

MyPower S5820 Series Switch

Installation Manual

V1.0

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Security Statement

Important! Before powering on and starting the product, please read the security and compatibility information of the product.

Environmental protection

This product has been designed to comply with the environmental protection requirements. The storage, use, and disposal of this product must meet the applicable national laws and regulations.

Preface

Manual Introduction

This manual first describes the appearance and hardware of MyPower S5820 Series 10G routing switch; secondly, describes the installation preparations and installation methods of MyPower S5820 series 10G routing switch; at last, describes the basic using methods and daily maintenance of MyPower S5820 series 10G routing switch from the aspects of powering on and running the device, troubleshooting and device maintenance.

Product Versions

The corresponding product versions of the manual are as follows:

Product Name	Product Version
MyPower S5820 10G routing switch	SM5820-52F (V1)

Audience

This documentation is intended for:

- Hardware installation engineers
- Commissioning engineers
- Field maintenance engineers
- System maintenance engineers




Conventions

Conventions of screen output format:

Format	Description
Screen print	Represents the output information of the screen
Keywords of Screen print	The red part represents the key information in the screen output

Symbol conventions:


Format	Description
--------	-------------

Format	Description
 Note	An alert that contains additional or supplementary information.
 Caution	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
 Warning	An alert that calls attention to important information that if not understood or followed can result in personal injury or device damage.

Command conventions:

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
Italic	Italic text represents arguments that you replace with actual values.
[]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x y ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x y ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x y ... } *	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

The icons used in the manual and the meanings:

Icon	Description
	Represents a generic switch

Supporting Manuals of Product

The supporting manuals of the product:

Manual name	Overview
<i>MyPower S5820 Series 10G Routing Switch Installation Manual</i>	Describes the device hardware specifications and installation methods, guiding you to install the device
<i>MyPower S5820 Series 10G</i>	Describes the configuration methods and configuration steps of the

Manual name	Overview
<i>Routing Switch Configuration Manual</i>	device software functions, providing typical cases for reference
<i>MyPower S5820 Series10G Routing Switch Command Manual</i>	Describes the device commands, equivalent to command dictionary, convenient for searching for the function of each command

Obtaining Documentation

You can access the most up-to-date Maipu product documentation on the World Wide Web at www.maipu.com.

Technical Support

- Technical supporting hotline: 400-886-8669
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Revision Records

Version	Revision Date	Revised Content
V1.0	2014-05-23	First formal release

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First formal release

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1 Product Introduction

MyPower S5820 data center 10G routing switch (hereinafter referred to as SM5820) is the next-generation data center 10G routing switch developed by Maipu. This series switch has the 10G core switch technology and is designed for the data center Gigabit server high-density access. The high availability, multi-redundancy, high density, and flexible convergence ratio features of the SM5820 switch provide powerful network support for the GE access and 10G aggregation solution in the data center and campus network.

The chapter mainly introduces the product specifications of SM5820, including:

[1.1 Product Models](#)

[1.2 Product Appearance and Dimension](#)

[1.3 Power Module Introduction](#)

[1.4 Fan Module Introduction](#)

[1.5 Device Air Passage](#)

[1.6 Physical Parameters](#)

1.1 Product Models

The product model of the SM5820 10G routing switch is listed in Table 1-1.

TABLE 1-1 PRODUCT MODELS

Product Model	Supported Interface and Description
SM5820-52F	48 x 10G interface (SFP+), 4 x 40G interface (QSFP+), 1 Console port, 1 management Ethernet interface, dual-power slot, 5 fan slots

1.2 Product Appearance and Dimension

SM5820 adopts centralized hardware platform and 1U standard desk-top architecture.

Note

- The chassis dimension of SM5820 is 438 mm × 433.3 mm × 43.80 mm (W x D x H).

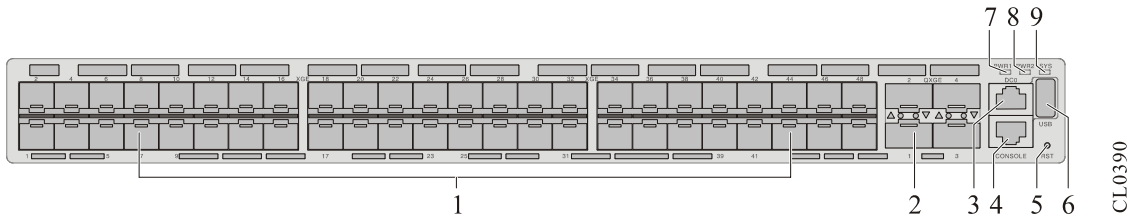


FIGURE 1-1 FRONT PANEL DIAGRAM OF SM5820-52F

1. SFP+ port	2. QSFP+ port
3. Management Ethernet interface	4. Console port
5. Reset button	6. USB port
7. PWR1 power state indicator	8. PWR2 power state indicator
9. System state indicator	

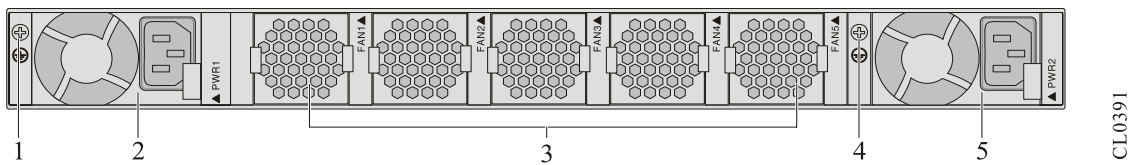


FIGURE 1-2 BACK PANEL DIAGRAM OF SM5820-52F

1. Ground terminal	2. Pluggable power module 1
3. Pluggable fan module 1-5	4. Ground terminal
5. Pluggable power module 2	

1.3 Power Module Introduction

The back panel of SM5820 switch provides two power slots, configured with one power module. SM5820 switch supports two power modules working concurrently, used to back up the system power. The specific AC power model and function provided by the switch are shown in the following table:

TABLE 1-2 POWER MODULE SUPPORTED BY SM5820

Model	Name	Remarks
AD460-1S005J	460W AC power	Two power modules of the same type can be used for hot backup of the system power.

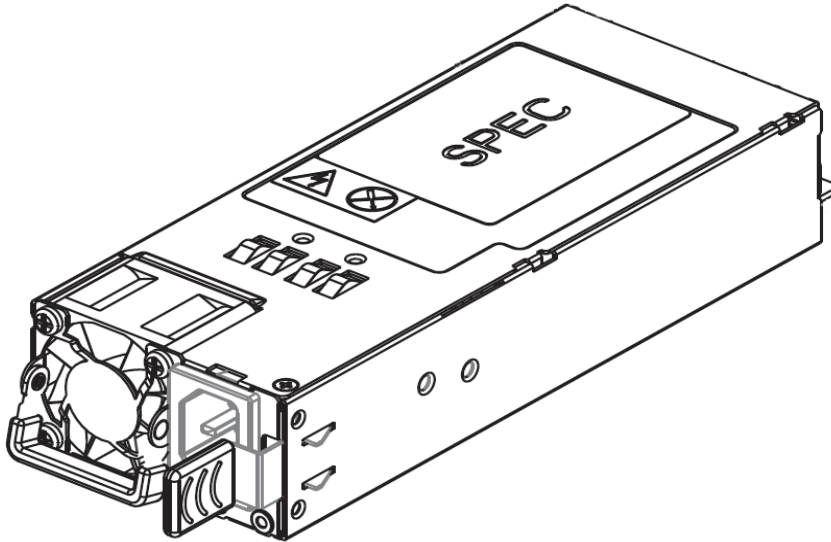


FIGURE 1-3 APPEARANCE OF AD460-1S005J

Note

- When the power module enters the over-temperature protection state due to high temperature, please adopt cooling measure immediately. When the temperature cools down, the power module will automatically recover to normal operating state.

1.4 Fan Module Introduction

The back panel of SM5820 provides 5 fan slots, configured with 5 fan modules. It supports 4+1 redundancy backup. The specific fan module and function provided by the switch are shown in Table 1-3.

TABLE 1-3 POWER MODULE SUPPORTED BY SM5820

Model	Name	Remarks
SM58-FAN-A	Fan module	Support 4+1 redundancy backup and hot plugging. The fan rotation speed is automatically adjusted with the system temperature.

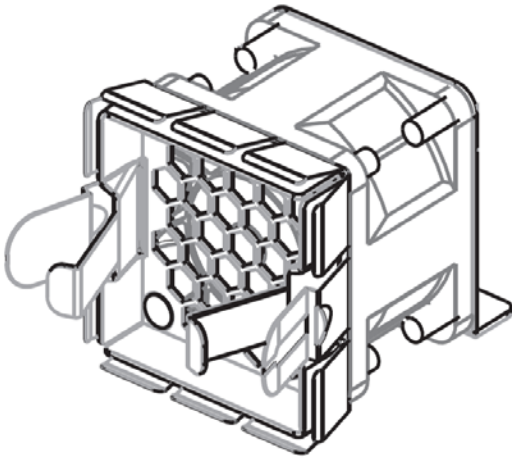


FIGURE 1-4 FAN MODULE APPEARANCE OF SM58-FAN-A

1.5 Device Air Passage

The radiator air passage of the switch is front in and rear out, as shown in the following figure. The front and rear sides of the device should have the enough spaces (it should be no less than 60mm) for good ventilation.

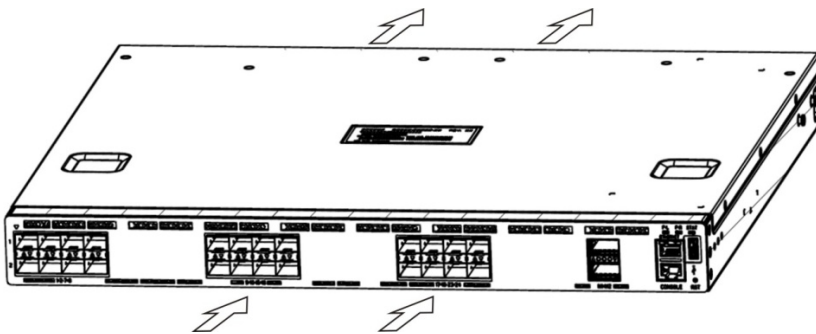


FIGURE 1-5 DEVICE AIR PASSAGE DIAGRAM

1.6 Physical Parameters

TABLE 1-4 PHYSICAL PARAMETERS

Item	Description
Appearance dimension (W x D x H)	438 mm x 433.3 mm x 43.80 mm

Item	Description
Fixed port	48 SFP+ ports, 4 QSFP+ ports, 1 management Ethernet interface
Management port	1 RJ-45 serial Console port
Max. Power (full-configured)	< 120W
Weight	7.69 Kg (configured with one AC power module)
Rated input voltage	AC: 100-240VAC, 2.8A-5.6A 50/60HZ, DC: 180-300VDC
Short-term work temperature	-5°C to 55°C
Long-term work temperature	0°C to 45°C
Storage temperature	-40°C to 75°C
Long-term work humidity	15% to 85%RH, non-condensing
Altitude	< 5000m
Noise (SPL, normal temperature 25°C)	< 60dBA
Anti-lightning specification	Interface protection common mode \pm 1KV, power protection common mode \pm 6KV, differential mode \pm 6KV
Heat-dissipating mode	Forced cooling, air passage front in and rear out
Power module backup	Support 1+1 backup
Fan module backup	Support 4+1 backup
Hot plugging	Power module, fan module, and interface optical module all support hot plugging.

Note

- The short-term working condition means less than 48h continuous work and less than 15-day accumulative work annually.

2 Installation Preparations

This chapter describes the preparations before installing the devices and the related work, including:

[2.1 Safety Precautions](#)

[2.2 Check Device Running Environment](#)

[2.3 Open-Package and Inspection](#)

Note

- When the device is delivered, there is the packing list. Please confirm whether the accessories are complete and good according to the items in the packing list. If there is damaged or loss, please contact Maipu technical staff to change.
-

2.1 Safety Precautions

2.1.1 General Safety

Caution

- Ensure that the ground of the installation place is dry and smooth and you have made the anti-skidding measures.
 - Keep the device clean and dust-free; do not place the device in the damp place.
 - When moving the switch device, avoid that the body is scratched by the sharp part of the equipment.
-

2.1.2 Electrical Safety

Caution

- Please check whether there are potential dangers. For example, the power is not grounded, power supply grounding is not reliable, and the ground is wet.
 - Before installation, get to know the location of the emergency power switch in the room;
-

when there is an accident, cut off the emergency power switch at first.

- Before moving the chassis, be sure to unplug all external cables (including power cable).
 - When maintaining with power, it is recommended that there are two or more persons in the field.
 - When closing the power, ensure that the neutral line and live line are disconnected.
-

2.1.3 Static Safety

To avoid the static from damaging the electronic parts of the switch, we need to take the anti-static measures.

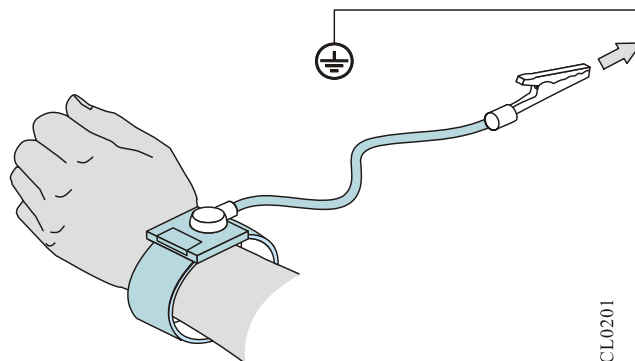
Caution

- When installing the components of the switch, especially installing the components with the circuit board (such as board), we should wear anti-static wrists.
 - When holding the circuit board, please hold the edge of the circuit board and do not touch the components or printed circuit.
 - For the security, please check the resistance of the anti-static wrists. The resistance between the body and the ground should be 1-10 megohms.
-

The using steps of the anti-static wrists are as follows:

- Step 1: Put his hand into the anti-static wrist.
- Step 2: Tighten the fastener and confirm that the piece metal on the anti-static wrist is well contacted with the skin.
- Step 3: Clip the alligator clip of the anti-static wrist to the grounding screw of the device.
- Step 4: Confirm that the anti-static wrist well-grounded.

The using method of the anti-static wrist is as shown in the following figure.



CL0201

FIGURE 2-1 USING METHOD DIAGRAM OF ANTI-STATIC WRISTS

2.1.4 Handling Safety

- Before handling or moving the device, unplug all external cables (including power cable).
- If the moving distance is long, it is recommended to use the professional mechanical handling tools.

2.1.5 Laser Safety

For the switch with the optical port, avoid directly viewing the laser beam from the optical module inside.

Warning

- Viewing the laser beam from the optical module inside directly may damage your eyes.
-

2.2 Check Device Running Environment

2.2.1 Check Equipment Room Conditions

To ensure the normal running of the device, take the corresponding measures to meet the environment requirement of the device running:

- Air conditioning and ventilation system can ensure the normal running temperature and humidity conditions of the device. For details, refer to [Environment Requirements of Equipment Room](#).
- The good grounding is the basis of the device running and the important guarantee conditions of preventing lightning and resisting interference. Ensure that grounding meets the grounding specifications. For details, refer to [Device Grounding Specifications](#).
- Confirm whether there is enough installation space and handling channel space.
- Ensure that the cleanness of the equipment room meets the requirement. Do not place the device in the environment with lots of dust, such as being renovated.

2.2.2 Check Power Supply System

The good power system is the basis of the switch starting and stable running. The series switch is the desk-top device and is configured with power when leaving the factory, so you just need to check the power system of the installation place.

Ensure that the power supply system of the installation place is stable and can meet the parameter requirement of the switch device, such as input mode and rated input voltage. For details, refer to [Power Condition Requirements](#).

Note

- For the power consumption data of the switch, refer to [Physical Parameters](#).
-

2.3 Open-Package and Inspection

2.3.1 Open Device Package

The desk-top switch adopts the carton packaging. The box comprises the carton, plastic bags, protection EPE and other packaging materials. The open-package steps are as follows:

- Step 1: View the carton label, and confirm the device model.
- Step 2: Use a paper knife to gash the tape along the lid commissure; be careful when using the knife and do not insert too deep to avoid damaging equipment inside.
- Step 3: Open the carton, remove the foam board, and then you can get out of the device.

2.3.2 Open-Package Inspection

- Step 1: Get the equipment list.
- Step 2: According to the equipment list and the device label, check whether the device is correct.
- Step 3: According to the equipment list, check whether the device and other accessories are complete.

Note

- Keep the accessories in the accessory box and do not lose.
-

3 Device Installation

This chapter describes the device installation, including:

[3.1 Install Device to Cabinet](#)

[3.2 Ground the Device](#)

[3.3 Install Power Module](#)

[3.4 Install Fan Module \(Optional\)](#)

[3.5 Connect Power Cable](#)

[3.6 Check after Installation](#)

3.1 Install Device to Cabinet

This section describes how to install the device to the 19-inch standard cabinet.

3.1.1 Installation Preparations

- SM5820 is 1U high and the user can fix the switch via one pair of hanging ears.
- Check the grounding and stability of the cabinet and ensure that there is no obstacle inside and around the cabinet affecting the switch installation

Note

- 1U is 44.45mm. Here, U is short for Rack Unit.
-

3.1.2 Install Hanging Ears to Switch

Step 1: When installing the hanging ears to the chassis, make the ears align with the fixed screw holes of the switch and the screw holes on the chassis side panel, as shown in the following figure:

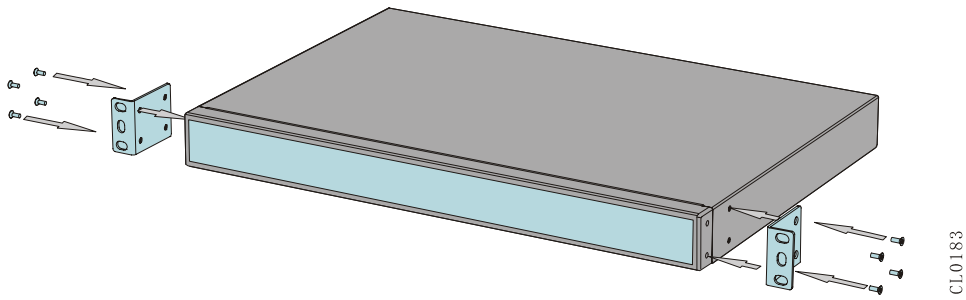


FIGURE 3-1 INSTALL HANGING EARS TO THE SWITCH

Step 2: Tighten the screw clockwise, so that the hanging ears are fixed to the chassis. After the installation is complete, it is as shown in the following figure:

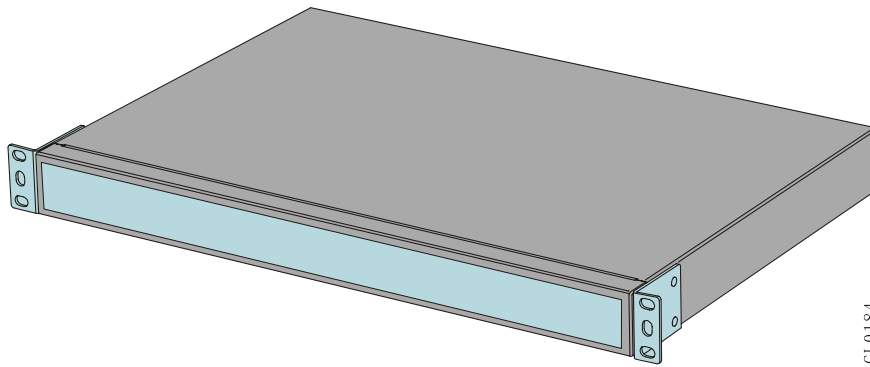


FIGURE 3-2 INSTALLING HANGING EARS IS COMPLETE

3.1.3 Install Device to Cabinet

! Caution

- Before installing the device to the cabinet, ensure that the cabinet is installed with the slide (tray) and the slide (tray) can support the weight of the device and the accessories.

The following describes the steps of installing the device to cabinet:

- Step 1: Wear the anti-static wrist strap, and check the grounding and stability of the cabinet.
- Step 2: Use the ears to compare and get the location of the floating nuts on the square holes of the cabinet column and mark it.
- Step 3: At the marked location, install the floating nuts, as shown in the following figure:

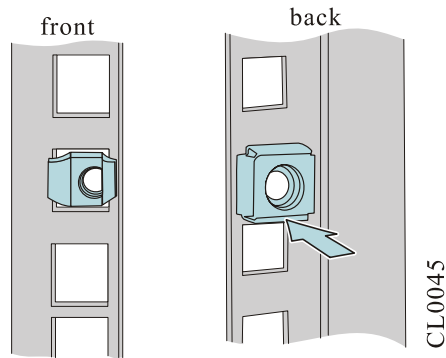


FIGURE 3-3 INSTALL FLOATING NUTS

- Step 4: Use the screws to fix the hanging ears at the two sides of the switch. For installation method, refer to [Install Hanging Ears to Switch](#).
- Step 5: According to the actuality and the installation location of the hanging ears, move the switch along the cabinet to the appropriate location.
- Step 6: Use the screws meeting the installation dimension of the cabinet (the switch does not have the screws for installing on the cabinet; the screws are provided by the manufacturer of the cabinet, the surface gets the anti-rust processing, and the screws match with the floating nuts) to fix the switch with the square holes of the cabinet column via the hanging ears. The installation methods are as shown in the following figure. Pay attention to keep the location level and firm.

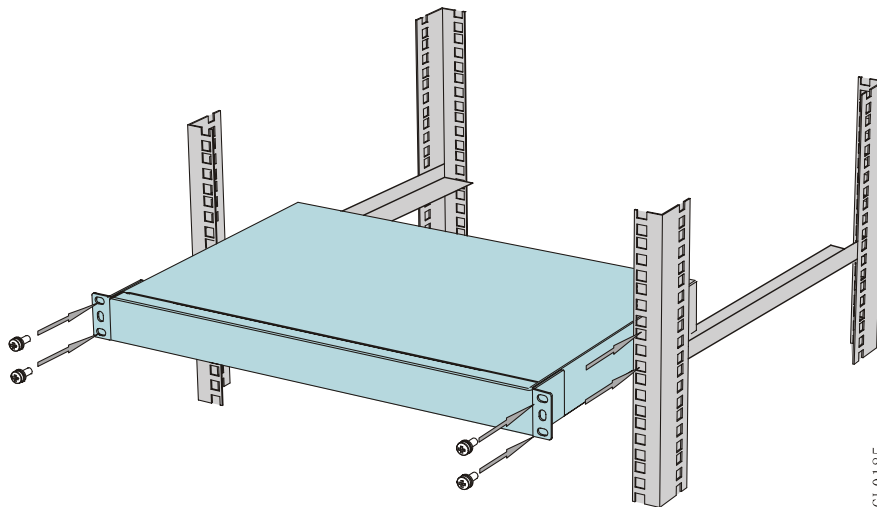


FIGURE 3-4 INSTALL HOST TO CABINET

3.1.4 Installation Check

After installing the switch to the cabinet, check according to the following items. It is required that the listed items are normal.

- The installation location of the switch is correct.
- The hanging ears of the switch are well fixed with the cabinet.

- There is enough space around the switch for radiating.

3.2 Ground the Device

Usually, there is the grounding bar on the cabinet and we can connect the grounding cable of the switch to the grounding bar.

Note

- Please use the grounding cable carried by the switch.

The steps of installing the grounding cable are as follows:

- Step 1: Remove the grounding screws on the chassis of the switch.
- Step 2: Bind the wiring terminal of the grounding wire carried by the switch to the grounding screws of the chassis.
- Step 3: Install the grounding screws with the grounding wire to the grounding holes and tighten it.
- Step 4: Use the same method to install the other side of the ground cable to the grounding terminal of the cabinet.

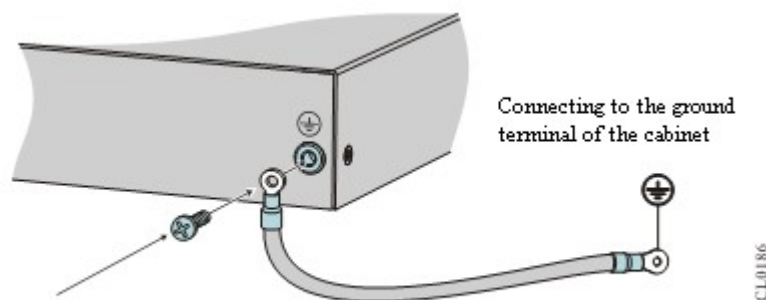


FIGURE 3-5 CONNECT THE GROUND WIRE

Caution

- If there is no appropriate grounding point on the cabinet, we also can connect the grounding wire of the device to other grounding bar of the installation place.
 - Fire hose and lightning rod grounding of the building are not the proper grounding location; the grounding wire of the device should be connected to the engineering grounding of the equipment room.
-

Warning

- To ensure the safety of the personnel and equipment, the device should be well-grounded and the resistance between the device chassis and the ground should be smaller than 1Ω .
-

3.3 Install Power Module

Install the power module by the following steps:

3.3.1 Installation Preparations

- Wear the antistatic wrist and confirm that the anti-static wrist is well-grounded.
 - If the installation location has the filler panel, please remove the filler panel first.
 - Take out the power module from the packing box.
-

Caution

- When moving the power module, please use the hands to hold the bottom of the component and do not carry the handle of the component to move.
-

3.3.2 Installation Steps

Push the power module along the guide slot slowly and horizontally by the gold-finger of the power module inward and downward direction until you hear a click sound. The diagram of installing the power module is shown in the following figure.

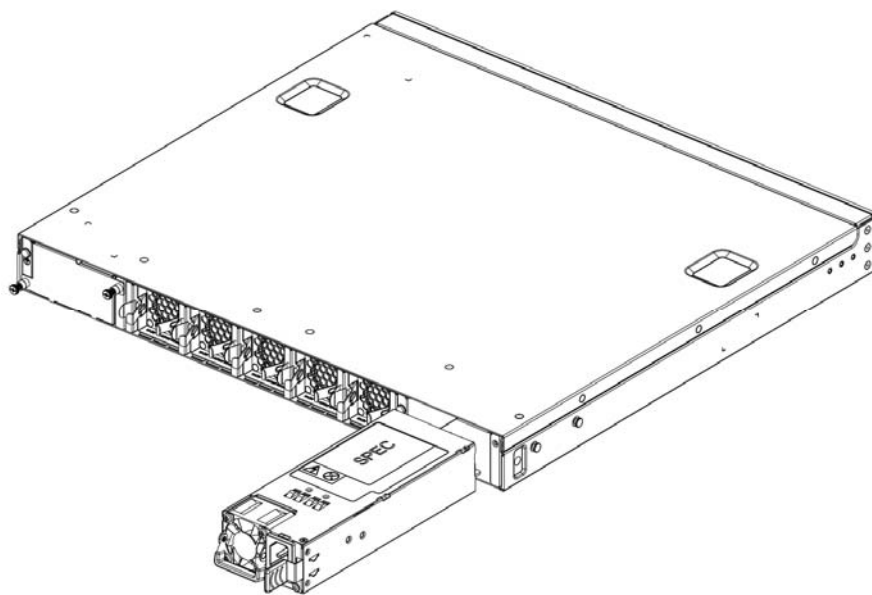


FIGURE 3-6 INSTALL POWER MODULE

3.4 Install Fan Module (Optional)

If the fan module is already installed on the chassis of the switch, skip the chapter.

3.4.1 Installation Preparations

- Wear the anti-static wrist and confirm that the anti-static wrist is well-grounded.
- Get the fan module out of the packing box.

3.4.2 Installation Steps

Push the fan module along the fan slot on the chassis back horizontally by the gold-finger of the fan module inward and downward direction until you hear a click sound. The diagram of installing the fan module is shown in the following figure.

Note

- The metal edge of the fan module is thin and therefore be careful of not injuring your finger when holding and plugging the fan module.
-

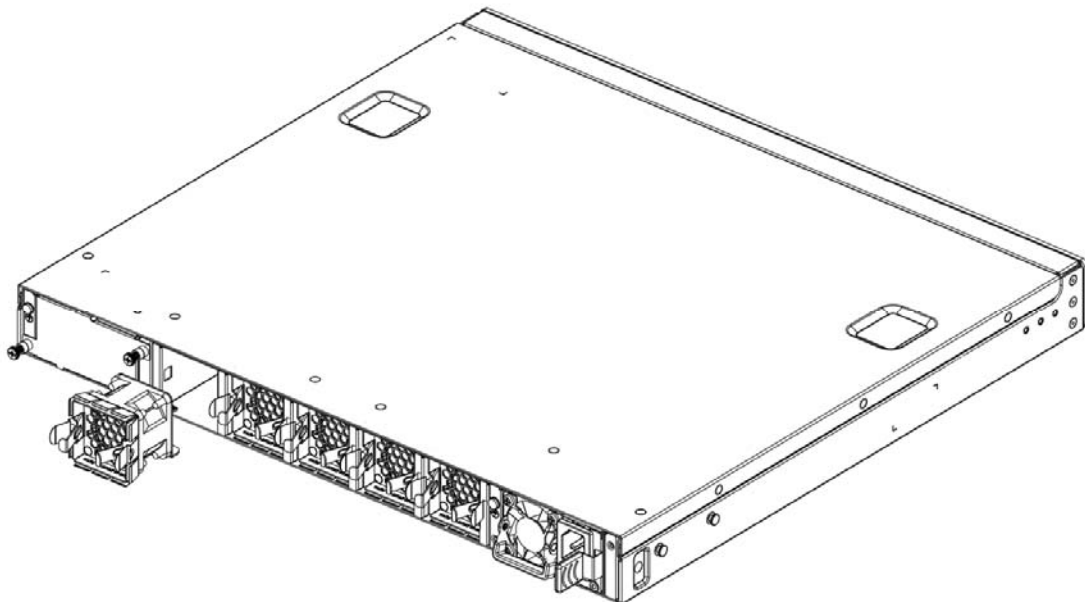


FIGURE 3-7 INSTALL INTERFACE CARD

3.5 Connect Power Cable

3.5.1 Installation Preparations

Considering the lightning protection requirement of the device, it is recommended that the AC power reaches the better lightning protection effect via the external lightning equipment when bringing in the device.

3.5.2 Connect AC Power Cable

Step 1: Connect one side of the AC power cable to the AC power interface of the front (back) panel of the switch chassis, as shown in the following figure.

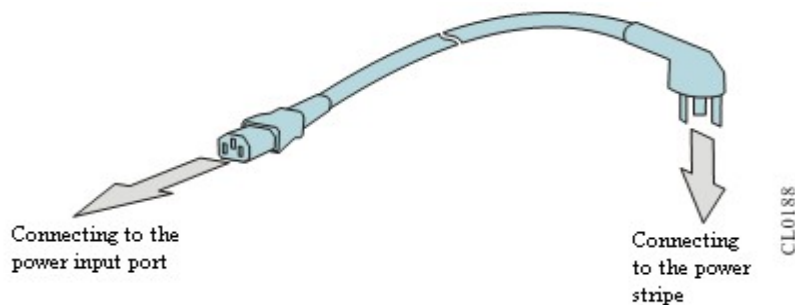


FIGURE 3-8 CONNECT AC POWER CABLE

Step 2: Insert the other side of the AC power cable to the socket of the external AC power system.

3.6 Check after Installation

- Confirm that the ground wire is connected correctly.
- Confirm that the power module is installed.
- Confirm that the power cable is connected correctly.
- Confirm that the fan module is well installed.

Warning

- Before checking whether the installation is correct, please confirm that the power is closed, avoiding that the connection error damages the body or component.
-

4 Power on and Run Device

The chapter describes the related operations of powering on and running the device, containing the following contents:

[4.1 Log into Device](#)

[4.2 Access Network](#)

[4.3 Hardware Management](#)

4.1 Log into Device

When logging into the device for the first time, you can only log in via Console port. This is the most basic mode of logging into the device and also the basis of configuring other login modes.

4.1.1 Connect Configuration Cable

SM5820 series routing switch provides the EIA/TIA-232 serial port. With this port, the user can adopt the PC (or laptop) with the RS-232 serial port to configure the switch.

To configure the switch via the PC (or laptop), connect according to the following steps:

- Step 1: Prepare one PC (or laptop). Confirm that the PC (or laptop) has the RS-232 serial port.
- Step 2: After confirming that the switch or PC (or laptop) is powered off, connect the RS-232 serial port of the PC (or laptop) with the RJ45 serial port of the switch via the configuration cable.

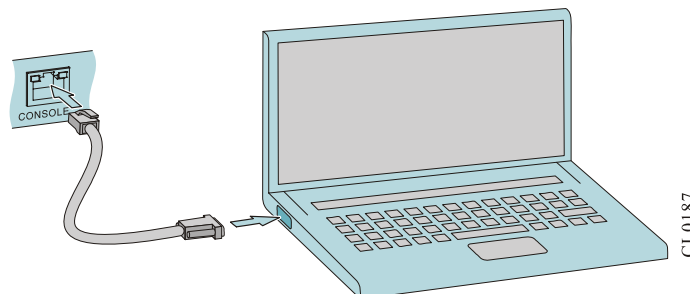


FIGURE 4-1 CONNECT SWITCH AND PC VIA RS-232 SERIAL PORT

Note

- The configuration cable used by RS-232 serial port (configured with the device) is one
-

eight-core unshielded cable. One side is the crimped RJ-45 plug, inserted to the Console port of the switch; the other side is one DB-9 (female), inserted to the nine-core (male) serial port socket of the PC (or laptop), as shown in Figure 4-1.

! Caution

- The contents that we should pay attention when installing or using the device are the key of installing and running the device correctly.
- When the PC is connected with the switch via the configuration cable, first connect the DB-9 side of the configuration cable to the PC and then connect the RJ-45 side of the configuration cable to the Console port of the switch.
- When removing the configuration cable that connect the PC (or laptop) with the switch, first remove the RJ-45 side of the configuration cable, and then remove the DB-9 side of the configuration cable.

4.1.2 Set PC HyperTerminal Parameters

The following takes running Windows XP HyperTerminal on the PC (or laptop) as an example to describe the setting of the serial port parameters of the PC (or laptop).

- Step 1: Enable the PC (or laptop), select **Start > All Programs > Accessories > Communication > HyperTerminal**, and click  to set up the new connection and display the interface of **Connection Description** as shown in Figure 4-2.

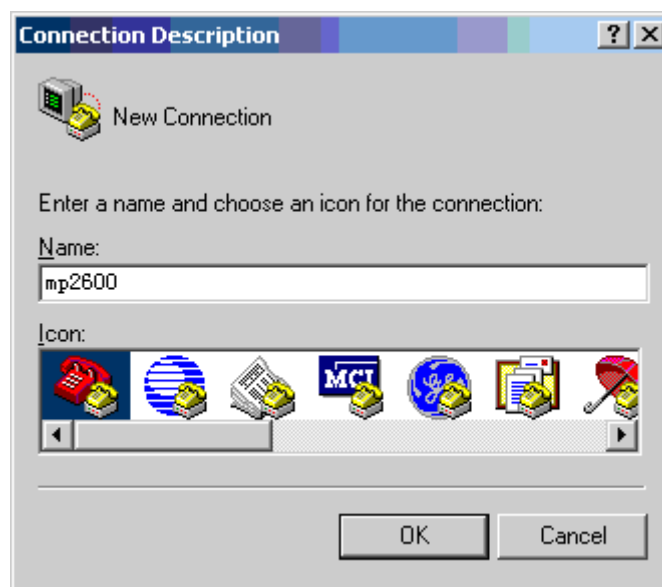


FIGURE 4-2 HYPERTERMINAL CONNECTION DESCRIPTION INTERFACE

- Step 2: On the **Connection Description** interface, input the new connection name and click **OK** to display the window as shown in Figure 4-3. Select the serial port used by the connection in the **Use when connecting**.

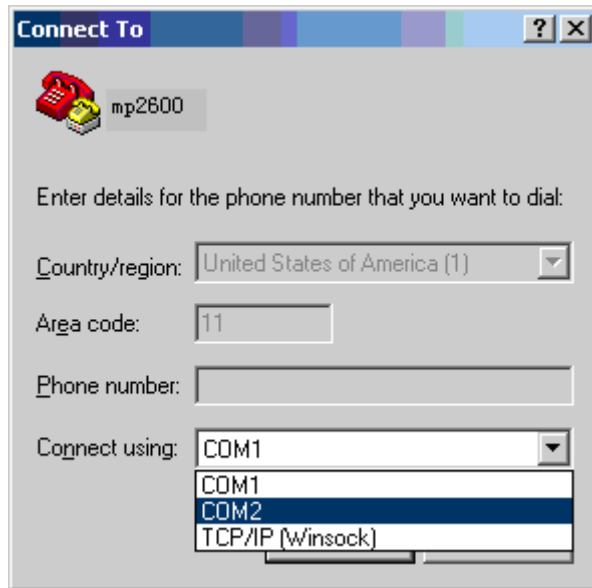


FIGURE 4-3 THE SETTING OF THE SERIAL PORT USED BY CONNECTING HYPERTERMINAL

Step 3: After selecting the serial port, click **OK** to display the interface of setting the serial port parameters as shown in Figure 4-4. Set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1 and data flow control as none.

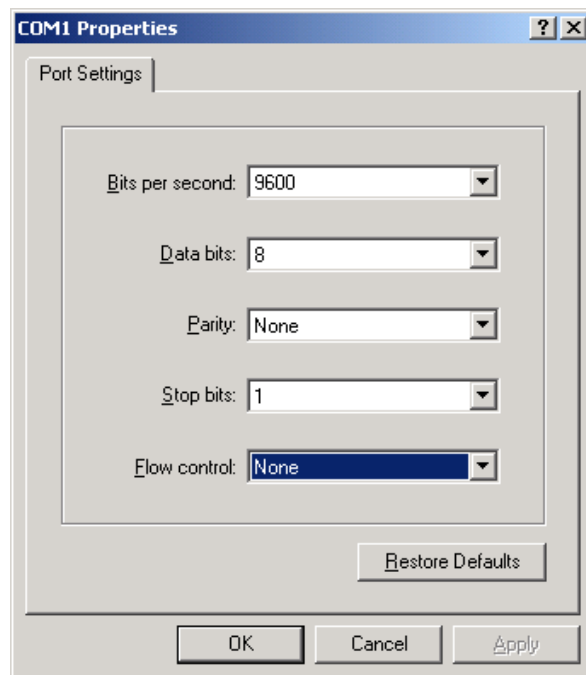


FIGURE 4-4 SERIAL PORT PARAMETER SETTING

Step 4: After setting the serial port parameters, click **OK** to enter the HyperTerminal interface.

Step 5: In the HyperTerminal attribute dialog box, select **Property** to enter the property window. Click **Setting** in the property window to enter the window of setting the property as shown in Figure 4-5. Select the terminal emulation as VT100 and then click **OK**.

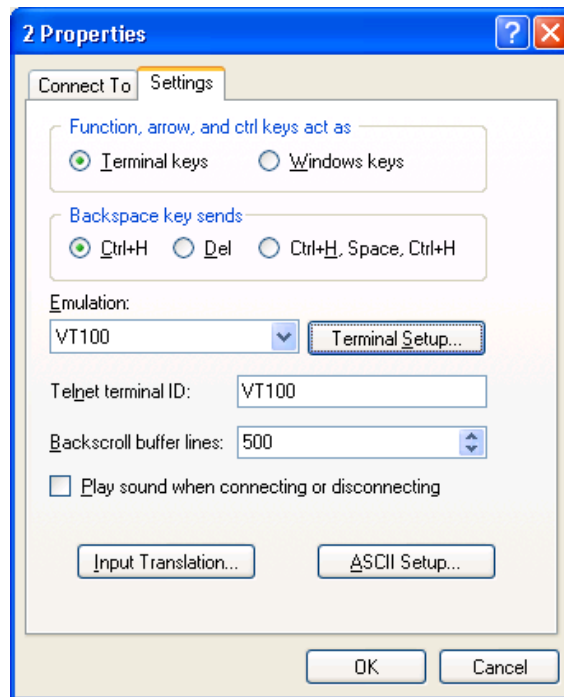


FIGURE 4-5 THE SETTING OF THE TERMINAL EMULATION

4.1.3 Power on and Start

Check before Power on

Check the switch before power-on:

- The interface cables, power cables, and ground wires are connected correctly.
- Power supply voltage meets the power requirement of the device. For details, refer to [Requirements for Power Supply](#).
- The configuration cable is connected correctly; the PC for configuration is enabled; the setting of the terminal parameters is complete.

! Caution

- Before the switch is powered on, confirm the location of the power switch of the equipment room where the switch is located, so as to cut off the power in time when there is accident.

Power on Switch

Power on according to the following order:

- Enable the power supply system switch of the switch.

After the switch is power on and started, the configuration terminal displays some basic manufacturing information of the switch:

```
MyPower (R) Operating System Software
MyPower S5820 system image file (flash0: /flash/sp8-g-6.6.3.3.2(23)(v1.0.0.6)-dbg.pck), version
6.6.3.3.2(23)(integrity), Com piled on Apr 21 2014, 03:15:00
Copyright (C) 2013 Maipu Communication Technology Co., Ltd. All Rights Reserved.
System ID      : 00017a011101
Hardware Model : SM5820-52F(V1)
Hardware Version : 001
MPU CPLD Version : 020
Monitor Version : 1.21
Software Version : 6.6.3.3.2(23)(integrity)
Software Image File : flash0: /flash/sp8-g-6.6.3.3.2(23)(v1.0.0.6)-dbg.pck
Compiled      : Apr 21 2014, 03:15:00
```

Note

- The above displayed information on the start interface is just for reference. Please refer to the actual display.
-

4.1.4 Check after Power on

Power on the switch and then check as follows to ensure that the later configuration work can be done normally:

- After the switch is powered on, the ventilation system works and check whether there is the sound of the fan rotation and whether there is air discharged from the ventilation holes of the switch.
- View whether the indicators on the switch are normal. For details, refer to [Device Indicators](#).

4.2 Access Network

4.2.1 Access Network via Ethernet Twisted Pair

The 10/100/1000Base-T electrical port of the device adopts the RJ-45 connector. The port supports MDI/MDIX auto-sensing and adopts class-5 or above twisted-pair to connect the network.

- Step 1: Insert one side of the Ethernet twisted pair to the Ethernet electrical port of the switch (RJ-45 port).
- Step 2: Insert the other side of the Ethernet twisted pair to the RJ-45 port of the device connected to the network device.

Note

- The switch does not carry Ethernet twisted pair. Please prepare the desired cables by self in advance.
-

4.2.2 Access Network via Fiber

For the SFP/SFP+ and QSFP+ optical interface of the switch, you can use the fiber to connect the network. Before connecting fiber, first install the optical module to the switch and then insert the fiber connector to the optical module. The appearance of the general LC fiber connector is as shown in Figure 4-6:

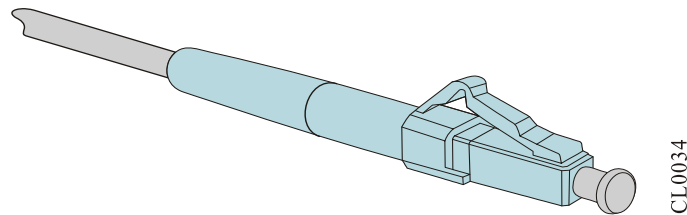


FIGURE 4-6 LC FIBER CONNECTOR

Install Optical Module

The installation steps of the SFP/SFP+ and QSFP+ modules are consistent. The following takes the SFP+ module as an example. The steps are as follows:

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well contacted with the skin and well-grounded.
- Step 2: Pull out the dust plug on the optical port of the switch, as shown in Figure 4-7.

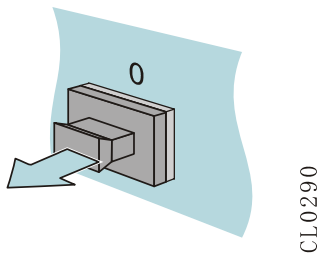


FIGURE 4-7 PULL OUT THE DUST PLUG

- Step 3: Get the SFP+ module out from the packing box. The diagram of the SFP+ module is as shown in Figure 4-8 Use the hands to hold the two sides of the SFP+ module and push it into the interface slot of the switch horizontally until the SFP+ module is close-contact with the slot (you can feel that the shrapnel at the top and bottom of the SFP+ module stuck the interface slot), as shown in Figure 4-9.

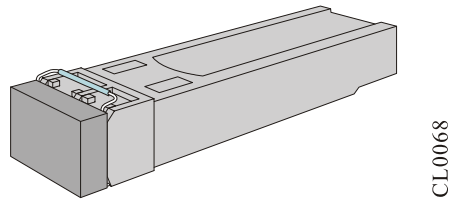


FIGURE 4-8 SFP MODULE

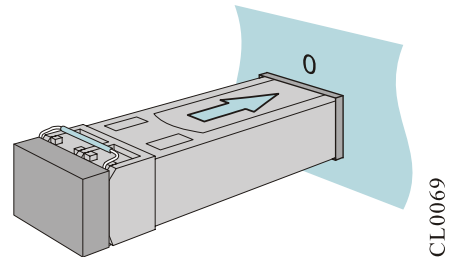


FIGURE 4-9 INSTALL SFP MODULE

Caution

- Before installing the fiber, do not pull out the protection rubber stopper on the SFP+ module.
 - For the unused optical port, do not unplug the dust plug on the optical port of the switch.
 - It is recommended not to insert the SFP+ module with the fiber into the interface slot directly. Please install after unplugging the fiber.
 - When installing the SFP+ module, do not use the hands to touch the gold-finger of the SFP module directly.
 - The TX wire should connect to the RX wire of the peer device; the RX wire should be connected to the TX wire of the peer device.
-

Connect Fiber on Optical Module

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well contacted with the skin and well-grounded.
- Step 2: Remove the dust cap of the fiber connector, as shown in Figure 4-10.

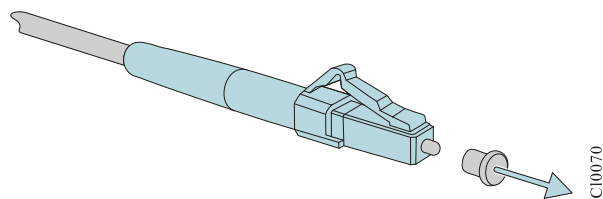


FIGURE 4-10 REMOVE FIBER DUST CONNECTOR

- Step 3: Remove the dust cap of the SFP+ module, as shown in Figure 4-11.

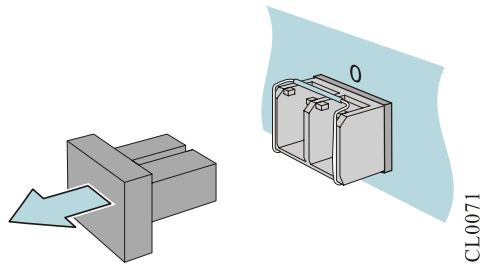


FIGURE 4-11 REMOVE DUST CAP OF THE SFP+ MODULE

Step 4: Insert the prepared fibers to the ports of the optical module in order, as shown in Figure 4-12.

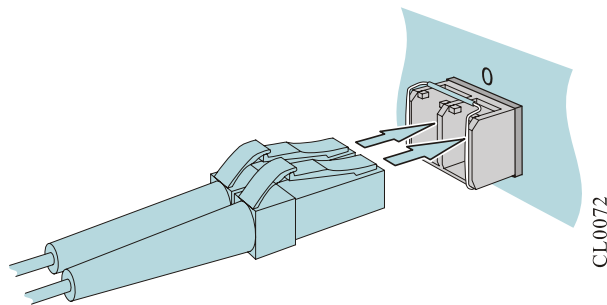


FIGURE 4-12 CONNECT FIBERS

Step 5: Connect the other side of the fiber to the peer device.

Caution

- When using the uni-directional dual fiber to connect the optical module, pay attention to make the receiving and sending signals of the modules at the two sides cross-connected.
 - If the fiber connector ferrule has dust, please use the air-laid paper to stick the absolute alcohol and clean the face of the fiber connector ferrule.
-

4.3 Hardware Management

This section describes various hardware management functions of the device. With the function interfaces, the user can conveniently view the software and hardware version information of the device, as well as the work status information of the hardware modules.

4.3.1 View Software and Hardware Version Information of Switch

You can use the **show version** command to view the software and hardware version information, including system serial number, hardware general information, hardware main board version, hardware CPLD version, Monitor version, software version and other information.

Command: **switch#show version**

Display as follows:

```
switch#show version
MyPower (R) Operating System Software
MyPower S5820 system image file (flash0: /flash/sp8-g-6.6.3.3.2(23)(v1.0.0.6)-dbg.pck), version
6.6.3.3.2(23)(integrity), Compiled on Apr 21 2014, 03:15:00
Copyright (C) 2013 Maipu Communication Technology Co., Ltd. All Rights Reserved.
```

```
MyPower S5820 Version Information
System ID      : 00017a011101
Hardware Model  : SM5820-52F(V1)
Hardware Version : 001
MPU CPLD Version : 020
Monitor Version : 1.21
Software Version : 6.6.3.3.2(23)(integrity)
Software Image File : flash0: /flash/sp8-g-6.6.3.3.2(23)(v1.0.0.6)-dbg.pck
Compiled       : Apr 21 2014, 03:15:00
```

System Uptime is 0 weeks 3 days

TABLE 4-1 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW VERSION

Field	Description
System ID	The serial number of the switch device, provided by the device supplier
Hardware Model	The switch module and the configured memory and FLASH capacity information
Hardware Version	Hardware version number
MPU CPLD Version	Hardware CPLD version number
Monitor Version	Monitor version number
Software Version	Software version number
Software Image File	Software mirror file name

4.3.2 View Status Information of Power Module

You can use the **show system power** command to view the information of the power used on the device, including the online information of the power, status information, alarm information, serial number, power module plugging count, and error count during power plugging. Wherein, the fixed power will only display the online information, status information, and alarm information.

Command: **switch#show system power**

Display as follows:

```
switch#show system power
System Power Information(Power 1 - ONLINE)
-----
      Status: Normal
      Last-Alarm: Normal
```


Serial No.:
 Description: N/A
 System power: Normal
 Power Input: Normal

 STATISTICS: 1 IN, 0 OUT, 0 IERR, 0 OERR

System Power Information(Power 2 - ONLINE)

 Status: Normal
 Last-Alarm: Normal
 Serial No.:
 Description: N/A
 System power: Normal
 Power Input: Normal

 STATISTICS: 1 IN, 0 OUT, 0 IERR, 0 OERR

TABLE 4-2 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW SYSTEM POWER

Field	Description
System Power Information (Power 2 - ONLINE)	System power information (power module 2 is online)
Status	Power module status
Last-Alarm	Power module alarm
Serial No.	Power module serial number
System power	System power output status
Power Input	Power module input status
STATISTICS	The plugging times of the power module and the error plugging times. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR means that the power module is inserted correctly for once.

4.3.3 View System Environment Temperature Information

You can use the **show environment** command to view the temperature information of the device board card and the main chips on the device board card.

```
switch#show environment
MPU CPU temperature is 7°C
MPU Switch temperature is 11°C
MPU LIA(Left Inlet Air) temperature is 1°C
MPU RIA(Right Inlet Air) temperature is 0°C
MPU ROA(Rear Outlet Air) temperature is 5°C
```



Note

- If the PoE temperature of the device supporting POE is displayed as 0, it indicates no POE load.

4.3.4 View Fan Status Information

You can use the **show system fan** command to view the information of the fan used on the device, including the fan location information, fan speed, fan work status, plugging times of the fan module, error plugging times, and other information.

```
switch#show system fan
System FAN Information(Fan 1 - ONLINE)
-----
      Status: Normal
      Description: N/A
      Speed Rate: 65%
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR

System FAN Information(Fan 2 - ONLINE)
-----
      Status: Normal
      Description: N/A
      Speed Rate: 65%
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR

System FAN Information(Fan 3 - ONLINE)
-----
      Status: Normal
      Description: N/A
      Speed Rate: 65%
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR

System FAN Information(Fan 4 - ONLINE)
-----
      Status: Normal
      Description: N/A
      Speed Rate: 65%
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR

System FAN Information(Fan 5 - ONLINE)
-----
      Status: Normal
      Description: N/A
      Speed Rate: 65%
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR
```

TABLE 4-3 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW SYSTEM FAN

Field	Description
System FAN Information(Fan 1 - ONLINE)	System fan information (fan 1, the status is online)
Status	Fan status information

Field	Description
Speed Rate	Fan speed percentage

4.3.5 View Pluggable Optical Module Information

You can use the **show optical all** command to view the work parameters of all optical modules used on the device.

```
switch#show optical all
Name          VendorName      LaserWaveLen(nm) Temperature(C) Voltage(V) TxPower(dBm) RxPower(dBm)
-----
te0/45        Eoptolink       850             11.773438    3.300200    -2.771194    -1.999706
te0/46        Eoptolink       850             11.335938    3.286100    -2.261405    -2.263598
te0/47        Eoptolink       850             10.398438    3.290900    -1.907771    -1.685782
te0/48        Eoptolink       850             11.128906    3.269900    -2.407856    -1.133965
fortygi0/1    FCI Electronics 38              ----         ----         ----         ----
fortygi0/2    FCI Electronics 38              ----         ----         ----         ----
fortygi0/4    AVAGO           850             5.714844     3.281800    ----         -1.887602
----
```

TABLE 4-4 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW OPTICAL ALL

Field	Description
Name	The name of the port where the optical module is located, such as gigabitethernet1/1
BitRate	The rate information of the optical module
VendorName	The name of the manufacturer of the optical module
LaserWaveLen(nm)	The center wavelength of the sent laser
Temperature(C)	The temperature of the optical module (only for the optical module supporting the DDMI function)
Voltage(V)	The work voltage of the optical module (only for the optical module supporting the DDMI function)
TxPower(dBm)	The sending power of the optical module (only for the optical module supporting the DDMI function)
RxPower(dBm)	The receiving power of the optical module (only for the optical module supporting the DDMI function)

Besides, you can use the following commands to view the details of the inserted optical module on one specified port of the device, including the optical module name, interface type, supplier name, optical module model, optical module serial number, the production date of the optical module, the sending power of the optical module and so on. If the used optical module supports the DDMI function, you can use the command to get the internal monitor parameters

Field	Description
Monitor Parameters	<p>Monitor parameters (only for the optical module supporting the DDMI function)</p> <ul style="list-style-type: none"> ● Temperature/Alarm-High/Alarm-low/Warning-High/Warning-Low Temperature/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● Voltage/Alarm-High/Alarm-low/Warning-High/Warning-Low Voltage/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● Tx Bias/Alarm-High/Alarm-low/Warning-High/Warning-Low Tx bias current/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● RxPower /Alarm-High/Alarm-low/Warning-High/Warning-Low Rx optical power/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● TxPower /Alarm-High/Alarm-low/Warning-High/Warning-Low Tx optical power/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold

5 Device Maintenance and Troubleshooting

This chapter describes how to exclude the installation failure of SM5820 and the maintenance of the device module, including:

[5.1 Troubleshooting of Configuration System](#)

[5.2 Troubleshooting Power Module](#)

[5.3 Troubleshooting Fan Module](#)

[5.4 Device Maintenance](#)

[5.5 Device Anti-dust Maintenance](#)

[5.6 Get Technical Supporting](#)

5.1 Troubleshooting of Configuration System

After the switch is powered on and if the system is normal, the start information is displayed on the configuration terminal. If the configuration system fails, there may be no display or messy code on the configuration terminal.

5.1.1 Troubleshooting about no Display on Terminal

If there is no display information on the configuration terminal after being powered on, check according to the following steps:

- Step 1: Check whether the power system of the switch works normally (view whether the power indicator on the panel is always on. If no, it indicates that the power is abnormal). For details, refer to [System Status Indicators](#).
- Step 2: Check whether the configuration cable is connected to Console port.

Step 3: Check whether the indicator of the switch works normally. For details, refer to [Interface Status Indicator](#).

If no problem is found in the above checks, there may be the following reasons:

1. The serial port connected to the configuration cable is wrong (the actual selected serial port is not consistent with the set serial port of the terminal).
2. The setting of the configuration terminal parameters is wrong (the parameter requirement: set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1, traffic control as none, and select the terminal emulation as VT100). For details, refer to [Set PC HyperTerminal Parameters](#).
3. There is something wrong with the configuration cable and you can try to change the configuration cable.

5.1.2 Troubleshooting about Messy Code on Terminal

If messy code is displayed on the configuration terminal, maybe the setting of the configuration terminal parameters is wrong (set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1, traffic control as none, and select the terminal emulation as VT100), and please check correspondingly. For details, refer to [Set PC HyperTerminal Parameters](#).

5.2 Troubleshooting Power Module

There are two power status indicators PWR1 and PWR2 on the front panel of SM5820, used to indicate the work status of the power modules. For details, refer to [System Status Indicators](#).

SM5820 adopts the modular power. There is one power status indicator PWR on the panel of the modular power, used to indicate the status of the modular power. For details, refer to [Power Module Status Indicator](#).

- Step 1: Check whether the faulty power indicator PWR is green. If yes, it indicates that the power supply system is normal. If no, check the power supply system connected to the switch, and confirm whether the power supply system supplies power normally and whether the voltage is normal.
- Step 2: Check the connection of the power cable on the faulty power slot; remove and install the power cable to confirm whether the power cable is loose.
- Step 3: Unplug the power cable connected to the faulty power slot, connect it to another power slot and check whether another power indicator can be on normally. If yes, it indicates that the previous power may be damaged; if no, it indicates that the power cable may be damaged and then perform the next step.
- Step 4: Change the power cable of the faulty power and then check whether the indicator of the power module can recover normally. If yes, it can be confirmed that the previous power cable connected to the power is damaged. If no, please contact the agent or local technical service engineers.

5.3 Troubleshooting Fan Module

The SM58-FAN-A fan module is the mandatory module for SM5820, which supports hot plugging. SM5820 has 5 fan slots and at least 4 SM58-FAN-A fan modules must be installed to ensure the normal system running.

Under the **show system fan** command, use the Status field to view the fan states. If Abnormal is displayed, it indicates that the fan module is abnormal. Please troubleshoot the fan module by the following steps:

- Step 1: If the fan module state is displayed as Abnormal, check whether the power module works normally. For details, refer to [Troubleshooting Power Module](#).
- Step 2: Check whether the air outlet and inlet are blocked. If yes, please clear the inlet or outlet to ensure smooth ventilation.
- Step 3: Check whether the fan module is installed well. You can remove the fan module and insert it again to view the fan module recovers to normal.
- Step 4: Try to install the faulty fan module to another fan slot and check whether it works normally. If yes, it indicates that the fan slot is damaged. If no, perform the next step.
- Step 5: If it is necessary, try to replace the fan module. Check whether the replaced fan module can work normally. If yes, it indicates that the fan module is damaged.

If the fault still cannot be located by the preceding steps, please contact the agent or local technical service engineers.

5.4 Device Maintenance

The device maintenance mainly refers to the changing of the module, including power module, fan module and pluggable optical module.

Caution

- Keep the replaced hardware module and it is recommended to place it in the anti-static bag or the packing box.
-

5.4.1 Change Power Module

Preparation before Changing

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well-grounded.

Step 2: Unplug the power connection cable on the power module.

! Caution

- The power module supports hot-plugging and you can change the power when running. Please ensure safety.
 - Do not touch any terminal marked with power or maybe with power, avoiding the risk of electric shock.
-

Change Power Module

The steps of changing the power module of SM5820 are as follows:

- Step 1: Push the buckle on the AC cable hole to the power fan direction and simultaneously pull the handle and take out the power module.
- Step 2: Put the uninstalled power module to the anti-static mat or package box.
- Step 3: Push another power module along the guided slot slowly and horizontally until the rear end of the power module well contacts to the main board slot.

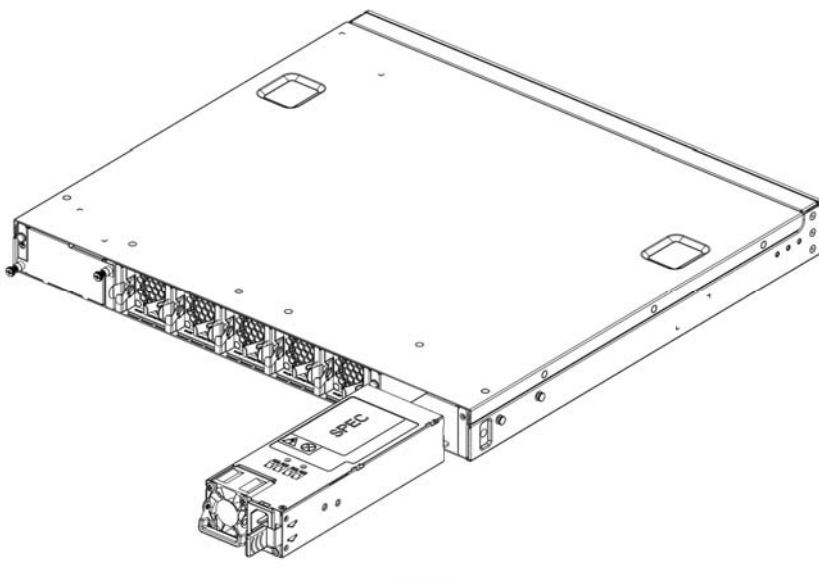


FIGURE 5-1 DIAGRAM OF REPLACING THE POWER MODULE

5.4.2 Change Fan Module

! Caution

- Do not touch any uncovering lead, terminal, or dangerous voltage sign part marked on the product to avoid human injury.
 - The fan module supports hot plugging. If the fan module is replaced in the switch working state, do not remove the replaced fan module out of the chassis. Remove the fan module when the fan stops rotating. Meanwhile, to avoid injury, do not stretch your hand into the fan module in case of the fan is still running.
 - Before replacing the fan module, prepare the new fan module in advance. When the fan module is uninstalled in the switch working state, the new fan module needs to be installed immediately to ensure normal switch working.
-

The fan module of SM5820 is composed of 5 isolated fan subracks and each subrack needs to be replaced independently. The steps are as follows:

- Step 1: Wear the anti-static wrist.
- Step 2: Press the two metal sheets on the fan subrack inward and also pull the fan module outward.
- Step 3: Put the uninstalled fan module on the anti-static mat or package box.
- Step 4: Push the fan module to be installed along the slot stably into the fan module slot to enable the fan module to close contact to the chassis back panel.

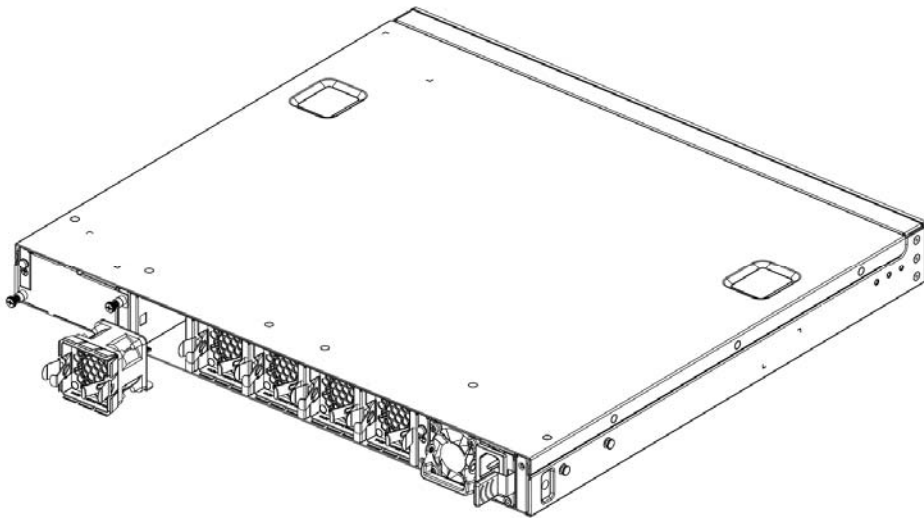


FIGURE 5-2 DIAGRAM OF REPLACING THE FAN MODULE

5.4.3 Change Pluggable Optical Module

The steps of changing the SFP/SFP+ and QSFP+ modules are consistent. The following takes the SFP+ module as an example.

Warning

- When installing or un-installing the SFP+ module, do not use the hands to touch the gold finger part of the SFP+ module directly.
-

- Do not directly stare at the fiber connection holes of the optical module when the fiber is pulled down, but the optical module is not pulled out.

Step 1: Wear the anti-static wrist and pull out the fiber connected to the SFP+ module.

Step 2: Pull the handle of the SFP+ module down to the horizontal position, and then pull out the SFP+ module. The diagram of un-installing the SFP+ module is as shown in Figure 5-3.

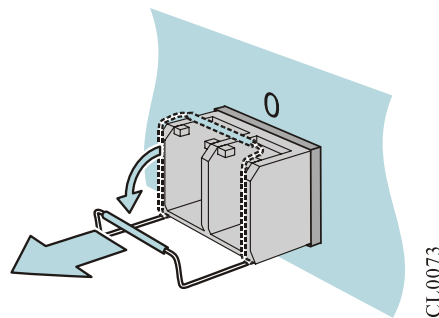


FIGURE 5-3 UNINSTALL SFP+ MODULE

Step 3: Fit the removed SFP+ module with the dust cap and put it in the anti-static bag or packing box. The diagram of installing the dust cap for the SFP+ module is as shown in Figure 5-4.

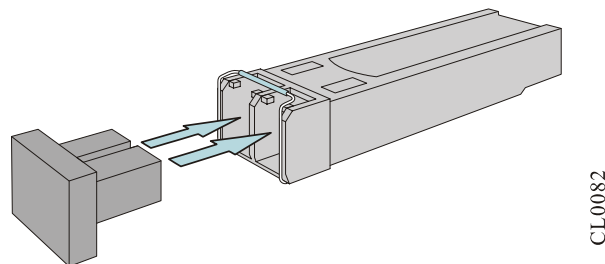


FIGURE 5-4 INSTALL DUST CAP FOR SFP+ MODULE

Step 4: Up-turn the handle of the installed SFP+ module to the vertical position to lock the buckle at the top of the module. Use the hands to hold the two sides of the SFP+ module and push it into the SFP+ slot horizontally until the SFP+ module closely-contacts with the slot (you can feel that the shrapnel at the bottom and top of the SFP+ module locks the SFP slot). The diagram of installing the SFP+ module is as shown in Figure 5-5.

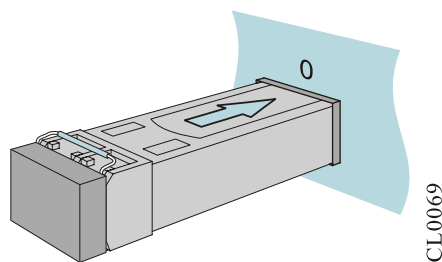


FIGURE 5-5 INSTALL SFP+ MODULE

Step 5: Remove the dust cap. The diagram of removing the dust cap of the SFP+ module is as shown in Figure 5-6

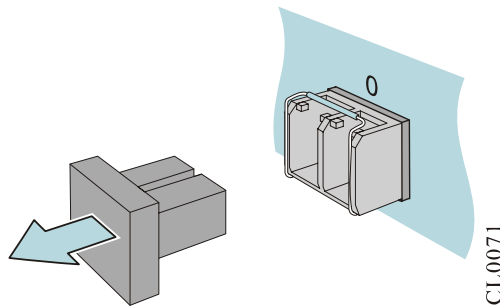


FIGURE 5-6 REMOVE DUST CAP OF SFP+ MODULE

Step 6: Insert the fibers into the SFP+ ports in order. The diagram of connecting the SFP+ to the fiber is as shown in Figure 5-7.

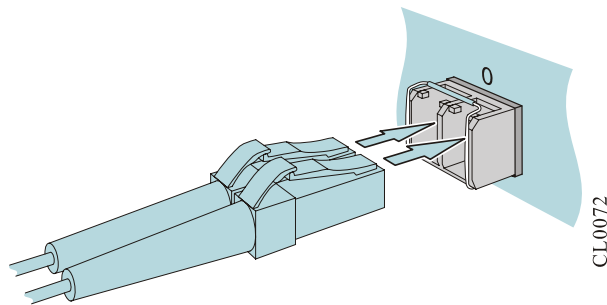


FIGURE 5-7 CONNECT SFP+ TO FIBER

Note

- It is suggested not to insert the SFP+ module with the fiber into the slot directly. Please first pull out the fiber and then install.
-

5.5 Device Dedusting Maintenance

This section mainly describes how to dedust the device.

[光接口及尾纤接头除尘 1](#)

Warning

- Execute the dedusting operation strictly by the anti-static requirement. For example, if dedusting on the anti-static work station, the work personnel should wear anti-static overalls and anti-static wrist or anti-static gloves.
 - The selection of dedusting tool and cleaner should meet the related standard
-

requirements. Otherwise, it may cause unpredictable damage to the device board.

5.5.1 Fan Module Dedusting

The fan module is an important component of the device and mainly provides power for heat dissipation and ventilation. During the device running process, the fan blade and control circuit board of the fan module will also absorb the dusts in the ambient air. When the absorbed dust accumulates to a certain extent, these dusts will affect the stable running of the fan module and these dusts also become the pollution source of other service board cards. This will lay potential danger for the stable device running.

To ensure long-term stable device running, the maintenance personnel will dedust the fan module regularly (once per year). The corresponding steps are as follows:

Note

- Before performing the dedusting, first prepare the standby fan module. The immediately install the standby fan module after the fan module is uninstalled when the device is running to ensure device normal running.
-

- Step 1: Dedust the standby fan module as follows. When the maintenance personnel correctly wear the anti-static wrist or gloves, use cleaning tools, a clean cotton cloth, anti-static brush, and cleaner to dedust the fan blade and control circuit board. The dedusted fan module should be free from dust.
- Step 2: Replace the fan module to be dedusted. For detailed steps, refer to [Change Fan Module](#). The entire process of replacing the fan module should be quick and timely. Otherwise, it may cause chassis overtemperature, which will severely threaten the device security the stable running.
- Step 3: The replaced and dedusted fan module will serve as the standby fan module.

5.5.2 Optical Interface and Tail Fiber Connector Dedusting

To ensure the device stable and reliable running, it is necessary to dedust the optical interface and tail fiber connector on the device regularly. The corresponding dedusting steps are as follows:

- Step 1: Remove the interface subcard where the optical interface is located. When cleaning the optical interface, first remove the optical fiber connected to the optical interface and then remove the corresponding interface subcard for cleaning.
- Step 2: Conduct cleaning using dedicated tool and material. When cleaning the optical interface and tail fiber connector, you must use the dedicated cleaning tool and material. You can purchase these materials from optical fiber/cable manufacturer.

s

- The unused optical interfaces on the board and tail fiber should be covered by the dust cap.
 - When the tail fiber on the operating interface needs to be removed, use a dust cap to cover the optical interface and the fiber connector connected with the optical interface. In this way, it can prevent the invisible laser sent by the laser radiating to the human eyes and also has the dedusting function to avoid the loss increase of the dusted optical interface or tail fiber.
-

Caution

- Before dedusting the optical interface, first remove the corresponding interface subcard and ensure that the normal service deployment will not be affected.
 - For the laser interface with high power, use the cleaning tool and material for cleaning.
 - For the optical interface with low power, use a clean, dry and soft anti-static brush to clean the dust on the optical interface when the dedicated cleaning tool and cleaning material cannot be obtained.
-

Warning

- The laser sent by the laser on the optical interface is invisible infrared light. When it radiates to the human eye, it may cause permanent damage to the eyes.
 - Do not use any cleaning tools or materials that are not proved to be suitable for cleaning the optical interface and tail fiber connector.
-

5.6 Get Technical Supporting

If the fault cannot be removed via the above contents of the chapter, please contact the agent or local technical engineers in time. Before you contact the customer service, please prepare the following information, which is convenient for the customer service staff to help you solve the problem.

1. The arrival time of the switch
2. The serial number of the chassis (labeled on the chassis)
3. Software version number (it can be viewed via **show version** in the command line view)
4. Maintenance agreement or warranty card
5. Simple description of the fault problem

6. Simple introduction of the taken troubleshooting steps

You can contact the customer service via the customer service hotline and you can also search for help via the website or email.

Customer service: 400-886-8669

Website: <http://www.maipu.com>

E-mail: techsupport@maipu.com

Appendix

A Specifications of General Interfaces

Describe the attributes of the device interfaces.

A.1 Console Port Attribute

SM5820 provides one Console port complying with EIA/TIA-232 asynchronization serial specifications. With the interface, the user can complete the local configuration for the switch. For the attributes of USB Console port, refer to Appendix table A-2:

APPENDIX TABLE A-1 THE ATTRIBUTES OF CONSOLE PORT

Attribute	Description
Interface standard	Asynchronous EIA/TIA-232
Connector type	RJ45
Rate	9600bit/s-115200bit/s (the default value is 9600bit/s)
Supported services	Connected with the serial port of the local terminal (such as PC), and run the terminal emulation program on the terminal

A.2 USB Port Attribute

SM5820 provides one USB port complying with USB2.0 specifications. With the interface, the user can complete the local configuration or expand the storage space for the switch. For the attributes of USB port, refer to the appendix table A-2:

APPENDIX TABLE A-2 THE ATTRIBUTES OF THE USB PORT

Attribute	Description
Interface standard	USB2.0
Connector type	USB
Rate	12Mbps

Attribute	Description
Supported services	Use a USB flash disk to upgrade the configuration or expand the storage space.

A.3 10Base-T/100Base-TX/1000Base-T-RJ45 Electrical Port Attributes

APPENDIX TABLE A-3 10BASE-T/100BASE-TX/1000BASE-T-RJ45 ELECTRICAL PORT ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3, IEEE802.3u, IEEE802.3ab
Connector type	RJ45
Work mode	10Mbps/100Mbps/1000Mbps Half-duplex/full-duplex/auto-negotiation
Maximum transmission distance	100m
Specifications of used cable	Category-5 or above twisted pair

A.4 10G SFP+ Ethernet Optical Port Attributes

APPENDIX TABLE A-4 10G SFP+ ETHERNET OPTICAL PORT ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3ae
Supported optical module model	SFP+
User interface type of optical module	LC
Support SFP+ interface/SFP interface	Support 1000Base-X Support 10GBase-SR Support 10GBase-LR

A.5 40G QSFP+ Ethernet Optical Interface Attribute

APPENDIX TABLE A-5 40G QSFP+ ETHERNET OPTICAL PORT ATTRIBUTES

Attribute	Description
-----------	-------------

Attribute	Description
Interface standard	IEEE 802.3ae
Supported optical module model	QSFP+
User interface type of optical module	LC/MPO
Support QSFP+ interface	Support 40GBase-SR

B Device Indicators

B.1 System Status Indicators

With the system status indicator, we can initially judge the work status of the switch. For details, refer to appendix table B-1:

APPENDIX TABLE B-1 SWITCH SYSTEM STATUS INDICATOR DESCRIPTION

Indicator Type	Indicator Name	Indicator Color	Status
System status indicator	SYS	Green	Quickly flash (5Hz flash frequency): Indicate that the hardware starts to work after power-on;
			Slowly flash (0.5Hz flash frequency): Indicate that the system works normally
			Always on/off: Indicate that the system works abnormally.
Power status indicator	PWR1	Green	Always on: Power 1 works normally; Off: Power 1 works abnormally or is offline
	PWR2	Green	Always on: Power 2 works normally; Off: Power 2 works abnormally or is offline

B.2 Interface Status Indicator

With the interface status indicator, we can judge the interface work status of the switch. For details, refer to appendix table B-2:

APPENDIX TABLE B-2 STATUS INDICATOR OF SWITCH INTERFACE

Indicator Type	Indicator Name	Indicator Color	Status
Management Ethernet interface	LINK	Green (right)	Always on: indicates that the current interface rate is high. Off: indicates that the current interface rate is low.
	ACT	Green (left)	Always on: indicates that the Ethernet link is connected. Off: indicates that the Ethernet link is not connected. Flash: indicates that there is data receiving and sending.
SFP+ port status indicator	LINK/ACT	Green	Always on: indicates that the link is connected and works in highest rate. Flash: indicates that there is high-rate data receiving and sending. Off: indicates that the Ethernet link is not connected.
		Amber	Always on: indicates that the link is connected and works in lowest rate. Flash: indicates that there is low-rate data receiving and sending. Off: indicates that the Ethernet link is not connected.
QSFP+ port status indicator	LINK/ACT	Green	Always on: indicates that the link is connected and works in highest rate. Flash: indicates that there is high-rate data receiving and sending. Off: indicates that Ethernet link is not connected.
		Amber	Always on: indicates that the link is connected and works in lowest rate. Flash: indicates that there is low-rate data receiving and sending. Off: indicates that the Ethernet link is not connected.

B.3 Power Module Status Indicator

With the power module status indicator, we can judge the power module work status of the switch. For details, refer to appendix table B-3:

APPENDIX TABLE B-3 POWER MODULE STATUS INDICATOR

Indicator Type	Indicator Name	Indicator Color	Status
----------------	----------------	-----------------	--------

Indicator Type	Indicator Name	Indicator Color	Status
Power input status indicator	PWR	Dual-color light (yellow, green)	Green and always on: The power input is normal. Green flash: The power input is abnormal. Yellow always on: The power input is abnormal. Off: The power input is not connected

C Interface Cable Specifications

Note

- It is recommended that related modules of Maipu be used on the device.
- The following information is just for reference. For details, consult the marketing personnel or technical assistant personnel.

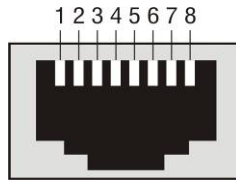
C.1 Ethernet Electrical Port Cables

It is recommended that the management Ethernet interface cable of SM5820 is eight-core unshielded category-5 or above straight-through twisted pair.

APPENDIX TABLE C-1 CONNECTION RELATION TABLE OF RJ45 STRAIGHT-THROUGH CABLE (CATEGORY-5 TWISTED PAIR)

RJ45	Signal	Direction	RJ45	Description	Length
1	TRD0+	↔	1	Twisted pair 1	Support 100m
2	TRD0-	↔	2		
3	TRD1+	↔	3	Twisted pair 2	
6	TRD1-	↔	6		
4	TRD2+	↔	4	Twisted pair 3	
5	TRD2-	↔	5		
7	TRD3+	↔	7	Twisted pair 4	
8	TRD3-	↔	8		

The line sequence of Ethernet RJ45 port is as shown in appendix figure C-1:



APPENDIX FIGURE C-1 RJ45 SOCKET DIAGRAM

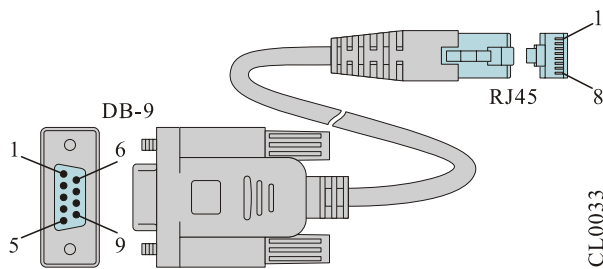
C.2 Console Port (EIA/TIA-232) Adapter Cable Sequence

The internal signal connection relation of the console port (EIA/TIA-232) adapter cable is as shown in appendix table C-2:

APPENDIX TABLE C-2 ADAPTER CABLE CONNECTION RELATION OF CONSOLE PORT (EIA/TIA-232)

RJ-45	Signal	Direction	DB-9
1	RTS	→	8
2	DTR	→	6
3	TXD	→	2
4	GND	---	5
5	NC	---	---
6	RXD	←	3
7	DSR	←	4
8	CTS	←	7
---	---	---	1
---	---	---	9

The appearance of Console port (EIA/TIA-232) adapter cable is as shown in appendix figure C-2:



APPENDIX FIGURE C-2 CONSOLE PORT (EIA/TIA-232) ADAPTER CABLE DIAGRAM

C.3 1000Base-X GE Optical Module Model and Corresponding Interface Cable

APPENDIX TABLE C-3 1000BASE-X SFP GE OPTICAL MODULE MODEL AND CORRESPONDING INTERFACE CABLE

Optical Module Model	Center Wavelength	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
SFP-M1-L24P8	850nm	LC	50/125 μ m multi-mode fiber	500M	—
			62.5/125 μ m multi-mode fiber	275M	—
SFP-S2-L24P3	1310nm	LC	9/125 μ m single-mode fiber	20KM	—
SFP-S2-L24P3 (E1)	1310nm	LC	9/125 μ m single-mode fiber	20KM	Support DDMI
SFP-S4-L24P3	1310nm	LC	9/125 μ m single-mode fiber	40KM	—
SFP-S4-L24P5(V2)	1550nm	LC	9/125 μ m single-mode fiber	40KM	Support DDMI
SFP-S8-L24P5	1550nm	LC	9/125 μ m single-mode fiber	80KM	—

C.4 10G Optical Module Model and Corresponding Interface Cable

APPENDIX TABLE C-4 10GBASE-X SFP+ 10 GE OPTICAL MODULE MODEL AND CORRESPONDING INTERFACE CABLE

Optical Module Model	Center Wavelength	User Interface Type	Interface Cable Specification	Maximum Transmission Distance
SFP-M1-L192P8	850nm	LC	50/125 μ m multi-mode fiber	300M
SFP-S1-L192P3	1310nm	LC	9/125 μ m single-mode fiber	10KM
SFP-S4-L192P5	1550nm	LC	9/125 μ m single-mode fiber	40KM

C.5 40G Optical Module Type and Corresponding Interface Cable

APPENDIX TABLE C-5 40GBASE QSFP+ 10G OPTICAL MODULE TYPE AND CORRESPONDING INTERFACE RELATIONSHIP TABLE

Optical Module Model	Center Wavelength	User Interface Type	Interface Cable Specification	Maximum Transmission Distance
QSFP-M1-M768C8	850nm	MPO	50/125 μ m multi-mode fiber	100m (OM3)
QSFP-S1-L768C3	1310nm	LC	9/125 μ m single-mode fiber	10km

C.6 40G Interface Passive Cable Module

APPENDIX TABLE C-6 40GBASE QSFP+ INTERFACE PASSIVE CABLE RELATIONSHIP TABLE

Cable Type	User Interface Type	Cable Specification	Electric Attribute
C0707-1453	QSFP+ \leftrightarrow to \rightarrow QSFP+	1m	Passive
C0707-1454	QSFP+ \leftrightarrow to \rightarrow QSFP+	3m	Passive
C0707-1455	QSFP+ \leftrightarrow to \rightarrow QSFP+	5m	Passive

D Device Running Environment Requirement

D.1 Environment Requirement of Equipment Room

D.1.1 Building Requirement of Equipment Room

It is recommended that the equipment room adopts the anti-static floor, which is dust-free. It is required to lay the static floor. The laying of the floor plate should be tight and sturdy and the level error per square meter should be less than 2mm. When there is no raised floor, lay the static conductive ground material (the volume resistivity should be $1.0 \times 10^7 \Omega \cdot \text{m} - 1.0 \times 10^{10} \Omega \cdot \text{m}$). The static conductive ground material or raised floor should be static grounding. We can use the current limiting resistor and connection line to connect with the grounding device. The resistance of the current limiting resistor is $1\text{M}\Omega$.

D.1.2 Temperature/Humidity Requirement

To ensure that the switch can work normally, it is recommended to maintain a certain temperature and humidity in the equipment room. For details, refer to [Physical Parameters](#).

Caution

- If the temperature is too high, the reliability of the switch reduces greatly. The long-time high temperature affects the life and speeds up the aging of insulation materials.
 - When the switch enters the high-temperature environment from the low-temperature environment and if there is condensed water on the switch, be sure to take some measures (such as drying and airing) before the switch is powered on, so as to prevent the internal components of the switch from short-circuit and being burned.
 - Measuring points of the working temperature and humidity of the switch in the equipment room mean the values measured from the floor above 1.5 m and 0.4 m from the front of the rack when there are no protection boards;
 - If the humidity in the equipment room is too high for long time, it causes the poor insulation and even electricity leak of insulation materials easily. Sometimes, the mechanical performances of materials change and the metal parts are corroded easily, too.
 - If the relative humidity in the equipment room is too low, insulation pads shrink, which causes the fastened screws loose. Meanwhile, in dry environment, static electricity appears easily, which harms the circuits on the switch.
-

D.1.3 Load-bearing Requirement

According to the actual weight of the installed switch and its accessories, access the ground load-bearing requirement and ensure that the ground load-bearing capability of the installation place meets the requirement. For the weights of the switch components, refer to [Physical Parameters](#).

D.1.4 Space Requirement

To ensure that there is enough operation space for moving the chassis and plugging the module, it is recommended that the aisle width of the equipment room is no less than 0.8m. If installing the switch in the cabinet, the net height of the equipment room cannot be less than 3m.

To be convenient for cooling and maintaining the switch, do not install the switch against the wall. The front and rear space of the switch should be no less than 0.7m.

D.1.5 Cleanliness Requirement

Dust is harmful for the switch operation. Dust causes electrostatic absorption, which makes the poor contact of metal connectors. Electrostatic absorption appears especially when the temperature and humidity are lower, which affects the device life and easily causes communication fault. The requirement for the dust content and particle diameter in the equipment room is as shown in appendix table D-1:

APPENDIX TABLE D-1 DUST REQUIREMENT FOR EQUIPMENT ROOM

Max. Diameter (µm)	0.5	1	3	5
Max. density (tablets/m ³)	1.4×10 ⁷	7×10 ⁵	2.4×10 ⁵	1.3×10 ⁵

! Caution

- If there is no visible dust on the desk within three days, it meets the cleanliness requirement.

Apart from dust, the switch equipment room has the strict requirements for salts, acids, and sulfides contained in the air, because these harmful gases speed up the eroding of metals and the aging of some components.

We should prevent the harmful gases, such as SO₂, H₂S, NO₂, NH₃ and Cl₂, from entering the equipment room. The specific limited values are as shown in appendix table D-2:

APPENDIX TABLE D-2 LIMITATIONS FOR THE HARMFUL GASES IN THE EQUIPMENT ROOM

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

D.1.6 Anti-interference Requirement

The various interference sources no matter from the exterior of devices or application systems or from the interior affect the devices through capacitance coupling, inductance coupling, electromagnetic radiation, public impedance (including grounding system) and lead (such as power lines, signal lines and output lines). Therefore, pay attention to the following:

! Caution

- Take valid anti-grid disturbance measures for the power system.
- The working place of the switch had better not be used with the grounding settings of power devices or anti-lightening grounding settings and the distance between them had better be as long as possible.
- Be away from the strong power radio transmitters, radar transmitter, and high frequency high-current equipment; take electromagnetic shielding methods when necessary.

D.1.7 Grounding Requirement

The well grounding system is the basis for the switch to run stably and reliably, and the important guarantee for anti-lightning, anti-jamming, and anti-static of the switch. The user should provide the well grounding system for the switch. The resistance between the switch chassis and the ground should be smaller than 1ohm.

D.2 Requirements for Power Supply

D.2.1 AC Power Supply Requirement

Use the AC device, its power input allowed range is described in appendix table D-3.

APPENDIX TABLE D-3 AC BASIC POWER REQUIRED TABLE

Item	Index
Input voltage range	100–240V
Input frequency range	50–60Hz

Caution

- The low-voltage power supply system should adopt the three-phase five-wire or single-phase three-wire system. The voltage of the low-voltage power supply system is 110V/220V and the frequency is 50Hz/60Hz.
- It is required to adopt the un-interruptible power, such as UPS, as the AC backup power supply. The AC backup power and AC should keep the same phase and the switching time with the AC should be smaller than 10ms. Otherwise, the device may restart or reset.
- The AC capacity of the equipment room should consider the work current and faulty current of the device. Ensure that the independent device has the independent AC power distribution protection device. The configuration protection switch should be larger than the protection switch of the post powered device.
- AC wire should adopt the flame-retardant wire. The wire layout should be done according to *Code for fire protection design of tall buildings GB50045-95*. The low-voltage distribution is done according to *Specifications for the design of low-voltage electric power distribution systems GB50045-95*.

D.2.2 AC Power Supply Suggestions

Suggestions for AC power supply:

- If the AC directly provides power for the device, the power supply voltage exceeds –10% to 5% of the rated voltage, or exceeds the permitted voltage range of the device. We should adopt the voltage regulator to meet the requirement.
- It is required that the AC uninterruptible or transient communication load should adopt the UPS power supply system or inverter power supply system to provide power.

- When the AC becomes abnormal, to ensure the important communication load and important power load, the telecommunications site should be configured with the generator set as the self power supply. The capacity should be no less than 1.5-2 multiples of the total capacity of the AC uninterruptible powered device.

E Device Grounding Specification and Protection

E.1 Device Grounding Specifications

The grounding specifications include universal grounding specification, building grounding specifications of equipment room, device grounding specifications, grounding specifications of communication power, and grounding wire laying specifications.

E.1.1 Universal Grounding Specifications

The universal grounding specifications are as shown in appendix table E-1:

APPENDIX TABLE E-1 UNIVERSAL GROUNDING SPECIFICATIONS

No.	Description
1	Grounding design should comply with the voltage sharing and equipotential principle, that is, the work grounding and protect grounding (including the shielded grounding and lightning grounding of distribution frame) share one group of grounding.
2	The cabling rack, hanging metal frame, rack or cabinet, metal ventilation pipe, metal doors and windows in the equipment room should be connected to the earth for protection.
3	The unpowered metal parts of the device should be connected to the earth for protection.
4	Ensure that the grounding wire well contacts with the protection grounding bar of the equipment room.
5	Do not use other device as an integral part of the grounding wire in electrical communication.

E.1.2 Building Grounding Specifications of Equipment Room

The specific requirements for the building grounding specifications of the equipment room:

The grounding resistance of the integrated communication building should be no more than 1ohm; in the common communication site, it should be smaller than 5ohm (for the area with high soil resistivity, it can be raised to 10ohm).

E.1.3 Device Grounding Specifications

The device grounding specifications are as shown in appendix table E-2:

APPENDIX TABLE E-2 DEVICE GROUNDING SPECIFICATIONS

No.	Description
1	The communications devices and corollary equipment (mobile base station, transmission, switching, power, and so on) in the equipment room should be connected to the earth for protection. The protection groundings of the devices should be integrated to one total grounding bar. The protection groundings of the devices in the same equipment room should be integrated to the protection grounding bar of the same equipment room.
2	The protection ground (PGND) of the device should be connected to the nearest protection grounding bar provided by the consumer. The short-circuit wire should be yellow and green plastic insulated copper wire 2.5mm ² above.
3	There is the ground terminal and ground symbol below the front, back and side doors of the cabinet, which should be connected to the ground terminals of the cabinet via the connection cable with the cross-sectional area no less than 2.5mm ² respectively.
4	The metal components of the device cabinet should have good conductivity. The metal component connections of the cabinet cannot be painted with the insulation paint.
5	The frame body of the same line cabinet is interconnected closely via the top fastening bolts and washers. Do not spray at the 30mm*50mm rectangular surface around the connection hole of the fastening bolts, but we should do the anti-rust and anti-corrosion treatment. Washers and nuts should also be color zinc plated to ensure good electrical contact.
6	When combining the cabinets of the same type, the ground bus bars of the neighboring cabinets (if any) need to be interconnected via the bus bar short-circuit cable. The cross-sectional area of the short-circuit cable is 6mm ² and the length is no more than 300mm. Connect the two ends to the ground bus bar terminals of the neighboring cabinets respectively and tighten.

E.1.4 Grounding Specifications of Communication Power

The grounding specifications of the communication power are as shown in appendix table E-3:

APPENDIX TABLE E-3 GROUNDING SPECIFICATIONS OF COMMUNICATION POWER

No.	Description
1	The AC power supply system of the communication equipment room should adopt the TN-S power supply mode.
2	At the entrance of the AC power wire entering the equipment room, we should configure the AC power mine (C-class mine) with the discharge current no less than 20KA.
3	The protection ground of the communications power should share one group of ground body with the protection ground of the communication device. When the communication power and the communication device are at the same equipment room, they should share the protection ground bar of the same equipment room.
4	AC power port should be added with lightning protection circuit.
5	The positive polarity of -48V DC power should be grounded at the DC power output site.
6	The working ground and PGND of the DC power should share the same grounding body with the communication device PGND. When the communication power and the communication device are in the same equipment room, it is recommended for them to

No.	Description
	share the same protection grounding bar in the same equipment room.
7	The DC power port should ass surge protection circuit.

E.1.5 Laying Specifications of Ground Wires

The laying specifications of the ground wire are as shown in appendix table E-4:

APPENDIX TABLE E-4 LAYING SPECIFICATIONS OF GROUND WIRE

No.	Description
1	Ground lead should not be intertwined or parallel with the signal line.
2	Grounding cable cannot be led aerially, but should be buried in the earth or routed indoor.
3	On the protection ground wire, prohibit the connectors; prohibit installing the switch or fuse.
4	The protection ground wire should adopt the yellow and green plastic insulated copper wire.
5	The neutral line of the AC power cable in the equipment room cannot be connected with the protection ground of the transmission and communication devices in the equipment room.
6	The length of the protection ground wire should not exceed 45m, but should be as short as possible. When exceeding 45m, it is required that the consumer re-sets the ground row at the nearest.

E.2 Device Protection

This section mainly describes the precautions for the lightning protection of the device during installation.

E.2.1 General Requirement of Lightning Protection Wires

The device cables can be divided to indoor cables and outdoor cables according to the location of connecting the terminal. They have different requirements for the wiring in the lightning protection design.

Caution

- Communication connection cable should be routed indoors, which can effectively reduce the damage rate of the induction lightning of the device. The Ethernet cable is the interconnection line of the indoor signals and should not be overhead outdoors.

The general requirements for the wiring of the indoor cables:

- The cable installation is required to be done by category, avoiding that the cables of different categories are bundled with each other.
- It is recommended that the cable is bundled with one line deduction every 100 mm, strengthening the combing and fixing.
- The ground wire should be as short and thick as possible. The connection of the ground wire and grounding bar needs to use the screw to tighten or welding and preservative treatment.

The general requirements for the wiring of the outdoor cables:

- If the actual conditions cannot meet the indoor wiring, the outdoor cables should be laid and buried (introduced to the indoor from the underground).
- If you cannot lay and bury all outdoor cables, the aerial cables should be dressed with the metal pipes 15m before entering the indoor. The two sides of the metal pipe are grounded and we should install the signal mine at the corresponding interface of the device after the cable enters the indoor.
- If using the shielded cable, ensure that the shielded layer well contacts with the metal shell of the device at the device interface. We should install the signal mine at the corresponding interface of the device after the cable enters the indoor.
- When the outdoor cable without any protection is connected to the device, we should install the signal mine at the corresponding port.
- When laying the fibers, it is required that the wiring is smooth and the bundling the neat. It is required that the internal core wire is grounded before the outdoor fiber enters the indoor. The fiber cannot be stretched or bundled too tightly.

E.2.2 Installation Method of Cable Wiring

Installation Method of Power Cable

One end of the power cable is connected to the device and the other end is connected to the power strip or lightning protection bar. The excessive part is folded to the shape of S and fixed in the chassis. Keep a distance of more than 20cm with other cables.

Installation Method of Cables

The signal cables should be installed and bundled by indoor and outdoor, drawn from the outlet holes of different chassis to the user terminal or cascading device.

Precautions for Using Fiber

Caution

- When using the fiber to connect the network device, first confirm whether the type of the optical connector and the fiber type conform to the used optical port type.
- Before connecting the fiber, first confirm that the optical power of the receiving end does

not exceed the upper threshold of the receiving optical power of the optical module. Otherwise, it may burn the optical module.

- If the optical port is not connected to the optical connector, please be sure to wear a protective cap.
- If the optical port is not connected to the optical connector and the protective cap is opened, maybe some invisible rays emitted from the optical port, so you do not directly look at the optical port.
- The fiber connector should have the safe and reliable packaging and the connector should have the dust cap. When not using, the fiber connector should wear the dust cap, avoiding scratching the end face of the insert core of the fiber connector, and affecting the performance index. If the dust cap is too loose or polluted, change it in time.
- Before connection, we should use the dust-free paper to soak the absolute alcohol and wipe the end face of the insert core of the fiber connector. You can wipe in one direction only and you also need to wipe the end face of the peer fiber connector.
- When connecting, you cannot twist or bend the fiber. After installation, the bent radius of the fiber cannot be smaller than 40 mm (In dynamic bending case, the minimum bend radius is 20D; in the static bending case, the minimum bend radius is 10D; D is the fiber sheath diameter).
- If the fiber needs to pass through the metal board hole when connecting, the metal board hole should have the smooth and fully-filleted surface (the filleting radius should be no less than 2 mm). When passing through the metal board hole and turning along the sharp edge of the structural part, we should add the protective sleeve or pad.
- Be careful when plugging the connector and avoid damaging the connector or fracturing the fiber because of too much force. Avoid pulling, pressing, and extruding the fiber. The permitted maximum tensile force and crush force of the fiber are as shown in appendix table E-5.

APPENDIX TABLE E-5 PERMITTED FORCE OF THE FIBER

Force Time	Tensile Force (N)	Crush Force (N/100mm)
Short-term force	150	500
Long-term force	80	100

Installation Method of Fiber

After the fiber is drawn out from the optical port, the fiber directly connected to the photoelectric converter can be coiled to hang in the inner side of the chassis. The fiber cascaded with other devices should slip over the PVC pipe to draw out, avoiding traction and stretching.

⚠ Caution

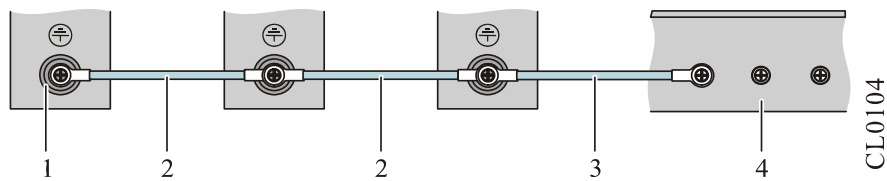
- Fiber itself does not belong to the conductor, and it does not sense or transduce the over-voltage, but the strengthen core of the fiber optic cable (the armored component installed to prevent the fiber from being affected by the environment event) can easily sense and transduce the lightning overvoltage, so we should treat properly. It is recommended that the user performs the ground protection at the user end of the fiber optic cable.

E.2.3 Equipotential Connection Requirement and Method

The interconnected devices in the same work range need the equipotential connection. For example, the interconnected devices, the metal sheath of the cable, power supply PE line, and the installed metal structure should ensure the equipotential connection.

Device Equipotential Connection Mode

For the equipotential connection of the interconnected devices, refer to figure E-1. After connection, use the multimeter to measure whether each equipotential connection point well contacts and the impedance is low enough.



APPENDIX FIGURE E-1 CONNECTION DIAGRAM OF DEVICE EQUIPOTENTIAL

1. Device ground terminal	2. Device equipotential connection line
3. Ground protection cable	4. Ground bar

F Environmental Substance Statement

APPENDIX TABLE F-1 TOXIC AND HAZARDOUS SUBSTANCE NAME AND CONTENT

Part Name ¹	Toxic and Hazardous Substance or Element					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Printed circuit board component ²	×	○	○	○	○	○
Switch power	×	○	○	○	×	×
Cabinet/frame (metal)	○	○	○	○	○	○
Chassis mat	○	○	○	○	×	×
Screw	×	○	×	○	○	○
Dust cover (Plastic)	×	×	×	×	×	×
Radiator	○	○	○	○	○	○

Fan	O	O	O	O	O	O
Cable	x	x	x	x	x	x
Lithium battery	O	O	O	O	O	O

O: It indicates that the content of the toxic and hazardous substance in all homogeneous materials of the component is below the limit requirement in SJ/T11363-2006 standard.

x: It indicates that the content of the toxic and hazardous substance in at least one homogeneous material of the component exceeds the limit requirement in SJ/T11363-2006 standard.

In the environmental protection use period, only strictly complying with the using conditions in the environmental protection use period, the environmental substances or elements contained in the product do not leak or mutate.

The environmental protection use period of the Li battery of the product is 5 years; the environmental protection use period of the other components is 50 years.

For the use conditions of the product in the environmental protection use period, refer to the requirements for the use environment in the product manuals.

Note 1: In the statement, list all components that may be configured in Maipu products. For the actual components contained in each product, please prevail in kind.

Note 2: PCB components include the printed circuit boards and the formed IC devices and the discrete devices, such as resistors, capacitors, integrated circuits, and connectors.