more information, see "Logging in to the Web interface for the first time."

Concurrent login users

The Web interface allows a maximum of 32 concurrent users. If this limit is reached, login attempts will fail.

Logging in to the Web interface for the first time

! IMPORTANT:

For security purposes, HP recommends that you change the login information and assign access permissions immediately after the first successful login.

By default, HTTP and HTTPS are enabled.

To log in to the Web interface:

1. Use an Ethernet cable to connect the configuration terminal to an Ethernet port on the device.
2. Identify the IP address and mask of the device.
 - o If the device is not connected to the network, or no DHCP server exists on the network, the device uses the default IP address and mask. The default mask is 255.255.0.0. The default IP address is 169.254.xxx.xxx, where xxx.xxx depends on the rightmost two bytes of the MAC address. Find the MAC address label on the device and use the following rules to determine the rightmost two bytes for the IP address:

Rightmost two bytes of the MAC address	Rightmost two bytes for the IP address
All 0s	0.1
All Fs	255.1
Not all 0s or all Fs	Decimal values of the rightmost two bytes of the MAC address

For example:

MAC address	IP address
08004E080000	169.254.0.1
08004E08FFFF	169.254.255.1
08004E082A3F	169.254.42.63 (The decimal value of 2A is 42. The value of 3F is 63.)

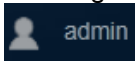
- If a DHCP server is available, the device obtains an IP address from the server. To identify the address, log in to the device through the console port, and then execute the **summary** command. The following is the sample output:

```
<Sysname> summary
Select menu option:          Summary
IP Method:                   DHCP
IP address:                   10.153.96.86
Subnet mask:                  255.255.255.0
Default gateway:              0.0.0.0
```

For more information about console login, see the getting started guide for the device.

3. Assign the login host an IP address in the same subnet as the device.
4. Open the browser and enter login information.
 - a. In the address bar, enter the IP address of the device.
 - **HTTP access**—Enter the address in the **http://ip-address:port** or **ip-address:port** format.
 - **HTTPS access**—Enter the address in the **https://ip-address:port** format.

The *ip-address* argument represents the IP address of the device. The *port* argument represents the HTTP or HTTPS service port. The default port number is 80 for HTTP and 443 for HTTPS. You do not need to enter the port number if you have not changed the service port setting.
 - b. On the login page, enter the default username (**admin**) and the verification code.

You do not need to enter a password at the first login.
 - c. Click **Login**.
5. Change the login information.
 - To change the password of the login user (**admin** at the first login), click the **Admin** icon .
 - To add new user accounts and assign access permissions to different users, select **Device** > **Maintenance** > **Administrators**.

For more information about how to configure the device by using the Web interface, see *HP 1950 Switch Series User Guide*.

Setting up an HP 1950 stack

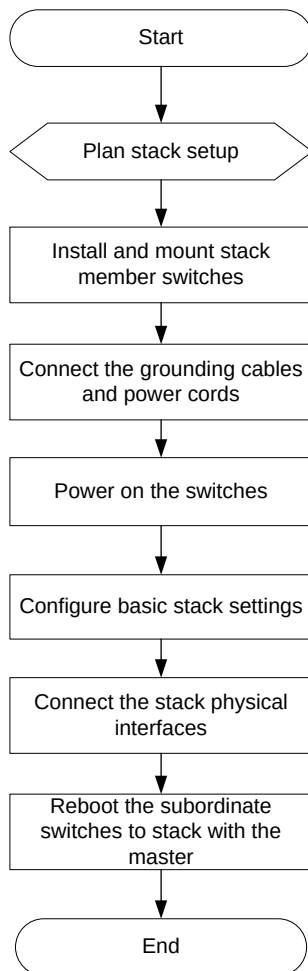
You can use HP IRF technology to connect and virtualize HP 1950 switches into a large virtual stack for flattened network topology, and high availability, scalability, and manageability.

NOTE:

Stacking and stack are called IRF on the webpages and in online help.

Setup flow

Figure 21 Stack setup flow



To set up an HP 1950 stack:

Step	Description
1. Plan the stack setup.	Plan the installation site and stack setup parameters: • Planning stack size and the installation site • Identifying the master switch and planning stack member IDs • Planning stack topology and connections • Identifying stack physical interfaces on the member switches • Planning the cabling scheme
2. Install stack member switches.	See "Installing the switch in a 19-inch rack" or "Mounting the switch on a workbench."
3. Connect grounding cables and power cords.	See "Grounding the switch" and "Connecting the power cord."
4. Power on the switches.	N/A
5. Configure basic stack settings.	See <i>HP 1950 Switch Series User Guide</i> .
6. Connect the physical stack ports.	Connect stack physical interfaces on the switches. • Use SFP+ transceiver modules and fibers to connect 10-Gigabit SFP+ ports over a long distance. • Use SFP+ DAC cables to connect 10-Gigabit SFP+ ports over a short distance. All subordinate switches automatically reboot to stack with the master.

Planning the stack setup

This section provides information for planning the stack setup.

Planning stack size and the installation site

Choose switch models and identify the number of required stack member switches, depending on the user density and upstream bandwidth requirements. The switching capacity of a stack equals the total switching capacities of all member switches.

An HP 1950 stack can have a maximum of nine switches.

Plan the installation site depending on your network solution, as follows:

- Place all stack member switches in one rack for centralized high-density access.
- Distribute the stack member switches in different racks to implement the ToR access solution for a data center.

Identifying the master switch and planning stack member IDs

1. Determine which switch you want to use as the master for managing all member switches in the stack. A stack has only one master switch. You configure and manage all member switches in the stack from the CLI of the master switch. Stack member switches automatically elect a master. You can affect the election result by assigning a high member priority to the intended master switch. For more information about master election, see *HP 1950 Switch Series User Guide*.

2. Prepare a stack member ID assignment scheme. A stack uses member IDs to uniquely identify and manage its members, and you must assign each stack member switch a unique member ID.

Planning stack topology and connections

! IMPORTANT:

When connecting two neighboring stack member switches, you must connect the physical interfaces of IRF-port 1 on one switch to the physical interfaces of IRF-port 2 on the other switch.

You can create a stack by using daisy chain topology or you can use the more reliable ring topology. In ring topology, the failure of one stack link does not cause the stack to split as in daisy chain topology. Instead, the stack changes to a daisy chain topology without interrupting network services. HP recommends that you use ring topology to connect the switches. The following describes cabling schemes in ring topology.

You connect the stack member switches through stack IRF ports. Stack IRF ports are logical interfaces for the connections between stack member switches. Each stack member switch has an IRF-port 1 and an IRF-port 2. To use an IRF port, you must bind a minimum of one physical interface to it.

The HP 1950 switches support 10-GE stack connections through 1/10-GE Ethernet ports or SFP+ ports. You can bind multiple 1/10-GE Ethernet ports or SFP+ ports to an IRF port for increased bandwidth and availability.

Figure 22 and Figure 23 show the topologies of stacks that contain three HP 1950-24G-2SFP+2XGT switches. The stack connections in the two figures are for illustration only.

Figure 22 Stack in daisy chain topology

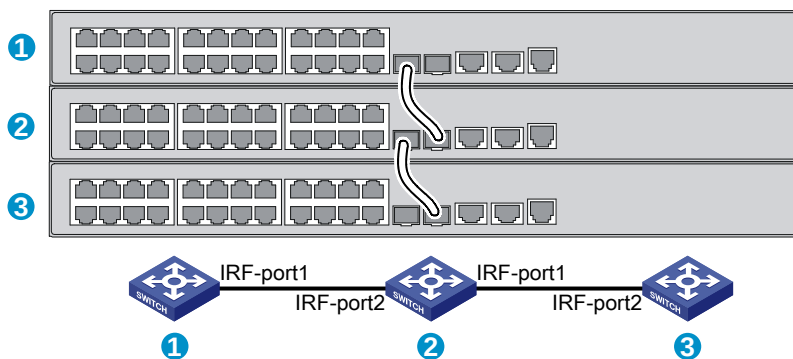
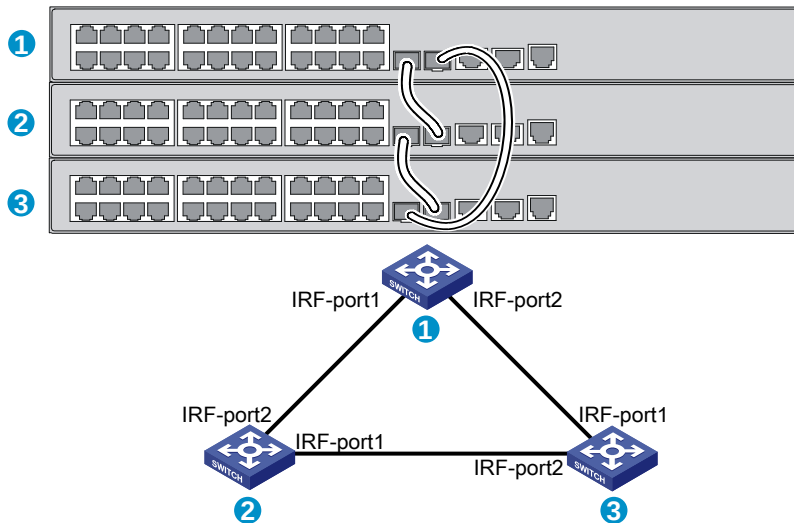


Figure 23 Stack in ring topology



Identifying stack physical interfaces on the member switches

Identify the stack physical interfaces on the member switches according to your topology and connection scheme.

Planning the cabling scheme

Use SFP+ DAC cables or SFP+ transceiver modules and fibers to connect the stack member switches.

- If the stack member switches are far away from one another, choose the SFP+ transceiver modules with optical fibers.
- If the stack member switches are all in one equipment room, choose SFP+ DAC cables.

Connecting the stack member switches in one rack

Use SFP+ DAC cables to connect the stack member switches (four switches in this example) in a rack, as shown in [Figure 24](#) and [Figure 25](#).

Figure 24 Connecting the switches in one rack (1)

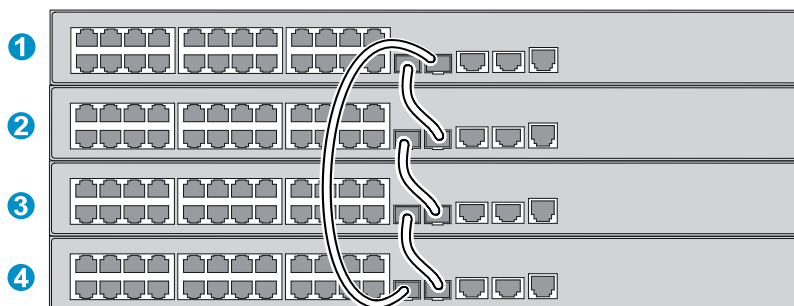


Figure 25 Connecting the switches in one rack (2)

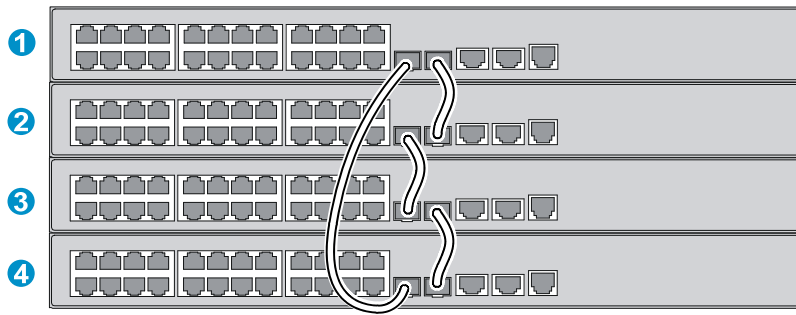
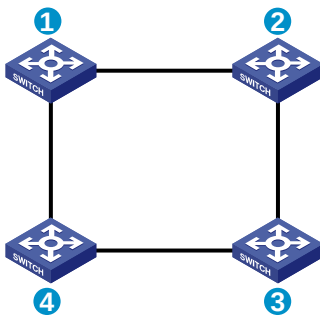


Figure 26 Stack topology

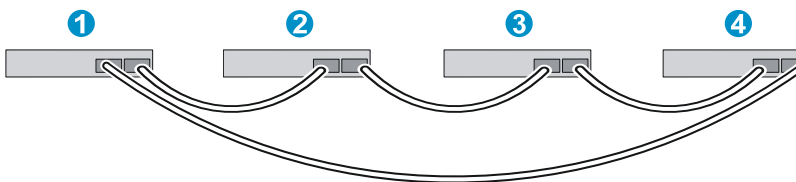


Connecting the stack member switches in a ToR solution

You can install stack member switches in different racks side by side to deploy a top of rack (ToR) solution.

Figure 27 shows an example for connecting four top of rack stack member switches by using SFP+ transceiver modules and optical fibers. The topology is the same as Figure 26.

Figure 27 ToR cabling



Configuring basic stack settings

After you install the stack member switches, power on each switch, and log in to configure their member IDs, member priorities, and stack port bindings.

When you configure basic stack settings, follow these guidelines:

- Assign the master switch the highest member priority.
- Make sure the physical interfaces bound to IRF-port 1 and IRF-port 2 are consistent with the stack connections. You can bind physical interfaces to the stack IRF ports before or after connecting stack physical interfaces.

For more information about configuring basic stack settings, see *HP 1950 Switch Series User Guide*.

Connecting the stack physical interfaces

When you connect the stack physical interfaces, follow these guidelines:

- When connecting two neighboring stack member switches, you must connect the physical interfaces of IRF-port 1 on one switch to the physical interfaces of IRF-port 2 on the other switch.
- Use SFP+ DAC cables or SFP+ transceiver modules and fibers to connect the stack member switches.
- Wear an ESD wrist strap when you connect SFP+ DAC cables or SFP+ transceiver modules and fibers. For how to connect them, see *SFP/SFP+/XFP Transceiver Modules Installation Guide*.

Maintenance and troubleshooting

Power supply failure

Built-in power supply failure

- The HP 1950-24G-2SFP+2XGT and HP 1950-48G-2SFP+2XGT switches use built-in power supplies and support only AC power input.
- The HP 1950-24G-2SFP+2XGT-PoE+(370W) and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches use built-in power supplies and support AC power input, RPS power input, and concurrent AC and RPS DC inputs.

To identify a built-in power supply failure, examine the system status LED and the RPS status LED of the switch.

Table 9 Built-in power supply LED description

LED	Mark	Status	Description
System status LED	SYS	Off	The switch is powered off.
RPS status LED	RPS	Steady green	The AC input is normal, and the RPS is in position or working normally.
		Steady yellow	RPS power input is normal, but AC input has failed or AC input is not connected.
		Off	No RPS is connected.

AC input

If the system status LED is off, an AC input failure has occurred.

To resolve the problem:

1. Verify that the AC power cord is securely connected to the switch, and the AC-input power receptacle on the switch and the connected AC power outlet are in good condition.
2. Verify that the AC power source is operating correctly.
3. Verify that the operating temperature of the switch is in the acceptable range, and the power supply has good ventilation. Over-temperature can cause the power supply to stop working and enter the protection state.
4. If the problem persists, contact HP Support.

RPS DC input

If the system status LED or RPS status LED is off, an RPS input failure has occurred.

To resolve the problem:

1. Verify that the switch is securely connected to the RPS.

2. Verify that the RPS is operating correctly.
3. Verify that the operating temperature of the switch is in the acceptable range, and the power supply has good ventilation. Over-temperature can cause the power supply to stop working and enter the protection state.
4. If the problem persists, contact HP Support.

Concurrent RPS and AC inputs

- If the system status LED is off, the AC power supply and the RPS both have an input failure.
To resolve the problem:
 - a. Verify that the AC power cord is securely connected to the switch, and the AC-input power receptacle on the switch and the connected AC power outlet are in good condition.
 - b. Verify that the AC power source is operating correctly.
 - c. Verify that the switch is securely connected to the RPS.
 - d. Verify that the RPS is operating correctly.
 - e. Verify that the operating temperature of the switch is in the acceptable range, and the power supply has good ventilation. Over-temperature can cause the power supply to stop working and enter the protection state.
 - f. If the problem persists, contact HP Support.
- If the system status LED is on but the RPS status LED is steady yellow, an AC input failure has occurred.
To resolve the problem:
 - a. Verify that the AC power cord is securely connected to the switch, and the AC-input power receptacle on the switch and the connected AC power outlet are in good condition.
 - b. Verify that the AC power source is operating correctly.
 - c. If the problem persists, contact HP Support.
- If the system status LED is on but the RPS status LED is off, an RPS input failure has occurred.
To resolve the problem:
 - a. Verify that the switch is securely connected to the RPS.
 - b. Verify that the RPS is operating correctly.
 - c. If the problem persists, contact HP Support.

Configuration terminal problems

No display on the configuration terminal

The configuration terminal has no display when the switch is powered on.

To resolve the problem:

1. Verify that the power system is operating correctly.
2. Verify that the switch is operating correctly.
3. Verify that the console cable has been connected correctly.
4. Verify that the following settings are configured for the terminal:
 - **Baud rate**—38400.

- **Data bits**—8.
 - **Parity**—None.
 - **Stop bits**—1.
 - **Flow control**—None.
5. Verify that the console cable is not faulty.
 6. If the problem persists, contact HP support.

Garbled display on the configuration terminal

The configuration terminal displays garbled text.

To resolve the problem:

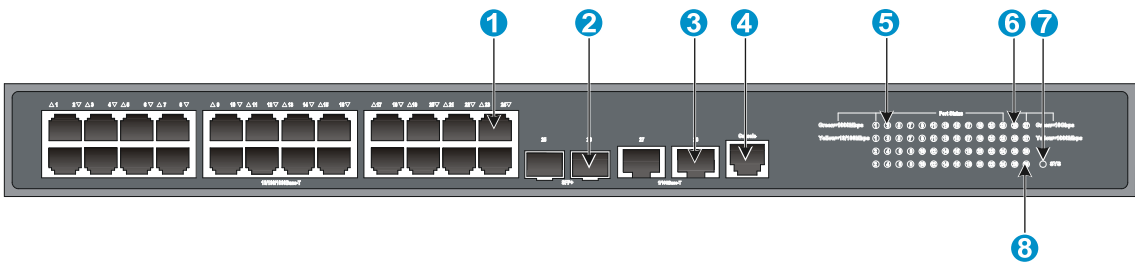
1. Verify that the following settings are configured for the terminal:
 - **Baud rate**—38400.
 - **Data bits**—8.
 - **Parity**—None.
 - **Stop bits**—1.
 - **Flow control**—None.
2. If the problem persists, contact HP Support.

Appendix A Chassis views and technical specifications

Chassis views

HP 1950-24G-2SFP+-2XGT

Figure 28 Front panel



(1) 10/100/1000Base-T auto-sensing Ethernet port	(2) SFP+ port
(3) 1/10GBase-T auto-sensing Ethernet port	(4) Console port
(5) 10/100/1000Base-T Ethernet port LED	(6) SFP+ port LED
(7) System status LED (SYS)	(8) 1/10GBase-T Ethernet port LED

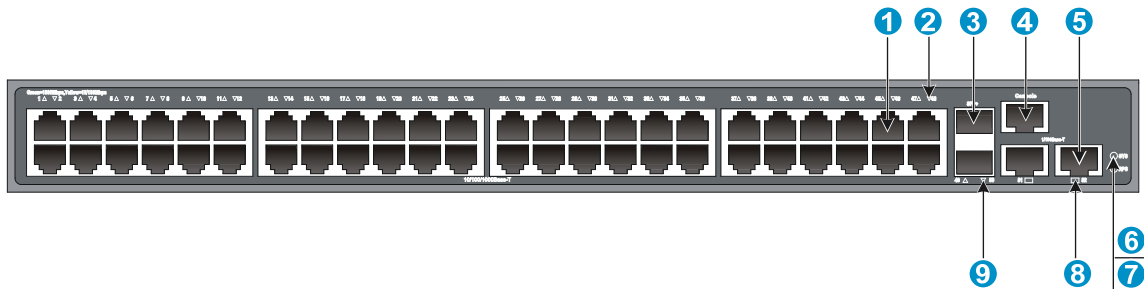
Figure 29 Rear panel



(1) AC-input power receptacle	(2) Grounding screw
-------------------------------	---------------------

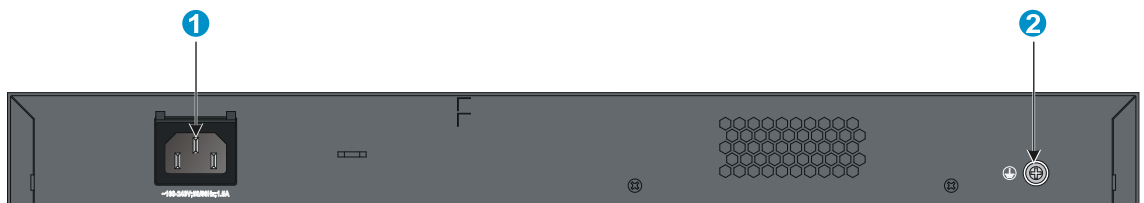
HP 1950-48G-2SFP+-2XGT

Figure 30 Front panel



- | | |
|--|---|
| (1) 10/100/1000Base-T auto-sensing Ethernet port | (2) 10/100/1000Base-T Ethernet port LED |
| (3) SFP+ port | (4) Console port |
| (5) 1/10GBase-T auto-sensing Ethernet port | (6) System status LED (SYS) |
| (7) RPS status LED (RPS) | (8) 1/10GBase-T Ethernet port LED |
| (9) SFP+ port LED | |

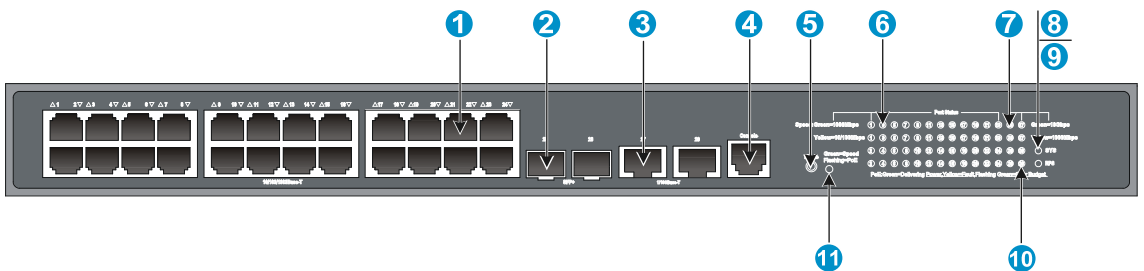
Figure 31 Rear panel



- | | |
|-------------------------------|---------------------|
| (1) AC-input power receptacle | (2) Grounding screw |
|-------------------------------|---------------------|

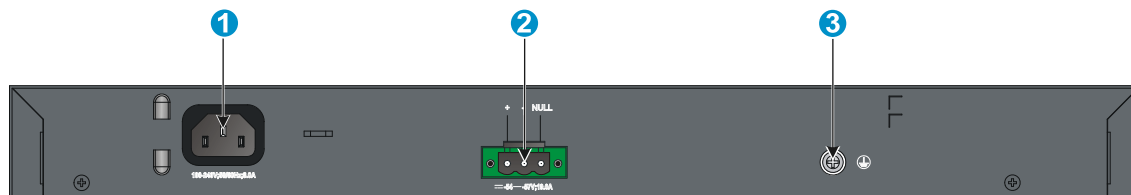
HP 1950-24G-2SFP+-2XGT-PoE+(370W)

Figure 32 Front panel



- | | |
|--|---|
| (1) 10/100/1000Base-T auto-sensing Ethernet port | (2) SFP+ port |
| (3) 1/10GBase-T auto-sensing Ethernet port | (4) Console port |
| (5) Port LED mode switching button | (6) 10/100/1000Base-T Ethernet port LED |
| (7) SFP+ port LED | (8) System status LED (SYS) |
| (9) RPS status LED (RPS) | (10) 1/10GBase-T Ethernet port LED |
| (11) Port mode LED | |

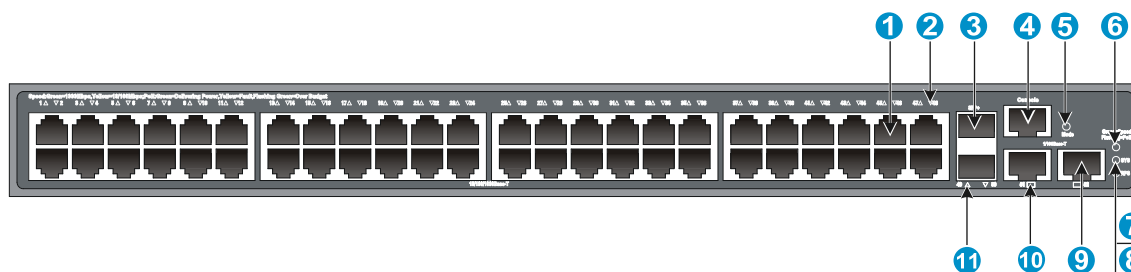
Figure 33 Rear panel



- | | |
|-------------------------------|--------------------|
| (1) AC-input power receptacle | (2) RPS receptacle |
| (3) Grounding screw | |

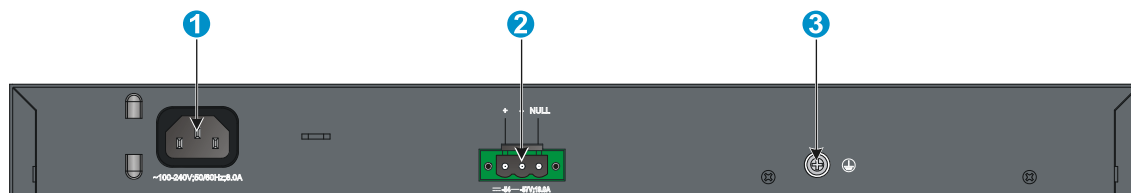
HP 1950-48G-2SFP+-2XGT-PoE+(370W)

Figure 34 Front panel



- | | |
|--|---|
| (1) 10/100/1000Base-T auto-sensing Ethernet port | (2) 10/100/1000Base-T Ethernet port LED |
| (3) SFP+ port | (4) Console port |
| (5) Port LED mode switching button | (6) Port mode LED |
| (7) System status LED (SYS) | (8) RPS status LED (RPS) |
| (9) 1/10GBase-T auto-sensing Ethernet port | (10) 1/10GBase-T Ethernet port LED |
| (11) SFP+ port LED | |

Figure 35 Rear panel



- | | |
|-------------------------------|--------------------|
| (1) AC-input power receptacle | (2) RPS receptacle |
| (3) Grounding screw | |

Technical specifications

Table 10 Technical specifications for non-PoE switch models

Item	HP 1950-24G-2SFP+-2XGT	HP 1950-48G-2SFP+-2XGT
Dimensions (H × W × D)	43.6 × 440 × 160 mm (1.72 × 17.32 × 6.30 in)	43.6 × 440 × 270 mm (1.72 × 17.32 × 10.63 in)
Weight	≤ 3 kg (6.61 lb)	≤ 5 kg (11.02 lb)
Console ports	1	
10/100/1000Base-T Ethernet ports	24	48
1/10G Base-T Ethernet ports	2	
SFP+ ports	2	
Input voltage	- Rated voltage: 100 VAC to 240 VAC @ 50 or 60 Hz - Max voltage: 90 VAC to 264 VAC @ 47 to 63 Hz	
Minimum power consumption	20 W	30 W
Maximum power consumption	34 W	46 W
Chassis leakage current compliance	- UL60950-1 - EN60950-1 - IEC60950-1 - GB4943.1	
Melting current of power supply fuse	AC-input: 2 A/250 V	AC-input: 3.15 A/250 V
Operating temperature	0°C to 45°C (32°F to 113°F)	
Operating humidity	5% to 95%, noncondensing	
Fire resistance compliance	- UL60950-1 - EN60950-1 - IEC60950-1 - GB4943.1	

Table 11 Technical specifications for PoE switch models

Item	HP 1950-24G-2SFP+-2XGT-PoE+(370W)	HP 1950-48G-2SFP+-2XGT-PoE+(370W)
Dimensions (H × W × D)	43.6 × 440 × 360 mm (1.72 × 17.32 × 14.17 in)	43.6 × 440 × 420 mm (1.72 × 17.32 × 16.54 in)
Weight	≤ 6 kg (13.23 lb)	≤ 7 kg (17.64 lb)
Console ports	1	
10/100/1000Base-T Ethernet ports	24	48
1/10G Base-T Ethernet ports	2	

Item	HP 1950-24G-2SFP+-2XGT-PoE+(37 0W)	HP 1950-48G-2SFP+-2XGT-PoE+(37 0W)
SFP+ ports	2	
Input voltage	- AC power source - Rated voltage: 100 VAC to 240 VAC @ 50 or 60 Hz - Max voltage: 90 VAC to 264 VAC @ 47 to 63 Hz - DC power source: HP A-RPS1600 - Rated voltage: -54 VDC to -57 VDC - Max voltage: -44 VDC to -60 VDC for single DC input and -54 VDC to -57 VDC for AC+DC dual inputs	
Maximum PoE per port	30 W	30 W
Total PoE	- AC: 370 W - DC: 740 W	- AC: 370 W - DC: 800 W
Minimum power consumption	- AC: 31 W - DC: 20 W	- AC: 43 W - DC: 30 W
Maximum power consumption (including PoE consumption)	- AC: 425 W (including 370 W PoE consumption) - DC: 770 W (including 740 W PoE consumption)	- AC: 470 W (including 370 W PoE consumption) - DC: 910 W (including 800 W PoE consumption)
Chassis leakage current compliance	- UL60950-1 - EN60950-1 - IEC60950-1 - GB4943.1	
Melting current of power supply fuse	- AC-input: 10 A/250 V - DC-input: 25 A/250 V	- AC-input: 10 A/250 V - DC-input: 25 A/250 V
Operating temperature	0°C to 45°C (32°F to 113°F)	
Operating humidity	5% to 95%, noncondensing	
Fire resistance compliance	- UL60950-1 - EN60950-1 - IEC60950-1 - GB4943.1	

Appendix B Ports and LEDs

Ports

Console port

The switch provides a console port.

Table 12 Console port specifications

Item	Specification
Connector type	RJ-45
Compliant standard	EIA/TIA-232
Transmission baud rate	9600 bps to 115200 bps (the default is 38400 bps.)
Services	• Provides connection to an ASCII terminal. • Provides connection to the serial port of a local or remote (through a pair of modems) PC running terminal emulation program.

10/100/1000Base-T Ethernet port

The switch provides 10/100/1000Base-T Ethernet ports.

Table 13 10/100/1000Base-T Ethernet port specifications

Item	Specification
Connector type	RJ-45
Interface attributes	10/100/1000 Mbps, half/full duplex, MDI/MDI-X autosensing
Max transmission distance	100 m (328.08 ft)
Transmission medium	Category-5 (or above) twisted pair cable
Compatible standards	• IEEE 802.3i • 802.3u • 802.3ab

1/10GBase-T autosensing Ethernet port

The switch provides 1/10GBase-T autosensing Ethernet ports.

Table 14 1/10GBase-T autosensing Ethernet port specifications

Item	Specification
Connector type	RJ-45
Port transmission rate	1/10 Gbps, full duplex, MDI/MDI-X autosensing
Transmission medium and max transmission distance	• 55 m (180.45 ft) over category-6 unshielded twisted pair cable • 100 m (328.08 ft) over category-6 shielded twisted pair cable • 100 m (328.08 ft) over category-6A or above twisted pair cable
Compatible standards	• IEEE 802.3ab • IEEE 802.3an

To avoid packet loss caused by interferences, HP recommends that you layer cables as follows:

- Use category-6A or above cables and connectors.
- Do not bundle cables in their first 20 m (65.62 ft).
- Separate power cords and twisted pair cables at and around the distribution frame.
- For ports adjacent to one another on the device, the peer ports on the distribution frame are not adjacent, for example:
 - If the device connects to one distribution frame, connect port 1 on the device to port 1 on the distribution frame and port 2 on the device to port 3 on the distribution frame.
 - If the device connects to two distribution frames, connect port 1 on the device to port 1 on distribution frame 1 and port 2 on the device to port 1 on distribution frame 2.
- Keep the device and twisted pair cables away from interference sources, such as a two-way radio or a high-power variable-frequency drive.

SFP+ port

The switch provides SFP+ ports. You can install the 1000 Mbps SFP transceiver modules in [Table 15](#), the SFP+ transceiver modules in [Table 16](#), and the SFP+ DAC cables in [Table 17](#) in the SFP+ ports as needed.

Table 15 SFP transceiver modules available for the SFP+ ports

Product code	HP description	Central wavelength (nm)	Connector	Cable/fiber diameter (μm)	Modal bandwidth (MHz × km)	Max transmission distance
JD118B	HP X120 1G SFP LC SX Transceiver	850	LC	Multi-mode, 50/125	500	550 m (1804.46 ft)
				Multi-mode, 62.5/125	400	275 m (902.23 ft)
JD119B	HP X120 1G SFP LC LX Transceiver	1310	LC	Single-mode, 9/125	N/A	10 km (6.21 miles)
				Multi-mode, 50/125	500 or 400	550 m (1804.46 ft)
				Multi-mode, 62.5/125	500	550 m (1804.46 ft)

Product code	HP description	Central wavelength (nm)	Connector	Cable/fiber diameter (μm)	Modal bandwidth (MHz × km)	Max transmission distance
JD061A	HP X125 1G SFP LC LH40 1310nm Transceiver	1310	LC	Single-mode, 9/125	N/A	40 km (24.86 miles)
JD062A	HP X120 1G SFP LC LH40 1550nm Transceiver	1550	LC	Single-mode, 9/125	N/A	40 km (24.86 miles)
JD063B	HP X125 1G SFP LC LH70 Transceiver	1550	LC	Single-mode, 9/125	N/A	70 km (43.50 miles)
JD089B	HP X120 1G SFP RJ45 T Transceiver	N/A	RJ-45	Category-5 twisted pair	N/A	100 m (328.08 ft)

Table 16 SFP+ transceiver modules available for the SFP+ ports

Product Code	HP description	Central wavelength (nm)	Connector	Fiber diameter (μm)	Modal bandwidth (MHz × km)	Max transmission distance
JD092B	HP X130 10G SFP+ LC SR Transceiver	850	LC	Multi-mode, 50/125	2000	300 m (984.25 ft)
					500	82 m (269.03 ft)
					400	66 m (216.54 ft)
				Multi-mode, 62.5/125	200	33 m (108.27 ft)
					160	26 m (85.30 ft)
JD094B	HP X130 10G SFP+ LC LR Transceiver	1310	LC	Single-mode, 9/125	N/A	10 km (6.21 miles)

Table 17 SFP+ DAC cables available for the SFP+ ports

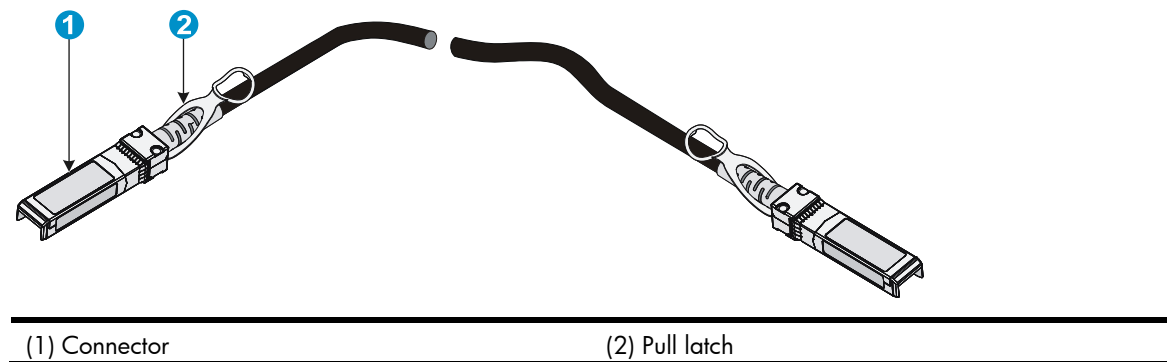
Product code	HP description	Max transmission distance
JD095C	HP X240 10G SFP+ SFP+ 0.65m DA Cable	0.65 m (2.13 ft)
JD096C	HP X240 10G SFP+ SFP+ 1.2m DA Cable	1.2 m (3.94 ft)
JD097C	HP X240 10G SFP+ SFP+ 3m DA Cable	3 m (9.84 ft)
JG081C	HP X240 10G SFP+ SFP+ 5m DA Cable	5 m (16.40 ft)

NOTE:

HP recommends that you use HP 1000 Mbps SFP transceiver modules, SFP+ transceiver modules, or SFP+ DAC cables for the SFP+ ports on the switch. HP 1000 Mbps SFP and SFP+ transceiver modules available for the switch are subject to change over time. For the most up-to-date list of SFP and SFP+ transceiver modules, contact your HP sales representative or technical support engineer.

For more information about the 1000 Mbps SFP transceiver modules, SFP+ transceiver modules, and SFP+ DAC cables, see *HP Comware-Based Devices Transceiver Modules User Guide*.

Figure 36 SFP+ DAC cable



LEDs

System status LED

The system status LED shows the operating status of the switch.

Table 18 System status LED description

LED mark	Status	Description
SYS	Steady green	The switch is operating correctly.
	Flashing green	The switch is performing power-on self test (POST).
	Steady red	POST has failed.
	Flashing yellow	Some ports have failed to pass POST.
	Off	The switch is powered off.

RPS status LED

The HP 1950-24G-2SFP+2XGT-PoE+(370W) and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches support RPS input and provide an RPS status LED on the front panel to indicate the RPS operating status.

Table 19 RPS status LED description

LED mark	Status	Description
RPS	Steady green	Both the RPS DC input and the AC input are normal.
	Steady yellow	The RPS DC input is normal, but the AC input is disconnected or has failed.
	Off	The RPS DC input has failed, or no RPS is connected.

Port mode LED

The HP 1950-24G-2SFP+2XGT-PoE+(370W) and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches provide a port mode LED. The port mode LED indicates the type of information that the network port LEDs are showing. You can use the port LED mode switching button to change the type of displayed port information.

Table 20 Port mode LED description

LED mark	Status	Description
Mode	Steady green	The network port LEDs are showing port rates.
	Flashing green	The network port LEDs are showing the PoE status of the ports.

10/100/1000Base-T Ethernet port LED

The HP 1950-48G-2SFP+2XGT and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches provide a double-color LED for each 10/100/1000Base-T Ethernet port to indicate their operating status.

Figure 37 10/100/1000Base-T Ethernet port LED description for HP 1950-48G-2SFP+2XGT and HP 1950-48G-2SFP+2XGT-PoE+(370W) switches

Switch model	Port mode LED (Mode) status	Status	Description
HP 1950-48G-2SFP+2XGT	N/A	Steady green	The port is operating at 1000 Mbps, and a link is present on the port.
		Flashing green	The port is sending or receiving data at 1000 Mbps.
		Steady yellow	The port is operating at 10/100 Mbps, and a link is present on the port.
		Flashing yellow (not 3 Hz)	The port is sending or receiving data at 10/100 Mbps.
		Flashing yellow (3 Hz)	POST has failed on the port.
		Off	No link is present on the port.
HP 1950-48G-2SFP+2XGT-PoE+(370W)	Steady green (rate mode)	Steady green	The port is operating at 1000 Mbps, and a link is present on the port.
		Flashing green	The port is sending or receiving data at 1000 Mbps.
		Steady yellow	The port is operating at 10/100 Mbps, and a link is present on the port.
		Flashing yellow (not 3 Hz)	The port is sending or receiving data at 10/100 Mbps.

Switch model	Port mode LED (Mode) status	Status	Description
		Flashing yellow (3 Hz)	POST has failed on the port.
		Off	No link is present on the port.
	Flashing green (PoE mode)	Steady green	The port is supplying PoE correctly.
		Flashing green (3 Hz)	- The PD power requirement exceeds the port PoE capacity. - The port fails to meet the power requirement of the PD because of power insufficiency of the switch.
		Steady yellow	A non-PD device is attached to the port, or the port is experiencing a PoE failure.
		Flashing yellow (3 Hz)	POST has failed on the port.
		Off	The port is not supplying PoE.

The HP 1950-24G-2SFP+2XGT and HP 1950-24G-2SFP+2XGT-PoE+(370W) switches provide two single-color LEDs for each 10/100/1000Base-T Ethernet port to indicate their operating status. When one of the two LEDs is on, the other is off.

Table 21 10/100/1000Base-T Ethernet port LED description for HP 1950-24G-2SFP+-2XGT and HP 1950-24G-2SFP+-2XGT-PoE+(370W) switches

Switch model	Port mode LED (Mode) status	LED	Status	Description
HP 1950-24G-2SFP+2XGT	N/A	Green LED	Steady on	The port is operating at 1000 Mbps, and a link is present on the port.
			Flashing	The port is sending or receiving data at 1000 Mbps.
			Off	No link is present on the port, or the port is not operating at 1000 Mbps.
		Yellow LED	Steady on	The port is operating at 10/100 Mbps, and a link is present on the port.
			Flashing (not 3 Hz)	The port is sending or receiving data at 10/100 Mbps.
			Flashing yellow (3 Hz)	POST has failed on the port.

Switch model	Port mode LED (Mode) status	LED	Status	Description
HP 1950-24G-2SFP+2XGT-PoE+(3 70W)	Steady green (rate mode)	Green LED	Off	No link is present on the port, or the port is not operating at 10/100 Mbps.
			Steady on	The port is operating at 1000 Mbps, and a link is present on the port.
			Flashing	The port is sending or receiving data at 1000 Mbps.
			Off	No link is present on the port, or the port is not operating at 1000 Mbps.
		Yellow LED	Steady on	The port is operating at 10/100 Mbps, and a link is present on the port.
			Flashing (not 3 Hz)	The port is sending or receiving data at 10/100 Mbps.
			Flashing yellow (3 Hz)	POST has failed on the port.
			Off	No link is present on the port, or the port is not operating at 10/100 Mbps.
		Green LED	Steady on	The port is supplying PoE correctly.
			Flashing (3 Hz)	- The PD power requirement exceeds the port PoE capacity. - The port fails to meet the power requirement of the PD because of power insufficiency of the switch.
			Off	The port is not supplying PoE power.
	Flashing green (PoE mode)	Yellow LED	Steady on	A non-PD device is attached to the port, or the port is experiencing a PoE failure.

Switch model	Port mode LED (Mode) status	LED	Status	Description
			Flashing (3 Hz)	POST has failed on the port.
			Off	The port is not supplying PoE power.

1/10GBase-T autosensing Ethernet port LEDs

Table 22 1/10GBase-T autosensing Ethernet port LED description

Status	Description
Steady green	The port has a link and is operating at 10 Gbps.
Flashing green	The port is sending or receiving data at 10 Gbps.
Steady yellow	The port has a link and is operating at 1 Gbps.
Flashing yellow	The port is sending or receiving data at 1 Gbps.
Off	No link is present on the port.

SFP+ port LED

The HP 1950-24G-2SFP+2XGT and HP 1950-24G-2SFP+2XGT-PoE+(370W) switches provide two single-color LEDs for each SFP+ port to indicate their operating status.

Table 23 SFP+ port LED description for the HP 1950-24G-2SFP+2XGT and HP 1950-24G-2SFP+2XGT-PoE+(370W) switches

LED	Status	Description
Green LED	Steady on	A transceiver module is installed in the port. The port is operating at 10 Gbps, and a link is present on the port.
	Flashing	The port is sending or receiving data at 10 Gbps.
	Off	- No transceiver module is installed in the port, or no 10 Gbps link is present on the port. - The port mode LED is operating in PoE mode (applicable to the PoE switch models.)
Yellow LED	Steady on	A transceiver module is installed in the port. The port is operating at 1 Gbps, and a link is present on the port.
	Flashing (not 3 Hz)	The port is sending or receiving data at 1 Gbps.
	Flashing (3 Hz)	POST has failed on the port.
	Off	- No transceiver module is installed in the port, or no 1 Gbps link is present on the port. - The port mode LED is operating in PoE mode (applicable to the PoE switch models.)

The HP 1950-48G-2SFP+-2XGT and HP 1950-48G-2SFP+-2XGT-PoE+(370W) switches provide a double-color LED for each SFP+ port to indicate its operating status.

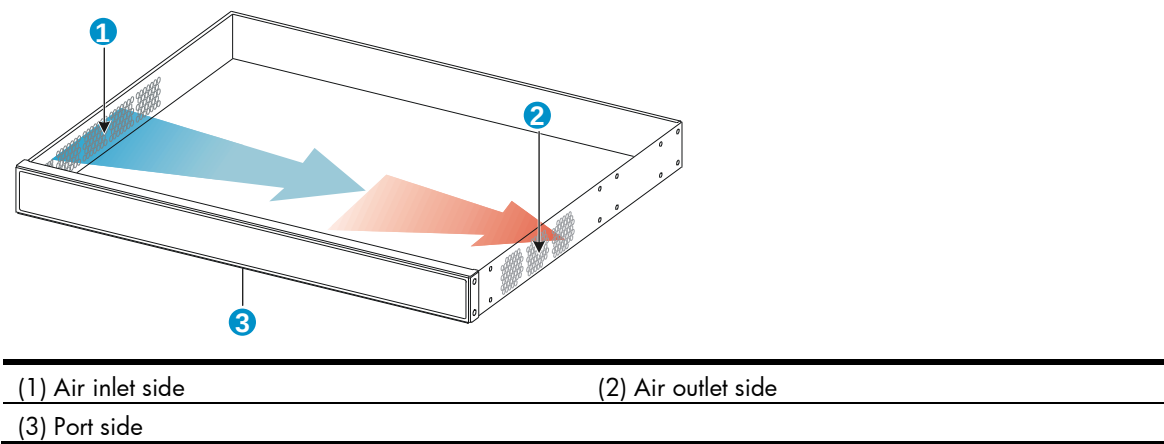
Table 24 SFP+ port LED description for the HP 1950-48G-2SFP+-2XGT and HP 1950-48G-2SFP+-2XGT-PoE+(370W) switches

Status	Description
Steady green	A transceiver module is installed in the port. The port is operating at 10 Gbps and a link is present on the port.
Flashing green	The port is sending or receiving data at 10 Gbps.
Steady yellow	A transceiver module is installed in the port. The port is operating at 1 Gbps and a link is present on the port.
Flashing yellow (not 3 Hz)	The port is sending or receiving data at 1 Gbps.
Flashing yellow (3 Hz)	POST has failed on the port.
Off	• No transceiver module is installed in the port, or no link is present on the port. • The port mode LED is operating in PoE mode (applicable to the PoE switch models.)

Appendix C Cooling system

The cooling system of the switch includes the air vents in the chassis and built-in fans. To maintain good ventilation for the switch, consider the ventilation design at the installation site when you plan the installation position for the switch.

Figure 38 Airflow through the chassis



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 access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load-balancing device.
	Represents a security card, such as a firewall, load-balancing, NetStream, SSL VPN, IPS, or ACG card.

Port numbering in examples

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

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