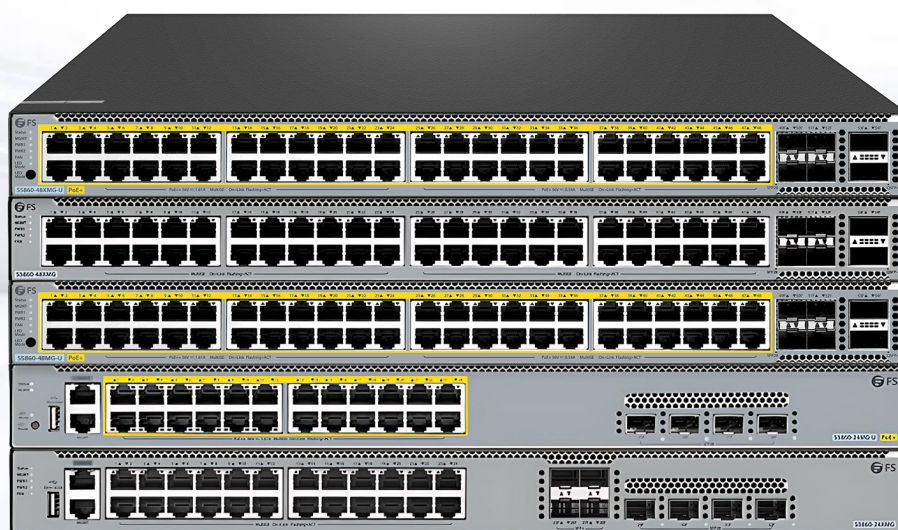


S5860 Series

Switches Hardware Installation and Maintenance Guide

V1.0 .2306A



Preface

Audience:

This document is for network engineers responsible for installing and maintaining S5860 series switches. Experience with network equipment installation and maintenance is required.

Feature Statement:

Please visit the [FS.COM Technical Documents](#) page to download the datasheet and obtain information on the specifications supported by the product .

Safety Statement:

- To avoid harm to people and equipment, please read the safety recommendations in the [Safety Precautions for FS Switches](#) before installing the FS Switch .
- Verify that the requirements described in the [Safety Precautions for FS Switches](#) have been met .

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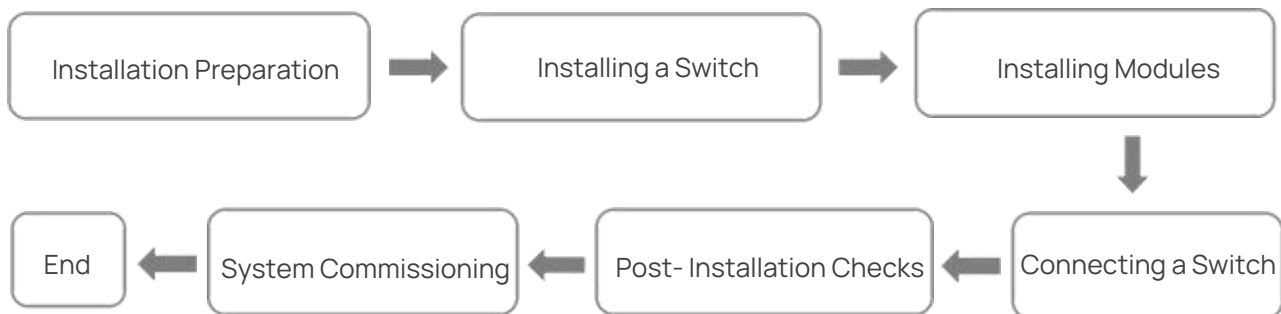
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Hardware Installation and Parts Replacement

The S5860 series switches, launched by FS.com, are a new generation of Layer 3 switches that integrate high performance, high security, and multiple services. They are primarily used in the convergence layer of campus networks, providing line-speed multi-layer switching and comprehensive QoS (Quality of Service) policies. They classify and prioritize different types of traffic based on specific applications, ensuring minimal latency for critical data transmission.

1.1 Installation Procedure



1.2 Installation Preparation

The S5860 series switches are relatively complex devices. Before installation, careful planning and arrangements should be made for the installation location, networking mode, power supply and wiring of the devices. Confirm the following before installation:

- The installation site provides sufficient space for heat dissipation.
- The installation site meets the temperature and humidity requirements of the switch.
- The power supply and required current are available on the installation site.
- The Ethernet cables have been deployed on the installation site.

1.2.1 Checking the Installation Site

The S5860 series switches must be installed indoors. The installation site must meet the following requirements.

Table 1: Requirements for the Installation Site

Item	Requirement
Cleanliness	The device must be installed in a clean, dry, and well ventilated standard equipment room with controllable temperature .
Dust proofing	Dustproof measures must be taken in the site . Dust will cause electrostatic discharges on the chassis and affect connections of metal connectors and joints . This shortens service life of the device and may cause failures of the device .
Temperature and humidity	The equipment room must be free from leaking or dripping water, heavy dew, and damp . The temperature and humidity in the installation site must be within specifications . For the operating temperature and relative humidity ranges required by the device, see the device specifications . If the relative humidity exceeds 70%, using dehumidifiers or dehumidifying air conditioners is recommended .
Corrosive gases avoidance	The installation site must be free from acidic, alkaline, or corrosive gases.

1.2.2 Mounting the Cabinet or Rack

Precautions

When mounting the cabinet, please note the following:

- All expansion bolts for fastening the cabinet base to the ground should be installed and tightened in sequence from bottom to up (large flat washer, spring washer, and nut), and the installation holes on the base and the expansion bolts are aligned.
- The installed cabinet is not movable after installation.
- The installed cabinet is vertical to the ground.
- When multiple cabinets are placed side by side in the equipment room, they should be aligned with each other, leaving an error less than 5mm (0.20 in.).
- The front and rear doors of the cabinet should be installed to allow you open and close them smoothly. The locks should work normally, and all keys should be complete.
- There should be no unnecessary and informal labels inside the cabinet and on service modules.
- Filler panels are installed in empty slots.
- The switch is securely installed, and the screws on the panel should be fastened tightly.
- All wiring outlets at the top and bottom of the cabinet should be installed with rodent-resistant nets with openings of no more than 15mm (0.59 in.) in diameter to prevent rodents and other small animals from entering the cabinet.
- An anti-static wrist strap should be provided in the cabinet. The screws in the cabinet should be fastened tightly and be of the same model.

Installation Steps

1. Plan the available space before installing the cabinet. Maintain a clearance before the front and back doors for maintenance and operation.
2. Install and fasten the cabinet in the specified site as planned.
3. Install the cable troughs and cables.
4. Install the trays and cable management brackets on the rack according to the number of switches installed into the cabinet.

1.2.3 Checking the Power Conditions

- Before use, please check whether there is obvious damage to the power supply shell and whether the power supply is defective, such as abnormal noise.
- The device is only allowed to be plugged into the power module that accompanies the device, otherwise it may lead to unknown risks.
- Power module in 1+1 backup can be hot-swapped one of them, need to ensure that the other power module on the equipment is in the power supply state when replaced, otherwise unplugging the power module will cause the switch to lose power, resulting in business interruption.
- Prohibit the mixed use of power modules with different power and different cooling methods.

1.2.4 Preparing Installation Tools and Accessories

Common Tools	Phillips screwdriver, Ethernet and optical cables, cage nuts, diagonal pliers and cable ties
Special Tools	Anti-static gloves, wire stripper, crimping plier, RJ45 connector crimping plier, and wire cutter
Cleaning Tools	Dust-free paper and fiber end-face microscope
Meters	Multimeter, bit error rate tester (BERT), and optical power meter

- The S5860 series switches are delivered without a tool kit. Please prepare a tool kit.

1.3 Installing a Switch

Precautions

Before installing the S5860 series switch in a cabinet, please check whether the racks are properly positioned. If the racks are too close to the front door of the cabinet, you may not be able to close the front door after plugging in the Ethernet and fiber cables. The front panel of the switch should be at least 10 mm (0.39 in.) away from the front door of the cabinet. Please confirm the following before installing the switch:

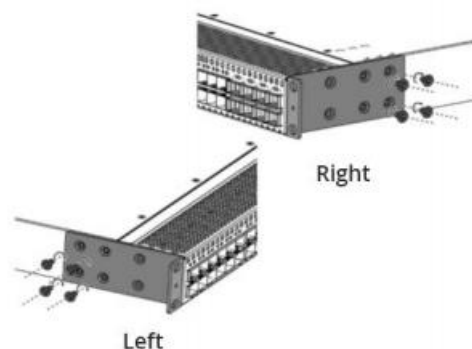
- The cabinet is secured.
- The modules in the cabinet are installed.
- There are no obstructions in and around the cabinet.
- The switch is prepared and transported to a location close to the cabinet.

1.3.1 Mounting the Switch in a Cabinet or Rack

Mounting the Brackets

1. Take out the two L-shaped mounting brackets and the M4*8FMO flat head screws from the plastic bag.
2. Place the mounting brackets against the side walls of the switch and secure them using the M4*8FMO flathead screws. The installation method is the same for both sides.

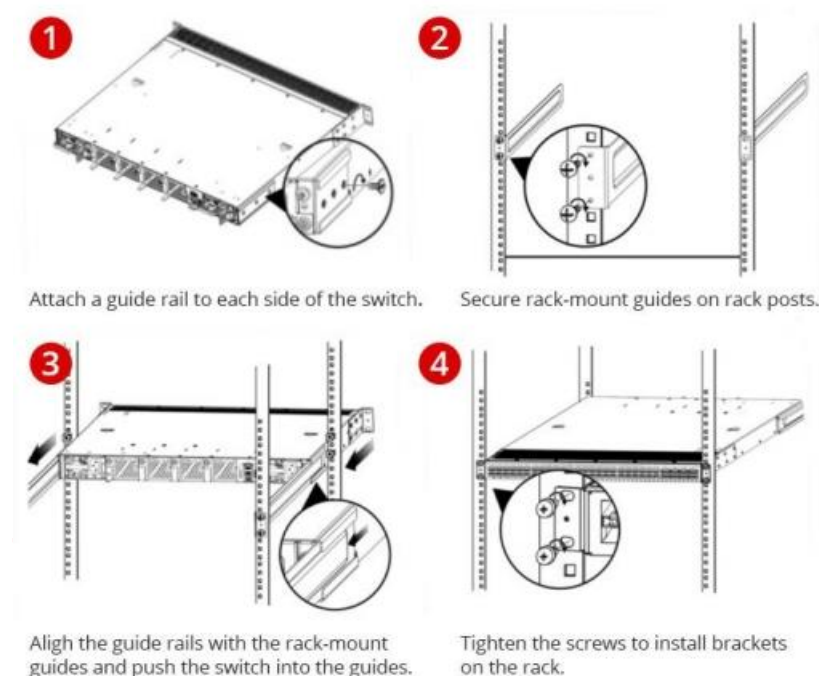
Figure 1: Mounting the Brackets



Mounting the Switch in a Rack

The S5860 series switches are designed to meet the EIA standard size and can be installed in a 19-inch rack. During installation, the front panel of the switch should be placed forward on the brackets. It is recommended to use a tray for mounting the S5860 series switch and then secure it to the rack brackets. Alternatively, the provided rear brackets can be used for fixation. The S5860 series switches have a smaller depth and do not come with rear brackets as standard equipment.

Figure 2: Mounting the Switch in a Rack



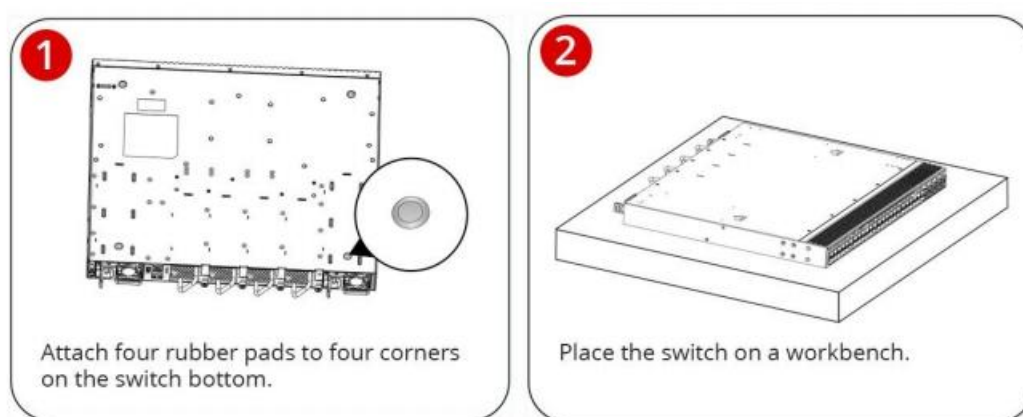
- The mounting position for wall-mount installation is the four screw holes on the left and right sides of the rear panel of the main unit.
- Differentiate the left and right rear brackets based on the direction indicated on the brackets.
- Use cabinets with a depth of 600mm or 800mm, ensuring that the front and rear columns are spaced between 398mm and 674mm apart. This spacing is necessary for the proper installation of rear brackets and equipment.

1.3.2 Mounting the Switch on a Workbench

In most cases, users do not have a standard 19-inch rack. Therefore, the most common method is to place the switch on.

1. Attach four rubber pads to the four corners on the switch bottom.
2. Place the switch on the workbench to allow for adequate airflow.

Figure 3: Mounting the Switch on a Workbench

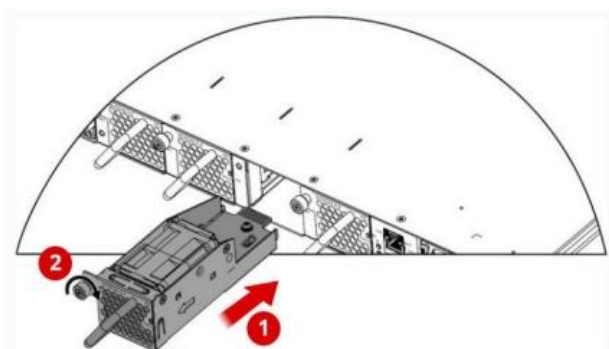


1.4 Installation and Removal of Modules

1.4.1 Installing of Fan Modules

1. Remove the new fan module from the packaging box.
2. Hold the handle at the tail end of the fan module and slowly insert it straight along the guide rail until the fan module is fully inserted into the chassis and securely contacts the fan slot.
3. Use a screwdriver to tighten the screw at the tail end of the fan, securing the fan module in the switch chassis.

Figure 4: Installing a Fan Module



- Insert the fan module smoothly and steadily. Pay attention to the orientation of the fan panel and ensure it is inserted correctly.
- If the module is not aligned properly during insertion, it must be withdrawn and reinserted.
- If you encounter difficulty tightening the screw and it remains loose, it is likely that the fan module is not fully inserted into the chassis. Please double-check carefully.
- Power supplies and fans with different airflow directions should not be mixed or used interchangeably.

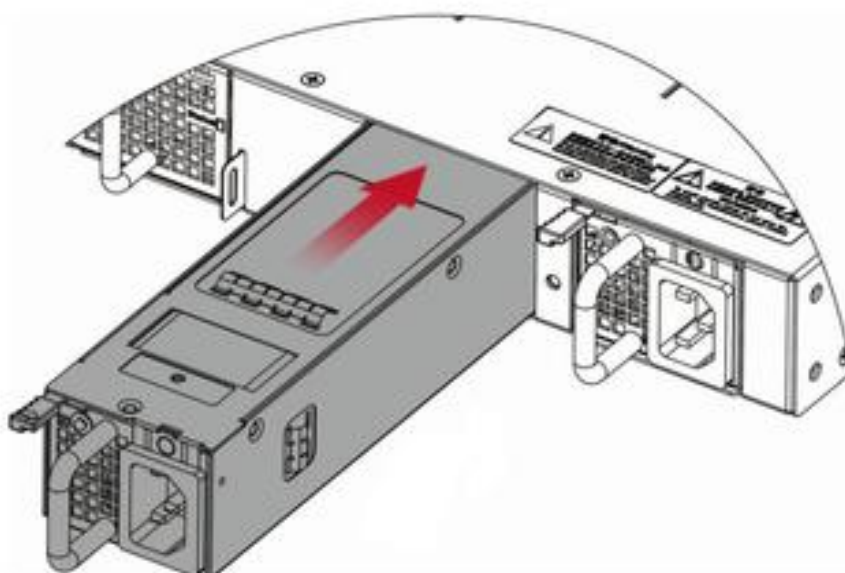
1.4.2 Installing Pluggable Power Modules

- Wear an anti-static wrist strap before the following operations

Installing PSM-C550WAC Power Module

1. Take out the new power module from the power module packaging box and confirm that the input method and specifications of the power module match the required ones.
2. Remove the power module barrier. Use the surface with the power nameplate information as the top panel of the power module. With one hand, grip the handle of the power module, and with the other hand, support the bottom of the power module. Slowly and steadily insert the power module along the guide rail until it is completely inserted into the chassis. You will hear a "click" sound, ensuring that the power module is properly seated in the power slot.

Figure 5: Installing PSM-C150WAC Power Module



- Insert the power module smoothly. When inserting, pay attention to the orientation of the power panel and ensure it is inserted correctly.
- If you encounter resistance or difficulty while inserting, you must retract the module being inserted, recheck the alignment between the power module and the guide rail, and then insert it again.

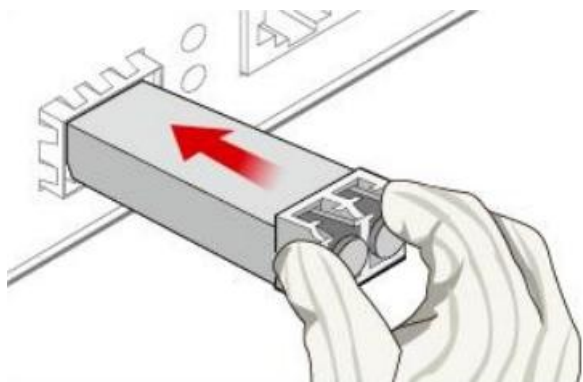
1.4.3 Installing an Optical Module

1. Please take proper electrostatic protection measures before installation, such as wearing an anti-static wristband or gloves.
2. During the installation of optical modules, do not touch the pre-pad of the optical module directly with your hands.
3. Do not directly insert optical modules with fiber into the optical ports of the equipment. Install the optical module first and then connect the fiber.
4. Dust plugs should be installed on unused optical interfaces temporarily. Dust plugs are installed on the optical ports when the equipment is shipped.
5. When installing optical modules, please ensure they are inserted horizontally. If it can not be fully inserted in one direction, do not force it. Flip the optical module 180 degrees and reinsert it.

Procedure

1. Wear an anti-static wristband or anti-static gloves. If you wear an anti-static wristband, ensure that one end of the wristband is grounded and the other end has contact with your skin.
2. Remove the dust plug from the optical interface.
3. Properly store the removed dust plug for future use.
4. Install the optical module into the optical interface.
5. Slide the optical module smoothly along the optical interface until it is fully inserted. After correct installation, the optical module's spring clip will make a "click" sound.

Figure 6: Installing an Optical Module



- Check whether the optical module is securely seated in the optical port.

Keep the handle of the optical module closed, use your thumb and forefinger to hold two sides of the optical module, and gently pull the optical module.

1. If the optical module is not pulled out, it has been correctly installed.
2. If the optical module is pulled out, it is installed incorrectly. Install the optical module again.

1.5 Connecting a Switch

1.5.1 Connecting the Grounding Cable

There is one ground terminal on the back of the S5860 series switches chassis, which should be connected to the grounding lug of the rack first, and then connect the grounding lug to the grounding bar of the equipment room.

Precautions

- The cross-sectional area of the grounding wire should be determined based on the maximum current load that may pass through it, and it should be made of a good conductor.
 - Do not have bare wires exposed.
 - Grounding resistance: Less than 1Ω.
-
- To guarantee the security of the person and the equipment, the switch must be grounded properly. The grounding resistance between the chassis and the ground should be less than 1Ω.
 - The maintenance personnel should check whether the AC socket is reliably connected to the protective ground of the building. If not, the maintenance personnel should use a protective ground conductor from the AC outlet protective ground terminal to the building protective ground.
 - The power socket should be installed near the equipment and easily accessible.
 - When installing the switch, connect the grounding first and disconnect it last.
 - The cross-sectional area of the protection ground wire should be at least 2.5mm² (12AWG).

1.5.2 Connecting Power Cables

- To avoid electric shock, do not connect the power cable while the power is on.
- Please take appropriate anti-static precautions, such as wearing an anti-static wristband or anti-static gloves.
- Power cables must be buried underground or routed indoors and can not be led into the equipment room aerially.
- Do not power on a switch before you finish installing the switch and connecting cables.

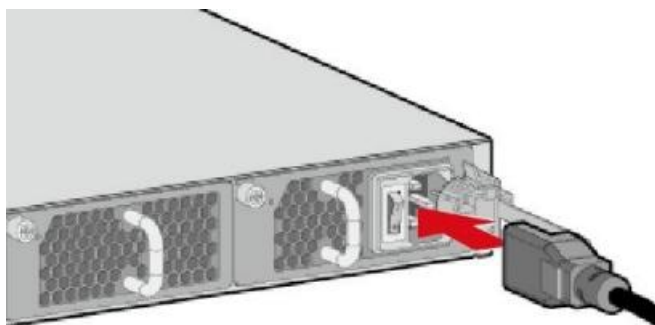
Procedure

1. Wear an anti-static wristband or anti-static gloves. If you wear an anti-static wristband, ensure that one end of the wristband is grounded and the other end has contact with your skin.
2. Turn off the power module and the external power supply system for the switch.
3. Connect the power cable to the power module.

Perform the following steps to connect the AC power cable:

Insert the plug of the AC power cable into the power socket in the AC power module.

Figure 7: Connect the AC Power Cable

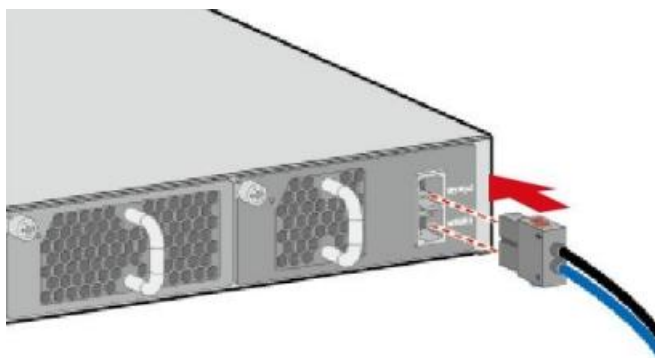


Connect the other end of the AC power cable to the external AC power supply system.

Perform the following steps to connect the DC power cables:

Insert the DC power cable plug to the power socket in the DC power module. Ensure that the positive pole of the plug is connected to the positive socket and the negative pole is connected to the negative socket on the power module.

Figure 8: Connect the DC Power Cable



Connect the other end of the DC power cable with a cold-pressed terminal to the external DC power supply system. Ensure that the polarity is consistent with the equipment end.

1.5.3 Connecting Ethernet Cables

Connect the RJ45 connector of an Ethernet cable to the management port on the equipment, and the other end to a network management switch or terminal.

1.5.4 Connecting Optical Fibers

Insert the single-mode or multi-mode fiber into the corresponding interface according to the panel identification, and distinguish the transmit and receive ends of a fiber cable.

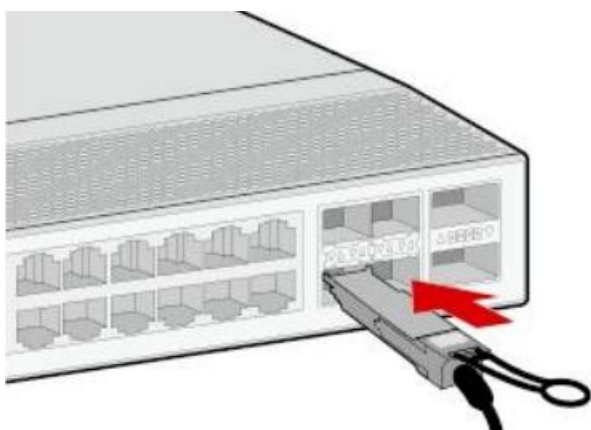
1.5.5 Connecting High-speed Cables

- Please take appropriate anti-static precautions, such as wearing an anti-static wristband or anti-static gloves.
- Use anti-static protective caps on both ends of unused high-speed cables.
- Avoid excessive bending of high-speed cables at corners to prevent damage to the core wires. Ensure that the bending radius is greater than the cable's minimum bending radius.

Procedure

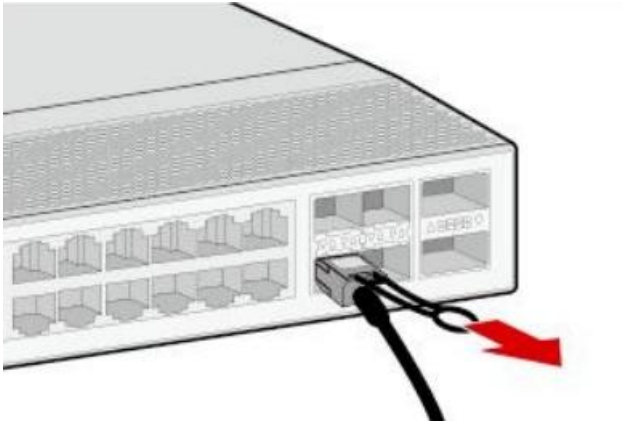
1. Determine the number of interfaces to be connected and their interconnections, and plan the wiring route accordingly.
2. Select high-speed cables of the appropriate quantity and length based on the number of interfaces and the distance of the installation.
3. Wear an anti-static wristband or anti-static gloves. If using an anti-static wristband, ensure that one end is grounded and the other end has good contact with the wearer's skin.
4. Attach temporary labels on both ends of each high-speed cable and mark them with corresponding numbers using a pen.
5. Connect the high-speed cables to the switch interfaces.
6. Find the interfaces corresponding to the labeled high-speed cables and insert the cable connectors into the switch interfaces. Ensure that all high-speed cables are correctly connected to the switch before proceeding further.
7. During the connection, ensure that the connector's orientation is correct, then insert the cable connector into the interface. Once you hear a "click" sound, it indicates that the installation is complete and in place, as shown in Figure 9.

Figure 9: Connecting a High-speed Cable



When disassembling, first gently push the cable connector inwards, then hold the pull ring and pull it outwards. Do not directly pull the cable by gripping the cable connector. Refer to Figure 10 for reference.

Figure 10: Removing a High-speed Cable



8. Cable bundling: Arrange the connected high-speed cables neatly without crossing each other. Every 150mm to 300mm, use cable ties to secure them, and trim off any excess portion of the cable ties using diagonal cutting pliers.

9. Replace all temporary labels with official high-speed cable labels.

1.5.6 Connecting the Console Port

Steps

Connect the RJ45 connector of an Ethernet cable to the console port of the switch, and connect the DB9 connector to a network management switch or terminal.

- By default, the baud rate is 9600, data bit 8, parity check none, stop bit 1, and flow control none.

1.6 Post-Installation Checks

1.6.1 Verifying Cabinet

- External power supply matches the distribution panel of the cabinet.
- The front and back doors can be closed after the switch is installed in the cabinet.
- The cabinet and all cables are securely fastened.
- The switch has been installed in the cabinet.
- Maintain a minimum clearance of 200mm (7.87 in.) around the switch for air circulation.

1.6.2 Verifying Cable Connection

- Verify that the fiber optic cables and twisted pair cables match the interfaces.
- Confirm that the cable bundling is done correctly.
- Ensure that the grounding wire specifications and connections are correct.
- Check if all interface cables are routed indoors and there are no outdoor routing scenarios. If outdoor routing is present, verify if measures such as AC power surge protectors and Ethernet surge protectors are connected.

1.6.3 Verifying Power Supply

Confirm that the power cord is properly connected and compliant with safety requirements.

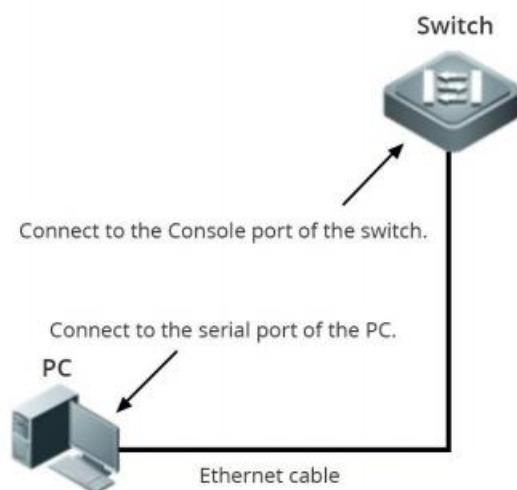
- Before checking the installation for correctness, make sure to disconnect the power source to prevent potential harm to individuals and damage to product components from incorrect connections.

1.7 System Commissioning

1.7.1 Setting Up the Configuration Environment

Connect the PC to the console port of the switch through the Ethernet cable, as shown in the figure below.

Figure 11: Configuration Environment

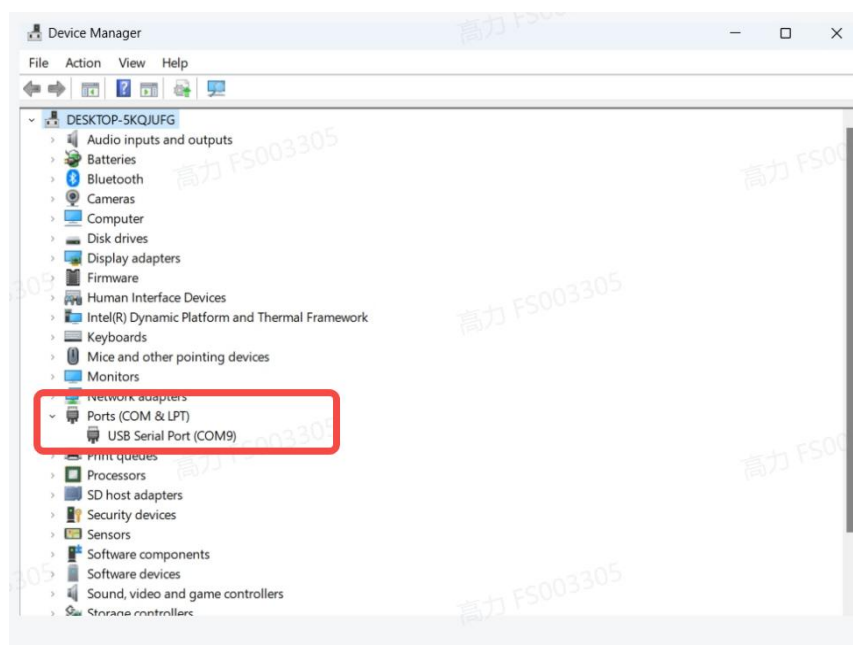


Step 1: Connecting the Ethernet Cable

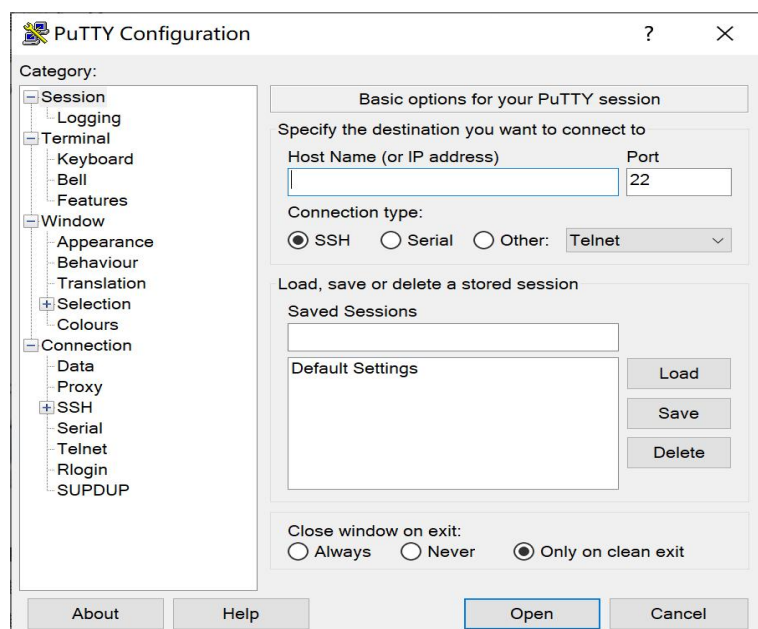
1. Connect the DB-9 connector of the console cable to the serial port of the PC that will be used for configuring the switch.
2. Connect the RJ45 end of the console cable to the switch's configuration port (Console).

Step 2: Check the Serial Port Number

Open Device Manager on the computer and check the serial port number.



Step 3: Start Terminal Emulation Software on the Computer (Such as PUTTY)

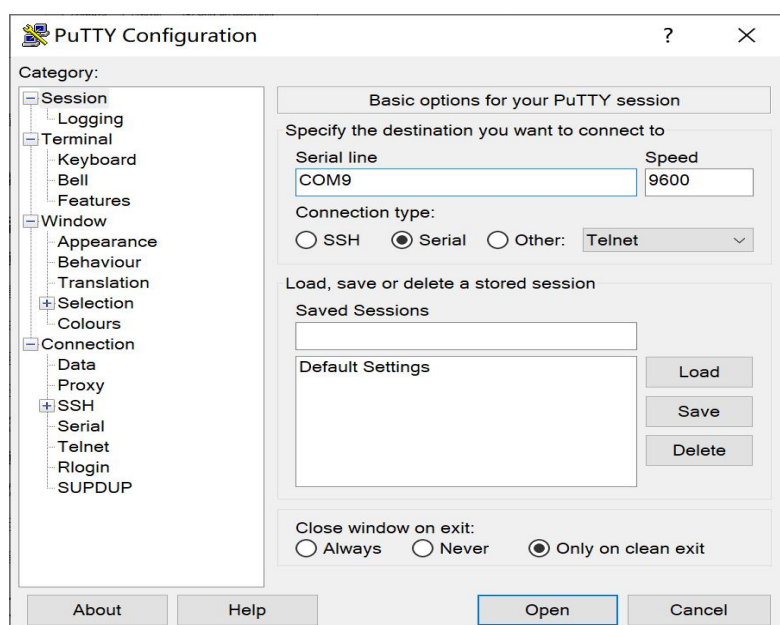


Step 4: Setting Terminal Parameters

Parameter requirements:

Baud rate is 9600, connection type is Serial, fill in COM port number according to the actual situation. The specific diagram is as follows.

Figure 10: Setting Terminal Parameters



1.7.2 Powering On the Switch

Checklist before Power-On

- The switch is fully grounded.
- The fan module and the power module are properly installed.
- Check if the power cord is properly connected.
- The power supply voltage matches the requirement.
- The Ethernet cable is properly connected. The terminal (it can be a PC) used for configuration is already started. The parameters are already configured.

Checklist after Power-On

After power-on, check the following:

- Check whether there is message printed on the terminal interface.
- Check the LED status.

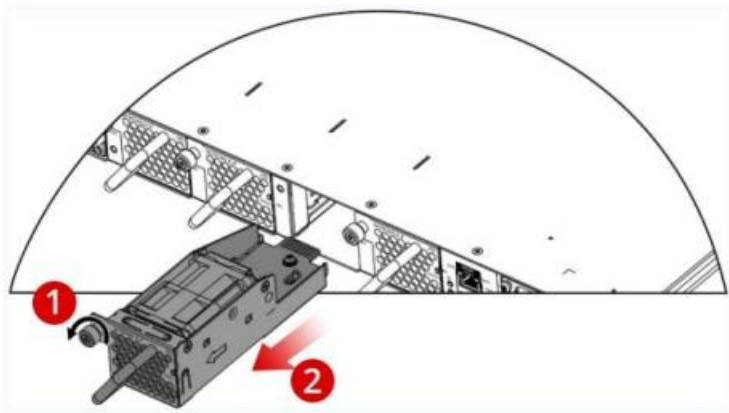
1.8 Parts Replacement

1.8.1 Removing a Power Module and Fan Module

Removing a Fan Module

1. Loosen the captive screws of the fan module.
2. Grasp the handle and pull the fan module out of the slot gently.
3. Install the filler panel in the unoccupied slot and put the removed fan module back into its packaging materials.

Figure 12: Removing a Fan Module

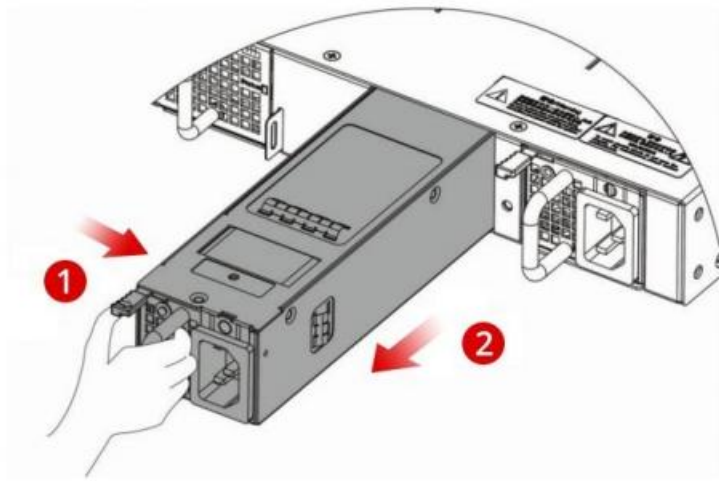


- Slowly and vertically remove the fan module.
- Install a fan slot blanking plate if no fan module is installed in the removed position to maintain proper ventilation and prevent dust accumulation.

Removing a Power Module

1. Press the latch on the module and grasp the handle with one hand. Place your other hand under the module to support its weight. Pull the power module out of the slot gently.
2. Install the filler panel in the empty slot. Put the removed module back into its packing materials.

Figure 13: Removing a Power Module



- Slowly and vertically remove the PSM-C150WAC power module.
- Install a power slot blanking plate if no power module is installed in the removed position to maintain proper ventilation and prevent dust accumulation in the chassis.

1.8.2 Replacing an Optical Module

When replacing the optical module, pay attention to the following requirements:

- Prepare for electrostatic discharge protection before replacing.
- Laser beams will cause eye damage. Do not look into bores of optical modules or optical fibers without eye protection.
- Ensure the new optical module matches the center wavelength and supported standards of the module being replaced.
- After removing the optical fibers from an optical module, cover the fiber connectors with dust caps.
- When replacing an optical module, ensure that no optical fiber is connected to the optical module. Install or remove optical fibers carefully to avoid damage to fiber connectors. Exercise caution when installing or removing optical fibers to prevent damage to the optical module.

Procedure

1. Wear an anti-static wristband or anti-static gloves. If you wear an anti-static wristband, ensure that one end of the wristband is grounded and the other end has contact with your skin.

2. Before replacing an optical module, determine in which cabinet and chassis the optical module is installed, find the optical module in the chassis, and attach a label to the optical module. Record optical fiber locations on the optical module to be replaced and check whether the labels on the optical fibers are correct and clear. If any label is unclear, make and attach a new label to the optical fiber to ensure correct connection.

3. Rotate the handle of the optical module down, gently push the optical module, and then pull out the optical module with the handle. Remove the optical fibers from the optical module and cover them with dust caps.

Two types of latches on fiber optic connectors:

- LC/PC connector, opened by pressing the buckle, as shown in Figure 14.
- MPO connector, opening automatically when the buckle is pulled, as shown in Figure 15.

Figure 14: LC/PC Connector

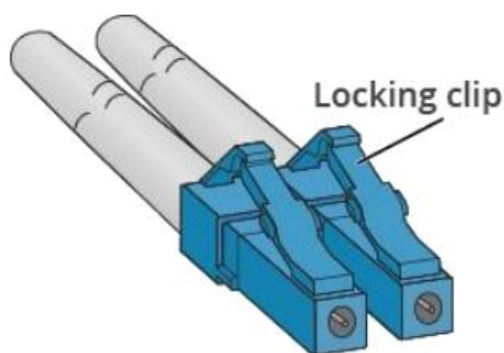
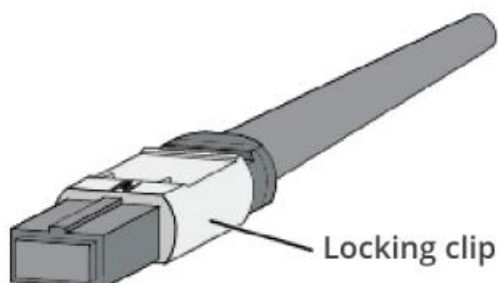


Figure 15: MPO Connector



4. Pull out the optical module, plug the dustproof plug and dispose of it.

There are two types of buckles on the optical module. A pull-rod handle that needs to be turned over to open, as shown in Figure 16. The other is a handle-type handle, which is automatically opened during the process of pulling the handle, as shown in Figure 17.

Figure 16: Pull-rod Handle

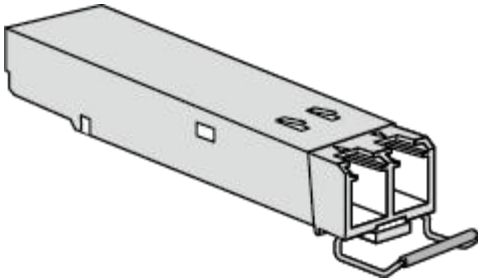
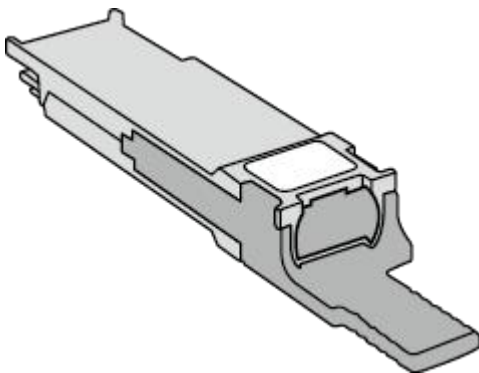


Figure 17: Handle-type Handle



5. Take out the new optical module from the package, and slowly insert it into the interface until you hear a "pop" sound, indicating that it has been installed in place.

6. Find the fiber to be connected, find the interface corresponding to the fiber through the label on the fiber, remove the dust cap and connect the fiber to the interface.

1.8.3 Replacing a Switch

When replacing a faulty switch, pay attention to the following requirements:

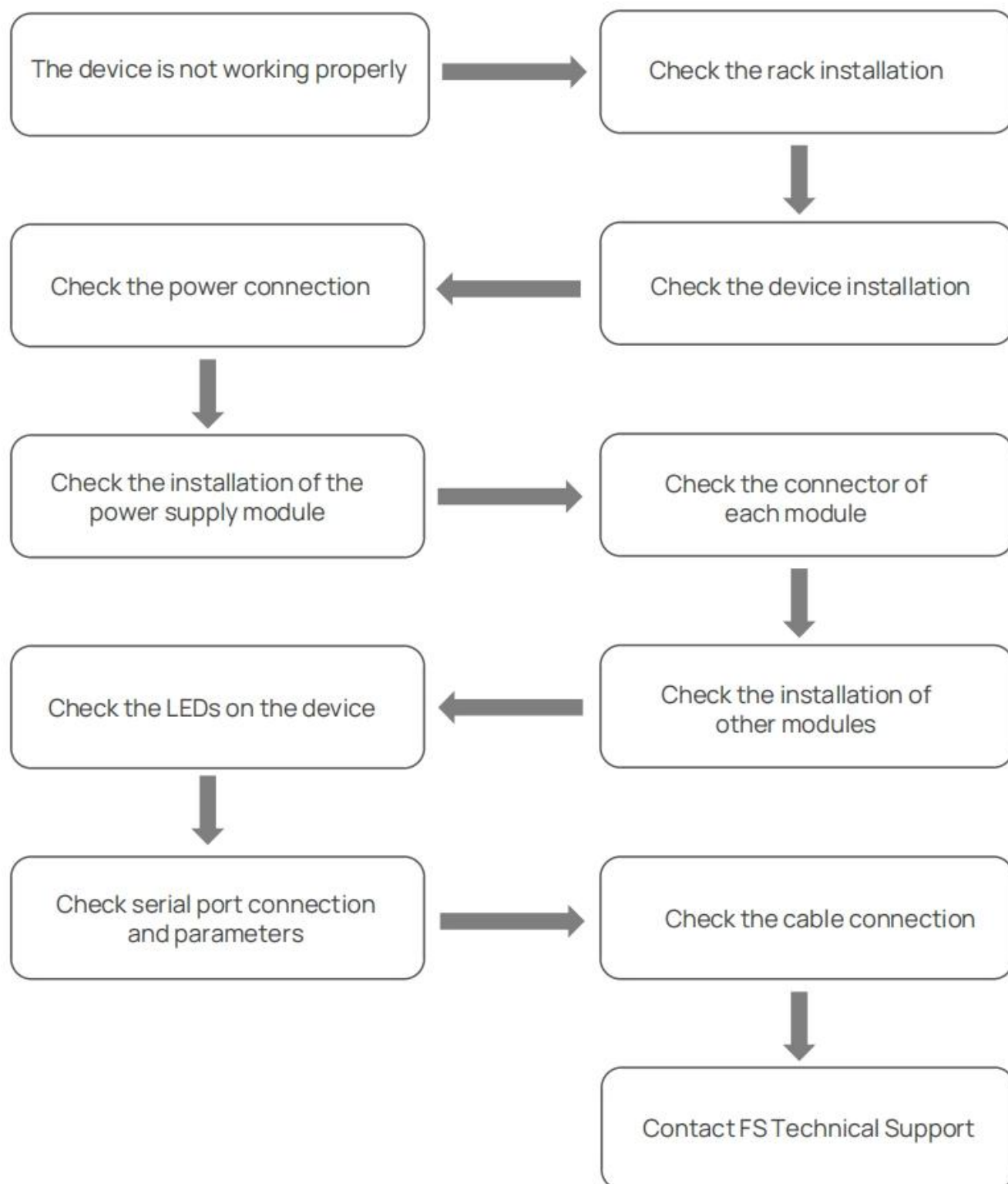
- Anti-static preparations must be made before replacement.
- Laser beams will cause eye damage. Do not look into bores of optical modules or optical fibers without eye protection.

Procedures

1. Before replacing the faulty switch, be sure to clearly mark the corresponding relationship between the network cable and the port.
2. Check whether the business is ready for power-off, and save relevant business information.
3. Disconnect the power cord and ground wire of the faulty device.
4. Pull out all the network cables and optical fibers of the faulty device.
5. Loosen the fixing screws of the faulty device and remove the faulty device.
6. Install the new equipment, the sequence is the reverse of dismantling the faulty equipment. Fix the screws first, then connect the network cable, optical fiber, and finally connect the power cord and ground wire of the device. Be careful not to touch the power lines, network cables, and optical fibers of other equipment during the replacement process to avoid greater losses.

Troubleshooting After Installation

2.1 Troubleshooting Flowchart



2.2 Guide to Using Switches

Fault 1: The login password is forgotten.

Fault Symptom

The login password is forgotten.

Handling Method

Contact FS technical support.

Fault 2: The AC power module does not work

Fault Symptom

All LEDs on the front panel are off. The fan status LED is off, and the fan does not rotate. The power supply status LED is off. The fan does not rotate.

Handling Method

1. Unplug the power cord from the power module.
2. Check whether the power cord is securely connected to the power socket.
3. Check whether the power cord is securely connected to the power module.
4. Check whether the power module is securely seated. If necessary, pull out the power module and check its connector.

Fault 3: The fan tray does not work

Fault Symptom

After the system starts, the fan does not rotate or the Status LED is off.

Handling Method

Check if the connection between the fan module and the chassis is secure and if the connector gets loose. If the connection is secure, replace the fan tray.

Fault 4: The serial port console has no output

Fault Symptom

After the system is started, the serial console does not display any information.

Handling Method

1. Check the serial cable: Make sure the serial port is properly connected to the console port of the switch. Check for loose or damaged connections and reseal the connections.
2. Check whether the connected serial port is consistent with what is configured on the HyperTerminal.

3. Check whether the configuration of the serial port on the HyperTerminal is consistent with that in Configuration Guide (such as SSH, Telnet) log in to the switch to check the working status of the serial port. It may be necessary to view and configure the serial port through the command line interface or web interface of the switch.
4. Replace the serial cable or serial adapter: If none of the above methods solve the problem, try to replace the serial cable or use a different serial adapter. Sometimes glitches can appear on these hardware.
5. Contact Vendor Support: If there is still no output on the serial port, please contact FS technical support.

Fault 5: The serial port console output is garbled

Fault Symptom

The serial port console output is garbled.

Handling Method

1. Check the serial port settings: Make sure the serial port settings used match the console settings of the switch. Check whether the settings of baud rate, data bits, stop bits and parity bits are correct. If the settings do not match, it will cause data transmission errors, resulting in garbled characters.
2. Check the terminal software encoding setting: In the terminal software, check whether the character encoding setting is correct. Make sure that the character encoding used is consistent with the character encoding of the switch, usually ASCII encoding is used.
3. Contact Vendor Support: If there is still no output on the serial port, please contact FS technical support.

Fault 6: The newly inserted expansion module cannot be powered on

Fault Symptom

The system runs normally, the indicators on the panel of the newly inserted expansion module are all off, and the ports can not work normally.

Handling Method

First confirm whether the module is inserted in place. If everything is normal, but the newly inserted module still can not be powered on and works, please contact FS technical support.

Fault 7: The link can not be set up between optical ports

Fault Symptom

The system runs normally. After you insert an optical transceiver into an optical port and plug in a fiber cable, the link cannot be set up.

Handling Method

1. Check whether the receive and transmit ends are reversed. The transmit end of an optical port must be connected to the receive end at the other end. You can confirm both ends by exchanging the connection order of two fiber cables.

2. Check whether wavelengths of optical transceivers on both sides are consistent. For example, an optical transceiver with a wavelength of 1310 nm cannot be connected to an optical transceiver of 1550 nm.
3. Check whether the distance between two sides exceeds the maximum length marked on the optical transceiver.
4. Check whether the speeds of two sides are consistent and whether the fiber cable type meets requirements. For ports supporting different speeds, check their duplex mode settings.

2.3 Guide to Using Optical Modules

2.3.1 Common Faults of an Optical Module

1. An optical module is not completely installed in position.

If the optical module is not completely installed in position and the latch boss is not secured, the device cannot identify the optical module. After the optical module works for a long time, it will be ejected under external stress.

2. The optical receptacle on an optical module is contaminated.

If an optical module is not cleaned or protected properly, contaminants may accumulate on the fiber pin in the optical module. As a result, the coupling efficiency is reduced, optical signals are cut off, or even worse, the surface of the fiber pin is damaged permanently.

3. An optical module is burnt.

If high-power optical signals (caused by an optical time domain reflectometer or self-loop test) are transmitted through an optical module that is used for long-distance transmission but no optical attenuator is used, the optical power will exceed the overload power of the avalanche photodiode (APD). Then the optical module is burnt.

The preceding faults lead to temporary or long-term cut-off of optical signals; or even cause permanent damages to the optical module, affecting communication services.

2.3.2 Measures to Prevent a Loosened Optical Module

1. When installing an optical module, insert it in position. If you hear a click or feel a slight shake, it indicates that the latch boss is secured.

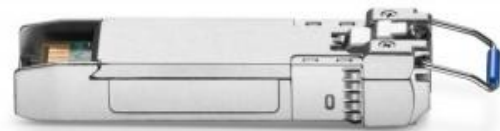
If the latch boss is not secured, the gold finger of the optical module is not in good contact with the connector on the board. In this case, the link may be connected but optical signals will be cut off or the optical module will be loosened when the optical module is shaken or hit.

2. Figure 18 shows the release handle on an optical module when it is open and closed. When inserting the optical module, make sure that the release handle is closed. At this time, the latch boss locks the optical module. After the optical module is inserted, try pulling it out to see if it is installed in position. If the optical module cannot be pulled out, it is secured.

Figure 18: State of the release handle



Close the release handle



Open the release handle

2.3.3 Measures to Prevent Receptacle Contamination

1. Cleaning tissues must be prepared on site. You need to clean the optical connector before inserting it in the receptacle. This protects the receptacle against contamination on the surface of the optical connector.

Figure 19: Cleaning optical fibers with special cleaning tissues



- Place at least three cleaning tissues on the work bench. As shown in Figure19, wipe the end of an optical connector from left to right or from right to left on a cleaning tissue, and then move the connector end to the unused part of the cleaning tissue to continue.

2. over an unused optical module with a protective cap to prevent dust, as shown in Figure20.

Figure 20: Installing a protective cap



If no protective cap is available, use fibers to protect the optical module, as shown in Figure 20.

Figure 21: Using fibers to protect an optical module



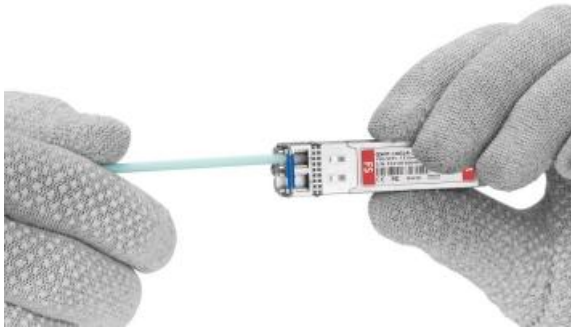
3. Cover unused optical connectors with protective caps, as shown in Figure 21, and then lay out fibers on the fiber rack or coil them in a fiber management tray to prevent fibers from being squeezed.

Figure 22: Installing a protective cap on a fiber



4. If a receptacle or an optical connector has not been used for a long time and is not covered with a protective cap, you need to clean it before using it. Clean a receptacle with a cotton swab, as shown in Figure 22. Clean an optical connector with cleaning tissues.

Figure 23: Cleaning a receptacle with a cotton swab



- When cleaning a receptacle, insert the cotton swab and turn it slowly in the receptacle. Do not use too much strength because the receptacle may be damaged.

5. If optical signals are lost during the operation of a device, use the preceding method to clean the receptacle or the optical connector. In this manner, the possibility of contamination can be excluded.

2.3.4 Measures to Prevent an Optical Module from Being Burnt

1. Before using an optical time-domain reflectometer (OTDR) to test the connectivity or the attenuation of optical signals, disconnect the optical fibers from the optical module. Otherwise, the optical module will be burnt.
2. When performing a self-loop test, use an optical attenuator. Do not loosen the optical connector instead of the optical attenuator.

2.3.5 Precautions

1. The optical connector should be vertically inserted in the receptacle to avoid damages to the receptacle.
2. Fibers must be inserted into optical modules of the corresponding type. That is, multimode fibers must be inserted into multimode optical modules, and single mode fibers must be inserted into single mode optical modules. If a fiber is inserted into an optical module of a different mode, faults may occur. For example, optical signals will be lost.



FS has invested resources in product R&D, quality control, intelligent manufacturing, industry-leading experts, professional technical support, and networking solutions. All is to provide customers with higher-performance, lower-power consumption, and the most cost-effective products, promoting clients' network upgrades.

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