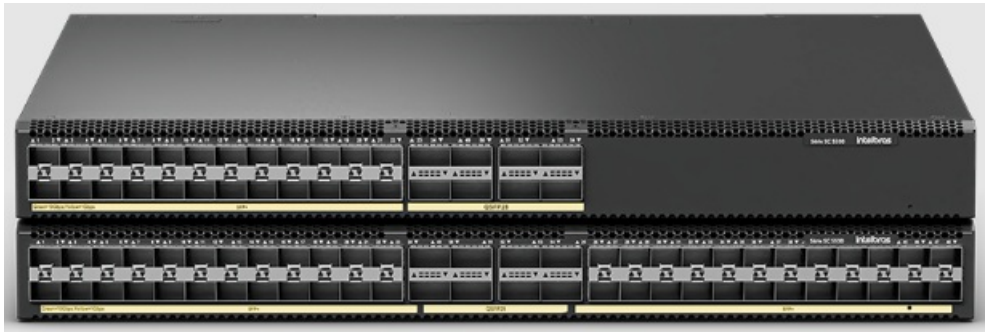
intelbras SC 5530 Series Switch Campus User Guide

Contents

intelbras SC 5530 Series Switch Campus



Product Information

Specifications

- **Product Name:** Series SC 5530
- **Approval:** Anatel approved
- **Data Protection:** Follow local laws and regulations
- **Personal Data Processing:** Uses and processes personal data
- **Encryption:** This product does not have encryption
- **Images:** All images in this document are for illustrative purposes only
- **Additional Components:** AC power supplies, DC power supplies, fan modules, and expansion cards are sold separately

Product Usage Instructions

Preparing for Installation

This document provides instructions for the installation of the following Ethernet switches:

Switch Series	Switch Model
SC 5530 switch series	SC 5530-48Y-8H SC 5530-24Y-8H

Safety Recommendations

To ensure proper usage and avoid equipment damage or bodily injury, please read and follow the safety recommendations below:

Examining the Installation Environment

To ensure correct operation of your switch, make sure the installation environment meets the following requirements:

Item	Requirements
Ventilation and Heat Dissipation	Adequate ventilation to prevent overheating
Anti-moisture	Avoid water or moisture damage
Temperature/Humidity	Maintain acceptable ranges for proper operation
Lightning Protection	Ensure proper grounding
Cable Routing	Do not run Ethernet cable and power cord in parallel
ESD Prevention	Follow guidelines for ESD prevention
Cleanliness	Maintain cleanliness to prevent dust buildup and corrosion
Corrosive Gas Prevention	Avoid corrosive gases in the installation site
EMI	Ensure proper EMI protection for cables

FAQ (Frequently Asked Questions)

- **Q: Does the product come with additional components?**

  A: No, AC power supplies, DC power supplies, fan modules, and expansion cards are sold separately and are not included with the product.

- **Q: Does the product have encryption?**
  A: No, this product does not have encryption.
- **Q: Does the product process personal data?**
  A: Yes, this product uses and processes personal data such as passwords, detailed call records, network addresses, and customer data records.
- **Q: Does Intelbras access or transfer personal data from the product?**
  A: No, Intelbras does not access, transfer, capture, or carry out any other type of processing of personal data from this product, except for data necessary for the operation of the product itself.

INSTRUCTION

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

- 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.

Preparing for installation

This document is applicable to the following Ethernet switches:
Table1-1 Switch series and models

Switch series	Switch model
SC 5530 switch series	SC 5530-48Y-8H
	SC 5530-24Y-8H

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 power supplies. 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.
- Wear an ESD wrist strap when you replace a removable power supply or fan tray. 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 Table1-2.
Table1-2 Checking list for the installation environment:

Item	Requirements
Ventilation and heat dissipation	**CAUTION:** To ensure correct operation of your device, make sure the installation environment is adequately ventilated to prevent the switch from overheating. · Ensure a minimum clearance of 10 cm (3.94 in) around the chassis. · Do not install the device near a heat source, for example, a stove or heater. · Ensure air ventilation in the installation environment. · Do not block the ventilation holes in the device or power adapter.

Item	Requirements
Anti-moisture	**CAUTION:** Water or moisture might damage the circuits of the device. · Do not place the device near water or in a damp environment. · Install the switch in a clean, dry, and ventilated place where temperature is controlled in a stable range. · 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). · Do not operate the device under or near the water source, such as the wash basin, laundry room, or areas with high humidity. · Do not touch the device with wet hands.
Temperature/humidity	For correct operation and long service life of your switch, maintain the temperature and humidity in the equipment room at acceptable ranges. · Lasting high relative humidity can cause poor insulation, electricity leakage, mechanical property change of materials, and metal corrosion. · Lasting low relative humidity can cause washer contraction and ESD and cause issues including loose mounting screws and 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 the switch, see technical specifications in the hardware information and specifications for the switch.

Lightning protection	**CAUTION:** Ground the switch correctly and verify the grounding. For more information, see “**Grounding the switch**.” · If you ground the switch by using a grounding strip, make sure the g rounding resistance of the grounding strip in the equipment room is less th an 1W. · If you ground the switch by using a grounding conductor buried in t he earth ground, make sure the grounding resistance of the grounding con ductor in the ground is less than 10W. · Route the signal cables along indoor walls, bury the cables in the e arth ground, or thread the cables through steel tubes. Install a signal lightni ng arrester with a nominal discharge current for a corresponding network in terface. · Keep the signal cables far from power cords and lightning rod down conductors. · As a best practice, route power cords indoors. If an AC power cord i s routed from outdoors, connect the AC power cord first to a power lightnin g arrester before leading it to the AC power port on the switch. Make sure the power lightning arrester has a nominal discharge cur rent and the total length of the power cord from the power lighting arrester t o the power port on the switch is less than 5 m (16.40 ft). · Ground the switch, rack, independent power supplies, and lightning arresters separately. · You must ground optical fibers with reinforcing metal stiffener from outdoors on an optical distribution frame (ODF) or fiber splice enclosure.
Cable routing	**CAUTION:** Do not run an Ethernet cable and power cord in parallel.

Item	Requirements
	· Route different types of cables separately. · Keep power cords a minimum of 5 cm (1.97 in) away from other cables.
ESD prevention	· Ground the switch correctly. · To avoid ESD damage to the device or removable components, always wear an ESD wrist strap when you install or remove the device or removable components. · Make sure the wrist strap has good skin contact and is reliably grounded.
Cleanliness	For more information, see "**Cleanliness**."
Corrosive gas prevention	The installation site must be free from corrosive gases such as acid gases and alkaline gases. For more information, see "**Corrosive gas limits**."
EMI	· If AC power is used, use a single-phase three-wire power receptacle with protection earth (PE) to filter interference from the power grid. · Keep the device far away from radio transmitting stations, radar stations, and high-frequency devices. · Use electromagnetic shielding, for example, shielded interface cables, when necessary.

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. Table1-3 describes the switch requirement for cleanliness.

Table1-3 Switch requirement for cleanliness

Substance	Particle diameter	Concentration limit
Dust particles	≥ 0.5 μm	≤ 1.8×10^7 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 limits
Corrosive gases can accelerate corrosion and aging of metal components. Make sure the corrosive gases do not exceed the concentration limits as shown in Table1-4.
Table1-4 Corrosive gas concentration limits

Gas	Average concentration (mg/m^3)	Maximum concentration (mg/m^3)
SO2	0.3	1.0
H2S	0.1	0.5
Cl2	0.1	0.3
HCl	0.1	0.5
HF	0.01	0.03
NH3	1.0	3.0
O3	0.05	0.1
NOX	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.
Table1-5 Installation sites

Category	Definition	Example
A1: indoor controlled environment	· Indoor environments where temperature and humidity are controlled. · Completely enclosed or shielded indoor environments.	Central equipment rooms, IDC equipment rooms, mobile cabins with air conditioners, outdoor air conditioner cabinets, and heat exchanger cabinets.
A2: indoor partially controlled environment	· Indoor environments where temperature and humidity are partially controlled. · Incompletely enclosed or shielded places. · Places far from pollution sources.	Simple equipment rooms, ordinary houses, garages, corridors, and direct ventilation cabinets far from pollution sources, houses without direct exposure to sunlight or rain, railway station platforms, and stadiums.
A3: indoor uncontrolled environment	· Indoor environments where temperature and humidity are uncontrolled. · Incompletely enclosed or shielded places. · Places near pollution sources.	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	· Unshielded places where the temperature and humidity are not controlled. · Places far from pollution sources.	Completely exposed outdoor places far from pollution sources.
B2: harsh environment	· Unshielded places where the temperature and humidity are not controlled. · Sea environments or outdoor land environments near pollution sources.	Islands, ships, and completely exposed outdoor places near pollution sources.
C: special environments	Special application environments	Buried, underwater, or undersea environments and manholes.

Table1-6 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 h eat and power plants	≤ 3 km (1.86 miles)
Medium pollution sources such as chemical factories, rubber plants, an d 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

Table1-7 Requirements for power distribution or power supply environment

Item	Requirements
Preparation	The power supply 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 technical specifications in the hardware informati on and specifications for the switch.
Power receptacle and cables	· If the external power supply system provides an AC power outlet, prepare a country-specific AC power cord yourself. Make sure the PE wire of the AC power supply is grounded reliably.

Item	Requirements
	· If the external power supply system provides a DC distribution box, prepar e DC power cords yourself. · Do not use the power cord provided with the switch on other devices.

Laser safety

WARNING! The switch is Class 1 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.

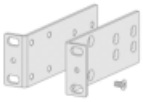
Installation tools

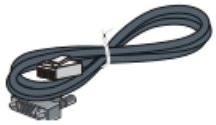
No installation tools are provided with the switch. Prepare the following tools yourself as required:

- Flathead screwdriver
- Phillips screwdriver
- ESD wrist strap
- Marker

Installation accessories

Table1-8 Installation accessories

Part number	Description	Quantity
2150A0JG	Mounting bracket kit, including a pair of mounting brackets and eight M4 screws 	1 kit, provided
N/A	M6 screw 	4, user supplied
N/A	Cage nut 	4, user provided
N/A	Grounding cable 	1, provided
26010496	Grounding screw	1, provided

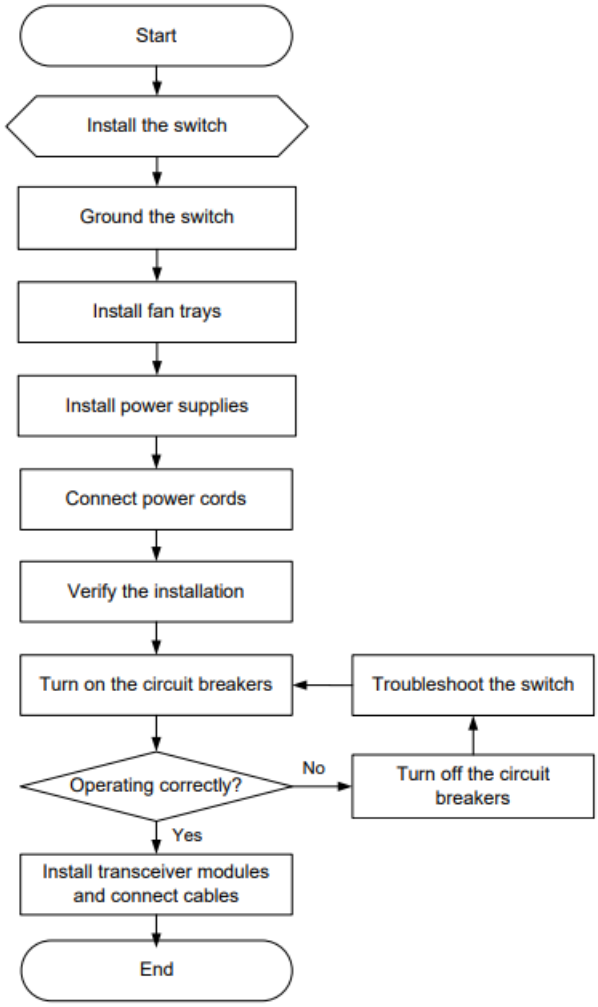
Part number	Description	Quantity
		
N/A	AC/HVDC power cord	1, provided with PSR250-12A and PSR250-12A1 power supplies
N/A	DC power cord 	1, provided with the PSR450-12D power supply
04042967	DB9-to-RJ45 console cable 	1, optional
0404A1EE	USB-to-RJ45 console cable 	1, optional

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:

Figure2-1 Hardware installation flow



Installing the switch in a 19-inch rack
IMPORTANT:

- M4 screws are used for attaching the mounting brackets to the chassis. As a best practice, use a torque of 12 kgf-cm (1.18 Nm) to fasten M4 screws.
- M6 screws and cage nuts are user supplied. As a best practice, use a torque of 30 kgf-cm (2.94 Nm) to fasten M6 screws.

Attaching 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 mounting brackets. Select one position as needed.
To attach the 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.
    - To install the mounting brackets at the port-side mounting position, see Figure2-2.
    - To install the mounting brackets at the power supply-side mounting position, see Figure2-3.
2. Fasten the M4 screws to secure the mounting bracket to the switch.
3. Attach the other mounting bracket to the other side of the chassis in the same way.

Figure2-2 Attaching the mounting brackets to the port-side mounting position

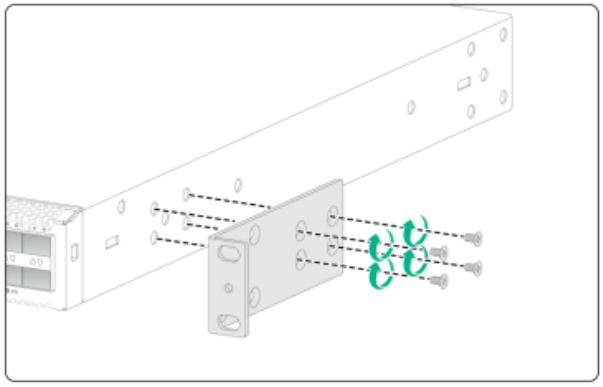
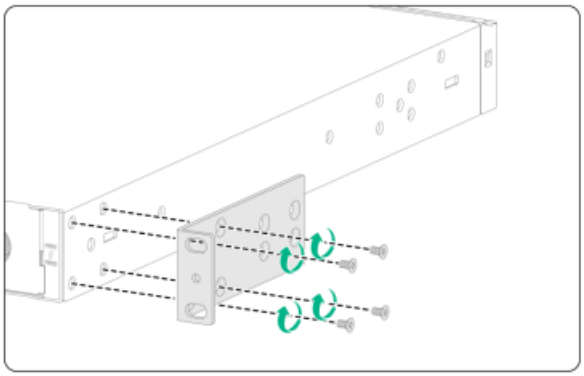


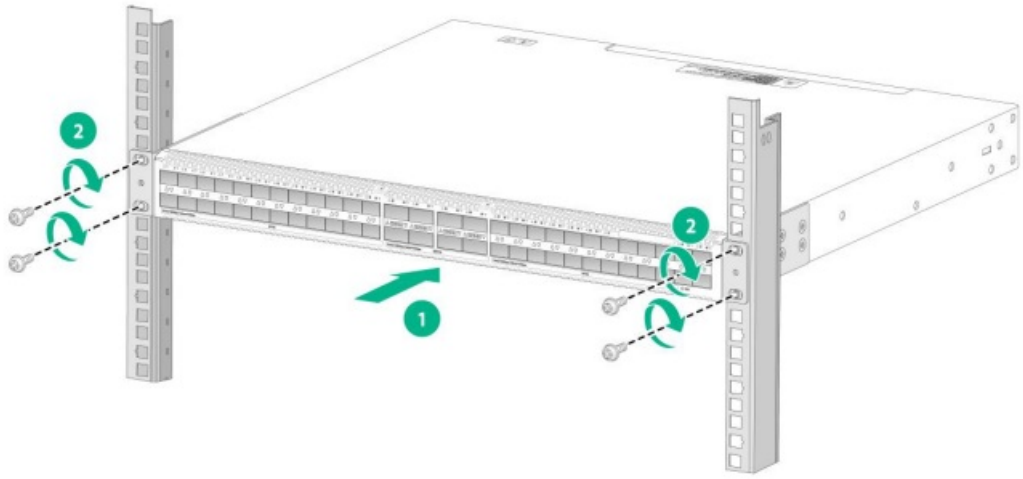
Figure2-3 Attaching the mounting brackets to the power supply-side mounting position



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

Figure2-4 Mounting the switch in the rack



Grounding the switch

WARNING!

- Correctly connecting the grounding cable is crucial to lightning, ESD, and EMI protections. Make sure you connect the grounding cable correctly for the switch.
- For information about how to protect your switch from lightning strikes, see Intelbras Network Devices Lightning Protection Guide.

To protect against the following types of issues, use a grounding cable to connect the switch to the earthing facility at the installation site:

- Bodily injury from electric shocks.
- Device and power and data line damages.
- Electrical fires, lightning strokes, electromagnetic coupling interferences, and ESD damages.

Select a grounding method based on the installation environment.

NOTE: The positions of power supplies and grounding terminals in this section are for illustration only.

Grounding the switch by using a grounding strip

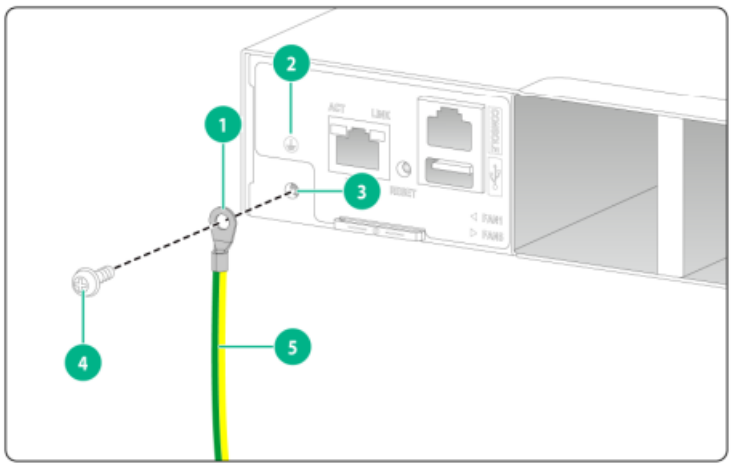
CAUTION:

- Connect the grounding cable to the grounding system 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.

Connecting the grounding cable to the chassis
IMPORTANT: As a best practice, use a torque of 12 kgf-cm (1.18 Nm) to fasten the grounding screw.
To connect the grounding cable to the chassis:

1. Remove the grounding screw from the grounding hole in the chassis.
   The grounding screw and grounding hole are on the rear panel of the chassis and a grounding sign is provided.
2. Attach the grounding screw to the ring terminal of the grounding cable.
3. Use a screwdriver to fasten the grounding screw into the grounding hole.

Figure2-5 Connecting the grounding cable to the chassis

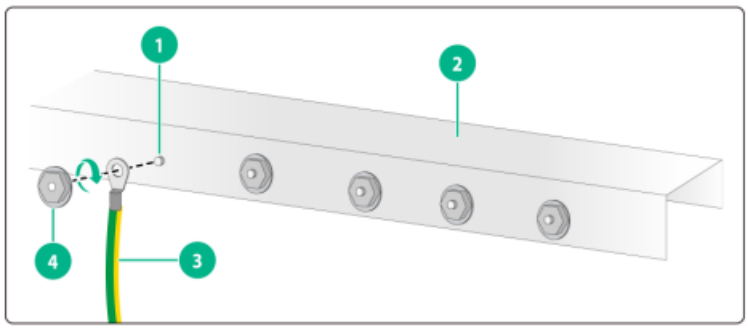


(1) Ring terminal	(2) Grounding sign
(3) Grounding hole	(4) Grounding screw
(5) Grounding cable	

Connecting the grounding cable to a grounding strip

1. Remove the hex nut of a grounding post on the grounding strip.
2. Attach the ring terminal of the grounding cable to the grounding post and use the hex nut to secure the ring terminal to the post.

Figure2-6 Connecting the grounding cable to a grounding strip



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

Verifying the connection after grounding the switch

1. 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
2. Use a grounding resistance tester to measure the grounding resistance of the grounding strip, and make sure the grounding resistance is less than 1

For information about resistance measurement, see Intelbras Network Devices Lightning Protection Guide.

Installing and removing fan trays
CAUTION:

- You can power on the switch only when the switch is installed with five fan trays of the same model.
- If more than one fan tray fails during switch operation, do not remove the failed fan trays simultaneously. Replace the fan trays one by one and finish replacing each fan tray within three minutes.

The switch can be delivered with removable fan trays installed on it. Contact the Intelbras marketing personnel if you want the switch to be delivered with the ordered fan trays installed on it.
The switch came with empty fan tray slots. Choose fan tray models for the switch based on the heat dissipation requirements.

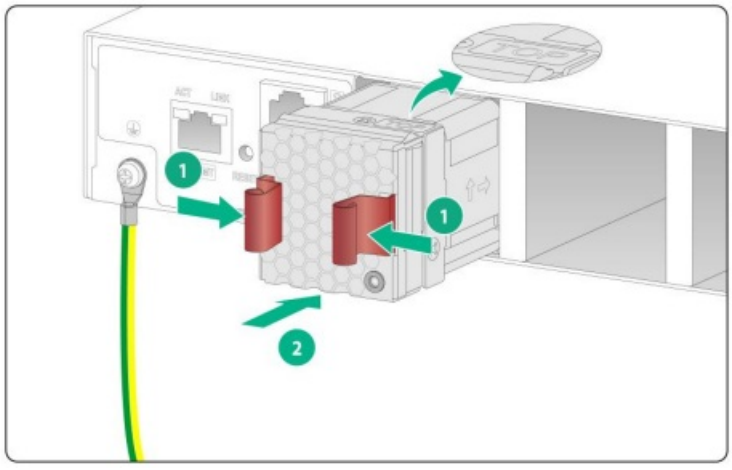
- The LSPM1FANSA-SN fan tray provides power supply side-intake and port side-exhaust airflow. Its handle is blue.
- The LSPM1FANSB-SN fan tray provides port side-intake and power supply side-exhaust airflow. Its handle is red.

Installing a fan tray
CAUTION: To prevent damage to the fan tray or the connectors on the backplane, 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.

To install a fan tray:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Unpack the fan tray and verify that the fan tray model is correct.
3. Grasp the two handles of the fan tray with the side marked TOP facing up, and slide the fan tray along the guide rails into the slot until the fan tray seats in the slot and has a firm contact with the backplane.

Figure2-7 Installing a fan tray



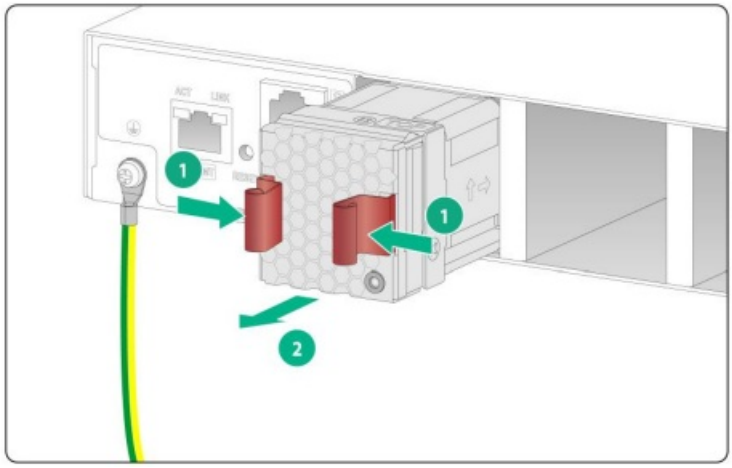
Removing a fan tray
WARNING!

- Do not touch any bare wires or terminals on the fan tray.
- Do not place a fan tray in a moist location or let liquid flow into it.
- Contact Intelbras Support if the circuits or components on a fan tray are faulty. Do not remove any fan tray components.

To remove a fan tray:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Grasp the two handles of the fan tray, as shown by callout 1 in Figure2-8, and pull out the fan tray slowly along the guide rails.
3. Put the removed fan tray in an antistatic bag.

Figure2-8 Removing a fan tray



Installing and removing power supplies

The switch can be delivered with removable power supplies installed on it. Contact the Intelbras marketing personnel if you want the switch to be delivered with the ordered power supplies installed on it.

WARNING!

- To avoid bodily injury or switch damage, strictly follow the procedures in Figure2-9 and Figure2-10 to install and remove a power supply.
- You must provide a circuit breaker for each power supply.

CAUTION: To use two power supplies for the switch, make sure they are the same model.

Figure2-9 Installation procedure

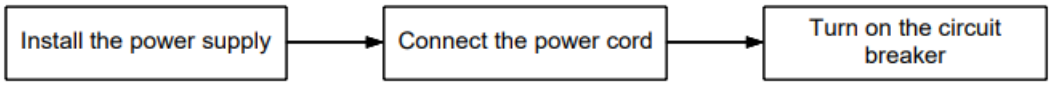
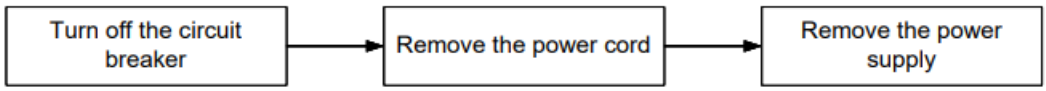


Figure2-10 Removal procedure

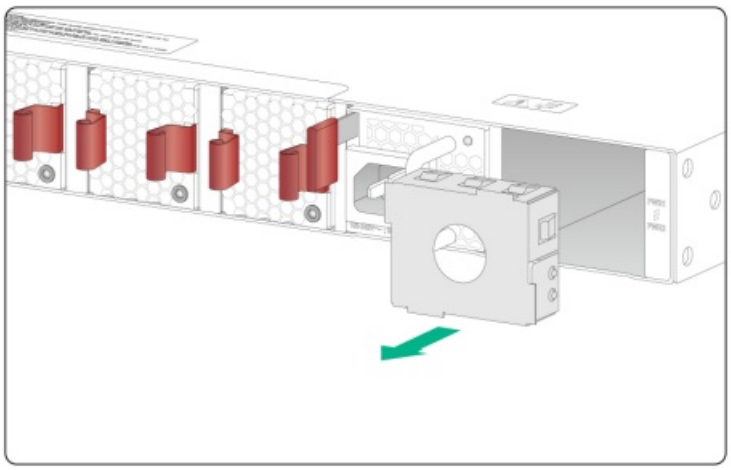


Installing a power supply

The installation procedure is the same for the PSR250-12A, PSR250-12A1, and PSR450-12D 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.

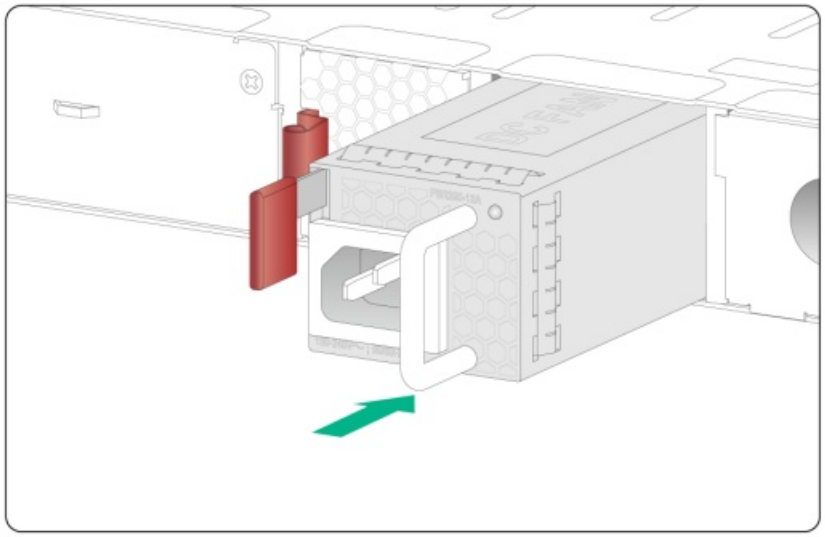
Figure2-11 Removing the filler panel from the target power supply slot



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. 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 place.

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.

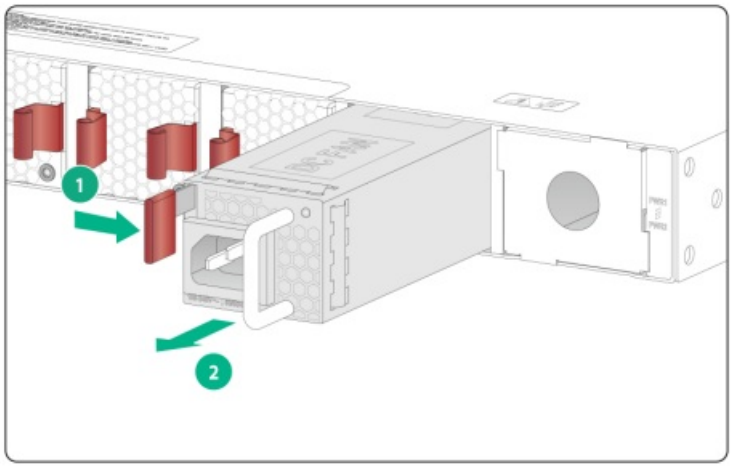
Figure2-12 Installing a power supply



Removing a 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. Grasping the handle of the power supply with one hand with the thumb pressing the latch towards the handle direction, pull the power supply part way out of the slot. Then supporting the power supply bottom with the other, pull the power supply slowly out of the slot.
4. Place the removed power supply on an antistatic mat or its packaging bag for future use.
5. If you are not to install a new power supply after removing the old one, install a filler panel in the slot in time.

Figure2-13 Removing a power supply



Connecting the power cords

CAUTION: Provide a circuit breaker for each power input and make sure the circuit breaker is off before connecting the power cord.

Table2-1 Power cord connection procedures at a glance

Power supply model	Available power source	Connection procedure reference
PSR250-12A PSR250-12A1	AC power source	Connecting the power cord for a PSR250-12A/PSR250-12A1 power supply
PSR450-12D	–48 VDC power source in the equipment room	Connecting the power cord for a PSR450-12D power supply
	RPS1600-A	

Connecting the power cord for a PSR250-12A/PSR250-12A1 power supply

The power cord connection procedure is the same for the PSR250-12A and PSR250-12A1 power supplies. The following uses a PSR250-12A1 as an example.

To connect the power cord:

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 Figure2-14.
3. Use a releasable cable tie to secure the power cord to the handle of the power supply, as shown by callout 2 in Figure2-14.
4. Connect the other end of the power cord to an AC power source.

Figure2-14 Connecting the power cord for a PSR250-12A1 power supply (1)

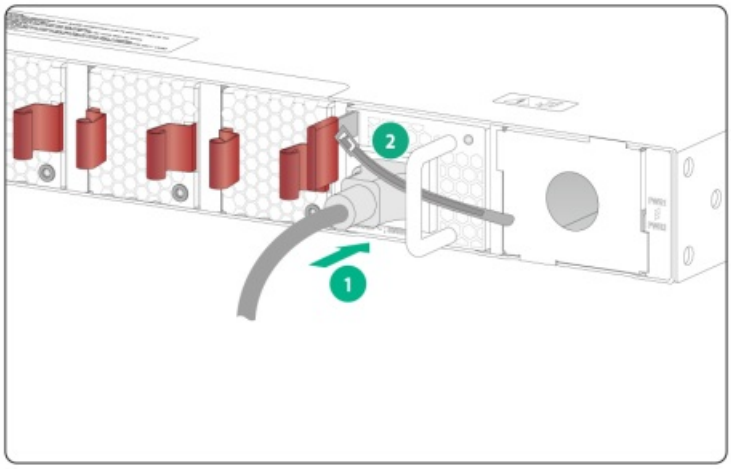
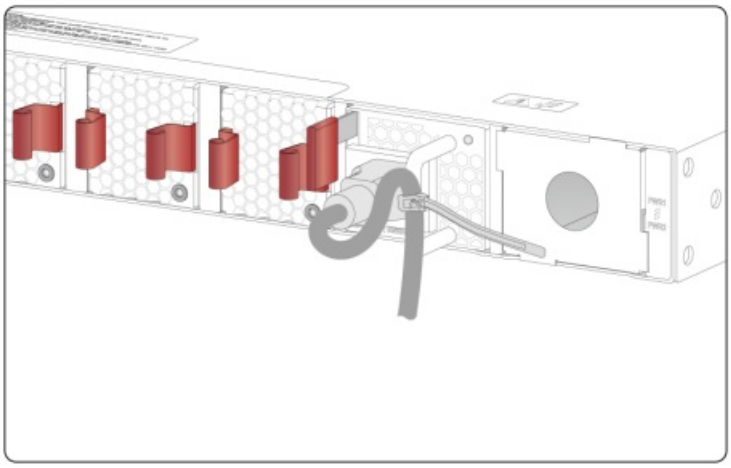


Figure2-15 Connecting the power cord for a PSR250-12A1 power supply (2)



Connecting the power cord for a PSR450-12D power supply
CAUTION:

- To use a 48 VDC power source in the equipment room to supply power to the power supply, use the DC power cord supplied with the power supply. When connecting the DC power cord, identify the positive (+) and negative ((–) marks on the two wires to avoid connection
- To use an Intelbras RPS to supply power to the power supply, use a compatible RPS power cord to connect the RPS to the power supply.

To connect the power cord for a PSR450 12D power supply:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
2. Use a flathead screwdriver to loosen the screws on the protection cover over the DC power receptacle on the power supply and then remove the protection cover (see callouts 1 and 2 in Figure2-16).
3. Correctly orient the power cord plug, and then insert the plug into the power receptacle (see callout 3 in Figure2-17). If you orient the plug upside down, you cannot insert it into the power receptacle.
4. Use a flathead screwdriver to fasten the screws on the plug to secure the plug in the power receptacle (see callout 4 in Figure2-17).
5. Connect the other end of the power cord to a –48 VDC power source or an RPS.

Figure2-16 Connecting the power cord for a PSR450-12D power supply (1)

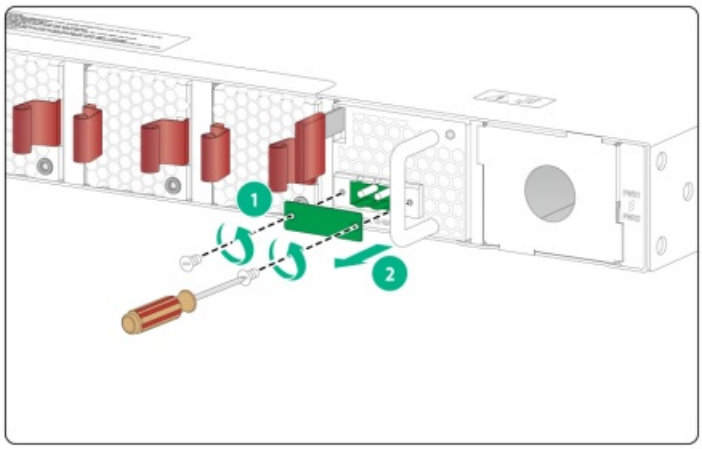
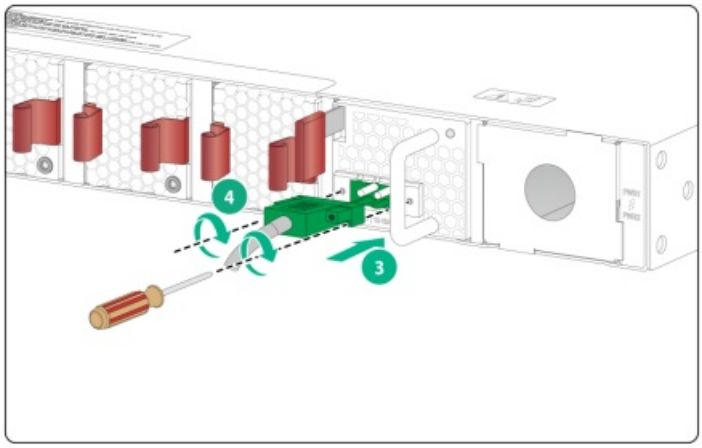


Figure2-17 Connecting the power cord for a PSR450-12D power supply (2)



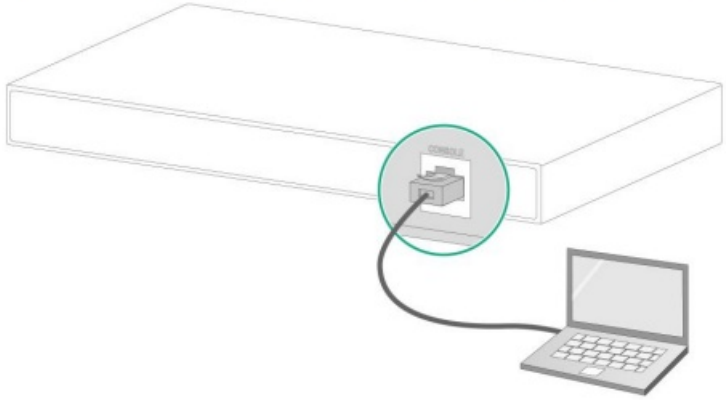
Verifying the installation
Before powering on the switch, verify the following items

- There is enough space around the switch for heat dissipation
- The rack on which the switch is mounted is stable.
- The ground ing cable is securely connected.
- The power source specifications are as required by the device
- The power input cables 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.

Accessing the switch for the first time

Connecting the switch to a configuration terminal
As shown in Figure3-1, you can access the switch by connecting the serial console port on the switch to a configuration terminal.

Figure3-1 Connecting the switch to a configuration terminal



As shown in Table3-1, two types of console cables can be used for connecting the switch to a configuration terminal.
Table3-1 Connection methods and console cables

Connection method	Console cable type	Configuration terminal-side connector	Switch-side connector
Using the serial console port for connection	DB9-to-RJ45 console cable	DB-9 female connector	RJ-45 connector
	USB-to-RJ45 console cable	USB connector	RJ-45 connector

The RJ-45 signal pinout varies by the vendor of the cable. To avoid abnormal display on the configuration terminal, use a console cable provided by Intelbras (as shown in Table1-8).. To prepare a serial console cable yourself, make sure the RJ-45 connector signal pinout is as shown in Table3-2.

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

- dentify 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

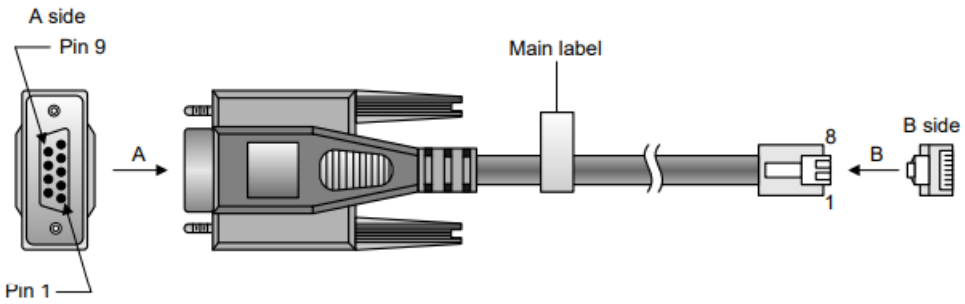


Table3-2 Serial console cable signal pinout

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.

NOTE: For the RJ-45 connector signal pinout of the USB-to-RJ45 console cable, see Table3-2.

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:

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:
  - 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**

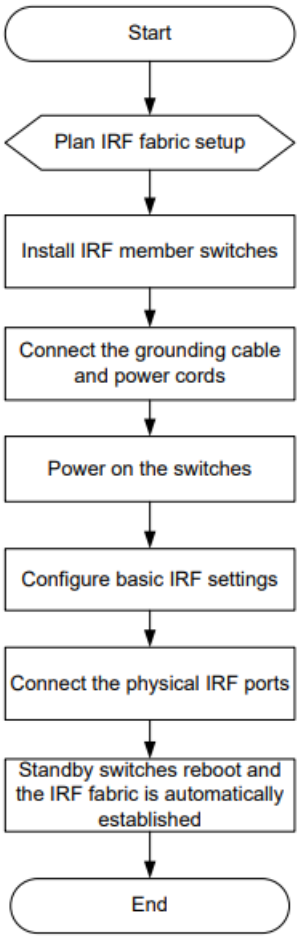
  During the startup process, you can access Boot ROM menus to perform tasks such as software upgrade and file management. The Boot ROM interface and menu options differ with software versions. For more information about Boot ROM menu options, see the software-matching release notes for the device. After the startup process is completed, you can access the CLI to configure the switch. For more information about the configuration commands, see the configuration guides and command references for the switch.

Setting up an IRF fabric (Stacking)

You can use Intelbras IRF technology to connect and virtualize multiple SC 5530 switches into a large virtual switch called an “IRF fabric” for flattened network topology, and high availability, scalability, and manageability. A SC 5530 switch can form an IRF fabric only with switches in the same series 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:

Step	Description
	· Planning IRF fabric size and the installation site · Identifying the master switch and planning IRF member IDs · Planning IRF topology and connections · Reserving physical IRF ports on the member switches · Planning the cabling scheme
2. Install IRF member switches	See "Installing the switch in a 19-inch rack. "
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 IRF settings	See *IRF Configuration Guide* for the switch series.
6. Connect the physical IRF ports	Connect IRF member switches. Use QSFP+/QSFP28 transceiver modules and optical fibers for long distance connection. Use QSFP+/QSFP28 copper cables for short distance connection. 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.

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 the configuration guides and command references for the switch.
- 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 QSFP28 ports on the switch can provide 40GE/100GE IRF connection. 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. 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

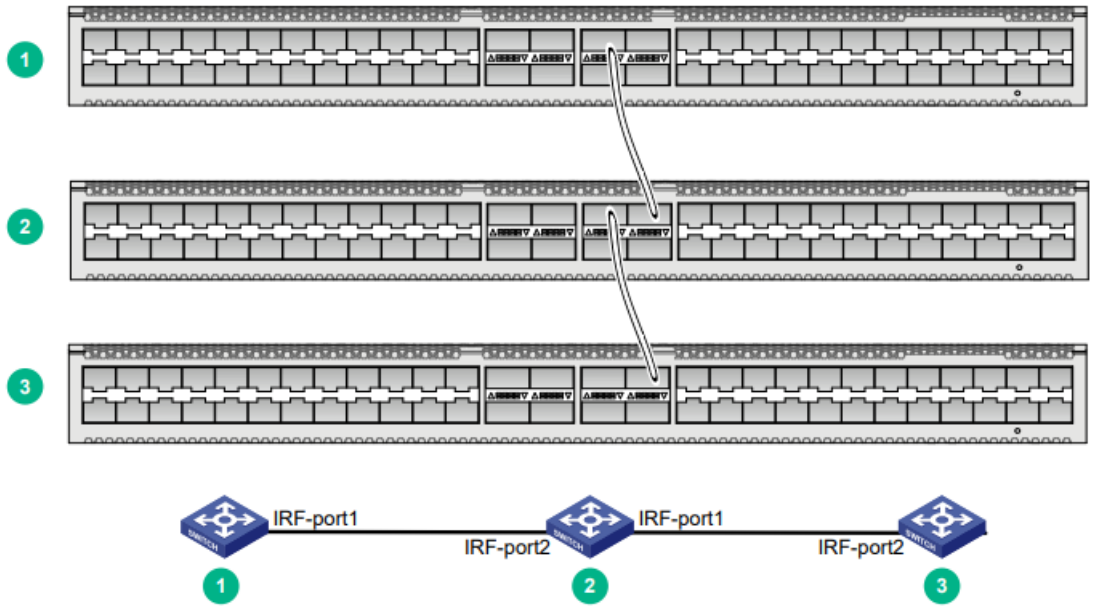
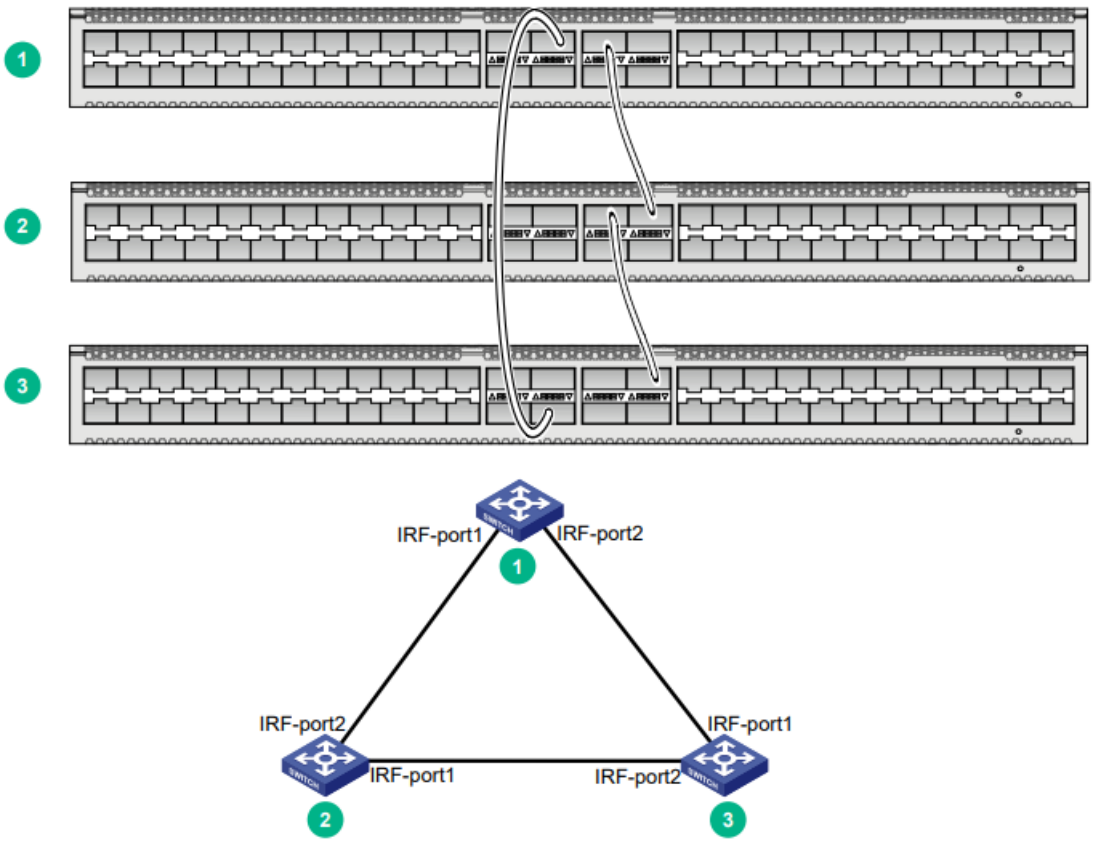


Figure4-3 IRF fabric in ring topology



Reserving physical IRF ports on the member switches

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

QSFP28 ports on the switch can be used for IRF connection. 25-GE/10-GE breakout interfaces split from a QSFP28 port cannot be used for IRF connection.

IMPORTANT:

- All physical ports to be bound to an IRF logical interface must have the same data rate.
- QSFP28 ports on the switch operate at 40 Gbps by default. Licenses are available for you to increase the QSFP28 port speed to 100 Gbps.

Planning the cabling scheme
You can use QSFP+/QSFP28 transceiver modules and optical fibers or QSFP+/QSFP28 copper cables for IRF connection:

- For a short-distance IRF connection in an equipment room, use a QSFP+/QSFP28 cable.
- For a long-distance IRF connection, use QSFP+/QSFP28 transceiver modules and optical fibers.

The following subsections describe several Intelbras recommended IRF connection schemes. All these schemes use a ring topology. The ring topology is not applicable to IRF setup with two devices.

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 (4 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

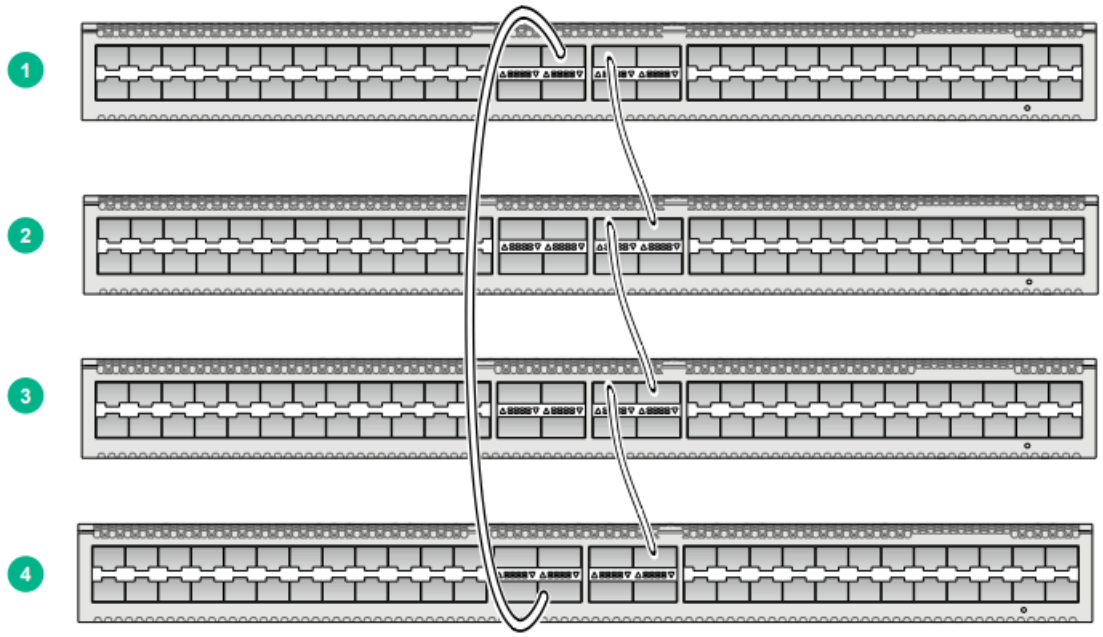
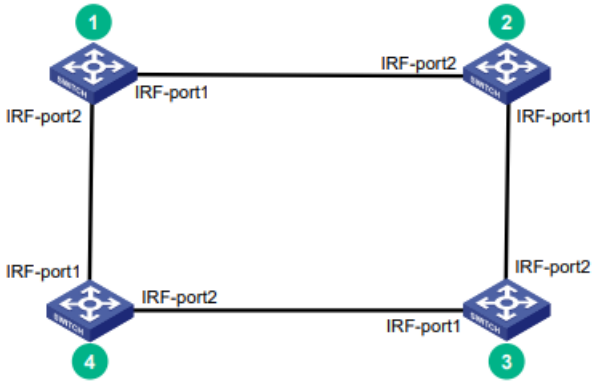


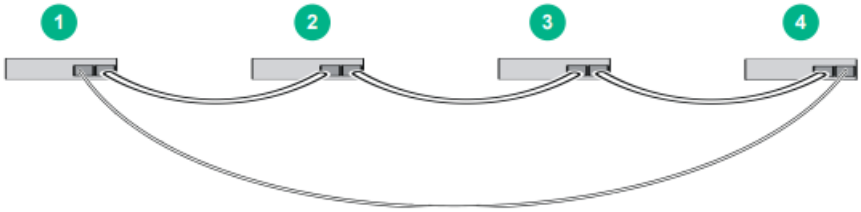
Figure4-5 IRF fabric topology



Connecting the IRF member switches in a ToR solution

You can install IRF member switches (4 switches in this example) in different racks side by side to deploy a top of rack (ToR) solution as shown in Figure4-6. Use QSFP+/QSFP28 transceiver modules and optical fibers for connection if a large distance exists between the member switches.

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 to configure their member IDs, member priorities, and IRF port bindings. For information about accessing the switch, see Fundamentals Configuration Guide for the switch. For more information about configuring basic IRF settings, see IRF Configuration Guide for the switch.

Connecting the physical IRF ports

- Connect the IRF member switches as planned.
- Wear an ESD wrist strap when you connect cables or transceiver modules and fibers. For information about 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 Fundamentals Configuration Guide for the switch.)
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 Table4-1.

Table4-1 Displaying and maintaining IRF configuration and running status

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

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 IRF Configuration Guide for the switch.

Maintenance and troubleshooting

Power supply failure

The switch uses removable power supplies. You can determine whether a power supply is faulty by observing the status LED on the power supply.

- **Symptom**

  The status LED on the power supply is not steady green, which indicates that the power supply is faulty.
- **Solution**

  To resolve the issue:

  1. Verify that the power supply model is as required by the switch.
  2. Verify that the power supply is securely installed in the switch.
  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 power supplies.”

Fan tray failure

CAUTION: If more than one fan tray fails during the switch operation, do not remove the failed fan trays simultaneously. Replace the fan trays one by one and finish replacing each fan tray within 3 minutes.
CAUTION: If more than one fan tray fails during the switch operation, do not remove the failed fan trays simultaneously. Replace the fan trays one by one and finish replacing each fan tray within 3 minutes.
The switch uses removable fan trays. You can determine whether a fan tray is faulty by observing the status LED on the fan tray.

- **Symptom**

  The status LED on a fan tray indicates that the fan tray is faulty..
- **Solution**

  Replace the fan tray. For information about how to replace the fan tray, see “Installing and removing 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.

Documents / Resources

	intelbras SC 5530 Series Switch Campus [pdf] User Guide SC 5530-48Y-8H, SC 5530-24Y-8H, SC 5530 Series Switch Campus, Series Switch Campus, Switch Campus, Campus

References

- Anatel — Agência Nacional de Telecomunicações
- User Manual