

xStack DES-7200

Hardware Installation Guide

D-Link[®]

DES-7200 Series Hardware Installation Guide

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Preface

Thank you for using our switches. This manual provides you with detailed operation guide that allows you to easily install and use the switches.

Scope

This manual introduces functional and physical features of our switches and provides installation procedures, troubleshooting, technical specifications, and rules of using cables and connectors. It is intended for the users that have some experience in installing and maintaining network hardware and want to learn the above information.

At the same time, it is assumed that the users of this switch are already familiar with the related terms and concepts of Ethernet.

Document Structure

- Chapter 1 “**Product Overview**” describes the scope of application, main features, technical specifications, and related extension modules of the product.
- Chapter 2 “**Preparation Before Installation**” lists the safety, power supply, and site requirements that must be met before the switch can be installed.
- Chapter 3 “**Product Installation**” describes how to install the switch as a whole and its various modules, and to connect the power supply and the grounding cables.
- Chapter 4 “**DES-7206/7210 Maintenance**” describes how to maintain the switch in use.
- Chapter 5 “**Troubleshooting**” describes the problems that may occur during the installation and use of this switch and how to handle them.

Handling Method.

Appendix A “**Connectors and Connection Media**”.

Related Documents

Software Manual——covering CLI commands, configuration guide, version release notes, and system messages.

Obtaining Documentation

You can obtain the documentation you need through the following channels:

Internet:

<http://www.dlink.com>

Documentation CD-ROM:

The documentation of D-Link Corporation switches is stored in the CD-ROM package, which is provided to you together with the product you purchase.

The CD-ROM is updated frequently, and may be more current than the printed documents.

Obtaining Technical Assistance

D-Link Corporation provides excellent technical support services for all our products. You can obtain the technical assistance you need through any of the following channels:

Technical Assistance

- D-Link Corporation Website, On D-Link Corporation Website, you can obtain the latest technical information, reasons of common faults, problem analysis, product application solution and software upgrading information.
- D-Link Corporation customer service center, which can provide all customers with needed technical assistance for: products, technologies and solutions. The customer service center provides responsive technical support for your product installation problems, software configuration problems, and other network performance problems.

Documentation Conventions

The symbols used in this document are described as below:



Note

This symbol brings your attention. It includes some helpful suggestions and references.



Warning

This symbol means that you must be extremely careful. It reminds you to avoid behaviors that can bring data loss and cause damage to a device.



Danger

This symbol means danger. You are in a situation that may cause personal injury, It reminds you to take precautions before using a device.

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Product Overview

1.1 Product Overview

In recent years as the Internet users grow at an explosive rate, they are no longer satisfied with various existing ways of communications that rely largely on telephone networks, and demand telecom operators to provide multimedia services such as voice, data, and image. The traditional narrowband access method can no longer meet the needs for telecom services, while the broadband access technology will bring about tremendous changes to the life and work of the people.

Compared with the broadband access methods such as ADSL and HFC, the Ethernet access method features such advantages as high bandwidth and low cost.

The Ethernet is the most direct way of bearing the IP service, which is the major service of the broadband metropolitan area network (MAN). The network and users do not need to add any other special equipment, reducing the cost in protocol conversion. In addition, the Ethernet access method is ideal for the users densely populated in residential areas and it accommodates the trend where optical fibers are used for the access network. Therefore, the Ethernet gains rapid development and wide application in the broadband access field.

In this situation, D-Link Corporation introduces high-density multi-service IPv6 core router switch DES-7200 by sparing great efforts, after the release of the multi-service 10,000M core router switch DES-7200 being applicable to the backbone Ethernet. DES-7200, as a multi-service IPv6 10,000M core router switch of the new generation, provides powerful defense ability while ensuring high performance and large capacity. It also boasts the ability of service addition and expansion on demand, thus satisfying the design requirements of equal emphasis on service and performance. Currently, two models are available, DES-7206 and DES-7210, which offer ten vertical slots and six horizontal slots respectively.

The DES-7210 series multi-service Ipv6 10,000M core router switch provides users with high-speed non-blocking data switching. With powerful switching and routing functions and secure intelligent technologies, it can be used together with various series of D-Link switches to provide users with complete end-to-end solutions. It is ideal for large-scale network core backbone and heavy traffic node switch. By expanding with high-performance multi-service cards, the DES-7200 series switches support policy routing and IPV6, and satisfies customers' flexible and complex application requirements.

Applications:

- Core layers of such enterprise networks of educational, financial and governmental organizations
- Running environment that needs powerful routing function and carrier-class security & reliability
- High-layer switching of enterprise networks with high bandwidth and 10G needs
- Enterprise environment that needs to provide high QoS assurance for various applications

1.2 Technical Specifications of DES-7206/7210

1.2.1 Product Features

- Powerful expandability

DES-7200 supports strategic routing and IPv6. It provides faster and more effective processing ability by expanding high-performance multi-service cards.

- Hot-swappability

With a modular design, all the switching modules, management modules, power supply, and fan tray of the DES-7200 are hot swappable, allowing modules to be replaced without first shutdown of the system.

- Redundancy configuration

The DES-7200 provides system redundancy configuration, particularly dual redundancy for its power supply and management module, which greatly enhances system reliability and stability.

- Powerful data processing design

Complicated functions of the DES-7200 such as switching, routing, ACL, and QoS are implemented via hardware, which avoids the impact produced by the implementation via software on high-speed data processing.

The management module performs such functions as route management, network management, and network service. The user interface module can independently implement such functions as hardware routing, switching and multicast. On the other hand, the user switching port independently implements hardware ACL and QoS. All these greatly enhance the processing capability of the equipment as a whole.

- High security assurance

Physical security:

The DES-7200 provides physical security assurance such as redundant management modules, redundant power modules, hot-swappability of each module.

Virus and attack protection:

Responding to the increasingly more network viruses and attacks in the network environment, the DES-7200 provides powerful network virus and attack prevention, not only ACL, but also Source IP Spoofing prevention, among many others.

The DES-7200 provides the multiple-port synchronous monitoring technology, which supports flexible network monitoring and offers higher monitoring capability.

Equipment management security:

To prevent non-administrators from logging in and manipulating the network equipment, which affects network transmission and security, the DES-7200 provides the SSH encrypted login function and the source IP restriction for telnet/web login.

Access security:

The hardware supports IP, MAC, and port binding to enhance user access control.

They support 802.1X to meet 6-element binding access restriction.

The switch supports IGMP source port check to effectively control invalid multicast sources and improve network security.

The PVLAN (port protection) is used to isolate the information exchanged between users, without needing to occupy the VLAN resources.

The port MAC address lock and port MAC address access quantity restriction can bar the access from illegal hosts.

- A full range of application support techniques (QoS, multicast)

The DES-7200 provides multiple traffic classification techniques and QoS techniques, including SP, WRR, CAR, and HOL, to provide needed techniques of bandwidth assurance for various applications.

The DES-7200 provides multiple multicast support techniques, including IGMP snooping, IGMP, PIM (SM, DM), and DVMRP, to ensure reasonable bandwidth occupation when multicast services are provided in the network.

- Supporting L2 VPN (VPLS)

The DES-7200 supports Service Provider VLAN (Double Tagging, VLAN tunnel), which enables secondary VLAN identification for switched data. The outer layer IDs are used to create VPNs and provide link selection, while the inner layer IDs are used to identify the service VLAN function and implement L2 VPNs in the Ethernet environment, offering a solution to the absence of data transmission security control in the traditional Ethernet environment.

- ECMP/WCMP (Equal-Cost Multipath Routing/ Weight-Cost Multipath Routing)

In the network environment where multiple links reach the same destination address, the packets to the destination address can take only one link of them when the traditional routing technology is used, with all other links being in the standby or inactive status. In addition, the switching between the links takes some time in the dynamic routing environment. On the other hand, the ECMP and WCMP can use multiple links at the same time in such network environment. This not only increases the transmission bandwidth, but also backs up the data transmission for the failed link without delay and packet loss.

- Supporting sophisticated dual-core technology

The DES-7200 supports multiple STPs and VRRPs including 802.1D, 802.1W, and 802.1S, offering sophisticated dual-core assurance technologies.

- Providing visual status display

DES-7200 is embedded with an LCD screen, used for providing current system information such as working time and system utilization.

- Supporting the advanced 10,000M Ethernet technology

DES-7200 provides current mainstream 10,000M LAN transmission standards such as 10GBASE-R and 10GBASE-W.

- Supporting the PoE technology

DES-7200 provides cable cards supporting PoE. PoE design completely conforms to the requirements of the IEEE 802.3af standards.

DES-7210 provides up to 198 fast Ethernet PoE ports; DES-7206 provides up to 192 fast Ethernet PoE ports, offering flexible network expansion for large enterprise parks.

- High-density port design

DES-7210 provides up to 384 fast Ethernet ports, 192 1000M optical fiber ports and 16 10000M ports; DES-7206 provides up to 192 fast Ethernet ports, 96 1000M optical fiber ports and 8 10000M ports, offering flexible network expansion for large enterprise parks.

1.2.2 Technical Specifications

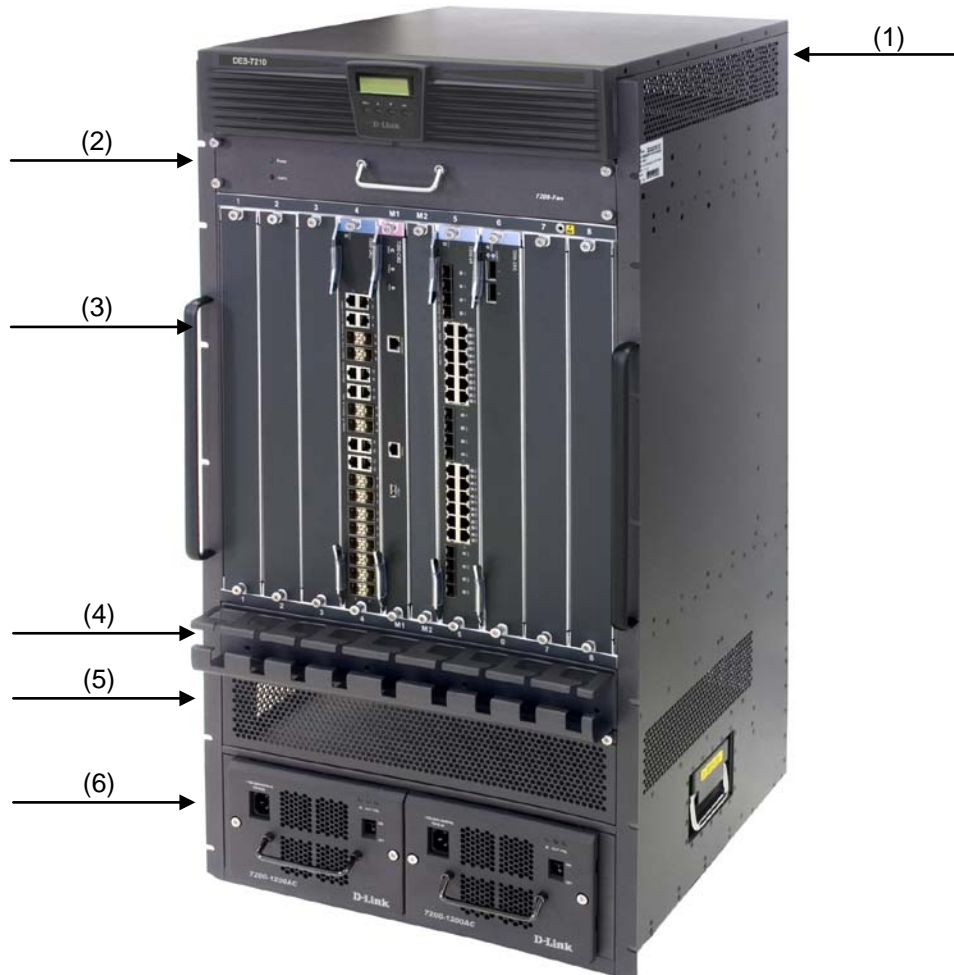
Table 1-1 Technical Specifications

Product Model	DES-7210:	DES-7206:
Module slot	10 (two for the management engine modules)	6 (two for the management engine modules)
VLAN	4K	
L2 Protocol	IEEE802.3, IEEE802.3u, IEEE802.3z, IEEE802.3ae, IEEE802.3x, IEEE802.3ad, IEEE802.3af, IEEE802.1p, IEEE802.1x, IEEE802.3ab, IEEE802.1Q, IEEE802.1d, IEEE802.1W, IEEE802.1S, port mirror, IGMP SNOOPING, aggregate port, GVRP, jumbo frame(9Kbytes) and VPLS	
L3 Protocol	BGP4, OSPF, RIPV1, RIPV2, IGMP v1/v2/v3, DVMRP, PIM-SM/DM, LPM Routing, Policy-based Routing, ECMP and WCMP	
Virus and attack protection	Comprehensive ACL, Source IP Spoofing prevention	
Management mode	SNMPv1/v2, Telnet, Console, CLI, RMON and SSH	
Other protocols	VRRP, BootP/DHCP client, ARP PROXY, DHCP relay and Syslog	
Control Module	7200-CM2, 7200-CM4	7200-CM1, 7200-CM3
I/O Module	7200-24G, 7200-24, 7200-48, 7200-2XG, 7200-4XG, 7200-24P, 7200-48P	
Enhanced I/O Module	7200-24GE, 7200-24G2XGE, 7200-48E	
ASE Module	7200-ASE3	
Fan Module	7210-FAN	7206-FAN
Hot swap ability	Supported	
Management redundancy	Supported	
Power supply/fan		
Power supply	7200-1200AC: 90VAC~264VAC, 47Hz~63Hz; Power:1200W 7200-2000AC: 90VAC~264VAC, 47Hz~63Hz; Power: 2000W 7200-1200DC: -36Vdc~-72Vdc; Power: 1200W 7200-2000DC: -36Vdc~-72Vdc; Power: 2000W	
Power supply redundancy	Supported (must be the same type [all AC or DC])	
Fan	7210-FAN (supporting hot swap ability and fault alarming)	7206-FAN (supporting hot swap ability and fault alarming)
Environment		
EMC	GB9254-1998 FCC Class A	
Safety regulation	GB4943-2001	
MTBF	438,352hrs	505,339hrs
Operating temperature	0 to 40°C	
Storage temperature	-40 to 70°C	
Operating humidity	10% - 90% RH	
Weight		
	Main unit: 67.5kg	Main unit: 43.5kg
Dimensions		
	1045x436.8x448 (L x W x Hmm)	736.4x436.8x508 (L x W x Hmm)

1.3 Product Appearance

1.3.1 Appearance of the DES-7210

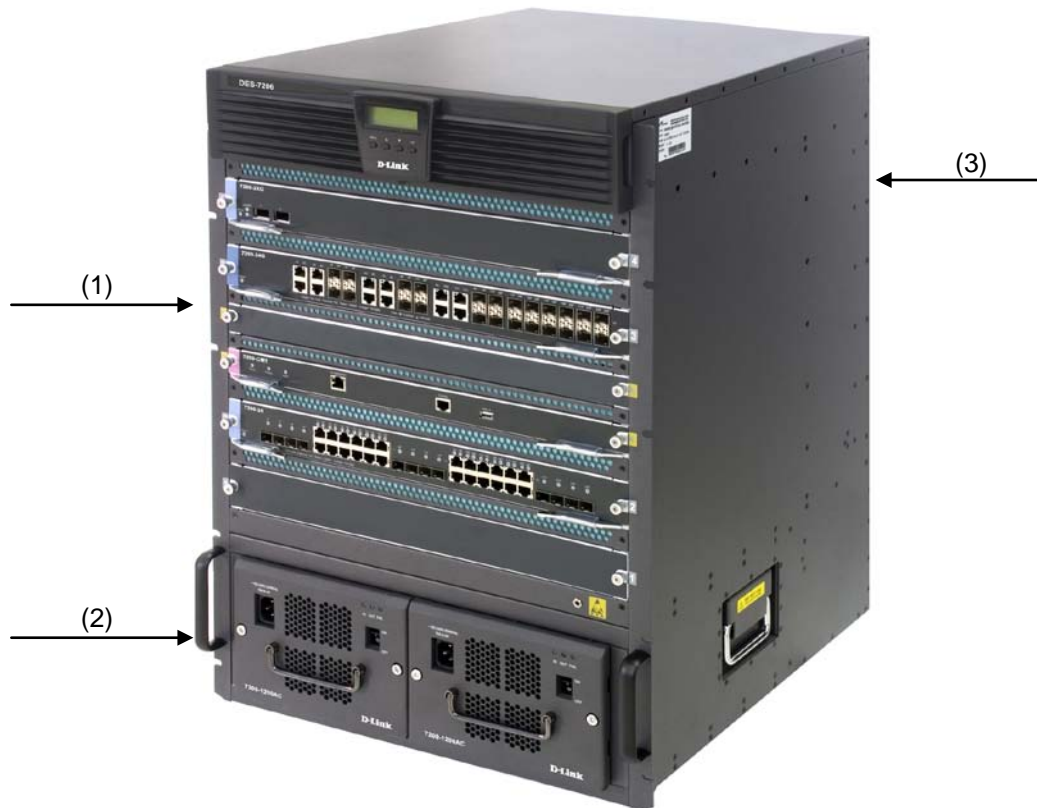
Figure 1-1 Appearance of the DES-7210



1. Air outlet layer: the air outlet layer of the entire system, discharging air on three sides;
2. Fan tray: the slot for the fan tray, which is the main heat dissipation unit of the system;
3. Modular player: providing 10 vertical module slots, which house different functional modules;
4. Wiring layer: arranging and leading out various cables in good order, while preventing the drooping cables from blocking the air inlet;
5. Air inlet layer: the air inlet channel of the heat dissipation system, suctioning air into the chassis;
6. Power layer: supporting two AC or DC power supplies for the maximum.

1.3.2 Appearance of the DES-7206

Figure 1-2 Appearance of the DES-7206



1. Module layer: offering up to 6 module slots;
2. Power layer: supporting two AC or DC power supplies for the maximum.
3. Air outlet: located at the back of the chassis to discharge air.

1.4 DES-7206/10 Hardware Composition

The DES-7210 hardware system consists of the chassis, power system, system modules, cabling rack, fan tray, air inlet/outlet ducts and air filter.

The DES-7206 hardware system consists of the chassis, power system, system modules, and fan tray.

1.4.1 Chassis

1.4.1.1 DES-7210 chassis

The DES-7210 uses a standard 19-inch chassis, whose standard height is 1,045mm, width is 436.8mm, and depth is 448 mm. It consists of the system module layer, fan layer, air inlet/outlet layer, cabling rack, air filter, and power layer.

The system module layer is a module plug-in frame, which mechanically supports various modules of the DES-7210 system.

At the bottom of the chassis are two power frames, above which are the air inlet layer. The air filter is located between the air inlet layer and the cabling rack, which is located below the system module layer. Above the system module layer is the fan layer, which houses six layers. At the top of the chassis is the air outlet layer, which works by the induced draught.

1.4.1.2 DES-7206 chassis

The DES-7206 uses a standard 19-inch chassis, whose standard height is 736.4mm, width is 436.8mm, and depth is 508 mm. It consists of the system module layer, fan layer and power layer.

The functional module layer is a module plug-in frame, which mechanically supports various modules of the DES-7206 system.

At the top of the chassis are two power frames. Located at the back of the chassis module plug-in box, the fan layer is the house of six fans, which induct air.

1.4.2 Module Plug-in Frame

The DES-7210/7206 module frame consists of the module slots and backplane.

The DES-7210 offers 10 module slots, of which the two in the middle are for the management modules only. The eight slots on both sides can accommodate a mix of various user modules. For the DES-7210, the modules are inserted vertically, and they have the same height of 412 mm, depth of 350 mm, and thickness of 2.0 mm. The DES-7210 backplane implements the interconnection of high-speed data links between the switching management cards and module line cards and that of various management and control signals.

The DES-7206 offers six module slots, of which the two in the middle are for the management modules only. The four slots on the upper and lower sides can accommodate a mix of various user modules. For the DES-7206, the modules are inserted horizontally, and they have the same width of 412 mm, depth of 350 mm, and thickness of 2.0 mm. The DES-7200 backplane implements the interconnection of high-speed data links between the switching management cards and module line cards and that of various management and control signals.

1. Functions of the DES-7210/7206 backplane

- Interconnecting various signals between modules and providing high-speed communication channels
- Passive backplane
- Supporting active/standby switching between management modules
- Supporting automatic identification of various slots
- Implementing distributed power supply
- Introducing monitoring signal lines of the fan and power supply

2. Slot numbers of the DES-7210/7206

When in full configuration, the modules in the module slots of the DES-7210 are as below:

- Two management modules serving as mutual backup
- Eight modules selected to meet the specific needs

The slots for the two management modules are in the middle, and they are identified as M1 and M2 from left to right. The other eight module line cards are numbered as 1-8 from the left to the right.

When in full configuration, the modules in the module slots of the DES-7206 are as below:

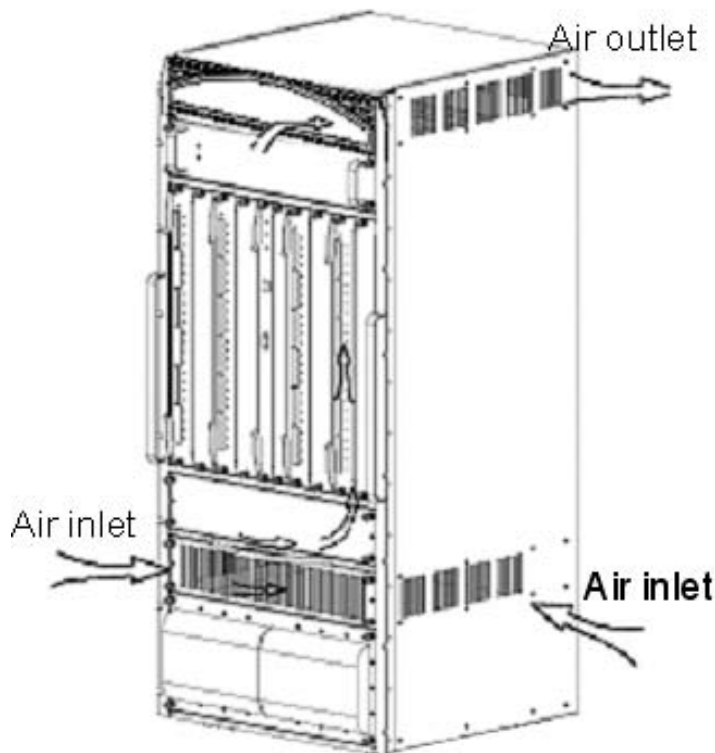
- Two management modules serving as mutual backup
- Four modules selected to meet the specific needs

The slots for the two management modules are in the middle, and they are identified as M1 and M2 from bottom up. The other four module line cards are numbered as 1-4 from bottom up.

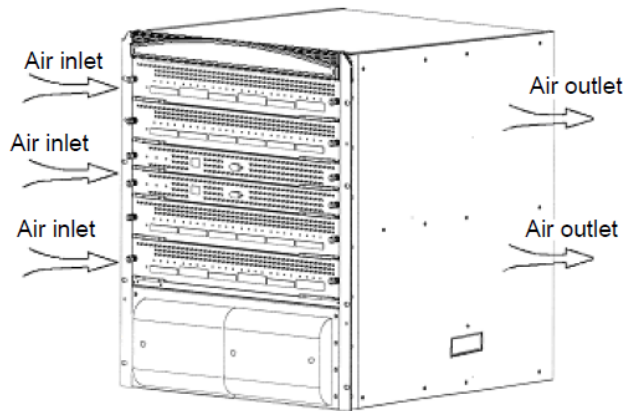
1.5 Ventilation/Heat Dissipation System of the DES-7206/7210

The operating temperature of the DES-7206/7210 is 0-40°C. The thermal design must ensure that the surface temperature of the components does not exceed the maximum allowed temperature of 50-80% at such an ambient temperature, while allowing for reliability, security, and reparability. In the thermal design of the DES-7206/7210, the fans are used to induct air for a forced convection in order to ensure the normal running of the equipment in the specified environment. Figure 1-3 and Figure 1-4 show the ventilation/heat dissipation solution.

Figure 1-3 Ventilation/Heat Dissipation Solution of the DES-7210



This structure is designed with air inlet at front/back and two sides, and air outlet at top back and both sides. Six 120*120*38 fans are used to blow the air to the outside for convection and ultimately heat dissipation. Therefore, the chassis should be mounted at a place with adequate spacing around for air circulation.

Figure 1-4 Ventilation/Heat Dissipation Solution of the DES-7206**Note**

This structure is designed with air inlet from the front panels of the modules, and air outlet at the back. Six 120*120*38 fans are used to blow the air to the outside for convection and ultimately heat dissipation. Therefore, the chassis should be mounted at a place with adequate spacing around for air circulation.

1.6 DES-7206/7210 Modules

DES-7210/7206 supports the modules described in Table 1-1.

7200-CM1~CM4: As the switching and central control module of the DES-7210/7206, the 7200 Control Modules implements the management of the entire system, including L2/L3 processing, route management, control and management user access, and network and operation maintenance.

7200-24G module: It provides 12 1000BASE-X SFP interfaces and 12 optical-electrical multiplexing 1000M interfaces and supports up to 24 1000BASE-X SFP interfaces or supports 12+M 1000BASE-X SFP interfaces and N 10/100/1000BASE-T interfaces, where M plus N equals 12. It features the functions of layer-2/3 wire speed switching and routing, and supports multi-mode SFP with the wavelength being 850nm, single-mode SFP module with that being 1310nm, and long-distance SFP module and SFP copper interface with that being 1550nm.

7200-24: It provides twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supports up to twenty-four 10/100/1000BASE-T interfaces or 12+M 10/100/1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. It features the functions of layer-2/3 wire speed switching and routing, and supports multi-mode SFP with the wavelength being 850nm, single-mode SFP module with that being 1310nm, and long-distance SFP module and SFP copper interface with that being 1550nm.

7200-48: It provides forty-four 10/100/1000BASE-T 1000M electrical ports and four optical/electrical combo 1000M interfaces, and supports up to forty-eight 10/100/1000BASE-T interfaces, or 44+M 10/100/1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals to 4. It features the functions of layer-2/3 wire speed switching and routing, and 850nm supports multi-mode SFP, 1310nm single-mode SFP module, and 1550nm long-distance SFP module and SFP copper interface.

7200-2XG module: It provides two 10000M XFP interfaces. It features the functions of layer-2/3 wire speed switching and routing, and supports multi-mode XFP module with the wavelength being 850nm, single-mode XFP module with that being 1310nm, and single XFP module with that being 1550nm.

7200-4XG module: It provides four 10,000M XFP interfaces. It features the functions of layer-2/3 wire speed switching and routing, and supports 850nm multi-mode XFP module, 1310nm single-mode XFP module, and 1550nm single XFP module.

7200-24P: It provides twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supports up to twenty-four 10/100/1000BASE-T interfaces or 12+M 10/100/1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. The 24 10/100/1000BASE-T 1000M electrical interfaces support IEEE 802.3af. The PoE port, the default one, can be directly connected PoE devices. It features the functions of layer-2/3 wire speed switching and routing, and supports multi-mode SFP with the wavelength being 850nm, single-mode SFP module with that being 1310nm, and long-distance SFP module and SFP copper interface with that being 1550nm.

7200-48P module: It provides forty-four 10/100/1000BASE-T 1000M electrical ports and four optical/electrical combo 1000M interfaces, and supports up to forty-eight 10/100/1000BASE-T interfaces, or 44+M 10/100/1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals to 4. The 48 10/100/1000BASE-T 1000M electrical interfaces support IEEE 802.3af and are considered to be PoE ports by default to connect PoE devices directly. It features the functions of layer-2/3 wire speed switching and routing, and 850nm supports multi-mode SFP, 1310nm single-mode SFP module, and 1550nm long-distance SFP module and SFP copper interface.

7200-24GE module: It provides 24 SFP interfaces that support 1000BASE-X and 100BASE-X modes. It features the functions of layer-2/3 wire speed switching and routing, and supports 850nm multi-mode SFP module, 1310nm single-mode SFP module, and 1550nm single SFP module and SFP copper interface.

7200-24G2XGE module: It provides 24 SFP interfaces that support 1000BASE-X and two 10000M XFP interfaces. It features the functions of layer-2/3 wire speed switching and routing. The SFP ports support 850nm multi-mode SFP module, 1310nm single-mode SFP module, 1550nm single SFP module and SFP copper interface. The XFP ports support multi-mode XFP module with the wavelength being 850nm, single-mode XFP module with that being 1310nm, and single XFP module with that being 1550nm.

7200-48E: It provides forty-four 10/100/1000BASE-T 1000M electrical ports and four optical/electrical combo 1000M interfaces, and supports up to forty-eight 10/100/1000BASE-T interfaces, or 44+M 10/100/1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals to 4. It features the functions of layer-2/3 wire speed switching and routing, and 850nm supports multi-mode SFP, 1310nm single-mode SFP module, and 1550nm long-distance SFP module and SFP copper interface.

7200-ASE3 module: It enables the MPLS function of the chassis.

7206/7210-Fan: As the fan tray of the system, it provides six 120*120*38 fans, which guarantee reliable heat dissipation of the system.

7200-1200AC/2000AC: As the AC power module of the system, it provides the input interface for 110/220V AC power supply.

7200-1200DC/2000DC: As the DC power module of the system, it provides the input interface for -48V DC power supply.

1.6.1 7200-CM1~4 Control Modules:

Figure 1-5, 1-7 shows the basic appearance of the 7200-CM1/CM3 which is the major management module of the DES-7206; Figure 1-6, 1-8 shows the basic appearance of the 7200-CM2/CM4 which is the major management module of DES-7210. The 7200 Control Module performs such functions as system switching, system status control, route management, user access control and management, and network maintenance. Inserted in slots M1 and M2 on the backplane of the chassis, the management module supports active/standby redundancy for hot backup and also hot swappability.



Note

In the system, there must be at least one 7200 Control Module for the system to work normally. However, you are recommended to configure this module for both slots for higher reliability.

Figure 1-5 Basic Appearance of the 7200-CM1



Figure 1-6 Basic Appearance of the 7200-CM2



Figure 1-7 Basic Appearance of the 7200-CM3



Figure 1-8 Basic Appearance of the 7200-CM4



1. Interface

The 7200 Control Modules provides three interfaces:

- **USB interface:** By connecting the USB interface, USB storage devices can keep logs, host versions, alarms and other diagnosis information, thus facilitating online upgrade of switch software and log information keeping.
- **Console port:** As the serial communication port, it uses the RS-232 interface level and uses standard RJ45 connector. This port is used to connect the serial port of the background terminal computer for such tasks as system debug, configuration, maintenance, management, and host software load.
- **10/100M MGMT port:** As the 10/100BASE-T Ethernet port, it uses the RJ-45 connector. This port can be used to connect the Ethernet port of the background computer for

program loading. It can also be used to connect the equipment such as remote NM workstation for remote management of the equipment. When it is connected to the Ethernet port of the background computer, the standard network cable suffices. For remote management of the equipment, you can use standard network cable to connect it to the HUB or switch, from which it is further connected to the NM workstation on the LAN. You can use the standard network cable to connect it to the router, from which it is further connected to the NM workstation on the WAN.



The Firmware v10.0 does not support any USB interface. To use a USB interface, you must adopt the Firmware v10.1 or a later version.



To secure data and prevent damage on the device, it is recommended to use qualified USB flash disk. The USB interface of DES-7200 is compatible with most USB controllers. Some types of USB flash disk may not be identified. You are recommended to use Patriot and Start-net Digital USB flash disk.

2. LEDs

The 7200-Control Module provides various system LEDs, as described in the following table:

Table 1-2 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on Red: The module is faulty Flashing green: The module is initializing; if it keeps on flashing, the module is faulty Solid green: The module has finished initialization and can perform switching normally
Primary	Primary/standby management module LED	OFF: The current module is the standby management module Green: The current module is the active management module
Alarm	Fault alarm	OFF: Free from fault Red: System fault
10/100M MGMT Port LED	LED1 (Full duplex)	OFF: Working in the half duplex mode Yellow: Working in the full duplex mode
	LED2 (Link/ACT)	OFF: Port is not linked Green: Port is linked Flashing green: data transmission

3. Technical Specifications

Table 1-3 Technical Specifications of the 7200-Control Modules

Product Model	7200-CM1	7200-CM2	7200-CM3	7200-CM4
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q			
Management mode	CLI, Telnet and Web-based			
Port type	One 10/100M Ethernet port as the management port One standard RJ45 serial port			

Product Model	7200-CM1	7200-CM2	7200-CM3	7200-CM4
LED	Status, Primary, Alarm and 10/100M MGMT Port LED			
Hot swap ability	Supported			
Management redundancy	Supported			
Power consumption	<30W		<50W	
EMC	GB9254-1998 FCC Class A			
Safety regulation	GB4943-2001			
MTBF	246,987hrs	240,558hrs	174,420hrs	173,868hrs
Operating temperature	0 to 40°C			
Storage temperature	-40 to 70°C			
Operating humidity	10% - 90% RH			
Weight	Net weight: 2.8 Kg			
Dimensions	436*346x30 (Lx W x Hmm)			

1.6.2 7200-24G Module

Figure 1-9 shows the basic appearance of the 7200-24G, which is the line card module of the DES-7210/7206. 7200-24G provides 12 1000M SFP ports and 12 1000M optical-electrical multiplexing ports, and supports up to 24 1000BASE-X interfaces or 12+M 1000BASE-X interfaces and N 1000BASE-T interfaces, where M plus N equals 12. It features the function of layer-2/3 wire speed switching. The 7200-24G module supports the hot swap function and also supports hot swapping of SFP ports.

Figure 1-9 Basic Appearance of the 7200-24G



1. Interface

7200-24G provides 12 1000M SFP ports and 12 1000M optical-electrical multiplexing ports. It features the function of layer-2/3 switching with the 1000M wire speed. When the function of automatic negotiation is enabled, the 1000M electrical interface supports automatic MDI/MDI-X identification. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) 1000M SFP optical modules and long-wave (1550nm) 1000M SFP optical modules and SFP copper ports, thus facilitating configuration for users. In addition, the SFP port supports hot swappability of the SFP module.



Note

The 7200-24G provides twelve SFP optical ports of 10/100/1000BASE-T ports that are in the combo form. In other words, each SFP port corresponds to one 10/100/1000BASE-T port, and only one port can be used at a time, with the other being unavailable. The MDI/MDI-X automatic identification of the 10/100/1000M electrical ports takes effect only when auto negotiation is enabled.

2. LEDs

The 7200-24G provides various system LEDs, as described in the following table:

Table 1-4 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on Red: Module fault Flashing green: The module is initializing Solid green: The module has finished initialization and can perform switching normally
Link/ACT	Port status LED	OFF: Port is not linked Green: Port is linked Flashing green: data transmission at the port

3. Technical Specifications

Table 1-5 Technical Specifications of the 7200-24G

Product Model	7200-24G
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	Providing 12 SFP 1000M module ports and 12 1000M optical-electrical multiplexing ports (supporting 1000BASE-SX/LX, 1000BASE-TX, 1000BASE-LH and 10/100/1000BASE-TX)
Transmission media	1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125 um MMF: 500m 1000BASE-LX(1310nm) 9/125 um SMF: 10KM (550m for multi-mode optical fibers) 1000BASE-LH(1310nm) 9/125 um SMF: 40KM 10/100/1000BASE-TX: 100m (Category-5 UPT)
LED	Status, Link/ACT LEDs
Hot swappability	Supported
Power consumption	<75W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	167,577hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% - 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45 (L x W x Hmm)

1.6.3 7200-24 Module

Figure 1-10 shows the basic appearance of the 7200-24, which is the line card module of the DES-7210/7206. The 7200-24 provides twelve 10/100/1000BASE-T electrical interfaces and twelve optical/electrical combo 1000M interfaces, which deliver L2/L3 wire-speed switching. It is hot swappable while supporting the hot swappability of the SFP port.

Figure 1-10 Basic Appearance of the 7200-24

1. Interface

7200-24: It provides twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supports up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. When the function of automatic negotiation is enabled, the 1000M electrical interface supports automatic MDI/MDI-X identification. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) 1000M SFP optical modules and long-wave (1550nm) 1000M SFP optical modules and SFP copper ports, thus facilitating configuration for users.



Note

The 7200-24 provides twelve SFP optical ports and 10/100/1000BASE-T ports that are in the combo form. In other words, each SFP port corresponds to one 10/100/1000BASE-T port, and only one port can be used at a time, with the other being unavailable. The MDI/MDI-X automatic identification of the 10/100/1000M electrical ports takes effect only when auto negotiation is enabled.

2. LEDs

The 7200-24 provides various system LEDs, as described in the following table:

Table 1-6 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on Red: Module fault Flashing green: The module is initializing Solid green: The module has finished initialization and can perform switching normally
Link/ACT	Port status LED	OFF: Port is not linked Green/Orange: Port is linked Flashing green: data transmission at 1000M Flashing orange: data transmission at 10/100M

3. Technical Specifications

Table 1-7 Technical Specifications of the 7200-24

Product Model	7200-24
Standard Compliance	IEEE 802.3-2000 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	Providing twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supporting up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12.

Product Model	7200-24
Transmission media	10/100/1000BASE-T: 100m (Category-5 UPT) 1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125um MMF: 500m 1000BASE-LX(1310nm) 9/125um SMF: 10KM 1000BASE-LH(1310nm) 9/125um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<85W+15.4xN (N indicates the PoE port being used, of which the value is less than 24.)
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	166,442hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% - 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45 (L x W x Hmm)

1.6.4 7200-48 Module

Figure 1-11 shows the basic appearance of the 7200-48, the line card module of the DES-7200 series. The 7200-48 provides 44 10/100/1000BASE-T electrical 1000M interfaces and 4 optical/electrical combo 1000M interfaces, which deliver L2/L3 wire-speed switching. The 7200-48 is hot swappable.

Figure 1-11 Basic Appearance of the 7200-48



1. Interface

7200-48 provides 44 10/100/1000BASE-T electrical ports and 4 optical/electrical combo 1000M interfaces, and supports up to 48 1000BASE-T interfaces or 44+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 4. When the function of automatic negotiation is enabled, the 1000M electrical interface supports automatic MDI/MDI-X identification. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) 1000M SFP optical modules and long-wave (1550nm) 1000M SFP optical modules and SFP copper ports, thus facilitating configuration for users.



Note

The 7200-48 provides four 10/100/1000BASE-T SFP optical ports that are in the multiplexing form. In other words, each SFP port corresponds to one 10/100/1000BASE-T port, and only one port can be used at a time, with the other being unavailable. The MDI/MDI-X automatic identification of the 10/100/1000M electrical ports takes effect only when auto negotiation is enabled.

2. LEDs

The 7200-48 provides various system LEDs, as described in the following table:

Table 1-8 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on. Red: Module fault Flashing green: The module is initializing. Solid green: The module has finished initialization and can perform switching normally.
Link/ACT	Port status LED	OFF: Port is not linked. Green/Orange: Port is linked. Flashing green: Data is transmitted at 1000M. Flashing orange: Data is transmitted at 10/100M.

3. Technical Specifications

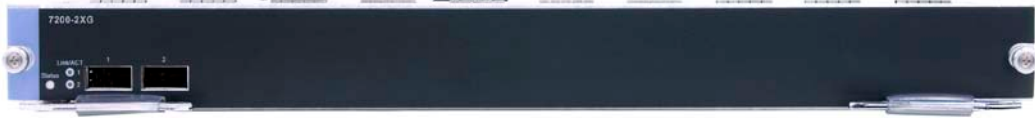
Table 1-9 Technical Specifications of the 7200-48

Product Model	7200-48
Standard Compliance	IEEE 802.3-2000 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	Twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces; Up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12.
Transmission media	10/100/1000BASE-T: 100m (Category-5 UPT) 1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125um MMF: 500m 1000BASE-LX(1310nm) 9/125um SMF: 10KM 1000BASE-LH(1310nm) 9/125um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<100w
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	151,112hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 3.5 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.5 7200-2XG Module

Figure 1-12 shows the basic appearance of the 7200-2XG, which is the line card module of the DES-7200 series. 7200-2XG provides two 10000M XFP interfaces and features the function of layer-2/3 wire speed switching. The 7200-2XG is hot swappable, while supporting hot swappability of the XFP ports.

Figure 1-12 Basic Appearance of the 7200-2XG



1. Interface

7200-2XG provides two 10000M XFP module interfaces and features the function of layer-2/3 switching with the 10000M wire speed. The XFP ports support short-wave (850nm, multi-mode), long-wave (1310nm, single-mode) and long-wave (1550nm) 10000M XFP optical modules, thus facilitating configuration for users.

2. LEDs

The 7200-2XG provides various system LEDs, as described in the following table:

Table 1-10 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on Red: Module fault Flashing green: The module is initializing Solid green: The module has finished initialization and can perform switching normally
Link/ACT	Port status LED	OFF: Port is not linked Green: Port is linked Flashing green: data transmission at the port

3. Technical Specifications

Table 1-11 Technical Specifications of the 7200-2XG

Product Model	7200-2XG
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	Providing two 10000M XFP interfaces
Transmission media	10GBASE-SR(850nm) 62.5/125um MMF: 220m 1000BASE-LR(1310nm) 9/125 um SMF: 10KM (550m for multi-mode optical fibers) 10GBASE-LH(1550nm) 9/125 um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<75W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001

Product Model	7200-2XG
MTBF	180,698hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% - 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45 (L x W x Hmm)

1.6.6 7200-4XG Module

Figure 1-13 shows the basic appearance of the 7200-4XG, the line card module of the DES-7200 series. 7200-4XG provides four 10,000M XFP interfaces and features the functions of layer-2/3 wire speed switching. The 7200-4XG is hot swappable.

Figure 1-13 Basic Appearance of the 7200-2XG



1. Interface

7200-4XG provides four 10,000M XFP module interfaces and features the function of layer-2/3 switching with the 10,000M wire speed. The XFP ports support short-wave (850nm, multi-mode), long-wave (1310nm, single-mode) and long-wave (1550nm) 10,000M XFP optical modules, thus facilitating configuration for users.

2. LEDs

The 7200-4XG provides various system LEDs, as described in the following table:

Table 1-12 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on. Red: Module fault Flashing green: The module is initializing. Solid green: The module has finished initialization and can perform switching normally.
Link/ACT	Port status LED	OFF: Port is not linked. Green: Port is linked. Flashing green: Data is transmitted on the port.

3. Technical Specifications

Table 1-13 Technical Specifications of the 7200-4XG

Product Model	7200-4XG
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	Four 10,000M XFP interfaces
Transmission media	10GBASE-SR(850nm) 62.5/125um MMF: 220m 1000BASE-LR(1310nm) 9/125 um SMF: 10KM (550m for multi-mode optical fibers) 10GBASE-LH(1550nm) 9/125 um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<100W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	174,055hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.7 7200-24P Module

Figure 1-14 shows the basic appearance of the 7200-24P, which is the line card module of the DES-7200 series. 7200-24P provides twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supports up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. It features the function of layer-2/3 wire speed switching and supports hot plug-in. The hot pull-out function is limited to some extent and it only supports the hot swapping function of SFP interface modules.

Figure 1-14 Basic Appearance of the 7200-24P

1. Interface

7200-24P provides twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supports up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. The 1000 electrical interface supports PoE devices by default. When the function of automatic negotiation is enabled, it supports automatic MDI/MDI-X identification. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) 1000M SFP optical modules and long-wave (1550nm) 1000M SFP optical modules and SFP copper ports, thus facilitating configuration for users.

**Note**

The 7200-24P provides twelve SFP optical ports and 10/100/1000BASE-T ports that are in the combo form. In other words, each SFP port corresponds to one 10/100/1000BASE-T port, and only one port can be used at a time, with the other being unavailable. The MDI/MDI-X automatic identification of the 10/100/1000M electrical ports takes effect only when auto negotiation is enabled.

**Warning**

7200-24P does not support the hot pull-out operation. You need to perform the following operations to achieve it:

1. Disconnect all cables connected with cable card ports;
2. Hold the **Mode** button for over three seconds until all LEDs on the cable card ports are off;
3. Configure the pull-out operation through software commands. (For relevant software configuration commands, refer to the corresponding software description.)

2. LEDs

The 7200-24P provides various system LEDs, as described in the following table:

Table 1-14 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on Red: Module fault Flashing green: The module is initializing Solid green: The module has finished initialization and can perform switching normally
Mode	LED status indication	Green: Data exchange indication Orange: PoE status indication
Link/ACT	Port status LED	When Mode is green: OFF: Port is not linked Green: Port is linked Flashing green: data transmission at the port When Mode is orange: Off: The PoE device does not work normally. Green: The PoE device works normally.

3. Technical Specifications

Table 1-15 Technical Specifications of the 7200-24P

Product Model	7200-24P
Standard Compliance	IEEE 802.3-2000 IEEE 803.ab, IEEE 802.3af, IEEE 802.1D and IEEE 802.1Q 802.1X authentication
Port type	Providing twelve 10/100/1000BASE-T electrical ports and twelve optical/electrical combo 1000M interfaces, and supporting up to twenty-four 1000BASE-T interfaces or 12+M 1000BASE-T interfaces and N 1000BASE-X interfaces, where M plus N equals 12. Providing up to 24 PoE ports

Product Model	7200-24P
Transmission media	10/100/1000BASE-T: 100m (Category-5 UPT) 1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125um MMF: 500m 1000BASE-LX(1310nm) 9/125um SMF: 10KM 1000BASE-LH(1310nm) 9/125um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<85W+15.4xN (N indicates the PoE port being used, of which the value is less than 24.)
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	153,221hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% - 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45 (L x W x Hmm)

1.6.8 7200-48P Module

Figure 1-15 shows the basic appearance of the 7200-48P, the line card module of the DES-7200 series. 7200-48P provides 44 10/100/1000BASE-T electrical 1000M interfaces and 4 optical/electrical combo 1000M interfaces, and supports up to 48 1000BASE-T interfaces or 44+M 1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals 4. The 7200-48P module is hot swappable.

Figure 1-15 Basic Appearance of the 7200-48P



1. Interface

7200-48P provides 44 10/100/1000BASE-T electrical 1000M interfaces and 4 optical/electrical combo 1000M interfaces, and supports up to 48 1000BASE-T interfaces or 44+M 1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals 4. The 1000M electrical interface supports PoE by default. Automatic MDI/MDI-X identification is available only when automatic negotiation is enabled. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) 1000M SFP optical modules and long-wave (1550nm) 1000M SFP optical modules and SFP copper ports, thus facilitating configuration for users.

Note: The 7200-48P provides twelve SFP optical ports and 10/100/1000BASE-T ports that are in the combo form. In other words, each SFP port corresponds to one 10/100/1000BASE-T port, and only one port can be used at a time, with the other being unavailable. The MDI/MDI-X automatic identification of the 10/100/1000M electrical ports takes effect only when auto negotiation is enabled.



7200-48P does not support the hot pull-out operation. You need to perform the following operations to achieve it:

1. Disconnect all cables connected to the cable card ports;
2. Hold the **Mode** button for over three seconds until all LEDs on the cable card ports go off;
3. Configure the pull-out operation through software commands. (For relevant software configuration commands, refer to the corresponding software description.)

2. LEDs

The 7200-48P provides various system LEDs, as described in the following table:

Table 1-16 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on. Red: Module fault Flashing green: The module is initializing. Solid green: The module has finished initialization and can perform switching normally.
Mode	LED status indication	Green: Data exchange indication Orange: PoE status indication
Link/ACT	Port status LED	Electrical interface: When Mode is green (switching): OFF: Port is not linked. Green: Port is linked at 1000M. Orange: Port is linked at 10/100M. Flashing: Data is transmitted on the port. When Mode is orange (PoE): Off: The PoE device does not work normally. Green: The PoE device works normally. Orange: the PoE device is overloaded. Red: The port cannot be powered. Optical interface: OFF: Port is not linked. Green: Port is linked. Flashing green: Data is transmitted on the port.

3. Technical Specifications

Table 1-17 Technical Specifications of the 7200-48P

Product Model	7200-48P
Standard Compliance	IEEE 802.3-2000 IEEE 803.ab, IEEE 802.3af, IEEE 802.1D and IEEE 802.1Q 802.1X authentication
Port type	44 10/100/1000BASE-T electrical 1000M interfaces and 4 optical/electrical combo 1000M interfaces; Up to 48 1000BASE-T interfaces, or 44+M 1000BASE-T interfaces and N 1000BASE-X interfaces where M plus N equals to 4. Up to 48 PoE ports.

Product Model	7200-48P
Transmission media	10/100/1000BASE-T: 100m (Category-5 UPT) 1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125um MMF: 500m 1000BASE-LX(1310nm) 9/125um SMF: 10KM 1000BASE-LH(1310nm) 9/125um SMF: 40KM
LED	Status, Link/ACT
Hot swappability	Supported
Power consumption	<100W+15.4xN (N indicates the PoE port being used, of which the value is less than 48.)
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	141,824hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.9 7200-24GE Module

Figure 1-16 shows the basic appearance of the 7200-24GE, the line card module of the DES-7200 series. 7200-24GE 24 1000M and 100M combo SFP interfaces, that is, it supports 1000BASE-X and 100BASE-X modes. It features the function of layer-2/3 wire speed switching. The 7200-24GE module is hot swappable.

Figure 1-16 Basic Appearance of the 7200-24GE



1. Interface

7200-24GE provides 24 1000M and 100M combo SFP interfaces, that is, it supports 1000BASE-X and 100BASE-X modes. It features the function of layer-2/3 switching with the 1000M wire speed. The SFP ports support short-wave (850nm, multi-mode) and long-wave (1310nm, single-mode) and long-wave (1550nm) 1000M/100M SFP optical modules and SFP copper ports. The module is hot swappable.

2. LEDs

The 7200-24GE provides various system LEDs, as described in the following table:

Table 1-18 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on. Red: Module fault Flashing green: The module is initializing. Solid green: The module has finished initialization and can perform switching normally.

Sign	Description	Detailed Information
Link/ACT	Port status LED	OFF: Port is not linked. Green: The 1000BASE-X Port is linked. Flashing green: Data is transmitted on the 1000BASE-X port. Orange: The 100BASE-X port is linked. Flashing orange: Data is transmitted on the 100BASE-X port.

3. Technical Specifications

Table 1-19 Technical Specifications of the 7200-24GE

Product Model	7200-24GE
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
Port type	24 1000M and 100M combo SFP interfaces (supporting 1000BASE-X/ and 100BASE-X)
Transmission media	1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125 um MMF: 500m 1000BASE-LX(1310nm) 9/125 um SMF: 10KM (550m for multi-mode optical fibers) 1000BASE-LH(1310nm) 9/125 um SMF: 40KM
LED	Status, Link/ACT LEDs
Hot swappability	Supported
Power consumption	<75W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	220,531hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.10 7200-24G2XGE Module

Figure 1-17 shows the basic appearance of 7200-24G2XGE, the link card of DES-7200 series. 7200-24G2XGE comes with two 10G XFP ports, 12 gigabit SFP ports and 12 gigabit optical-electrical multiplex ports, and supports up to 2 XFP ports plus 24 1000BASE-X interfaces, or 2 XFP ports plus 12+M 1000BASE-X interfaces + N 1000BASE-T interfaces where M+N=12. Moreover, it offers Layer2/3 line rate switching. 7200-24G2XGE supports hot-swapping as well as hot-swapping on XFP and SFP ports.

Figure 1-17 Basic Appearance of the 7200-24G2XGE



1. Interface

7200-24G2XGE comes with two 10G XFP ports, 12 gigabit SFP ports and 12 gigabit optical-electrical multiplex ports, and offers gigabit-level line rate of Layer 2/3 switching. With auto-negotiation enabled, the gigabit electrical port supports automatic MDI/MDI-X identification. The gigabit SFP optical module of short wave (850nm, multi mode), long wave (1310nm, single mode) and long distance (1550nm) is supported on the SFP port. The SFP copper port is also supported to offer flexible configuration. The SFP module is hot swappable on the SFP port.



Note

7200-24G2XGE offers 12 multiplex ports whose 10/100/1000BASE-T port is SFP optical port. Only one port is available at a time. The automatic MDI/MDI-X function of the 10/100/1000M electrical port takes effect only after auto negotiation is enabled.

2. LEDs

7200-24G2XGE comes with various LED indicators. The following table describes these indicators:

Table 1-20 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System indicator	Off: The module is not powered on. Red: The module fails. Flashing green: The module is initializing. Constant green: The module is initialized and can switch
Module	Module indicator	Off: The module is not available. Green: The module is available.
Link/ACT	Port status indicator	Off: The port is not linked. Green: The port is linked. Flashing green: Data is transmitted through the port.

3. Technical Specifications

Table 1-21 Technical Specifications of the 7200-24G2XGE

Product Model	7200-24G2XGE
Standard Compliance	IEEE 802.3 -2002 Ethernet standard IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X
Port type	12 SFP gigabit ports and 12 gigabit optical-electrical multiplex ports (supporting 1000BASE-SX/LX,1000BASE-TX, 1000BASE-Lh and 10/100/1000BASE-TX)
Transmission media	1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125 um MMF: 500m 1000BASE-LX (1310nm) 9/125 um SMF: 10KM (550m for multimode optical fibers) 1000BASE-LH(1310nm) 9/125 um SMF: 40KM 10/100/1000BASE-TX: 100m (Cat-5 UPT twisted pairs) 10GBASE-SR(850nm) 62.5/125um MMF: 220m 10GBASE-LR(1310nm) 9/125 um SMF: 10KM(550m for multimode optical fibers) 10GBASE-ER(1550nm) 9/125 um SMF: 40KM
LED	Status, Link/ACT, module indicator

Product Model	7200-24G2XGE
Hot swappability	Supported
Power consumption	<75W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	151,800hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.11 7200-48E Module

Figure 1-18 is the basic appearance of 7200-48E, the line card of DES-7200 series. 7200-48E comes with 44 10/100/1000BASE-T gigabit electric interfaces and 4 electric-optic multiplexing gigabit interfaces. 7200-48E supports hot-swapping as well as hot-swapping on SFP ports.

Figure 1-18 Basic Appearance of the 7200-48E



1. Interface

7200-48E comes with 44 10/100/1000BASE-T gigabit electric interfaces and 4 electric-optic multiplexing gigabit interfaces. It supports up to 48 1000BASE-T interfaces, or 44 +M 1000BASE-T interfaces and N 1000BASE-X interfaces where M+N=4. With auto-negotiation enabled, the gigabit electrical port supports automatic MDI/MDI-X identification. The gigabit SFP optical module of short wave (850nm, multi mode), long wave (1310nm, single mode) and long wave (1550nm) is supported on the SFP port. The SFP electric interface is also supported to offer flexible configuration.



Note

7200-48E offers 4 multiplex ports whose 10/100/1000BASE-T port is SFP optical port. Only one port is available at a time. The automatic MDI/MDI-X function of the 10/100/1000M electrical port takes effect only after auto negotiation is enabled.

2. LEDs

7200-48E comes with various LED indicators. The following table describes these indicators:

Table 1-22 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System indicator	Off: The module is not powered on. Red: The module fails. Flashing green: The module is initializing. Constant green: The module is initialized and can switch.

Sign	Description	Detailed Information
Link/ACT	Port status indicator	<p>Electric port:</p> <p>Off: The port is not linked.</p> <p>Green: The port is linked at 1000M.</p> <p>Orange: The port is linked at 10/100M.</p> <p>Flashing green: Data is transmitted through the port.</p> <p>Optic port:</p> <p>Off: The port is not linked.</p> <p>Green: The port is linked.</p> <p>Flashing green: Data is transmitted through the port.</p>

3. Technical Specifications

Table 1-23 Technical Specifications of the 7200-48E

Product Model	7200-48E
Standard Compliance	IEEE 802.3 -2002 Ethernet standard IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X
Port type	44 10/100/1000BASE-T gigabit electric interfaces and 4 electric-optic multiplexing gigabit interfaces. Up to 48 1000BASE-T interfaces, or 44 +M 1000BASE-T interfaces and N 1000BASE-X interfaces where M+N=4
Transmission media	10/100/1000BASE-T: 100m (Cat-5 UTP twisted pair) 1000BASE-SX(850nm) 62.5/125um MMF: 220m 1000BASE-SX(850nm) 50/125um MMF: 500m 1000BASE-LX(1310nm) 9/125um SMF: 10KM 1000BASE-LH(1310nm) 9/125um SMF: 40KM
LED	Status, Link/ACT
Hot swapability	Supported
Power consumption	<100W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 3.5 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.12 7200-ASE3 Module

Figure 1-19 shows the basic appearance of 7200-ASE3. The 7200-ASE3 is an agent card that supports MPLS. The line card does not provide any external port for improving the performance of DES-7200 series.

Figure 1-19 Basic Appearance of the 7200-ASE3

1. Indicators

7200-ASE3 module provides the LEDs for indicating system status, as described in the following table:

Table 1-24 LEDs on the Front Panel

Sign	Description	Detailed Information
Status	System LED	OFF: The module has not been powered on. Red: Module fault Flashing green: The module is initializing. Solid green: The module has finished initialization and can perform switching normally.

3. Technical Specifications

Table 1-25 Technical Specifications of the 7200-ASE3

Product Model	7200-ASE3
Standard Compliance	IEEE 802.3-2002 IEEE 803.ab, IEEE 802.1D, and IEEE 802.1Q 802.1X authentication
LED	Status
Hot swappability	Supported
Power consumption	<100W
EMC	GB9254-1998 FCC Class A
Safety regulation	GB4943-2001
MTBF	172,738hrs
Operating temperature	0 to 40°C
Storage temperature	-40 to 70°C
Operating humidity	10% to 90% RH
Weight	Net weight: 2.8 Kg
Dimensions	436*346*45mm (L x W x H)

1.6.13 7206/7210-Fan Module

The 7210-Fan is the fan module of the DES-7210, while the 7206-Fan is that of the DES-7206. The 7206/7210-Fan provides a sound heat dissipation system for the entire system to ensure the stable working of the system.

The 7210-Fan provides various system LEDs, as described in the following table:

Table 1-26 LEDs on the Front Panel of the 7210-FAN

Sign	Description	Detailed Information
Power	Power LED	OFF: The fan tray has not been powered on Solid green: The fan module is normally powered on
Alarm	Alarm LED	OFF: Normally working Red: The fan tray fails

**Note**

In the DES-7210/7206 system, when the 7206/7210-Fan has an alarm, it means that the fan tray has failed. When this happens, you should replace the failed one with a normal one as promptly as possible, preferably within 10 minutes. The 7206/7210-Fan is hot swappable.

1.6.14 7200-1200AC/2000AC Power Module

As the AC power module of the system, the 7200-1200AC/2000AC provides the input interface of 110/220V AC power supply for the DES-7210/7206.

**Note**

The DES-7210/7206 system supports 1+1 redundancy for the AC power supply. For higher stability and reliability of the entire system, you are recommended to configure 1+1 redundancy of the 7200-1200AC/2000AC for the DES-7210/7206.

**Warning**

The DES-7210/7206 system supports 1+1 redundancy for both the AC power supply and DC power supply. However, please note that the two power supplies in the 1+1 redundancy must be of the same power module. In other words, they must be both AC power supplies or DC power supplies. Do not mix them, as this may cause abnormal running or even damage of the system. In addition, two power modules are mandatory when a PoE device is in use. 7200 single power does not support any POE device.

1.6.15 7200-1200DC/2000DC Power Module

As the DC power module of the system, the 7200-1200DC/2000DC provides the input interface of -48V DC power supply for the DES-7210/7206.

**Note**

The DES-7210/7206 system supports 1+1 redundancy for the DC power supply 7200-1200DC/2000DC. For higher stability and reliability of the entire system, you are recommended to configure 1+1 redundancy of the 7200-1200DC/2000DC for the DES-7210/7206.

**Warning**

The DES-7210/7206 system supports 1+1 redundancy for both the AC power supply 7200-1200DC/2000DC and DC power supply 7200-1200DC/2000DC. However, please note that the two power supplies in the 1+1 redundancy must be of the same power module. In other words, they must be both AC power supplies or DC power supplies. Do not mix them, as this may cause abnormal running or even damage of the system. In addition, two power modules are mandatory when a PoE device is in use. 7200 single power does not support any POE device.

2 Preparation Before Installation

2.1 Safety Suggestions

To avoid personal injury and equipment damage, please carefully read the safety suggestions before you install the DES-7210/7206.



Note

The following safety suggestions do not cover all possible dangers.

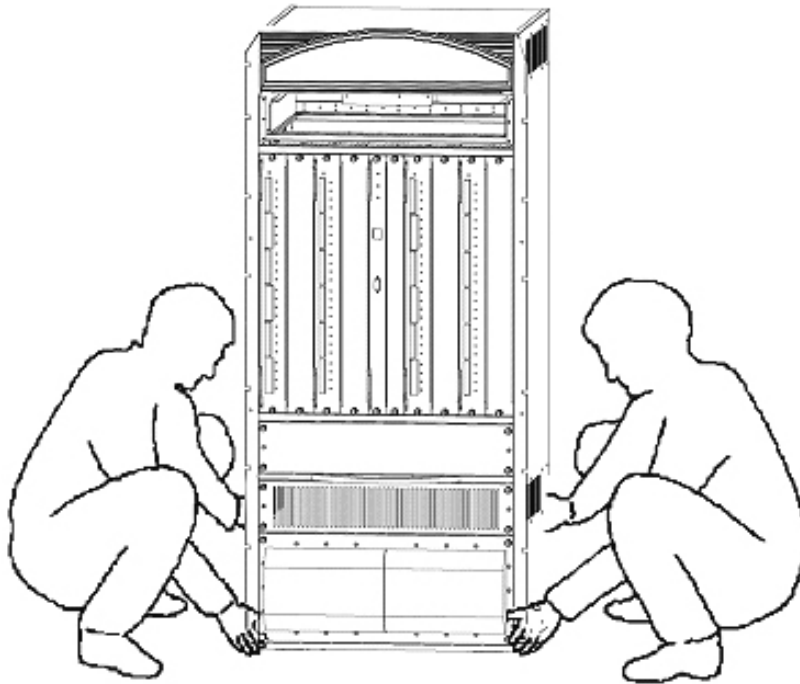
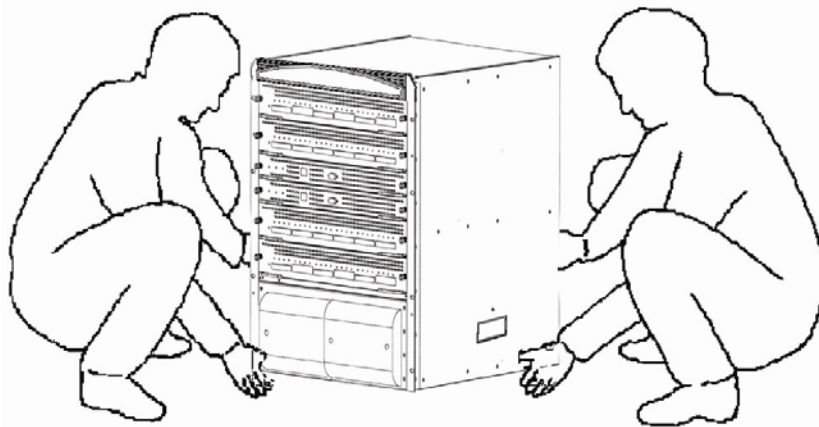
2.1.1 Safety Precautions for Installing the System

- Keep the chassis clean, free from any dust.
- Do not place the equipment in a walking area.
- Do not wear loose clothes or any other things that may be caught by the chassis during installation and maintenance.
- Turn off all power supplies and unplug all power cables before you can remove the chassis.

2.1.2 Safety Precautions for Removing

The DES-7210/7206 is large and heavy. When you handle them, please pay attention to the following requirement:

- Avoid moving the equipment frequently.
- At least two persons are needed to move the equipment. Do not attempt to move the equipment by one person only.
- Keep balanced in moving the equipment, and avoid injuring your leg and feet or spraining your waist.
- Turn off all power supplies and unplug all power cables before you can remove the equipment.
- First remove all the line cards, fan tray, and power module from the chassis before you can move the DES-7210/7206 by using the handles on both sides, to avoid any damage.

Figure 2-1 Schematic Diagram for Correctly Moving the DES-7210**Figure 2-2** Schematic Diagram for Correctly Moving the DES-7206

Do not move the equipment by grasping the panel, power supply handle, ventilation holes of the chassis, as they are not designed to bear the weight of the entire equipment. Failing to do so may cause damage or even injure yourself.

2.1.3 Electrical Safety

- Please observe local regulations and specifications when performing electrical operations. Relevant operators must be qualified.
- Please carefully check for any potential danger in the working area, for example, ungrounded power supply, unreliable grounding of the power supply, and damp/wet ground or floor.
- Find out the location of the emergency power supply switch in the room before installation. First cut off the power supply in the case of an accident.

- Do not maintain the equipment alone when it is energized, unless absolutely necessary.
- Be sure to make a careful check before you shut down the power supply.
- Do not place the equipment in a damp/wet location. Do not let any liquid enter the chassis
- Connect the negative and positive lines correctly according to the instructions when DC power supply is used.



Warning

Any nonstandard and inaccurate electrical operation can cause an accident such as fire or electrical attack, thus causing severe even fatal damages to human bodies and equipment.



Warning

Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

2.1.4 Static Discharge Damage Prevention

Although much has been done in the DES-7210/7206 to prevent static electricity, great damage may be caused to the circuitry and equipment when the static electricity exceeds a certain limit.

In the communication network of the DES-7210/7206, electrostatic induction may come from the following sources:

- External electric field produced by the high-voltage supply cable, lightning, etc;
- Internal systems such as the indoor floor and the entire structure.

To prevent damage from static electricity, you must pay attention to the following:

1. Proper grounding of the equipment and floor
2. Dust prevention measures are taken in the room.
3. An appropriate humidity is maintained.
4. Always wear an anti-static wrist strap when you touch any circuit board.
5. Try to hold a circuit board by its edges. Do not touch any components or the PCB.
6. Do not let any clothes touch a circuit board. An antistatic wrist strap can only prevent static electricity from human damaging the circuit board, but cannot prevent any static electricity on clothes.

2.1.5 Laser Safety

Among the modules supported by the DES-7210/7206, there are a great number of optical modules that are Class I laser products. Therefore, pay attention to the following during your use of this product:

- When a fiber transceiver works, ensure that the port has been connected with an optical fiber or is covered with a dust cap, to keep out dust and avoid burning your eyes.
- Do not stare into any optical port.



Danger

Do not stare into any optical port under any circumstances, as this may cause permanent damage to your eyes.

2.2 Installation Site Requirements

The DES-7210/7206 must be used indoors. To ensure the normal working and a prolonged useful life of the equipment, the installation site must meet the following requirements.

2.2.1 Requirements for Rack Mounting

If you plan to mount the DES-7210/7206 in a frame, you must verify that the frame meets the following conditions:

- Install the switch in an open cabinet as much as possible. If you install the switch inside a closed cabinet, please make sure that the cabinet has a good ventilation and heat dissipation system.
- Make sure that the cabinet is firm enough to bear the weight of the DES-7210/7206 and its installation accessories.
- Make sure that the dimensions of the cabinet spare certain space for the installation of the front, rear, left and right panels of the DES-7210/7206 for the sake of heat dissipation.
- The frame should be properly grounded.

2.2.2 Ventilation Requirements

Figure 2-3 and Figure 2-4 show the ventilation requirements of the DES-7210/7206. You must ensure that sufficient spacing is reserved at the ventilation openings to ensure the normal working of ventilation. After various cables have been connected, they should be arranged into bundles or placed on the cabling rack, to avoid blocking the air inlets.

Figure 2-3 Schematic Diagram for the Ventilation of the DES-7210

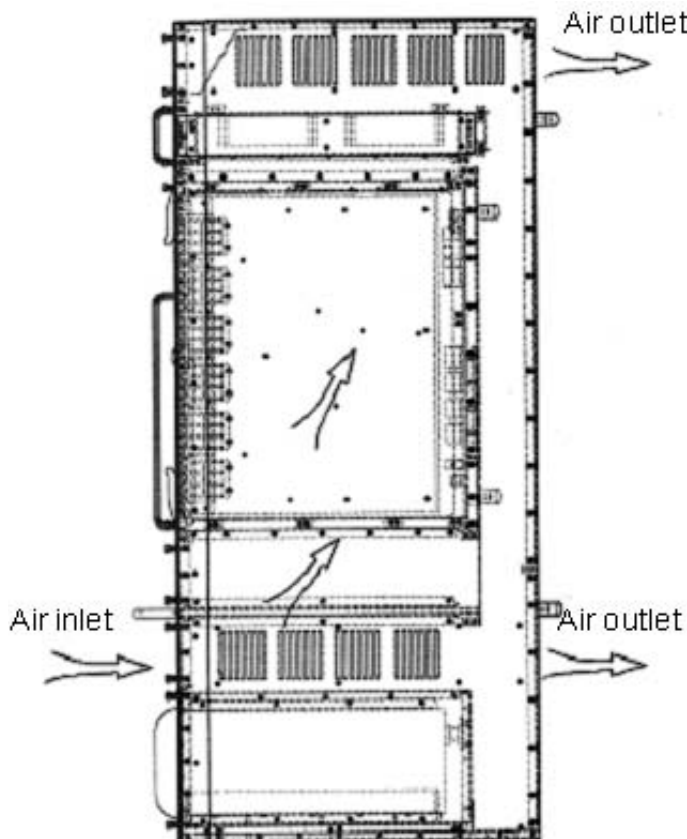
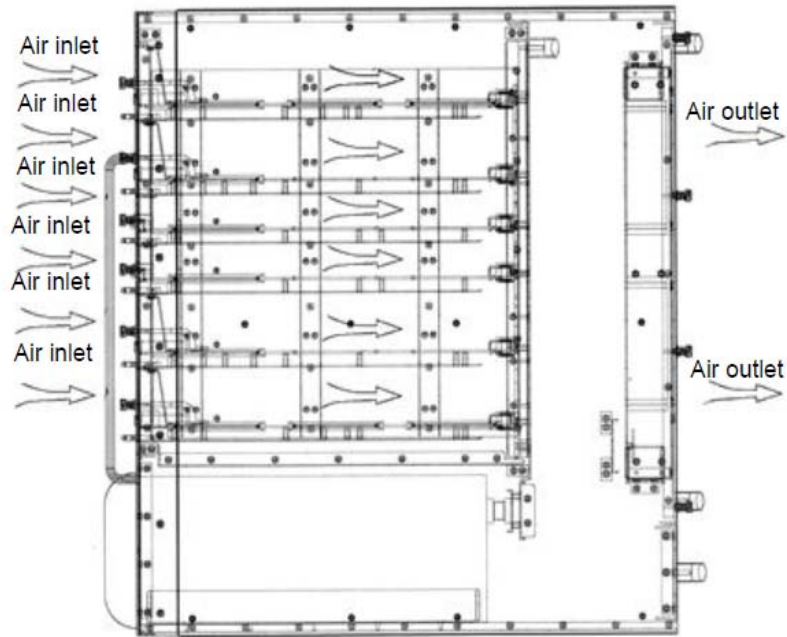


Figure 2-4 Schematic Diagram for the Ventilation of the DES-7206

2.2.3 Temperature and Humidity Requirements

To ensure the normal working and a prolonged useful life of the DES-7210/7206, appropriate temperature and humidity must be maintained in the equipment room.

If the equipment room has temperature and humidity that do not meet the requirements for a long time, the equipment may be damaged.

- In an environment with high relative humidity, the insulating material may have bad insulation or even leak electricity, and sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.
- On the other hand, in an environment with low relative humidity, the insulating strip may dry and shrink, and static electricity may occur easily and endanger the circuit on the equipment.
- In an environment with high temperature, the equipment is subjected to even greater harm, as its performance may degrade significantly and its useful life may be shortened in the case of long-term exposure that expedites the aging process.

Therefore, the ambient temperature and humidity of the DES-7210/7206 equipment must meet the requirements listed in Table 2-1:

Table 2-1 Temperature and Humidity Requirements of the DES-7210/7206

Temperature		Relative Humidity	
Long-term condition	Short-term condition	Long-term condition	Short-term condition
0°C-45°C	0°C-45°C	40%-65%	10%-90%

**Note**

1. The ambient temperature and humidity are measured at the point that is 1.5m above the floor and 0.4m before the equipment when there is no protective plate in front or back of the equipment rack.
2. The short-term working condition applies where the continuous working period does not exceed 48 hours and the accumulative total period within a year does not exceed 15 days.

2.2.4 Cleanness Requirements

Dust poses the top threat to the running of the equipment. The indoor dust falling on the equipment may be adhered by the static electricity, causing bad contact of the metallic joint. Such electrostatic adherence may occur more easily when the relative humidity is low, not only affecting the useful life of the equipment, but also causing communication faults. Table 2-2 shows the requirements for the dust content and granularity in the equipment room.

Table 2-2 Requirements for the Dust content and Granularity in the Equipment Room

Maximum diameter (μm)	0.5	1	3	5
Max. density (Particles/m ³)	1.4×10^7	7×10^5	2.4×10^5	1.3×10^5

**Note**

The air filter of the DES-7210 must be cleaned at regular intervals to ensure good ventilation and dust prevention.

Apart from dust, the salt, acid and sulfide in the air in the equipment room must also meet strict requirements, as such poisonous substances may accelerate the corrosion of the metal and the aging of some parts. The equipment room should be protected from the intrusion of harmful gases (for example, sulfur dioxide, sulfured hydrogen, nitrogen dioxide, and chlorine), whose requirements are listed in Table 2-3.

Table 2-3 Requirements for Harmful Gases in the Equipment Room

Gas	Average (mg/m ³)	Maximum (mg/m ³)
Sulfur dioxide	0.2	1.5
Sulfured hydrogen	0.006	0.03
Nitrogen dioxide	0.04	0.15
Ammonia	0.05	0.15
Chlorine	0.01	0.3

2.2.5 Power Requirements

When the DES-7210/7206 uses the AC power supply:

AC input voltage: 90Vac~264Vac, 47Hz~63Hz

Power: 1200W/2000W

When the DES-7210/7206 uses the DC power supply:

DC input voltage: DC - 36Vdc ~ -75Vdc

Power: 1200W/2000W

**Note**

The DES-7210/7206 provides 1+1 redundancy of power supply. You are recommended to use multiple power supplies for the equipment to ensure its continuous and stable working by avoiding the impact of unexpected power failures on the equipment. However, you must note that the redundancy power supplies must be of the same type; a mix of power supplies is not allowed.

2.3 System Grounding Requirements

A good grounding system is the basis for the stable and reliable operation of the DES-7210/7206. It is the chief condition to prevent lightning stroke and resist interference. Please carefully check the grounding conditions on the installation site according to the grounding requirements, and perform grounding properly as needed.

2.3.1 Safety Ground

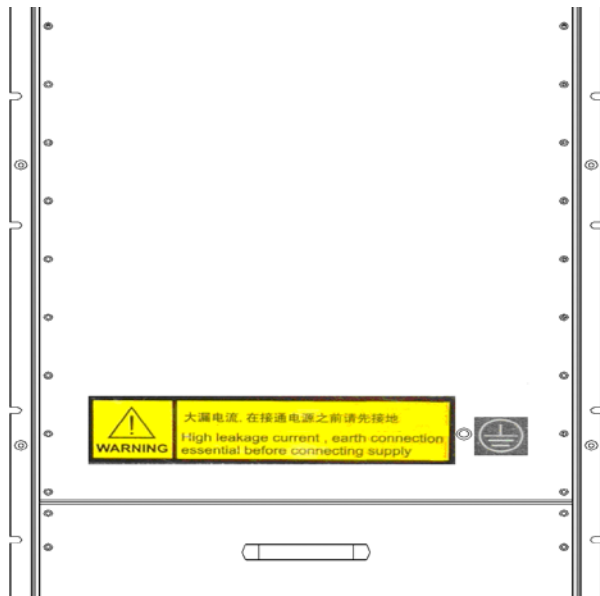
The equipment using AC power supply must be grounded by using the yellow/green safety grounding cable. Otherwise, when the insulating resistance decreases the power supply and the enclosure in the equipment, electric shock may occur.

2.3.2 Lightning Ground

The lightning protection system of the facility is a separate system that consists of the lightning rod, downlead conductor and the connector to the grounding system, which usually shares the power reference ground and yellow/green safety cable ground. The lightning discharge ground is for the facility only, irrelevant to the equipment.

2.3.3 EMC Ground

The ground required for EMC design includes shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The grounding resistance should be less than 1. The DES-7210/7206 chassis is installed with two grounding posts, as shown in Figure 2-5. Post 1 is installed for shell protection and post 2 is installed for circuit working. The two are converged on the grounding post of the cabinet.

Figure 2-5 Schematic Diagram for the Grounding of the DES-7210/7206

The system cables must ensure the normal working of the equipment. Before you connect the cables, please carefully read the following precautions.

2.3.4 EMI Consideration

Various interference sources, from either outside or inside the equipment or application system, affect the system in the conductive ways such as capacitive coupling, inductive coupling, and electromagnetic radiation.

There are two types of electromagnetic interferences: radiated interference and conducted interference, depending on the type of the propagation path.

When the energy, often RF energy, from a component arrives at a sensitive component via the space, the energy is known as radiated interference. The interference source can be both a part of the interfered system and a completely electrically isolated unit. Conducted interference results from the electromagnetic wire or signal cable connection between the source and the sensitive component, along which cable the interference conducts from one unit to another. Conducted interference often affects the power supply of the equipment, but can be controlled by a filter. Radiated interference may affect any signal path in the equipment, and is difficult to shield.

1. Effective measures should be taken for the power system to prevent the interference from the electric grid.
2. The working ground of the routers should be preferably separated and kept as far away as possible from the grounding device of the power equipment or the anti-lightning grounding device.
3. Keep the equipment away from high-power radio transmitter, radar transmitting station, and high-frequency large-current device.
4. Measures must be taken to isolate static electricity.

2.3.5 Precaution for Fiber Connection

Before you connect the fibers, verify that the optical connector type and fiber type match the optical interface type used, and pay attention to the Tx and Rx directions of the fiber. The Tx

end of this equipment should be connected to the Rx end of the opposite equipment, and the Rx end of this equipment to the Tx end of the opposite equipment.

2.4 Requirements of Installation Tools

Table 2-4 List of Installation Tools

Common tools	Cross screwdriver, straight screwdriver, related electric and optical cables Bolts, diagonal pliers, straps
Special-purpose tools	Anti-static tool
Meter	Multimeter

2.5 Unpacking Inspection Requirements

2.5.1 Checking Goods

1. DES-7210/7206 chassis carton

- Whether various panels of the equipment have been installed and adjusted properly
- Documentation

2. DES-7210/7206 accessories carton

- Whether the power module of the equipment is the required AC or DC module
- Fan tray
- Antistatic hand ring
- Screwdriver
- Power cable (for AC power configuration only)
- Documentation

3. Module carton

It contains the modules, packing list and documentation of the DES-7210/7206.



Note

The above lists the items of a normal delivery, which may differ from the actual delivery. All depend on the purchasing contract. Please check your goods carefully against the packing list or purchasing contract. If you have any questions or there are any errors, please contact your distributor.

3

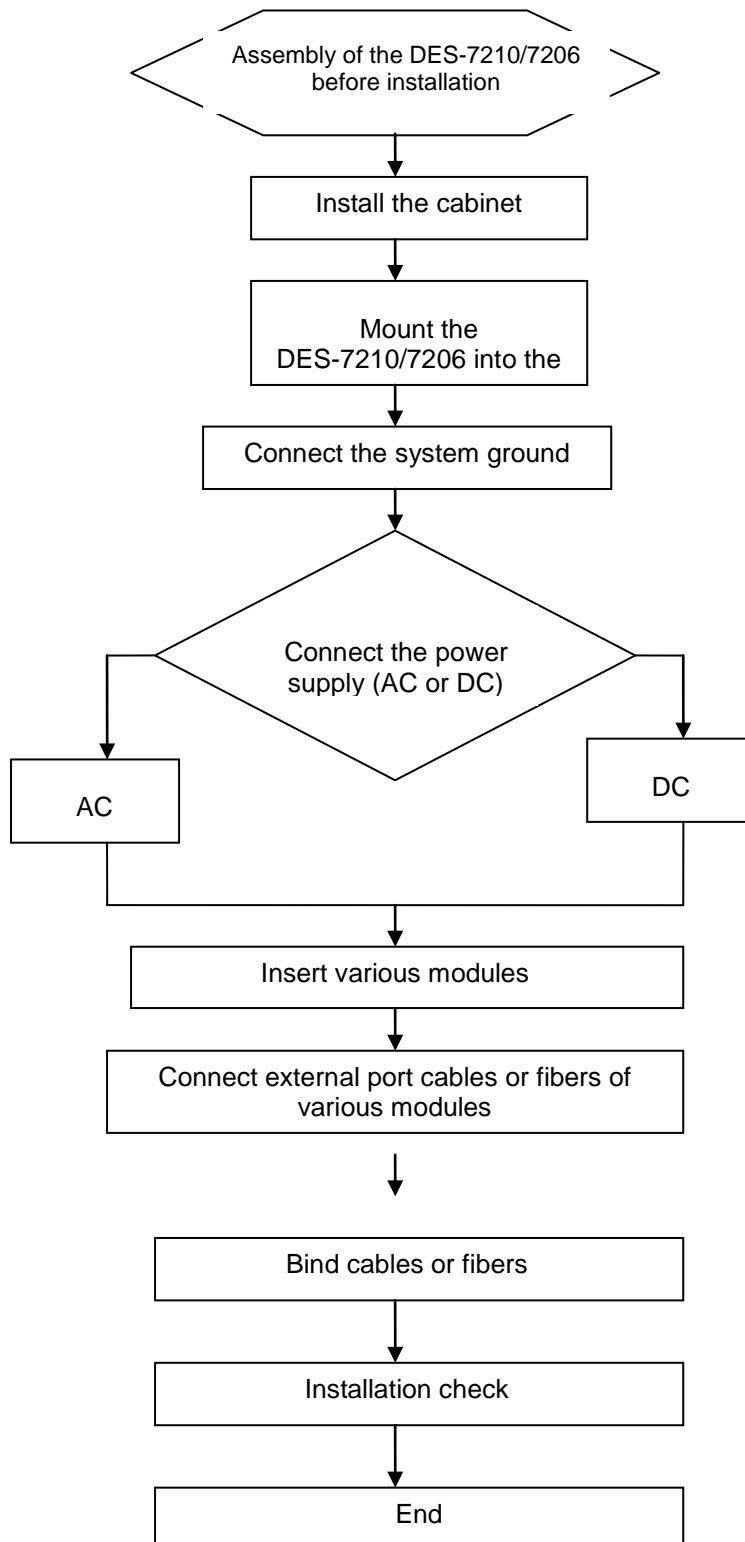
Product Installation



Note

1. Before you install the DES-7210/7206, make sure you have carefully read Chapter 2 and this chapter.
 2. Make sure that the requirements set forth in Chapter 2 have been met.
-

3.1 Installation Flow



3.2 Installation Verification

The DES-7210/7206 is a kind of complicated equipment, so you must carefully plan and arrange its installation location, networking mode, power supply, and wiring before installation.

Verify the following before installation:

- The installation location offers sufficient flow of air.
- The installation location meets the requirements of the equipment for temperature and humidity.
- The power supply that meets the requirements has been provided at the installation location.
- The related network cables have already been deployed at the installation location.
- Rated DC or AC power supply is selected.

3.3 Cabinet Installation

3.3.1 Precautions

When you install the cabinet, pay attention to the following:

- All expansion bolts for fastening the cabinet base to the ground should be installed and tightened in sequence from bottom up (large plain washer, spring washer, and nut), and the installation holes on the base and the expansion bolts should be well aligned.
- After the cabinet is installed, it should be stable and still.
- After the cabinet is installed, it should be vertical to the ground.
- When a cabinet is put side on side with another cabinet in the same equipment room, they should be aligned in a straight line, with an error less than 5 mm.
- The front/back doors of the cabinet should be properly installed, open and close smoothly. The locks should work normally, and all keys should be complete.
- There should be no unnecessary formal labels inside the cabinet and on various boards.
- Blank panels should be installed completely.
- Fastening screws of various devices in the cabinet should be tightened, complete, and of the same model.
- Various boards of the equipment should be installed securely, and the fastening screws on the panel should be tightened.
- All wiring inlets at the top and bottom of the cabinet should be installed with rodent-resistant nets where the seams should be no more than 1.5 cm in diameter, to prevent rodents and other small animals from entering the cabinet.
- Antistatic wrist straps should be provided in the cabinet.

3.3.2 Simple Installation Steps

1. Plan on the available space before installing the cabinet, for whose front and back doors sufficient spacing must be reserved for maintenance.
2. Mount and fasten the 19" cabinet at the designed location as planned.
3. Install the appropriate chute and cables.

4. Install the tray and wiring layer on the rack according to the configuration of one rack with one cabinet and one rack with multiple cabinets.

3.4 Mounting the DES-7210/7206 into the Cabinet

3.4.1 Precautions

Before the DES-7210/7206 is mounted into the cabinet, first verify that the front and back brackets of the cabinet are at the right locations. If the bracket is in the too front, the front panel of the equipment may be too close to the front door, so that the front door cannot be closed when network cables and pigtail fibers are connected. Usually, you should ensure that the spacing of at least 10mm is reserved between the front panel of the equipment and that of the cabinet after installation.

Verify the following before installation:

The cabinet has been fastened properly and various modules in the frame have been installed. There should be no obstacles for installation in the frame and in the surrounding. The equipment to be installed is ready, and has been moved to a place of easy handling and close to the frame.

3.4.2 Simple Installation Steps

1. Levelly lift the DES-7210/7206 by two persons on both sides, and slowly move it to the front of the frame.
2. Levelly lift the DES-7210/7206 to a position slightly higher than the tray or the slide rail of the cabinet, put the equipment onto the tray or the slide rail, and push it into the cabinet.
3. Fasten the DES-7210/7206 onto the cabinet with screws. There are fastening notches on both the left and right of the front panel on the equipment frame. Use screws to fasten them to the fastening bracket of the cabinet. After fastened, the equipment should be stable and still in the cabinet.

3.5 Installing the Fan Tray

The DES-7210/7206 provides a ventilation system, 7210-FAN for DES-7210, and 7206-FAN for DES-7206. Install the fan tray by performing the following steps:

1. Remove the blank panel of the fan tray by loosing the captive screws with a straight screwdriver and the cross screws with a cross screwdriver.
2. Push the fan into the cabinet along the guide rail.
3. Tighten the captive screws with a straight screwdriver. Figure 3-2 and Figure 3-3 show the installed fan tray

Figure 3-1 Installing the Fan Tray of the DES-7210

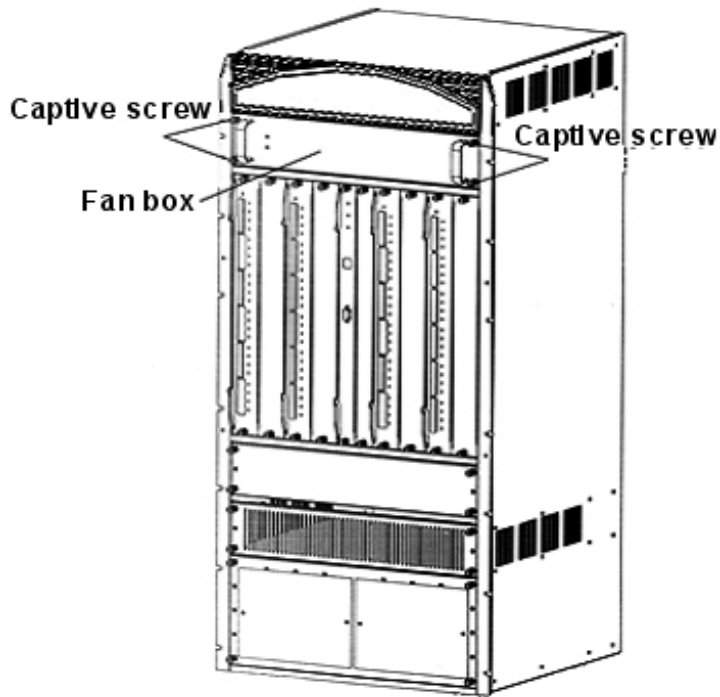
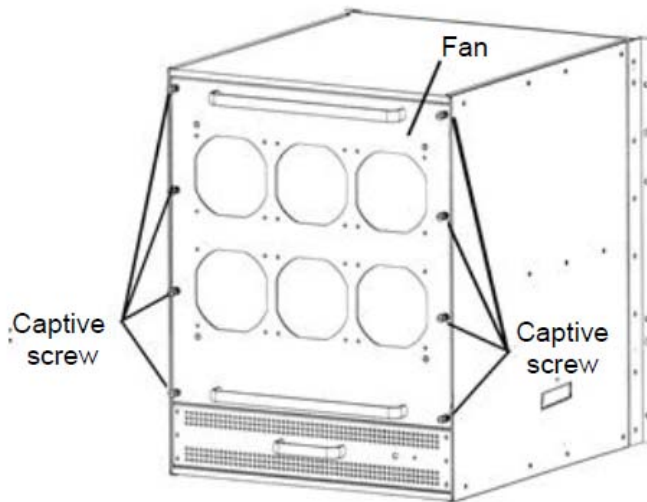


Figure 3-2 Installing the Fan Tray of the DES-7206



3.6 Installing the Power Supply

The DES-7210/7206 system provides AC and DC power, which can be installed in the same way by performing the following steps:

1. Remove any blank panel of the power module by loosening the two cross screws with a cross screwdriver, as shown in Figure 3-4 and 3-5.

Figure 3-3 Schematic Diagram for Installing the Power Supply of the DES-7210

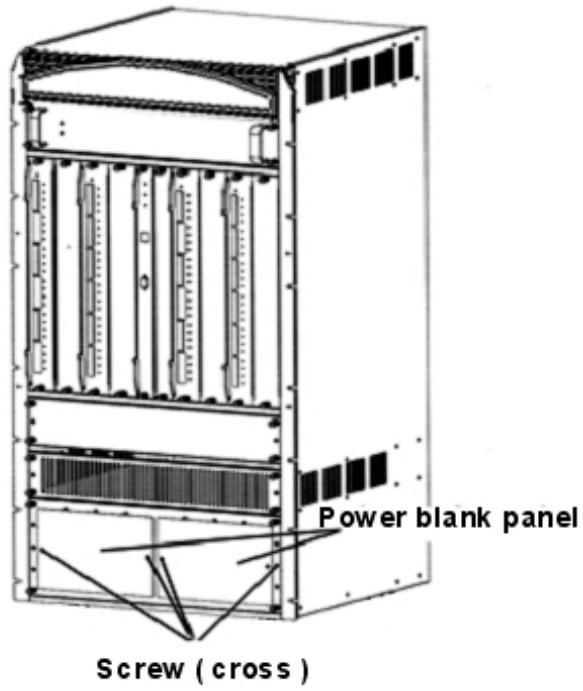
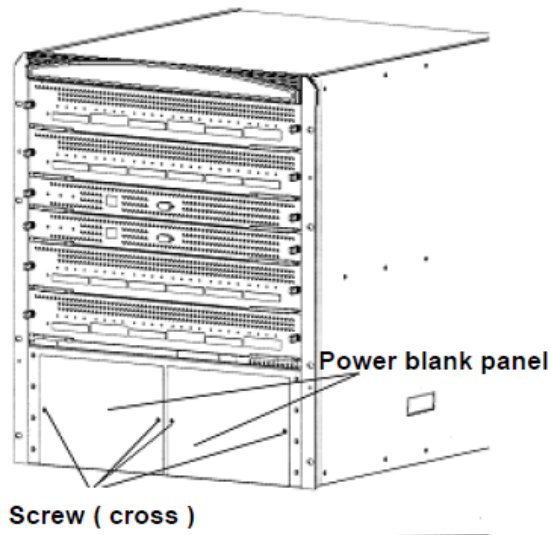


Figure 3-4 Schematic Diagram for Installing the Power Supply of the DES-7206



2. Insert the power supply module into the cabinet along the guide rail, as shown in Figure 3-6 and Figure 3-7:

Figure 3-5 Schematic Diagram for Installing the Power Supply of the DES-7210

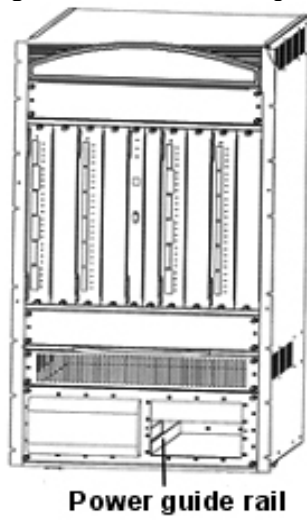
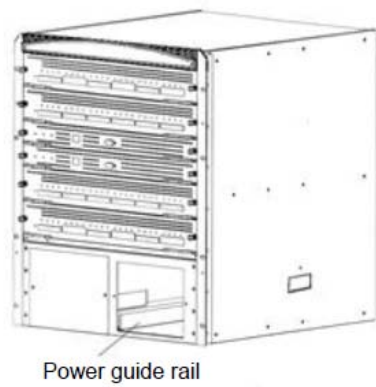


Figure 3-6 Schematic Diagram for Installing the Power Supply of the DES-7206



3. Tighten the screws on both sides of the power supply by using a straight screwdriver, as shown in Figure 3-8 and Figure 3-9.

Figure 3-7 Schematic Diagram for Installing the Power Supply of the DES-7210

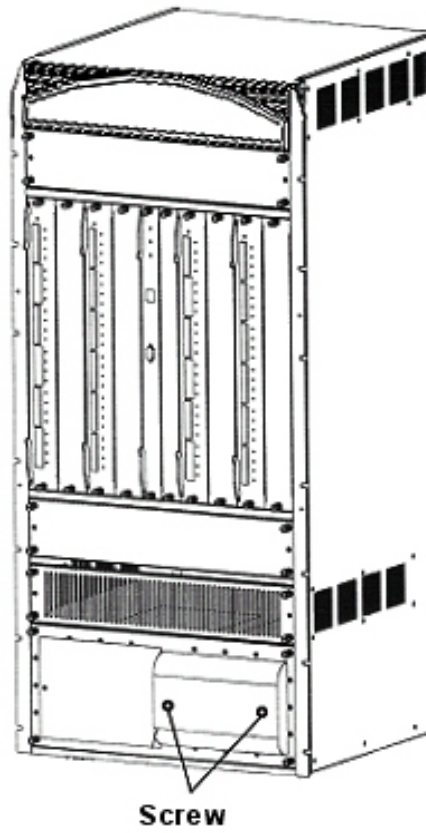
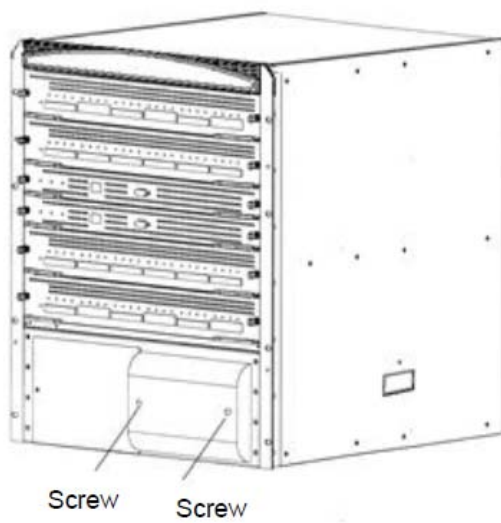


Figure 3-8 Schematic Diagram for Installing the Power Supply of the DES-7206



3.7 Installing the Handle

For easy handling of the system, the DES-7210/7206 chassis is provided with a handle, which can be installed by performing the following steps:

1. Align the handle with the sunk hole on the fastening bar;
2. Tighten the cross M4 sunk screws provided with the unit, as shown in Figure 3-10 and Figure 3-11.

Figure 3-9 Installing the Handle of the DES-7210

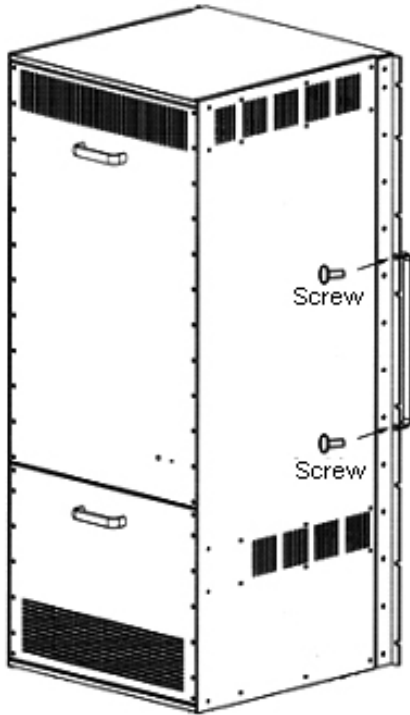
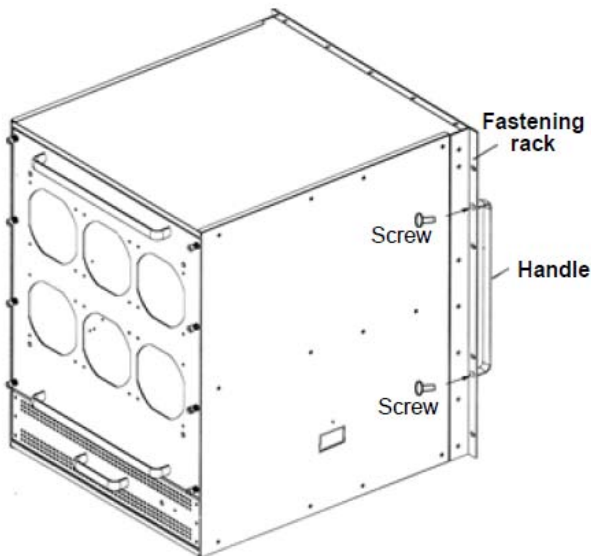


Figure 3-10 Installing the Handle of the DES-7206

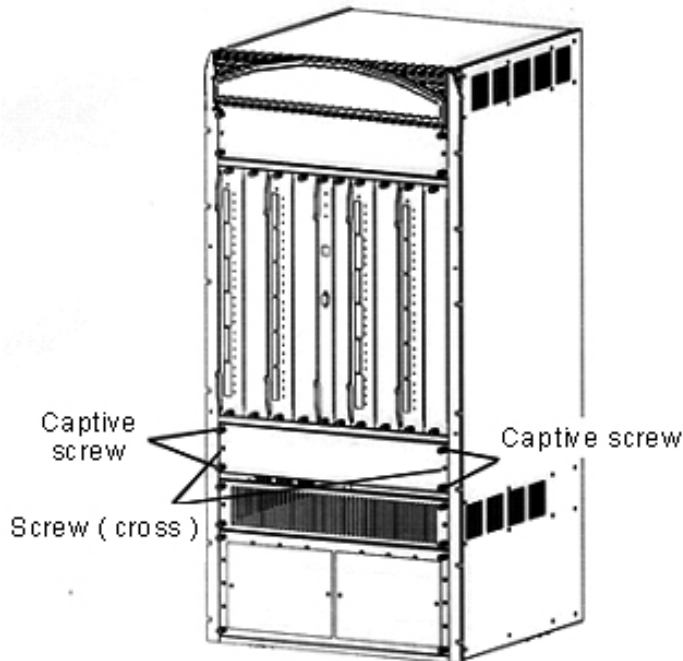


3.8 Installing the Cabling Rack of the DES-7210

The cabling rack of the DES-7210 can be performed by performing the following steps:

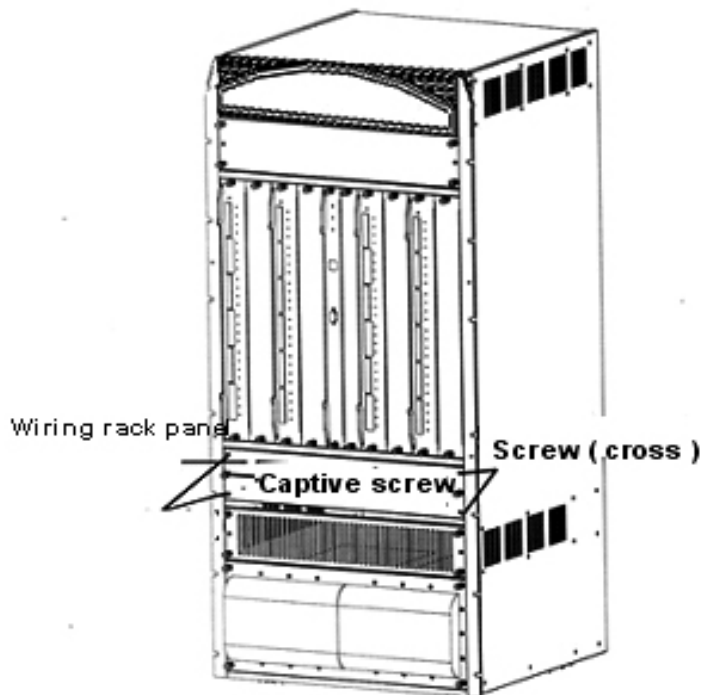
1. Remove the blank panel of the tracing rack by loosening the captive screws with a straight screwdriver and the cross screws with a cross screwdriver, as shown in Figure 3-12.

Figure 3-11 Installing the Cabling Rack of the DES-7210



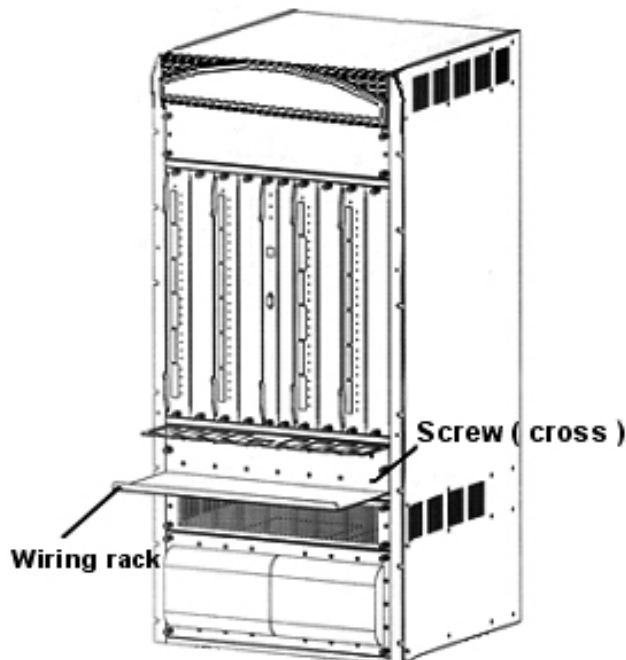
2. Install the panel of the tracing rack by tightening the two captive screws with a straight screwdriver and the four cross screws with a cross screwdriver, as shown in Figure 3-13.

Figure 3-12 Installing the Cabling Rack of the DES-7210



3. Fasten the cabling rack by using the cross M3 screws provided, as shown in Figure 3-14. (The cabling rack is available in two sizes, and you can select the appropriate one)

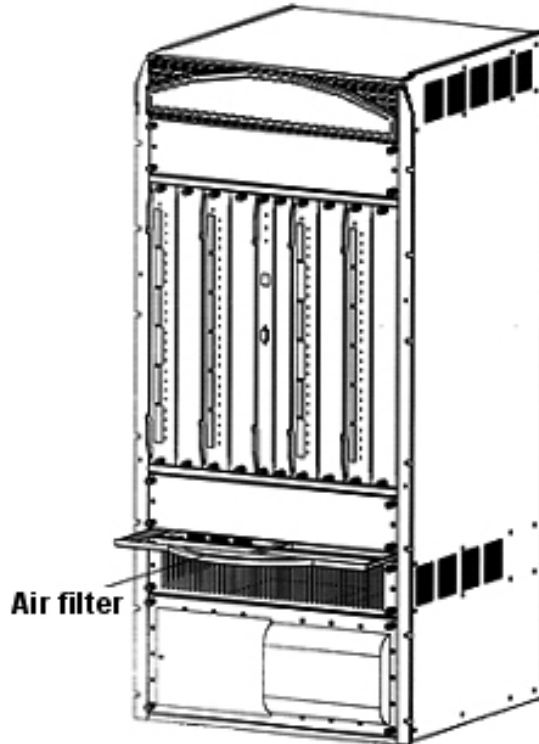
Figure 3-13 Installing the Cabling Rack of the DES-7210



3.9 Installing the Air Filter of the DES-7210

Simply push the air filter of the DES-7210 into the cabinet along the guide rail, as shown in Figure 3-15.

Figure 3-14 Installing the Air Filter of the DES-7210

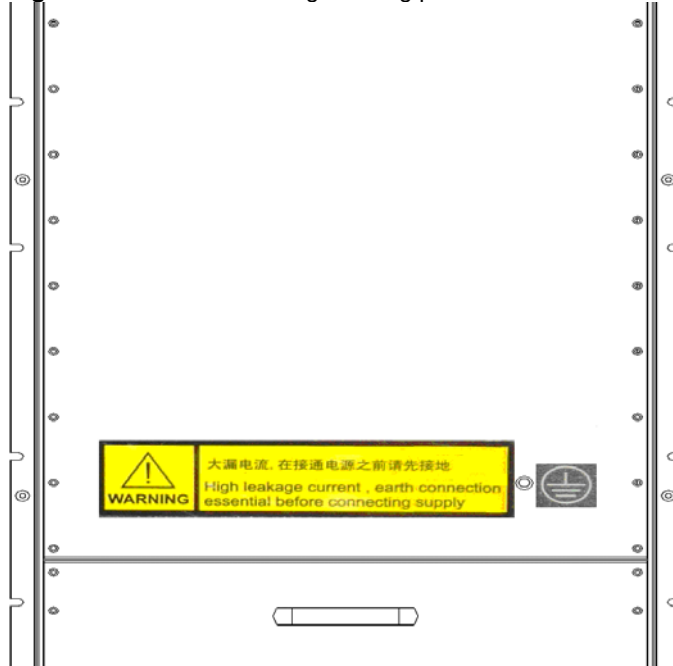


Note

You are recommended to install the air filter as the last step of the chassis installation.

3.10 Connecting the System Ground

A working ground GND is installed on the back of DES-7210/7206. In order to protect the system, the ground must be well treated. GND is directly connected to the ground bar or ground pole of the equipment room.

Figure 3-15 Connection of grounding posts on the DES-7210/7206 back

3.10.2 Precautions

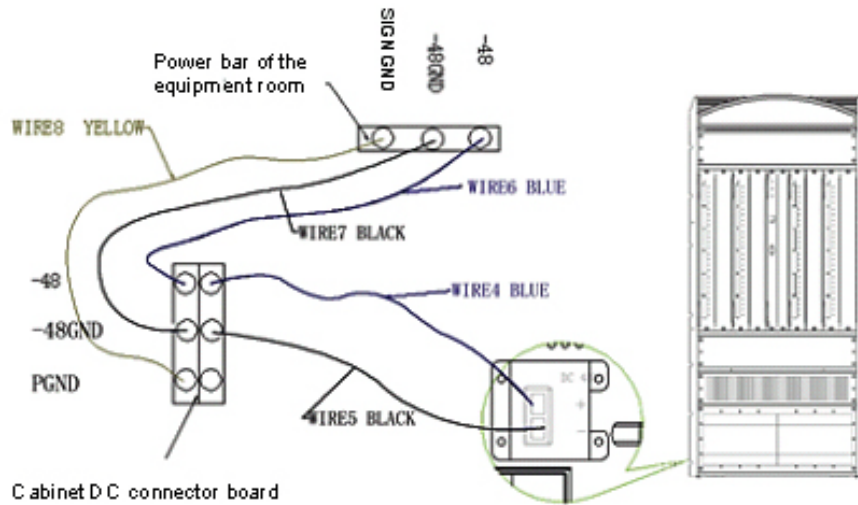
- The sectional area of the grounding cable should be determined according to the possible maximum current. Cables of good conductor should be used.
- Do not use bare wire.
- The grounding resistance for combined grounding should be less than 1Ω .

3.10.3 Simple Grounding Steps

1. Release the nut on the rear grounding post of the equipment.
2. Lock the terminal of the grounding cable to the grounding pole.
3. Tighten the nut.
4. Connect the related terminals according to the above steps and the wiring diagram.

3.11 Connecting the DC Power Supply to the Power Module

Connect the related DC power cable according to the ID on the panel of the DC power module and the location requirement, as shown in the following diagram.

Figure 3-16 Schematic Diagram for the Connection of the DC Power Cable

3.11.2 Precautions

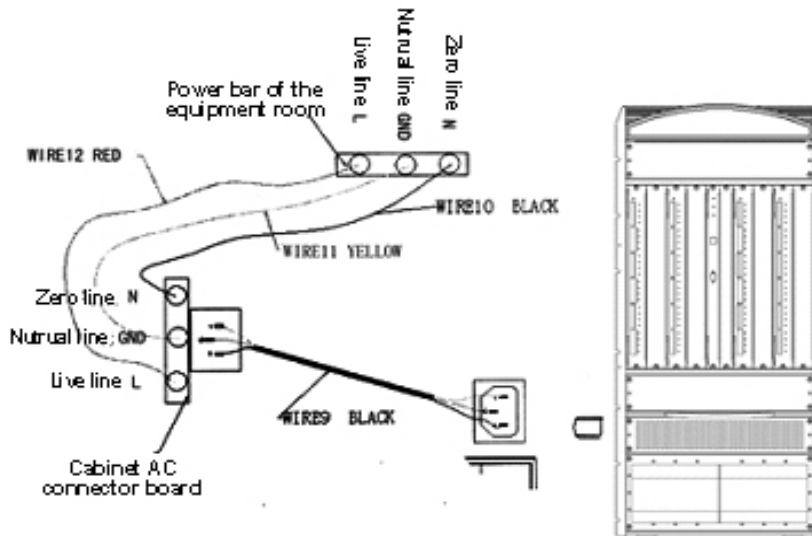
- Before connecting the power supply, you must verify that the external power supply provided matches the power module installed of this equipment.
- Before connecting the power cable, you must make sure that the switch of the power module is at the OFF position.
- The power cables of various colors must be connected to the appropriate wiring posts.
- You must ensure that the power cables connected are in good contact.

3.11.3 Simple Connection Steps

1. Remove the protection cover of the DC wiring terminal.
2. Lock the power cable to the appropriate terminal according to the identification, and tighten the pressing screw.
3. Put on the protection cover and tighten the screw.
4. Connect the other end of the power cable to the corresponding socket or connector.

3.12 Connecting the AC Power Supply to the Power Module

Connect the related AC power cable according to the ID on the panel of the AC power module and the location requirement, as shown in the following diagram.

Figure 3-17 Schematic Diagram for the Connection of the AC Power Cable

3.12.2 Precautions

- Before connecting the power supply, you must verify that the external power supply provided matches the power module installed of this equipment.
- Before connecting the power cable, you must make sure that the switch of the power module is at the OFF position.
- The power cable with a standard 3-pin connector should be used for connection.
- You must ensure that the power cables connected are in good contact.

3.12.3 Simple Connection Steps

1. Insert the plug of the power cable into the power module.
2. Connect the other end of the power cable to the corresponding socket or connector.

3.13 Connecting the Cable of the Management Module

3.13.1 Simple Connection Steps

1. Connect the end of the Ethernet cable with the RJ45 connector to the Ethernet port of the equipment management module (7210/7200-CM1), and the other end to the NM or control terminal.
2. Connect the end of the standard DB9 serial cable with the RS-232 serial port to the RS-232 serial port of the equipment management module, and the other end to the NM or control terminal.



Note

The DES-7210/7206 system must have at least one management module to work normally.

3.14 Removing Boards from the DES-7210/7206

3.14.1 Steps for Removing Boards

1. Unplug all cables/fibers such as optical fibers and RJ45 twisted pairs from the panel.
2. Tighten two captive screws on the panel.
3. Draw out the board by holding the ejector with both hands, as shown in Figure 3-18 and Figure 3-20.



1. Always wear an anti-static wrist strap before plugging/unplugging a board.
2. Do not hold the edge of the PCB or collide the components on the PCB.

Figure 3-18 Schematic Diagram for the Components of the DES-7210

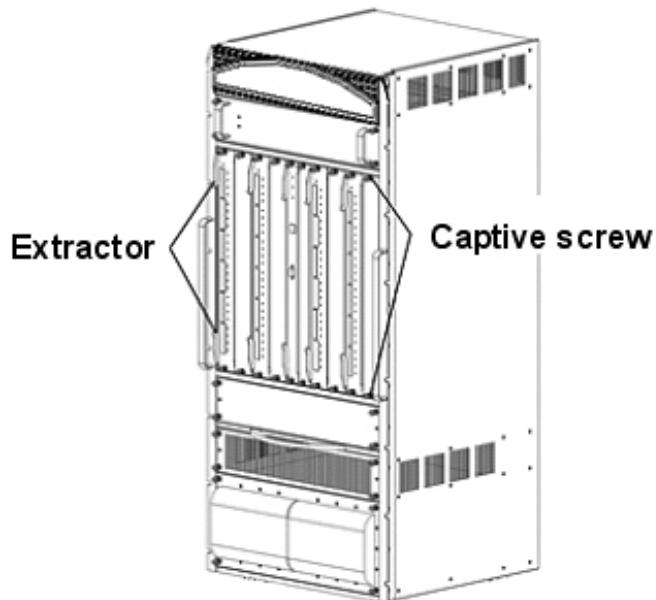
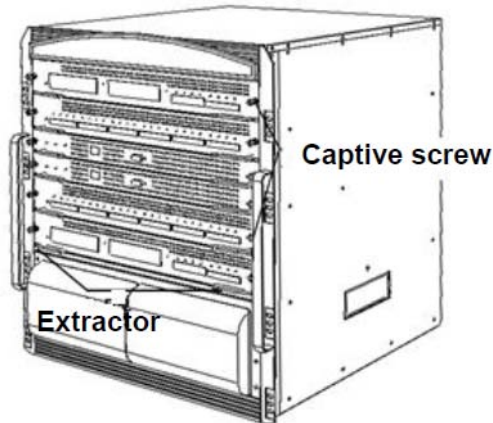


Figure 3-19 Schematic Diagram for the Components of the DES-7206

3.15 Installing Boards on the DES-7210/7206

3.15.1 Simple Steps of Board Installation

1. Remove the appropriate component card or blank panel according to 3.14.
2. Replace it with the appropriate card and insert into the guide rail.
3. Push the card into position by using the ejector, and tighten the two captive screws on the card with a straight screwdriver.



1. Do not hold the edge of the PCB or collide the components on the PCB.
 2. When you plug/unplug a PCB module, use the ejector, instead of forcedly.
-

3.16 Connecting the External Interface Cables

3.16.1 Precautions

- Correctly distinguish single-mode and multi-mode fibers and interfaces.
- Avoid bends of small radius at the connector.

3.16.2 Simple Connection Steps

1. Connect one end of the RJ45 connector for configuring Ethernet cables to the Ethernet interface of the device board and the other end to the NMS or a control terminal; or connect one end of the standard RJ45 serial port cable to the serial port of the device board and the other end to the NMS or a control terminal.
2. Insert the single-mode or multi-mode fiber into the appropriate interface according to the identification on the panel of the line card. Distinguish the Rx/Tx end of the optical fiber.

3. Insert the twisted pair with the RJ45 port into the appropriate interface according to the identification on the panel of the line card. Distinguish the crossover cable and straight-through cable.
4. Connect the cables and optical fibers of each board in sequence.

3.17 Binding the Cables

3.17.1 Precautions

- The power cables and other cables should be bound in a visually pleasing way.
- When you bind fibers, make sure that the fibers at the connectors have natural bends or bends of large radius.
- You should not bind optical fibers and twisted pairs too tightly, as this may press hard the fibers and affect their useful life and transmission performance.

3.17.2 Simple Binding Steps

1. Bind the drooping part of the optical fibers and twisted pairs of each board, and lead them to both sides of the chassis according to the convenience. For the DES-7200, you can lead out the optical fibers and twisted pairs by using the cabling chute on the chassis.
2. On both sides of the chassis, fasten the optical fibers or twisted pairs to the cabinet cable management ring or cabling chute.
3. For the power cables, you should bind them closely along the bottom of the chassis, in a straight line wherever possible.

3.18 Installation Check

3.18.1 Cabinet Check

- Verify if the external power supply matches the distribution panel of the cabinet.
- After the equipment is installed, check if the front/back cabinet doors can be closed.
- Verify that the cabinet has been fastened completely, and does not move or tilt.
- Verify that the equipment has been installed in the cabinet, and all the cables have been fastened to the cabinet.

3.18.2 Checking the Cables

- Verify that the optical fibers and twisted pairs match the interfaces.
- Verify that the cables have been bound properly.

3.18.3 Checking the Power Supply

- Verify that the power cables are in good contact and comply with the safety requirements.
- Verify that the power module has been fastened onto the equipment with the two screws on the panel.
- Turn on the power switch and verify that the power module can work normally.

4

DES-7210/7206 Maintenance

4.1 Monitoring Function of the DES-7210/7206

When the DES-7210/7206 is running, you can monitor the status of each board by inspecting the status LED of the appropriate board. When the Status LED of a board is OFF, RED, or flashing, it means that the board is faulty, in which case you need to find out the cause, and shut down the power when necessary. When the Alarm LED of the main management board is red, it means that the system has a fault, in which case you can determine and eliminate the fault by viewing with the management software.

When the Alarm LED of the fan tray is red, it means that the fan tray is faulty, in which case you need to replace or repair the fan tray.

When the FAIL LED of the power supply is red, it means that the power supply is faulty, in which case you should replace it promptly.

The DES-7210/7206 allows you to monitor various status of the system by executing the appropriate CLI commands, including:

- In-position status of the module or board
- Configuration information and status of the port
- Working status of the fan and power supply
- Temperature status of the system

For the monitoring commands, see the *DES-7200 Configuration Guide* of the DES-7210/7206.

4.2 DES-7210/7206 Hardware Maintenance

4.2.1 Board Maintenance

When you need to replace a board in the case of a fault, perform replacement according to the instructions provided in Section 3.9.

4.2.2 Ventilation System Maintenance

- The fan in the equipment is provided with the fault monitoring signals. When the fan fails, an appropriate alarm will occur.
- To replace the fan, first loosen the fastening screw on the fan tray.
- Replace the failed fan with a good one.
- Tighten the fastening screws of the fan tray.



During the process, you should clean the air filter of the DES-7210/7206.

4.2.3 Power Supply Maintenance

When the power supply fails, you only need to disconnect the power cable, loosen the two panel screws on the power module, unplug the power module, replace it with a good one, and tighten the panel screws, and then connect the power cables.

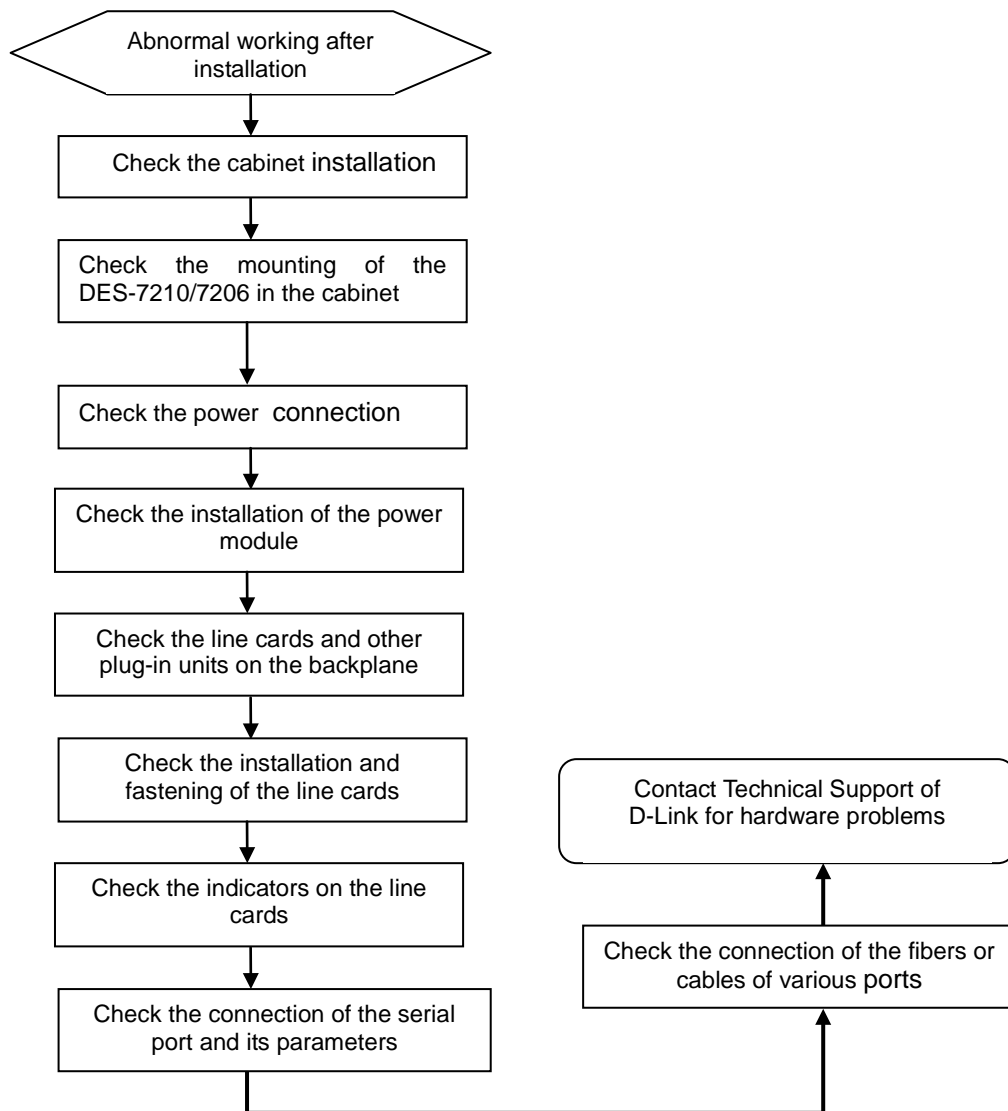
4.3 Remote Maintenance

The DES-7210/7206 supports remote maintenance. By utilizing the Internet, a user can realize communication through remote Telnet login. During installation and networking, DES-7210/7206 and the Internet are connected, therefore, the user can log in to the DES-7210/7206 in the Telnet mode and maintain DES-7210/7206 remotely through various monitoring commands.

5

Troubleshooting

5.1 General Flow for Troubleshooting Installation Faults



5.2 Common Troubleshooting Procedures

Fault 1: The system login password is lost.

[Fault Description]

The system login password of the switch is forgotten or lost, and so it is not possible to configure the data.

[Troubleshooting]

Please contact D-Link Customer Service Department for technical support.

Fault 2: The AC power module does not work.

[Fault Description]

The Status LED of each line card is OFF, the Power LED of the fan tray is OFF (only for DES-7210), and the fan does not work.

The LED on the panel of the power module is OFF. The fan does not work.

[Troubleshooting]

First place the switches of all the power modules to OFF. Check if the cables of the cabinet have been correctly connected. Check whether the power cables are tightly connected to the cabinet power sockets and power modules. Check whether the power modules are installed correctly. If necessary, check whether the connectors on the backboard of the power system are tightened. Check if there is a mix of AC and DC power supplies.

Fault 3: The DC power module does not work.

[Fault Description]

The Status LED of each line card is OFF, the Power LED of the fan tray is OFF (only for DES-7200), and the fan does not work.

The LED on the panel of the power module is OFF. The fan does not work.

[Troubleshooting]

First place the switches of all the power modules to OFF. Check if the cables of the cabinet have been correctly connected. Check whether the cabinet power sockets and DC power modules are tightly connected in a correct way. Check whether the power modules are installed correctly. If necessary, pull out the power modules and check whether the connectors on the backboard of the power system are tightened. Check if there is a mix of AC and DC power supplies.

Fault 4: An exception occurs to the LEDs when cable cards are powered on.

[Fault Description]

The Status LED of the line card is OFF, flashing, or RED. The Link/ACT LED of the line card is solid ON when no network cable or optical fiber is plugged.

[Troubleshooting]

Check if the line card is firmly inserted. If yes, install the line card again and ensure that it is inserted into position, before you tighten the fastening screws. If the line card still does not work, check if the connector of the slot on the backplane is loose. If yes, insert the board to another slot for a try. If the slot and connection are not the cause, return the line card for repair.

Fault 5: The LED is abnormal after a line card works for some time.

[Fault Description]

The Status LED of the line card is OFF or RED. The Link/ACT LED of the line card is solid ON when no network cable or optical fiber is plugged. The fault remains after restart.

[Troubleshooting]

Check if the board gets loose. If yes, install the line card again and ensure that it is inserted into position, before you tighten the fastening screws. If the line card still does not work, check if the connector of the slot on the backplane is loose and check if the guide rail of the slot is deformed. If yes, insert the board to another slot for a try. If the slot and connection are not the cause, return the line card for repair.

Fault 6: The LED of the management board is abnormal.

[Fault Description]

The LED of the management board becomes abnormal after the board is powered on or works for some time. For example, the Status LED is flashing or OFF, and the Alarm LED is red.

[Troubleshooting]

Check if the management board gets loose. If yes, install the management card again and ensure that it is inserted into position, before you tighten the fastening screws. If the line card still does not work, check if the connector of the slot on the backplane is loose and check if the guide rail of the slot is deformed. If yes, insert the board to another slot for a try. If the slot and connection are not the cause, return the management card for repair.

When the Alarm LED is red, the cause may be the fault of another module in the system, in which case you can check other modules (for example, line card, fan, power, and overheating) for any alarm. If yes, you should first handle the faults of other modules. You can also identify the faults by logging in to the management software.

Fault 8: The fan tray does not work or an exception occurs to the LED.

[Fault Description]

After the system is started, the fans in the fan tray do not work or the Power LED is OFF, and the Alarm LED is red.

[Troubleshooting]

Check if the connection between the fan tray and the backplane is secure and if the connector gets loose. If the connection is secure, you need to replace the fan tray.

Fault 9: The serial port console has no output.

[Fault Description]

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

[Troubleshooting]

Check whether serial port cables are connected correctly and whether the connected serial port is identical with that configured on the super terminal. Check whether the configuration of the serial port on the super terminal is the same as that described in *DES-7200 Configuration Guide*. If not, modify the serial port configuration parameters. If there is still no serial port printed information, please contact D-Link Customer Service Department for technical support.

Fault 10: The serial port console outputs illegible characters.

[Fault Description]

The serial port console outputs illegible characters.

[Troubleshooting]

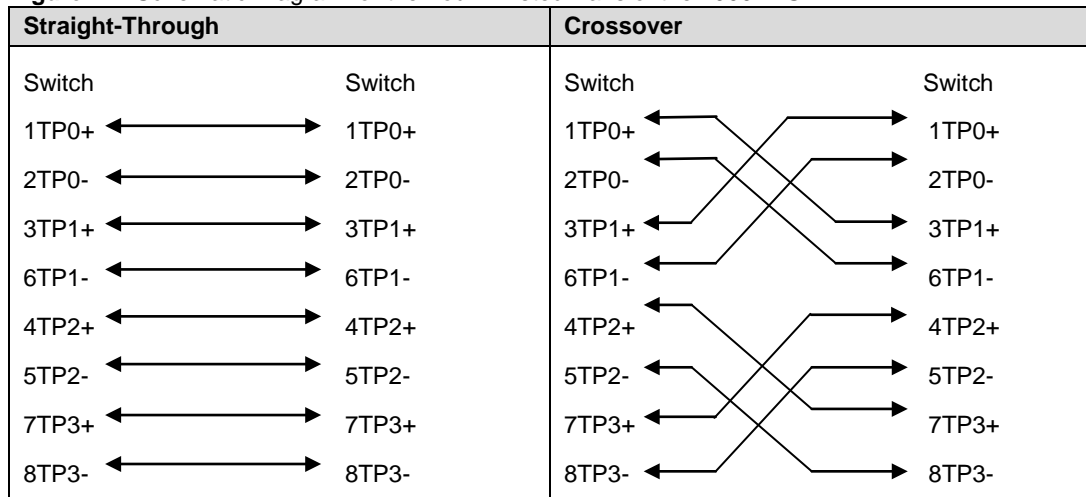
Such problem is related to the settings of the serial port. Check if the settings of such parameters as the baud rate match those in the *DES-7210/7206 Configuration Guide*.

A Connectors and Connection Media

A.1 1000BASE-T/100BASE-TX/10BASE-T SE-T Port

The 1000BASE-T/100BASE-TX/10BASE-T is a port that supports adaptation of three rates, and automatic MDI/MDIX Crossover at these three rates. The 1000BASE-T complies with IEEE 802.3ab, and uses the cable of 100-ohm Category-5 or Supper Category-5 UTP or STP, which can be up to 100 m. The 1000BASE-T port uses four pairs of wires for transmission, all of which must be connected. Figure A-1 shows the connections of the twisted pairs used by the 1000BASE-T port:

Figure A-1 Schematic Diagram for the Four Twisted Pairs of the 1000BASE-T



In addition to the above cables, the 100BASE-TX/10BASE-T can also use 100-ohm Category-3, 4, 5 cables for 10Mbps, and 100-ohm Category-5 cables for 100Mbps, which can be up to 100 m. Figure A-2 shows the pinouts of the 100BASE-TX/10BASE-T:

Figure A-2 Pinouts of the 100BASE-TX/10BASE-T

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4,5,7,8	Not Used	Not Used

Figure A-3 shows the connections of the straight-through and crossover twisted pairs of the 100BASE-TX/10BASE-T.

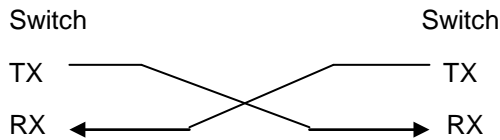
Figure A-3 Connections of the Twisted Pairs of the 100BASE-TX/10BASE-T

Straight-Through		Crossover	
(Switch)	(Adanter)	(Switch)	(Hub/Switch)
1 IRD+	1 OTD+	1 IRD+	1 IRD+
2 IRD-	2 OTD-	2 IRD-	2 IRD-
3 OTD+	3 IRD+	3 OTD+	3 OTD+
6 OTD-	6 IRD-	6 OTD-	6 OTD-

A.2 Optical Fiber Connection

For the optical fiber ports, select single-mode or multiple-mode optical fibers for connection according to the fiber module connected. The connection schematic diagram is shown in Figure A-4:

Figure A-4 Schematic Diagram for Optical Fiber Connection



B Mini-GBIC and 10G XENPAK Modules

We provide the appropriate 1000M SFP module (Mini-GBIC module) and 10G XENPAK module for the types of interfaces of the switch modules. You can select the SFP or XENPAK module to suit your specific needs. Below the models and technical specifications of some 1000M SFP and 10G XENPAK modules are listed for your reference.

B.3 Models and Technical Specifications of the Mini-GBIC (SFP) Module

Table B-1 Models and Technical Specifications of the Mini-GBIC (SFP) Module

Mini-GBIC (SFP)	Wavelength (nm)	Media Type	Core Size (nm)	Modular Bandwidth (MHz/km)	Transmission Distance	Optical Intensity MAX	Reception Sensitivity (dbm) MAX	Standard Compliance
Mini-GBIC-SX	850	Multi-mode optical fiber	62.5 62.5 50.0 50.0	160 200 400 500	220M 275M 500M 550M	-4	-17	IEEE802.3
Mini-GBIC-LX	1300	Multi-mode optical fiber Single-mode optical fiber	62.5 50.0 50.0 9/10	500 400 500 -	550m 550m 550m 10km	-3	-20	
Mini-GBIC-ZX50	1550	Single-mode optical fiber	N/A	N/A	50 Km	0	-22	
Mini-GBIC-ZX80					80 Km	4.7	-22	
Mini-GBIC-GT	N/A	CAT 5 UTP	N/A	N/A	100M	N/A	N/A	



For the Mini-GBIC-ZX50 or Mini-GBIC-ZX80, one on-line optical attenuator should be added on the link to avoid the overload of the optical receiver when short single-mode optical fibers are used.

B.4 Models and Technical Specifications of the 10G XENPAK Module

Table B-2 Models and Technical Specifications of the 10G XENPAK Module

XENPAK Model	Wavelength (nm)	Media Type	Core Size (nm)	Modular Bandwidth (MHz/km)	Transmission Distance	Optical Intensity (MAX)	Reception sensitivity (MAX)	Standard Compliance
10GBASE-SR	850	Multi-mode optical fiber (SC connector)	62.5	200 160	Max: 33 m Max: 22 m	-1.0 dBm	-11.98 dBm	IEEE 803.ae XENPAK MSA R3.0 IEEE 803.ak
			50	2000 500 400	Max: 300 m Max: 82 m Max: 66 m			
10GBASE-LR	1310	Single-mode optical fiber (SC connector)	10	N/A	Max. 10KM;	0.5dBm	-12.6dBm	
10GBASE-ER	1550	Single-mode optical fiber (SC connector)	10	N/A	Max. 40KM;	4dBm	-13.4dBm	
10GBASE-LX4	1310	Multi-mode optical fiber (SC connector)	62.5	500	Max: 300 m	-0.5dBm (per lane)	-14.25dBm (per lane)	
			50	400 500	Max: 240 m Max: 300 m			
		Single-mode optical fiber (SC connector)	10	N/A	Max. 10KM;	-0.5dBm (per lane)	-14.85dBm (per lane)	
10GBASE-CX4	N/A	Cable	N/A	N/A	Max: 15 m	N/A	N/A	



For the 10GBASE-ER, you need to avoid the overload of the optical receiver when the transmission distance is short: As long as the optical power at the reception end of the fiber is greater than or equal to -1 dBm, you should add an appropriate optical attenuator between the fiber at both ends of the link and the reception port of the 10GBASE-ER, so that the optical power at the reception end falls under -1 dBm.

B.5 Models and Technical Specifications of the 10G XENPAK Module

Table B-3 Models and Technical Specifications of the 10G XENPAK Module

XENPAK Model	Wavelength (nm)	Media Type	Core Size (nm)	Modular Bandwidth (MHz/km)	Transmission Distance	Optical Intensity (MAX)	Reception sensitivity (MAX)	Standard Compliance
10GBASE-SR	850	Multi-mode optical fiber (LC connector)	62.5	200 160	Max: 33 m Max: 22 m	-1.0 dBm	-11.98 dBm	IEEE 803.ae
			50	2000 500 400	Max: 300 m Max: 82 m Max: 66 m			XFP MSA R1.0

XENPAK Model	Wavelength (nm)	Media Type	Core Size (nm)	Modular Bandwidth (MHz/km)	Transmission Distance	Optical Intensity (MAX)	Reception sensitivity (MAX)	Standard Compliance
10GBASE-LR	1310	Single-mode optical fiber (LC connector)	10	N/A	Max. 10KM;	0.5dBm	-12.6dBm	
10GBASE-ER	1550	Single-mode optical fiber (LC connector)	10	N/A	Max. 40KM;	4dBm	-13.4dBm	