

MAIPU



NSS11500 Series NSS11500-04, 08, 12(V2)

Installation Manual

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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 introduces the appearance, hardware components, boards, power modules, etc. of the NSS11500 series switches. Next, introduce the installation preparations of the equipment and how to install them in the cabinet. Finally, the basic usage and daily maintenance of the equipment are introduced from three aspects: power-on operation, troubleshooting, and equipment maintenance.

Product Version

The products corresponding to this manual are as follows:

Product Name	Product Model
NSS11500 Series Switches	NSS11500-04(V2)
NSS11500 Series Switches	NSS11500-08(V2)
NSS11500 Series Switches	NSS11500-12(V2)

Readers

This manual is mainly applicable to the following persons:

- On-site technical support and maintenance personnel
- Administrators responsible for network configuration and maintenance




Conventions

Conventions of screen output format:

Format	Description
Screen print	Represents the output information of the screen

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

Symbol conventions:



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.
<i>Italic</i>	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
	Represents a generic router

Product Supporting Manuals

The accompanying manuals for this product are as follows:

Manual Name	Overview
<i>NSS6600(V2), NSS11500(V2) Series Switches Configuration Manual-V10.1.1.3 1 (R)-20221206</i>	Introduces the configuration method and configuration steps of the device software functions in detail, and provides typical cases for reference.
<i>NSS6600(V2), NSS11500(V2) Series Switch Command Manual-V10.1.1.3 1(R)-20221206</i>	Introduce the commands of the device in detail, which is equivalent to a command dictionary, which is convenient for consulting the functions of each command.
<i>NSS6600(V2), NSS11500(V2) Series Switches NETCONF YANG API Reference Manual-V10.1.1.1 (R)-20221021</i>	Describes in detail how to deal with typical faults and problems that occur during routine maintenance.

Data Acquisition Method

Obtain the latest product manuals from Maipu's website (www.maipu.com).

Technical Support

If you encounter difficult-to-determined or difficult-to-solve problems in the process of equipment operation and maintenance, and you still cannot solve them through the guidance of the manual, please contact Maipu Technology Service Center directly, and we will provide you with technical support services.

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1 Product Description

NSS11500 series switches adopt the industry-leading control and switching separation technology. The whole machine can provide up to 576 10G interfaces or 192 40G or 144 100G high-density port deployment capabilities. It provides 1:N, N:1 and other physical resource virtualization technologies, realizing the integration of SDN deployment and common switch functions.

NSS11500 series switches can meet the requirements of various high-throughput, high-density, high-speed interface deployment scenarios in the construction of new generation data centers. Cooperating with Maipu NSS5930 and other series switches, it can provide all-round, high-guarantee, multi-series integrated next-generation data center construction solutions for the construction of data centers in various industries such as finance, government, operators, and energy.

This chapter introduces the hardware composition of the device, containing the following:

[1.1 Product Appearance and Hardware Composition](#)

[1.2 Introduction to MPU Card](#)

[1.3 Introduction to SFU Card](#)

[1.4 Introduction to LPU Card](#)

[1.5 Power Modules](#)

[1.6 Fan Modules and Equipment Air Ducts](#)

1.1 Product Appearance and Hardware Composition

NSS11500 series switch product model: NSS11500-04(V2)\NSS11500-08(V2)\NSS11500-12(V2).



- NSS11500 series switches include three slot types: MPU, SFU, and LPU slots. These three slots correspond to the MPU card, SFU card, and LPU card
-

respectively.

- MPU: Main Processing Unit. For specific specifications, see "[Appendix A2 MPU Card Specifications](#)".
- SFU: Switching Fabric Unit. For details, see "[Appendix A3 SFU Card Specifications](#)".
- LPU: Line Processing Unit. For specific specifications, see "[Appendix A4 LPU Card Specifications](#)".

1.1.1 NSS11500-04 (V2)

The dimension of the NSS11500-04(V2) bare frame are 442mm (excluding mounting ears) mm (excluding mounting ears) × 748 mm × 263 mm (width × depth × height). The chassis demission after installing the mounting ears and cabling rack is 442 (excluding mounting ears) mm (excluding mounting ears) × 848mm × 263mm (width × depth × height). Figure 1-1 shows the front appearance of the NSS11500-04(V2). The schematic diagram of the rear appearance is shown in Figure 1-2.

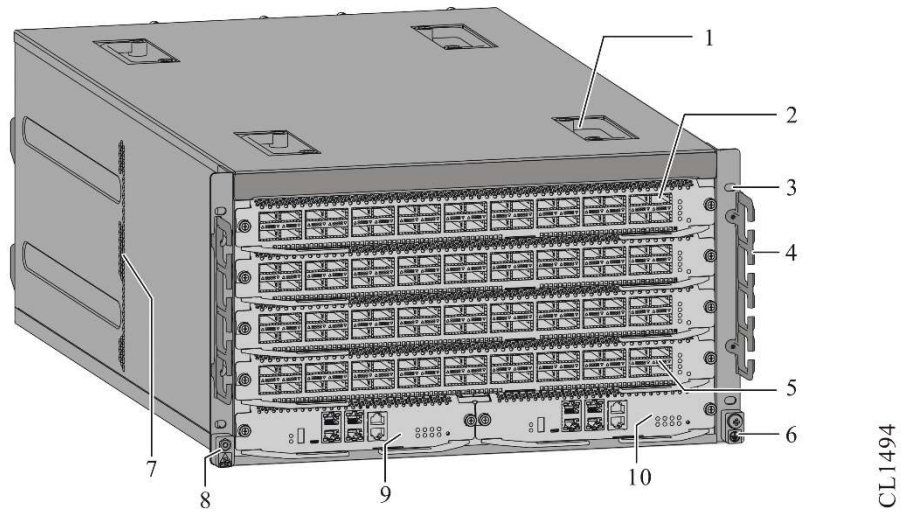


Figure 1-1 Front appearance of NSS11500-04(V2)

1. Chassis handle	2. LPU card slot 0
3. Upper cabinet screw holes	4. Cabling rack
5. LPU card slot 3	6. Ground Stud
7. Power inlet hole	8. Electrostatic bracelet socket
9. MPU card slot 0	10. MPU card slot 1

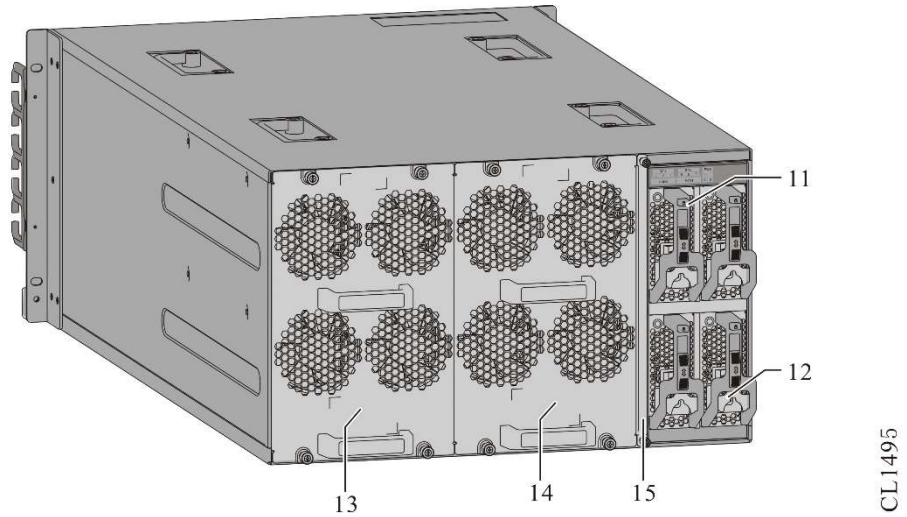


Figure 1-2 Rear appearance of NSS11500-04 (V2)

11. Power module slot 0	12. Power module slot 3
13. Fan module slot 0	14. Fan module slot 1
15. Barrier	

1.1.2 NSS11500-08 (V2)

The dimension of the NSS11500-08 (V2) bare frame is 442 (excluding mounting ears) mm×465mm×666mm (width × depth × height). The dimension of the chassis after installing the chassis mounting ears, equipment head, and cabling rack is 442 (not including mounting ears) mm×565mm×666mm (width × depth × height). Figure 1-3 shows the front appearance of NSS11500-08 (V2). Figure 1-4 shows the schematic diagram of the rear appearance.

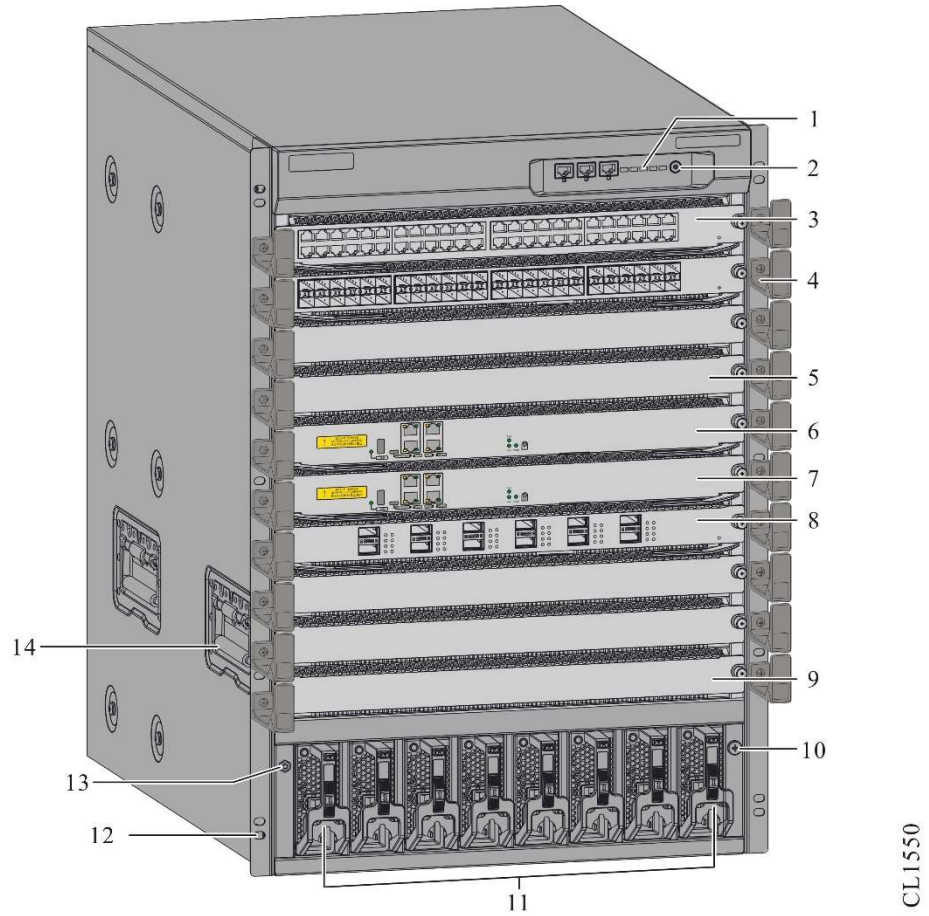


Figure 1-3 NSS11500-08(V2) front appearance diagram

1. System indicator	2. Host power switch
3. LPU card slot 0	4. Cabling rack
5. LPU card slot 3	6. MPU card slot 0
7. MPU card slot 1	8. LPU card slot 4
9. LPU card slot 7	10. Ground stud
11. Power module slot	12. Upper cabinet screw holes
13. Electrostatic bracelet jack	14. Chassis handle

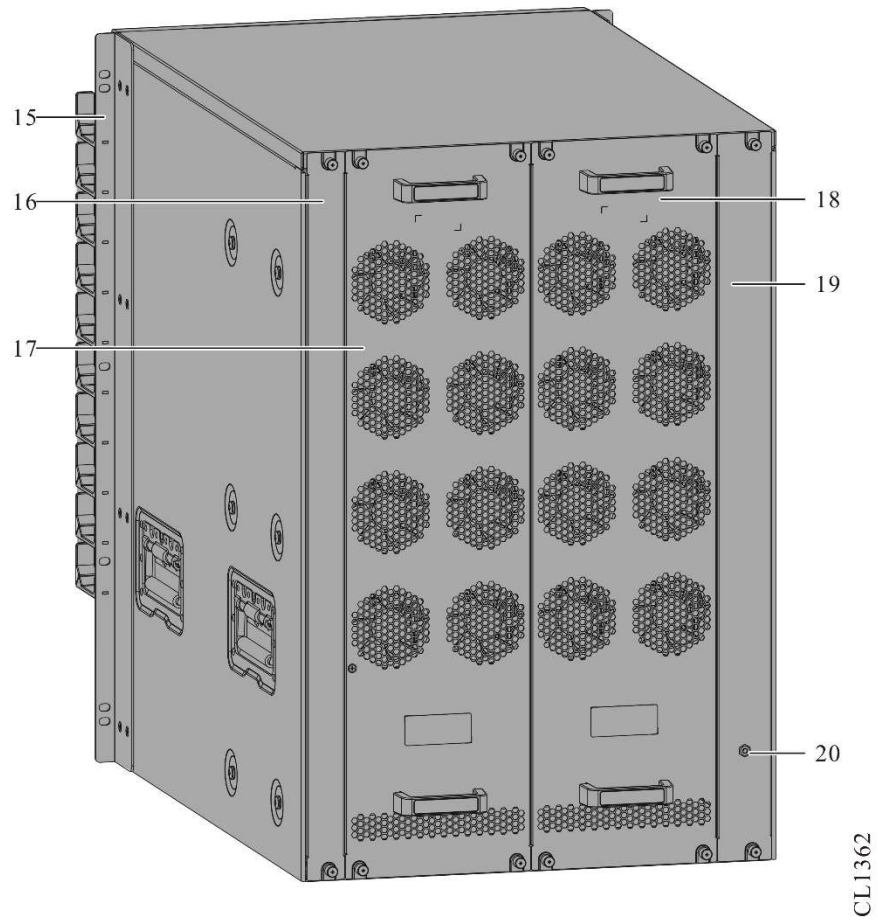
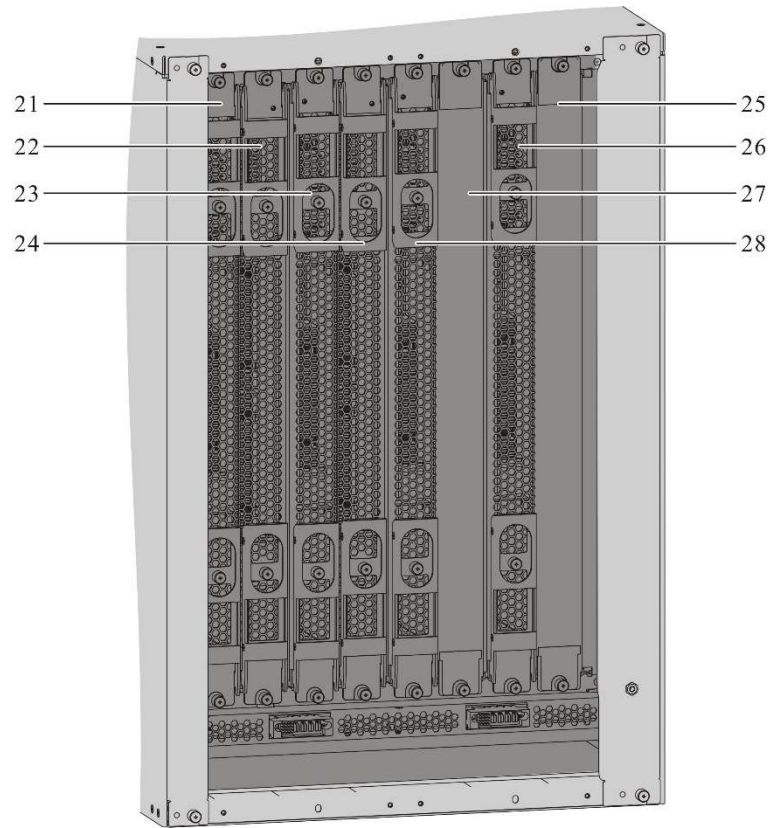


Figure 1-4 NSS11500-08(V2) Rear Appearance Diagram

15. Chassis mounting ear	16. Blank baffle at the rear of the equipment
17. Fan module slot 0	18. Fan module slot 1
19. Blank baffle at the rear of the equipment	20. Electrostatic bracelet socket



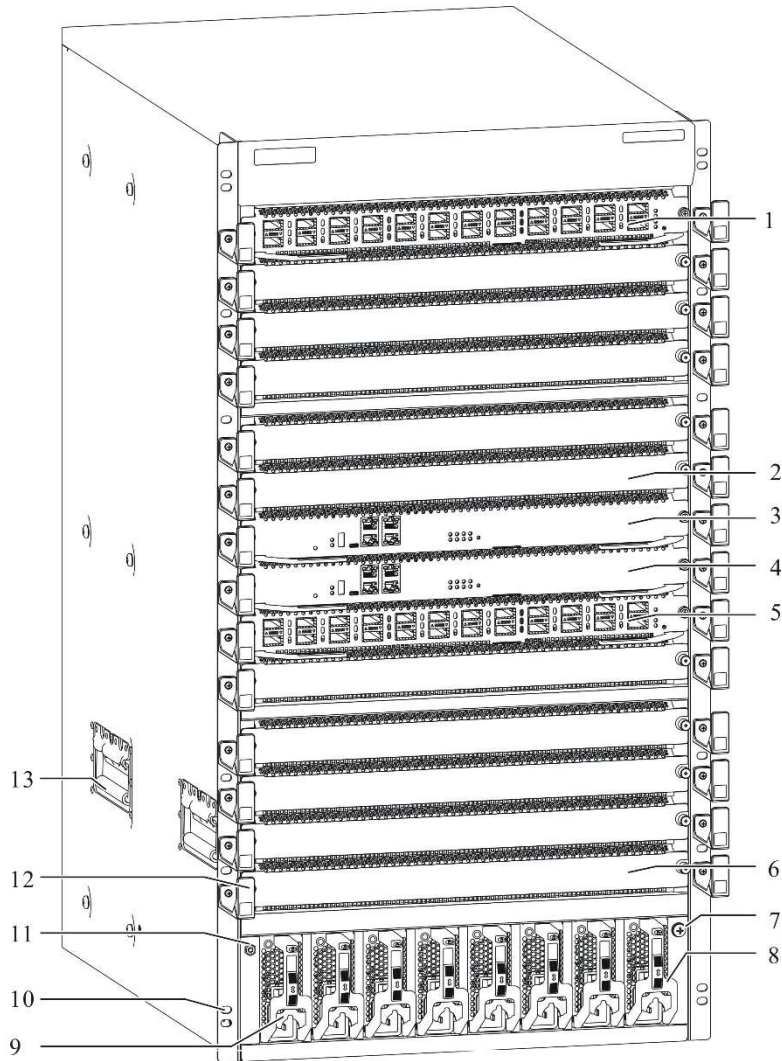
CL1552

Figure 1-5 Rear appearance of NSS11500-08 (V2)

21. SFU slot 0	22. SFU slot 4
23. SFU slot 1	24. SFU slot 5
25. Blank baffle 0	26. SFU slot 3
27. Blank baffle 1	28. SFU slot 2

1.1.3 NSS11500-12 (V2)

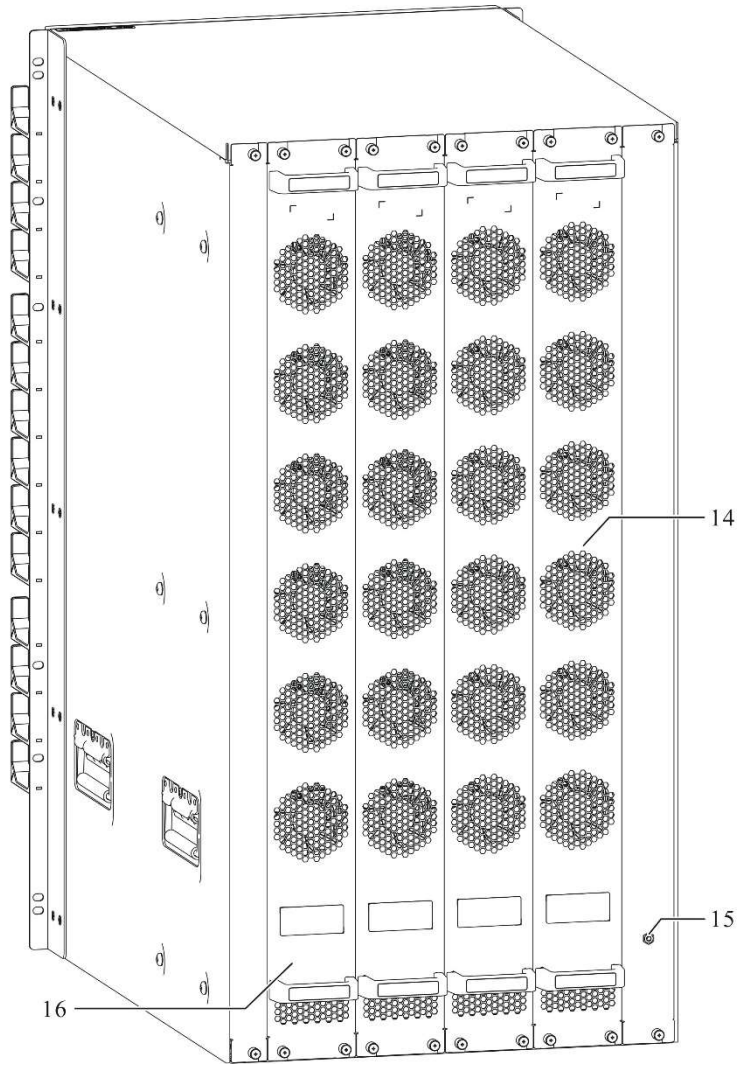
The dimension of the NSS11500-12 (V2) bare frame is 442 (excluding mounting ears) mm×645mm×880mm (width × depth × height), and the dimension of the chassis after installing the chassis mounting ears, equipment head and power supply dust cover is 484mm ×745mm×880mm (width × depth × height). Figure 1-6 shows the front appearance of the NSS11500-12(V2). Figure 1-7 shows the schematic diagram of the rear appearance.



CL1533

Figure 1-5 Front appearance of NSS16000-L(V1)

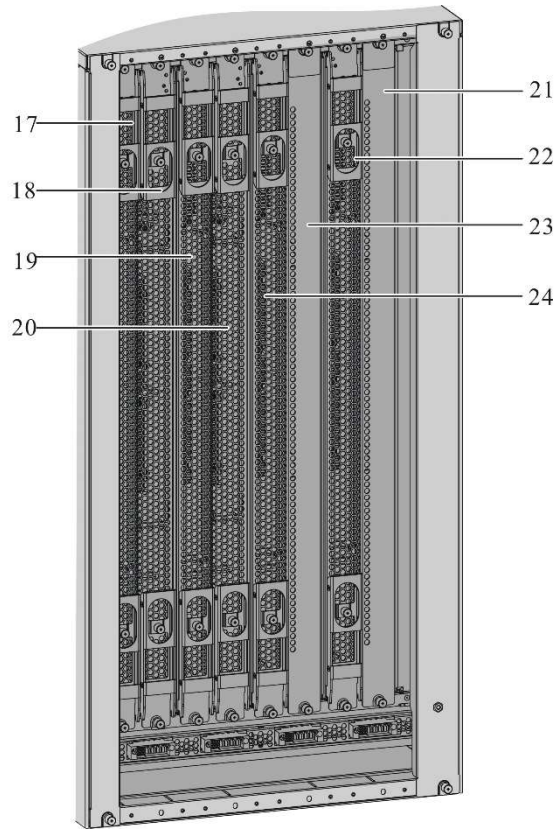
1. LPU card slot 0	2. LPU card slot 5
3. MPU card slot 0	4. MPU card slot 1
5. LPU card slot 6	6. LU card slot 11
7. Ground stub	8. Power module slot 7
9. Power module slot 0	10. Bottom cabinet screw holes
11. Electrostatic bracelet socket	12. Cabling rack
13. Chassis handle	



CL1534

Figure 1-6 The rear appearance of NSS16000-L (V1)

14. Fan module slot 3	15. Electrostatic bracelet socket
16. Slot 0 of the fan module	



CL1570

Figure 1-8 Schematic diagram of the rear appearance of NSS16000-L(V1)

17 SFU slot 0	18 SFU slot 4
19 SFU slot 1	20 SFU Slot 5
21 Blank baffle 0	22 SFU Slot 3
23 Blank baffle 1	24 SFU Slot 2

1.2 Introduction to MPU Card

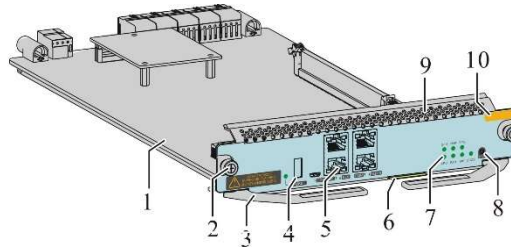
MPU: Main Processing Unit

The MPU card is the most important and necessary board card in the NSS11500 series switch, and its function is to serve as the control center of the device. Each frame can support two MPU cards at the same time, realizing the working mode of 1:1 backup.

The MPU card of the NSS11500 series switch NSS11500-04(V2) is half-width.

The MPU card of NSS11500 series switches NSS11500-08(V2)\NSS11500-12(V2) is full width.

The appearance diagram of the half- width MPU card is as follows:

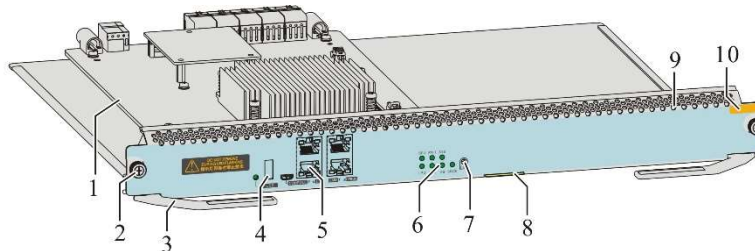


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Figure 1-9 The appearance of the half -width MPU card

1. PCB component area	2. Captive screws
3. Board puller	4. USB interface
5. Function port	6. ID plate pull bar
7. Function status indicator	8. Reset button
9. Ventilation holes	10. Module model ID area

The appearance diagram of the full-width MPU card is as follows:



CLI1580

Figure 1-7The appearance of a full-width MPU card

1. PCB	2. Captive screws
3. Board puller	4. USB interface
5. Function port	6. Function status indicator
7. Reset button	8. Device barcode
9. Cooling holes	10. Model ID

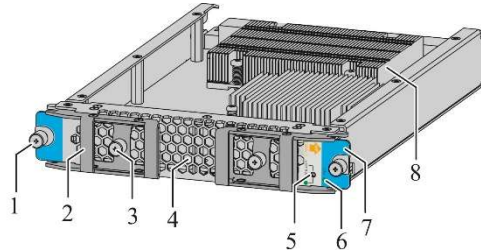
1.3 Introduction to SFU Card

SFU: Switching Fabric Unit

The SFU card is the switching network unit of the NSS11500 series switch, which is responsible for the exchange of business data between the LPU cards;

There are seven types of SFU cards for NSS11500 series switches: NSM115-SFUB-EX(V1), NSM115-SFUB(V1), NSM115-SFUD-EX(V1), NSM115-SFUD(V1), NSM115-SFUC(V1), NSM115-SFUF-EX(V1), NSM115-SFUF(V1). The NSS11500 chassis supports a maximum of six SFU cards, which can realize 1+N backup function;

The appearance diagram of the NSM115-SFUB(V1) card is as follows:

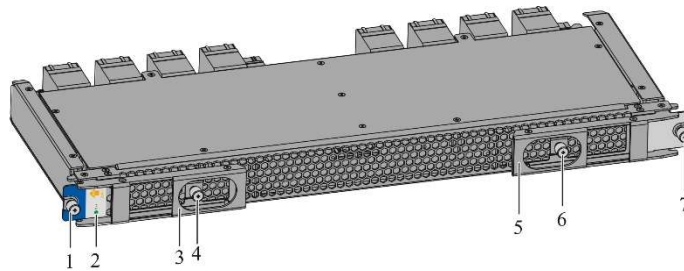


CL1497

Figure 1-8 Appearance diagram of NSM115-SFUB(V1) card

1. Captive screws	2. Board puller
3. Captive screws of the puller	4. Ventilation holes
5. Board status indicator	6. HOT SWAP button
7. Module model ID area	8. PCB component area

The appearance diagram of the NSM115-SFUD(V1) card is as follows:



CL1364

Figure 1-9 Appearance diagram of NSM115-SFUD(V1) card

1. Captive screws (top)	2. Board status indicator
3. Board card puller (top)	4. The captive screw of the puller (upper)
5. Board card puller (bottom)	6. The captive screw of the puller (bottom)
7. Captive screws (bottom)	

The appearance diagram of the NSM115-SFUF(V1) card is as follows:

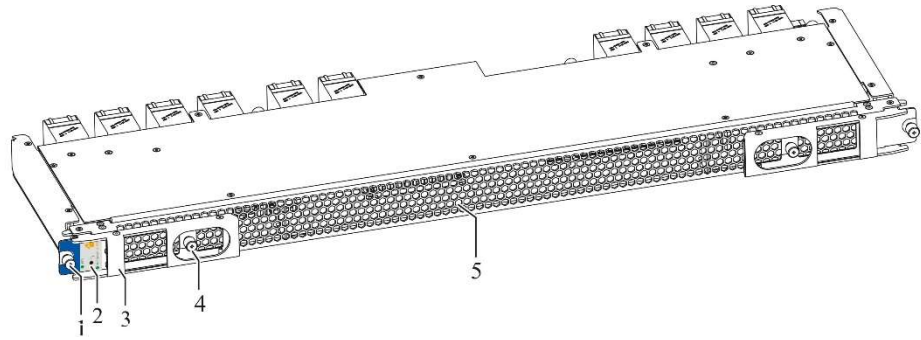


Figure 1-10 Appearance diagram of NSM115-SFUF(V1) card

1. Captive screws (top)	2. Board status indicator
3. Board card puller (top)	4. The captive screw of the puller (upper)
5. Ventilation holes	

1.4 Introduction to LPU Card

LPU: Line Processing Unit, which provides a variety of different interface forms for users to choose to meet the needs of various application scenarios. LPU boards are divided into 8180 boards and 7132 boards, both of which use different numbers of connectors and different radiators in appearance, as shown below:

1.4.1 7132 LPU Board

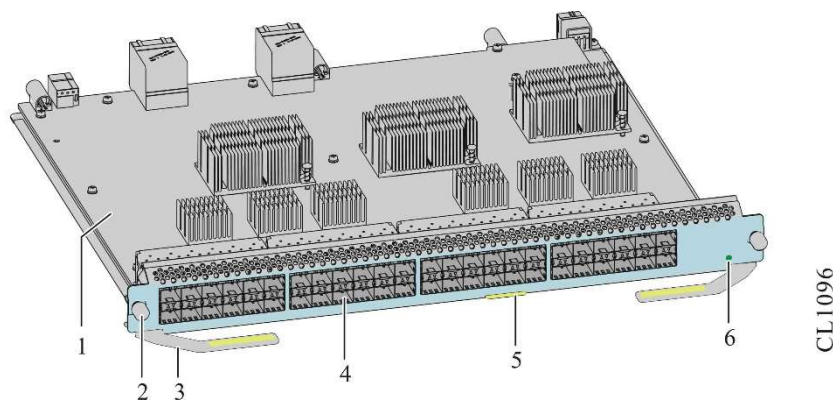


Figure 1-14 The appearance of the 7132 LPU card

1. PCB component area	2. Captive screws
3. Board puller	4. Function port
5. ID plate pull bar	6. LPU card status indicator

1.4.2 8180 LPU Line Card

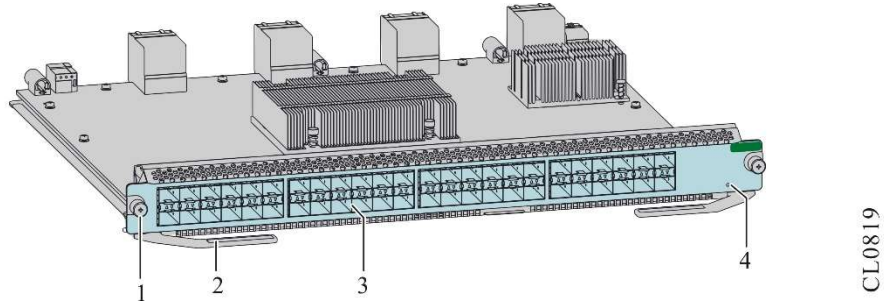


Figure 1-15 The appearance of the LPU card

1. Captive screws	2. Board puller
3. Function port	4. Status Indicator

1.5 Power Modules

The NSS11500 switch supports AC power supply and DC power supply, can support N+1 redundant backup, and can also achieve power output power balance to improve system reliability. Automatically realize current sharing between power modules without user operation.

The power module of NSS11500-12(V2) series switches has two specifications: AD1600-1D005M (V2), and DD1600M-5V1F (V1).

The power modules of NSS11500-04(V2) series switches have three specifications: AD800M-HV1B(V1), AD1600M-HV0B(V1), and DD1600M-5V0B(V1).

The power modules of NSS11500-08(V2) series switches have three specifications: AD800-1D005M (V1), AD1600-1D005M (V2), and DD1600M-5V1F(V1).

Caution

- When installing the power supply, please unplug the external power cord, or make sure the main control switch of the power supply is off.
- If some power modules are inserted into the chassis but are not connected to power cables that are powered on, the system considers these power modules that are not powered on to be in a fault state, and the system alarms.

- Do not support the mixed insertion of power modules of different models.
- For details about the configuration of the power module of the NSS11500 switch on the device, see the chapter "[A5 Power Module Specifications](#)" in the appendix.

The appearance diagram of AD1600-1D005M (V2) AC power module is as follows:

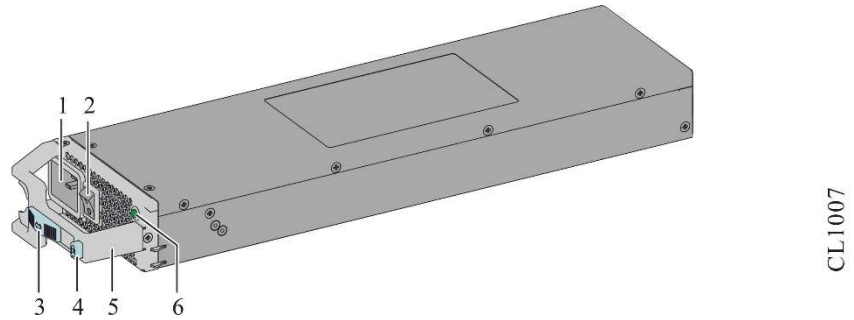


Figure 1-11 Appearance diagram of AD1600-1D005M (V2) AC power supply module

1. AC power socket	2. Power switch
3. Power cord anti-trip slider	4. Power module unlock button
5. Power handle	6. Power status indicator

The appearance diagram of DD1600M-5V1F (V1) DC power module is as follows:

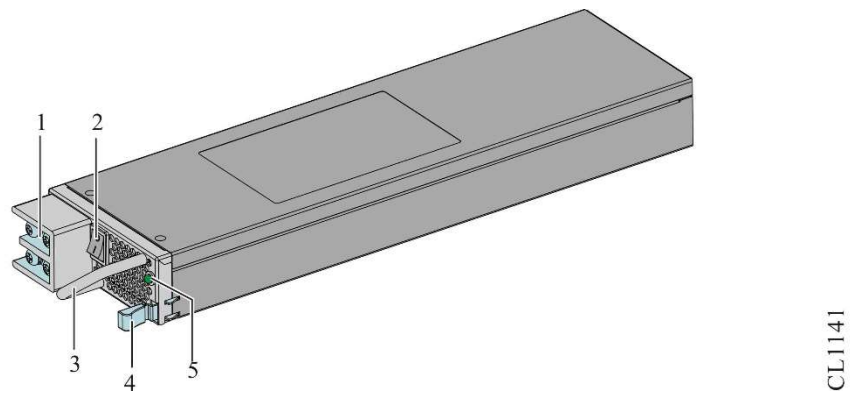
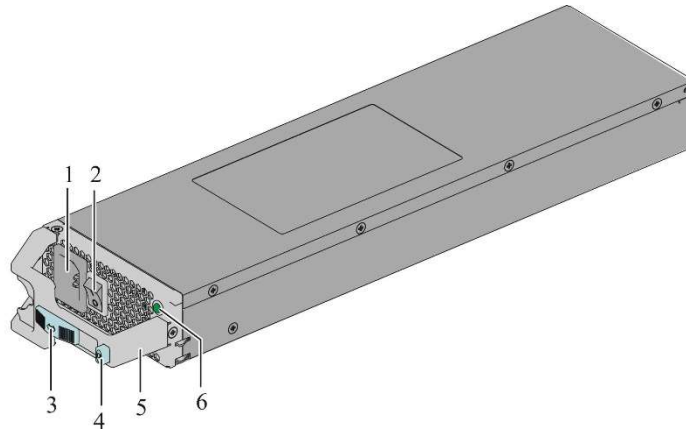


Figure 1-12 Appearance diagram of DD1600M-5V1F (V1) DC power module

1. DC power input interface	2. Power switch
3. Power handle	4. Power module unlock button
5. Power status indicator	

The appearance diagram of AD800M-HV1B(V1) AC power module is as follows:

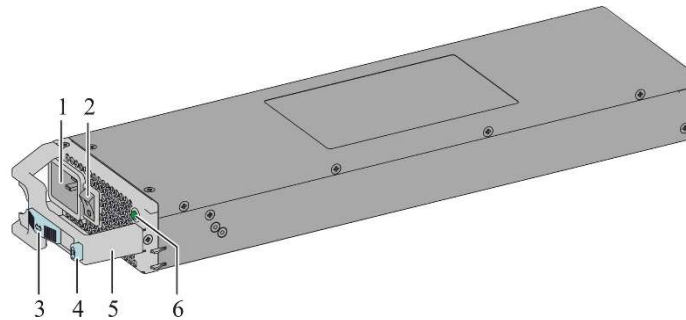


CL0990

Figure 1-13 AD800M-HV1B(V1) AC power module appearance diagram

1. AC power socket	2. Power switch
3. Power cord anti-trip slider	4. Power module unlock button
5. Power handle	6. Power status indicator

The appearance diagram of AD1600M-HV0B(V1) AC power module is as follows:

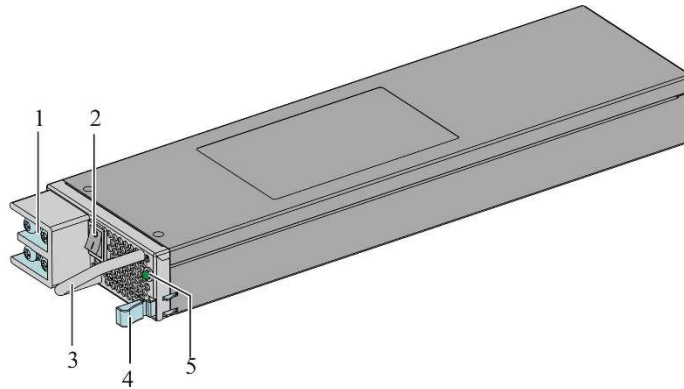


CL1007

Figure 1-14 AD1600M-HV0B(V1) AC power module appearance

1. AC power socket	2. Power switch
3. Power cord anti-trip slider	4. Power module lock button
5. Power handle	6. Power status indicator

The appearance diagram of DD1600M-5V0B(V1) DC power module is as follows:

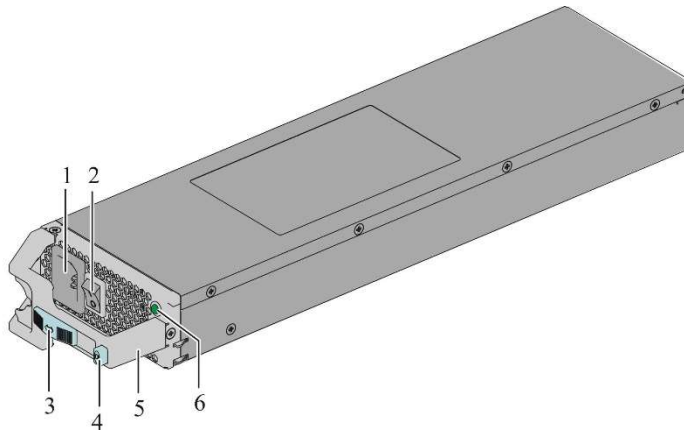


CL1141

Figure 1-15 Appearance diagram of DD1600M-5V0B(V1) DC power module

1. DC power input interface	2. Power switch
3. Power handle	4. Power module unlock button
5. Power status indicator	

The appearance diagram of AD 8 00-1D005M (V1) AC power module is as follows:



CL0990

Figure 1-16 AD800-1D005M (V1) AC power module appearance

1. AC power socket	2. Power switch
3. Power cord anti-trip slider	4. Power module unlock button
5. Power handle	6. Power status indicator

1.6 Fan modules and Equipment Air Ducts

The fan module of NSS11500 series switches is an important part (required module) to ensure the normal operation of the equipment system, and provides airflow for the heat dissipation of the system. It has the following functions and characteristics:

- Effective heat dissipation: to ensure the normal operation of the equipment for a long time.
- Status monitoring: support fan failure alarm.
- Auto speed adjustment: It can automatically adjust the speed according to the operation of the equipment, effectively reducing noise and energy consumption.
- Four indicators on the front panel of the FAN-06A-01B(V1) fan module, among which the fan indicator "FAN" is used to indicate the running status of the fan module in real time, and the switch card indicator indicates the running status of the SFU card corresponding to the fan module.
- Support hot-swap: The single-fan module can be replaced without interrupting the operation of the device.

NSS11500-04(V2): FAN-06A-01B(V1)

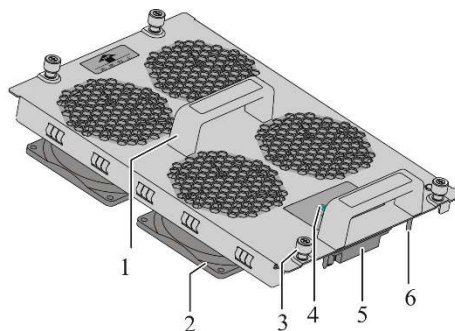
NSS11500-08(V2): FAN-15B-01B(V1)

NSS11500-12(V2): FAN-20A-01(V1)

1.6.1 FAN-06A-01B(V1) Fan Module

The FAN-06A-01B(V1) fan module is a required module for the NSS11500-04(V2), and supports hot swapping. Each NSS11500-04(V2) has two FAN slots, and two FAN-06A-01B(V1) fan modules must be installed to ensure the normal operation of the system.

The diagram of the fan module is as follows:



CL1498

Figure 1-17 FAN-06A-01B(V1) module

1. Fan handle	2. Fan
3. Captive screws	4. Status indicator
5. Modular connector	6. Locating pin

1.6.2 FAN-20A-01(V1) Fan Module

The FAN-20A-01(V1) fan module is a required module of the NSS16000-L(V1), and supports hot swapping. Each NSS16000-L (V1) has four FAN slots, and four FAN-20A-01 (V1) fan modules must be installed to ensure the normal operation of the system.

The diagram of the fan module is as follows:

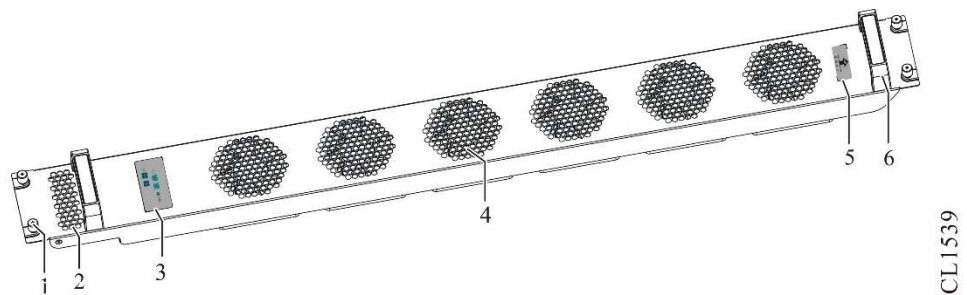


Figure 1-23 FAN-20A-01 (V1) module

1. Captive screws	2. Hollow air inlet
3. Status indicator	4. Fan outlet
5. Marking of fan installation direction	6. Fan handle

1.6.3 FAN-15B-01B(V1) Fan Module

The FAN-15B-01B(V1) fan module is a required module for the NSS11500-08(V2), and supports hot swap. Each NSS11500-08(V2) has two FAN slots, and two FAN-15B-01B(V1) fan modules must be installed to ensure the normal operation of the system.

The diagram of the fan module is as follows:

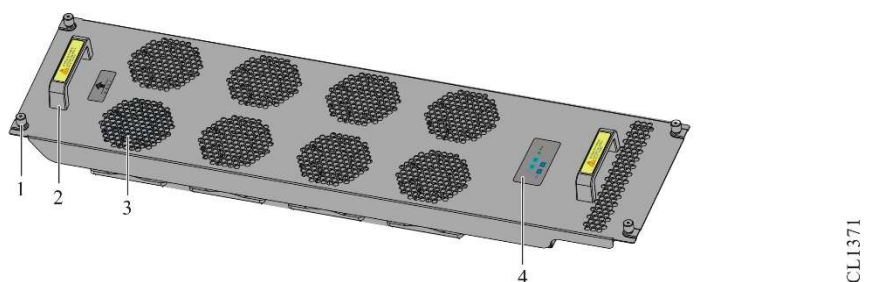


Figure 1-24 FAN-15B-01B (V1) module

1. Captive screw	2. Fan handle
3. Fan outlet	4. Status Indicator

1.6.4 Equipment Duct

NSS11500-04 (V2) switch chassis inlet and outlet air ducts: the airflow direction is forward and then backward. The schematic diagram is as follows:

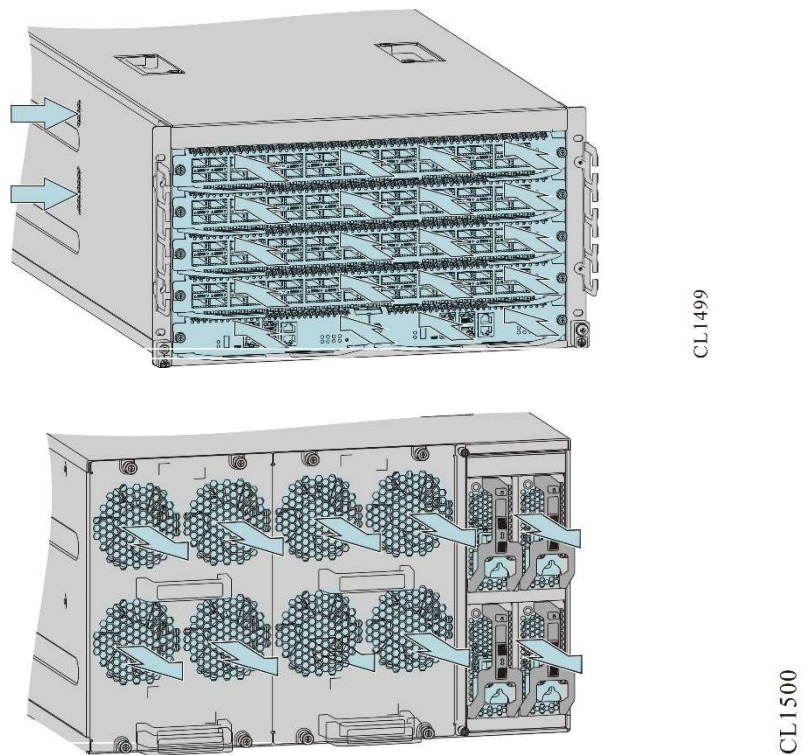


Figure 1-18 NSS11500-04 (V2) switch chassis air ducts

NSS12800-08 (V3) switch chassis inlet and outlet air ducts: the airflow direction is forward and then backward. The schematic diagram is as follows:

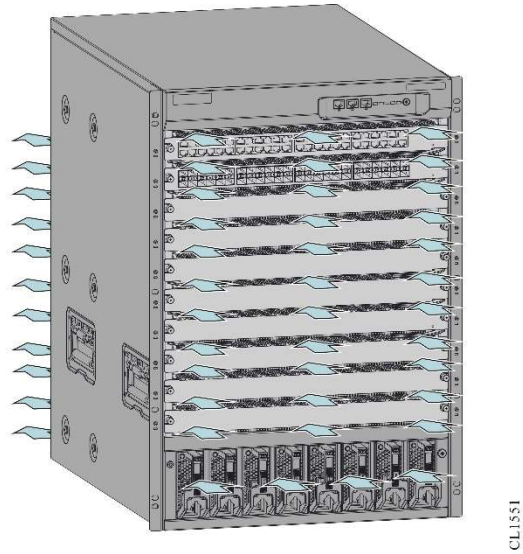


Figure 1-19 Schematic diagram of NSS12800-08 (V3) switch chassis air ducts

NSS16000-L(V1) switch chassis inlet and outlet air ducts: the airflow direction is forward and then backward. The schematic diagram is as follows:

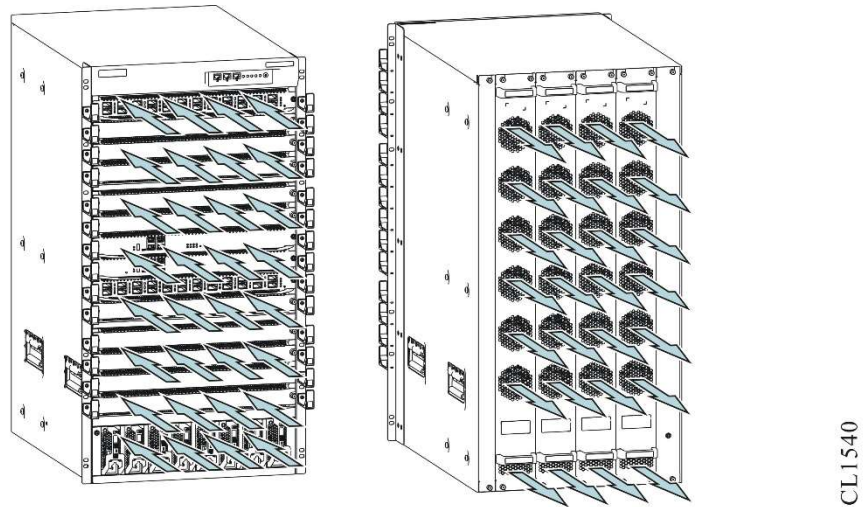


Figure 1-20 NSS16000-L(V1) switch chassis air ducts

! Caution

- Please keep the air duct of the equipment unblocked during the operation of the equipment.
-

 **Note**

- Noise for NSS11500-04 (V2) equipment in a 25°C environment ≤ 81 dB
-

2 Installation Preparation

This chapter introduces the preparations and related work before equipment installation, containing the following:

[2.1 Device Operating Environment Inspection](#)

[2.2 Security Precautions](#)

[2.3 Carton Unpacking and Inspection](#)

[2.4 Unpacking Wooden Box](#)

Note

- A packing list will be attached to the device when it is delivered. Please confirm whether the delivery accessories are complete and in good condition according to the list of items in the packing list. If it is damaged or lost, please contact Maipu technical support engineers for replacement.
-

2.1 Device Operating Environment Inspection

2.1.1 Check Machine Room Condition

In order to ensure the normal operation of the device all the time, corresponding measures should be taken to meet the environmental requirements of the device during operation.

- The air conditioning and ventilation system is sufficient to ensure the temperature and humidity conditions for the normal operation of the device. For details, see "[Appendix D1 Environmental Requirements for Computer Room](#)".
- Good grounding is the basis for stable operation of device, and an important guarantee for preventing lightning strikes and resisting interference, ensuring that the grounding meets the grounding specification requirements. For details, see "[Appendix E1 Equipment Grounding Specifications](#)".
- Confirm whether the installation space and the transportation channel space are sufficient.
- Confirm that the cleanliness of the device room meets the requirements, and it is forbidden to place the device in a dusty environment such as being renovated.

2.1.2 Check Power Supply System

A good power supply system is the basis for device to start up and operate stably. In order to meet the power supply requirements of the NSS11500 series switch, please complete the following steps:

step 1: Estimate the overall power consumption of the device.

Step 2: Choose a suitable power module according to the power consumption of the whole machine and the power supply mode of the device.

To ensure normal operation of the device, ensure that the maximum output power of the power module that supplies power to the device is greater than the power consumption of the entire switch (it is recommended to reserve a certain amount of power consumption derating).

Step 3: Confirm that the power supply system at the installation site can meet the input requirements of the device power supply.

Make sure that the power supply system at the installation site is stable and can meet the requirements of the input mode and rated input voltage of the selected power module. For details, see "[Appendix D2 Power Condition Requirements](#)".

Note

- For the power consumption data and power module parameters of the device, see "[Appendix A Machine and Common Modules Specifications](#)".
-

2.2 Security Precautions

2.2.1 General Security

Caution

- Make sure that the ground of the installation site is dry and flat, and that you have taken anti-slip measures.
 - Keep the device clean and dust-free, and do not place the device in a humid place.
 - The whole device and related components (such as power supply, chassis, etc.) are relatively heavy. When carrying and lifting, please cooperate with more than
-

one person to prevent the body from being scratched by the sharp parts of the device. Please wear labor protection gloves during handling.

- This is a Class-A product. In the living environment, this product may cause radio interference. In this case, the user may need to take practical measures against the interference. When disconnecting power, remove all power cords.
-

2.2.2 Electrical Security

Caution

- Please carefully check whether there are potential dangers such as ungrounded power supply, unreliable power grounding, and wet ground in the working area.
 - Before installation, please know the position of the main power switch in the room where the device is located. When an accident occurs, first cut off the main power switch.
 - Be sure to unplug all external cables (including the power cord) before moving the chassis.
 - When performing live maintenance, it is recommended that two or more people be on site.
 - When turning off the power, please confirm that the neutral and live wires of the device have been disconnected, and must be checked carefully to confirm.
-

2.2.3 Handling Security

NSS11500 series switches are large in size and heavy in weight. Please pay attention to the following requirements during handling:

Caution

- Before carrying or moving the device, unplug all external cables (including the power cord).
 - If the handling distance is long, it is recommended to use professional mechanical handling tools.
 - When transporting equipment at a close distance, please cooperate with multiple people: even force, steady steps, and consistent steps to prevent the transporters from slipping or the equipment from toppling over.
-

Warning

- When moving the device, use the handles on both sides of the top of the chassis for weight or the bottom of the device for weight. It is strictly forbidden to use the chassis panel, fan module handle, power supply handle and other parts to exert force, so as not to cause equipment hardware damage or even personal injury.

2.2.4 Static Security

In order to prevent static electricity from causing damage to the electronic components of the equipment, anti-static measures must be taken.

! Caution

- When installing various device components, especially components with circuit boards (such as single boards), you must wear an antistatic wrist.
- When installing the board, please hold the edge of the circuit board, and prohibit touching components and printed circuit boards.
- For the sake of safety, check the resistance of your anti-static wrist. The resistance between the human body and the earth should be between 1 and 10 megohms.

The steps to use the anti-static wrist are as follows:

- Step 1: Put your hand in the anti-static wrist wrap.
- Step 2: Tighten the buckle and confirm that the metal sheet on the anti-static wrist is in good contact with the skin.
- Step 3: Insert the anti-static wrist into the anti-static wrist socket on the device chassis, or clip it to the grounding post of the chassis with alligator clips.
- Step 4: Confirm that the anti-static wrist is well grounded.

The schematic diagram of how to use the anti-static wrist is as follows:

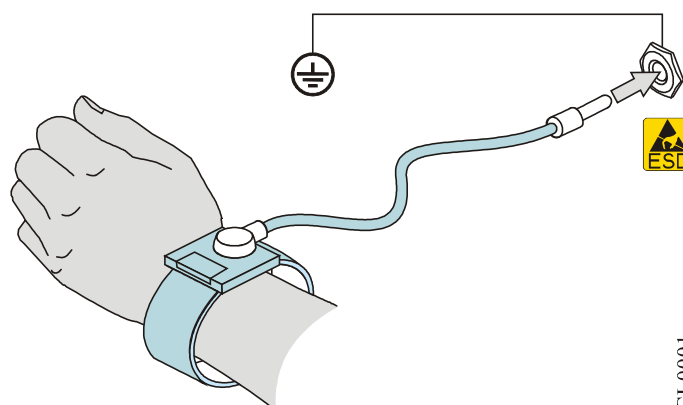


Figure 2-1 Schematic diagram of how to use the anti-static wrist

2.2.5 Laser Security

Warning

- NSS11500 series switch boards contain optical interfaces, so avoid looking directly at the laser beam inside the optical module when using them. Laser light can damage your eyes.
-

2.3 Carton Unpacking and Inspection

When the NSS11500 series switch is delivered, some single cards or modules will be individually packed in cartons according to the configuration purchased by the user. Please follow the steps below for acceptance.

- step 1: Check the carton label to confirm the model of the board or module.
- Step 2: Use a paper knife to cut the tape along the seam of the box cover. When using the knife, be careful not to insert it too deep to avoid scratching the internal items.
- Step 3: Open the carton and take out the board protective pearl cotton boxes one by one.
- Step 4: Check the type and quantity of boards in the box against the packing list.
- Step 5: Wear an anti-static wrist, unpack the anti-static packaging bag, take out the board, and check whether there is any obvious damage to the appearance of the board (including whether the pins/holes of the backplane connector are deformed, whether the heat sink is detached, etc.).

2.4 Unpacking Wooden Box

The chassis of the NSS11500 series switch is packed in a wooden box. The packaging of a machine frame consists of wooden boxes, plastic bags, protective pearl cotton and other packaging materials. Before unpacking, it is best to move the packing box to the machine room or near the machine room (if the space permits) for unpacking, so as to avoid damage to the frame during transportation.

Warning

- The wooden box is directional, and it is forbidden to put it upside down or sideways. Otherwise, it will cause fatal damage to the product.
-

Caution

- When carrying and unpacking the wooden box, two or more people must cooperate to operate.
 - After unpacking, please check the packing list to confirm whether the accessories are complete, and keep the items in the box properly for installation and use.
-

step 1: Put on work gloves.

Step 2: Put the wooden box flat on the ground, pay attention to the directionality of the wooden box, and it is forbidden to turn it upside down.

Step 3: Rotate the butterfly clasps on the wooden box in turn to open the clasp.

Step 4: Open the box board and open the wooden box.

Step 5: Remove the protective pearl cotton, open the plastic bag, and lift it out of the case.

3 Device Installation

This chapter describes device installation, containing the following:

[3.1 Install Device into Cabinet](#)

[3.2 Device Grounding](#)

[3.3 Install a SPD \(Optional\)](#)

[3.4 Post-Installation Inspection](#)

3.1 Install Device into Cabinet

This section will introduce how to install the NSS11500-04(V2) switch into a 19-inch standard cabinet. The installation method of the NSS11500-08(V2) and NSS11500-12(V2) is the same. We will not describe it separately.

3.1.1 Installation Preparation

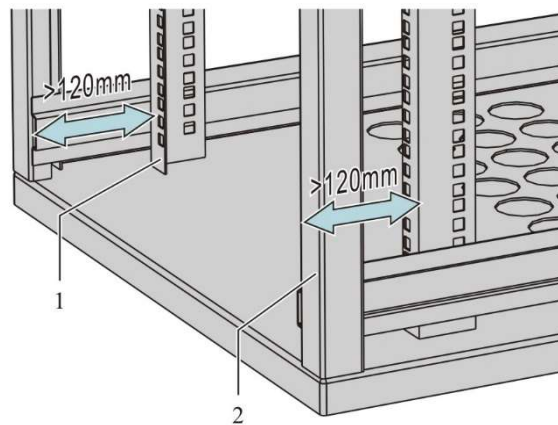
- The customized cabinet should be a 19-inch standard cabinet. The depth of the cabinet should be more than 150mm greater than the depth of the device. The cabinet needs to meet the requirements that the front and rear air ducts are unobstructed. No objects blocking the air ducts are allowed to be placed near the front and rear doors.
- Adjust the position of the cabinet. The NSS11500 series switch adopts the front and rear maintenance mode, and sufficient maintenance aisles must be left at the front and back of the cabinet.
- When installing the NSS11500 series switch, you need to check the maximum load-bearing capacity of the cabinet, tray, and floor of the device room in advance (for the weight of each component of the NSS11500 series switch, see "[Appendix A Machine and Common Module Specifications](#)"). For load bearing, heat dissipation, and wiring considerations, it is recommended that only one NSS11500 series switch be installed in a standard cabinet.
- Check the grounding and stability of the cabinet, and ensure that there are no obstacles in and around the cabinet that will affect the installation of device.



- 1U is 44.45mm. Here U is the abbreviation of RU (Rack Unit).

3.1.2 Cabinet Adjustment

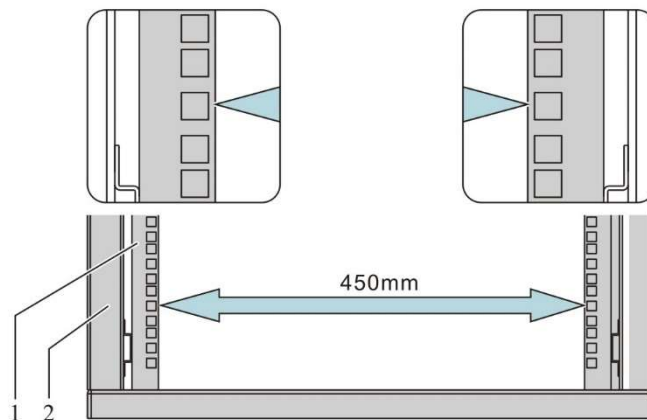
To ensure that the device can be installed in the cabinet normally, the depth of the front column and the square hole column is required to be greater than 120mm, and the width of the square hole column on both sides of the cabinet is 450mm. See Figure 3-1 for the depth adjustment of the column in the square hole of the cabinet, and Figure 3-2 for the width adjustment of the column in the square hole of the cabinet.



CL0586

Figure 3-1 The depth adjustment of the square hole column of the cabinet

1. Square hole column	2. Front column of the cabinet
-----------------------	--------------------------------



CL0587

Figure 3-2 Adjust the width of the columns in the square holes of the cabinet

1. Square hole column	2. Front column of the cabinet
-----------------------	--------------------------------

3.1.3 Install and Adjust Load-bearing Pallet

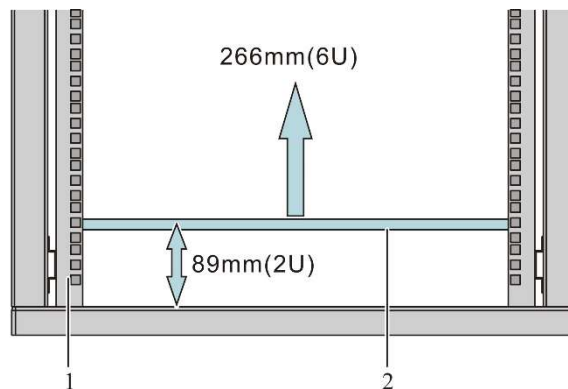
The tray plays the role of supporting the weight of the device. Please install and adjust the tray according to the requirements below. If the cabinet is not equipped with trays, please purchase them separately and install them as required.

! Caution

- Before installing the tray, please confirm whether the load-bearing capacity of the tray used meets the weight requirements of the NSS11500 series switch chassis and internal boards. For the weight of each component, see "[Appendix A Machine and Common Module Specifications](#)".

📌 Note

- Make sure the tray is 2U from the bottom of the cabinet and the three holes on the square rail are 1U. As shown in Figure 3-3.
- When installing the equipment, please confirm whether the installation space of the cabinet meets the height requirements of the chassis; When installing the NSS11500-04(V2) frame, ensure that there is an installation space of 16U (267mm) between the tray and the top of the cabinet;



CL1240

Figure 3-3 The installation height of the pallet

1. Cabinet column	2. Load-bearing pallet
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The following takes a 19-inch standard cabinet as an example to introduce the tray installation process.

The specific installation steps of the tray are as follows:

- step 1: Determine the installation position of the tray on the cabinet, and mark the installation holes with a marker pen.

The height of the space above the tray should be greater than the height of the equipment chassis to be installed, and there should be sufficient margin (1U margin is recommended).

Caution

- To ensure the stability of the cabinet, install heavy and high-height devices under the cabinet as much as possible.
- For the dimensions of the NSS11500 series switch mainframe, please refer to "[1.1 Product Appearance and Hardware Composition](#)".

- Step 2: Keep the tray level, install the tray to the marked position, and tighten each fixing screw.

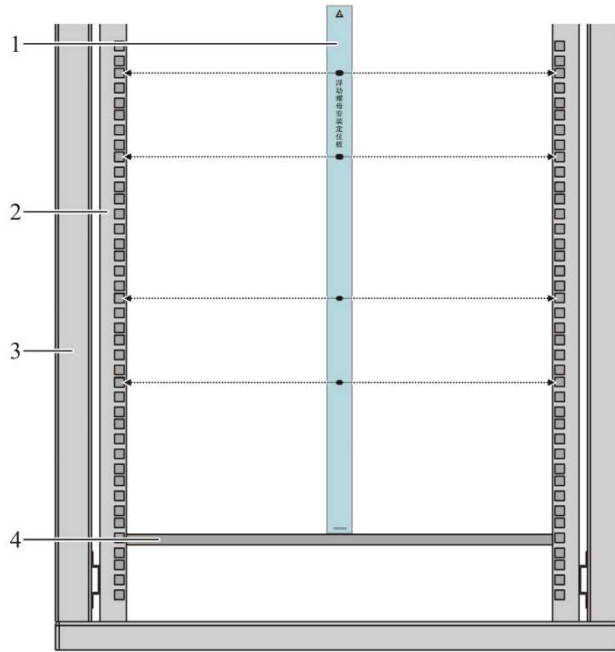
Note

- Different types of cabinets and pallets may have different appearances and installation methods. The content in this section is for reference only. The actual situation shall prevail.
-

3.1.4 Install Floating Nuts to the Cabinet

Before installing the chassis into the cabinet, you need to install floating nuts on the square holes of the columns on both sides of the front of the cabinet.

- step 1: Take out the floating nut from the accessory bag of the accessory box and install the positioning plate, and mark the installation position of the floating nut on the square hole column of the cabinet according to the hole position on the positioning plate.



CL0589

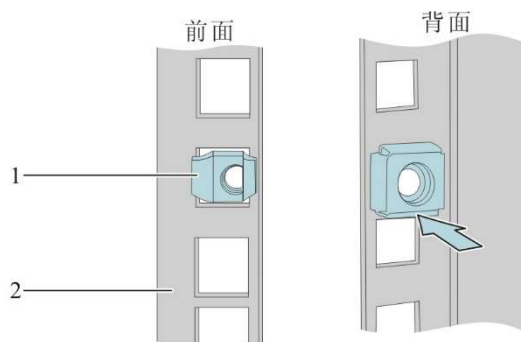
Figure 3-4 Mark the position where the floating nut is installed

1. Floating nut installation positioning plate	2. Square hole column
3. Cabinet column	4. Load-bearing pallet

 **Note**

- When planning device installation, ensure that the total height of all devices to be installed in the cabinet does not exceed the installation height of the cabinet panel.

Step 2: Install floating nuts at the marked positions (a floating nut must be installed in each mounting hole on the mounting ear), as shown in Figure 3-5.



CL0590

Figure 3-1 Install the floating nut

1. Floating nut	2. Square hole column
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3.1.5 Install Device into Cabinet

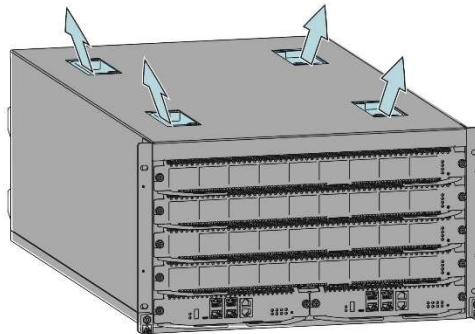
Caution

- Before installing the device into the cabinet, make sure that the load-bearing tray has been installed in the corresponding position on the cabinet, and that the tray is sufficient to support the weight of the device and its accessories.
-

The installation methods of the NSS11500 series switches are similar. The following will introduce how to install the NSS11500-04(V2) chassis into the cabinet.

The steps to install the device into the cabinet are as follows:

- step 1: Lift out the host chassis from the packaging tray. When lifting the chassis, you need to hold the handles on the top of the chassis with your hands and lift it out smoothly. Except for the four handles on the top, the rest of the chassis cannot be used as a stress-bearing part, as shown in Figure 3-6.



CLI501

Figure 3-6 Schematic diagram of lifting the chassis

- Step 2: Lift the host and place it on the load-bearing pallet, and push the host into the cabinet until the mounting ears on both sides of the mainframe fit into the square holes, as shown in Figure 3-7.

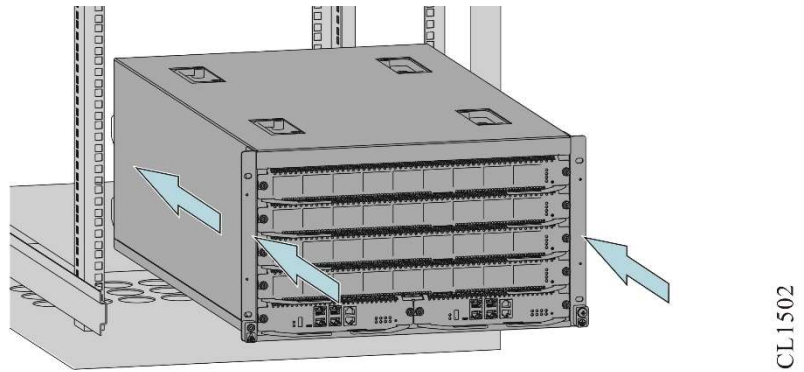


Figure 3-7 Push the chassis into the cabinet

- Step 3: Use M6 panel screws to fix the mounting ears of the chassis and the floating nuts on the square hole bars of the cabinet columns. The purpose of fixing is to prevent the equipment from sliding back and forth.

Note

- If the screw holes on the mounting ears cannot be completely aligned with the floating nuts you installed on the cabinet, please check whether the load-bearing plane of the tray is on the dividing line of the entire U and whether the floating nuts are installed in the correct holes.

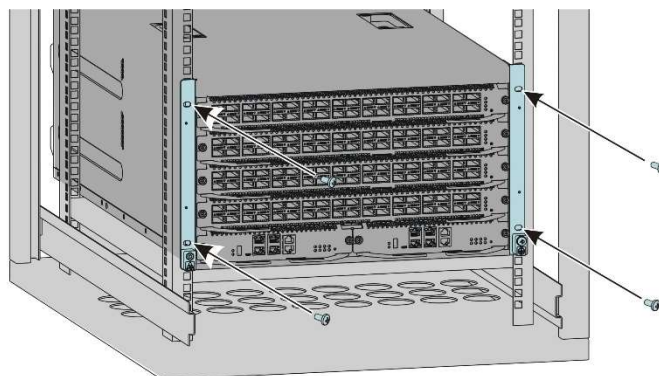


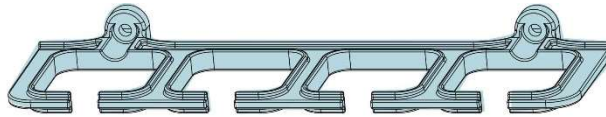
Figure 3-2 Fix the chassis

Warning

- The hanging ears are not load-bearing. Do not install the tray and only use the hanging ears to support the device.

3.1.6 Install Cabling Rack

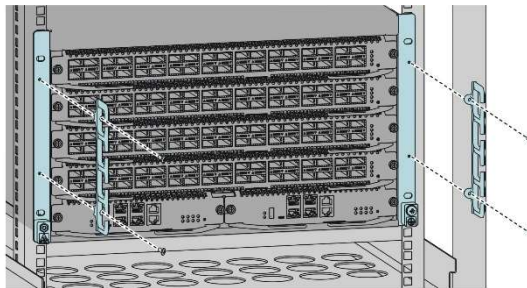
The NSS11500-04(V2) cabling rack is a rotatable open-close cable rack, as shown in the following figure:



CL1242

Figure 3-9 Cabling rack

When installing the cabling rack, insert the mounting holes on the cabling rack into the studs on the mounting ears of the host chassis, and then lock them with the supplied screws, as shown in Figure 3-10.



CL1504

Figure 3-10 Install the cabling rack

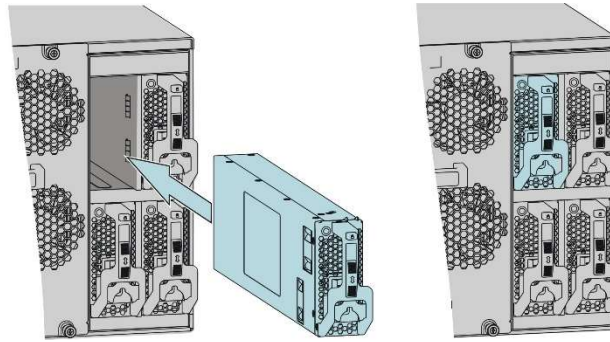
3.1.7 Install Power Module

Note

- The power supply configured in the NSS11500-04(V2) chassis is placed in the main box packaging;
-

step 1: Take the power module out of the packing box and save the accessories in the carton.

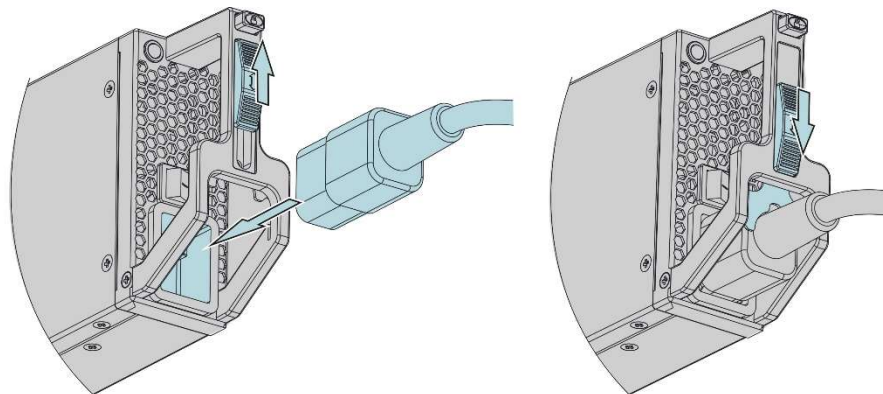
Step 2: Insert the power module into the power slot of the host chassis, as shown in the figure below.



CL1506

Figure 3-4 Install NSS11500-04(V2) chassis power module

- Step 3: Push in the power module, and the power module is locked with the chassis.
- Step 4: Slide the cable anti-trip on the AC power module right until it is opened; insert the output plug of the power cable into the input hole of the power module until it is firmly inserted; slide the anti-trip of the power cable left until the output plug of the power cable is locked; The specific operation is shown in the diagram below.



CL0830

Figure 3-12 Install the power cable of the AC power module

If installing a DC power supply module, first remove the four cross screws on the DC power supply module with a cross screwdriver, and then place the external input DC power supply line in the corresponding position of the power supply module according to the wiring sequence of "connecting the red DC power supply line to 0V, and connecting the black DC power supply line to -48V", and then lock it with the cross screws. The installation diagram is shown in the following figure.

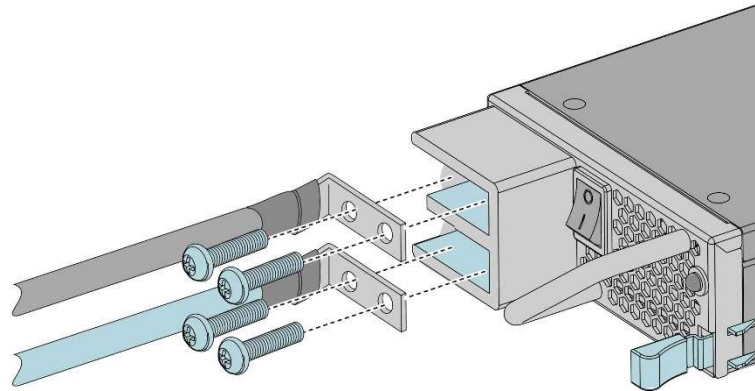


Figure 3-5 Install DC power module power cable

3.1.8 Arrange Cables

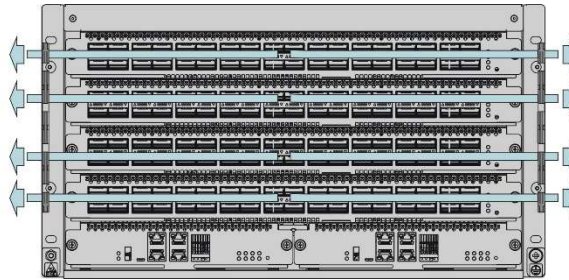


Figure 3-6 Arrangement of NSS11500-04(V2) frame service board cables

The principle of wiring is to route interface cables and power cables separately. By properly routing cables, you can easily remove or install switch fan modules, power modules, and other components to improve efficiency.

- The interface cables are bundled on both sides of the cabinet through the two cable racks in front of the chassis, and arranged according to the conditions of the user's computer room (the signal line in the computer room is connected from the cable rack on the top of the cabinet, or from the cable trough under the ground).
- All transferred data signal cable connectors should be placed at the bottom of the cabinet (not in places outside the cabinet that are easy to be touched).
- The power cables are routed from the left side of the rear of the cabinet. According to the conditions of the user's device room (power distribution cabinet, lightning protection box, terminal block, etc.), arrange the nearest up or down route.

Caution

- Cables that are too long can be bundled with wire buckles. Do not bundle the cables at the air outlet of the switch to prevent premature aging of the cables.
- Fix the cable near the switch, and keep the cable loose between the fixed point

and the switch port. In order to mark the cables, labels can be pasted to them.

3.1.9 Installation Check

After the device is installed in the cabinet, please check according to the following items, and the listed items are required to be in normal condition.

- Confirm that the device is installed in the correct location.
- Make sure that the mounting ears of the device are securely fastened to the cabinet.
- Make sure there is enough space around the device for heat dissipation.

3.2 Device Grounding

Warning

- In order to ensure the safety of personnel and device, good grounding must be provided for the device. The resistance between the device chassis and the ground should be less than 1Ω.
-

Generally, there are grounding bars on the cabinet, and the grounding wires of the device can be connected to the grounding bar.

Note

- Use the ground wire provided with the device.
-

The steps to install the ground wire are as follows:

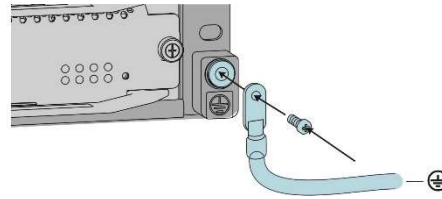
step 1: Remove the ground screw from the device chassis.

Step 2: Put the terminal of the grounding wire provided by the device on the grounding screw of the chassis.

Step 3: Install the ground screw with the ground wire on the ground hole and tighten.

Step 4: Install the other end of the ground wire to the ground terminal of the cabinet in the same

way.



CL1527

Figure 3-15 Connect ground wires

! Caution

- If there is no suitable grounding point on the cabinet, you can also connect the grounding wire of the device to other grounding bars in the installation site.
- The fire water pipe and the lightning rod of the building are not grounded correctly. The grounding wire of the device should be connected to the engineering grounding of the machine room.

3.3 Install a SPD (Optional)

3.3.1 Install an AC Power Surge Protector

The AC power surge protector has the function of suppressing the induced lightning shock wave on the power transmission line and the transient overvoltage caused by other reasons. When in use, the alternating current enters the lightning protector first, and then enters the device after passing through the lightning protector.

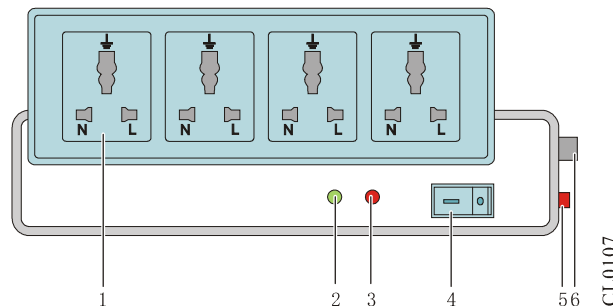


Figure 3-16 The diagram of the power surge protectors

1. Socket	Used to connect device power
2. Normal working indicator (green)	On: Indicates that the circuit is working normally Off: Indicates that the protection circuit

	has been damaged.
3. Ground and polarity detection indicator (red)	On: Indicates wrong wiring (no grounding wire or reverse connection of fire and neutral wires), please check the power supply circuit at this time.
4. Power switch	Used for power disconnection
5. Overload auto protector	Overload shutdown, automatic reset after the load returns to normal
6. Standard socket	Connect to the power supply of the computer room through the power cable

Caution

- The power surge protector is not provided with the device, and users can purchase it according to their actual needs.
- When the power surge protector is used, it must be ensured that its PE terminal is grounded.
- After the AC power plug of the device is inserted into the socket of the power surge protector (lightning protection wiring block), the power surge protector can only be considered to have realized the lightning protection function when the green light representing operation is always on and there is no red light alarm.
- For the red light alarm of the power surge protector, it is necessary to pay enough attention and deal with it, and confirm whether the fire (L), zero (N), and ground wires (PE) are connected correctly. In the case of confirming that the PE connection is correct, it can be detected by the following method: the multimeter is adjusted to the AC range, and the voltage between N and PE is less than or equal to 5V, and the voltage between L and PE is about 220V. If not, it means that the fire and neutral wires are reversed.

3.3.2 Install a Network Port Surge Protector

When the device is in use, if there is an outdoor network cable connected to the device, it is recommended to connect the network port lightning protector in series before the network cable is connected to the device interface to reduce the probability of damage to the device due to lightning strikes.

The steps of installing the network port lightning protection device:

- step 1: According to the distance between the device grounding terminal or the lightning protection grounding copper bar in the device room, shorten the ground wire of the network port SPD, and firmly tighten the ground wire of the network port SPD to the device grounding terminal or the lightning protection grounding copper bar of the device room.
- Step 2: Use a multimeter to measure whether the ground wire of the SPD is in good contact with the device ground terminal or the SPD ground copper bar in the device room.
- Step 3: According to the description in the instruction manual of the network port SPD, connect the network port SPD with the network port transfer cable (pay attention to the direction, the external cable is connected to the IN terminal, and the transfer cable connected to the device is connected to the OUT terminal), and observe whether the board indicator display is normal at the same time.
- Step 4: Bind the cables neatly with cable ties.

 **Note**

- The network port surge protector is not provided with the device, and users can purchase it according to their actual needs.
- The network port surge protector is only for the Ethernet port of the 10/100/1000M electrical interface (using RJ45 connector).
- The user manual of the network port surge protector includes the technical parameters of the lightning protector and the installation and maintenance instructions of the lightning protector. Please read the manual carefully during the actual installation.

 **Caution**

- Avoid reverse connection of the network port SPD. "IN" is connected to the external cable, and "OUT" is connected to the network port of the device.
- Avoid poor grounding of the network port SPD. When installing the ground wire of the lightning arrester, the ground wire should be as short as possible to ensure good contact with the device ground terminal. After the connection is completed, please use a multimeter to confirm.
- Avoid incomplete installation of the network port SPD. When the device is connected to other devices with more than one cable outlet network port, it is necessary to install lightning protectors for all the cable outlet network ports for protection.

3.4 Post-Installation Inspection

Warning

- Before checking whether the installation is correct, please make sure to turn off the power to avoid personal injury and damage to device components caused by incorrect connections.
-
- Make sure the ground connection is correct.
 - Make sure the power cord is connected correctly.
 - Confirm that all boards, fan cards, and power modules are installed securely.
 - Confirm that the configuration of the power module meets the power requirements of the whole device.

4 Power On and Run the Device

This chapter introduces the operation related to power-on operation of the device, containing the following:

[4.1 Log into Device](#)

[4.2 Connect Network](#)

[4.3 Hardware Management](#)

4.1 Log into Device

When you log in to the device for the first time, you can only log in through the console port. This is the most basic way to log into the device, and it is also the basis for configuring other login methods.

4.1.1 Connect Configuration Cable

NSS18500 series switches provide two serial ports (EIA/TIA-232 and Micro USB 2.0). Through these two interfaces, users can use a PC (or laptop) with RS-232 serial port (or USB interface) to configure the switch.

To configure the switch through a PC (or laptop), please follow the steps below to connect:

- step 1: Prepare a PC (or laptop). Make sure the PC (or laptop) has an RS-232 serial port (or USB port).
- Step 2: After confirming that one of the switch or PC (or laptop) is powered off, connect the RS-232 serial port (or USB port) of the PC (or laptop) to the RJ45 serial port (or Micro USB serial port) connected. For details about configuration cables, see "[Appendix C1 Configuration Port Cables](#)."

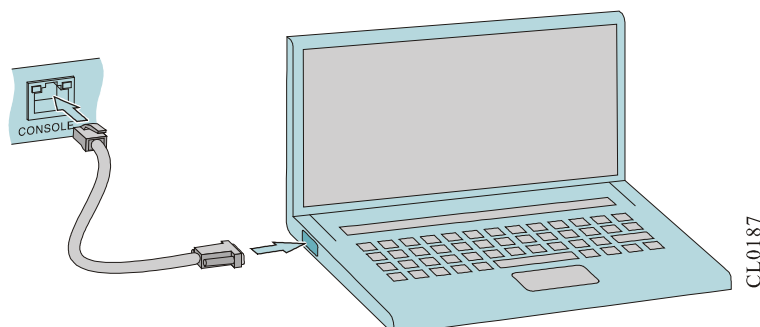


Figure 4-1 Connect the switch and PC through the RS-232 serial port

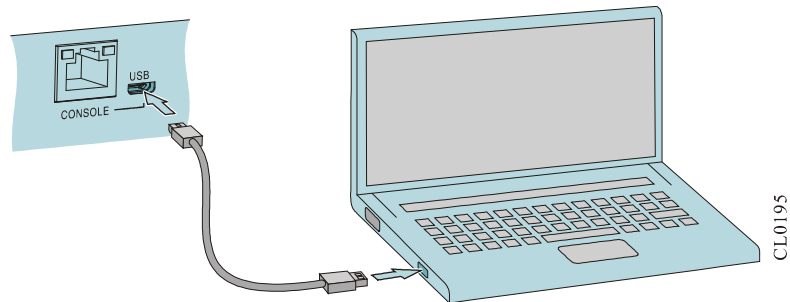


Figure 4-2 Connect the switch and PC through the USB serial port

Note

- The configuration cable for RS-232 serial port (random distribution) is an 8-core unshielded cable, one end is a crimped RJ-45 plug, which is inserted into the Console port of the switch. The other end has a DB-9 (hole), which can be inserted into the 9-core (pin) serial socket of the PC (or laptop), as shown in Figure 4-1.
- The configuration cable for the USB serial port (optional) is a 4-core unshielded cable, one end is a Micro USB 5P (male) interface, and it is inserted into the Micro USB Console port of the switch. The other end has a USB AM interface, which can be plugged into the USB interface of a PC (or laptop), as shown in Figure 4-2.
- Before using the Micro USB serial port, please install the Micro USB serial port driver. The driver name and storage path are as follows:

Driver name: UART_USB_driver

Driver storage path:

<http://doc.maipu.cn/Doc/FileDownload.aspx?FileAddress=D%3a%5cwww%5cTDC%5cTechnicalDocCenter%5cSyncFile%5c2016%5c3%5c1842815a-f70c-419b-aaa8-9378aed652af.zip&FileName=mico-usb%E9%A9%B1%E5%8A%A8.zip>


Caution

- When a PC (or laptop) is connected to the switch through a configuration cable, first connect the DB-9 end (or USB AM end) of the configuration cable to the PC, and then connect the RJ-45 end (or Micro USB 5P end) of the configuration cable to the console port of the switch.

- When removing the configuration cable connecting the PC (or laptop) and the switch, first pull out the RJ-45 end (or Micro USB 5P end) of the configuration cable, and then pull out the DB-9 end (or USB AM end).
- The RS-232 serial port and the Micro USB serial port are automatically switched, and the two cannot be used at the same time. If these two ports are connected to the PC at the same time, the switch communicates with the PC through the RS-232 serial port by default.

4.1.2 Set PC Hyperterminal Parameters

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

- step 1: Start the PC (or laptop), select the [Start/All Programs (or Programs)/Accessories/Communications/HyperTerminal] menu item, click the “

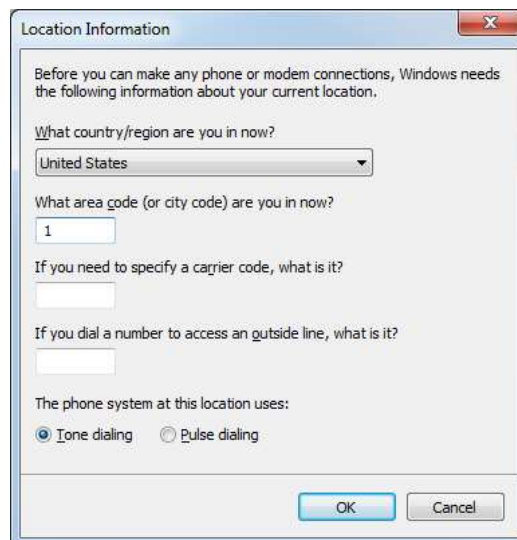


Figure 4-3"Location Information" interface

- Step 2: The "Phone and Modem " interface will pop up as shown below, click the <OK> button.

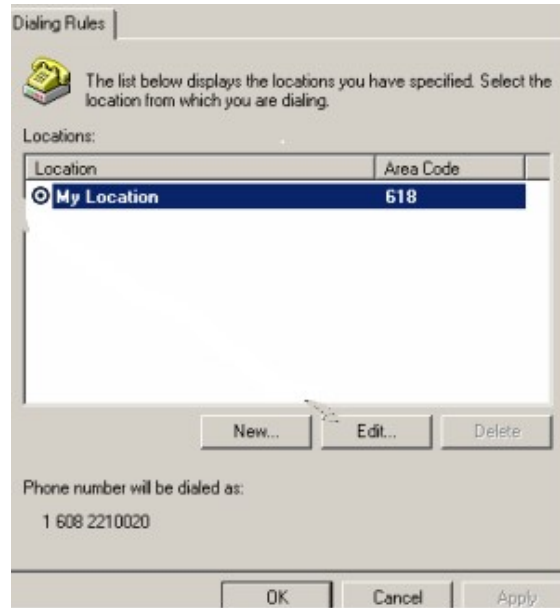


Figure 4-4"Phone and Modem " interface

Step 3: The "Connection Description" interface as shown below pops up. Fill in the name in the "Name (N)" column, such as test, and click the <OK> button.



Figure 4-5"Connection Description" interface

Step 4: The "Connect to" interface as shown below will pop up, select the serial port used for connection in the "Use when connecting" column, and click the <OK> button.



Figure 4-6"Connect to" interface

- Step 5: The "com* properties" interface will pop up as shown below, set the bits per second to 9600, data bits to 8, parity to none, stop bit to 1, data flow control to none, and click the <OK> button.

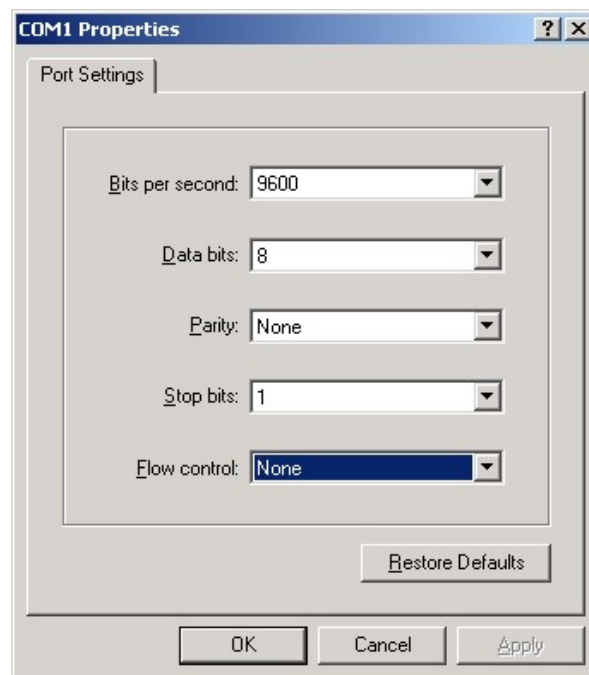


Figure 4-7"com* properties" interface

- Step 6: The "test-HyperTerminal" interface pops up as shown below, click the "Attributes" button.

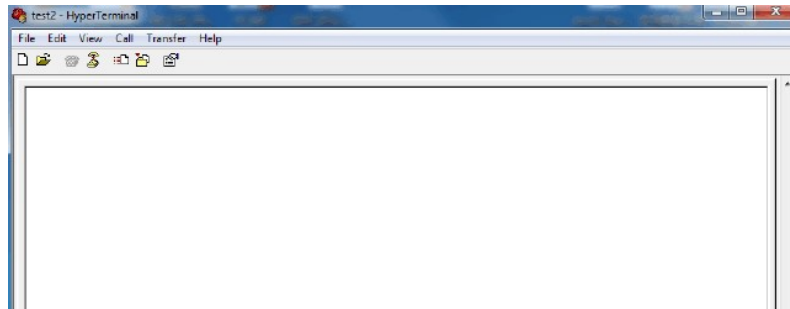


Figure 4-8 "test-HyperTerminal" interface

- Step 7: The "test properties" interface will pop up as shown below, click the [Settings] bar in the properties window, as shown in the figure below, select VT100 in the "Terminal Emulation" column, and click the <OK> button.

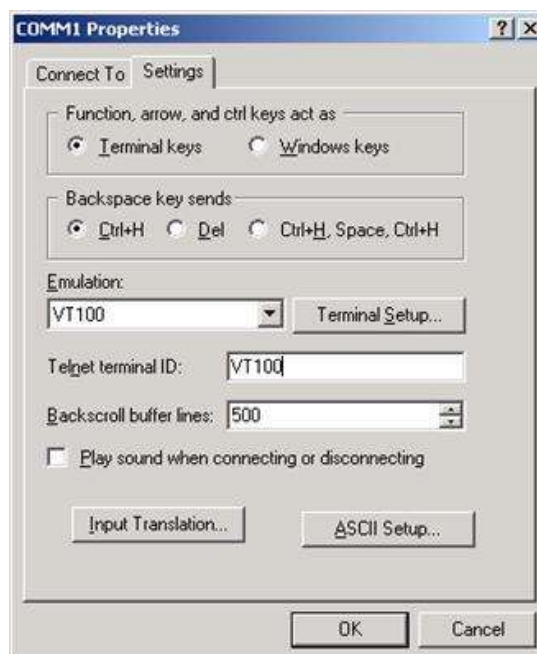


Figure 4-9 "test properties" interface

- Step 8: The "test-HyperTerminal" interface as shown below pops up, press Enter in the blank space of the interface, and the serial port will print information, and the HyperTerminal is set up.

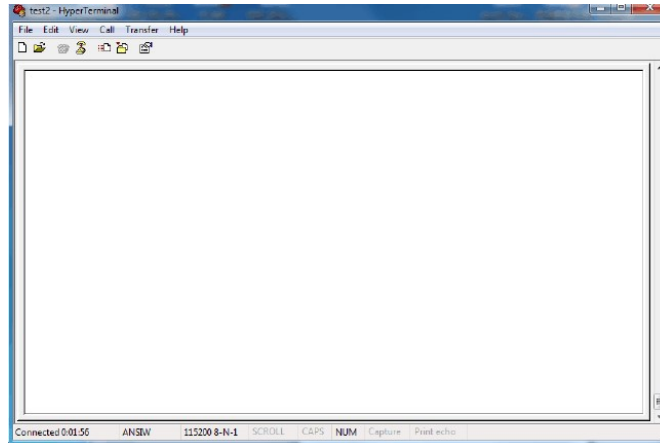


Figure 4-9 The test-HyperTerminal interface after the setup is complete

4.1.3 Power On and Start

Check before power on

Check the switch as follows before powering on:

- The interface cables, power cables, and ground cables are connected correctly.
- The power supply voltage meets the power requirements of the device. For specific requirements, see "[Appendix D2 Requirements for Power Conditions](#)".
- The configuration cable is connected correctly, the PC used for configuration has been turned on, and the terminal parameters have been set.

Caution

- Before the switch is powered on, it is necessary to confirm the position of the power switch in the computer room where the switch is located, so that the power supply can be cut off in time in the event of an accident.
-

Power on the switch

Please power on in the following order:

- Control the power-on through the switch of the power supply strip.

The power module of the NSS11500 switch has a power switch. When the power module is inserted into the frame for the first time, connect the power supply cables, then insert all the power supply cables to the power supply strips, turn on the switch of the power

supply strips, and then turn on the power switch on the power module, the device will start booting.

Caution

- In order to completely power off the device, it is recommended that the time interval between power off and power on be greater than 20 seconds.

After the switch is powered on, some basic manufacturing information of the switch will be displayed on the configuration terminal, for example:

```
MyPower (R) Operating System Software
NSS11500 system image file (flash0: /flash/sp44-g-9.8.0(103)(R).pck), version 9.8.0(103)(integrity),
Compiled on Nov 29 2021, 09:58:49
Copyright (C) 2021 Maipu Communication Technology Co.,Ltd.All Rights Reserved.
```

```
System ID       : 00017a006102
Hardware Model  : NSS11500-04(V2)
Hardware Version : 002(Hotswap Supported)
MPU CPLD Version : 102
Bootloader Version : 1.0.0.22
Software Version : 9.8.0(103)(integrity)
Software Image File : flash0: /flash/sp44-g-9.8.0(103)(R).pck
Compiled       : Nov 29 2021, 09:58:49
```

Note

- The displayed information on the boot interface above is for reference only, please refer to the actual display.

4.1.4 Inspection after Power On

After the switch is powered on, after all boards are fully loaded, it is best to check the following to ensure that the subsequent configuration works normally:

- After the switch is powered on, the ventilation system is working. Please check whether you can hear the sound of the fan rotating and whether there is air coming out of the switch vent outlet.
- Check whether the various indicators on the switch are normal.

Caution

- Different models of switch devices have different indicators. Please refer to "[Appendix A Overall Machine and Common Module Specifications](#)"

4.2 Connect Network

4.2.1 Connect Network via Ethernet Twisted Pair

The 10/100/1000Base-T electrical interface of the device adopts RJ-45 connector, and the port supports MDI/MDIX self-adaptation, and is connected to the network by category 5 or above twisted pair.

Connection steps:

- step 1: Insert one end of the twisted-pair Ethernet cable into the Ethernet electrical port (RJ-45 port) of the switch.
- Step 2: Insert the other end of the twisted-pair Ethernet cable into the RJ-45 port of the access network device.

4.2.2 Connect Network via LC-type Optical Fibers

For the SFP, SFP+, LC-type QSFP+, and QSFP28 optical interfaces of the switch, LC-type optical fibers can be used to connect to the network. Before connecting the optical fiber, you need to install the optical module on the switch first, and then insert the optical fiber connector into the optical module. The appearance of commonly used LC fiber optic connectors is shown in the figure below.

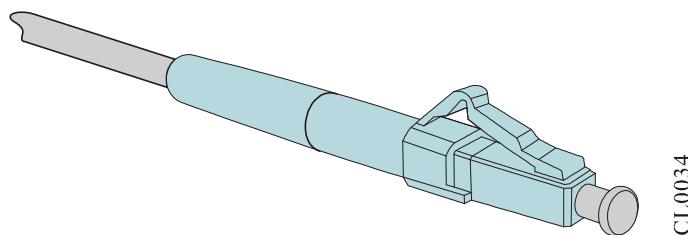


Figure 4-10 Appearance of LC type optical fiber connector

Install the optical module

The installation process of SFP module, SFP+ module, LC-type QSFP+ module, and QSFP28 module is similar. The following description uses the SFP module as an example. The steps are as follows:

Caution

- During the installation of the SFP module, please do not directly touch the gold finger part of the SFP module with your hands.
- It should be noted that the wire marked TX should be connected with the wire marked RX of the peer device, and the wire marked RX should be connected with

the wire marked TX of the peer device.

- step 1: Wear an anti-static wrist, and make sure that the anti-static wrist is in good contact with the skin and is well grounded.
- Step 2: Pull out the dustproof plug on the optical port of the switch, as shown in Figure 4-12.
- Step 3: Take out the SFP module from the packaging box. Figure 4-13 shows the diagram of the SFP module. Hold both sides of the SFP module with your hands, and push it horizontally into the interface slot of the switch until the SFP module is in close contact with the slot (you can feel the shrapnel on the top and bottom of the SFP module stuck the interface slot), as shown in Figure 4-14 Show.

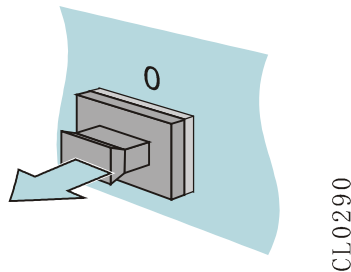


Figure 4-12 Pull out the dust plug

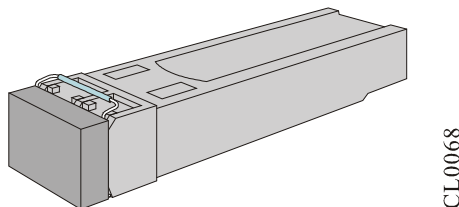


Figure 4-13 SFP modules

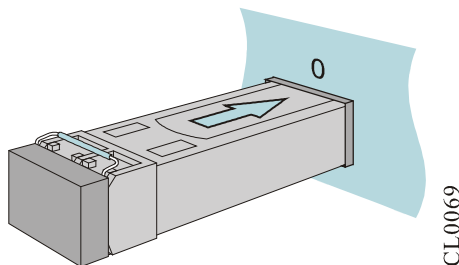


Figure 4-14 Install the SFP module

! Caution

- Before installing the optical fiber, do not pull out the dustproof plug on the SFP module.
- For unused optical ports, please plug the optical ports with the dustproof plugs provided with the device.
- It is recommended that you do not directly insert the SFP module with the optical fiber inserted into the interface slot. Please pull out the optical fiber before installing it.
- It should be noted that the wire marked TX should be connected with the wire marked RX of the peer device, and the wire marked RX should be connected with the wire marked TX of the peer device.

Connect the optical fiber to the optical module

- step 1: Wear an anti-static wrist, and make sure that the anti-static wrist is in good contact with the skin and is well grounded.
- Step 2: Remove the dustproof cap from the fiber optic connector, as shown in Figure 4-15.

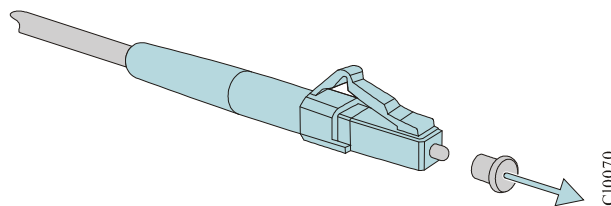


Figure 4-15 Remove the dustproof cap of the fiber

- Step 3: Remove the dustproof plug of the SFP module, as shown in Figure 4-16.

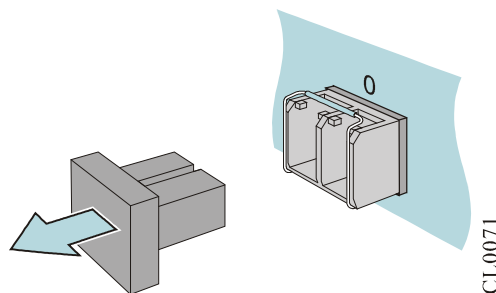


Figure 4-16 Remove the dustproof plug of the SFP module

- Step 4: Insert the prepared optical fibers into the ports of the optical module in sequence, as shown in Figure 4-17.

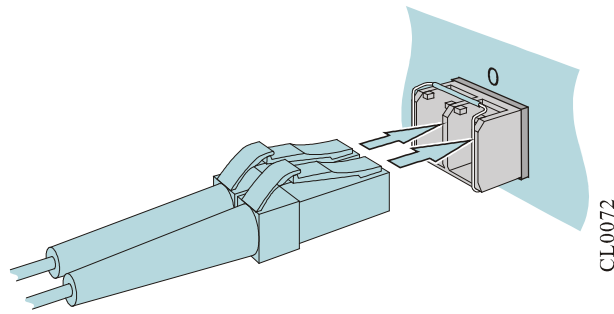


Figure 4-17 Connect the optical fiber

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

Caution

- In the process of interconnecting optical modules with unidirectional dual optical fibers, pay attention to cross-connect the sending and receiving signals of the modules at both ends.
 - If there is dust on the ferrule of the fiber optic connector, wipe the end face of the ferrule of the fiber optic connector with a dust-free paper and absolute alcohol.
-

4.2.3 Connect Network via MPO-type Optical Fiber

For the MPO-type QSFP+ and QSFP28 optical interfaces of the switch, MPO-type optical fibers can be used to connect to the network. Before connecting the optical fiber, you need to install the optical module on the switch first, and then insert the optical fiber connector into the optical module. The appearance of commonly used MPO fiber optic connectors is shown in the figure below.

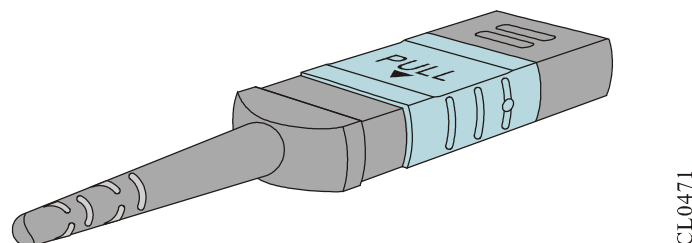


Figure 4-18 Appearance of MPO fiber optic connectors

Install the optical module

The installation process of the MPO QSFP+ and QSFP28 modules is similar. The following description uses the QSFP+ module as an example. The steps are as follows:

! Caution

- During the installation of QSFP+ and QSFP28 modules, please do not directly touch the golden finger part of the module with your hands.
-

step 1: Wear an anti-static wrist, and make sure that the anti-static wrist is in good contact with the skin and grounded reliably.

Step 2: Take out the QSFP+ module from the packing box. Figure 4-19 shows the schematic diagram of the QSFP+ module. Hold both sides of the QSFP+ module with your hands, and push it horizontally into the interface slot of the switch until the QSFP+ module is in close contact with the slot (you can feel that the shrapnel on the top and bottom of the QSFP+ module are stuck in the interface slot during the insertion process), as shown in Figure 4-20 shown.

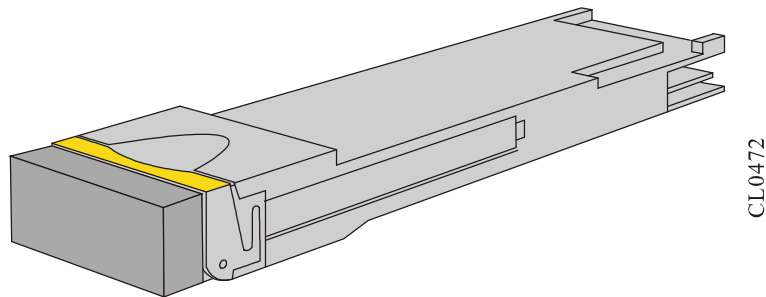


Figure 4-19 QSFP+ modules

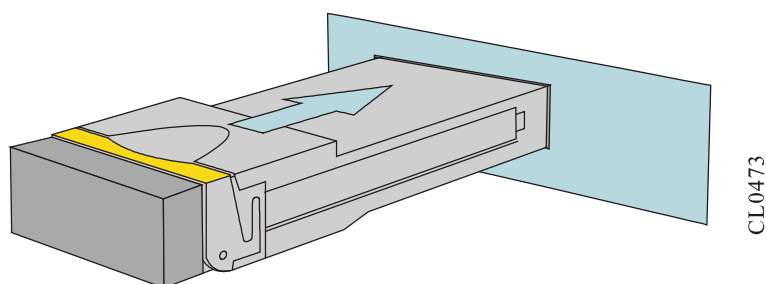


Figure 4-20 Install the QSFP+ module

! Caution

- Before installing the optical fiber, please do not pull out the protective rubber plug on the QSFP+ module.
 - It is recommended that you do not directly insert the QSFP+ module with the optical fiber inserted into the interface slot, please pull out the optical fiber before
-

installing it.

Connect the optical fiber to the optical module

step 1: Wear an anti-static wrist, and make sure that the anti-static wrist is in good contact with the skin and grounded reliably.

Step 2: Remove the dust cap from the fiber optic connector.

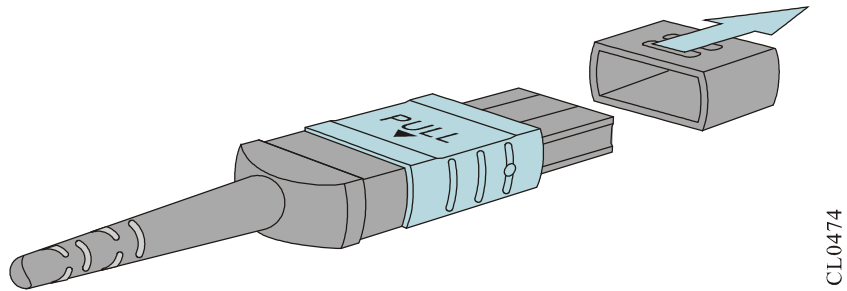


Figure 4-21 Remove the dustproof cap of the optical fiber

Step 3: Remove the dust cap from the QSFP+ module.

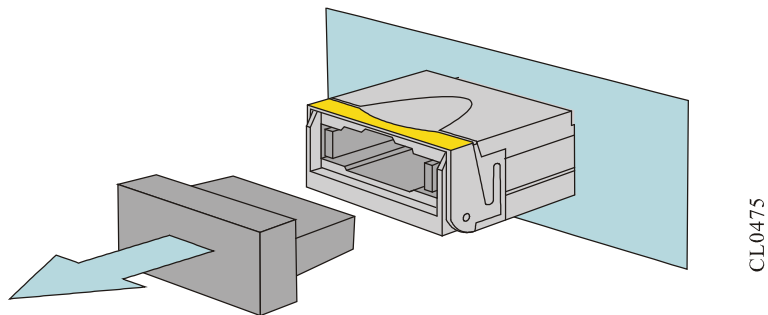


Figure 4-11 Remove the dustproof cap of the QSFP+ module

Step 4: Insert the prepared optical fibers into the ports of the optical module in sequence.

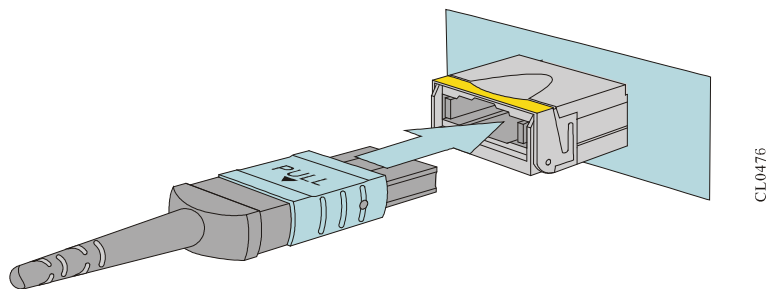


Figure 4-23 Connect the optical fiber

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

Caution

- If there is dust on the ferrule of the fiber optic connector, wipe the end face of the ferrule of the fiber optic connector with a dust-free paper dampened with absolute alcohol.
-

4.3 Hardware Management

This section mainly introduces the various hardware management functions provided by the NSS11500 series switch. Through these functional interfaces, users can easily view the software and hardware version information of the NSS11500 series switch, as well as the working status information of each hardware module.

Note

- The printing information involved in the description process of this section is for reference only, and the actual displayed information shall prevail.
-

4.3.1 View Switch Software and Hardware Version Information

You can use the **show version** command to view the software and hardware version information of NSS11500 series switches, including: system number, general hardware information, hardware version, MPU card CPLD version, backplane version, Bootloader version, software version and other information, for example:

```
switch #show version
MyPower (R) Operating System Software
NSS11500 system image file (flash0: /flash/ sp44-g-9.8.0(103)(R).pck ), version 9.8.0(103)(integrity), Compiled on
Nov 29 2021, 09:58:49
Copyright (C) 2021 Maipu Communication Technology Co.,Ltd. All Rights Reserved.
```

```
NSS11500 Version Information
System ID: ccd81f1cd333
Hardware Model: NSS11500-04(V2)
Hardware Version: 001(Hotswap Supported)
MPU CPLD Version: 102
Bootloader Version: 1.0.0.22
Software Version: 9.8.0(103)(integrity)
Software Image File: flash0: /flash/ sp44-g-9.8.0(103)(R).pck
Compiled: Nov 29 2021, 09:58:49
```

Local MPU Uptime is 1 day 4 hours
System Uptime is 1 day 4 hours

Table 4-1 Description of the key fields displayed by the **show version** command

Field	Description
System ID	This value shows the first MAC address in the frame, for example: ccd81f000333.
Hardware Model	Hardware information, such as: NSS11500-04(V2)
Hardware Version	PCB version, such as: 00 1 (Hotswap Supported)
MPU CPLD Version	The CPLD version of the MPU card, such as: 102
Bootloader Version	Bootloader version, such as: 1.0.0.22
Software Version	Software version, such as: 9.8.0(103)(integrity)
Software Image File	Software image files, such as: flash0: /flash/sp44-g-9.8.0(103)(R).pck
Compiled	Version compilation time, such as: Nov 29 2021, 09:58:49

4.3.2 View System Ambient Temperature Information

You can use **the show environment** command to view the temperature information of each board in place and the main chips on the board of the NSS11500 series switch, for example:

```
switch #show environment
mpu 0 CPU temperature is 63 C
mpu 0 switch temperature is 44C
mpu 0 inletair temperature is 30C
mpu 0 outlet air temperature is 33 C
lpu 3 CPU temperature is 77 C
lpu 3 switch1 temperature is 93 C
lpu 3 inlet air temperature is 38 C
lpu 3 outlet air 1 temperature is 46 C
sfu 0 CPU temperature is 63 C
sfu 0 switch temperature is 54 C
sfu 0 inlet air temperature is 31 C
sfu 0 outlet air temperature is 36 C
sfu 1 CPU temperature is 63 C
sfu 1 switch temperature is 47 C
```


sfu 1 inlet air temperature is 30 C
sfu 1 outlet air temperature is 32 C

4.3.3 View Fan Module Status Information

You can use **the show system fan** command to view information about fan modules used on NSS18500 series switches, including: fan presence information, fan working status, fan module serial number, fan speed, swapping times of the fan module, error times during the swapping process, and other information, such as:

```
switch#show system fan
System FAN Information (Fan 0 - ONLINE)
```

```
-----
Fan Name: FAN-06A-01B(V1)
Status: Normal
Last-Alarm: Normal
Serial No.: C049174282600062
Description:
Fan-RT-Information:
Fan-speed: 40%
```

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

```
System FAN Information (Fan 1 - ONLINE)
```

```
-----
Fan Name: FAN-06A-01B(V1)
Status: Normal
Last-Alarm: Normal
Serial No.: C049174282600063
Description:
Fan-RT-Information:
Fan-speed: 40%
```

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

Table 4-2 Description of the key fields of the information displayed by the **show system fan** command

Field	Description
System Fan Information	Fan presence information, such as: Fan 0 - ONLINE
CardName	Board name, such as: FAN-06A-01B(V1)
Status	Fan working status, such as: Normal <ul style="list-style-type: none"> ● Normal: The fan module is working normally ● Abnormal: The fan module is working abnormally
Last-Alarm	Fan alarm information, such as: Normal <ul style="list-style-type: none"> ● Normal: No fan alarm information ● Abnormal: The fan has warning

Field	Description
	information
Serial No.	Fan module serial number, such as: C049174282600062
Description	Description field, configured by the user
Fan-RT-Information	Fan speed information
Fan-speed	Fan speed (this speed reflects the duty ratio of the PWM signal actually output by the fan controller), such as: 30(PWM)
STATISTICS	<p>Statistics on the number of fan module insertions and removals and the number of insertion errors. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR indicates that the fan module has been inserted correctly once, where:</p> <p>IN: The number of physical fan insertions, such as: 1</p> <p>IERR: The number of fan physical insertion errors, such as: 0</p> <p>OUT: The number of times the fan is physically pulled out, such as: 0</p> <p>OERR: The number of errors in physically pulling out the fan, such as: 0</p>

4.3.4 View Power Module Status Information

You can use the **show system power** command to view information about the power modules used on NSS11500 series switches, including: the presence information of the power modules, the working status of the power modules, the times of swapping the power modules, and the error times in the process, such as:

```

switch#show system power
System Power Information (Power 0 - OFFLINE)
-----
STATISTICS: 0 IN, 0 OUT, 0 IERR, 0 OERR

System Power Information (Power 1 - OFFLINE)
-----
STATISTICS: 0 IN, 0 OUT, 0 IERR, 0 OERR

System Power Information(Power 2 - OFFLINE)
-----
    
```

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

System Power Information (Power 3 - OFFLINE)

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

System Power Information(Power 4 - ONLINE)

Power Name: AD1600-1D005M(V2)
 Status: Normal(AC:Normal/DC:Normal)
 Last-Alarm: Normal
 Serial No.: C762185670500006
 Description:

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

System Power Information (Power 5 - OFFLINE)

STATISTICS: 3 IN, 3 OUT, 0 IERR, 0 OERR

System Power Information(Power 6 - ONLINE)

Power Name: AD1600-1D005M(V2)
 Status: Normal(AC:Normal/DC:Normal)
 Last-Alarm: Normal
 Serial No.: C762185670500004
 Description:

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

Table 4-3 Description of the key fields of the information displayed by the **show system power** command

Field	Description
System Power Information	Power presence information, such as: Power 0 - ONLINE
Power Name	Power supply name: such as AD1600-1D005M(V2)
Status	The working status of the power module, such as: Normal <ul style="list-style-type: none"> ● Normal: The power module is working normally ● Abnormal: The power module is working abnormally
Last-Alarm	Alarm information of the power module, such as: Normal <ul style="list-style-type: none"> ● Normal: no alarm information for the power module ● Abnormal: The power module has alarm information

Field	Description
Serial No.	The serial number of the power module, such as: C762185670500004
Description	Description field, configured by the user
STATISTICS	The statistics of the number of plug-in and plug-in errors of the power module, such as 1 IN, 0 IERR, 0 OUT, 0 OERR, indicates that the power module has been inserted correctly once, where: IN: The number of times the power supply is physically inserted, such as: 1 IERR: The number of errors in the physical insertion of the power supply, such as: 0 OUT: The number of physical unplugging of the power supply, such as: 0 OERR: The number of times the power supply is physically unplugged, such as: 0

4.3.5 View Backplane Status Information

You can use the **show system chassis** command to view information about the backplane used on the NSS11500 series switch, including the information about the backplane, chassis type, backplane serial number, the MAC address stored in the backplane memory chip, and other information such as:

```
switch#show system chassis
System Chassis Information Device: 0 (ONLINE)
-----
Chassis Type: NSS11500-04(V2)
Serial No.: C05017A680400063
Chassis-MAC-Group-0: ccd81f1cd333
ccd81f1cd334
ccd81f1cd335
ccd81f1cd336
ccd81f1cd337
Chassis-MAC-Group-1: 000000000000
000000000000
000000000000
000000000000
000000000000
-----
STATISTICS: 1 IN, 0 OUT, 0 IERR, 0 OERR
```

Table 4-4 Description of the key fields of the information displayed by the **show system chassis** command

Field	Description
System Chassis Information	System chassis status information, such as: Device:0 (ONLINE)
Chassis Type	Backplane type, such as: NSS11500-04(V2)
Serial No.	Backplane serial number, such as: C05017A680400063
Chassis-MAC-Group-0	Displays the MAC address group 0 stored on the backplane memory chip, which can store 5 MAC addresses, such as: ccd81f1cd333 ccd81f1cd334 ccd81f1cd335 ccd81f1cd336 ccd81f1cd337
Chassis-MAC-Group-1	Displays the MAC address group 1 stored on the backplane memory chip, which can store 5 MAC addresses. The default is: 000000000000 000000000000 000000000000 000000000000 000000000000
STATISTICS	Statistics on the times of swapping the backplane and the swapping errors, such as: 1 IN, 0 IERR, 0 OUT, 0 OERR means that the backplane has been inserted correctly once, where: IN: The number of times the backplane is physically inserted, such as: 1 IERR: the number of errors in the physical insertion of the backplane, such as: 0 OUT: The number of times the backplane is physically pulled out, such as: 0 OERR: The number of errors in physically pulling out the backplane, such as: 0

4.3.6 View Status Information of the MPU Card

You can use the **show system mpu <slot number>** command to check the information

about the MPU card on the NSS11500 series switch, which includes board presence information, board name, board status information, board software and hardware version information, board card storage space status information, etc., such as:

```
switch#show system mpu local
System Card Information(Mpu 1 - OFFLINE)
```

```
-----
STATISTICS: 0 IN, 0 OUT, 0 IERR, 0 OERR
```

```
System Card Information(Mpu 0 - ONLINE)
```

```
-----
Type: NSM185-MPUA(V1)
Status: Start Ok
Last-Alarm: Normal
Card-Port-Num: 0
Card-SubSlot-Num: 0
Power-INTF-Status: Normal
Power-Card-Status: On
Serial No.: C626194480500037
Description:
Power-RT-Information:
Voltage-In: 3.42V
Hardware-Information:
PCB-Version: 001
CPLD-Version: 105
FPGA-Version: 102
Software-Information:
Bootloader-Version: 1.1.21
Software-Version: 9.6.5.0(23)(integrity)
Temperature-Information:
Temperature-State:
Switch-Temperature = 44C
Last-Alarm = Normal.
InletAir-Temperature = 30C
Last-Alarm = Normal.
OutletAir-Temperature = 33C
Last-Alarm = Normal.
CPU-On-Card-Information: < 1 CPUs>
CPU-Idx: 00
Status: Normal
Core-Num: 0001
Core-State:
Core-Idx-00
Core-Status: 0000
Core-Utilization: 6%
Temperature:
Temperature-State:
Temperature = 62C
Last-Alarm = Normal.
MEM-On-Card-Information: <1 MEMs>
MEM-Idx: 00
MEM-State:
BytesFree = 2558373888 bytes
BytesAlloc = 1736593408 bytes
BlocksFree = 44 blocks
BlocksAlloc = 13535 blocks
MaxBlockSizeFree = 264241152 bytes
SizeTotal = 4294967296 bytes
DISK-On-Card-Information: <1 DISKs>
DISK-Idx: 00
Type: Flash
Status: Online
DISK-State:
SizeTotal = 2361634816 bytes
SizeFree = 160681984 bytes
FPGA-On-Card-Information: <1 FPGAs>
FPGA-Idx: 00
Status: Online
```

```
Info-Struct:
id = 0000
version = 102
CPLD-On-Card-Information: <1 CPLDs>
CPLD-Idx: 00
Info-Struct:
version = 105
CMM-Information:
Software-Version: 1.0.0.48
```

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

Table 4-5 Description of the key fields of the information displayed by the **show system mpu <slot number>** command

Field	Description
System Card Information	MPU card status, such as: Mpu 0 - ONLINE
Type	MPU card type, such as: NSM185-MPUA(V1)
Status	MPU card status, such as: Start ok <ul style="list-style-type: none"> ● Start ok: MPU card started successfully ● Init: MPU card initialization ● Unload ok: The board is unloaded successfully
Last-Alarm	MPU card alarm information, such as: Normal: There is no alarm on the MPU card
Card-Port-Num	Number of MPU card ports, default: 0
Card-SubSlot-Num	Number of MPU card slots, default: 0
Power-INTF-Status	MPU card power status, such as: Normal
Power-Card-Status	MPU card power-on status, such as: On
Serial No.	MPU card serial number, such as C626194480500037
Description	Description field, configured by the user
Power-RT-Information	MPU card power real-time information
Voltage-In	The voltage inside the MPU card, such as: 3.42V

Field	Description
Hardware-Information	MPU card hardware information
PCB-Version	MPU card PCB version, such as: 001
CPLD-Version	The CPLD version of the MPU card, such as: 105
FPGA-Version	The FPGA version of the MPU card, such as: 102
Software-Information	MPU card software information
Bootloader-Version	MPU card Bootloader version, such as: 1.1.21
Software-Version	MPU card software version, such as: 9.6.5.0(23)(integrity)
Temperature-Information	MPU card temperature information
Temperature-State	MPU card temperature status
Switch-Temperature	MPU card switching chip temperature, such as: 44°C
InletAir-Temperature	MPU card air outlet temperature, for example: 30°C
OutletAir-Temperature	MPU air inlet temperature, such as: 33°C
Last-Alarm	MPU card PCB temperature warning information, such as: Normal: No alarm for MPU card PCB temperature
CPU-On-Card-Information	CPU information on the MPU card
CPU-Idx	CPU number, such as: 00
Status	CPU status, such as: Normal
Core-Num	The number of CPU cores, such as: 0001
Core-State	CPU core status information
Core-Idx-00	CPU core number, such as: Core-Idx-00

Field	Description
Core-Status	CPU core status, such as: 0000
Core-Utilization	CPU core utilization, such as 6%
temperature	CPU temperature
Temperature-State	CPU temperature status
temperature	CPU temperature, such as 62°C
Last-Alarm	CPU temperature warning information, such as: Normal: No alarm for CPU temperature
MEM-On-Card-Information	Memory information on the MPU card
MEM-Idx	Memory number, such as: 00
MEM-State	Memory status
Bytes Free	Free memory byte size, such as: 2558373888bytes
BytesAlloc	Memory allocation byte size, such as: 1736593408 bytes
Blocks Free	Free memory block size, such as: 44 blocks
BlocksAlloc	Memory allocation block size, such as: 13535 blocks
MaxBlockSizeFree	The maximum free block byte size, such as 264241152 bytes
SizeTotal	The total size of memory, such as: 4294967296 bytes
DISK-On-Card-Information	Storage device information on the MPU card
DISK-Idx	Storage device number, such as: 00
type	Storage device type, such as: Flash
Status	Storage device presence information, such as: Online

Field	Description
DISK-State	Storage device status
SizeTotal	The total size of the storage device, such as: 2361634816 bytes
SizeFree	The remaining space of the storage device, such as: 160681984 bytes
FPGA-On-Card-Information	MPU card FPGA information
FPGA-Idx	FPGA number, such as: 00
Status	FPGA in-position status, such as: online
Info-Struct	FPGA information list
id	FPGA core number, such as: 0000
version	FPGA version information, such as: 102
CPLD-On-Card-Information	MPU card CPLD information
CPLD-Idx	CPLD number, such as: 00
Info-Struct	CPLD information list
version	CPLD version information, such as: 105
CMM-Information	CMM information on the MPU card
Software-Version	The software version of the CMM on the MPU card, such as: 1.0.0.48
STATISTICS	<p>Statistics on the times of swapping the MPU card and the error swapping times. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR indicates that the MPU card has been inserted correctly once, of which:</p> <p>IN: The number of physical insertions of the MPU card, such as: 1</p> <p>IERR: The number of errors in the physical insertion of the MPU card, such as: 0</p> <p>OUT: Number of times the MPU card has been physically pulled out, such as: 0</p> <p>OERR: The number of times the MPU card is physically pulled out, such as: 0</p>

4.3.7 View Status Information of the SFU Card

You can use the **show system sfu <slot number>** command to check the information about the SFU card on the NSS11500 series switch, which includes board card in-position information, board name, board status information, board software and hardware version information, board card storage space status information, etc., such as:

```
switch#show system sfu 0
System Card Information (Sfu 0 - ONLINE)
```

```
-----
Type: NSM185-SFUA(V1)
Status: Start Ok
Last-Alarm: Normal
Card-Port-Num: 0
Card-SubSlot-Num: 0
Power-INTF-Status: Normal
Power-Card-Status: On
Serial No.: C045174570100380
Description:
Power-RT-Information:
Voltage-In: 3.24V
Hardware-Information:
PCB-Version: 001
CPLD-Version: 101
Software-Information:
Bootloader-Version: 1.1.21
IOS-Version: 9.6.5.0(23)(integrity)
Temperature-Information:
Temperature-State:
Switch-Temperature = 54C
Last-Alarm = Normal.
InletAir-Temperature = 31C
Last-Alarm = Normal.
OutletAir-Temperature = 36C
Last-Alarm = Normal.
CPU-On-Card-Information: < 1 CPUs>
CPU-Idx: 00
Status: Normal
Core-Num: 0001
Core-State:
Core-Idx-00
Core-Status: 0000
Core-Utilization: 4%
Temperature:
Temperature-State:
Temperature = 63C
Last-Alarm = Normal.
MEM-On-Card-Information: <1 MEMs>
MEM-Idx: 00
MEM-State:
BytesFree = 1156743168 bytes
BytesAlloc = 990740480 bytes
BlocksFree = 40 blocks
BlocksAlloc = 5462 blocks
MaxBlockSizeFree = 65011712 bytes
SizeTotal = 2147483648 bytes
DISK-On-Card-Information: <1 DISKs>
CPLD-On-Card-Information: <1 CPLDs>
CPLD-Idx: 00
Info-Struct:
version = 106
CMM-Information:
Software-Version: 1.0.0.48
```

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

Table 4-6 Description of the key fields of the information displayed by the **show system sfu <slot number>** command

Field	Description
System Card Information	SFU card status, such as: Sfu 0 - ONLINE
Type	SFU card type, such as: NSM185-SFUA(V1)
Status	SFU card status, such as: Start ok <ul style="list-style-type: none"> ● Start ok: SFU card started successfully ● Init: SFU card initialization ● Auth ok: SFU card authentication is successful ● Unload ok: The board is unloaded successfully
Last-Alarm	SFU card alarm information, such as: Normal: no alarm on the SFU card
Card-Port-Num	Number of SFU card ports, default: 0
Card-SubSlot-Num	Number of SFU card sub-slots: Since the SFU card does not have sub-slots, the default is: 0
Power-INTF-Status	SFU card power status, such as: Normal
Power-Card-Status	The power-on status of the SFU card, such as: On
Serial No.	SFU card serial number, such as: C045174570100380
Description	Description field, configured by the user
Power-RT-Information	SFU card power real-time information
Voltage-In	The voltage inside the SFU card, such as: 3.24V
Hardware-Information	SFU card hardware information

Field	Description
PCB-Version	SFU card PCB version, such as: 002
CPLD -Version	SFU card CPLD version, such as: 101
Software-Information	SFU card software information
Bootloader-Version	SFU card Bootloader version, such as: 1.1.21
IOS-Version	SFU card software version, such as: 9.6.5.0(23)(integrity)
Temperature-Information	SFU card temperature information
Temperature-State	SFU card temperature status
Switch-Temperature	SFU card switching chip temperature, such as: 54°C
InletAir-Temperature	SFU card air inlet temperature, for example: 31°C
OutletAir-Temperature	SFU card air outlet temperature, for example: 36°C
Last-Alarm	SFU card PCB temperature warning information, such as: Normal: No alarm for SFU card PCB temperature
CPU-On-Card-Information	CPU information on the SFU card
CPU-Idx	CPU number, such as: 00
Status	CPU status, such as: Normal
Core-Num	The number of CPU cores, such as: 0001
Core-State	CPU core status information
Core-Idx-00	CPU core number, such as: Core-Idx-00
Core-Status	CPU core status, such as: 0000
Core-Utilization	CPU core utilization, such as 4%
temperature	CPU temperature

Field	Description
Temperature-State	CPU temperature status
Temperature	CPU temperature, such as 63°C
Last-Alarm	CPU temperature warning, such as: Normal: No alarm for CPU temperature
MEM-On-Card-Information	Memory information on the SFU card
MEM-Idx	Memory number, such as: 00
MEM-State	Memory status
Bytes Free	Free memory byte size, such as: 1156743168 bytes
BytesAlloc	Memory allocation byte size, such as: 990740480 bytes
Blocks Free	Free memory block size, such as: 40 blocks
BlocksAlloc	Memory allocation block size, such as: 5462 blocks
MaxBlockSizeFree	The maximum free block byte size, such as 65011712 bytes
SizeTotal	The total size of memory, such as: 2147483648 bytes
DISK-On-Card-Information	Storage device information on the SFU card
CPLD-On-Card-Information	SFU card CPLD information
CPLD-Idx	CPLD number, such as: 00
Info-Struct	CPLD information list
version	CPLD version information, such as: 106
CMM-Information	CMM information on the SFU card
Hardware-Type	CMM hardware model, the default is: 0000
Software-Version	The software version of the CMM on the

Field	Description
	SFU card, such as: 1.0.121
STATISTICS	<p>Statistics of the times of swapping the SFU card and the error swapping times. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR indicates that the SFU card has been inserted correctly once, of which:</p> <p>IN: The number of physical insertions of the SFU card, such as: 1</p> <p>IERR: SFU card physical insertion error times, such as: 0</p> <p>OUT: Number of times the SFU card has been physically pulled out, such as: 0</p> <p>OERR: The number of errors in physically pulling out the SFU card, such as: 0</p>

4.3.8 View LPU Card Status Information

You can use the **show system lpu < slot number >** command to check the information about the LPU card on the NSS11500 series switch, including board presence information, board name, board status information, board software and hardware version information, board card storage space status information, etc., such as:

```
switch#show system lpu 1
System Card Information(Lpu 0 - ONLINE)
-----
Type: NSM185-12QFP-DB(V1)
Status: Start Ok
Last-Alarm: Normal
Card-Port-Num: 12
Card-SubSlot-Num: 0
Power-INTF-Status: Normal
Power-Card-Status: On
Serial No.: B280164280800029
Description:
Power-RT-Information:
Voltage-In: 3.31V
Hardware-Information:
PCB-Version: 001
CPLD-Version: 101
Software-Information:
Bootloader-Version: 1.1.21
IOS-Version: 9.6.5.0(23)(integrity)
Temperature-Information:
Temperature-State:
Switch1-Temperature = 76C
Last-Alarm = Normal.
InletAir-Temperature = 35C
Last-Alarm = Normal.
OutletAir1-Temperature = 47C
Last-Alarm = Normal.
CPU-On-Card-Information: < 1 CPUs>
CPU-Idx: 00
```

```

Status: Normal
Core-Num: 0001
Core-State:
Core-Idx-00
Core-Status: 0000
Core-Utilization: 10%
Temperature:
Temperature-State:
Temperature = 69C
Last-Alarm = Normal.
MEM-On-Card-Information: <1 MEMs>
MEM-Idx: 00
MEM-State:
BytesFree = 1122537472 bytes
BytesAlloc = 1024946176 bytes
BlocksFree = 26 blocks
BlocksAlloc = 5460 blocks
MaxBlockSizeFree = 65011712 bytes
SizeTotal = 2147483648 bytes
DISK-On-Card-Information: <1 DISKs>
CPLD-On-Card-Information: <3 CPLDs>
CPLD-Idx: 00
Info-Struct:
version = 101
CPLD-Idx: 01
Info-Struct:
version = 101
CPLD-Idx: 02
Info-Struct:
version = 101
CMM-Information:
Software-Version: 1.0.0.48

```

```

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

```

Table 4-7 Description of the key fields of the information displayed by the **show system lpu <slot number>** command

Field	Description
System Card Information	LPU card status, such as: Lpu 0 - ONLINE
type	LPU card type, such as: NSM185-12QFP-DB(V1)
Status	LPU card status, such as: Start ok <ul style="list-style-type: none"> ● Start ok: The LPU card starts successfully ● Init: LPU card initialization ● Auth ok: board authentication is successful ● Unload ok: The board is unloaded successfully
Last-Alarm	LPU card alarm information, such as: Normal: no alarm on the LPU card

Field	Description
Card-Port-Num	Number of LPU card ports, for example: 12
Card-SubSlot-Num	Number of LPU card slots, such as: 0
Power-INTF-Status	LPU card power status, such as: Normal
Power-Card-Status	The power-on status of the LPU card, such as: On
Serial No.	LPU card serial number, such as: B280164280800029
Description	Description field, configured by the user
Power-RT-Information	LPU card power real-time information
Voltage-In	The internal voltage of the LPU card, such as: 3.31V
Hardware-Information	LPU card hardware information
PCB-Version	LPU card PCB version, such as: 001
CPLD -Version	LPU card CPLD version, such as: 101
Software-Information	LPU card software information
Bootloader-Version	LPU card Bootloader version, such as: 1.1.21
IOS -Version	LPU card software version, such as: 9.6.5.0(23)(integrity)
Temperature-Information	LPU card temperature information
Temperature-State	LPU card temperature status
Switch-Temperature	LPU card exchange chip temperature, such as: 76°C
InletAir-Temperature	LPU card air inlet temperature, for example: 35°C
OutletAir-Temperature	LPU card air outlet temperature, for example: 47°C
Last-Alarm	LPU card PCB temperature warning

Field	Description
	information, such as: Normal: no alarm for LPU card PCB temperature
CPU-On-Card-Information	CPU information on the LPU card
CPU-Idx	CPU number, such as: 00
Status	CPU status, such as: Normal
Core-Num	The number of CPU cores, such as: 0001
Core-State	CPU core status information
Core-Idx-00	CPU core number, such as: Core-Idx-00
Core-Status	CPU core status, such as: 0000
Core-Utilization	CPU core utilization, such as 10%
Temperature	CPU temperature
Temperature-State	CPU temperature status
temperature	CPU temperature, such as 69°C
Last-Alarm	CPU temperature alarm information, such as: Normal: No alarm for CPU temperature
MEM-On-Card-Information	Memory information on the LPU card
MEM-Idx	Memory number, such as: 00
MEM-State	Memory status
Bytes Free	Free memory byte size, such as: 1122537472 bytes
BytesAlloc	Memory allocation byte size, such as: 1024946176 bytes
Blocks Free	Free memory block size, such as: 40 blocks
BlocksAlloc	Memory allocation block size, such as: 5460 blocks

Field	Description
MaxBlockSizeFree	The maximum free block byte size, such as 65011712 bytes
SizeTotal	The total size of memory, such as: 2147483648 bytes
DISK-On-Card-Information	Storage device information on the LPU card
CPLD-On-Card-Information	LPU card CPLD information
CPLD-Idx	CPLD number, such as: 00
Info-Struct	CPLD information list
version	CPLD version information, such as: 101
CMM-Information	CMM information on the LPU card
Hardware-Type	CMM hardware model, the default is: 0000
Software-Version	The software version of the CMM on the LPU card, such as: 1.0.117
STATISTICS	<p>Statistics of the times of swapping the LPU card and the error swapping times. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR indicates that the LPU card has been inserted correctly once, of which:</p> <p>IN: The times of inserting the LPU card physically, such as: 1</p> <p>IERR: The error times of inserting the LPU card physically, such as: 0</p> <p>OUT: The times the LPU card has been physically pulled out, such as: 0</p> <p>OERR: The errors in physical pulling out of the LPU card, such as: 0</p>

4.3.9 View Status Information of the Pluggable Optical Module

You can run **the show optical all** command to view the relevant working parameters of all optical modules in use on the NSS11500 series switch, for example:

```
switch #show optical all
Name VendorName LaserWaveLen(nm) Temperature(C) Voltage(V) TxPower(dBm) RxPower(dBm)
-----
t e 1 / 4 5 LINTES 850 33.679688 3.335500 -Inf 1.831559
t e 1 / 46 LINTES 850 32.222656 3.331800 -Inf 1.979694
te 1 / 47 LINTES 850 32.953125 3.333400 -Inf 1.359273
```

te 1 / 48 LINTES 850 31.496094 3.331500 -Inf 1.008184

Table 42 Description of the key fields of the **show optical all** command

Field	Description
name	The port number where the optical module is located, such as: te1/45
Vendor Name	The name of the optical module manufacturer, such as: LINTES
LaserWaveLen(nm)	Optical module laser center wavelength, such as: 850
Temperature(C)	Optical module temperature (only for optical modules supporting DDMI function), such as: 33.679688
Voltage(V)	Optical module working voltage (only for optical modules supporting DDMI function), such as: 3.335500
TxPower(dBm)	Transmit optical power of the optical module (only for optical modules supporting DDMI function), such as: -Inf
RxPower(dBm)	Received optical power of the optical module (only for optical modules supporting DDMI function), such as: 1.831559

In addition, you can also use the following command to check the detailed information of the optical module inserted into a specific port on the NSS11500 series switch, which includes: the name of the optical module, interface type, vendor name, optical module model, and optical module sequence number, production date of the optical module, transmit optical power of the optical module, etc. If the optical module you are using supports the DDMI function, you can also use this command to obtain information such as the monitoring parameters inside the optical module and the corresponding alarm thresholds. Command format: **show optical interface <maximum rate supported by the interface> <slot number> / <port number> detail**. For example, the command to view the detailed information of the 10G optical module on port 45 in slot 1 is as follows: **show optical interface tengigabitethernet 1/45 detail**

```
switch#show optical interface tengigabitethernet 1 /4 5 detail
```

```
tengigabitethernet 1 /4 5 optical information
Device Name: SFP
Connector Name: unspec(00)
Encoding Code: 64B/66B
Bit Rate: 10.400GBd
Transmit Distance: 5m(copper)
Vendor OUI: e0-ef-25
Vendor Name: LINTES
Part Number: SAA005-F0101
Revision Number: 1
Serial Number: 21305014C0040
```


[2022-10-23-12:57:04] 2.5ge4/3 On low Deliver power Standard USER-DEFINED 52.9V
1045.0mA 55.2W -10.0

[2022-10-23-12:57:04] 2.5ge4/4 On low Deliver power Standard USER-DEFINED 53.0V
1048.0mA 55.5W -10.0

omit...

Table 4-3 Description of the key fields of the **show power summary** command

Field	Description
Interface	The interface name
Opera	Indicates the enabling status of the PoE function on the interface. The status types include: On: open Off: closed
priority	Power supply priority, level types include: low: low priority medium: medium priority high: high priority critical: Urgent priority, the highest level
Detect-Status	PD detection status, the status types include: Disable: The PD detection function is not enabled, usually the interface or the global PoE function is not enabled Searching: PD is being detected Deliver power: Powering the PD Forced on: Forced power is being supplied to the PD Error: detection error Request Power: PD is requesting power supply HV protect: overvoltage protection status
PD-Type	Detected PD types, including: None: no PD detected Standard: A PD that conforms to the IEEE80.23af or IEEE802.3at standard is detected

Field	Description
	Legacy: Compatibility PD detected Invalid: Invalid PD detected
Classification	The type of PD classification detected, including: CLASS0-15.4W: The maximum output power is 15.4 watts CLASS1-4.0W: The maximum output power is 4.0 watts CLASS2-7.0W: The maximum output power is 7.0 watts CLASS3-15.4W: The maximum output power is 15.4 watts CLASS4-High: High power type, can support 30.0 watts power output
Voltage	Supply voltage
Current	Supply current
power	Power
temperature	PSE chip temperature

You can also view the power consumption information of the entire poe card through "**show power manage**":

```
[2022-10-23-12:57:14 ]switch# show power manage
```

```
[2022-10-23-12:57:14 ] PoE System 4, Subsystem 0:
```

```
[2022-10-23-12:57:14 ] Power Management Mode: Dynamic FIFS
```

```
[2022-10-23-12:57:14 ] System Total Power: 1200.0W
```

```
[2022-10-23-12:57:14 ] Guard Band Power: 40.0W
```

```
[2022-10-23-12:57:14 ] Alarm Threshold: 99% [Threshold Power: 1188.0W]
```

```
[2022-10-23-12:57:14 ] Total Allocated Power: 998.7W
```

```
[2022-10-23-12:57:15 ] Pre-allocate Power: 100W
```

```
[2022-10-23-12:57:15 ] Poe Power Online: TRUE
```

Table 4-4 Description of the key fields displayed by the **show power manage** command

Field	Description
Power Management Mode	Configured PoE power management mode
System Total Power	Configured total PoE power
Guard Band Power	Configured Power Protection Power
System Threshold	Configured PoE power alarm threshold
Total Available Power	Total power currently available
Total Allocated Power	Total power currently allocated
Remained Power	System reserved power
Poe Power Online	Whether the PoE power supply is online

5 Troubleshooting

This chapter introduces how to troubleshoot the installation of NSS11500 series switches, containing the following:

[5.1 Configuration System Troubleshooting](#)

[5.2 Power Failure Troubleshooting](#)

[5.3 Fan Troubleshooting](#)

[5.4 MPU Card Troubleshooting](#)

[5.5 SFU Card Troubleshooting](#)

[5.6 LPU Card Troubleshooting](#)

[5.7 Get Technical Support](#)

5.1 Configuration System Troubleshooting

After the switch is powered on, if the system is normal, the startup information will be displayed on the configuration terminal. If the configuration system fails, the configuration terminal may display nothing or messy codes.

5.1.1 Troubleshooting When There Is No Display on the Terminal

If no information is displayed on the configuration terminal after power-on, please follow the steps below to check:

- step 1: Check whether the power system of the whole switch is working normally.
- Step 2: Check whether the indicators on the MPU card (main control card) of the switch work normally.

Check whether the board is inserted properly and whether the MPU card (main control card) is damaged.
- Step 3: Check whether the configuration cable has been connected to the configuration serial port (CONSOLE) of the MPU card (main control card).

If no problem is found in the above checks, the possible causes are as follows:

1. The serial port connected by the configuration port cable is wrong (the actual selected

serial port does not match the serial port set by the terminal).

2. The configuration terminal parameters are set incorrectly (parameter requirements: set the baud rate to 9600, data bits to 8, parity check to none, stop bit to 1, flow control to none, and terminal emulation to VT100). For details, please refer to "[4.1.2 Set PC HyperTerminal Parameters](#)".

3. If there is a problem with the configuration port cable itself, you can try to replace the configuration port cable.

5.1.2 Troubleshooting for Displaying Messy Codes on Terminal

If messy codes are displayed on the configuration terminal, it is likely that the configuration terminal parameter settings are wrong (set the baud rate to 9600, the data bit to 8, the parity to none, the stop bit to 1, the flow control to none, and the terminal emulation to be VT100), check accordingly. For details, please refer to "[4.1.2 Set PC HyperTerminal Parameters](#)".

5.2 Power Failure Troubleshooting

The power modes of NSS11500 series switch are:

The power modules of NSS11500-12(V2) series switches has two specifications: AD1600-1D005M (V2), and DD1600M-5V1F (V1).

The power modules of NSS11500-04(V2) series switches have three specifications: AD800M-HV1B(V1), AD1600M-HV0B(V1), and DD1600M-5V0B(V1).

The power modules of NSS11500-08(V2) series switches have three specifications: AD 800-1D005M (V1), AD1600-1D005M (V2), and DD1600M-5V1F (V1).

There is a status indicator on the panel of the module power supply to indicate the working status of a single power module, defined in the following table:

Table 5-1 Meanings of the indicators on the power module panel

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no voltage input, or the power cord is in poor contact, or the power supply is damaged. Orange and on: abnormal power supply (abnormal power supply fan, output overvoltage, output overcurrent protection, output short circuit, power supply over-temperature protection, no output, input under-voltage, etc.) Green and on: The power supply is working normally

When the POWER indicator on the panel of the power module is off or the orange indicator is always on, it indicates that the power module is faulty. Please refer to the following steps for troubleshooting:

- step 1: Check the power supply system connected to the switch, and confirm that the power supply system supplies power normally and the voltage is normal.
- Step 2: Check the connection of the power cable of the faulty power module, unplug and plug the power cable again, and check whether the power cable is loose.
- Step 3: Replace the power cable of the faulty power module, and check whether the indicator of the power module returns to normal.
- Step 4: Check the installation of the faulty power module, and reinstall the power module to ensure reliable connection between the power module and the chassis backplane.
- Step 5: Check the connector of the faulty power module to see if the pins are bent and fall off.
- Step 6: Install the power module to another power slot and check if it works normally. If so, the original power slot may be damaged. If not, proceed to the next step. (Please carefully confirm whether the service can be interrupted before the switch is powered off).
- Step 7: Install a power module of the same model in the original power slot, connect the same power input cable, and check whether the power module can work normally. If it returns to normal after replacement, the original power module may be damaged, please contact the agent or local technical service engineer for replacement.

5.3 Fan Troubleshooting

The NSS11500 series NSS11500-04(V2) switch is equipped with a fan module of FAN-06A-01B(V1).

The FAN-06A-01B(V1) fan module is a required module for the NSS11500-04(V2), and supports hot swapping. NSS11500-04(V2) has two fan slots, and two FAN-06A-01B(V1) fan modules must be installed to ensure reliable and normal operation of the system.

There is a status indicator on the panel of the fan module to indicate the working status of the fan module, as defined in the following table:

Table 5-2 Meaning of the FAN indicator on the panel of the fan module

Name	LED Color	Status Description
FAN	red and green	Off: The fan is not working Green: The fan is working

Name	LED Color	Status Description
		properly Red: The fan is working abnormally

When the FAN indicator on the fan module panel is red, it indicates that the fan module is faulty. Please refer to the following steps to troubleshoot the fault:

- step 1: Please confirm that whether the power module is working normally. For details, please refer to "[5.2 Power Failure Troubleshooting](#)".
- Step 2: Check whether the fan is blocked by foreign objects. If there are foreign objects, please clean them to ensure the smooth flow of the air duct.
- Step 3: Check whether the fan module is properly installed. You can pull out the fan module, plug it back in, and see if the fan LED returns to normal.
- Step 4: If possible, try to replace the fan module to check whether the replaced fan module can work normally. If it returns to normal after replacement, it indicates that the original fan module is damaged.

If the fault still cannot be located through the above steps, please contact the agent or local technical service engineer.

5.4 MPU Card Troubleshooting

All NSS11500 series switches support two MPU card (master control card) slots. If two MPU cards are inserted, they will work in the master/slave mode. In normal working state: the SYS indicator on the MPU card panel is flashing green. If the SYS indicator is off or red and on, it indicates that the MPU card is faulty. Please refer to the following steps to troubleshoot:

- step 1: Check whether the power module works normally. For details, see "[5.2 Power Failure Troubleshooting](#)".
- Step 2: Check whether the MPU card is properly installed. You can pull out the MPU card and reinsert it to ensure that the MPU card is properly installed. After the MPU card starts up, check whether the MPU card status indicator SYS is flashing again.
- Step 3: Insert the MPU card into another MPU card slot and check whether the working status

is normal. If normal, the original MPU card slot may be damaged.

Step 4: Connect to the console port, and locate the fault by observing the specific startup information through the configuration terminal.

If the fault still cannot be located through the above steps, please contact the agent or local technical service engineer for processing.

5.5 SFU Card Troubleshooting

The SFU cards used in the NSS11500-04(V2) frame of the NSS11500 series switch are orthogonally and vertically inserted, and each fan module corresponds to three SFU card indicators.

Table 5-3 Meanings of SFU status indicators

Name	LED Color	Status Description
SFU	green	Flashing slowly: The SFU board is running normally. 0.5Hz Fast flashing: The SFU board is in the IOS loading state. 5Hz
	red	Fast flashing: The bootloader of the SFU board is starting. 5Hz Flashing slowly: Indicates that the SFU board has a fault that affects services and cannot be automatically recovered. 0.5Hz
	off	It indicates that the SFU board is not powered on, or the SFU board is powered on but not loaded normally.

If the SFU indicator is off or is steady red, it indicates that the SFU card corresponding to the fan card is loaded abnormally or the board is faulty.

Please refer to the following steps to troubleshoot:

step 1: MPU card is working normally. For details, see "[5.4 MPU Card Troubleshooting](#)".

Step 2: Check whether the output power of the power module is sufficient.

Step 3: Check whether the SFU card is properly installed. You can pull out the SFU card and reinsert it to ensure that the SFU card is properly installed.

Step 4: If there is a free SFU card slot on the switch, you can insert the SFU card into the free slot to check whether the working status is normal. If normal, the original SFU card slot

may be damaged.

If the fault still cannot be located through the above steps, please contact the agent or local technical service engineer.

5.6 LPU Card Troubleshooting

There is a STA two-color status indicator on the panel of each LPU card. In the normal state, STA is green and flashing (indicating that the board has been loaded successfully and is in normal working state). If the STA indicator on the panel is off or is steady red, it indicates that the board is loaded abnormally or the board is faulty. At the same time, there are LINK/ACT indicators on the interface of the LPU card, and the LINK/ACT is always on or flashing under normal conditions (indicating that the line has been connected or there is data transmission). If the LINK/ACT indicator of the interface is off, the interface or connecting cable may be faulty. Please refer to the following steps to troubleshoot:

- step 1: Check that the interface cable is properly connected. If the interface is an RJ45 Ethernet port, please refer to ["4.2.1 Connect Network via Ethernet Twisted Pair"](#). If the interface is an optical interface, please refer to ["4.2.2 Connect Network via LC-type Optical Fibers"](#) or "4.2.3 Network Access via MPO Optical Fiber".
- Step 2: Check whether the cable is damaged. Use the cable to connect a pair of normal working ports of the same type. If the port indicator lights up normally, the cable is normal. If the indicator of the interface is still off, it indicates that the cable is faulty. Please replace the cable.
- Step 3: If the interface uses a pluggable interface module, check whether the interface type matches the type of the pluggable module, and whether the type of the pluggable module matches the specification of the external cable.
- Step 4: For the interface that uses a pluggable interface module, try to replace the pluggable module to eliminate the fault of the pluggable module.
- Step 5: Use the **show interface switchport brief** command to check whether the port status is UP. If not, configure the **no shutdown** command for the corresponding port.
- Step 6: Please check whether the speed, duplex and other settings of the interfaces at both ends are consistent to ensure that the interface settings at both ends can work together.

If the fault still cannot be located through the above steps, please contact the agent or local technical service engineer.

5.7 Get Technical Support

If you still cannot troubleshoot the fault through the above contents in this chapter, please contact the agent or local technical service engineer in time. Before you contact customer service, please prepare the following relevant information, so that the customer service staff can help you solve the problem as soon as possible.

1. Switch arrival time
2. Chassis serial number (the chassis serial number is on the chassis label)
3. Software version number (version information can be viewed with the **show version command** in the command line view)
4. Maintenance agreement or warranty card
5. A brief description of the problem
6. Describe the troubleshooting steps that have been taken

You can contact customer service personnel through the technical support hotline, or seek help through the website or email.

Technical support hotline: 028-85240888, 400-886-8669

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

E-mail: support@maipu.com

6 Device Maintenance

This chapter describes device module replacement and maintenance, containing the following:

[6.1 Module Replacement](#)

[6.2 Dust Removal Maintenance for the Device](#)

6.1 Module Replacement

Caution

- Please place the replaced hardware module properly. It is recommended to put it on an antistatic bag or in a packing box.
-

6.1.1 Replace Power Module

Caution

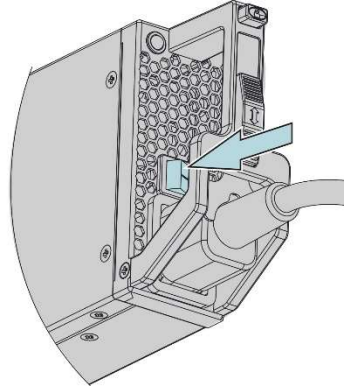
- When transporting the power module, please hold the bottom of the module part with your hands, and do not carry the module by its handle.
 - The power module supports hot swap, and the power supply can be replaced during operation. Please pay attention to ensure safety.
 - Do not touch any terminals that are marked with live signs or may be live to avoid the risk of electric shock.
-

Replacement Steps

The NSS11500 series switch chassis supports AC and DC power modules. The replacement steps for the AC power modules are as follows:

Step 1: Wear an anti-static wrist and make sure that the anti-static wrist is reliably grounded.

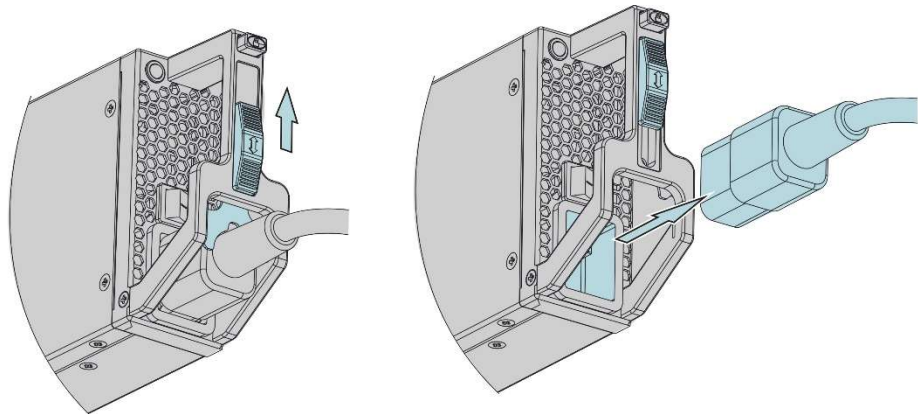
Step 2: Turn off the power switch.



CL0833

Figure 6-1 Turn off the power switch

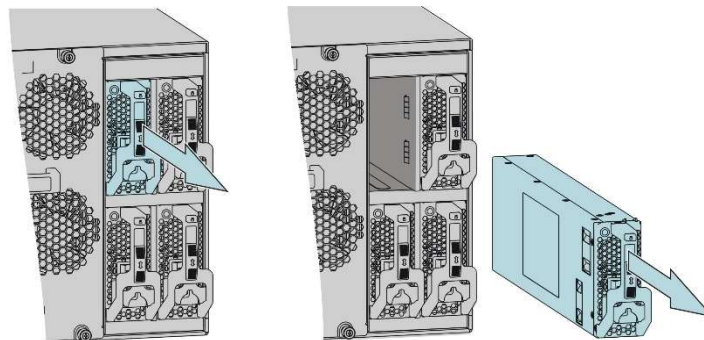
Step 3: Unlock the power cable and unplug the power cord.



CL0834

Figure 6-2 Pull out the plug of the power cord

Step 4: Unlock the power module and pull it out.



CL1505

Figure 6-3 Pull out the power module

Step 5: Insert the new power module to be replaced.

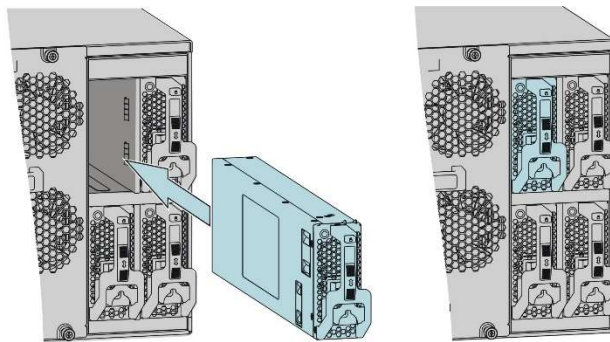


Figure 6-4 Insert the power module

Note

- The operation of replacing the DC power supply module is basically the same as that of replacing the AC power supply module. The only difference is that you need to use a Phillips screwdriver to loosen the screw that fixes the DC power cable, and then remove the DC power cable. After the module is replaced, you need to install it again, DC power cable, and fix the cable with Phillips screws.

6.1.2 Replace the MPU/LPU Board

Both MPU cards and LPU cards of NSS11500 series switches support hot swapping, but simultaneous hot swapping of multiple LPU cards is prohibited. The following takes the replacement of the MPU card as an example. Other LPU cards are similar and will not be repeated here.

Preparation before replacement

- step 1: Wear an anti-static wrist and make sure that the anti-static wrist is reliably grounded.
- Step 2: If there is a blank baffle at the position where the board is to be installed, remove the blank baffle first.
- Step 3: Prepare the board to be installed.

Replacement steps

- step 1: Wear an antistatic wrist, and use a Phillips screwdriver to loosen the captive screws on

both sides of the board to be replaced.

- Step 2: Hold the puller on the board with both hands, and turn the puller outwards to separate the board from the chassis backplane.
- Step 3: Slide smoothly along the guide rails of the slot, pull out the board, and place the unloaded board on an antistatic mat or in the original packing box. The following figure uses the MPU card as an example to illustrate board unloading:

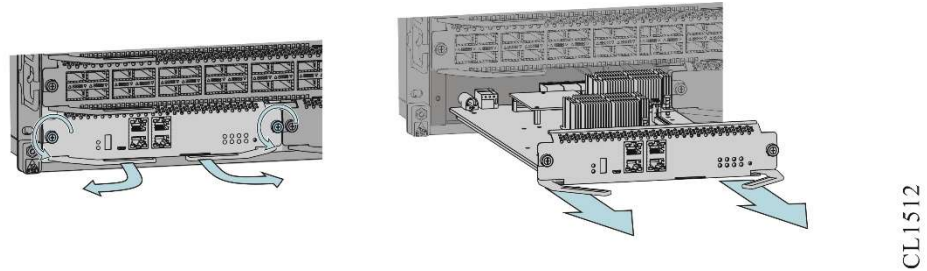


Figure 6-5 Unload the MPU card

- Step 4: Rotate the pullers on both sides of the board to be installed outward and keep them open. Then support the board with both hands, and insert it smoothly along the guide rail of the slot.
- Step 5: Fold the puller inwards so that the rear end of the board is in close contact with the backplane.
- Step 6: Manually guide and screw in the captive screws on both sides of the board, and then tighten the captive screws with a screwdriver to fix the board. The following figure uses the MPU card as an example to illustrate the board installation:

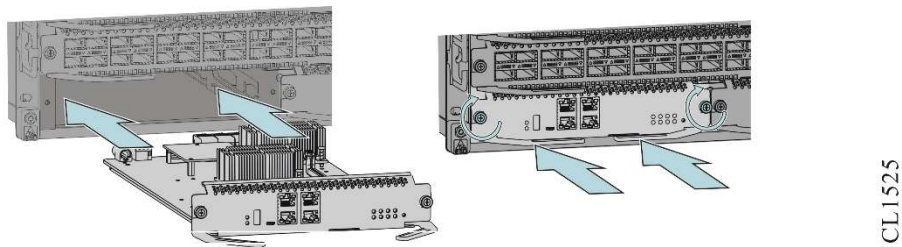


Figure 6-6 Insert the MPU card

6.1.3 Replace the SFU Board

All SFUs in NSS11500 series switches support hot swapping. The NSS11500-04(V2) frame adopts the installation method of rear vertical insertion and supports six SFU cards. The replacement steps of the SFU cards are as follows:

Preparation before replacement

- step 1: Wear an anti-static wrist and make sure that the anti-static wrist is reliably grounded.
- Step 2: Remove the fan module at the corresponding position of the SFU to be replaced. For details about removing the fan module, see [6.1.4 Replacing the Fan Module](#).
- Step 3: Prepare the board to be installed.

Replacement steps

- step 1: Wear an antistatic wrist strap, and use a Phillips screwdriver to loosen the captive screws and puller screws on the upper and lower sides of the board to be replaced.
- Step 2: Hold the puller on the board with both hands, and turn the puller outwards to separate the board from the chassis backplane.
- Step 3: Slide smoothly along the guide rails of the slot, pull out the board, and place the unloaded board on an antistatic mat or in the original packing box.

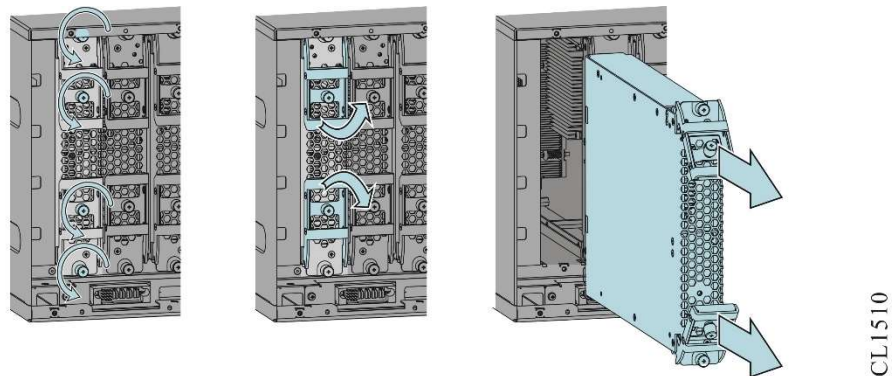


Figure 6-7 Upload the SFU card

- Step 4: Rotate the pullers on both sides of the board to be installed outward, then support the board with both hands, and insert it smoothly along the guide rails of the slot.
- Step 5: Fold the puller inwards so that the rear end of the veneer is in close contact with the backplane.
- Step 6: Manually guide and screw in the captive screws on both sides of the board, and then tighten the captive screws with a screwdriver to fix the board.

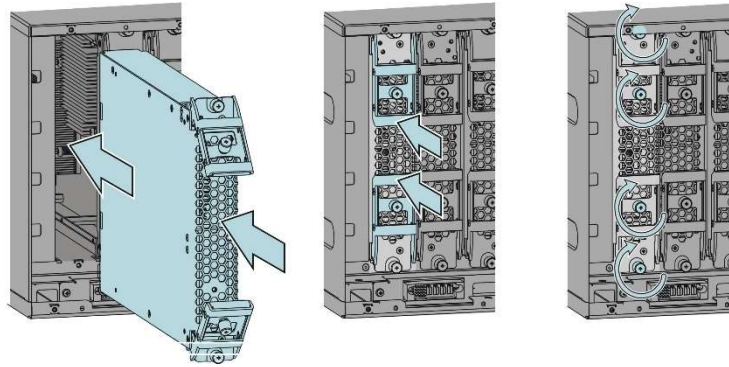


Figure 6-8 Insert the SFU card

CL1511

! Caution

- When replacing an SFU board while the device is running, ensure that a fan module is working properly, and then remove the fan module at the corresponding location of the SFU to be replaced.
 - After replacing the SFU card, install the removed fan module in time. After the fan module works normally, remove another fan module to complete the replacement of the SFU board at the corresponding position.
 - The operation time for replacing the SFU board should be shortened as much as possible, and preparations should be made in advance.
-

6.1.4 Replace a Fan Module

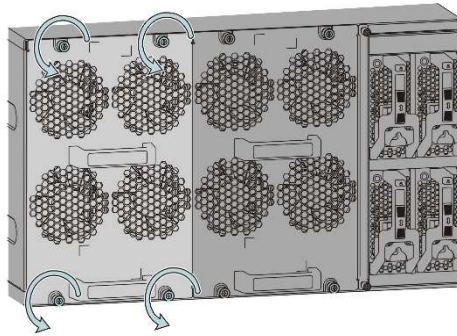
! Caution

- Do not touch any exposed wires, terminals and parts marked with dangerous voltage signs in the product, so as not to cause injury to the human body.
 - The fan module supports hot-swapping. If the fan module is replaced while the switch is working, do not pull out the replaced fan module from the chassis, and wait for the fan to stop before pulling it out. At the same time, considering that the fan may still be running, it is strictly forbidden to put your hands into the fan module to avoid injury.
 - Before replacing, please prepare a new fan module in advance, and install a new fan module in time after uninstalling the fan module when the switch is working (it is recommended that the whole replacement process should not exceed 2 minutes), so as to ensure the normal use of the switch.
-

The replacement steps are as follows:

step 1: Wear an antistatic wrist, and use a Phillips screwdriver to loosen the upper and lower

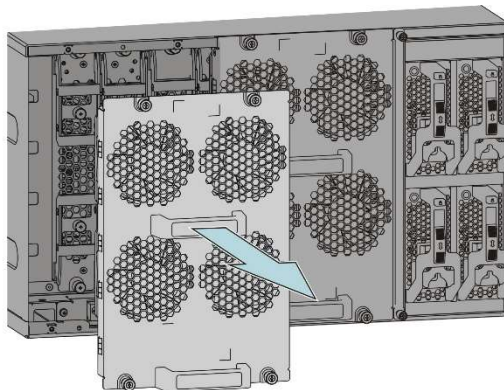
captive screws on the fan module.



CL1507

Figure 6-9 Uninstall a fan module

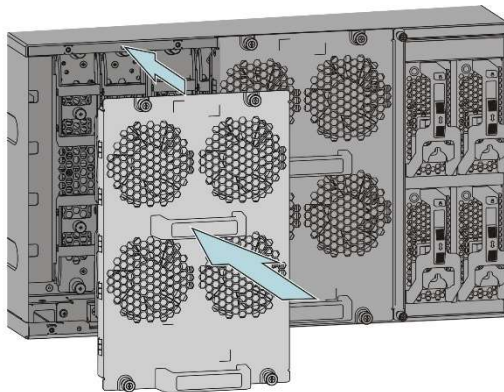
Step 2: Hold the handle of the fan module with one hand, hold the fan frame of the fan module with the other hand, pull out the fan module smoothly along the guide rail of the slot, and place the removed fan module on an antistatic mat or in the original packing box. The schematic diagram for removing the fan module is as follows:



CL1508

Figure 6-10 Uninstall the fan module

Step 3: Insert the fan module to be installed smoothly into the fan module slot along the slot guide rails so that the fan module is in close contact with the chassis backplane.



CL1509

Figure 6-11 Insert the fan module

Step 4: Tighten the captive screws at the top and bottom of the fan module panel.

6.1.5 Replace a Pluggable Optical Module

The replacement process for SFP modules, SFP+ modules, QSFP+ modules, and QSFP28 modules is similar. The following description uses SFP modules as an example.

Warning

- During the process of installing or uninstalling the SFP module, please do not directly touch the gold finger part of the SFP module with your hands.
 - Please do not look directly at the fiber connection hole of the optical module when the optical fiber is unplugged and the optical module is not pulled out.
-

step 1: Wearing an antistatic wrist, pull out the optical fiber connected to the SFP module.

Note

- The method of pulling out the MPO fiber is different from that of the LC fiber. Press and hold the fiber puller with the word "PULL" printed on the MPO fiber interface, and gently pull the fiber interface outward, and the MPO fiber can be pulled out relatively easily.
-

Step 2: Pull down the handle of the SFP module to the horizontal position, and then pull out the SFP module. The schematic diagram of unloading the SFP module is as follows:

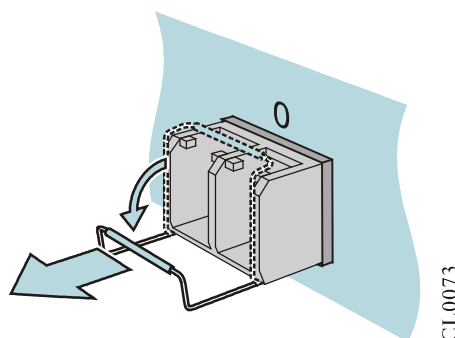
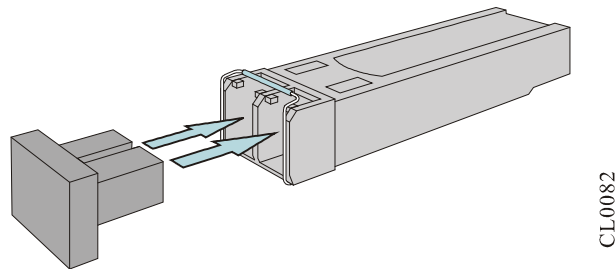


Figure 6-16 Unload the SFP module

Step 3: Put the removed SFP module on the dustproof cap and put it in an antistatic bag or

packing box. The schematic diagram of installing the dustproof cap of the SFP module is as follows:



picture 6-17 Install the SFP module dust cap

Step 4: Flip up the handle of the SFP module to be installed to the vertical position, lock the buckle on the top of the module, pinch both sides of the SFP module with your hands, and push it into the SFP slot horizontally until the SFP module is in close contact with the slot (you can feel that the shrapnel or clips on the top and bottom of the SFP module to lock the SFP slot). The schematic diagram of installing the SFP module is as follows:

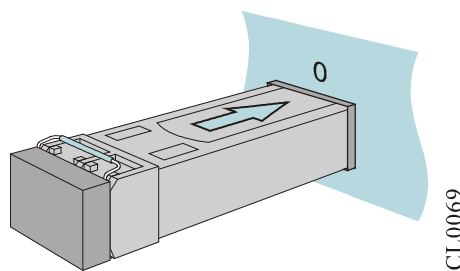


Figure 6-18 Install the SFP module

Step 5: Remove the dust cap. The schematic diagram of removing the dustproof cap of the SFP module is as follows:

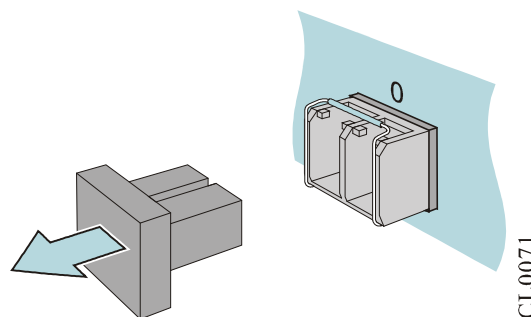


Figure 6-19 Remove the dust cap of the SFP module

Step 6: Insert the optical fibers into the corresponding SFP ports in sequence. The schematic diagram of connecting the SFP ports with fibers is as follows:

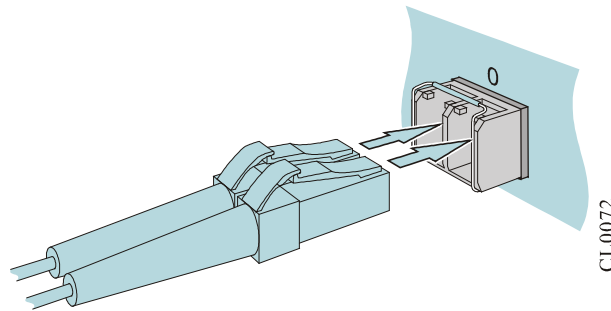


Figure 6-20 Connect SFP with optical fibers

 **Note**

- It is recommended that you do not directly insert an SFP module with an optical fiber inserted into the slot. Please pull out the optical fiber before installing it.
-

6.2 Dust Removal Maintenance for the Device

This section describes how to perform dust removal maintenance on the NSS11500 series switch.

 **Warning**

- All dust removal operations must be performed in strict accordance with anti-static requirements, such as operating on an anti-static workbench, and staff must wear anti-static overalls, anti-static wrists or anti-static gloves, etc.
 - The selection of dust removal tools and cleaning agents must meet the requirements of relevant standards. Otherwise, it will cause unpredictable damage to the device board.
-

6.2.1 Remove Dust for Fan Module

The fan module is an important part of the device, and it mainly provides power for heat dissipation and ventilation of the device. During the operation of the device, the fan blades and the control circuit board in the fan module will absorb dust in the surrounding air. When the adsorbed dust accumulates to a certain extent, the dust will affect the stable operation of the fan module on the one hand, and on the other hand, the dust will also become a source of pollution for other service boards in the device, thereby burying hidden dangers in the stable operation of the device.

To ensure long-term stable operation of the device, maintenance personnel should regularly (recommended once a year) perform dust removal maintenance on the fan module of the device. The relevant steps are as follows:

 **Note**

- Before operation, prepare a spare fan module in advance, and install the spare fan module in time after removing the fan module in the working state of the device to ensure the normal operation of the device.
-

step 1: Dedust the spare fan module: After the maintenance personnel wear antistatic wrists or gloves correctly, use clean cotton gauze, antistatic brush, vacuum cleaner, and other cleaning tools to dedust the fan blades and control circuit boards of the spare fan module., the fan module should be free of dust after dust removal.

Step 2: Replace the fan module to be dust-removed. For details, see "[6.1.4 Replace a Fan Module](#)". The replacement process of the entire fan module must be timely. Otherwise, the temperature of the chassis will be too high, which will seriously threaten the safety and stable operation of the device.

Step 3: The replaced and dust-cleaned fan module will be used as a spare fan module.

6.2.2 Remove Dust for Board

 **Caution**

- In order to reduce the maintenance risk as much as possible, the dust removal maintenance of the board should be carried out during the time period when the device business volume is small.
-

During the operation of the device, due to the charging of the board and the air convection during the heat dissipation of the device, the board will inevitably absorb charged particles or dust in the air and form accumulation. The worse the air cleanliness and the lower the relative humidity, the stronger the adsorption process. When this kind of dust accumulates to a certain extent, it will seriously affect the heat dissipation efficiency and electrical insulation performance of the board, thus burying a safety hazard for the stable operation of the device.

In order to ensure the long-term stable operation of the device, maintenance personnel

should regularly (recommended once every two years) conduct a comprehensive dust removal maintenance work on all business boards in the device. The relevant steps are as follows:

- step 1: Prepare a spare board: When maintenance personnel are going to perform dust removal maintenance on a board in the device, they first need to prepare a spare board for the board to be maintained.
- Step 2: Replace the board to be dust-removed. For specific replacement steps, see "[6.1.2 Replace the MPU/LPU Board](#)" and "[6.1.3 Replace the SFU board](#)."
- Step 3: Perform dust removal on the replaced board.

Caution

- There are many ways to remove dust from a board, but the general principle is not to damage the physical and electrical characteristics of the board.
 - When using a vacuum cleaner to remove dust, gently remove the dust on the surface of the board with a clean and dry antistatic soft brush. At the same time, point the suction nozzle of the vacuum cleaner at the antistatic brush and suck while brushing. The advantages of the vacuum cleaner method are simple operation and low cost, but this method cannot completely remove dust, and cannot effectively remove harmful dust attached to the surface of the veneer.
 - When using a cleaning agent to remove dust, use an anhydrous, non-corrosive, non-conductive, and highly volatile circuit board-specific cleaning agent to remove dust from the board, such as isopropyl alcohol (IPA). The advantage of this method is that the dust removal is more thorough, and the harmful gas attached to the surface of the veneer can be effectively removed, but the operation of this method is more complicated and the cost is higher.
-

6.2.3 Remove Dust for Optical Interface and Pigtail Connector

In order to ensure the stable and reliable operation of the device, it is also necessary to regularly remove dust from the optical interface and pigtail connector on the device. The corresponding dust removal steps are as follows:

- step 1: Pull out the interface sub-card where the optical interface is located: When cleaning the optical interface, you first need to unplug the optical fiber connected to the optical interface, and then pull out the corresponding interface sub-card for cleaning.
- Step 2: Clean with special tools and materials: When cleaning optical interfaces and pigtail connectors, special cleaning tools and materials must be used, and these materials

can be purchased from optical fiber/optical cable manufacturers.

 **Note**

- The unused optical connectors on boards and pigtails must be covered with dustproof caps.
 - For the optical interface in use, when you need to unplug the pigtail on it, be sure to cover the optical interface and the pigtail connector connected to it with a dustproof cap. In this way, on the one hand, it can prevent the invisible laser light sent by the laser from irradiating human eyes, and on the other hand, it can prevent dust from increasing the loss of dust-contaminated optical fiber interfaces or pigtail connectors.
-

 **Caution**

- Before performing dust removal maintenance on the optical interface, you need to pull out the corresponding interface subcard first, and ensure that the normal development of system services will not be affected after the interface subcard is pulled out.
 - For high-power laser interfaces, cleaning tools and materials must be used for cleaning.
 - For low-power optical interfaces, if you cannot obtain special cleaning tools and cleaning materials, you can clean them with a clean, dry anti-static soft brush to remove dust on the surface of the optical interface.
-

 **Warning**

- The laser light sent by the laser on the optical interface is invisible infrared light, which may cause permanent damage to the eyes when irradiating the human eyes.
 - Do not use any cleaning tools and materials that are not proven suitable for cleaning optical interfaces and pigtail connectors.
-

Appendix

A Machine and Common Module Specifications

A1 Power Consumption/Weight/Dimensions (Distinguish Different Frames)

Appendix Table A-1 Power Consumption/Dimension

Model	Power Consumption	Dimension
NSS11500-04(V2)	Single power supply 800W or 1600W (When the whole machine is fully loaded with boards, it is recommended to configure N+1 power redundancy backup)	442 (excluding mounting ears) mm × 748 mm × 263 mm (W × D × H)
NSS11500-08 (V2)	Single power supply 800W or 1600W (When the whole machine is fully loaded with boards, it is recommended to configure N+1 power redundancy backup)	442 (without mounting ear) mm × 645 mm × 666 mm (W × D × H)
NSS11500-12 (V2)	Single power supply 1600W (When the whole machine is fully loaded with boards, it is recommended to configure N+1 power redundancy backup)	442 (without mounting ear) mm × 645 mm × 880 mm (W × D × H)

Appendix Table A-24-slot frame/board weight

Model	Weight (kg)
NSS11500-04(V2) frame	36.48
FAN-06A-01B(V1)	1.48
AD800M-HV1B(V1)	2.02

Model	Weight (kg)
AD1600M-HV0B(V1)	2.18
DD1600M-5V0B(V1)	2.16
NSM115-48GET4XGEF-DA(V1)	3.48
NSM115-48XGEF2QXGE-DA(V1)	3.66
NSM115-16QXGE-DA(V1)	2.96
NSM115-12QFP-DA(V1)	3.7
NSM115-SFUB-EX(V1)	2.52
NSM115-SFUB-EX-XC(V1)	2.52
NSM115-48XGEF-EC(V1)	3.48
NSM115-48XGEFC-XC(V1)	3.48
NSM115-40GET8LT4XF-EC(V1)	3.43
NSM115-40GETP8LTP4XFC-XC(V1)	3.43
NSM115-16XGEF4QXGE-EC(V1)	3.12
NSM115-16XGEF4QXGEC-XC(V1)	3.12
NSM115-12QXGE-EC(V1)	3.30
NSM115-12QXGEC-XC(V1)	3.30
NSM115-24GET24GEF4XF-EC(V1)	3.24
NSM115-24GET24GEF4XFC-XC(V1)	3.24
NSM115-16XGEF-EC(V1)	3.04
NSM115-16XGEFC-XC(V1)	3.04
NSM115-SFUB(V1)	2.64
NSM115-SFUB-XC(V1)	2.64
NSM115-MPUB(V1)	2.46

Model	Weight (kg)
NSM115-MPUB-XC(V1)	2.46
NSM115-8QXGE-EC(V1)	3.04
NSM115-8QXGEC-XC(V1)	3.04
NSM115-32XGEF-EC(V1)	3.20
NSM115-32XGEFC-XC(V1)	3.20
NSM115-48GET4XGEF-EC(V1)	3.16
NSM115-48GET4XGEFC-XC(V1)	3.16
NSM115-48GEF4XGEF-EC(V1)	3.28
NSM115-48GEF4XGEFC-XC(V1)	3.28
MPU Empty Tray	0.80
LPU Empty Tray	1.56
SFU Empty Tray	1.22

Appendix Table A-38-slot frame/board weight

Model	Weight (kg)
NSS11500-08(V2) frame	79.78
FAN-15B-01B (V1)	1.86
AD800M-HV1B(V1)	2.02
AD1600M-HV0B(V1)	2.18
DD1600M-5V0B(V1)	2.16
NSM115-SFUD-EX(V1)	5.20
NSM115-SFUD-EX-XC(V1)	5.20

Model	Weight (kg)
NSM115-SFUD(V1)	5.10
NSM115-SFUD-XC(V1)	5.10
NSM115-SFUC(V1)	4.56
NSM115-SFUC-XC(V1)	4.56
NSM115-MPUC(V1)	2.46
NSM115-MPUC-XC(V1)	2.46
NSM115-48GET4XGEF-DA(V1)	3.16
NSM115-48XGEF2QXGE-DA(V1)	3.66
NSM115-16QXGE-DA(V1)	2.96
NSM115-12QFP-DA(V1)	3.7
NSM115-48XGEF-EC(V1)	3.48
NSM115-48XGEFC-XC(V1)	3.48
NSM115-40GET8LT4XF-EC(V1)	3.43
NSM115-40GETP8LTP4XFC-XC(V1)	3.43
NSM115-16XGEF4QXGE-EC(V1)	3.12
NSM115-16XGEF4QXGEC-XC(V1)	3.12
NSM115-12QXGE-EC(V1)	3.30
NSM115-12QXGEC-XC(V1)	3.30
NSM115-24GET24GEF4XF-EC(V1)	3.24
NSM115-24GET24GEF4XFC-XC(V1)	3.24
NSM115-16XGEF-EC(V1)	3.04
NSM115-16XGEFC-XC(V1)	3.04
NSM115-8QXGE-EC(V1)	3.04

Model	Weight (kg)
NSM115-8QXGEC-XC(V1)	3.04
NSM115-32XGEF-EC(V1)	3.20
NSM115-32XGEFC-XC(V1)	3.20
NSM115-48GET4XGEF-EC(V1)	3.16
NSM115-48GET4XGEFC-XC(V1)	3.16
NSM115-48GEF4XGEF-EC(V1)	3.28
NSM115-48GEF4XGEFC-XC(V1)	3.28
MPU empty tray	0.80
LPU empty tray	1.56
SFU empty tray	1.22

Appendix Table A-412-slot frame/board weight

Model	Weight (kg)
NSS16000-L(V1) frame	93.36
FAN-20A-01 (V1)	2.44
AD800M-HV1B(V1)	2.02
AD1600M-HV0B(V1)	2.18
DD1600M-5V0B(V1)	2.16
NSM115-SFUF-EX(V1)	6.64
NSM115-SFUF-EX-XC(V1)	6.64
NSM115-SFUF(V1)	6.64
NSM115-SFUF-XC(V1)	6.64
NSM115-MPUC(V1)	2.46

Model	Weight (kg)
NSM115-MPUC-XC(V1)	2.46
NSM115-48GET4XGEF-DA(V1)	3.16
NSM115-48XGEF2QXGE-DA(V1)	3.66
NSM115-16QXGE-DA(V1)	2.96
NSM115-12QFP-DA(V1)	3.7
NSM115-40GET8LT4XF-EC(V1)	3.43
NSM115-40GETP8LTP4XFC-XC(V1)	3.43
NSM115-24GET24GEF4XF-EC(V1)	3.24
NSM115-24GET24GEF4XFC-XC(V1)	3.24
NSM115-16XGEF-EC(V1)	3.04
NSM115-16XGEFC-XC(V1)	3.04
NSM115-8QXGE-EC(V1)	3.04
NSM115-8QXGEC-XC(V1)	3.04
NSM115-32XGEF-EC(V1)	3.20
NSM115-32XGEFC-XC(V1)	3.20
NSM115-48GET4XGEF-EC(V1)	3.16
NSM115-48GET4XGEFC-XC(V1)	3.16
NSM115-48GEF4XGEF-EC(V1)	3.28
NSM115-48GEF4XGEFC-XC(V1)	3.28
NSM115-16XGEF4QXGE-EC(V1)	3.12
NSM115-16XGEF4QXGEC-XC(V1)	3.12
MPU empty tray	0.80
LPU empty tray	1.56

Model	Weight (kg)
SFU empty tray	1.22

Appendix Table A-5 Board Power Consumption

Model	Power Consumption (W)
FAN-06A-01B(V1)	122 (speed is 76%)
FAN-15B-01B (V1)	105 (speed is 55%)
FAN-20A-01 (V1)	156 (speed is 55%)
NSM115-MPUB(V1)	42
NSM115-MPUB-XC(V1)	42
NSM115-MPUC(V1)	42
NSM115-MPUC-XC(V1)	42
NSM115-SFUB-EX(V1)	104
NSM115-SFUB-EX-XC(V1)	104
NSM115-SFUB(V1)	104
NSM115-SFUB-XC(V1)	104
NSM115-SFUD-EX(V1)	150
NSM115-SFUD-EX-XC(V1)	150
NSM115-SFUD(V1)	150
NSM115-SFUD-XC(V1)	150
NSM115-SFUC(V1)	86
NSM115-SFUC-XC(V1)	86
NSM115-SFUF-EX(V1)	150
NSM115-SFUF-EX-XC(V1)	150
NSM115-SFUF(V1)	150

Model	Power Consumption (W)
NSM115-SFUF-XC(V1)	150
NSM115-48GET4XGEF-DA(V1)	100
NSM115-48XGEF2QXGE-DA(V1)	165
NSM115-16QXGE-DA(V1)	125
NSM115-12QFP-DA(V1)	120
NSM115-48XGEF-EC(V1)	162
NSM115-48XGEFC-XC(V1)	162
NSM115-40GET8LT4XF-EC(V1)	67
NSM115-40GETP8LTP4XFC-XC(V1)	67
NSM115-16XGEF4QXGE-EC(V1)	92
NSM115-16XGEF4QXGEC-XC(V1)	92
NSM115-12QXGE-EC(V1)	111
NSM115-12QXGEC-XC(V1)	111
NSM115-24GET24GEF4XF-EC(V1)	85
NSM115-24GET24GEF4XFC-XC(V1)	85
NSM115-16XGEF-EC(V1)	55
NSM115-16XGEFC-XC(V1)	55
NSM115-8QXGE-EC(V1)	74
NSM115-8QXGEC-XC(V1)	74
NSM115-32XGEF-EC(V1)	111
NSM115-32XGEFC-XC(V1)	111
NSM115-48GET4XGEF-EC(V1)	72
NSM115-48GET4XGEFC-XC(V1)	72

Model	Power Consumption (W)
NSM115-48GEF4XGEF-EC(V1)	110
NSM115-48GEF4XGEFC-XC(V1)	110

A2 MPU Card Specifications

The MPU card is the most important and necessary board in the NSS11500 device, and its function is to serve as the control center of the device. Each frame can support two MPU cards at the same time, realizing the working mode of 1:1 backup.

A2.1 NSM115-MPUB(V1)

The schematic diagram of the NSM115-MPUB(V1) card panel is as follows:



Appendix Figure A-1NSM115-MPUB(V1) Card Panel Diagram

The interface description of NSM115-MPUB(V1) card is shown in the table below:

Appendix Table A-6Introduction to NSM115-MPUB(V1) Card Interface

Interface Name	Description
CMM	One RJ45 interface, asynchronous serial port, the default baud rate is 115200bps
CONSOLE	Console port: One RJ45 interface, asynchronous serial port, default baud rate: 9600bps; One micro usb console interface; Multiplexing mode, automatic switching, RJ45 interface prior
DC0	Network management port, one RJ45 interface, 10M/100M /1000M fast Ethernet port, support auto crossover of data sending and receiving, only used as network management
DEBUG	One RJ45 interface, asynchronous serial port; It can be configured to connect to the CPU CONSOLE and CMM CONSOLE on the LPU or SFU

Interface Name	Description
USB	One U disk slot
RST	<p>It is used to reset the board manually, please use the reset button with caution.</p> <p>Under single control board configuration: press the reset button, it will trigger the reset of the control board and restart the whole machine.</p> <p>In the configuration of dual control boards: press the reset button of the active control board to trigger the master/standby switchover. Press the reset button of the standby control board, the card will restart, and the work of the whole machine will not be affected.</p>

The meanings of the indicators on the NSM115-MPUB(V1) card are shown in the table below:

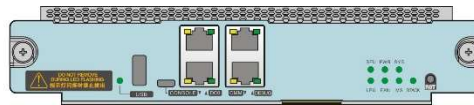
Appendix Table A-7 Meanings of NSM115-MPUB(V1) Card Indicators

Name	LED Color	Status Description
MS	green	<p>On: The MPU card is working in master mode.</p> <p>Off: The MPU card is working in slave mode.</p>
SYS	green	<p>Flashing slowly: Indicates that the board is running normally. 0.5Hz</p> <p>Fast flashing: Indicates that the board is in the bootloader startup state or IOS loading state. 5Hz</p> <p>Off: Indicates that the board is not powered on, or the board is powered on but not loaded normally.</p>
Stack	green	<p>Flashing: Indicates that the stacking function is enabled, and the control board is the active control board of the stacking system.</p> <p>On: Indicates that the stacking function is enabled, and the control board is not the active control board of the stacking system.</p> <p>Off: Indicates that the stacking function is not enabled.</p>
USB	green	Off: no U disk inserted

Name	LED Color	Status Description
		On: There is a U disk inserted Flashing: The U disk has data read and write (it is strictly forbidden to pull out the U disk at this time. Otherwise, the data files in the card will be damaged).
RJ45 for DC0 comes with LED	RJ45 comes with a green light	Off: the DC0 port is not linked On: the DC0 interface is linked, but no data is sent or received Flashing: DC0 interface is linked, data is being sent and received at the same time
	RJ45 comes with a yellow light	Off: DC0 is working at 10/100M or is not in the link state On: DC0 works at 1000M
RJ45 for serial port comes with LED	RJ45 comes with a yellow light	Off: No data is sent from the Console/CMM port Flashing: Console/CMM port has data sending
	RJ45 comes with a green light	Off: No data is received at the Console/CMM port Flashing: Console/CMM port has data reception

A2.2 NSM115-MPUB-XC(V1)

The schematic diagram of the NSM115-MPUB-XC(V1) card panel is as follows:



CL1520

Appendix Figure A-2NSM115-MPUB-XC(V1) Card Panel Diagram

The interface description of NSM115-MPUB-XC(V1) card is shown in the table below:

Appendix Table A-8Introduction to NSM115-MPUB-XC(V1) Card Interface

Interface Name	Description
CMM	One RJ45 interface, asynchronous serial port, the default baud rate is 115200bps
CONSOLE	Console port:

Interface Name	Description
	<p>One RJ45 interface, asynchronous serial port, default baud rate: 9600bps;</p> <p>One micro usb console interface;</p> <p>Multiplexing mode, automatic switching, RJ45 interface prior</p>
DC0	Network management port, one RJ45 interface, 10M/100M/1000M fast Ethernet port, supports auto crossover of data sending and receiving, only used as network management
DEBUG	<p>One RJ45 interface, asynchronous serial port;</p> <p>It can be configured to connect to the CPU CONSOLE and CMM CONSOLE on the LPU or SFU</p>
USB	One U disk slot
RST	<p>It is used to reset the board manually, please use the reset button with caution.</p> <p>Under single control board configuration: press the reset button, it will trigger the reset of the control board and restart the whole machine.</p> <p>In the configuration of dual control boards: press the reset button of the active control board to trigger the master/standby switchover. Press the reset button of the standby control board, the card will restart, and the work of the whole machine will not be affected.</p>

The meanings of the indicators on the NSM115-MPUB-XC(V1) card are shown in the table below:

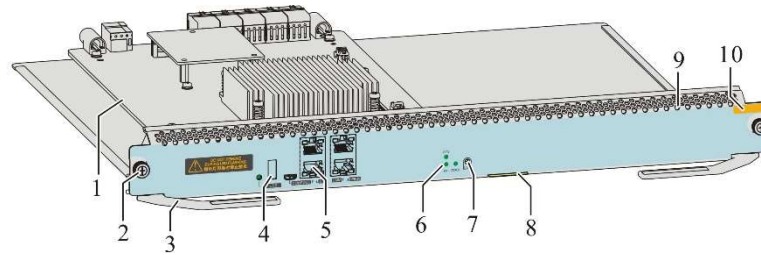
Appendix Table A-9 Meanings of the indicators on NSM115-MPUB-XC(V1) card

Name	LED Color	Status Description
MS	green	<p>On: The MPU card is working in master mode.</p> <p>Off: The MPU card is working in slave mode.</p>
SYS	green	<p>Flashing slowly: Indicates that the board is running normally. 0.5Hz</p> <p>Fast flashing: Indicates that the board is in the bootloader startup state or IOS loading state. 5Hz</p> <p>Off: Indicates that the board is not powered on, or the board is powered on but not</p>

Name	LED Color	Status Description
		loaded normally.
stack	green	Flashing: Indicates that the stacking function is enabled, and the control board is the active control board of the stack system. On: Indicates that the stacking function is enabled, and the control board is not the active control board of the stack system. Off: Indicates that the stacking function is not enabled.
USB	green	Off: no U disk inserted On: There is a U disk inserted Flashing: The U disk has data read and write (it is strictly forbidden to pull out the U disk at this time. Otherwise, the data files in the card will be damaged).
RJ45 for DC0 comes with LED	RJ45 comes with a green light	Off: the DC0 port is not linked On: the DC0 interface is linked, but no data is sent or received Flashing: DC0 interface is linked, data is being sent and received at the same time
	RJ45 comes with a yellow light	Off: DC0 is working at 10/100M or is not in the link state On: DC0 works at 1000M
RJ45 for serial port comes with LED	RJ45 comes with a yellow light	Off: No data is sent from the Console/CMM port Flashing: Console/CMM port has data sending
	RJ45 comes with a green light	Off: No data is received at the Console/CMM port Flashing: Console/CMM port has data reception

A2.3 NSM115-MPUC(V1)

The schematic diagram of the NSM115-MPUC(V1) card panel is as follows:



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Appendix Figure A-3 NSM115-MPUC(V1) Card Panel Diagram

The interface description of NSM115-MPUC(V1) card is shown in the table below:

Appendix Table A-10 Introduction to NSM115-MPUC(V1) Card Interface

Interface Name	Description
CMM	One RJ45 interface, asynchronous serial port, the default baud rate is 115200bps
CONSOLE	Console port: One RJ45 interface, asynchronous serial port, default baud rate: 9600bps; One micro usb console interface; Multiplexing mode, automatic switching, RJ45 interface prior
DC0	Network management port, one RJ45 interface, 10M/100M/1000M fast Ethernet port, supports automatic crossover of data sending and receiving, only used as network management
USB	One U disk slot
RST	It is used to reset the board manually, please use the reset button with caution. Under single control board configuration: press the reset button, it will trigger the reset of the control board and restart the whole machine. In the configuration of dual control boards: press the reset button of the active control board to trigger the master/standby switchover. Press the reset button of the standby control board, the card will restart, and the work of the whole machine will not be affected.

The meanings of the indicators on the NSM115-MPUC(V1) card are shown in the table below:

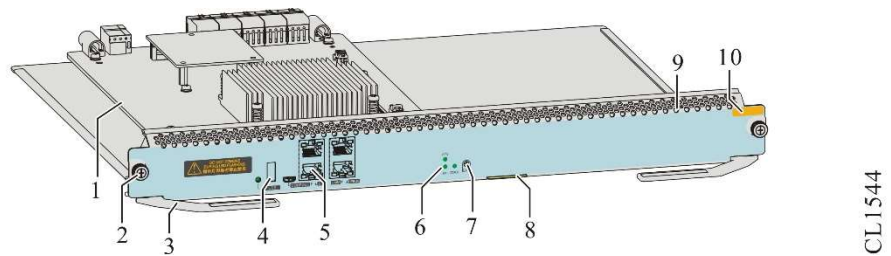
Appendix Table A-11 Meanings of indicators on the NSM115-MPUC(V1) card

Name	LED Color	Status Description
MS	green	On: The MPU card is working in master mode. Off: The MPU card is working in slave mode.
SYS	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the bootloader startup state or IOS loading state. 5Hz Off: the board is not powered on, or the board is powered on but not loaded normally.
stack	green	Flashing: Indicates that the stacking function is enabled, and the control board is the active control board of the stack system. On: Indicates that the stacking function is enabled, and the control board is not the active control board of the stack system. Off: indicates that the stacking function is not enabled.
USB	green	Off: no U disk inserted On: There is a U disk inserted Flashing: The U disk has data read and write (it is strictly forbidden to pull out the U disk at this time. Otherwise, the data files in the card will be damaged).
RJ45 for DC0 comes with LED	RJ45 comes with a green light	Off: the DC0 port is not linked On: the DC0 interface is linked, but no data is sent or received Flashing: DC0 interface is linked, data is being sent and received at the same time
	RJ45 comes with a yellow light	Off: DC0 is working at 10/100M or is not in the link state On: DC0 works at 1000M
RJ45 for serial port comes with LED	RJ45 comes with a yellow light	Off: No data is sent from the Console/CMM port Flashing: Console/CMM port has data sending

Name	LED Color	Status Description
	RJ45 comes with a green light	Off: No data is received at the Console/CMM port Flashing: Console/CMM port has data reception

A2.4 NSM115-MPUC-XC(V1)

The schematic diagram of the NSM115-MPUC-XC(V1) card panel is as follows:



Appendix Figure A-4NSM115-MPUC-XC(V1) Card Panel Diagram

The interface description of NSM115-MPUC-XC(V1) card is shown in the table below:

Appendix Table A-12Introduction to NSM115-MPUC-XC(V1) Card Interface

Interface Name	Description
CMM	One RJ45 interface, asynchronous serial port, the default baud rate is 115200bps
CONSOLE	Console port: One RJ45 interface, asynchronous serial port, default baud rate: 9600bps; One micro usb console interface; Multiplexing mode, automatic switching, RJ45 interface prior
DC0	Network management port, One RJ45 interface, 10M/100M/1000M fast Ethernet port, supports automatic crossover of data sending and receiving, only used as network management
USB	One U disk slot
RST	It is used to reset the board manually, please use the reset button with caution. Under single control board configuration: press the reset button, it will trigger the reset of the control board and restart the whole machine. In the configuration of dual control boards: press the reset button of the active control board to trigger the master/standby switchover. Press the reset button of the standby control board,

Interface Name	Description
	the card will restart, and the work of the whole machine will not be affected.

The meanings of the indicators on the NSM115-MPUC-XC(V1) card are shown in the table below:

Appendix Table A-13 Meanings of the indicators on NSM115-MPUC-XC(V1) card

Name	LED Color	Status Description
MS	green	On: The MPU card is working in master mode. Off: The MPU card is working in slave mode.
SYS	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the bootloader startup state or IOS loading state. 5Hz Off: the board is not powered on, or the board is powered on but not loaded normally.
stack	green	Flashing: Indicates that the stacking function is enabled, and the control board is the active control board of the stack system. On: Indicates that the stacking function is enabled, and the control board is not the active control board of the stack system. Off: indicates that the stacking function is not enabled.
USB	green	Off: no U disk inserted On: There is a U disk inserted Flashing: The U disk has data read and write (it is strictly forbidden to pull out the U disk at this time. Otherwise, the data files in the card will be damaged).
RJ45 for DC0 comes with LED	RJ45 comes with a green light	Off: the DC0 port is not linked On: the DC0 interface is linked, but no data is sent or received Flashing: DC0 interface is linked, data is

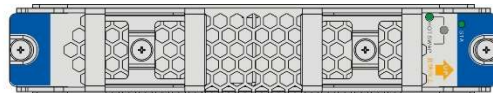
Name	LED Color	Status Description
		being sent and received at the same time
	RJ45 comes with a yellow light	Off: DC0 is working at 10/100M or is not in the link state On: DC0 works at 1000M
RJ45 for serial port comes with LED	RJ45 comes with a yellow light	Off: No data is sent from the Console/CMM port Flashing: Console/CMM port has data sending
	RJ45 comes with a green light	Off: No data is received at the Console/CMM port Flashing: Console/CMM port has data reception

A3 SFU Card Specifications

The SFU card is the switching network unit of the NSS11500 switch, which is responsible for the exchange of service data between LPU cards.

A3.1 NSM115-SFUB(V1)

The schematic diagram of the NSM115-SFUB (V1) card panel is as follows:



CL1513

Appendix Figure A-5NSM115-SFUB (V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUB (V1) card are shown in the table below:

Appendix Table A-14Meanings of the indicators on the NSM115-SFUB (V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz

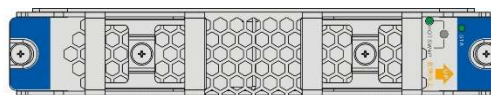
Name	LED Color	Status Description
		Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
HOT SWAP	blue	On: Indicates that the board is safe to be removed. Off: The board cannot be safely removed.
HOT SWAP button	--	Long press (8s): until the blue HOT SWAP light turns on, indicating that the swap card can be pulled out safely.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.2 NSM115-SFUB-XC(V1)

The schematic diagram of the NSM115-SFUB-XC(V1) card panel is as follows:



CL1513

Appendix Figure A-6NSM115-SFUB-XC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUB-XC(V1) card are shown in the following table:

Appendix Table A-15Meanings of the indicators on NSM115-SFUB-XC(V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.

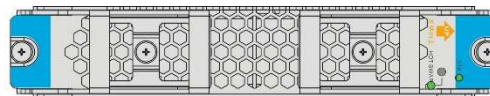
Name	LED Color	Status Description
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
HOT SWAP	blue	On: Indicates that the board is safe to be removed. Off: The board cannot be safely removed.
HOT SWAP button	--	Long press (8s): until the blue HOT SWAP light turns on, indicating that the swap card can be pulled out safely.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.3 NSM115-SFUB-EX(V1)

The diagram of the NSM115-SFUB -EX(V1) card panel is as follows:



CL1514

Appendix Figure A-7 NSM115 -SFUB-EX(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUB-EX(V1) card are shown in the following table:

Appendix Table A-16 Meanings of Indicators on the NSM115-SFUB-EX(V1) Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in

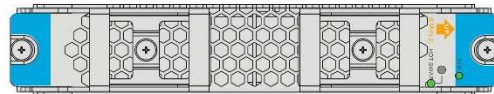
Name	LED Color	Status Description
		the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
HOT SWAP	blue	On: Indicates that the board is safe to be removed. Off: The board cannot be safely removed.
HOT SWAP button	--	Long press (8s): until the offline blue light is on, indicating that the switch card can be removed safely.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.4 NSM115-SFUB-EX-XC(V1)

The diagram of the NSM115-SFUB-EX-XC (V1) card panel is as follows:



CL1514

Appendix Figure A-8 NSM115-SFUB-EX-XC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUB-EX-XC(V1) card are shown in the following table:

Appendix Table A-17 Meanings of Indicators on the NSM115-SFUB-EX-XC(V1) Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz.

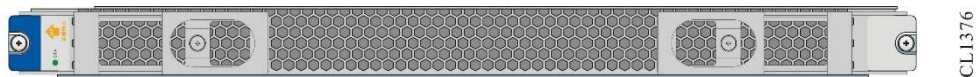
Name	LED Color	Status Description
		Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
HOT SWAP	blue	On: Indicates that the board is safe to be removed. Off: The board cannot be safely removed.
HOT SWAP button	--	Long press (8s): until the offline blue light is on, indicating that the switch card can be removed safely.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.5 NSM115-SFU C (V1)

The schematic diagram of the NSM115-SFUC(V1) card panel is as follows:



Appendix Figure A-9NSM115-SFUC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUC(V1) card are shown in the table below:

Appendix Table A-18Meanings of indicators on the NSM115-SFUC(V1) card

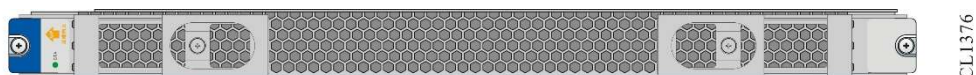
Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.6 NSM115-SFUC-XC(V1)

The schematic diagram of the NSM115-SFUC-XC(V1) card panel is as follows:



Appendix Figure A-10 NSM115-SFUC-XC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUC-XC(V1) card are shown in the following table:

Appendix Table A-19 Meanings of indicators on the NSM115-SFUC-XC(V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has

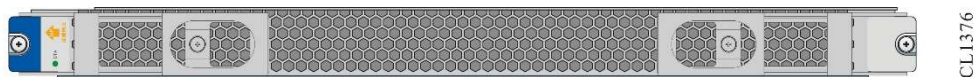
Name	LED Color	Status Description
		a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.7 NSM115-SFUD (V1)

The schematic diagram of the NSM115-SFUD (V1) card panel is as follows:



Appendix Figure A-11 Schematic Diagram of NSM115-SFUD(V1) Card Panel

The meanings of the indicators on the NSM115-SFUD(V1) card are shown in the table below:

Appendix Table A-20 Meanings of the indicators on NSM115-SFUD(V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.8 NSM115-SFUD-XC(V1)

The schematic diagram of the NSM115-SFUD-XC (V1) card panel is as follows:



Appendix Figure A-12 NSM115-SFUD-XC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUD-XC(V1) card are shown in the table below:

Appendix Table A-21 Meanings of the indicators on NSM115-SFUD-XC(V1) card

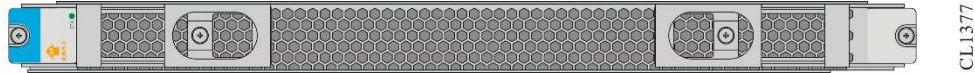
Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.9 NSM115-SFUD-EX(V1)

The diagram of the NSM115-SFUD-EX(V1) card panel is as follows:



Appendix Figure A-13 NSM115-SFUD-EX(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFU D -EX(V1) card are shown in the following table:

Appendix Table A-22 Meanings of the indicators on NSM115-SFUD-EX(V1) card

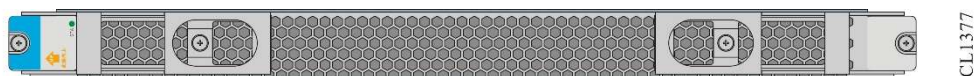
Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.10 NSM115-SFUD-EX-XC(V1)

The diagram of the NSM115-SFUD-EX-XC (V1) card panel is as follows:



Appendix Figure A-14 NSM115-SFUD-EX-XC(V1) card panel diagram

The meanings of the indicators on the NSM115-SFUD-EX-XC(V1) card are shown in the following table:

Appendix Table A-23 Meanings of the indicators on NSM115-SFUD-EX-XC(V1) card

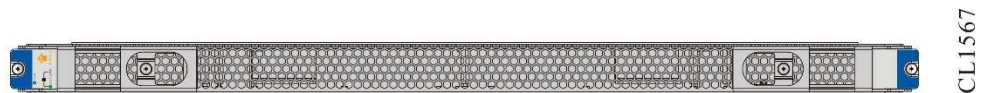
Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: Bootloader is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.11 NSM115-SFUF(V1)

The schematic diagram of the NSM115-SFUF (V1) card panel is as follows:



Appendix Figure A-15 Schematic Diagram of NSM115-SFUF(V1) Card Panel

The meanings of the indicators on the NSM115-SFUF(V1) card are shown in the following table:

Appendix Table A-24 Meanings of indicators on the NSM115-SFUF(V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: the monitor is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.12 NSM115-SFUF-XC(V1)

The schematic diagram of the NSM115-SFUF-XC(V1) card panel is as follows:



Appendix Figure A-16NSM115-SFUF-XC(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUF-XC(V1) card are shown in the following table:

Appendix Table A-25Meanings of the indicators on NSM115-SFUF-XC(V1) card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: the monitor is starting, 5Hz

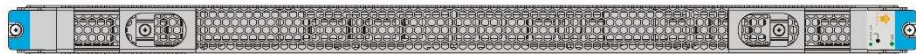
Name	LED Color	Status Description
		Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

 **Note**

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.13 NSM115-SFUF-EX(V1)

The diagram of the NSM115-SFUF-EX(V1) card panel is as follows:



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Appendix Figure A-17 NSM115-SFUF-EX(V1) Card Panel Diagram

The meanings of the indicators on the NSM115-SFUF-EX(V1) card are shown in the following table:

Appendix Table A-26 Meanings of Indicators on the NSM115-SFUF-EX(V1) Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz.
		Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: the monitor is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

A3.14 NSM115-SFUF-EX-XC(V1)

The diagram of the NSM115-SFUF-EX-XC (V1) card panel is as follows:



Appendix Figure A-18 Schematic diagram of NSM115-SFUF-EX-XC(V1) card panel

The meanings of the indicators on the NSM115-SFUF-EX-XC(V1) card are as follows:

Appendix Table A-27 Meanings of Indicators on the NSM115-SFUF-EX-XC(V1) Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally, 0.5Hz. Fast flashing: Indicates that the board is in the IOS loading state, 5Hz.
	red	Fast flashing: the monitor is starting, 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.

Note

- There is also an LED on the panel of the fan frame to indicate the status of the SFU card in the corresponding slot. The status definition is consistent with the STA definition on the panel of the SFU card itself.

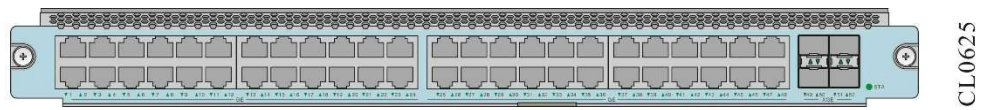
A4 LPU Card Specifications

LPU: Line Processing Unit, which provides a variety of different interface forms for users to choose to meet the needs of various application scenarios.

A4.1 NSM115-48GET4XGEF-DA(V1)

NSM115-48GET4XGEF-DA(V1) interface card is an interface card composed of Gigabit Ethernet signal card and 10 Gigabit Ethernet optical signal. This card supports 48 10Base-T/100Base-TX/1000Base-T RJ45 interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interface.

The panel diagram of NSM115-48GET4XGEF-DA(V1) is as follows:



Appendix Figure A-19 NSM115-48GET4XGEF-DA(V1) card panel diagram

The introduction of the NSM115-48GET4XGEF-DA(V1) interface card is shown in the following table:

Appendix Table A-28 NSM115-48GET4XGEF-DA(V1) interface card interface introduction

Interface Name	Description
GET: 1~48	10Base-T/100Base-TX/1000Base-T RJ45 interface
XGEF: 49~52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-48GET4XGEF-DA(V1) interface card are as follows:

Appendix table A-29 Meanings of the indicators on NSM115-48GET4XGEF-DA(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz

Name	LED Color	Status Description
		Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time

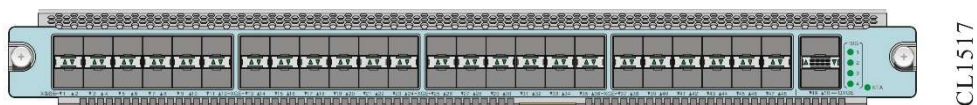
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.2 NSM115-48XGEF2QXGE-DA(V1)

The NSM115-48XGEF2QXGE-DA(V1) interface card is an interface card composed of 10 Gigabit Ethernet optical signals and 40G Ethernet optical signals. This card supports 48 10GBASE-SR/LR/ER/CR SFP+ optical interfaces and two 40GBASE-SR4 /LR4/CR4 QSFP+ optical interface.

The panel diagram of NSM115-48XGEF2QXGE-DA(V1) is as follows:



Appendix Figure A-20NSM115-48XGEF2QXGE-DA(V1) Card Panel Diagram

The interface introduction of the NSM115-48XGEF2QXGE-DA(V1) interface card is shown in the following table:

Appendix Table A-30 Introduction to NSM115-48XGEF2QXGE-DA(V1) Interface Card Interface

Interface Name	Description
XGEF: 1 ~48	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module
QXGE: 49~50	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-48XGEF2QXGE-DA(V1) interface card are as follows:

Appendix Table A-31 Meanings of indicators on the NSM115-48XGEF2QXGE-DA(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received

Name	LED Color	Status Description
		Flashing: 40G port is linked, data is being sent and received at the same time

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.3 NSM115-16QXGE-DA(V1)

The NSM115-16QXGE-DA(V1) interface card is a 40G Ethernet optical signal interface card. This card supports 16 40GBASE-SR4/LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-16QXGE-DA(V1) is as follows:



Appendix Figure A-21 Schematic diagram of NSM115-16QXGE-DA(V1) card panel

The interface introduction of the NSM115-16QXGE-DA(V1) interface card is shown in the following table:

Appendix Table A-32 Introduction to NSM115-16QXGE-DA(V1) interface card interface

Interface Name	Description
1~16	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-16QXGE-DA(V1) interface card are shown in the following table:

Appendix table A-33 Meanings of Indicators on the NSM115-16QXGE-DA(V1) Interface Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in

Name	LED Color	Status Description
		the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 40G port status indicator to indicate the current status of each 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

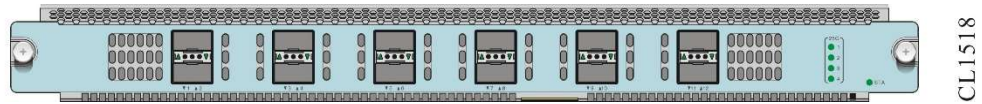
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.4 NSM115-12QFP-DA(V1)

The NSM115-12QFP-DA(V1) interface card is a 100G Ethernet optical signal interface card. This card supports 12 100GBase-SR4/LR4 QSFP28 optical interfaces.

The panel diagram of NSM115-12QFP-DA(V1) is as follows:



Appendix Figure A-22 NSM115-12QFP-DA(V1) Card Panel Diagram

The interface introduction of NSM115-12QFP-DA(V1) interface card is shown in the following table:

Appendix Table A-34 Introduction to NSM115-12QFP-DA(V1) interface card interface

Interface Name	Description
1~12	100GBase-SR4/LR4 QSFP28 optical interface

The meanings of the indicators on the NSM115-12QFP-DA(V1) interface card are shown in the following table:

Appendix table A-35 Meanings of Indicators on the NSM115-12QFP-DA(V1) Interface Card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP 28 comes with LED)	green	Off: The 100G port is not linked On: The 100G port is linked, but no data is being sent or received

Name	LED Color	Status Description
		Flashing: 100G port is linked, data is being sent and received at the same time
1/4 indicator	green	<p>The BREAKOUT light cooperates with the 100G port status indicator to indicate the current status of each 25G or 10G port after 1/4:</p> <p>When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface.</p> <p>When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface.</p> <p>When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface.</p> <p>When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface.</p> <p>Off: The port is not split</p>

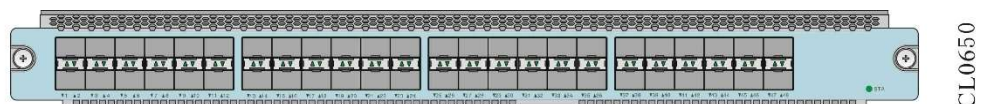
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.5 NSM115-48XGEF-EC(V1)

The NSM115-48XGEF-EC(V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 48 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-48XGEF-EC(V1) is as follows:



Appendix Figure A-23 NSM115-48XGEF-EC(V1) Card Panel Diagram

The interface introduction of NSM115-48XGEF-EC(V1) interface card is shown in the following table:

Appendix Table A-36 Introduction to NSM115-48XGEF-EC(V1) Interface Card Interface

Interface Name	Description
XGEF: 1~48	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module
QXGE: 49~50	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-48XGEF-EC(V1) interface card are shown in the following table:

Appendix Table A-37 Meanings of indicators on the NSM115-48XGEF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time

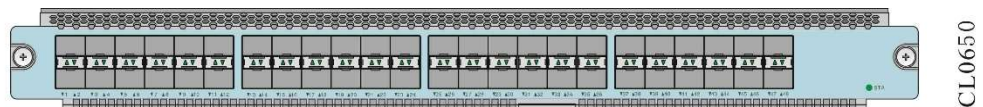
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.6 NSM115-48XGEFC-XC(V1)

The NSM115-48XGEFC-XC (V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 48 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-48XGEFC-XC (V1) is as follows:



Appendix Figure A-24 NSM115-48XGEFC-XC(V1) Card Panel Diagram

The interface introduction of NSM115-48XGEFC-XC(V1) interface card is shown in the following table:

Appendix Table A-38 Introduction to NSM115-48XGEFC-XC(V1) Interface Card Interface

Interface Name	Description
XGEF: 1 ~48	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module
QXGE: 49~50	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-48XGEFC-XC(V1) interface card are as follows:

Appendix Table A-39 Meanings of the indicators on the NSM115-48XGEFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz

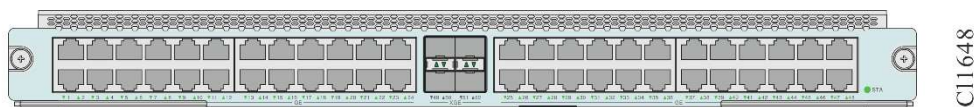
Name	LED Color	Status Description
		Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: The 40G port is linked, but no data is being sent or received Flashing: The 40G port is linked, data is being sent and received at the same time

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.7 NSM115-40GET8LT4XF-EC(V1)

NSM115-40GET8LT4XF-EC (V1) interface card is an interface card composed of Gigabit Ethernet signal, 2.5G Ethernet signal and 10 Gigabit Ethernet optical signal. This card supports 40 10Base-T/100Base-TX/1000Base-T RJ45 Interface, eight 0/100/1000M/2.5G Base-T electrical interfaces (support POE/POE+/POE++ 802.3af/at/bt) and four 10GBASE-SR/LR/ER/CR SFP+ optical interfaces. The panel diagram of NSM115-40GET8LT4XF-EC(V1) is as follows:



Appendix Figure A-25 NSM115-40GET8LT4XF-EC(V1) Card Panel Diagram

The interface introduction of the NSM115-40GET8LT4XF-EC(V1) interface card is shown in the following table:

Appendix Table A-40 Introduction to NSM115-40GET8LT4XF-EC(V1) interface card interface

Interface Name	Description
1~ 24	100GBase-SR4/LR4 QSFP28 optical interface

The meanings of the indicators on the NSM115-40GET8LT4XF-EC(V1) interface card are as follows:

Appendix table A-41 Meanings of the indicators on NSM115-40GET8LT4XF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP 28 comes with LED)	green	Off: The 100G port is not linked On: The 100G port is linked, but no data is being sent or received Flashing: 100G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 100G port status indicator to indicate the current status of each 25G or 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each

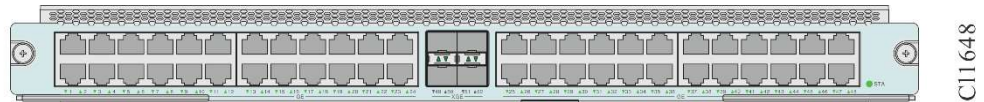
Name	LED Color	Status Description
		interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.8 NSM115-40GETP8LTP4XFC-XC(V1)

NSM115-40GETP8LTP4XFC-XC (V1) interface card is an interface card composed of Gigabit Ethernet signal, 2.5G Ethernet signal and 10 Gigabit Ethernet optical signal. This card supports 40 10Base-T/100Base-TX/1000Base-T RJ45 Interface, eight 0/100/1000M/2.5G Base-T electrical interfaces (support POE/POE+/POE++ 802.3af/at/bt) and four 10GBASE-SR/LR/ER/CR SFP+ optical interfaces. The panel diagram of NSM115-40GETP8LTP4XFC-XC(V1) is as follows:



Appendix Figure A-26 NSM115-40GETP8LTP4XFC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-40GETP8LTP4XFC-XC(V1) interface card is shown in the following table:

Appendix Table A-42 Introduction to NSM115-40GETP8LTP4XFC-XC(V1) interface card interface

Interface Name	Description
1~24	100GBase-SR4/LR4 QSFP28 optical interface

The meanings of the indicators on the NSM115-40GETP8LTP4XFC-XC(V1) interface card are as follows:

Appendix table A-43 Meanings of the indicators on NSM115-40GETP8LTP4XFC-XC(V1)

interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP 28 comes with LED)	green	Off: The 100G port is not linked On: The 100G port is linked, but no data is being sent or received Flashing: 100G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 100G port status indicator to indicate the current status of each 25G or 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

 **Note**

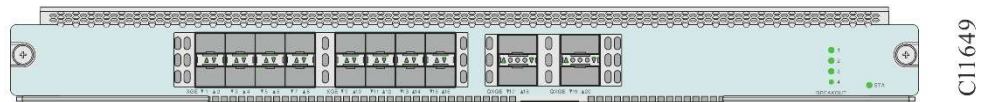
- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status

of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.9 NSM115-16XGEF4QXGE-EC(V1)

The NSM115-16XGEF4QXGE-EC(V1) interface card is an interface card composed of 10 Gigabit Ethernet optical signals and 40G Ethernet optical signals. This card supports 16 10GBASE-SR/LR/ER/CR SFP+ optical interfaces and four 40GBASE-SR4/LR4/CR4 QSFP+ optical interface.

The panel diagram of NSM115-16XGEF4QXGE-EC(V1) is as follows:



Appendix Figure A-27 NSM115-16XGEF4QXGE-EC(V1) Card Panel Diagram

The interface introduction of the NSM115-16XGEF4QXGE-EC(V1) interface card is shown in the following table:

Appendix Table A-44 Introduction to NSM115-16XGEF4QXGE-EC(V1) interface card interface

Interface Name	Description
1~ 36	100GBase-SR4/LR4 QSFP28 optical interface

The meanings of the indicators on the NSM115-16XGEF4QXGE-EC(V1) interface card are as follows:

Appendix table A-45 Meanings of the indicators on the NSM115-16XGEF4QXGE-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz
		Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz
Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz		
Off		It indicates that the board is not powered on, or the board is powered on but not

Name	LED Color	Status Description
		loaded normally.
LINK/ACT (QSFP 28 comes with LED)	green	Off: The 100G port is not linked On: The 100G port is linked, but no data is being sent or received Flashing: 100G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 100G port status indicator to indicate the current status of each 25G or 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

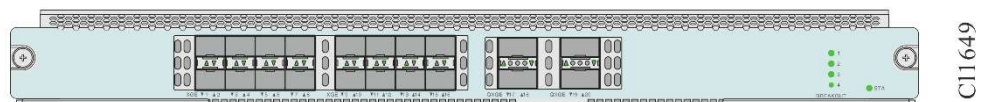
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.10 NSM115-16XGEF4QXGEC-XC(V1)

The NSM115-16XGEF4QXGEC-XC (V1) interface card is an interface card composed of 10 Gigabit Ethernet optical signals and 40G Ethernet optical signals. This card supports 16 10GBASE-SR/LR/ER/CR SFP+ optical interfaces and four 40GBASE-SR4 / LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-16XGEF4QXGEC-XC(V1) is as follows:



Appendix Figure A-28 NSM115-16XGEF4QXGEC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-16XGEF4QXGEC-XC(V1) interface card is shown in the following table:

Appendix Table A-46 Introduction to NSM115-16XGEF4QXGEC-XC(V1) interface card interface

Interface Name	Description
1~ 36	100GBase-SR4/LR4 QSFP28 optical interface

The meanings of the indicators on the NSM115-16XGEF4QXGEC-XC(V1) interface card are as follows:

Appendix table A-47 Meanings of the indicators on NSM115-16XGEF4QXGEC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP 28 comes with LED)	green	Off: The 100G port is not linked On: The 100G port is linked, but no data is being sent or received Flashing: 100G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 100G port status indicator to indicate the current status of each 25G or 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface.

Name	LED Color	Status Description
		<p>When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface.</p> <p>When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface.</p> <p>When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface.</p> <p>Off: The port is not split</p>

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.11 NSM115-12QXGE-EC(V1)

NSM115-12QXGE-EC (V1) interface card is a 40G Ethernet optical signal interface card. This card supports 16 40GBASE-SR4/LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-12QXGE- EC (V1) is as follows:



Appendix Figure A-29 NSM115-1 2 QXGE- EC (V1) card panel diagram

The interface introduction of NSM115-12QXGE- EC (V1) interface card is shown in the following table:

Appendix Table A-48 Introduction to NSM115-1 2 QXGE- EC (V1) interface card interface

Interface Name	Description
1~16	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-12QXGE- EC (V1) interface card are shown in the following table:

Appendix table A-49 NSM115-1 2 Meanings of the indicators on the QXGE- EC (V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP+ with LED) comes	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 40G port status indicator to indicate the current status of each 25G or 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

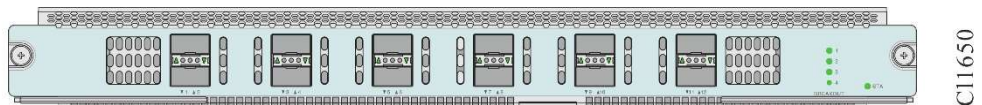


- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.12 NSM115-12QXGEC-XC(V1)

The NSM115-12QXGEC-XC (V1) interface card is a 40G Ethernet optical signal interface card. This card supports 16 40GBASE-SR4/LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-12QXGEC-XC (V1) is as follows:



Appendix Figure A-30 NSM115-12QXGEC-XC(V1) Card Panel Diagram

The interface introduction of NSM115-12QXGEC-XC(V1) interface card is shown in the following table:

Appendix Table A-50 Introduction to NSM115-12QXGEC-XC(V1) interface card interface

Interface Name	Description
1~16	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-12QXGEC-XC(V1) interface card are shown in the following table:

Appendix table A-51 Meanings of the indicators on NSM115-12QXGEC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz
		Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not

Name	LED Color	Status Description
		loaded normally.
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 40G port status indicator to indicate the current status of each 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

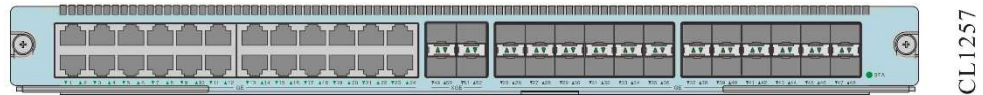
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.13 NSM115-24GET24GEF4XF-EC(V1)

NSM115-24GET24GEF4XF-EC(V1) interface card is an interface card composed of Gigabit Ethernet electrical signals, Gigabit Ethernet optical signals and 10 Gigabit Ethernet optical signals. This card supports 24 10Base-T/100Base-TX/1000Base-T RJ45 interface, 24 1000BASE-X SFP optical interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-24GET24GEF4XF-EC(V1) is as follows:



Appendix Figure A-31 NSM115-24GET24GEF4XF-EC(V1) Card Panel Diagram

The interface introduction of NSM115-24GET24GEF4XF-EC(V1) interface card is shown in the table below:

Appendix Table A-52 Introduction to NSM115-24GET24GEF4XF-EC(V1) interface card interface

Interface Name	Description
GE T: 1~24	10Base-T/100Base-TX/1000Base-T RJ45 interface
GEF: 25~48	1000BASE-X SFP optical interface
XGEF: 49 ~ 52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115- 24GET24GEF4XF-EC(V1) interface card are shown in the following table:

Appendix table A-53 Meanings of the indicators on the NSM115-24GET24GEF4XF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a

Name	LED Color	Status Description
		connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.14 NSM115-24GET24GEF4XFC-XC(V1)

NSM115-24GET24GEF4XFC-XC (V1) interface card is an interface card composed of Gigabit Ethernet electrical signal, Gigabit Ethernet optical signal and 10 Gigabit Ethernet optical signal. This card supports 24 10Base-T/100Base-TX/1000Base-T RJ45 interface, 24 1000BASE-X SFP optical interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-24GET24GEF4XFC-XC(V1) is as follows:



Appendix Figure A-32 NSM115-24GET24GEF4XFC-XC(V1) card panel diagram

The meanings of the indicators on the NSM115-24GET24GEF4XFC-XC(V1) interface card is shown in the following table:

Appendix Table A-54 Introduction to NSM115-24GET24GEF4XFC-XC(V1) interface card interface

Interface Name	Description
GE T: 1~24	10Base-T/100Base-TX/1000Base-T RJ45 interface
GEF: 25~48	1000BASE-X SFP optical interface

Interface Name	Description
XGEF: 49 ~ 52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-24GET24GEF4XFC-XC(V1) interface card are shown in the following table:

Appendix table A-55 Meanings of the indicators on NSM115-24GET24GEF4XFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time



Note

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.15 NSM115-16XGEF-EC(V1)

The NSM115-16XGEF-EC(V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 16 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-16XGEF-EC(V1) is as follows:



Appendix Figure A-33NSM115-16XGEF-EC(V1) Card Panel Diagram

The interface introduction of the NSM115-16XGEF-EC(V1) interface card is shown in the following table:

Appendix Table A-56Introduction to NSM115-16XGEF-EC(V1) interface card interface

Interface Name	Description
XGEF: 1~16	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-16XGEF-EC(V1) interface card are shown in the following table:

Appendix Table A-57Meanings of the indicators on the NSM115-16XGEF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz
		Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz
Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz		
	Off	It indicates that the board is not powered on, or the board is powered on but not

Name	LED Color	Status Description
		loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time

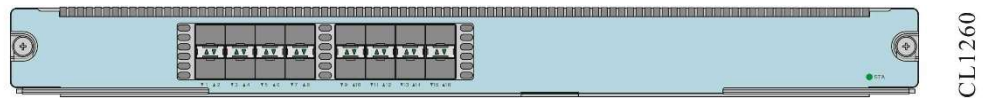
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.16 NSM115-16XGEFC-XC(V1)

The NSM115-16XGEFC-XC (V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 16 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-16XGEFC-XC(V1) is as follows:



Appendix Figure A-34NSM115-16XGEFC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-16XGEFC-XC(V1) interface card is shown in the following table:

Appendix Table A-58Introduction to NSM115-16XGEFC-XC(V1) interface card interface

Interface Name	Description
XGEF: 1~16	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-16XGEFC-XC(V1) interface card are as follows:

Appendix Table A-59 Meanings of the indicators on the NSM115-16XGEFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time

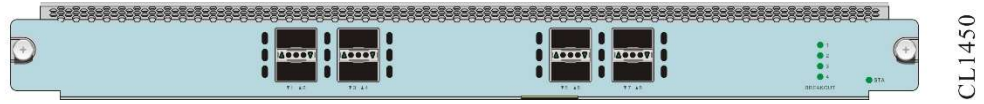
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.17 NSM115-8QXGE-EC(V1)

NSM115- 8 QXGE- EC (V1) interface card is a 40G Ethernet optical signal interface card. This card supports eight 40GBASE-SR4/LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-8QXGE-EC(V1) is as follows:



Appendix Figure A-35 NSM115-8QXGE-EC(V1) Card Panel Diagram

The interface introduction of NSM115-8QXGE-EC(V1) interface card is shown in the following table:

Appendix Table A-60 Introduction to NSM115-8QXGE-EC(V1) interface card interface

Interface Name	Description
1~8	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-8QXGE-EC(V1) interface card are shown in the following table:

Appendix table A-61 Meanings of the indicators on NSM115-8QXGE-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 40G port status indicator to indicate the current status of each 10G port after 1/4: When light 1 is on, the indicator of each

Name	LED Color	Status Description
		interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.18 NSM115-8QXGEC-XC(V1)

The NSM115-8QXGEC-XC (V1) interface card is a 40G Ethernet optical signal interface card. This card supports eight 40GBASE-SR4/LR4/CR4 QSFP+ optical interfaces.

The panel diagram of NSM115-8QXGEC-XC (V1) is as follows:



Appendix Figure A-36 NSM115-8QXGEC-XC (V1) card panel diagram

The interface introduction of NSM115-8QXGEC-XC(V1) interface card is shown in the following table:

Appendix Table A-62 Introduction to NSM115-8QXGEC-XC(V1) interface card interface

Interface Name	Description
1~8	40GBASE-SR4/LR4/CR4 QSFP+ optical interface

The meanings of the indicators on the NSM115-8QXGEC-XC(V1) interface card are shown in the following table:

Appendix table A-63 Meanings of the indicators on NSM115-8QXGEC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time
1/4 indicator	green	The BREAKOUT light cooperates with the 40G port status indicator to indicate the current status of each 10G port after 1/4: When light 1 is on, the indicator of each interface indicates the status of the first interface in the interface. When light 2 is on, the indicator of each interface indicates the status of the second interface in the interface. When light 3 is on, the indicator of each interface indicates the status of the third interface in the interface. When light 4 is on, the indicator of each interface indicates the status of the fourth interface in the interface. Off: The port is not split

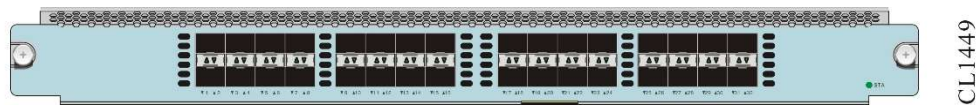
Note

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.19 NSM115-32XGEF-EC(V1)

The NSM115-32XGEF-EC(V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 32 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-32XGEF-EC(V1) is as follows:



Appendix Figure A-37NSM115-32XGEF-EC(V1) Card Panel Diagram

The interface introduction of the NSM115-32XGEF-EC(V1) interface card is shown in the following table:

Appendix Table A-64Introduction to NSM115-32XGEF-EC(V1) interface card interface

Interface Name	Description
XGEF: 1~32	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-32XGEF-EC(V1) interface card are shown in the following table:

Appendix Table A-65Meanings of the indicators on the NSM115-32XGEF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot

Name	LED Color	Status Description
		be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time

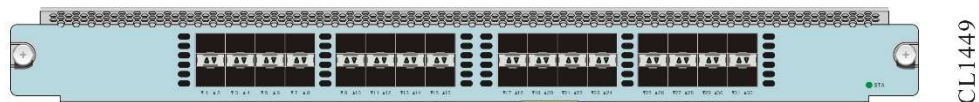
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.20 NSM115-32XGEFC-XC(V1)

The NSM115-32XGEFC-XC (V1) interface card is a 10 Gigabit Ethernet optical signal interface card. This card supports 32 10GBASE-SR/LR/ER/CR SFP+ optical interfaces.

The panel diagram of NSM115-32XGEFC-XC (V1) is as follows:



Appendix Figure A-38 NSM115-32XGEFC-XC(V1) Card Panel Diagram

The interface introduction of NSM115-32XGEFC-XC(V1) interface card is shown in the following table:

Appendix Table A-66 Introduction to NSM115-32XGEFC-XC(V1) interface card interface

Interface Name	Description
XGEF: 1~32	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-32XGEFC-XC(V1) interface card are shown in the following table:

Appendix Table A-67 Meanings of the indicators on the NSM115-32XGEFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (SFP+ comes with LED)	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time
LINK/ACT (QSFP+ comes with LED)	green	Off: The 40G port is not linked On: the 40G port is linked, but no data is being sent or received Flashing: 40G port is linked, data is being sent and received at the same time

 **Note**

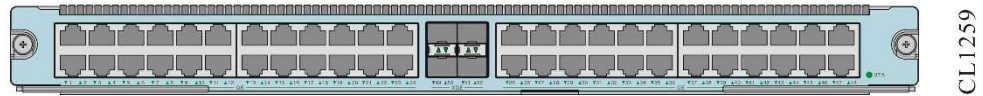
- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-

numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.21 NSM115-48GET4XGEF-EC(V1)

The NSM115-48GET4XGEF- EC (V1) interface card is an interface card composed of a Gigabit Ethernet signal card and a 10 Gigabit Ethernet optical signal. This card supports 48 10Base-T/100Base-TX/1000Base-T RJ45 interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interface.

The panel diagram of NSM115-48GET4XGEF-EC(V1) is as follows:



Appendix Figure A-39 NSM115-48GET4XGEF- EC (V1) Card Panel Diagram

The interface introduction of NSM115-48GET4XGEF- EC (V1) interface card is shown in the following table:

Appendix Table A-68 Introduction to NSM115-48GET4XGEF- EC (V1) interface card interface

Interface Name	Description
GET: 1~48	10Base-T/100Base-TX/1000Base-T RJ45 interface
XGEF: 49~52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-48GET4XGEF-EC(V1) interface card are shown in the following table:

Appendix table A-69 Meanings of the indicators on NSM115-48GET4XGEF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board

Name	LED Color	Status Description
		has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: The 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: The 10G port is linked, data is being sent and received at the same time

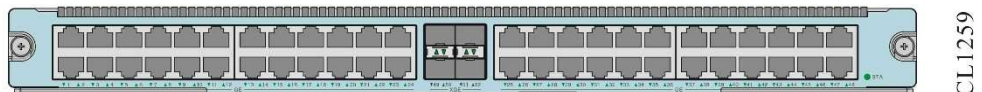
 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.22 NSM115-48GET4XGEFC-XC(V1)

The NSM115-48GET4XGEFC-XC (V1) interface card is an interface card composed of a Gigabit Ethernet signal card and a 10 Gigabit Ethernet optical signal. This card supports 48 10Base-T/100Base-TX/1000Base-T RJ45 interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interface.

The panel diagram of NSM115-48GET4XGEFC-XC (V1) is as follows:



Appendix Figure A-40 NSM115-48GET4XGEFC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-48GET4XGEFC-XC(V1) interface card is shown in the following table:

Appendix Table A-70 Introduction to NSM115-48GET4XGEFC-XC(V1) interface card

interface

Interface Name	Description
GE T: 1~48	10Base-T/100Base-TX/1000Base-T RJ45 interface
XGEF: 49~52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-48GET4XGEFC-XC(V1) interface card are as follows:

Appendix table A-71 Meanings of the indicators on NSM115-48GET4XGEFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: The 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time

 **Note**

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.23 NSM115-48GEF4XGEF-EC(V1)

NSM115-48GEF4XGEF-EC(V1) interface card is an interface card composed of Gigabit Ethernet electrical signal card and 10 Gigabit Ethernet optical signal. This card supports 48 1000BASE-X SFP optical interfaces and four 10GBASE-SR/LR/ER/CR SFP+ optical interface.

The panel diagram of NSM115-48GE F 4XGEF- EC (V1) is as follows:



Appendix Figure A-41 NSM115-48GET4XGEFC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-48GE F 4XGEF- EC (V1) interface card is shown in the following table:

Appendix Table A-72 Introduction to NSM115-48GE F 4XGEF- EC (V1) interface card interface

Interface Name	Description
GE T: 1~48	10Base-T/100Base-TX/1000Base-T RJ45 interface
XGEF: 49~52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-48GEF4XGEF-EC(V1) interface card are as follows:

Appendix table A-73 Meanings of the indicators on NSM115-48GE F 4XGEF-EC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in

Name	LED Color	Status Description
		the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with LED)	green	Off: The 10G port is not linked On: The 10G port is linked, but no data is being sent or received Flashing: 10G port is linked, data is being sent and received at the same time

Note

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A4.24 NSM115-48GEF4XGEFC-XC(V1)

The NSM115-48GEF4XGEFC-XC (V1) interface card is an interface card composed of a Gigabit Ethernet signal card and a 10 Gigabit Ethernet optical signal. This card supports 48 1000BASE-X SFP optical interfaces and four 10GBASE -SR/LR/ER/ CR SFP+ optical interface.

The panel diagram of NSM115-48GEF4XGEFC-XC (V1) is as follows:



Appendix Figure A-42 NSM115-48GET4XGEFC-XC(V1) Card Panel Diagram

The interface introduction of the NSM115-48GEF4XGEFC-XC(V1) interface card is shown in the following table:

Appendix Table A-74 Introduction to NSM115-48GEF4XGEFC-XC(V1) interface card interface

Interface Name	Description
GE T: 1~48	10Base-T/100Base-TX/1000Base-T RJ45 interface
XGEF: 49~52	10GBASE-SR/LR/ER/CR SFP+ optical interface Support 1000BASE-X SFP optical module

The meanings of the indicators on the NSM115-48GEF4XGEFC-XC(V1) interface card are as follows:

Appendix table A-75 Meanings of the indicators on the NSM115-48GEF4XGEFC-XC(V1) interface card

Name	LED Color	Status Description
STA	green	Flashing slowly: Indicates that the board is running normally. 0.5Hz Fast flashing: Indicates that the board is in the IOS loading state. 5Hz
	red	Fast flashing: Bootloader is starting. 5Hz Flashing slowly: Indicates that the board has a fault that affects services and cannot be recovered automatically. 0.5Hz
	Off	It indicates that the board is not powered on, or the board is powered on but not loaded normally.
LINK/ACT (RJ45 bottom LED)	green	Off: The link interface of the GE port is not connected On: GE port link interface has established a connection Flashing: Data is being sent or received on the link interface of the GE port
LINK/ACT (SFP+ comes with	green	Off: the 10G port is not linked On: The 10G port is linked, but no data is

Name	LED Color	Status Description
LED)		being sent or received Flashing: 10G port is linked, data is being sent and received at the same time

Note

- There are two types of port indicators: ▲ and ▼. ▲ indicates the status of even-numbered ports such as 2, 4, 6, etc. on the upper layer, and ▼ indicates the status of odd-numbered ports such as 1, 3, 5, etc. on the lower layer.

A5 Power Module Specifications

The power modules supported by NSS11500 series switches are as follows:

	Specification	Overview
4 slots	AD800M-HV1B(V1)	AC power module, 800W
	AD1600M-HV0B(V1)	AC power module, 1600W
	DD1600M-5V0B(V1)	DC power module, 1600W
8 slots	AD800-1D005M (V1)	AC power module, 800W
	AD1600-1D005M (V2)	AC power module, 1600W
	DD1600M-5V1F (V1)	DC power module, 1600W
12 slots	AD1600-1D005M (V2)	AC power module, 1600W
	DD1600M-5V1F (V1)	DC power module, 1600W

Caution

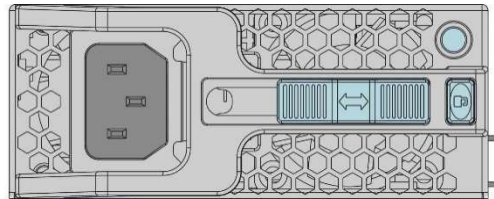
- When the power module is inserted into the chassis but does not provide power input to it. The system considers these power modules to be in a fault state, and

the system alarms.

- NSS11500 switches do not support mixed insertion of power modules of different models.

A5.1 AD800M-HV1B(V1) AC Power Module

The diagram of AD800M-HV1B(V1) AC power module panel is as follows:



CL0910

Appendix Figure A-43 AD800M-HV1B(V1) power module panel diagram

The meanings of the indicators on the AD800M-HV1B(V1) AC power module are shown in the following table:

Appendix Table A-76 Indicators on AD800M-HV1B(V1) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no AC power input, or the power cord is in poor contact, or the power supply is damaged.
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

The specifications of AD800M-HV1B(V1) AC power module are as follows:

Appendix Table A-77 AD800M-HV1B(V1) Power Module Specifications

Item	Data
Rated input voltage range	100V~240V AC 50/60Hz
Maximum input voltage range	90V~264V AC 47~63Hz
Output voltage	54V, 12V
Input current	AC 220V: 4A

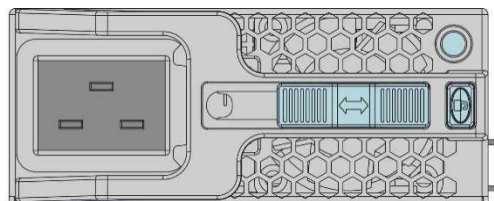
Item	Data
	AC110V: 5.5A
Max. output power	AC 220V: 800W AC110V: 600W

 **Note**

- When using 110V dual live wire input, the maximum output power of AD800-1D005M can also reach 800W.

A5.2 AD1600M-HV0B(V1) AC Power Module

The schematic diagram of AD1600M-HV0B(V1) AC power module panel is as follows:



CL0909

Appendix Figure A-44 AD1600M-HV0B(V1) power module panel diagram

The meanings of the indicators on the AD1600M-HV0B(V1) AC power module are shown in the following table:

Appendix Table A-78 Indicators on AD1600M-HV0B(V1) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no AC power input, or the power cord is in poor contact, or the power supply is damaged.
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

The specifications of AD1600M-HV0B(V1) AC power module are as follows:

Appendix Table A-79 AD1600M-HV0B(V1) Power Module Specifications

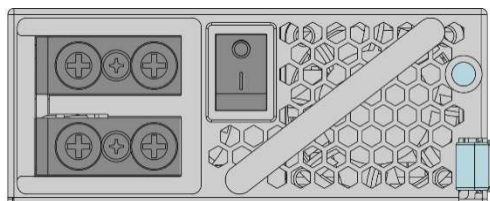
Item	Data
Rated input voltage range	100V~240V AC 50/60Hz
Maximum input voltage range	90V~264V AC 47~63Hz
Output voltage	54V, 12V
Input current	AC 220V: 8A AC110V: 11A
Maximum output power	AC 220V: 1600W AC110V: 1200W

 **Note**

- When using 110V dual live wire input, the maximum output power of AD1600M-HV0B(V1) can also reach 1600W.

A5.3 DD1600M-5V0B(V1) DC Power Module

The diagram of DD1600M-5V0B(V1) DC power module is as follows:



CL1142

Appendix Figure A-45 DD1600M-5V0B(V1) power module panel diagram

The meanings of the indicators on the DD1600M-5V0B(V1) DC power supply module are as follows:

Appendix Table A-80 Indicators on DD1600M-5V0B(V1) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no power input, or the power cord is in poor contact, or the power supply is damaged.

Name	LED Color	Status Description
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

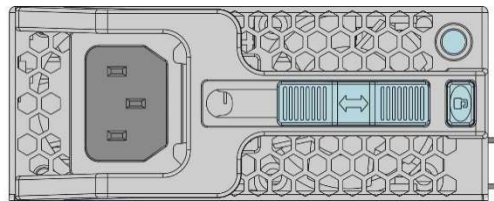
The specifications of the DD1600M-5V0B(V1) AC power module are as follows:

Appendix Table A-81 DD1600M-5V0B(V1) Power Module Specifications

Item	Data
Rated input voltage range	48V ~60V DC
Max. input voltage range	36V~72VDC
Output voltage	54V, 12V
Max. output power	36V~41V DC: 1200W 42V~72V DC: 1600W

A5.4 AD8 00-1D005M (V1) AC Power Module

The schematic diagram of AD800-1D005M (V1) AC power module panel is as follows:



CL0910

Appendix Figure A-46 AD800-1D005M (V1) power module panel diagram

The meanings of the indicators on the AD800-1D005M (V1) AC power supply module are as follows:

Appendix Table A-82 Indicators on AD800-1D005M (V1) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no AC power input, or the power cord is in poor contact, or the power supply is damaged.

Name	LED Color	Status Description
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

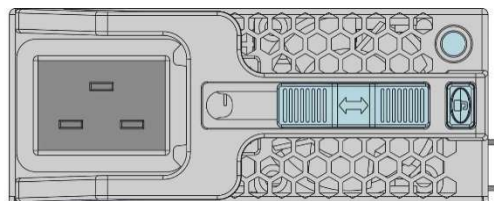
The specifications of AD800-1D005M (V1) AC power module are as follows:

Appendix Table A-83 AD800-1D005M (V1) Power Module Specifications

Item	Data
Rated input voltage range	100~240VAC 50/60Hz
Max. input voltage range	90~264VAC 47~63Hz
Output voltage	54V, 12V
Input current	100~240VAC/10A
Max. output power	800W

A5.5 AD1600-1D005M (V2) AC Power Module

The diagram of AD1600-1D005M (V2) AC power module panel is as follows:



CL0909

Appendix Figure A-47 AD1600-1D005M (V2) Power Module Panel Diagram

The meanings of the indicators on the AD1600-1D005M (V2) AC power module are as follows:

Appendix Table A-84 Indicators on AD1600-1D005M (V2) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no AC power input, or the power cord is in poor contact, or the power supply is damaged.

Name	LED Color	Status Description
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

The specifications of AD1600-1D005M (V2) AC power module are as follows:

Appendix Table A-85 AD1600-1D005M (V2) Power Module Specifications

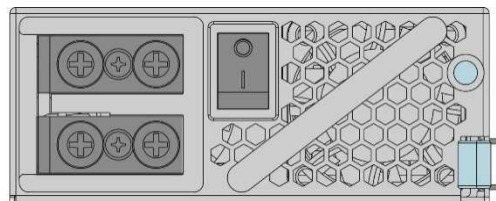
Item	Data
Rated input voltage range	100~240VAC 50/60Hz
Max. input voltage range	90~264VAC 47~63Hz
Output voltage	54V, 12V
Input current	220VAC: 9A 110VAC: 14A
Max. output power	220VAC: 1600W 110VAC: 1200W

 **Note**

- When using 110V dual live wire input, the maximum output power of AD1600-1D005M (V2) can also reach 1600W.

A5.6 DD1600M-5V1F (V1) DC Power Module

The diagram of DD1600M-5V1F (V1) DC power module is as follows:



CL1142

Appendix Figure A-48 DD1600M-5V1F (V1) power module panel diagram

The meanings of the indicators on the DD1600M-5V1F (V1) DC power module are as follows:

Appendix Table A-86 Indicators on DD1600M-5V1F (V1) power module

Name	LED Color	Status Description
POWER	Orange and green color	Off: There is no power input, or the power cord is in poor contact, or the power supply is damaged.
		Orange and on: There is an abnormality in the power supply output (overcurrent, overvoltage, overtemperature, fan damage, etc.)
		Green and on: The power supply is working normally

The specifications of the DD1600M-5V1F (V1) AC power module are as follows:

Appendix Table A-87 DD1600M-5V1F (V1) Power Module Specifications

Item	Data
Rated input voltage range	48V ~60V DC
Max. input voltage range	36V~72VDC
Output voltage	54V, 12V
Max. output power	36V~41V DC: 1200W 42V~72V DC: 1600W

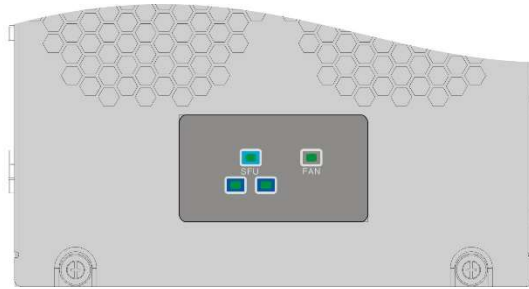
A6 Fan Module Specifications

The fan module is an important part to ensure the normal operation of the device system, and provides airflow for the system to dissipate heat. It consists of a fan frame, a fan, and a fan controller. Fan modules have the following specifications:

	Specification	Overview
4 slots	FAN-06A-01B(V1)	6U fan module
8 slots	FAN-15B-01B(V1)	15U fan module
12 slots	FAN-20A-01(V1)	20U fan module

A6.1 FAN-06A-01B(V1)

The schematic diagram of the FAN-06A-01B (V1) card panel is as follows:



CL1521

Appendix Figure A-49FAN-06A-01B(V1) Card Panel Diagram

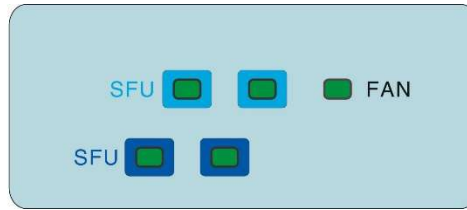
The meanings of the indicators on the FAN-06A-01B(V1) card are shown in the table below:

Appendix Table A-88Meanings of the indicators on FAN-06A-01B(V1) card

Name	LED Color	Status Description
FAN	red and green	Off: The fan is working abnormally/not working
		Green and on: The fan is working normally
		Red and on: The fan is working abnormally
SFU	green	Flashing slowly: The SFU board is running normally. 0.5Hz
		Fast flashing: The SFU board is in the IOS loading state. 5Hz
	red	Fast flashing: The bootloader of the SFU board is starting. 5Hz Flashing slowly: Indicates that the SFU board has a fault that affects services and cannot be automatically recovered. 0.5Hz
	Off	It indicates that the SFU board is not powered on, or the SFU board is powered on but not loaded normally.

A6.2 FAN-15B-01B(V1)

The schematic diagram of the FAN-15B-01B (V1) card panel is as follows:



CL1379

Appendix Figure A-50 Schematic diagram of the FAN-15B-01B(V1) card panel

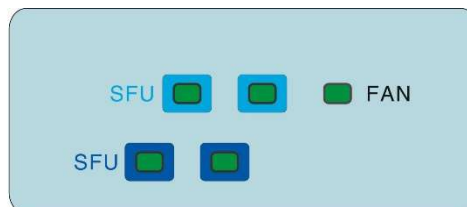
The meanings of the indicators on the FAN-15B-01B(V1) card are shown in the table below:

Appendix Table A-89 Meanings of the indicators on FAN-15B-01B(V1) card

Name	LED Color	Status Description
FAN	red and green	Off: The fan is working abnormally/not working Green and on: The fan is working normally Red and on: The fan is working abnormally
SFU	green	Flashing slowly: The SFU board is running normally. 0.5Hz Fast flashing: The SFU board is in the IOS loading state. 5Hz
	red	Fast flashing: The bootloader of the SFU board is starting. 5Hz Flashing slowly: Indicates that the SFU board has a fault that affects services and cannot be automatically recovered. 0.5Hz
	Off	It indicates that the SFU board is not powered on, or the SFU board is powered on but not loaded normally.

A6.3 FAN-20A-01(V1)

The schematic diagram of the FAN-20A-01(V1) card panel is as follows:



CL1379

Appendix Figure A-51 Schematic diagram of the FAN-20A-01(V1) card panel

The meanings of the indicators on the FAN-20A-01(V1) card are shown in the table below:

Appendix Table A-90 Meanings of the indicators on FAN-20A-01(V1) card

Name	LED Color	Status Description
FAN	red and green	Off: The fan is working abnormally/not working Green and on: The fan is working normally Red and on: The fan is working abnormally
SFU	green	Flashing slowly: The SFU board is running normally. 0.5Hz Fast flashing: The SFU board is in the IOS loading state. 5Hz
	red	Fast flashing: The bootloader of the SFU board is starting. 5Hz Flashing slowly: Indicates that the SFU board has a fault that affects services and cannot be automatically recovered. 0.5Hz
	Off	It indicates that the SFU board is not powered on, or the SFU board is powered on but not loaded normally.

A7 Blank Baffle Specifications

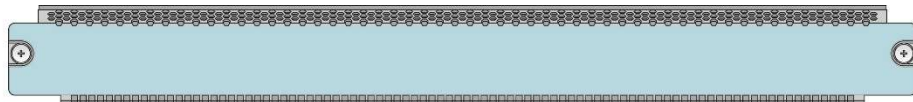
The MPU slots, LPU slots, and power supply slots all have corresponding blank baffles.

The schematic diagrams of the MPU blank baffles and the LPU blank baffles are as follows:



CL0698

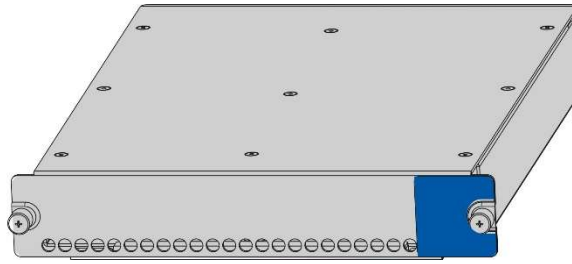
Appendix Figure A-52 The diagram of LPU and half-width MPU blank baffle



CL0699

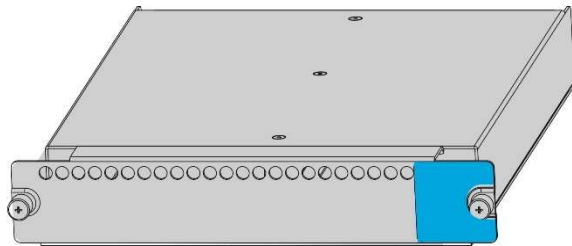
Appendix Figure A-53 The diagram of LPU and full-width MPU blank baffle

There are two types of SFU blank baffles, and the schematic diagram is as follows:



CL1523

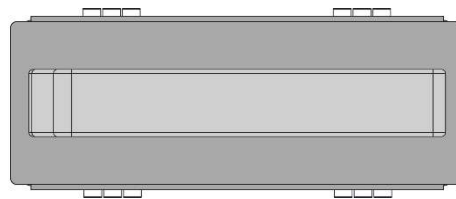
Appendix Figure A-54 Schematic diagram of the SFU blank baffles in slots 0-3



CL1524

Appendix Figure A-55 Schematic diagram of the SFU blank baffles in slots 4-7

The schematic diagram of the power blank baffle is as follows:



CL0853

Appendix Figure A-56 Schematic diagram of the power blank baffle

B Common Interface Specifications

Introduce device interface attributes

B1 Console Port Attributes

Appendix Table B-1 Console port attributes

Attributes	Description
Interface standard	Asynchronous EIA/TIA-232
Connector type	RJ45
Baud rate	9600~115200 (the default value is 9600)

Attributes	Description
Support services	Connected to the serial port of a local terminal (such as PC), and run a terminal emulation program on the terminal

B2 USB Console Port Attributes

The NSS11500 switch provides a USB Console port that conforms to the USB2.0 specification. Through this interface, the user can complete the local configuration of the switch. For the attributes of the USB Console port, see Table B-2 in the Appendix.

Appendix Table B-2Attributes of the USB Console port

Attributes	Description
Interface standard	USB2.0
Connector type	Micro USB
Interface speed	12Mbps
Support service	Connected to the USB of the local terminal (PC), and run the terminal emulation program on the terminal (the baud rate setting range is 9600bit/s~115200bit/s (the default value is 9600bit/s))

Note

- To use the usb console port, you need to install the corresponding driver software on the local terminal (PC) first.

B3 10Base-T/100Base-TX/1000Base-T RJ45 Electrical Interface Attributes

Appendix Table B-310Base-T/100Base-TX/1000Base-T RJ45 Electrical Interface Attributes

Attributes	Description
Interface standard	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE802.3az

Attributes	Description
Connector type	RJ45
Working mode	10Mbps/100Mbps/1000Mbps Half-duplex/full-duplex/auto-negotiation
Max. transmission distance	100m
Connection cable	Category 5 and above twisted pair

B4 10GBase-SR/LR /ER SFP+ Optical Interface Attributes

Appendix Table B-4 10GBase- SR/LR/ER SFP+ Optical Interface Attributes

Attributes	Description
Interface standard	Conforms to the standard IEEE 802.3ae
Connector type	SFP+
Working mode	10Gbps/1000Mbps full duplex
Support SFP+ interface	Supports 10GBase-SR Support 10GBase-LR Support 10GBase-ER
Connection cable	Single mode fiber or multimode fiber

B5 40GBase-SR4/LR4 QSFP+ Optical Interface Attributes

Appendix Table B-540GBase- SR4/LR4 QSFP+ Optical Interface Attributes

Attributes	Description
Interface standard	Conforms to standard IEEE 802.3ba
Connector type	QSFP+
Working mode	40Gbps full duplex
Support QSFP+ interface	Support 40G Base-SR4/LR4
Connection cable	Single mode fiber or multimode fiber

B6 100 GBase-SR4/LR4 QSFP28 Optical Interface Attributes

Appendix Table B-6 100GBase-SR4/LR4 QSFP28 Optical Interface Attributes

Attributes	Description
Interface standard	Conforms to standard IEEE 802.3ba
Connector type	QSFP28
Working mode	100Gbps full duplex
Support QSFP28 interface	Support 100GBase-SR4/LR4
Connection cable	Single mode fiber or multimode fiber

B7 USB Interface Attributes

Appendix Table B-7 USB Interface Attributes

Attributes	Description
Interface standard	USB2.0
Connector type	USB Type A
Working mode	1.5Mbps, 12Mbps, 480Mbps Host, support direct hot-swapping and controlled (command mode) hot-swapping. (Hot swapping operation is not allowed during data transfer)
Cable	none

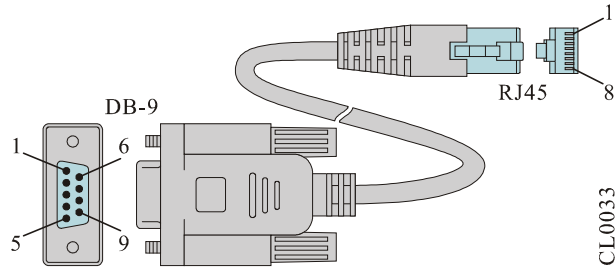
C Cables

Note

- It is recommended to use relevant cables of Maipu on the equipment.
- The following information is for reference only, please consult Maipu marketing personnel or technical support engineers for details.

C1 Console Port Cable

The console port cable of the NSS11500 switch is connected to the 9-core serial port socket of the computer. It is an 8-core unshielded cable with a crimped RJ45 crystal plug on one side and a DB9 (hole) on the other side. The schematic diagram of the configuration port cable is as follows:



Appendix Figure C-1 Schematic Diagram of Configuration Port Cable

The internal signal connection relationship table of the console port cable is as follows:

Appendix Table C-1 Console port cable connection relationship table

RJ45	Signal	Direction	DB-9
1	RTS	→	8
2	DTR	→	6
3	TXD	→	2
4	GND	—	5
5	GND	—	—
6	RXD	←	3
7	DSR	←	4
8	CTS	←	7
	—	—	1
	—	—	9

C2 Adapter Cable of USB Console Port

The USB Console port adapter cable is a universal standard USB-Micro USB adapter

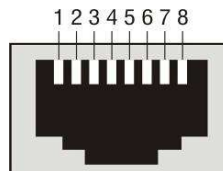
cable.

C3 Ethernet Electrical Interface Cable

Appendix Table C-2 RJ45 cable connection table

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 wiring sequence of the Ethernet RJ45 port is shown in Figure C-2 in the appendix:



Appendix Figure C-2 Schematic diagram of RJ45 seat

C4 10GBase-SR/LR/ER SFP+ 10Gigabit Optical Module Model and Corresponding Interface Cable Relationship Table

Appendix Table C-3 10GBase-SR/LR/ER SFP+ 10Gigabit Optical Module Model and Corresponding Interface Cable Relationship Table

Optical Module Model	Center Wavelength	Transmitting Optical Power	Receiving Optical Power	Overload Optical Power	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
SFP-M1-L192P8	850nm	-7.3 ~ -1	< -9.9 dBm	> -1 dBm	LC	Multimode (OM4) fiber (fiber diameter:	0.4km	support

		dBm				50μm)		DDMI
SFP-S1-L192P3	1310nm	-8.2~0.5 dBm	<-14.4 dBm	>0.5 dBm	LC	9/125μm single mode	10km	support DDMI
SFP-S4-L192P5	1550nm	-4.7~ 4 dBm	<-15.8 dBm	> -1 dBm	LC	9/125μm single mode	40km	support DDMI

C5 40GBase-SR4/LR4 QSFP+ 40G Optical Module Model and Corresponding Interface Cable Relationship Table

Appendix Table C-440GBase-SR4/LR4 QSFP+ 40G optical module model and corresponding interface cable relationship table

Optical Module Model	Center Wavelength	User Interface Type	Interface Cable Specifications	Max. Transmission Distance
QSFP-M1-M768C8	850nm	MPO	50/125μm multimode fiber	100m(OM3)
QSFP-M1-L768C8	850nm	LC	50/125μm multimode fiber	100m
QSFP-S1-L768C3	1310nm	LC	9/125μm single mode fiber	10km
QSFP-S4-L768C5	1550 nm	LC	9/125μm single mode fiber	30km

C6 100GBase-SR4/LR4 QSFP 28 100G Optical Module Model and Corresponding Interface Cable Relationship Table

Appendix Table C-6 100GBase-SR4/LR4 QSFP28 100G optical module model and corresponding interface cable relationship table

Optical Module Model	Center Wavelength	User Interface Type	Interface Cable Specifications	Max. Transmission Distance
QSFP28-M1-	850nm	MPO	50/125μm	70m(OM3)

Optical Model	Module	Center Wavelength	User Interface Type	Interface Cable Specifications	Max. Transmission Distance
M1920C8D				multimode fiber	100m(OM4)
QSFP28-S1-L1920C3DC		1296nm 1300nm 1305nm 1309nm	LC	9/125μm single mode fiber	10km

C7 10G Optical Interface Passive Cable Relationship Table

Appendix Table C-7 10G Optical Interface Passive Cable Relationship Table

Cable Model	User Interface Type	Cable Specifications	Electrical Characteristics
SFP-STACK-15	SFP+←to→SFP+	1.5m	Passive
SFP-STACK-30	SFP+←to→SFP+	3m	Passive
SFP-STACK-50	SFP+←to→SFP+	5m	Passive

C8 40G Optical Interface Passive Cable Relationship Table

Appendix Table C-8 40G Optical Interface Passive Cable Relationship Table

Cable Model	User Interface Type	Cable Specifications	Electrical Characteristics
QSFP-STACK-10	QSFP+←to→QSFP+	1m	Passive
QSFP-STACK- 3 0	QSFP+←to→QSFP+	3m	Passive
QSFP-STACK- 5 0	QSFP+←to→QSFP+	5m	Passive

C9 100G Optical Interface Passive Cable Relationship Table

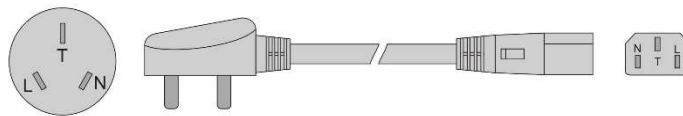
Appendix Table C-9 100G Optical Interface Passive Cable Relationship Table

Cable Model	User Interface Type	Cable Specifications	Electrical Characteristics
QSFP28-STACK-30	QSFP28←to→QSFP28	3m	Passive

C10 10A AC Power Cord

Appendix Table C-10 10A AC power cord description

Supporting Power Supply Model	Power Cord Length	Max. Load Current	Main Country or Region of Use
AD800-1D005M	1.5 meters	10A	Chinese mainland



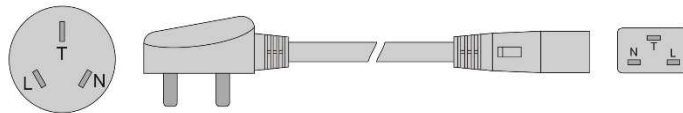
CL0694

Appendix Figure C-3 Schematic Diagram of 10A AC Power Line

C11 16A AC Power Cable

Appendix Table C-5 16A AC power cable description

Supporting Power Supply Model	Power Cable Length	Max. Load Current	Main Country or Region of Use
AD1600M-HV0B(V1)	3 meters	16A	Chinese mainland



CL0695

Appendix Figure C-4 Schematic diagram of 16A AC power cable

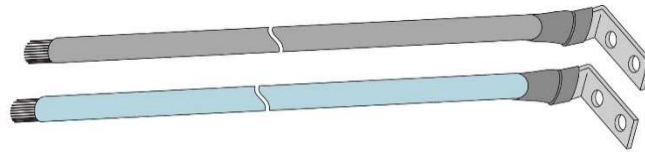
 **Note**

- The specification of the power cable is the big endian, and it is necessary to select a power strip that supports the specification of a 16A power cable.

C12 DC Power Cable

Appendix Table C-6DC power supply cable description

Supporting Power Supply Model	Power Cable Length	Wire Diameter	Main Country or Region of Use
DD1600M-5V0B(V1)	3 meters	10mm ²	Chinese mainland
DD1600M-5V0B(V1)	5 meters	10mm ²	Chinese mainland

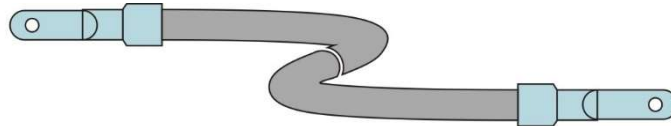


CL1180

Appendix Figure C-5Schematic Diagram of DC Power Cable

C13 10mm² Ground Wire

NSS11500-04(V2) is equipped with a 10mm² ground wire as standard, the schematic diagram is as follows:



CL0779

Appendix Figure C-6 Schematic diagram of 10mm² ground wire

The specifications of the ground wire are as follows:

Appendix Table C-710mm² ground wire specification information

Ground Wire Model	Length	Wire Diameter	Color	Terminal Specification
P7878-1465	3m	10mm ²	Yellow-green	Single-hole cold-press terminal

D Equipment Operating Environment Requirements

D1 Environmental Requirements for Computer Room

D1.1 Computer Room Building Requirements

It is recommended that the computer room adopt an anti-static floor to avoid dust. It is generally required to lay an electrostatic raised floor. The laying of floor boards should be tight and solid, and the horizontal error per square meter should not be greater than 2mm. When there is no access floor, static conductive floor materials should be laid (volume resistivity should be $1.0 \times 10^7 \Omega \cdot m \sim 1.0 \times 10^{10} \Omega \cdot m$). Static grounding materials or raised floors must be grounded electrostatically, and can be connected to the grounding device with a current-limiting resistor and a connecting wire. The resistance of the current-limiting resistor is $1M\Omega$.

D1.2 Temperature Requirements

To ensure the normal operation of the device, a certain temperature must be maintained in the device room. See the table below for the working environment temperature requirements.

Appendix Table D-1 Working Environment Temperature Requirements

Description	Temperature
Storage environment temperature	$-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$
Working conditions	$0^{\circ}\text{C} \sim 45^{\circ}\text{C}$

Caution

- If the temperature is too high, the reliability of the device will be greatly reduced. Long-term high temperature will also affect its life. Too high temperature will accelerate the aging process of insulating materials.
- When the device enters a high temperature environment from a low temperature environment, if there is condensed water on the device, please take certain measures (such as drying, drying, etc.).
- Long-term working altitude: $45^{\circ}\text{C}@2000\text{m}$. If it is greater than 2000m and less than 4000m, the temperature will decrease by 1°C for every 220m increase, which is a derating of $1^{\circ}\text{C}/220\text{m}$.
- Altitude: $<5000\text{m}$.

D1.3 Humidity Requirements

To ensure the normal operation of the switch, a certain humidity must be maintained in the device room. See the table below for the humidity requirements of the working environment.

Appendix Table D-2 Working Environment Humidity Requirements

Description	Humidity
Working environment relative humidity	10%~90%/RH, no condensation
Storage relative humidity	0~95% /RH, non-condensing

Caution

- The measured values of the temperature and humidity of the working environment in the NSS11500 series switch room refer to the values measured at 1.5m above the floor and 0.4m in front of the switch when there is no protective plate at the front and rear of the cabinet.

If the long-term humidity in the computer room is too high, it is easy to cause poor insulation of insulating materials or even leakage, and sometimes it is easy to cause changes in the mechanical properties of materials and corrosion of metal parts.

If the humidity in the computer room is too low for a long time, the insulating gasket will shrink and cause the fastening screws to loosen. At the same time, in a dry climate, static electricity is likely to be generated, which will damage the circuit on the switch.

D1.4 Load Requirements

Please evaluate the ground load-bearing requirements based on the actual weight of the installed switch and its accessories (such as cabinets, switch chassis, boards, power supplies, etc.), and ensure that the ground load-bearing capacity of the installation site meets this requirement. For the weight of each component of the switch, see "[Appendix A Specifications of the Switch and Common Modules](#)."

Caution

- When evaluating the ground load, please consider the need for future switch expansion (such as adding boards).

D1.5 Space Requirements

In order to ensure sufficient operating space for moving the chassis far away and for module plugging and maintenance, it is recommended that the aisle width of the device room should not be less than 0.8meters. If the switch is installed in the cabinet, the clear height of the device room should not be less than 3meters.

In order to facilitate heat dissipation and switch maintenance, please do not install the switch against the wall, and the space between the front and back of the switch should be no less than 0.7 meters.

D1.6 Cleanliness Requirements

Dust is a hazard to the safe operation of switches. Indoor dust falls on the machine body, which can cause electrostatic adsorption and cause poor contact of metal connectors or metal contacts. Especially in the case of low indoor relative humidity, it is more likely to cause electrostatic adsorption, which will not only affect the life of the device, but also easily cause communication failures. See the table below for the dust content and particle size requirements in the device room.

Appendix Table D-3Requirements for Dust Content in Computer Room

Max. Diameter (μ m)	0.5	1	3	5
Max. concentration (grains/m ³)	1.4×10 ⁷	7×10 ⁵	2.4×10 ⁵	1.3×10 ⁵

Caution

- The cleanliness requirement is met when there is no visible dust on the desktop within 3 days.

In addition to dust, the switch room also has strict requirements on the salt, acid, and sulfide contained in the air, because these harmful gases will accelerate the corrosion of metals and the aging process of certain components.

The device room should prevent the intrusion of harmful gases such as SO₂, H₂S, NO₂, NH₃, Cl₂, etc. The specific limit values are shown in the table below:

Appendix table D-4Harmful gas content index in computer room

Gas	Max. (mg/m ³)
Sulfur dioxide SO ₂	0.2
Hydrogen sulfide H ₂ S	0.006
Nitrogen dioxide NO ₂	0.2
Ammonia NH ₃	0.05
Chlorine Cl ₂	0.01

D1.7 Anti-Interference Requirements

There may be sources of interference in the use of the switch. Whether it comes from the outside of the application system or from the inside of the switch, it is conducted by capacitive coupling, inductive coupling, electromagnetic wave radiation, public impedance (including grounding system) coupling, wires (including power lines, signal lines, and output lines, etc.) The mode affects the switch. For this please note:

Caution

- Effective anti-grid interference measures should be taken for the power supply system.
- It is best not to use the working place of the switch with the grounding device of the power device or the lightning protection grounding device, and keep it as far away as possible.
- Stay away from high-power radio transmitters, radar transmitters, and high-frequency and high-current device. If necessary, users can adopt electromagnetic shielding method for anti-interference.

D1.8 Grounding Requirements

A good grounding system is the basis for the stable and reliable operation of the switch, and it is an important guarantee for the switch to prevent lightning strikes, anti-interference, and anti-static. The user must provide a good grounding system for the switch, and the resistance between the switch chassis and the ground should be less than 1ohm.

D2 Power Condition Requirements

D2.1 AC Basic Power Requirements

Caution

- The low-voltage power supply system should adopt a three-phase five-wire system or a single-phase three-phase system. The nominal voltage of low-voltage alternating current is 110V/220V, and the frequency is 50Hz/60Hz.
- An uninterruptible power supply is required. Such as UPS (Uninterrupted Power Supply) as an AC backup power supply. The AC backup power supply and the mains power should be in the same phase, and the switching time with the mains power should be less than 10ms, otherwise the device may restart or reset.
- The AC power distribution capacity of the device room should fully consider the working current and fault current of the device. Ensure that independent device has AC power distribution protection devices. The configuration protection switch should be larger than the protection switch of the subsequent electrical device.

The allowable fluctuation range of the power input of the device using AC power is shown in the table below.

Appendix Table D-5AC Basic Power Supply Requirements Table

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

Caution

- The AC wires should be flame-retardant wires, and the wire layout should be in accordance with the provisions of GB50045-95 "Class I Fire Protection Design Standards for High-rise Civil Buildings". Low-voltage power distribution is carried out in accordance with GB50045-95 "Code for Design of Low-Voltage Power Distribution Devices and Circuits".

D2.2 AC Base Power Recommendations

Suggestions on AC basic power supply are:

- If the device is directly powered by the mains, its supply voltage exceeds -10% to 5% of the rated voltage, or exceeds the allowable voltage range of the device. Regulating or stabilizing device should be used to meet the requirements.
- For communication loads that require uninterrupted AC or no transient, UPS power supply system or inverter power supply system should be used for power supply.
- When the mains power is abnormal, in order to ensure the important communication load and important power load, the communication station should be equipped with

a self-provided generator set as a self-provided power supply. Its capacity should be checked according to not less than 1.5 times to 2 times the total capacity of AC uninterrupted power device.

D2.3 DC Basic Power Requirements

The DC power supply method of the device should ensure stable and reliable power supply, and the power supply should be arranged close to the switch to make the length of the DC feeder line as short as possible. The requirements for the DC power supply are shown in the table below.

Appendix Table D-6DC Basic Power Supply Requirements Table

Item	Index
48V input terminal voltage allowable fluctuation range	36 V~72V
DC power supply withstand surge current capability	At least 1.5 times the rated current capacity of the load
Switch overshoot range	Not exceeding $\pm 5\%$ of the DC output voltage setting value
Peak-to-peak noise voltage	$\leq 200\text{mV}$
Dynamic Response	The recovery time is less than 200ms, and the overshoot shall not exceed $\pm 5\%$ of the DC output voltage setting value

D2.4 DC Basic Power Supply Recommendations

Suggestions on DC basic power supply are:

- It is recommended to adopt a decentralized power supply method, choose multiple DC power supply systems and install power supply device in multiple places.
- Adopt a DC power supply system that meets the standards, and set the output voltage of the communication power supply system to meet the required output voltage range.
- The total capacity configuration of the high-frequency switching rectifier should meet the communication load power and the charging power of the storage battery, and the number of rectifier modules should be redundantly configured.
- Batteries should be installed in two or more groups, and their total capacity is determined by the time when the battery groups independently supply power to the load.

E Equipment Grounding Specification and Protection

E1 Equipment Grounding Specifications

Grounding specifications include: general grounding specifications, device room building grounding specifications, device grounding specifications, communication power supply grounding specifications, and grounding wire layout specifications.

E1.1 General Grounding Specifications

Common grounding specifications are shown in the table below.

Appendix Table E-1 General Grounding Specifications

SN.	Description
1	The grounding design should be designed according to the principles of voltage equalization and equipotentiality, that is, the combined grounding method of a group of grounding bodies for working grounding and protective grounding (including shielding grounding and lightning protection grounding for distribution frames).
2	Cable racks, hanging iron frames, racks or cabinets, metal ventilation ducts, metal doors and windows in the machine room should be grounded for protection.
3	The metal parts of the device that are normally not charged shall be protectively grounded.
4	Ensure that the ground wire is in good contact with the protective ground bar in the device room.
5	No other device shall be used as part of the electrical connection to the ground wire.

E1.2 Specifications for Grounding of Computer Room Buildings

The specific requirements of the building grounding code for the computer room:

The grounding resistance of the comprehensive communication building should not be greater than 1ohm, and should be less than 5ohm in ordinary communication bureaus (stations) (it can be relaxed to 10ohm in areas with high soil resistivity).

E1.3 Equipment Grounding Specifications

The device grounding specifications are shown in the table below.

Appendix Table E-2 Equipment Grounding Specifications

SN.	Description
1	All communication equipment and supporting equipment (mobile base station, transmission, switching, power supply, etc.) in the machine room shall be protected and grounded. The protective grounding of all equipment in the station shall be connected to the same main grounding bar. The protective grounding of equipment in the same machine room shall be connected to the same protective grounding bar in the same machine room.
2	The protective ground (PGND) of the device is short-circuited to the protective grounding copper bar provided by the user, and the short-circuit wire should be a yellow-green two-color plastic insulated copper conductor with a cross-sectional area not smaller than the device standard grounding cable specification requirements..
3	There are grounding terminals and grounding signs under the front, rear and side doors of the cabinet, which must be connected to the grounding terminals of the cabinet structure through connecting cables with a cross-sectional area of not less than 2.5mm ² .
4	The metal components of the device cabinet must ensure good electrical conductivity, and it is strictly forbidden to spray insulating paint on the joints of the metal components of the cabinet.
5	The rack bodies of the cabinets in the same row are tightly connected to each other through fastening bolts and gaskets at the top. The 30mm*50mm rectangular surface around the fastening bolt connection hole should not be painted, and must be treated with anti-rust and anti-corrosion treatment. The surface of the gasket and nut should also be galvanized to ensure good electrical contact.
6	When cabinets of the same type are combined, the grounding bus bars of adjacent cabinets (if any) need to be interconnected through the bus bar short circuit cable. The short circuit cable has a sectional area of 6mm ² and a length of not more than 300mm. Both ends are connected to the grounding bus bar terminals of adjacent cabinets and fastened.

E1.4 Grounding Specifications for Communication Power

The grounding specifications of the communication power supply are shown in the table below.

Appendix Table E-3 Grounding Specifications for Communication Power Supply

SN.	Description
1	The AC power supply system of the communication room shall adopt the TN-S power supply mode.

SN.	Description
2	The entrance of the AC power cable into the computer room should be equipped with an AC power surge protector (Class-C surge protector) with a nominal discharge current of not less than 20KA.
3	The protective ground of the communication power supply and the protective ground of the communication device should share a set of grounding bodies. If the communication power supply and the communication device are in the same computer room, it is advisable to share the same protective ground bar in the computer room.
4	A lightning protection circuit should be added to the AC power port.
5	The positive pole of the 48V DC power supply should be grounded at the output of the DC power supply.
6	The working ground and protection ground of the DC power supply should share a set of grounding bodies with the protection ground of the communication device. If the communication power supply and the communication device are in the same computer room, it is advisable to use the same computer room protection ground bar.
7	A surge protection circuit should be added to the DC power port.

E1.5 Specifications for Layout of Grounding Wires

The laying specifications of ground wires are shown in the table below:

Appendix Table E-4 Specifications for laying out ground wires

SN.	Description
1	Ground leads should not run parallel to or intertwined with signal lines.
2	It is strictly forbidden to lead the grounding wire from outdoors overhead, and must be buried in the ground or routed indoors.
3	It is strictly forbidden to connect the protective ground wire, and it is strictly forbidden to install switches or fuses.
4	The protective ground wire should be a plastic insulated copper core wire with alternating yellow and green colors.
5	It is strictly forbidden to connect the neutral line of the AC power line to the protective ground of the transmission and various communication device in the device room.
6	The length of the protective ground wire should not exceed 45m and should be as short as possible. When it exceeds 45m, the user should be required

SN.	Description
	to reset the ground row nearby.

E2 Device Protection

This chapter mainly introduces the matters needing attention for device lightning protection during installation.

E2.1 General Requirements for Lightning Protection Cabling

Equipment cables can be divided into indoor cables and outdoor cables according to the location of the connection terminal. The two have different requirements for wiring in the lightning protection design.

Caution

- The communication connection cables should be routed indoors as far as possible, which can effectively reduce the damage rate of the device induced by lightning. The Ethernet cable is an indoor signal interconnection cable. Normally, it should not be routed overhead or over cornices outdoors.
-

General requirements for indoor cable wiring:

- Cable installation requires cables to be routed by category to avoid bundling cables of different categories.
- It is recommended that the cables be bundled with a cable tie every 100mm to strengthen combing and fixing.
- The ground wire should be as short and thick as possible. The connection between the ground wire and the ground bar must be screwed or welded and treated with anticorrosion.

General requirements for outdoor cable wiring:

- If the actual conditions cannot fully meet the indoor routing, the outdoor cables should be laid underground (introduced from the ground into the room).
- If it is impossible to lay all the outdoor cables underground, the overhead cables should pass through metal pipes 15 meters before entering the room, and the two ends of the metal pipes should be grounded. After the cables enter the room, a signal lightning protection device should be installed at the corresponding interface of the device.

- If a shielded cable is used, ensure that the shielding layer is in good contact with the metal shell of the device at the device interface. After the cable enters the room, a signal surge protector should be installed at the corresponding interface of the device.
- When the outdoor cable without any protection is connected to the device, a signal surge protector must be installed at the corresponding port.
- When routing optical fibers, it is required that the cables be routed smoothly and bundled neatly. Outdoor optical cables require that the internal strengthening core be grounded before entering the room, and the optical fibers cannot be stretched or bundled too tightly.

E2.2 Cable Routing Installation Method

How to install the 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 strip. The excess part is folded into an S shape and fixed inside the chassis. Keep a distance of more than 20cm from other cables.

How to install the cable?

The signal cables are installed and bundled according to indoor and outdoor categories, and are led out to user terminals or cascading device from different outlet holes of the chassis.

Precautions for Using Optical Fiber

Caution

- When selecting optical fiber to connect network device, please confirm whether the type of optical connector and the type of optical fiber are consistent with the type of optical interface used.
- Before connecting the optical fiber, please make sure that the optical power at the receiving end does not exceed the upper limit of the received optical power of the optical module. Otherwise, the optical module may be burned out.
- If the optical interface is not connected to an optical connector, be sure to cover the dustproof cap.
- When the optical interface is not connected to the optical connector and the dust cap is opened, invisible rays may emerge from the optical interface, so please do not look directly at the optical interface.
- Optical fiber connectors must have safe and reliable outer packaging, and their connectors must have dust-proof caps. When not in use, the fiber optic connector must wear a dust cap to avoid scratching the end face of the fiber optic connector ferrule during assembly and affecting its performance indicators. If the dust cap is too loose or contaminated, it should be replaced in time.
- Before connecting, the end face of the fiber optic connector ferrule must be wiped clean with a dust-free paper dipped in absolute alcohol. When wiping, it can only

be wiped in one direction, and the end face of the optical fiber connector that is connected to it must also be wiped.

- The optical fiber shall not be twisted or bent during connection, and the bending radius of the optical fiber after installation shall not be less than 40mm (the minimum bending radius is 20D in the case of dynamic bending, and 10D in the static state, and D is the outer diameter of the fiber sheath).
- When connecting, if the optical fiber needs to pass through the metal plate hole, then the metal plate hole should have a smooth, fully rounded surface (the rounding radius should not be less than 2mm), pass through the metal plate hole and turn along the sharp edge of the structural member. When used, a protective cover or liner should be added.
- Be careful when plugging and unplugging the connector to avoid damaging the connector or breaking the optical fiber due to excessive force. Avoid pulling, pressing, or squeezing the fiber. See the table below for the maximum tensile force and crushing force allowed by the cable.

Appendix Table E-5 Allowable force table for optical fibers

Stress Time	Tensile Force (N)	Flattening Force (N/100mm)
Temporary stress	150	500
Long-term stress	80	100

Fiber installation method

After the optical fiber is led out from the optical port, the optical fiber directly connected to the photoelectric converter can be coiled and hung inside the chassis. Optical fibers cascaded with other device should be led out through PVC pipes to avoid traction and stretching.

Caution

- Optical fiber itself is not a conductor, so it will not induce and transmit overvoltage. However, the strengthening core of the optical cable (the armored component installed to protect the optical fiber from the influence of environmental events) is very easy to induce and transmit lightning strike overvoltage, and must be properly handled. Therefore, it is recommended that users do a good job of grounding protection at the cable entry end.

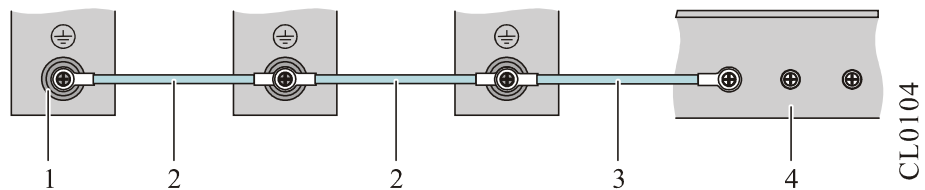
E2.3 Equipotential Connection Requirements and Methods

Caution

- Interconnected devices within the same operating range requires equipotential

connection. For example: the interconnected device, the metal sheath of the cable, the PE line of the power supply, and the installation of metal structural parts, etc., should ensure the equipotential connection.

The equipotential connection of interconnected devices can be carried out according to the following schematic diagram. After the connection is completed, use a multimeter to measure whether each equipotential connection point is in good contact and the impedance is low enough.



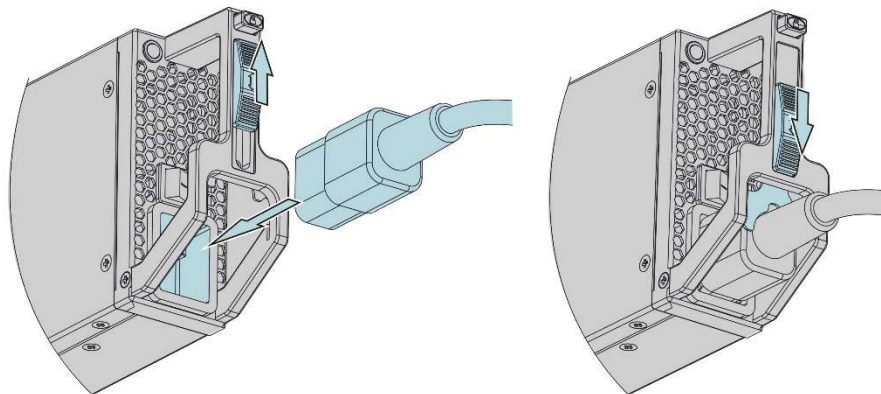
Appendix Figure E-1 Schematic diagram of device equipotential connection

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

F Cable Fixing Recommendation

F1 Anti-falling Treatment of AC Power Cable

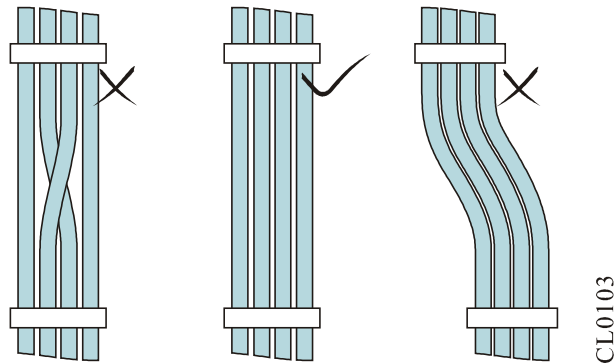
To ensure the normal operation of the device and prevent accidental power failure, please close the anti-disengagement device on the handle of the AC power module downwards and lock the cables, as shown in the following figure:



Appendix Figure F-1 Schematic diagram of anti-tripping of AC power lines

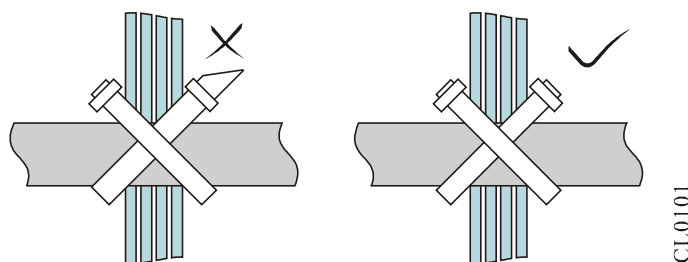
F2 Cable Bundling Recommendation

- After the cables are bundled in the cabinet, they should be straight and neatly bundled without cable entanglement or bending. A sample diagram of cable bundling is as follows:



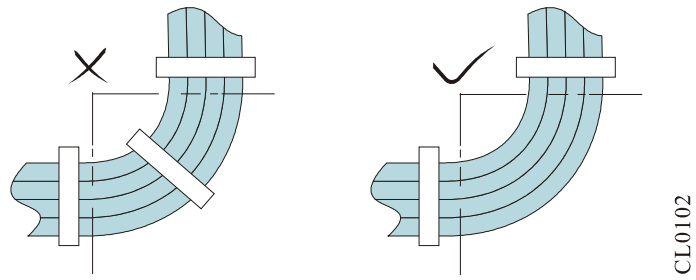
Appendix Figure F-2 Cable Bundling Diagram

- In the middle of the cable, the bending radius should not be less than 2 times of the cable diameter, and at the outlet of the connector, the bending radius should not be less than 5 times of the diameter.
- Different types of cables (power cables, signal cables, ground cables, etc.) should be routed and bundled separately in the cabinet. Do not mix together. When the distance is relatively short, cross wiring can be adopted. When wiring in parallel, the distance between the power cable and the signal line should not be less than 30mm.
- The cable binding frame and cable trough inside and outside the cabinet should be smooth and free of sharp edges and corners.
- After tying the cables with wire ties, cut off the excess part. The incision should be smooth and tidy without any sharp corners. A sample diagram of cable bundling is as follows:



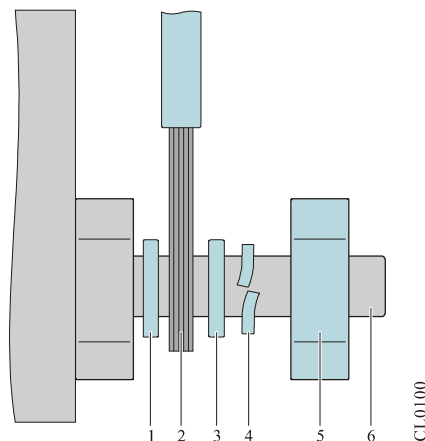
Appendix Figure F-3 Cable Bundling Diagram

- When the cable needs to be bent, it needs to be bound before the cable is bent. However, the wire tie cannot be bound in the bending area, so as not to generate a large stress in the cable and cause the cable core wire to break, as shown below.



Appendix Figure F-4 Schematic diagram of cable bending and bundling

- The power cord must not be tied to the rails of moving parts.
- For power cables connected to moving parts, such as grounding wires, etc., a certain margin should be left after assembly to prevent the cables from being stressed. When the moving parts reach the installation position, it should be ensured that the excess cables will not come into contact with heat sources, sharp corners, sharp edges, etc. When the heat source cannot be avoided, the cable should use high temperature resistant cable.
- The screw or nut of the cable connection terminal fixed by thread shall be firmly fixed, and anti-loosening measures shall be taken, as shown below.



Appendix Figure F-5 Cable Fixing Diagram

1. Flat pad	2. Cable	3. Flat pad
4. Spring pad	5. Nut	6. Threaded column

- For stiffer power cords, the cable should be secured near the termination to prevent stress on the termination and on the cable.
- Do not use self-tapping screws to fasten the terminals.
- Power cables of the same type and in the same direction should be bundled into a cable bundle, and the cables in the cable bundle should be clean and straight. The binding of the wire buckle should be carried out according to the following table:

Appendix Table F-1 Cord tie binding comparison table

Cable Bundle Diameter (mm)	Binding Spacing (mm)
10	80~150
10~30	150~200
40	200~300

- Any cable routing or bundling must not be knotted.
- For terminal blocks with crimped cold-pressed terminals (such as air switches, etc.), the metal part of the cold-pressed terminals should not be exposed outside the terminal block during assembly.

G Environmental Substance Declaration

Appendix Table G-1 Toxic and Hazardous Substance Name and Content Identification

Part name ¹	Toxic and hazardous substances or elements					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Each printed circuit board assembly ²	x	o	o	o	o	o
switching power supply	x	o	o	o	x	x
Chassis/Frame (Metal)	o	o	o	o	o	o
Chassis pads	o	o	o	o	x	x
screw	x	o	x	o	o	o
dust cover (plastic)	x	x	x	x	x	x
heat sink	o	o	o	o	o	o
fan	o	o	o	o	o	o
cable	x	x	x	x	x	x
lithium battery	o	o	o	o	o	o

O: Indicates that the content of this toxic and hazardous substance in all homogeneous materials of this part is below the limit requirement stipulated in the SJ/T11363-2006 standard.

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

During the environmental protection use period, as long as the use conditions within the environmental protection use period are strictly followed, the environmental substances or elements contained in this product will not leak or mutate.

The environmental protection use period of the lithium battery of this product is 5 years, and the environmental protection use period of other components is 50 years.

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

 **Note**

- The statement lists all possible components of our company's products. The actual parts contained in each product are subject to the actual product.
 - Printed circuit board assemblies include printed circuit boards and their constituent IC devices and discrete devices, such as resistors, capacitors, integrated circuits, connectors, etc.
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