

# intelbras

---

User guide  
**Series SC 5525**

This is a product approved by Anatel, the approval number can be found on the product label.

**For more information, consult the Anatel website:** <https://www.gov.br/anatel/pt-br>

### **Data protection and security**

Observe local laws regarding the protection and use of such data and the regulations that prevail in the country.

The aim of data protection legislation is to prevent infringements of individual privacy rights based on the misuse of personal data.

### **Processing of personal data**

This system uses and processes personal data such as passwords, detailed call records, network addresses and customer data records, for example.

### **Guidelines that apply to Intelbras employees**

» Intelbras employees are subject to safe trading practices and data confidentiality under the terms of the company's work procedures.

» It is imperative that the following rules are observed to ensure that statutory provisions relating to services (be they in-house services or remote administration and maintenance) are strictly followed. This preserves the client's interests and provides additional personal protection.

### **Guidelines controlling data processing**

» Ensure that only authorized persons have access to customer data.

» Use password assignment facilities, without allowing any exceptions. Never share passwords with unauthorized persons.

» Ensure that no unauthorized person can process (store, change, transmit, disable or erase) or use customer data.

» Prevent unauthorized persons from gaining access to data media, for example, backup disks or protocol printouts.

» Ensuring that data media that are no longer needed are completely destroyed and that documents are not stored or left in generally accessible places.

» Working together with the client builds trust.

### **Misuse and hacking**

» Access passwords allow access and alteration of any facility, such as external access to the company's system to obtain data. of misuse.

**Important:** This product does not have encryption. Intelbras does not access, transfer, capture, or carry out any other type of processing of personal data from this product, with the exception of data necessary for the operation of the product itself.

***All images in this document are for illustrative purposes only.***

***AC power supplies, DC power supplies, fan modules, and expansion cards are sold separately and are not included with the product.***

# Contents

<b>1 Preparing for installation</b> .....	<b>1-1</b>
Safety recommendations .....	1-1
Examining the installation environment .....	1-1
Cleanliness .....	1-3
Corrosive gas limit .....	1-3
Examining the installation site.....	1-4
Checking power distribution or power supply environment .....	1-5
Laser safety .....	1-6
Installation tools.....	1-6
Installation accessories .....	1-6
<b>2 Installing the switch</b> .....	<b>2-1</b>
Installing the switch in a 19-inch rack .....	2-3
Installation methods.....	2-3
Installation procedure at a glance .....	2-3
Installation accessories .....	2-4
Rack-mounting the switch by using only front mounting brackets.....	2-4
Mounting the switch on a workbench .....	2-6
Grounding the switch .....	2-7
Grounding the switch with a grounding strip .....	2-8
Grounding the switch with a grounding conductor buried in the earth ground .....	2-9
Verifying the connection after grounding the switch.....	2-10
Installing and removing a fan tray.....	2-11
Installing a fan tray .....	2-11
Removing a fan tray.....	2-12
Installing and removing a power supply .....	2-13
Installing a PSR250-12A, PSR250-12A1, PSR450-12D, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply .....	2-13
Installing a PSR180-12A-F or PSR180-12A-B power supply.....	2-14
Removing a PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply .....	2-15
Removing a PSR450-12D power supply .....	2-16
Removing a PSR180-12A-F or PSR180-12A-B power supply .....	2-17
Connecting the power cord .....	2-18
Connecting the power cord for a PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply .....	2-18
Connecting the power cord for a PSR180-12A-F or PSR180-12A-B power supply .....	2-19
Connecting the DC power cord for a PSR450-12D power supply.....	2-20
Installing and removing an expansion card.....	2-21
Installing an expansion card .....	2-21
Removing an expansion card .....	2-25
Verifying the installation .....	2-25
<b>3 Accessing the switch for the first time</b> .....	<b>3-1</b>
Connecting the switch to a configuration terminal.....	3-1
Connecting a DB9-to-RJ45 console cable .....	3-2
Connecting a USB-to-RJ45 console cable.....	3-3
Connecting a micro USB console cable .....	3-3
Setting terminal parameters .....	3-3
Starting the switch.....	3-4
Pre-start checklist.....	3-4
Powering on the switch.....	3-4

<b>4 Setting up an IRF fabric .....</b>	<b>4-1</b>
IRF fabric setup flowchart .....	4-1
Planning IRF fabric setup .....	4-2
Planning IRF fabric size and the installation site .....	4-2
Identifying the master switch and planning IRF member IDs .....	4-3
Planning IRF topology and connections .....	4-3
Identifying physical IRF ports on the member switches .....	4-4
Planning the cabling scheme .....	4-5
Configuring basic IRF settings .....	4-8
Connecting the physical IRF ports .....	4-8
Verifying the IRF fabric setup .....	4-8
<b>5 Maintenance and troubleshooting .....</b>	<b>5-1</b>
Power supply failure .....	5-1
Symptom .....	5-1
Solution .....	5-1
Fan tray failure .....	5-1
Configuration terminal display issues .....	5-2
No display .....	5-2
Garbled display .....	5-2

# 1 Preparing for installation

This document is applicable to the following Ethernet switches:

- SC 5525-24X-2QE
- SC 5525-48X-2QE
- SC 5525-24X-2HE
- SC 5525-48X-2HE
- SC 5525-24X-6H
- SC 5525-48X-6H

## 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.

- Before cleaning the switch, remove all power cords from the switch. Do not clean the switch with 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. The switch might be severely damaged in case of a fall.
- Ensure good ventilation of the equipment room and keep the air inlet and outlet vents of the switch free of obstruction.
- Make sure the power input voltage is as required by the power supply.
- To avoid electrical shocks, do not open the chassis while the switch is operating or when the switch is just powered off.
- During switch installation, wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.

## Examining the installation environment

To ensure correct operation of your switch, make sure the installation environment meets the requirements listed in [Table1-1](#).

**Table1-1 Checking list for the installation environment**

Item	Requirements
Ventilation and heat dissipation	<p><b>⚠ CAUTION:</b></p> <p>To ensure correct operation of your device, make sure the installation environment is adequately ventilated to prevent the switch from overheating.</p> <ul style="list-style-type: none"><li>• Ensure a minimum clearance of 10 cm (3.94 in) around the chassis.</li><li>• Do not install the device near a heat source, for example, a stove or heater.</li><li>• Ensure air ventilation in the installation environment.</li><li>• Do not block the ventilation holes in the device or power adapter.</li></ul>

Item	Requirements
Anti-moisture	<p><b>⚠ CAUTION:</b></p> <p>Water or moisture might damage the circuits of the device.</p> <ul style="list-style-type: none"> <li>• Do not place the device near water or in a damp environment.</li> <li>• Install the switch in a clean, dry, and ventilated place where temperature is controlled in a stable range.</li> <li>• Make sure the installation environment is free from water leakage or condensation. If required, install a dehumidification device (such as an air conditioner with a dehumidification function or a dedicated dehumidifier).</li> <li>• Do not operate the device under or near the water source, such as the wash basin, laundry room, or areas with high humidity.</li> <li>• Do not touch the device with wet hands.</li> </ul>
Temperature/humidity	<p>For correct operation and long service life of your switch, maintain the temperature and humidity in the equipment room at acceptable ranges.</p> <ul style="list-style-type: none"> <li>• Lasting high relative humidity can cause poor insulation, electricity leakage, mechanical property change of materials, and metal corrosion.</li> <li>• Lasting low relative humidity can cause washer contraction and ESD and cause issues including loose mounting screws and circuit failure.</li> <li>• High temperature can accelerate the aging of insulation materials and significantly lower the reliability and lifespan of the switch.</li> </ul> <p>For the temperature and humidity requirements of the switch, see technical specifications in hardware information and specifications for the switch series.</p>
Lightning protection	<p><b>⚠ CAUTION:</b></p> <p>Ground the switch correctly and verify the grounding. For more information, see "<a href="#">Grounding the switch.</a>"</p> <ul style="list-style-type: none"> <li>• If you ground the switch by using a grounding strip, make sure the grounding resistance of the grounding strip in the equipment room is less than 1Ω.</li> <li>• If you ground the switch by using a grounding conductor buried in the earth ground, make sure the grounding resistance of the grounding conductor in the ground is less than 10Ω.</li> <li>• Route the signal cables along indoor walls, bury the cables in the earth ground, or thread the cables through steel tubes. Install a signal lightning arrester with a nominal discharge current for a corresponding network interface.</li> <li>• Keep the signal cables far from power cords and lightning rod down conductors.</li> <li>• As a best practice, route power cords indoors. If an AC power cord is routed from outdoors, connect the AC power cord first to a power lightning arrester before leading it to the AC power port on the switch. Make sure the power lightning arrester has a nominal discharge current and the total length of the power cord from the power lightning arrester to the power port on the switch is less than 5 m (16.40 ft).</li> <li>• Ground the switch, rack, independent power modules, and lightning arresters separately.</li> <li>• You must ground optical fibers with reinforcing metal stiffener from outdoors on an optical distribution frame (ODF) or fiber splice enclosure.</li> </ul>
Cable routing	<p><b>⚠ CAUTION:</b></p> <p>Do not run an Ethernet cable and power cord in parallel.</p>

Item	Requirements
	<ul style="list-style-type: none"> <li>Route different types of cables separately.</li> <li>Keep power cords a minimum of 5 cm (1.97 in) away from other cables.</li> </ul>
ESD prevention	<ul style="list-style-type: none"> <li>Ground the switch correctly.</li> <li>To avoid ESD damage to the device or components, always wear an ESD wrist strap when you install or remove the device or components.</li> <li>Make sure the wrist strap has good skin contact and is reliably grounded.</li> </ul>
Cleanliness	For more information, see " <a href="#">Cleanliness</a> ."
Corrosive gas prevention	The installation site must be free from corrosive gases such as acid gases and alkaline gases. For more information, see " <a href="#">Corrosive gas limit</a> ."
EMI	<ul style="list-style-type: none"> <li>If AC power is used, use a single-phase three-wire power receptacle with protection earth (PE) to filter interference from the power grid.</li> <li>Keep the device far away from radio transmitting stations, radar stations, and high-frequency devices.</li> <li>Use electromagnetic shielding, for example, shielded interface cables, when necessary.</li> </ul>

## Cleanliness

Dust buildup on the chassis might cause electrostatic adsorption and dust corrosion, resulting in poor contact of metal connectors and contact points. This might shorten the device's lifetime and even cause device failure in the worst case. [Table1-2](#) describes the switch requirement for cleanliness.

**Table1-2 Switch requirement for cleanliness**

Substance	Particle diameter	Concentration limit
Dust particles	$\geq 0.5 \mu\text{m}$	$\leq 1.8 \times 10^7 \text{ particles/m}^3$

To maintain cleanliness in the equipment room, follow these guidelines:

- Keep the equipment room away from pollution sources. Do not smoke, eat, or drink in the equipment room.
- Use double-layer glass in windows and seal doors and windows with dust-proof rubber strips. Use screen doors and window screens for doors and windows open to the outside and make sure the external windows are air tight.
- Use dustproof materials for floors, walls, and ceilings and use wallpaper or matt paint that does not produce powders.
- Clean the equipment room regularly and clean the air filters of the rack each month.
- Wear ESD clothing and shoe covers before entering the equipment room, keep the ESD clothing and shoe covers clean, and change them frequently.

## Corrosive gas limit

Corrosive gases can accelerate corrosion and aging of metal components. Make sure the corrosive gases do not exceed the concentration limits as shown in [Table1-3](#).

**Table1-3 Corrosive gas concentration limits**

Gas	Average concentration (mg/m <sup>3</sup> )	Maximum concentration (mg/m <sup>3</sup> )
SO <sub>2</sub>	0.3	1.0
H <sub>2</sub> S	0.1	0.5
Cl <sub>2</sub>	0.1	0.3
HCl	0.1	0.5
HF	0.01	0.03
NH <sub>3</sub>	1.0	3.0
O <sub>3</sub>	0.05	0.1
NO <sub>x</sub>	0.5	1.0

**△ CAUTION:**

As a best practice, control the corrosive gas concentrations in the equipment room at their average values. Make sure the corrosive gas concentrations do not exceed 30 minutes per day at their maximum values.

To control corrosive gases, use the following guidelines:

- As a best practice, do not build the equipment room in a place with a high concentration of corrosive gases.
- Make sure the equipment room is not connected to sewer, vertical shaft, or septic tank pipelines and keep it far away from these pipelines. The air inlet of the equipment room must be away from such pollution sources.
- Use environmentally friendly materials to decorate the equipment room. Avoid using organic materials that contains harmful gases, such as sulfur or chlorine-containing insulation cottons, rubber mats, sound-proof cottons, and avoid using plasterboards with high sulfur concentration.
- Place fuel (diesel or gasoline) engines separately. Do not place them in the same equipment room with the device. Make sure the exhausted air of the engines will not flow into the equipment room or towards the air inlet of the air conditioners.
- Place batteries separately. Do not place them in the same room with the device.
- Employ a professional company to monitor and control corrosive gases in the equipment room regularly.

## Examining the installation site

Before you install the switch, verify that the installation site meets the installation requirements. The switch can operate correctly in an A1 or A2 installation site. Availability issues might occur if you install the switch in an A3, B1, B2, or C installation site.

**Table1-4 Installation sites**

Category	Definition	Example
A1: indoor controlled environment	<ul style="list-style-type: none"><li>• Indoor environments where temperature and humidity are controlled.</li><li>• Completely enclosed or shielded indoor environments.</li></ul>	Central equipment rooms, IDC equipment rooms, mobile cabins with air conditioners, outdoor air conditioner cabinets, and heat exchanger cabinets.
A2: indoor partially controlled	<ul style="list-style-type: none"><li>• Indoor environments where temperature and humidity are partially</li></ul>	Simple equipment rooms, ordinary houses, garages, corridors, and



Category	Definition	Example
environment	<p>controlled.</p> <ul style="list-style-type: none"> <li>Incompletely enclosed or shielded places.</li> <li>Places far from pollution sources.</li> </ul>	direct ventilation cabinets far from pollution sources, houses without direct exposure to sunlight or rain, railway station platforms, and stadiums.
A3: indoor uncontrolled environment	<ul style="list-style-type: none"> <li>Indoor environments where temperature and humidity are uncontrolled.</li> <li>Incompletely enclosed or shielded places.</li> <li>Places near pollution sources.</li> </ul>	Simple equipment rooms, ordinary houses, garages, corridors, and direct ventilation cabinets near pollution sources, houses without direct exposure to sunlight or rain, railway station platforms, stadiums, uncleaned rooms after decoration, and rooms under decoration.
B1: outdoor general environment	<ul style="list-style-type: none"> <li>Unshielded places where the temperature and humidity are not controlled.</li> <li>Places far from pollution sources.</li> </ul>	Completely exposed outdoor places far from pollution sources.
B2: harsh environment	<ul style="list-style-type: none"> <li>Unshielded places where the temperature and humidity are not controlled.</li> <li>Sea environments or outdoor land environments near pollution sources.</li> </ul>	Islands, ships, and completely exposed outdoor places near pollution sources.
C: special environments	Special application environments	Buried, underwater, or undersea environments and manholes.

**Table1-5 Pollution sources**

Category	Radius range
Saline water areas such as oceans and saline lakes	≤ 3.7 km (2.30 miles)
Serious pollution sources such as metallurgic plants, coal mines, and heat and power plants	≤ 3 km (1.86 miles)
Medium pollution sources such as chemical factories, rubber plants, and electroplating factories	≤ 2 km (1.24 miles)
Light pollution sources, such as food factories, tanneries, and heating boilers	≤ 1 km (0.62 miles)

## Checking power distribution or power supply environment

**Table1-6 Requirements for power distribution or power supply environment**

Item	Requirements
Preparation	The power module must be available before you install the switch.
Voltage	The voltage provided to the switch must be within the operating voltage range. For the operating voltage range, see hardware information and specifications for the switch series.
Power receptacle and cables	<ul style="list-style-type: none"> <li>If the external power supply system provides an AC power outlet, use a country-specific AC power cord. Make sure the PE wire of the AC power supply is grounded reliably.</li> </ul>

Item	Requirements
	<ul style="list-style-type: none"> <li>• If the external power supply system provides a DC distribution box, prepare DC power cords yourself.</li> <li>• Do not use the power cord provided with the switch on other devices.</li> </ul>

## Laser safety

### **WARNING!**

The switch is a Class 1M laser device. Disconnected optical fibers or transceiver modules might emit invisible laser light. Do not stare into beams or view directly with optical instruments when the switch is operating.

## Installation tools




No installation tools are provided with the switch. Prepare the following tools yourself as required:



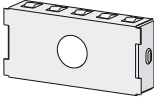


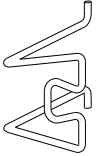
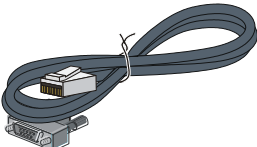
- ESD wrist strap
- Flat-blade screwdriver
- Phillips screwdriver
- Needle-nose pliers
- Diagonal pliers
- Crimping tool
- Marker
- Heat gun



## Installation accessories

Before installation, make sure you have all the required installation accessories. If any accessory is damaged or missing, use the BOM part number provided in this table to purchase a new one.

**Table1-7 Installation accessories**

BOM part No.	Description	Quantity	Applicable device models
2150A03X	Front mounting bracket kit (including two front mounting brackets and eight M4 screws) 	1 kit, provided	All switch models
N/A	M6 screw and cage nut 	User supplied	All switch models
63200063	Rubber feet 	4, provided	All switch models

BOM part No.	Description	Quantity	Applicable device models
N/A	<p>Grounding cable</p>  <p>The grounding cable in this figure is for illustration only. Your grounding cable might be slightly different from this one.</p>	1, provided	All switch models
N/A	<p>Grounding screw</p> 	1, provided	All switch models
N/A	<p>Power supply filler panel</p> 	1, provided	All switch models
N/A	<p>Interface module filler panel</p>  <p>The interface module filler panel in this figure is for illustration only. Your interface module filler panel might be slightly different from this one.</p>	2, provided	SC 5525-24X-2QE SC 5525-48X-2QE SC 5525-24X-2HE SC 5525-48X-2HE
N/A	<p>AC power cord</p> 	Removable power supply: 1, provided	All switch models
N/A	<p>AC power cord retainer clip</p>  <p>The AC power cord retainer clip in this figure is for illustration only. Your power cord retainer clip might be slightly different from this one.</p>	PSR180-12A-B and PSR180-12A-F power supplies: 1, provided	SC 5525-24X-6H SC 5525-48X-6H
04042967	<p>DB9-to-RJ45 console cable</p> 	1, optional	All switch models
0404A1EE	<p>USB-to-RJ45 console cable</p>	1, optional	All switch models

BOM part No.	Description	Quantity	Applicable device models
			
N/A	<p data-bbox="507 390 778 422">Micro USB console cable</p> 	1, user supplied	SC 5525-24X-2QE SC 5525-48X-2QE SC 5525-24X-2HE SC 5525-48X-2HE

# 2 Installing the switch

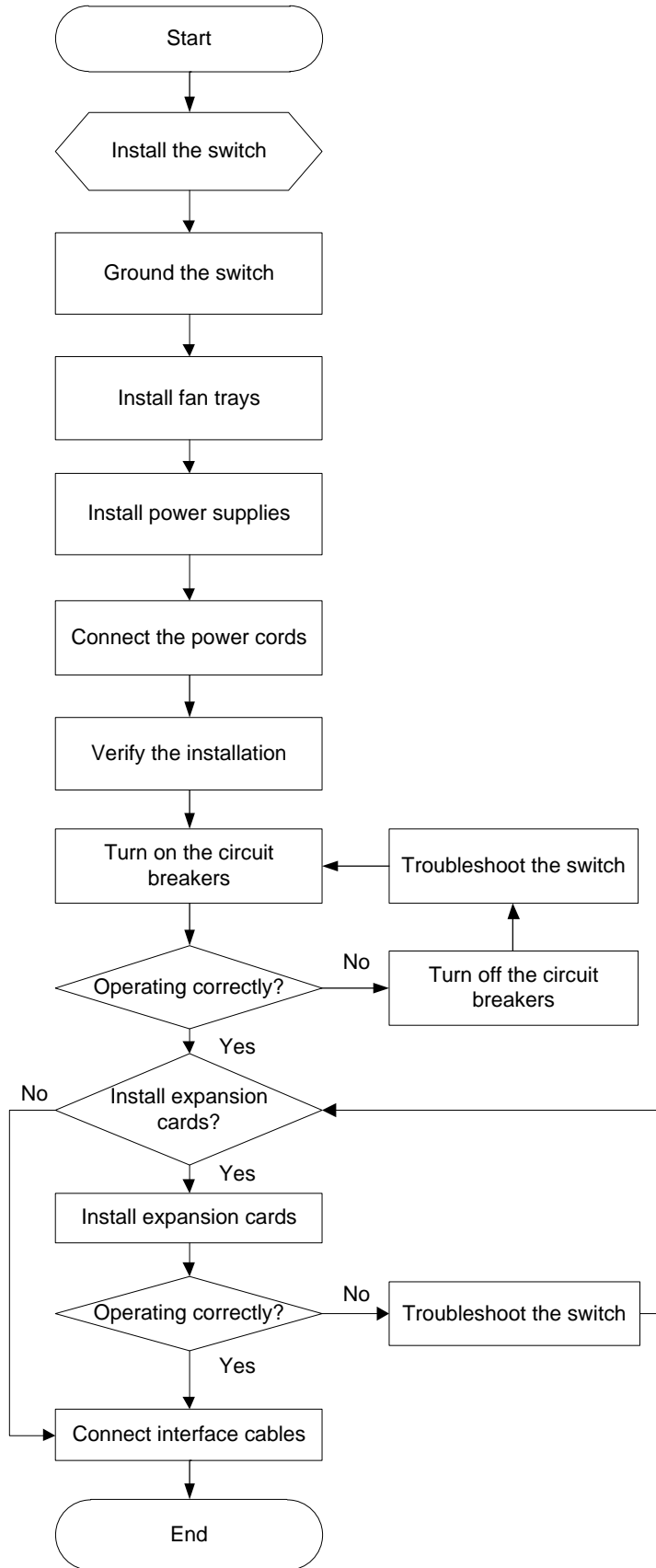
---

**△ CAUTION:**

Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Intelbras for permission. Otherwise, Intelbras shall not be liable for any consequence.

---

Figure2-1 Hardware installation flow



# Installing the switch in a 19-inch rack

## Installation methods

**Table2-2 Installation methods**

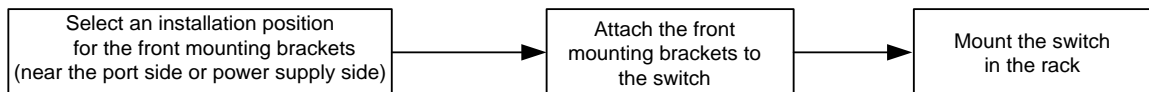
Installation method	Requirements and guidelines	Applicable switch models	Installation procedure
Using front mounting brackets	<ul style="list-style-type: none"> <li>Select an installation position for the front mounting brackets as required: near the power supply side or port side.</li> <li>Make sure the distance between the front rack posts and front door is equal to or greater than 130 mm (5.12 in).</li> <li>Make sure the distance between the front rack posts and rear door is equal to or greater than 550 mm (21.65 in).</li> </ul>	SC 5525-24X-6H SC 5525-48X-6H SC 5525-24X-2QE SC 5525-48X-2QE SC 5525-24X-2HE SC 5525-48X-2HE	See "Rack-mounting the switch by using only front mounting brackets."

**⚠ IMPORTANT:**

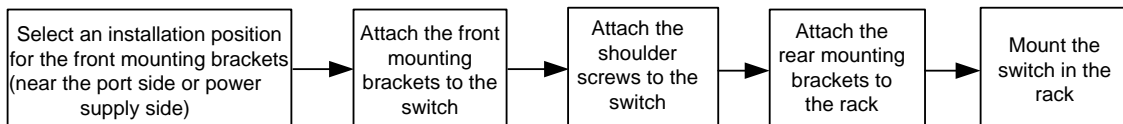
For the rack doors to close easily after switch installation, make sure the distance requirements described in [Table2-2](#) are met.

## Installation procedure at a glance

**Figure2-2 Procedure for installing the switch in a 19-inch rack by using front mounting brackets**



**Figure2-3 Procedure for installing the switch in a 19-inch rack by using front and rear mounting brackets**



**NOTE:**

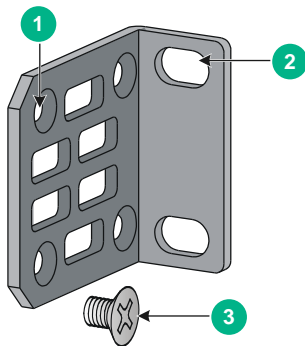
If a rack shelf is available, you can put the switch on the rack shelf, slide the switch to an appropriate location, and attach the switch to the rack by using the mounting brackets.

# Installation accessories

**Table2-3 Installation accessories**

Switch model	Front mounting brackets (as shown in <a href="#">Figure2-4</a> )
SC 5525-24X-2QE	Provided
SC 5525-48X-2QE	
SC 5525-24X-2HE	
SC 5525-48X-2HE	
SC 5525-24X-6H	
SC 5525-48X-6H	

**Figure2-4 Front mounting bracket**



- 
- (1) Screw hole for attaching the bracket to the switch    (2) Screw hole for attaching the bracket to the rack  
(3) M4 screw
- 

## Rack-mounting the switch by using only front mounting brackets

All switch models support rack mounting by using only front mounting brackets.

### Attaching the front mounting brackets to the switch

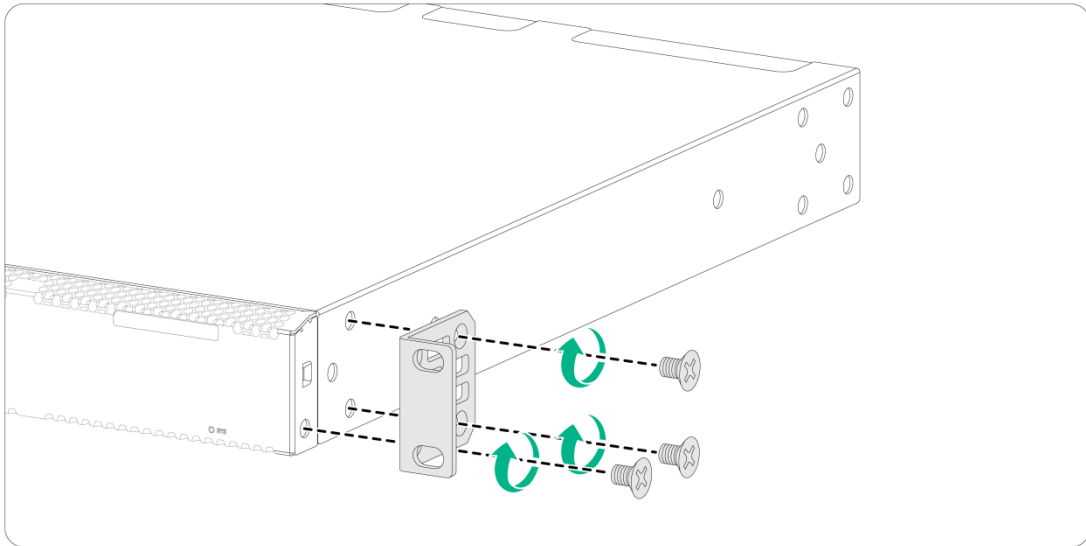
The switch has one mounting position near the network ports and the other mounting position near the power supplies for the front mounting brackets. Select one position as needed.

To attach the front mounting brackets to the chassis:

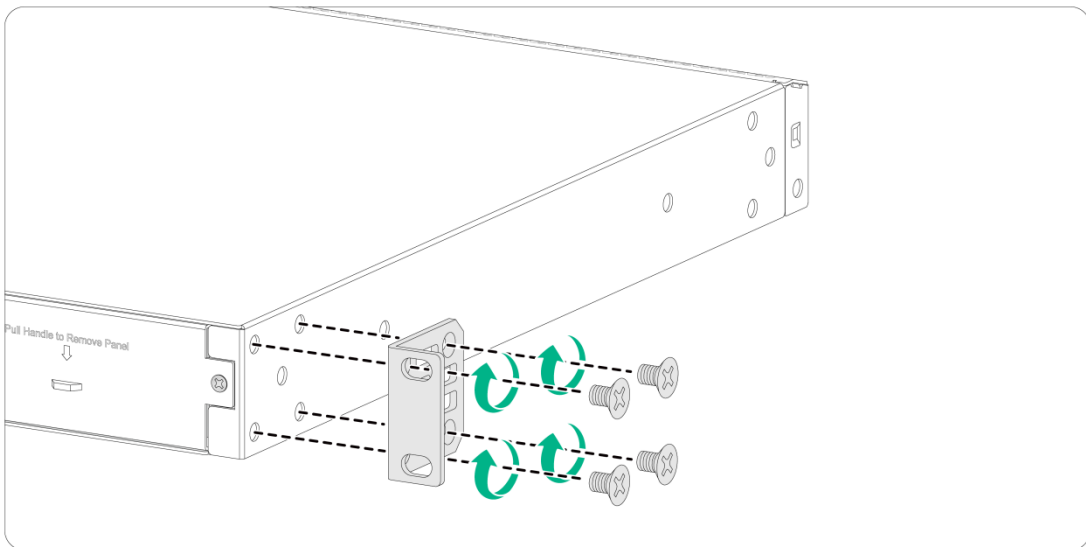
1. Place the wide flange of the mounting bracket against the chassis side panel. Align the mounting bracket installation holes with the screw holes in the chassis.
  - o To install the mounting brackets at the port-side mounting position, see [Figure2-5](#).
  - o To install the mounting brackets at the power supply-side mounting position, see [Figure2-6](#).
2. Fasten the M4 screws to secure the mounting bracket to the switch.
3. Attach the front mounting bracket to the other side of the chassis in the same way.



**Figure2-5 Attaching the front mounting brackets to the port-side mounting position (SC 5525-24X-6H switch as an example)**



**Figure2-6 Attaching the front mounting brackets to the power supply-side mounting position (SC 5525-24X-6H switch as an example)**



## Mounting the switch in the rack

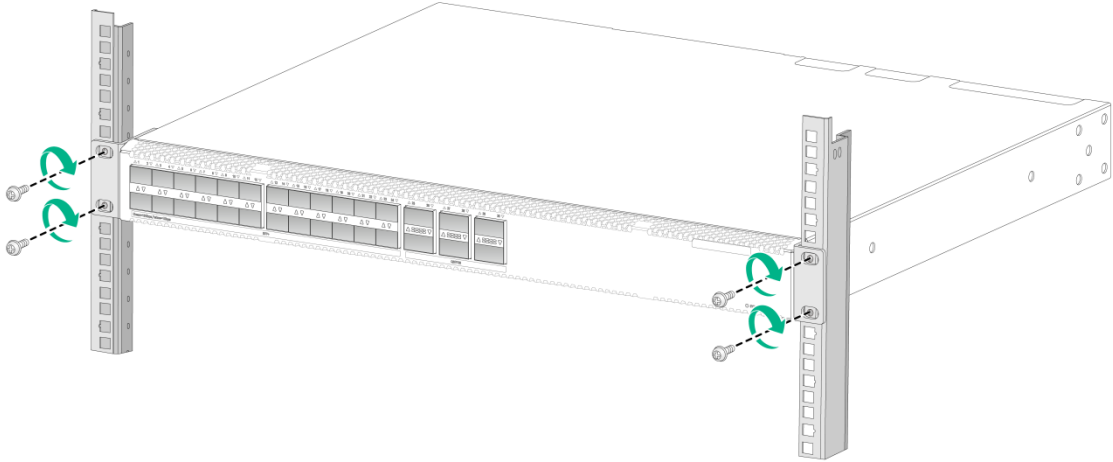
This task requires two people.

To mount the switch in the rack:

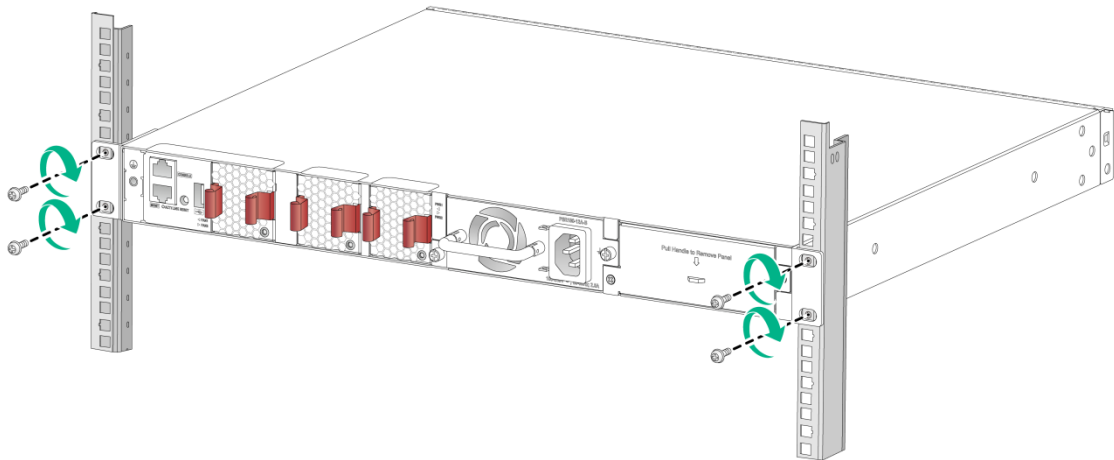
1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Verify that the front mounting brackets have been securely attached to the switch chassis. See "[Attaching the front mounting brackets to the switch.](#)"
3. Attach cage nuts to the front rack posts.
4. One person supports the bottom of the switch, and moves the switch to an appropriate position based on the installation positions of the front mounting brackets.

5. Another person uses M6 screws and cage nuts to attach the mounting brackets to the rack and verifies that the brackets are level and secure.

**Figure2-7 Mounting the switch in the rack (port-side mounting position for the front mounting brackets, SC 5525-24X-6H switch as an example)**



**Figure2-8 Mounting the switch in the rack (power supply-side mounting position for the front mounting brackets, SC 5525-24X-6H switch as an example)**



## Mounting the switch on a workbench

---

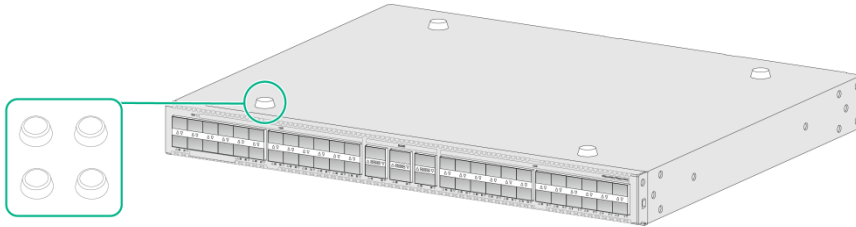
**⚠ IMPORTANT:**

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

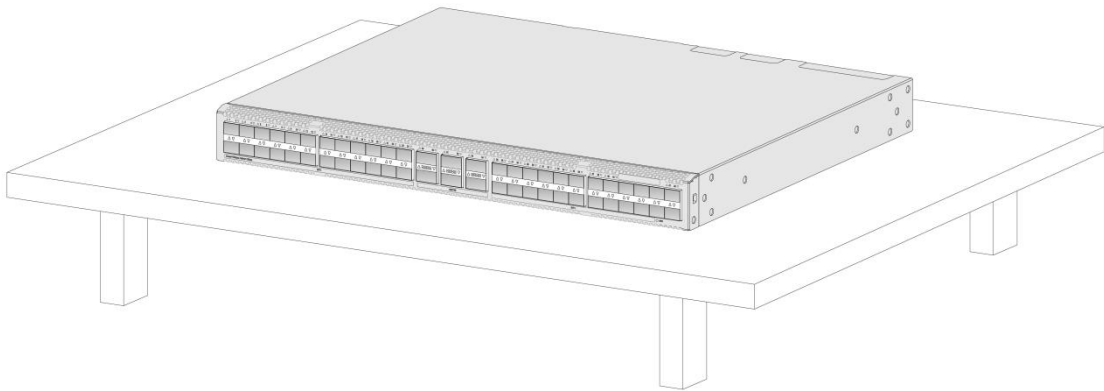
To mount the switch on a workbench:

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

**Figure2-9 Mounting the switch on a workbench (1) (SC 5525-48X-6H switch as an example)**



**Figure2-10 Mounting the switch on a workbench (2) (SC 5525-48X-6H switch as an example)**



## Grounding the switch

---

**⚠ WARNING!**

- Correctly connecting the grounding cable is crucial to lightning protection and ESD and EMI protection. You must connect the grounding cable correctly and reliably for the switch.
- 

To ensure correct operation of electrical devices and personal safety, you must ground electrical devices reliably. Use a grounding cable to connect the device to the earthing facility at the installation site.

Reliable grounding of devices brings the following benefits:

- Protects human body from electric shocks.
- Protects devices and power and data lines from damages.
- Prevents electrical fires, lightning strokes, electromagnetic coupling interferences, ESD damages, and ensures correct operation of the power system.

Select a grounding method based on the installation environment.

---

**NOTE:**

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

---

# Grounding the switch with a grounding strip

**⚠ CAUTION:**

- Connect the grounding cable to the grounding strip in the equipment room. Do not connect it to a fire main or lightning rod.
- To guarantee the grounding effect and avoid switch damage, use the grounding cable provided with the switch to connect the switch to a grounding strip in the equipment room.

If a grounding strip is available at the installation site, use the grounding cable provided with the switch to connect the switch to the grounding strip.

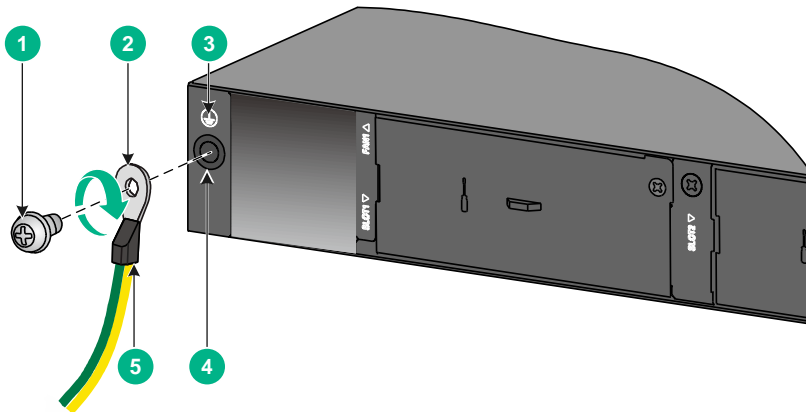
## Connecting the grounding cable to the chassis

1. Remove the grounding screw from the grounding hole in the chassis.
2. Use the grounding screw to attach the ring terminal of the grounding cable to the grounding screw hole. Fasten the screw.

**⚠ IMPORTANT:**

Orient the grounding cable as shown in [Figure2-11](#) so that you can easily install or remove the removable components.

**Figure2-11 Connecting the grounding cable to the chassis**



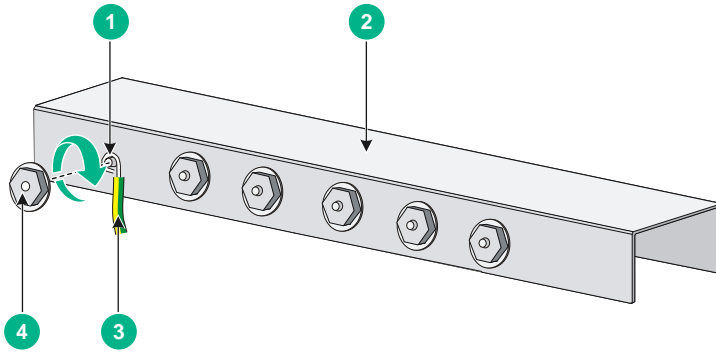
(1) Grounding screw	(2) Ring terminal
(3) Grounding sign	(4) Grounding hole
(5) Grounding cable	

## Connecting the grounding cable to a grounding strip

Use either of the following methods to connect the grounding cable to a grounding strip in the equipment room:

- Method 1
  - a. Use needle-nose pliers to bend the bare metal part to the shape as shown in [Figure2-12](#). Make sure the bended part can securely attached to the grounding post on the grounding strip.
  - b. Attach the bended part of the grounding cable to the grounding post and use the hex nut to fasten the bended part to the post.

**Figure2-12 Connecting the grounding cable to a grounding strip**



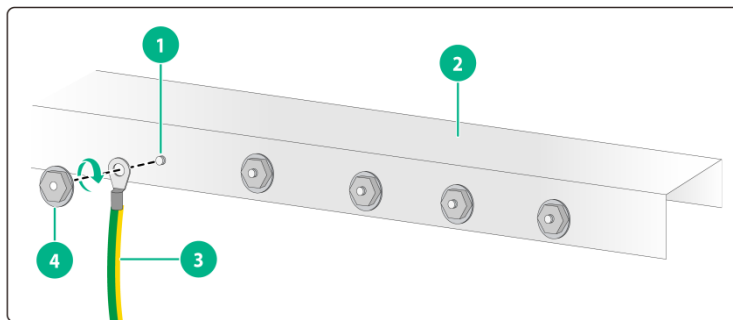
(1) Grounding post	(2) Grounding strip
(3) Grounding cable	(4) Hex nut

- Method 2

If the grounding cable has a ring terminal, use the ring terminal to connect the grounding cable to a grounding strip:

- Remove the hex nut from a ground post on the grounding strip.
- Attach the ring terminal to the grounding post and use the hex nut to secure the ring terminal to the grounding post.

**Figure2-13 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 does not have grounding strips, but earth ground is available, hammer a 2.5 m (8.20 ft) or longer angle iron or steel tube into the earth ground to act as a grounding conductor. Make sure a minimum of 0.7 m (2.30 ft) is left between the top of the grounding conductor and the ground. In cold areas, bury the grounding conductor below the frozen soil layer. In areas with thin soil or rocky gravel, determine the depth for burying the grounding conductor based on the actual condition.

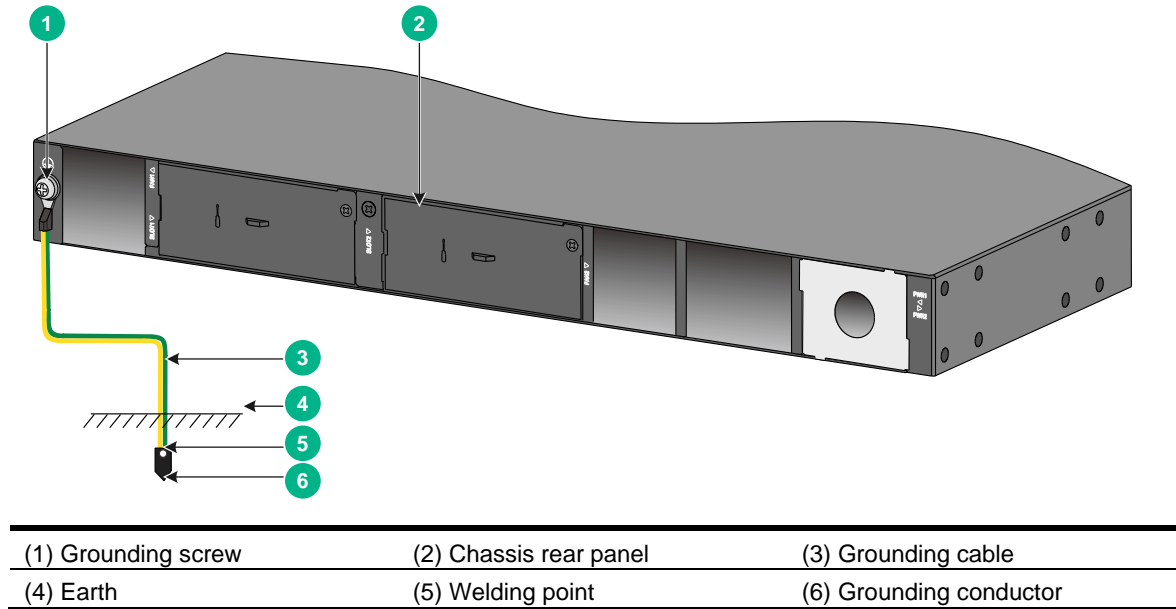
If zinc-coated steel is used, the following dimensions requirements must be met:

- **Angle iron**—A minimum of 50 × 50 × 5 mm (1.97 × 1.97 × 0.20 in).
- **Steel tube**—A minimum of 3.5 mm (0.14 in) in thickness.
- **Flat steel**—A minimum of 40 × 4 mm (1.57 × 0.16 in).

- **Round steel**—A minimum of 10 mm (0.39 in).

Weld the yellow-green grounding cable to the angel iron or steel tube and treat the joint for corrosion protection.

**Figure 2-14 Grounding the switch by burying the grounding conductor into the earth ground**



## Verifying the connection after grounding the switch

- If you ground the switch by using a grounding strip, perform the following tasks:
  - a. Use a multimeter to measure the resistance between the switch grounding terminal and grounding point, and make sure the resistance is less than  $0.1\Omega$ .
  - b. Use a grounding resistance tester to measure the grounding resistance of the grounding strip, and make sure the grounding resistance is less than  $1\Omega$ .
- If you ground the switch by using a grounding conductor buried in the earth ground, perform the following tasks:
  - a. Use a multimeter to measure the resistance between the switch grounding terminal and grounding point, and make sure the resistance is less than  $0.1\Omega$ .
  - b. Use a grounding resistance tester to measure the grounding resistance of the angle iron in the ground, and make sure the grounding resistance is less than  $10\Omega$ . For locations with high soil resistivity, sprinkle some resistance reducer to reduce soil resistivity or replace soil around the grounding strip with soil with lower resistance.

# Installing and removing a fan tray

---

## **△ CAUTION:**

- You can power on the switch only when the switch is fully configured with fan trays of the same model.
  - Do not leave any slots empty when the switch is operating. Install a module or filler panel in the slots.
  - If multiple fan trays fail during switch operation, do not remove them simultaneously. Replace the fan trays one after another and finish replacing each fan tray within 3 minutes.
  - If one fan tray fails while the switch is operating, perform either of the following tasks:
    - If the ambient temperature is not higher than 27°C (80.6°F), replace the fan tray within 24 hours and make sure the failed fan tray is in position before the replacement.
    - If the ambient temperature is higher than 27°C (80.6°F), replace the fan tray immediately.
  - If you power cycle the switch after a fan tray fails, the switch will fail to start up.
- 

The switch comes with empty fan tray slots. Select fan trays for the switch that match the ventilation requirements at the installation site.

- The LSWM1FANSCE fan tray draws in cool air from the faceplate. Its handle is blue.
- The LSWM1FANSCBE fan tray expels hot air from the faceplate. Its handle is red.
- The LSPM1FANSA-SN fan tray draws in cool air from the faceplate.
- The LSPM1FANSB-SN fan tray expels hot air from the faceplate.
- The FAN-40B-1-A fan tray expels hot air from the faceplate. Its handle is red.

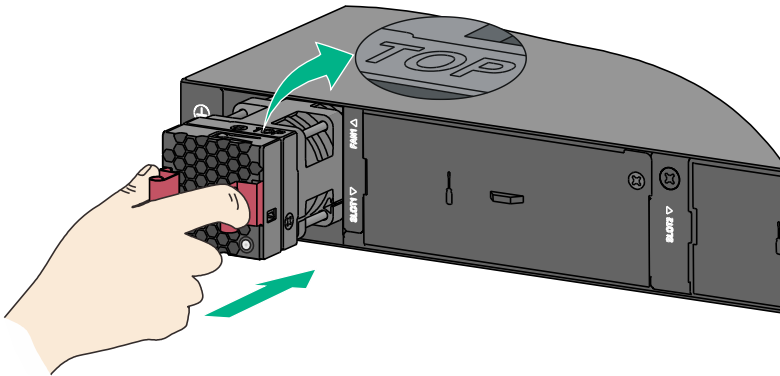
For the fan trays available for the switch and their specifications, see hardware information and specifications for the switch series.

## Installing a fan tray

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Unpack the fan tray and verify that the fan tray model is as required.
3. Orient the fan tray with the TOP mark facing up.
4. Align the fan tray with the fan tray slot. Holding the fan tray handles, slide the fan tray into the slot along the guide rails. Make sure the fan tray is fully seated in the slot and has a firm contact with the backplane.

To prevent damage to the fan tray or the connectors in the chassis, insert the fan tray gently. If you encounter a hard resistance while inserting the fan tray, pull out the fan tray and insert it again.

Figure2-15 Installing a fan tray



**!** IMPORTANT:

- In other versions, the switch does not check the preferred airflow direction at system start. You only need to ensure consistent airflow directions of all fan trays on the switch. If the airflow directions of the fan trays are inconsistent, the system outputs traps and logs.

## Removing a fan tray

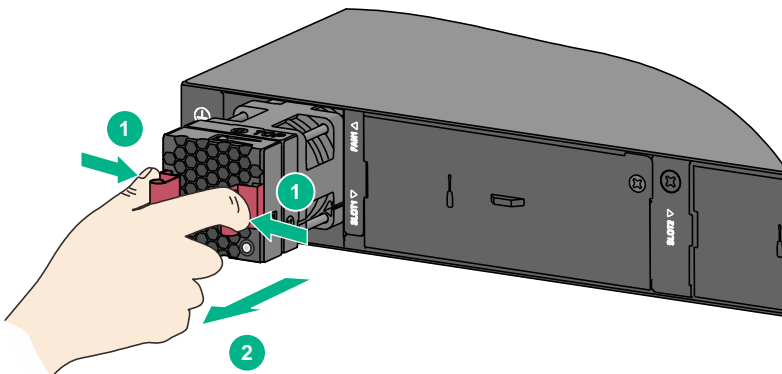
**⚠** WARNING!

- To avoid bodily injury, disturbing the dynamic balance of the fan tray, and causing loud noises, do not touch the rotation axis, or any bare wires, fan blades, or terminals on the fan tray.
- Do not place the fan tray in a moist place. Prevent liquid from entering the fan tray.
- Fan trays with faulty internal wiring and conductors require maintenance from maintenance engineers. Do not disassemble the faulty fan trays.

To remove a fan tray:

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Holding the fan tray handles, pull the fan tray slowly out of the slot along the guide rails.
3. Put the removed fan tray in an antistatic bag.

Figure2-16 Removing a fan tray





# Installing and removing a power supply

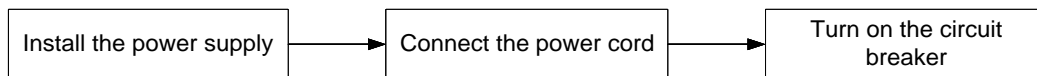
The switch provides two power supply slots. It comes with power supply slot PWR1 empty and power supply slot PWR2 installed with a filler panel. You can install one or two power supplies for the switch as required. For the power supplies available for the switch and their specifications, see hardware information and specifications for the switch series.

---

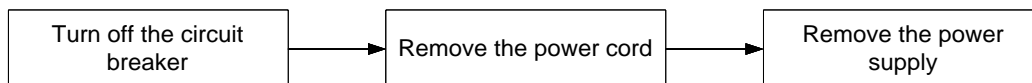
## **⚠ WARNING!**

- To avoid bodily injury or switch damage, strictly follow the procedures in [Figure2-17](#) and [Figure2-18](#) to install and remove a power supply.
  - You must provide a circuit breaker for each power supply.
- 

**Figure2-17 Installation procedure**



**Figure2-18 Removal procedure**



---

## **⚠ CAUTION:**

- To prevent damage to the power supply and the connectors on the backplane, insert the power supply gently. If you encounter a hard resistance when inserting the power supply, pull out the power supply and insert it again. Make sure the power supply has a good contact with the connectors.
  - When the switch has two power supplies working in 1+1 redundancy, removing one power supply does not affect system operation. If the switch has only one power supply, removing the power supply causes power down of the switch.
  - If you are not to install a new power supply after removing the old one, install a filler panel in the slot in time.
  - Use a torque of 5 kgf-cm (0.49 Nm) to fasten the captive screws on a power supply.
- 

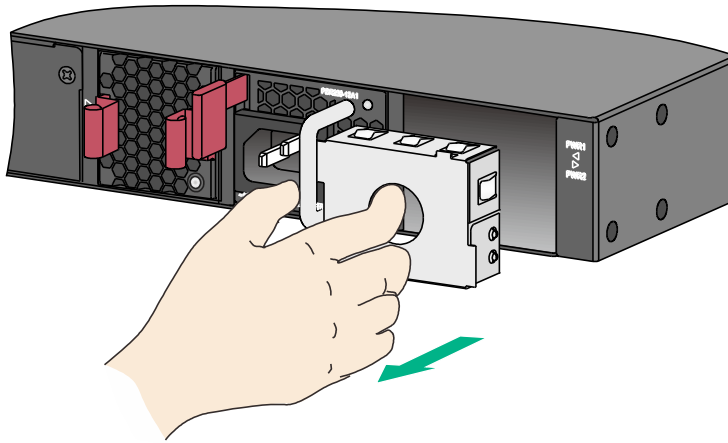
## Installing a PSR250-12A, PSR250-12A1, PSR450-12D, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply

The installation procedure is the same for the PSR250-12A, PSR250-12A1, PSR450-12D, PSR1600-54A-B, PSR920-54A-B, and PSR600-54A-B power supplies. The following procedure installs a PSR250-12A1 power supply.

To install a PSR250-12A1 power supply:

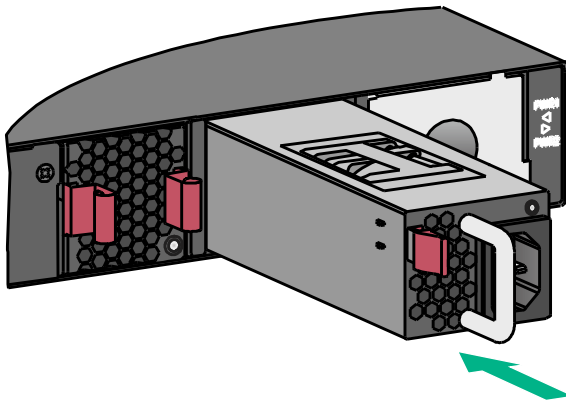
1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Remove the filler panel, if any, from the target power supply slot.  
Put your forefinger into the hole in the filler panel and then pull the filler panel out of the slot gently.  
Keep the removed filler panel secure for future use.

**Figure2-19 Removing the filler panel from the target power supply slot**



3. Unpack the power supply. Make sure the power supply model is as required.  
Keep the packaging box and packaging bag for the power supply secure for future use.
4. Correctly orient the power supply. Make sure the lettering on the power supply is upward.
5. Align the power supply with the power supply slot. Grasping the handle of the power supply with one hand and supporting its bottom with the other, slide the power supply slowly into the slot along the guide rails until the latch of the power supply clicks into the slot.  
To prevent damage to the power supply or the connectors on the backplane, insert the power supply gently. If you encounter a hard resistance when inserting the power supply, pull out the power supply and insert it again.

**Figure2-20 Installing a power supply**



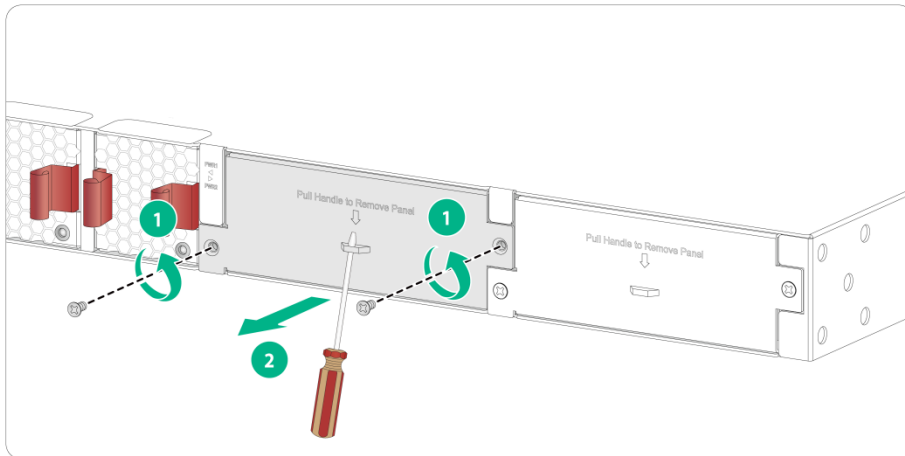
## Installing a PSR180-12A-F or PSR180-12A-B power supply

The installation procedure is the same for the PSR180-12A-F and PSR180-12A-B power supplies. The following procedure installs a PSR180-12A-B power supply.

To install a PSR180-12A-B power supply:

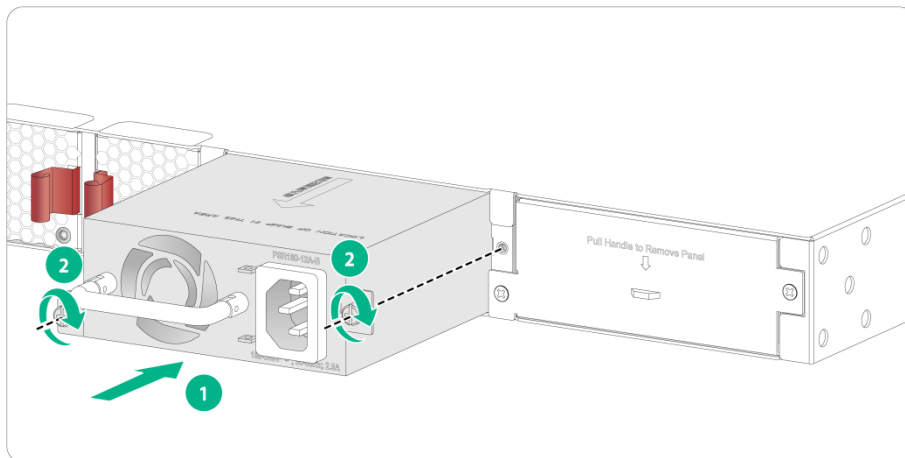
1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Remove the filler panel from the target power supply slot as follows:
  - a. Remove the screws from the filler panel.
  - b. Use a flathead screwdriver to remove the filler panel.

**Figure2-21 Removing the filler panel**



3. Unpack the power supply and verify that the power supply model is correct.
4. Correctly orient the power supply with the power supply slot (use the letters on the power supply faceplate for orientation), grasp the handle of the power supply with one hand and support its bottom with the other, and slide the power supply slowly along the guide rails into the slot (see callout 1 in [Figure2-22](#)).
5. Fasten the captive screws on the power supply with a Phillips screwdriver to secure the power supply in the chassis (see callout 2 in [Figure2-22](#)). If the captive screw cannot be tightly fastened, verify the installation of the power supply.  
As a best practice, use a torque of 5 kgf-cm (0.49 Nm) to fasten the captive screws.
6. Install the filler panel over the empty power supply slot to prevent dust and ensure good ventilation if you install only one power supply.

**Figure2-22 Installing a power supply**



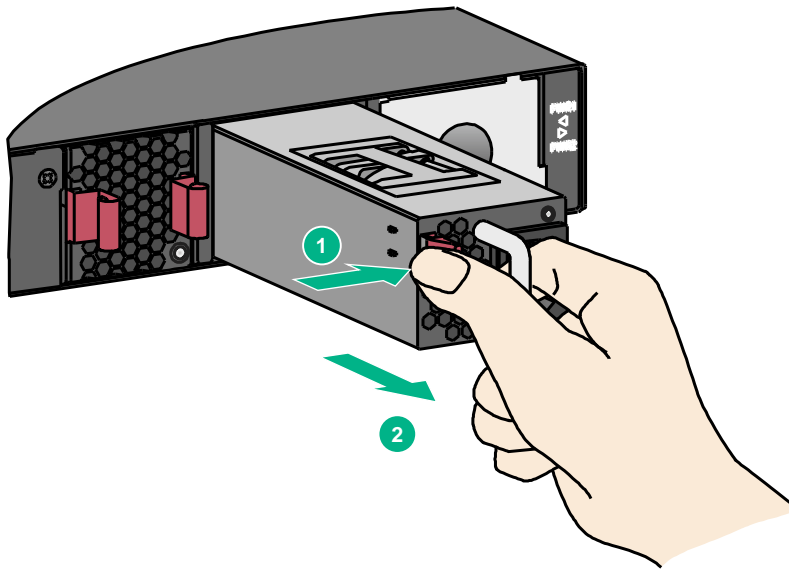
## Removing a PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply

The removal procedure is the same for the PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, and PSR600-54A-B power supplies.

To remove a PSR250-12A1 power supply:

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Disconnect the power cord.
3. Press the latch on the power supply towards the handle side, and pull the power supply part way out of the slot along the guide rails.
4. Grasping the handle of the power supply with one hand and supporting module bottom with the other, pull the power supply slowly out of the slot along the guide rails.
5. Place the removed power supply on an anti-static mat or put it into its packaging bag.
6. If you are not to install a new power supply in the slot, install a filler panel in the slot to prevent dust and ensure good ventilation.

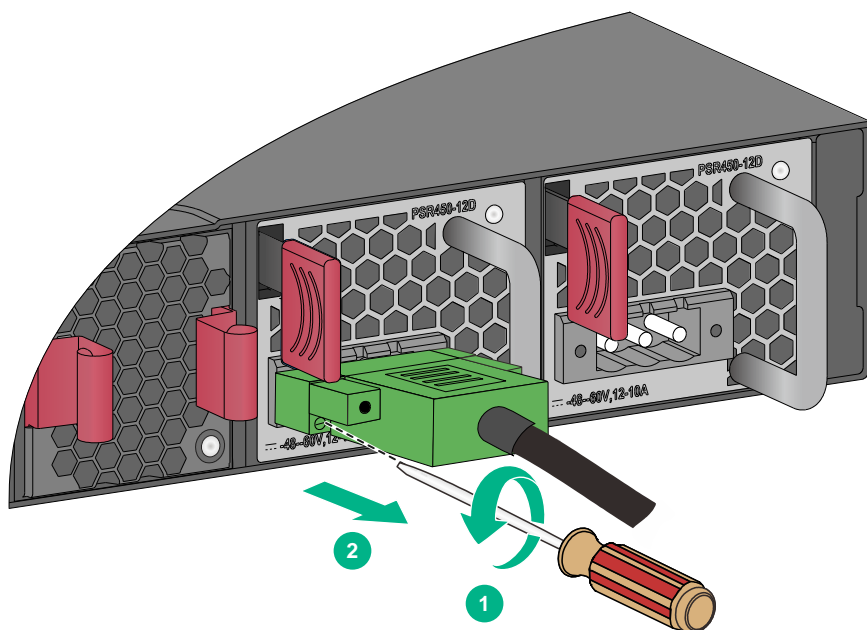
**Figure2-23 Removing a power supply**



## Removing a PSR450-12D power supply

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Remove the power cord from the power supply. As shown in [Table3-3](#), use a flathead screwdriver to loosen the two screws on the power cord connector and then pull the connector out.
3. Holding the power supply handle with one hand and using your thumb to press the latch on the power supply rightwards, pull the power supply part way out of the slot. Supporting the power supply bottom with the other, pull the power supply slowly out of the slot.

Figure 2-24 Removing the power cord from a PSR450-12D power supply



- 
- (1) Use a flathead screwdriver to loosen the two screws on the power cord connector
  - (2) Pull the power cord connector out
- 

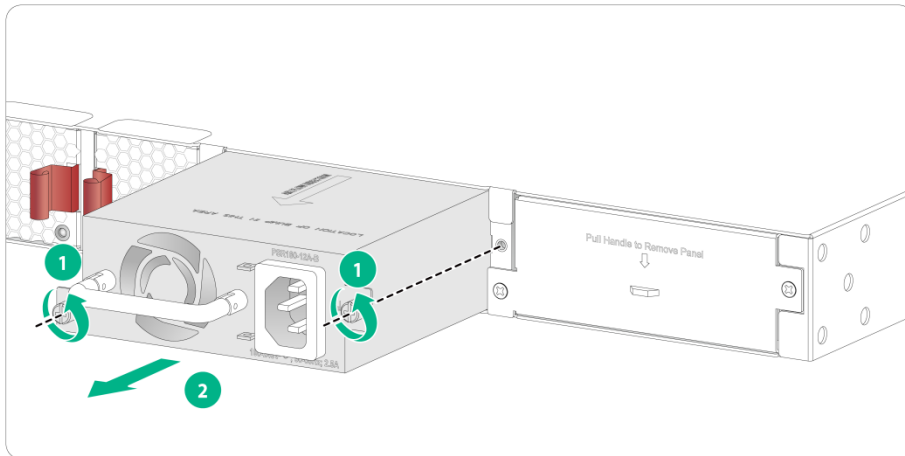
## Removing a PSR180-12A-F or PSR180-12A-B power supply

The removal procedure is the same for the PSR180-12A-F and PSR180-12A-B power supplies. The following procedure removes a PSR180-12A-B power supply.

To remove a PSR180-12A-B power supply:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Disconnect the power cord.
3. Loosen the captive screws on the power supply with a Phillips screwdriver until they are completely disengaged.
4. Grasp the handle of the power supply with one hand and pull it out a little, support the bottom with the other hand, and pull the power supply slowly along the guide rails out of the slot.  
Put away the removed power supply in an antistatic bag or the power supply package bag for future use.

**Figure2-25 Removing a power supply**



## Connecting the power cord

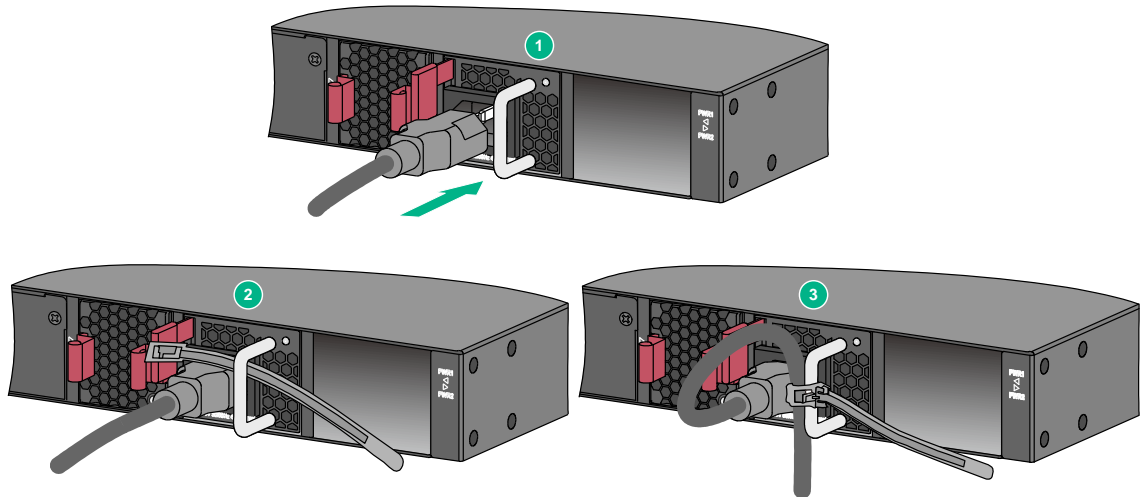
### Connecting the power cord for a PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, or PSR600-54A-B power supply

The power cord connection procedure is the same for the PSR250-12A, PSR250-12A1, PSR1600-54A-B, PSR920-54A-B, and PSR600-54A-B power supplies. The following procedure connects the power cord for a PSR250-12A1 power supply.

To connect the power cord for a PSR250-12A1 power supply:

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Plug the female connector of the power cord into the power receptacle on the power supply, as shown by callout 1 in [Figure2-26](#).
3. Use a cable tie to secure the power cord to the handle of the power supply, as shown by callout 2 and callout 3 in [Figure2-26](#).
4. Connect the other end of the power cord to an AC power source or a high-voltage DC power source.

**Figure2-26 Connecting the power cord for a PSR250-12A1 power supply**



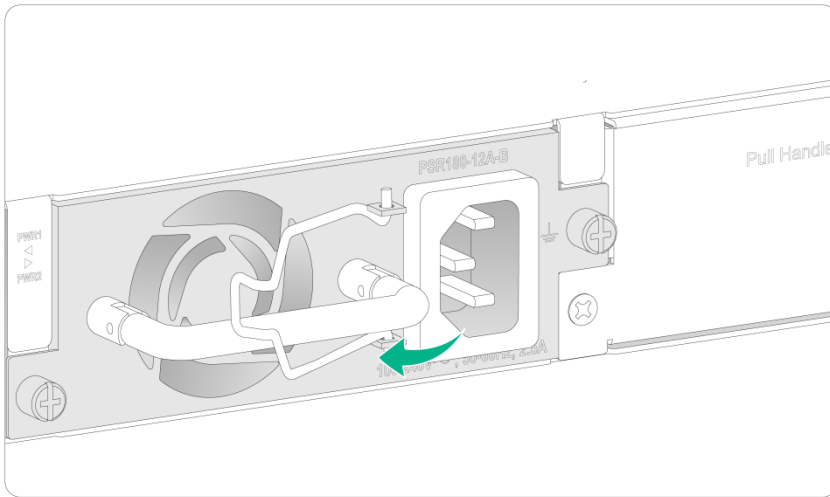
## Connecting the power cord for a PSR180-12A-F or PSR180-12A-B power supply

The power cord connection procedure is similar for the PSR180-12A-F and PSR180-12A-B power supplies. The following procedure connects the power cord for a PSR180-12A-B power supply.

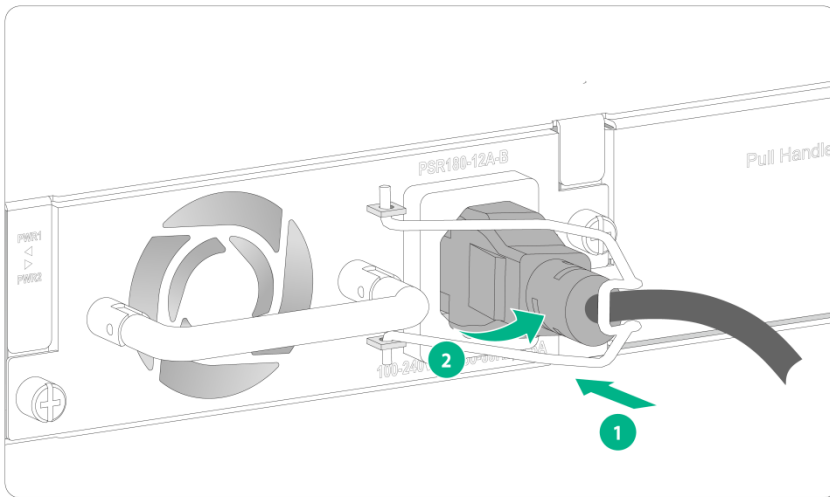
To connect the power cord for a PSR180-12A-B power supply:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Attach the power cord retainer clip (supplied with the power supply) into the two holes next to the AC-input power receptacle on the power supply, and pull the retainer clip leftwards (see [Figure2-27](#)).
3. Connect the female connector of the AC power cord supplied with the power supply to the power receptacle (see callout 1 in [Figure2-28](#)).
4. Pull the retainer clip rightwards to secure the connector to the AC-input power receptacle (see callout 2 in [Figure2-28](#)).
5. Connect the other end of the power cord to an AC power source.

**Figure2-27 Connecting a power cord (1)**



**Figure2-28 Connecting a power cord (2)**

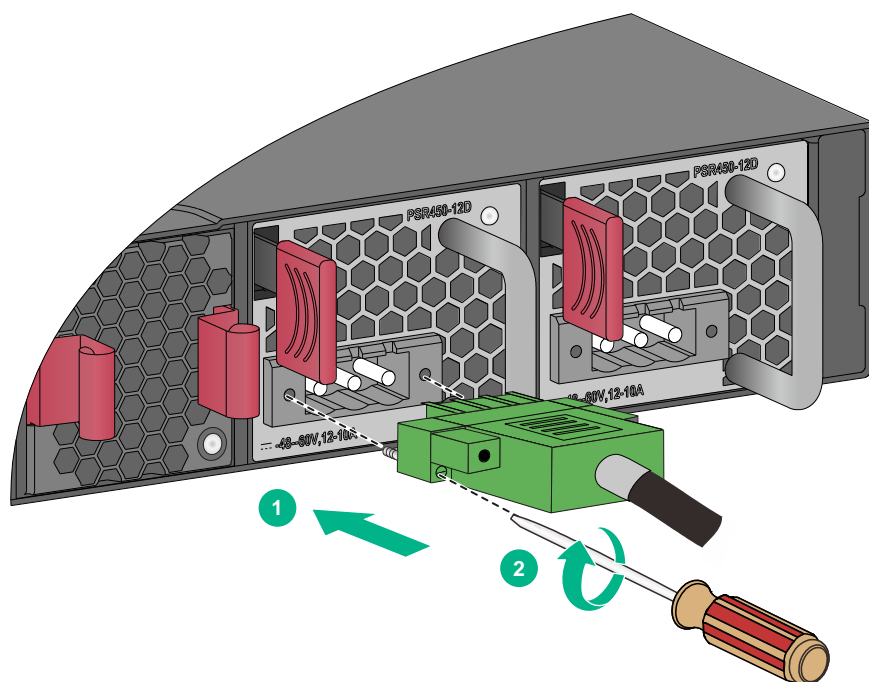


## Connecting the DC power cord for a PSR450-12D power supply

1. Correctly orient the DC power cord connector and insert it into the DC power input receptacle on the power supply, as shown by callout 1 in [Figure2-29](#).  
If you orient the DC power cord connector upside down, you cannot insert it into the DC power input receptacle.
2. Use a flathead screwdriver to fasten the two screws on the power cord connector to secure the connector in place, as shown by callout 2 in [Figure2-29](#).
3. Connect the other end of the DC power cord to an external DC power supply system.



Figure2-29 Connecting the DC power cord for a PSR450-12D power supply



## Installing and removing an expansion card

### ⚠ CAUTION:

- Do not touch the surface-mounted components on an expansion card directly with your hands.
- Do not use excessive force when you install or remove an expansion card.
- You can install or remove an expansion card when the switch is operating correctly. Do not install or remove an expansion card while the switch is starting up.
- Only the LSWM124MUPWR interface module cannot be hot swapped. The other interface modules can be hot swapped.

The SC 5525-24X-2QE, SC 5525-48X-2QE, SC 5525-24X-2HE, and SC 5525-48X-2HE switches each provide two expansion slots on the rear panel. For the expansion cards available for the switch, see hardware information and specifications for the switch series.

The installation and removal procedures are similar for expansion cards. The following procedures install and remove LSWM4SP8PM (with one ejector lever), LSWM124SFPP (with two ejector levers), and LSPM6FWD (without an ejector lever) interface modules.

## Installing an expansion card

To install an expansion card:

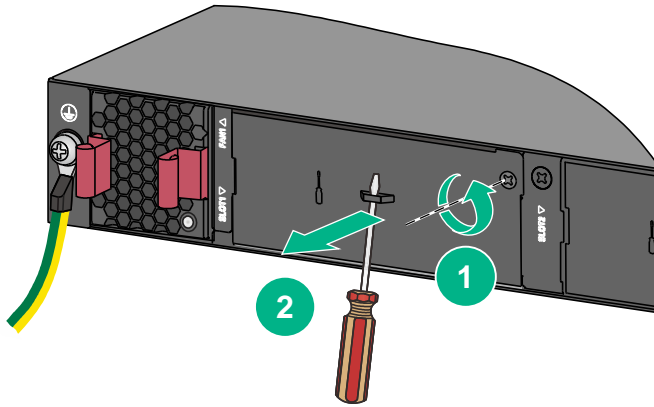
1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Use a Phillips screwdriver to remove the screw on the filler panel in the target expansion slot. Then remove the filler panel.

Keep the filler panel secure for future use.

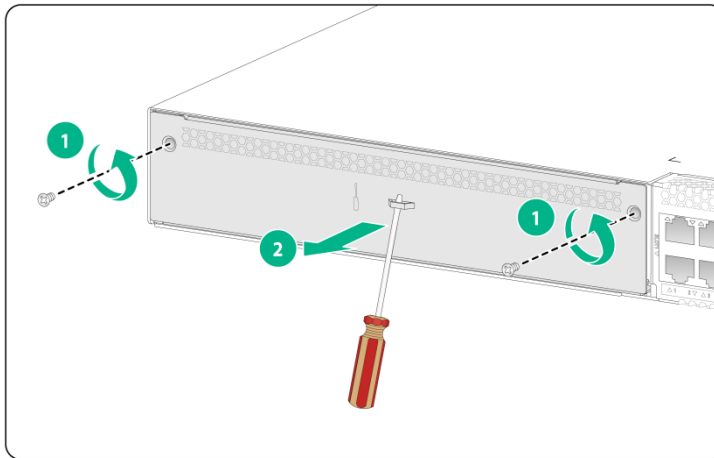
For interface modules other than the LSWM124SFPP and LSWM124MUPWR, use method 1 to remove the filler panel.

For the LSWM124SFPP and LSWM124MUPWR interface modules, use method 2 to remove the filler panel.

**Figure2-30 Removing the filler panel from the target expansion slot (method 1)**

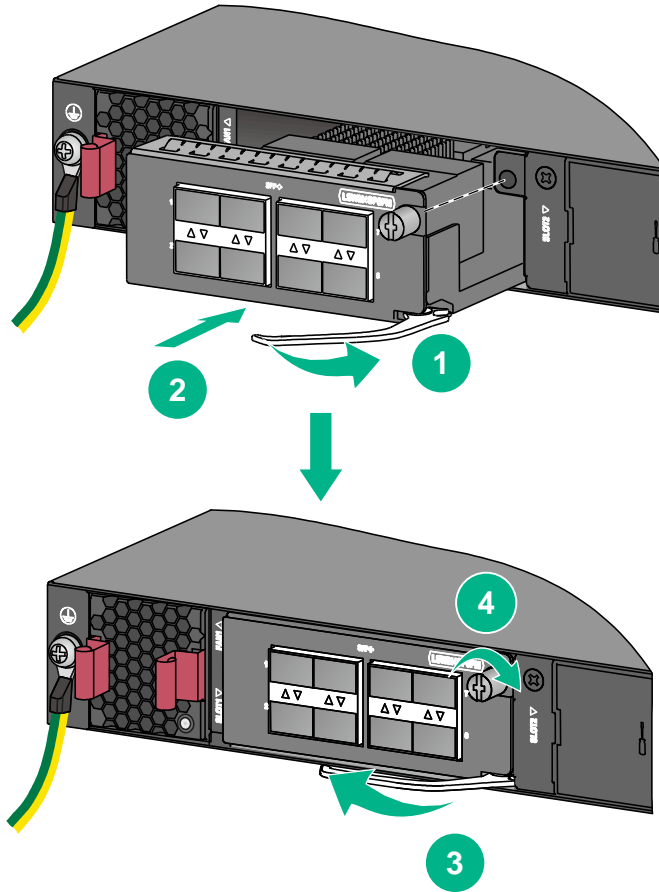


**Figure2-31 Removing the filler panel from the target expansion slot (method 2)**



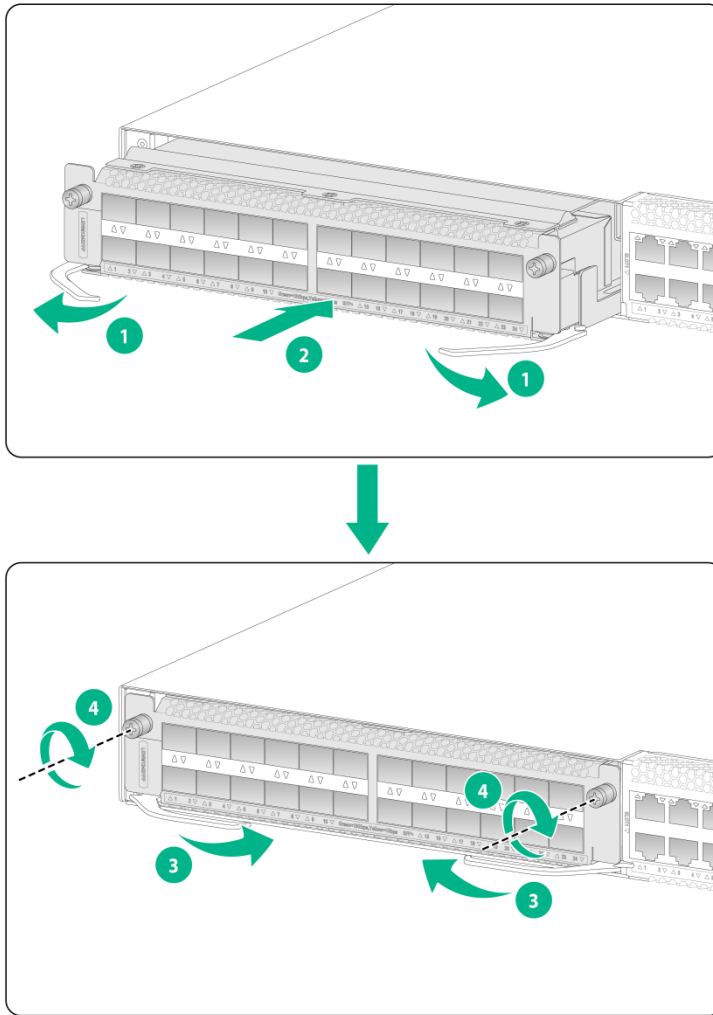
3. Unpack the expansion card.
4. (Optional.) If the expansion card has one ejector lever, perform the following steps to install it:
  - a. Fully open the ejector lever, as shown by callout 1 in [Figure2-32](#).
  - b. Gently push the expansion card into the slot along the guide rails until the expansion card has good contact with the chassis. See callout 2 in [Figure2-32](#).
  - c. Close the ejector lever, as shown by callout 3 in [Figure2-32](#).
  - d. Use a Phillips screwdriver to fasten the captive screw on the expansion card to secure the card in the slot. See callout 4 in [Figure2-32](#).

**Figure2-32** Installing an expansion card with one ejector lever



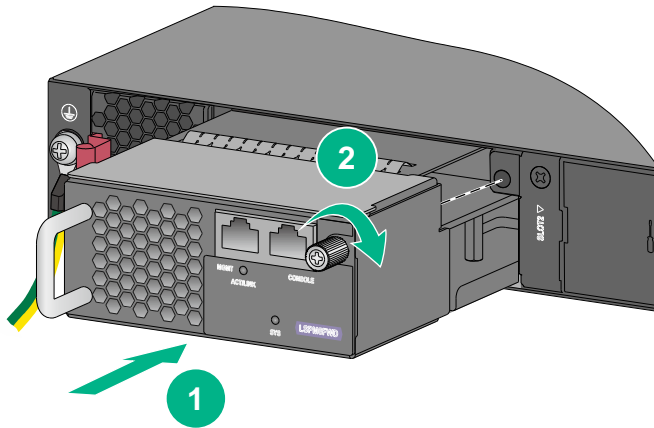
5. (Optional.) If the expansion card has two ejector levers, perform the following steps to install it:
  - a. Rotate outwards the left and right ejector levers of the card, as shown by callout 1 in [Figure2-33](#).
  - b. Gently push the expansion card into the slot along the guide rails until the expansion card has good contact with the chassis, as shown by callout 2 in [Figure2-33](#).
  - c. Rotate inwards the left and right ejector levers, as shown by callout 3 in [Figure2-33](#).
  - d. Use a Phillips screwdriver to fasten the captive screws on the expansion card, as shown by callout 4 in [Figure2-33](#).

**Figure2-33 Installing an expansion card with two ejector levers (LSWM124SFPP)**



6. (Optional.) If the expansion card does not have an ejector lever, perform the following steps to install it:
  - a. Gently push the expansion card into the slot along the guide rails until the expansion card has good contact with the chassis. See callout 1 in [Figure2-34](#).
  - b. Use a Phillips screwdriver to fasten the captive screw on the expansion card to secure the card in the slot. See callout 2 in [Figure2-34](#).

**Figure2-34 Installing an expansion card without an ejector lever (LSPM6FWD)**



---

**NOTE:**

An LSPM6FWD firewall card including its handle adds 75 mm (2.95 in) to the chassis depth.

---

## Removing an expansion card

1. Wear an ESD wrist strap. Make sure the strap makes good skin contact and is reliably grounded.
2. Use a Phillips screwdriver to remove the captive screw on the expansion card.
3. Fully open the ejector lever.  
Skip this step for an expansion card that does not have an ejector lever.
4. Gently pull the expansion card out of the slot along the guide rails.
5. If you are not to install a new expansion card, install a filler panel in the slot to prevent dust and ensure good ventilation in the switch.

## Verifying the installation

Before powering on the switch, verify the following items:

- There is enough space around the switch for heat dissipation.
- The rack or workbench on which the switch is mounted is stable.
- The grounding cable is securely connected.
- The power source specifications are as required by the device.
- The power cords are correctly connected.
- If part of the network cable for a port is routed outdoors, verify that a network port lightning protector is used for the port.
- If a power line is routed from outdoors, verify that a surge protected power strip is used for the switch.

# 3 Accessing the switch for the first time

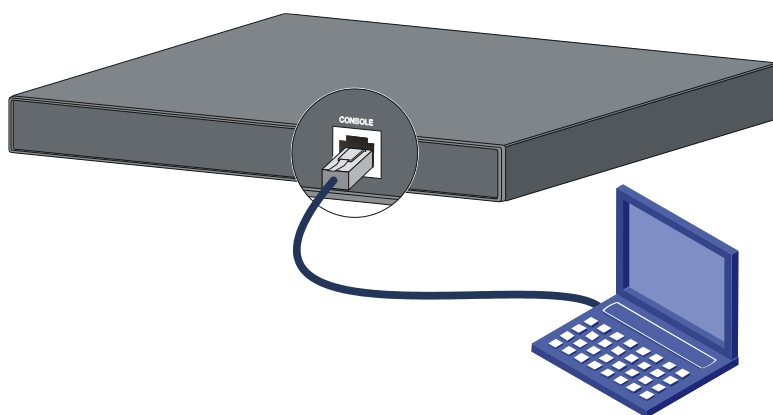
## Connecting the switch to a configuration terminal

The SC 5525-24X-2QE, SC 5525-48X-2QE, SC 5525-24X-2HE, and SC 5525-48X-2HE switches each provide a serial console port and a micro USB console port for connecting to a configuration terminal. If you connect configuration terminals to both ports, only the micro USB console port is effective.

The SC 5525-24X-6H and SC 5525-48X-6H switches each provide only a serial console for connecting to a configuration terminal.

In [Figure3-1](#), the switch is connected to a configuration terminal (PC as an example) from the serial console port.

**Figure3-1 Connecting the switch to a configuration terminal**



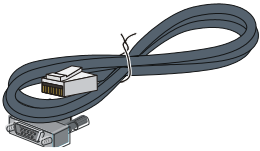


As shown in [Table3-1](#), three types of console cables can be used for connecting the switch to a configuration terminal. The switch is not provided with a serial console cable or a micro USB console cable.

**Table3-1 Connection methods and console cables**

Connection method	Applicable switch models	Console cable type	Configuration terminal-side connector	Switch-side connector
Using the serial console port for connection	All SC 5525 models	DB9-to-RJ45 console cable	DB-9 female connector	RJ-45 connector
		USB-to-RJ45 console cable	USB connector	RJ-45 connector
Using the micro USB console port for connection	SC 5525-24X-2QE SC 5525-48X-2QE SC 5525-24X-2HE SC 5525-48X-2HE	Micro USB console cable	USB connector	Micro USB connector

The signal pinout for the RJ-45 connector of a serial console cable varies by vendor. To avoid abnormal configuration terminal display, use a serial console cable provided by Intelbras. For more information, see [Table3-2](#). To prepare a serial console cable yourself, make sure the signal pinout for the RJ-45 connector is the same as that shown in [Table3-3](#).

**Table3-2 Console cable views**

Console cable type	Console cable view	Product code for the recommended Intelbras console cable
DB9-to-RJ45 console cable		04042967
USB-to-RJ45 console cable		0404A1EE
Micro USB console cable		User supplied,

## Connecting a DB9-to-RJ45 console cable

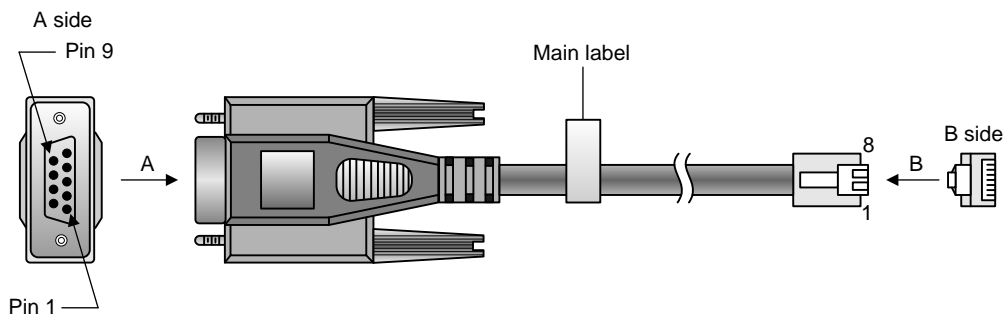
### ⚠ CAUTION:

Follow these guidelines when you connect a DB9-to-RJ45 console cable:

- Identify the mark on the serial console port and make sure you are connecting to the correct port.
- 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.

A DB9-to-RJ45 console cable is an 8-core shielded cable, with a crimped RJ-45 connector at one end for connecting to the serial console port of the switch, and a DB-9 female connector at the other end for connecting to the serial port on the console terminal.

**Figure3-2 DB9-to-RJ45 console cable**



**Table3-3 DB9-to-RJ45 console cable signal pinout**

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 the switch to a configuration terminal (for example, a PC) through a DB9-to-RJ45 console cable:

1. Plug the DB-9 female connector of the DB9-to-RJ45 console cable to the serial port on the PC.
2. Connect the RJ-45 connector to the serial console port on the switch.

## Connecting a USB-to-RJ45 console cable

### ⓘ **IMPORTANT:**

- To use a USB-to-RJ45 console cable to connect the switch to a configuration terminal, first download and install the USB-to-RJ45 console driver on the configuration terminal and then connect the USB-to-RJ45 console cable to the configuration terminal.
- If you have connected a USB-to-RJ45 console cable to the configuration terminal before driver installation, you must remove and reconnect the USB-to-RJ45 console cable to the configuration terminal.

For information about the signal pinout for the RJ-45 connector of a USB-to-RJ45 console cable, see [Table3-3](#).

The following installs the driver on the Windows system. To install the driver on other operating systems, see the installation guide in the driver compression package named by the corresponding operating system.

To connect the switch to the configuration terminal through a USB-to-RJ45 console cable.

## Connecting a micro USB console cable

A micro USB console cable has a micro USB Type B connector at one end to connect to the micro USB console port of the switch, and a standard USB Type A connector at the other end to connect to the USB port on the configuration terminal.

## Setting terminal parameters

To configure and manage the switch through the console port, you must run a terminal emulator program, such as TeraTermPro, on your configuration terminal. You can use the emulator program to connect a network device, a Telnet site, or an SSH site. For more information about the terminal emulator programs, see the user guides for these programs.

Configure the terminal parameters as follows:



- **Bits per second**—9,600.
- **Data bits**—8.
- **Parity**—None.
- **Stop bits**—1.
- **Flow control**—None.

## Starting the switch

### Pre-start checklist

Before powering on the switch, verify the following items:

- Each fan tray slot is installed with a fan tray.
- The power cord is correctly connected.
- The input power voltage is as required by the switch.
- The console cable is correctly connected.
- The PC has started, and the terminal parameters have been correctly configured.

### Powering 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 software-matching release notes for the device.

After the startup process is completed, you can access the CLI to configure the switch.

For more information about the configuration commands and CLI interface, see the configuration guides and command references for the switch series.

# 4 Setting up an IRF fabric (Stacking)

You can use Intelbras IRF technology to connect and virtualize SC 5525 switches into a large virtual switch called an "IRF fabric" for flattened network topology, and high availability, scalability, and manageability.

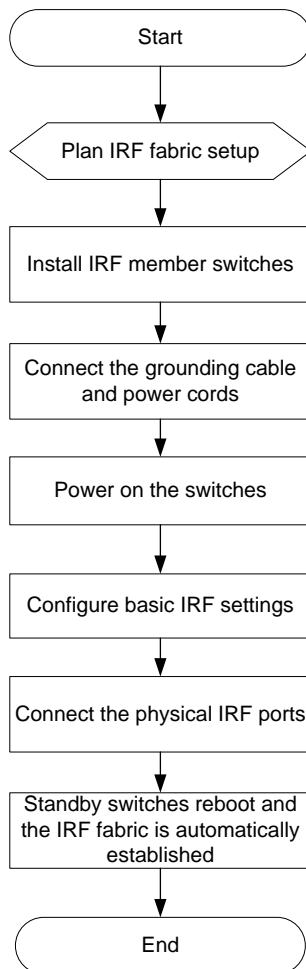
A SC 5525 switch can set up an IRF fabric only with switches from the same switch series.

The models SC 5525-24X-6H and SC 5525-48X-6H can set up an IRF fabric only between them.

All IRF member devices must run the same software image version. Make sure the software auto-update feature is enabled on all member devices.

## IRF fabric setup flowchart

Figure4-1 IRF fabric setup flowchart



To set up an IRF fabric:

Step	Description
1. Plan IRF fabric setup	Plan the installation site and IRF fabric setup parameters: <ul style="list-style-type: none"><li>• <a href="#">Planning IRF fabric size and the installation site</a></li><li>• <a href="#">Identifying the master switch and planning IRF member IDs</a></li><li>• <a href="#">Planning IRF topology and connections</a></li><li>• <a href="#">Identifying physical IRF ports on the member switches</a></li><li>• <a href="#">Planning the cabling scheme</a></li></ul>
2. Install IRF member switches	See " <a href="#">Installing the switch in a 19-inch rack</a> " or " <a href="#">Mounting the switch on a workbench</a> ."
3. Connect grounding cables and power cords	See " <a href="#">Grounding the switch</a> " and " <a href="#">Connecting the power cord</a> ."
4. Power on the switches	N/A
5. Configure basic IRF settings	See the virtual technologies configuration guide in the configuration guides for the switch series.
6. Connect the physical IRF ports	Connect physical IRF ports on switches. All switches except the master switch automatically reboot, and the IRF fabric is established.

## Planning IRF fabric setup

This section describes issues that an IRF fabric setup plan must cover.

### Planning IRF fabric size and the installation site

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

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

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

---

**NOTE:**

For the maximum IRF member devices supported by the switch, see the release notes that come with the switch.

---

# Identifying the master switch and planning IRF member IDs

Determine which switch you want to use as the master for managing all member switches in the IRF fabric.

An IRF fabric has only one master switch. You configure and manage all member switches in the IRF fabric at the CLI of the master switch. IRF 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 virtual technologies configuration guide in the configuration guides for the switch series.

Prepare an IRF member ID assignment scheme. An IRF fabric uses member IDs to uniquely identify and manage its members, and you must assign each IRF member switch a unique member ID.

## Planning IRF topology and connections

You can create an IRF fabric in daisy chain topology or more reliable ring topology. In ring topology, the failure of one IRF link does not cause the IRF fabric to split as in daisy chain topology. Instead, the IRF fabric changes to a daisy chain topology without interrupting network services.

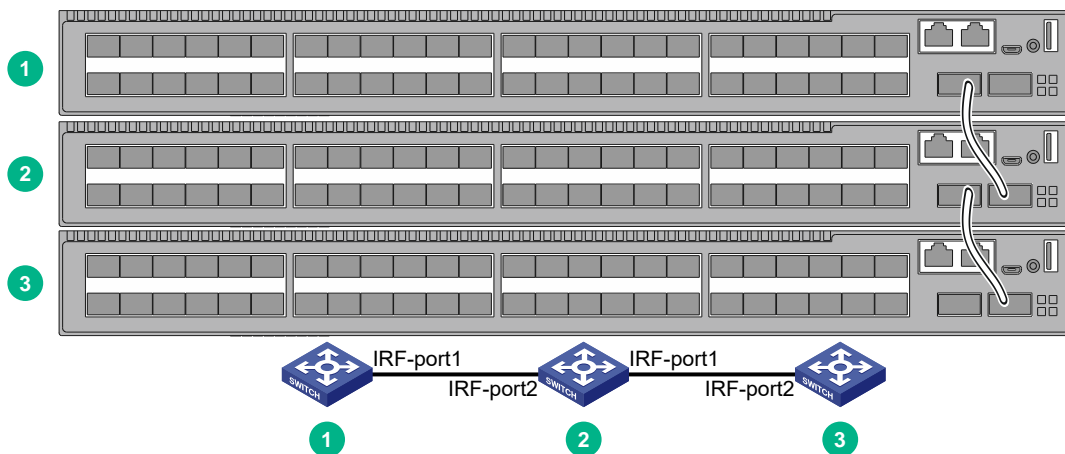
You connect the IRF member switches through IRF ports, the logical interfaces for the connections between IRF member switches. Each IRF member switch has two IRF ports: IRF-port 1 and IRF-port 2. To use an IRF port, you must bind a minimum of one physical port to it.

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

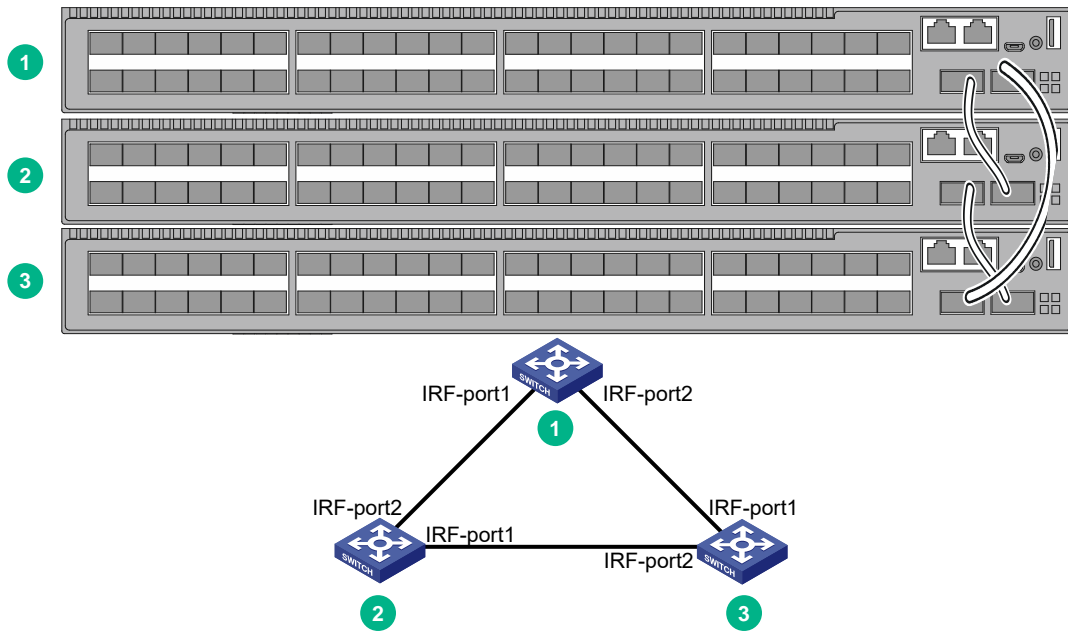
The switch can provide 5G/10GE/25G/40GE/100GE IRF connections. See [Table4-1](#) for the available IRF physical ports. You can bind several IRF physical ports to an IRF port for increased bandwidth and availability.

[Figure4-2](#) and [Figure4-3](#) show the topologies of an IRF fabric made up of three SC 5525-48X-2QE switches. The IRF port connections in the two figures are for illustration only, and more connection methods are available.

**Figure4-2 IRF fabric in daisy chain topology**



**Figure4-3 IRF fabric in ring topology**



## Identifying physical IRF ports on the member switches

Identify the physical IRF ports on the member switches according to your topology and connection scheme.

Table4-1 shows the physical ports that can be used for IRF connection and the port use restrictions.

**Table4-1 Candidate physical IRF ports and their use restrictions**

Chassis	Candidate physical IRF ports	Use restrictions
SC 5525-24X-2QE	<ul style="list-style-type: none"> <li>• 24 × SFP+ ports on the front panel</li> <li>• 2 × QSFP+ ports on the front panel</li> <li>• The following ports provided on the expansion cards:                             <ul style="list-style-type: none"> <li>○ 5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ 10G/5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ SFP+ ports</li> <li>○ QSFP+ ports</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Physical ports on interface modules and the front panel can be bound to the same IRF logical interface.</li> <li>• All physical ports to be bound to an IRF logical interface must have the same data rate.</li> <li>• A QSFP+ port that is split into four virtual SFP+ ports cannot be used as a physical IRF port.</li> <li>• A QSFP28 port that is split into four virtual SFP28 ports cannot be used as a physical IRF port.</li> </ul>
SC 5525-48X-2QE	<ul style="list-style-type: none"> <li>• 48 × SFP+ ports on the front panel</li> <li>• 2 × QSFP+ ports on the front panel</li> <li>• The following ports provided on the expansion cards:                             <ul style="list-style-type: none"> <li>○ 5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ 10G/5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ SFP+ ports</li> <li>○ QSFP+ ports</li> </ul> </li> </ul>	

Chassis	Candidate physical IRF ports	Use restrictions
SC 5525-24X-2HE	<ul style="list-style-type: none"> <li>• 24 × SFP+ ports on the front panel</li> <li>• 2 × QSFP28 ports on the front panel</li> <li>• The following ports provided on the expansion cards: <ul style="list-style-type: none"> <li>○ 5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ 10G/5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ SFP+ ports</li> <li>○ QSFP+ ports</li> </ul> </li> </ul>	
SC 5525-48X-2HE	<ul style="list-style-type: none"> <li>• 48 × SFP+ ports on the front panel</li> <li>• 2 × QSFP28 ports on the front panel</li> <li>• The following ports provided on the expansion cards: <ul style="list-style-type: none"> <li>○ 5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ 10G/5G/2.5G/1000BASE-T autosensing Ethernet ports</li> <li>○ SFP+ ports</li> <li>○ QSFP+ ports</li> </ul> </li> </ul>	
SC 5525-24X-6H	<ul style="list-style-type: none"> <li>• 24 × SFP+ ports on the front panel</li> <li>• 6 × QSFP28 ports on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>• All physical ports to be bound to an IRF logical interface must have the same data rate.</li> <li>• An SFP+ port can be used as an IRF physical port only when it operates in 10 Gbps.</li> <li>• A QSFP28 port can be used as an IRF physical port only when it operates at 100 Gbps.</li> </ul>
SC 5525-48X-6H	<ul style="list-style-type: none"> <li>• 48 × SFP+ ports on the front panel</li> <li>• 6 × QSFP28 ports on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>• All physical ports to be bound to an IRF logical interface must have the same data rate.</li> <li>• An SFP+ port can be used as an IRF physical port only when it operates in 10 Gbps.</li> <li>• A QSFP28 port can be used as a IRF physical port only when it operates at 100 Gbps.</li> </ul>

## Planning the cabling scheme

Use the following cables to connect the IRF physical ports on the switch :

- **5G/2.5G/1000BASE-T, 10G/5G/2.5G/1000BASE-T, and 10G/5G/2.5G/1000/100BASE-T autosensing Ethernet ports**—For the available cables, see hardware information and specifications for the switch series.
- **SFP+ ports**—SFP+ transceiver modules and optical fibers or SFP+ cables. For the available models, see hardware information and specifications for the switch series.
- **QSFP+ ports**—QSFP+ transceiver modules and optical fibers or QSFP+ cables. For the available models, see hardware information and specifications for the switch series.

- **SFP28 ports**—SFP28 transceiver modules and optical fibers or SFP28 cables. For the available models, see hardware information and specifications for the switch series.
- **QSFP28 ports**—QSFP28 transceiver modules and optical fibers or QSFP28 cables. For the available models, see hardware information and specifications for the switch series.

For a short-distance IRF connection in an equipment room, use a twisted pair/SFP+/QSFP+/SFP28/QSFP28 cable.

For a long-distance IRF connection, use SFP+/QSFP+/SFP28/QSFP28 transceiver modules and optical fibers.

The following subsections describe several Intelbras recommended IRF connection schemes by using SFP+ cables and SFP+ transceiver modules and fibers. All these schemes use a ring topology.

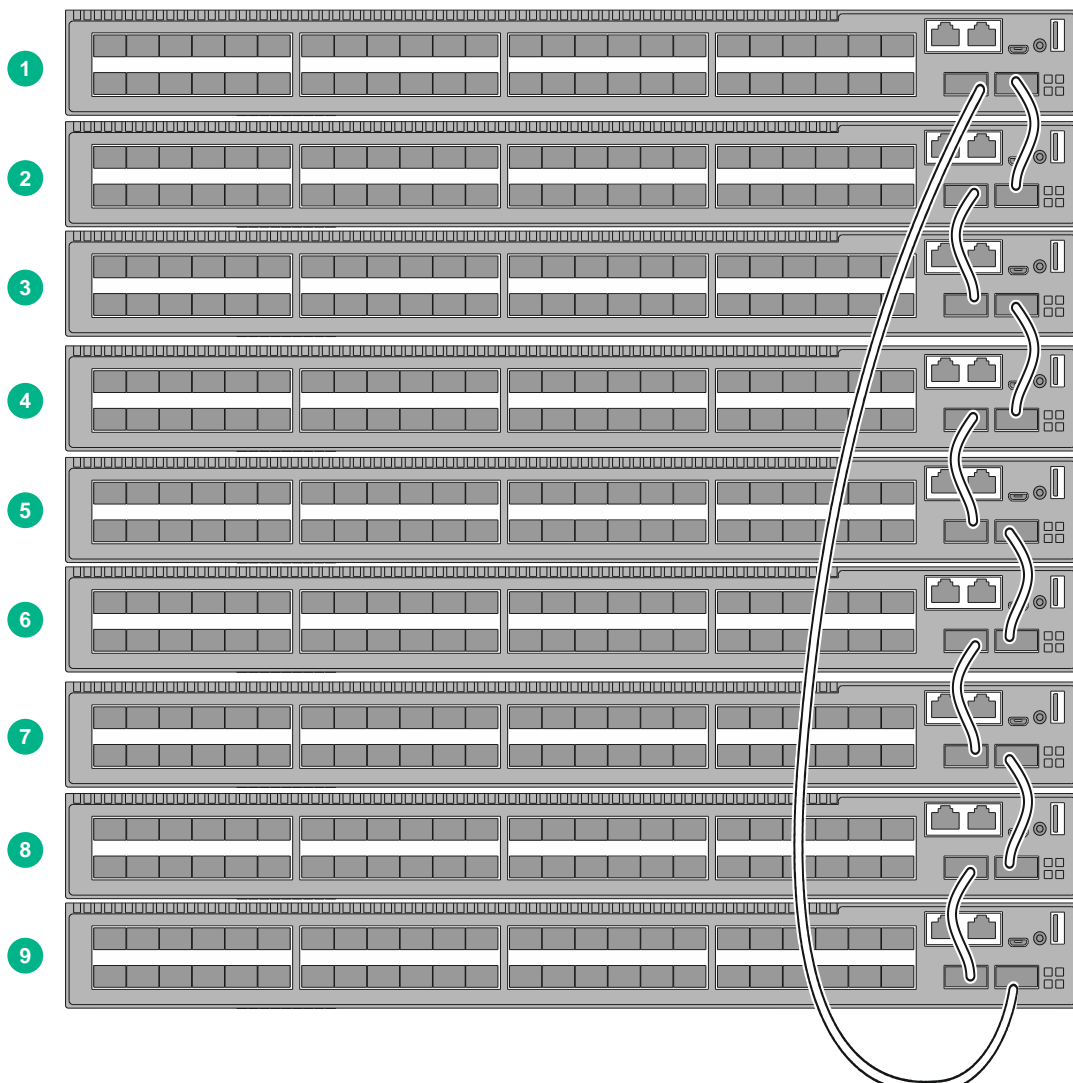
**⚠ IMPORTANT:**

In these schemes, all physical IRF ports are located on the same side. If physical IRF ports are on different sides, you must measure the distance between them to select an appropriate cable.

**Connecting the IRF member switches in one rack**

Connect the IRF member switches (9 switches in this example) in a rack as shown in [Figure4-4](#). The switches in the ring topology (see [Figure4-5](#)) are in the same order as connected in the rack.

**Figure4-4 Connecting the switches in one rack**



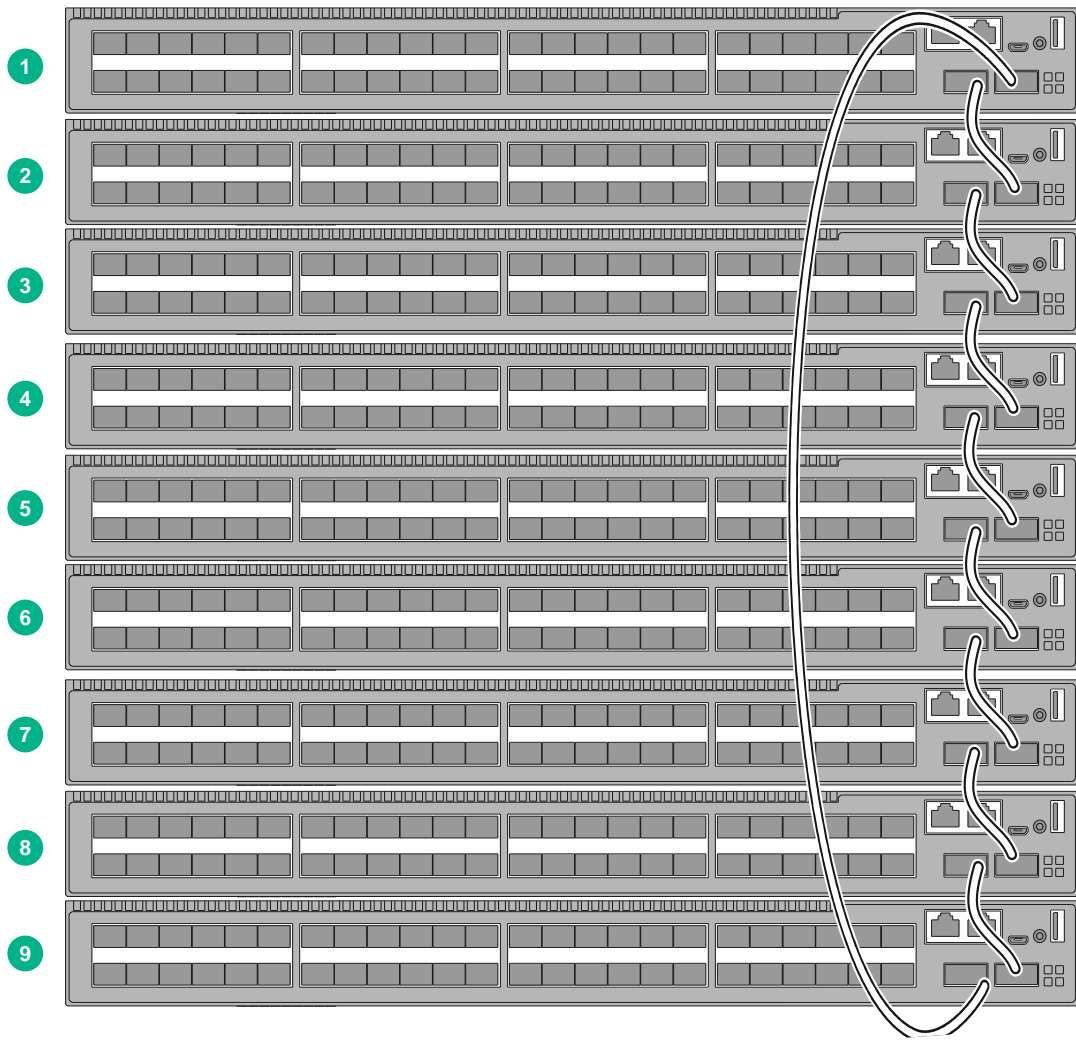
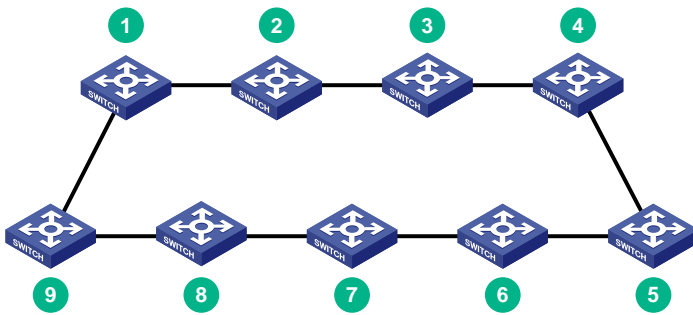


Figure4-5 IRF fabric topology

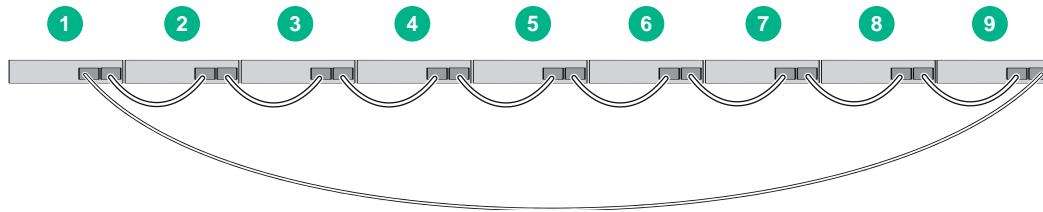




## Connecting the IRF member switches in a ToR solution

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

Figure4-6 ToR cabling



## Configuring basic IRF settings

After you install the IRF member switches, power on the switches, and log in to each IRF member switch (see the fundamentals configuration guide in the configuration guides for the switch series) to configure their member IDs, member priorities, and IRF port bindings.

Follow these guidelines when you configure the switches:

- Assign the master switch higher member priority than any other switch.
- Bind physical ports to IRF port 1 on one switch and to IRF port 2 on the other switch. You perform IRF port binding before or after connecting IRF physical ports depending on the software release.
- To bind the ports on an interface module to an IRF port, you must install the interface module first.
- Execute the **display irf configuration** command to verify the basic IRF settings.

For more information about configuring basic IRF settings, see the virtual technologies configuration guide in the configuration guides for the switch series.

## Connecting the physical IRF ports

Use twisted pair/SFP+/QSFP+/SFP28/QSFP28 cables or SFP+/QSFP+/SFP28/QSFP28 transceiver modules and fibers to connect the IRF member switches as planned.

Wear an ESD wrist strap when you connect twisted pair/SFP+/QSFP+/SFP28/QSFP28 cables or SFP+/QSFP+/SFP28/QSFP28 transceiver modules and fibers. For how to connect them, see *Intelbras Transceiver Modules and Network Cables Installation Guide*.

## Verifying the IRF fabric setup

To verify the basic functionality of the IRF fabric after you finish configuring basic IRF settings and connecting IRF ports:

1. Log in to the IRF fabric through the console port of any member switch.
2. Create a Layer 3 interface, assign it an IP address, and make sure the IRF fabric and the remote network management station can reach each other.
3. Use Telnet, web, or SNMP to access the IRF fabric from the network management station. (See the fundamentals configuration guide in the configuration guides for the switch series.)
4. Verify that you can manage all member switches as if they were one node.
5. Display the running status of the IRF fabric by using the commands in [Table4-2](#).

**Table4-2 Displaying and maintaining IRF configuration and running status**

<b>Task</b>	<b>Command</b>
Display information about the IRF fabric.	<b>display irf</b>
Display all members' IRF configurations that take effect at a reboot.	<b>display irf configuration</b>
Display IRF fabric topology information.	<b>display irf topology</b>

**NOTE:**

To avoid IP address collision and network problems, configure a minimum of one multi-active detection (MAD) mechanism to detect the presence of multiple identical IRF fabrics and handle collisions. For more information about MAD detection, see the virtual technologies configuration guide in the configuration guides for the switch series.

# 5 Maintenance and troubleshooting

## Power supply failure

The SC 5525-24X-2QE, SC 5525-48X-2QE, SC 5525-24X-2HE, and SC 5525-48X-2HE switches each provide two power supply status LEDs PWR1 and PWR2. The PSR250-12A, PSR250-12A1, PSR450-12D, PSR1600B-12A-B, PSR600-54A-B, and PSR920-54A-B power supplies provide also LEDs. You can observe the power supply status LEDs on the switch in combination with the LEDs on the power supplies to identify power supply failures. For information about the LEDs on the power supplies, see the manuals for the power supplies.

For the SC 5525-24X-6H and SC 5525-48X-6H switches, you can determine whether a power supply failure has occurred by observing the system status LED (SYS). For information, see hardware information and specifications for the switch series.

### Symptom

- SC 5525-24X-2QE, SC 5525-48X-2QE, SC 5525-24X-2HE and SC 5525-48X-2HE switches  
The status LED on a power supply in combination with the power supply status LED on the switch indicates that the power supply has failed.
- SC 5525-24X-6H and SC 5525-48X-6H switches  
The system status LED on the switch indicates a power supply failure.

### Solution

To resolve the issue:

1. Verify that the power cord is correctly connected.
2. Verify that the power source meets the requirement.
3. Verify that the operating temperature of the switch is in an acceptable range and the power supply has good ventilation.
4. If the issue persists, contact Intelbras Support.

To replace a power supply, see "[Installing and removing a power supply](#)."

## Fan tray failure

---

### WARNING!

- If both fan trays fail during switch operation, replace them within 2 minutes.
  - If one fan tray fails, perform either of the following tasks:
    - If the ambient temperature is not higher than 27°C (80.6°F), replace the fan tray within 24 hours and make sure the failed fan tray remains in position before the replacement.
    - If the ambient temperature is higher than 27°C (80.6°F), replace the fan tray immediately.
- 

The switch uses removable fan trays. If a fan tray fails, see "[Installing and removing a fan tray](#)" to replace the fan tray.

# Configuration terminal display issues

If the configuration environment setup is correct, the configuration terminal displays booting information when the switch is powered on. If the setup is incorrect, the configuration terminal displays nothing or garbled text.

## No display

### Symptom

The configuration terminal does not have display when the switch is powered on.

### Solution

To resolve the issue:

1. Verify that the power supply is supplying power to the switch correctly.
2. Verify that the console cable is correctly connected.
3. Verify that the console cable does not have any issues and the terminal settings are correct.
4. If the issue persists, contact Intelbras Support.

## Garbled display

### Symptom

The display on the configuration terminal is garbled.

### Solution

To resolve the issue:

1. Verify that the following settings are configured for the terminal:
  - **Baud rate**—9,600.
  - **Data bits**—8.
  - **Stop bits**—1.
  - **Parity**—None.
  - **Flow control**—None.
2. If the issue persists, contact Intelbras Support.

## Warranty term

It is expressly stated that this contractual guarantee is granted subject to the following conditions:

1. All parts, pieces and components of the product are guaranteed against any manufacturing defects that may occur, for a period of 3 (three) years – 3 (three) months of legal warranty and 33 (thirty-three) months months of contractual warranty -, counted from the date of delivery of the product to the Consumer, as stated on the product purchase invoice, which is an integral part of this Term throughout the national territory. This contractual warranty includes the free exchange of parts, pieces and components that present manufacturing defects, including the labor used in this repair. If no manufacturing defect is found, but rather defect(s) arising from inappropriate use, the Consumer will bear these expenses.
2. Installation of the product must be carried out in accordance with the Product Manual and/or Installation Guide. If your product requires installation and configuration by a qualified technician, look for a suitable and specialized professional, as the costs of these services are not included in the value of the product.
3. In the event that the Consumer requests home assistance, he or she must go to the nearest Authorized Service to consult the technical visit fee. If it is found necessary to remove the product, the costs resulting from transport and security to and from the product are the responsibility of the Consumer.
4. In the event that the Consumer requests home assistance, he or she must go to the nearest Authorized Service to consult the technical visit fee. If it is found necessary to remove the product, the resulting expenses, such as transport and security to and from the product, are the responsibility of the Consumer.
5. The guarantee will completely lose its validity in the occurrence of any of the following hypotheses: a) if the defect is not manufacturing, but caused by the Consumer or by third parties outside the manufacturer; b) if damage to the product arises from accidents, accidents, acts of nature (lightning, floods, landslides, etc.), humidity, voltage in the electrical network (overvoltage caused by accidents or excessive fluctuations in the network), installation/use in disagreement with the user manual or resulting from natural wear and tear of parts, pieces and components; c) if the product has been influenced by a chemical, electromagnetic, electrical or animal nature (insects, etc.); d) if the product's serial number has been tampered with or erased; e) if the equipment has been tampered with.
6. This warranty does not cover loss of data, therefore, it is recommended, if applicable to the product, that the Consumer makes a regular backup copy of the data contained in the product.
7. Intelbras is not responsible for the installation of this product, nor for any attempts at fraud and/or sabotage in its products. Keep the software and applications used up to date, if applicable, as well as the necessary network protections to protect against intrusions (hackers). The equipment is guaranteed against defects within its normal conditions of use, and it is important to be aware that, as it is electronic equipment, it is not free from fraud and scams that could interfere with its correct functioning.

The contractual guarantee of this term is complementary to the legal one, therefore, Intelbras S/A reserves the right to change the general, technical and aesthetic characteristics of its products without prior notice.

These being the conditions of this complementary Warranty Term, Intelbras S/A reserves the right to change the general, technical and aesthetic characteristics of its products without prior notice.

## Termo de garantia

Fica expresso que esta garantia contratual é conferida mediante as seguintes condições:

1. Todas as partes, peças e componentes do produto são garantidos contra eventuais defeitos de fabricação, que porventura venham a apresentar, pelo prazo de 3 (três) anos – sendo 3 (três) meses de garantia legal e 33 (trinta e três) meses de garantia contratual –, contado a partir da data de entrega do produto ao Senhor Consumidor, conforme consta na nota fiscal de compra do produto, que é parte integrante deste Termo em todo o território nacional. Esta garantia contratual compreende a troca gratuita de partes, peças e componentes que apresentarem defeito de fabricação, incluindo a mão de obra utilizada nesse reparo. Caso não seja constatado defeito de fabricação, e sim defeito(s) proveniente(s) de uso inadequado, o Senhor Consumidor arcará com essas despesas.
2. A instalação do produto deve ser feita de acordo com o Manual do Produto e/ou Guia de Instalação. Caso seu produto necessite a instalação e configuração por um técnico capacitado, procure um profissional idôneo e especializado, sendo que os custos desses serviços não estão inclusos no valor do produto.
3. Na eventualidade de o Senhor Consumidor solicitar atendimento domiciliar, deverá encaminhar-se ao Serviço Autorizado mais próximo para consulta da taxa de visita técnica. Caso seja constatada a necessidade da retirada do produto, as despesas decorrentes de transporte e segurança de ida e volta do produto ficam sob a responsabilidade do Senhor Consumidor.
4. Na eventualidade de o Senhor Consumidor solicitar atendimento domiciliar, deverá encaminhar-se ao Serviço Autorizado mais próximo para consulta da taxa de visita técnica. Caso seja constatada a necessidade da retirada do produto, as despesas decorrentes, como as de transporte e segurança de ida e volta do produto, ficam sob a responsabilidade do Senhor Consumidor.
5. A garantia perderá totalmente sua validade na ocorrência de quaisquer das hipóteses a seguir: a) se o vício não for de fabricação, mas sim causado pelo Senhor Consumidor ou por terceiros estranhos ao fabricante; b) se os danos ao produto forem oriundos de acidentes, sinistros, agentes da natureza (raios, inundações, desabamentos, etc.), umidade, tensão na rede elétrica (sobretensão provocada por acidentes ou flutuações excessivas na rede), instalação/uso em desacordo com o manual do usuário ou decorrentes do desgaste natural das partes, peças e componentes; c) se o produto tiver sofrido influência de natureza química, eletromagnética, elétrica ou animal (insetos, etc.); d) se o número de série do produto tiver sido adulterado ou rasurado; e) se o equipamento tiver sido violado.
6. Esta garantia não cobre perda de dados, portanto, recomenda-se, se for o caso do produto, que o Consumidor faça uma cópia de segurança regularmente dos dados que constam no produto.
7. A Intelbras não se responsabiliza pela instalação deste produto, e também por eventuais tentativas de fraudes e/ou sabotagens em seus produtos. Mantenha as atualizações do software e aplicativos utilizados em dia, se for o caso, assim como as proteções de rede necessárias para proteção contra invasões (hackers). O equipamento é garantido contra vícios dentro das suas condições normais de uso, sendo importante que se tenha ciência de que, por ser um equipamento eletrônico, não está livre de fraudes e burlas que possam interferir no seu correto funcionamento.

A garantia contratual deste termo é complementar à legal, portanto, a Intelbras S/A reserva-se o direito de alterar as características gerais, técnicas e estéticas de seus produtos sem aviso prévio.

Sendo estas as condições deste Termo de Garantia complementar, a Intelbras S/A se reserva o direito de alterar as características gerais, técnicas e estéticas de seus produtos sem aviso prévio.