DG-CS7000 Series

Stallion Chassis Switch

Install guide

V1.0

2012-03-20

Content

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1 Product Overview

RECOMMENDATION: Please read this manual first before using the switch, following the instructions to avoid damaging the device.

1.1 Product Brief

FIG 1-1 DG-CS7004 Switch

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FIG 1-2 DG-CS7010 Switch

1.2 Introduction

DIGISOL DG-CS7000 series is a high performance routing switch that can be deployed as a core layer device for campus and enterprise networks, or an aggregation device for IP metropolitan area networks (MAN).

DG-CS7004 provides 4 slots. DG-CS7010 provides 10 slots, 8 of which are interface module slots.

DG-CS7000 series supports various types of line cards, and can seamlessly support network interfaces from 100Mb, 1000Mb to 10GB Ethernet. Featuring functions such as

policy-based routing, IPv6, and load balance, it is capable of flexibly meeting the different requirements of complex customer environments. Furthermore, DG-CS7000 series allows redundancy for management modules, power supply. It supports both AC-input and DC-input* power supplies, with hot-swapping support for cards, power supplies and fans. The working temperature of all cards can be monitored in real-time, offering carrier-class reliability.

1.3 Main Features

- DG-CS7004 4 slots that can be configured in Primary controller-Primary Backup mode with 2 management modules and 2 network modules, or Single controller mode with one management module and 3 network modules.
- DG-CS7010 10 slots that can be configured in Primary controller-Primary Backup mode with 2 management modules and 8 network modules, or Single controller mode with one management module and 8 network modules.
- Store-and-forward switching, ensuring minimal latency.
- Auto MDI/MDI-X, enabled on all RJ-45 ports, allows connections to other switches using a non-crossover twisted pair cable.
- Full-duplex IEEE802.3x flow control, half-duplex backpressure flow control.
- Console management port provided.
- Port working status and statistics available.
- Restart and reset to factory setting can be done both locally and remotely.

- TFTP /FTP firmware upgrade available.
- Can be installed into standard 19-inch chassis.

1.4 Technical specifications

Item	DG-CS7004	DG-CS7010
Slot	4	10
Port	10/100/1000BASE-T, 188 at best 1000Base-SX, 188 at best 1000Base-LX, 188 at best 10GBase, 13 at best	10/100/1000BASE-T, 384 at best 1000Base-SX, 384 at best 1000Base-LX, 384 at best 10GBase, 32 at best
Backboard bandwidth	1.2Tbps(can extend to 2.4Tbps)	2.4Tbps(can extend to 4.8Tbps)
Exchange capacity	640Gbps	1.28Tbps/2.4Tbps (the second generation engine)
Packet Forwarding Speed	476Mpps	952Mpps/1785Mpps (the second generation engine)
Forwarding Delay Time among Ports	<=6ms	<=6ms
VLAN Item	4K	4K

Layer 2 Protocol Specifications	IEEE802.3(10Base-T), IEEE802.3u(100Base-TX), IEEE802.3z(1000BASE-X), IEEE802.3ab(1000Base-T), IEEE802.3ae(10GBase), IEEE802.1Q(VLAN), IEEE802.3ak(10GBASE-CX4), IEEEE802.1d(STP), IEEEE802.1W(RSTP), IEEEE802.1S(MSTP), IEEE802.1p(COS), IEEE802.1x(Port Control), IEEE802.3x(Flow control), IEEE802.3ad(LACP), Port Mirror, RSPAN, ULDP , LLDP, IGMP Snooping, QinQ, GVRP,VLAN, PVLAN, VOICE VLAN, Protocol Vlan, Multicast VLAN, Mac Vlan, Broadcast Storm Control
Layer 3 Protocol Specifications (IPv4)	Support ARP, ARP Proxy, ARP Limiting Speed, ARP Repeat-Authentication, Gratuitous ARP Support DNS client Support Static Routing, RIPv1/v2, OSPFv2, BGP4, GRE Unicast Routing Protocol etc. Support Routings for OSPF's different process import each other Support LPM Routing, Policy-based Routing(PBR), ECMP Support VRRP, URPF, Black Hole Routing Support IGMP v1/2/3, DVMRP, PIM-DM, PIM-SM, PIM-SSM, IGMP Proxy, anycast RP, MSDP, Static multicast Routing, boundary multicast Routing etc.
Strengthen Extend	Support in-embed firewall, IDS, IPSce VPN, Content-exchange service, Network Analysis hardware module etc.
Free-Resource	Support

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IPv6	Support ICMPv6, ND, DNSv6 Support IPv6 LPM Routing, IPv6 Policy-based Routing(PBR) Support IPv6 VRRPv3, IPv6 URPF, IPv6 Black Hole Routing Support RIPng, OSPFv3, BGP4+ Unicast Routing Protocol etc. Support 6to4 Tunnels, configured Tunnels, ISATAP etc. Support MLD Snooping, IPv6 Muticast VLAN Support MLDv1/v2, PIM-SM/DM for IPv6, IPv6 anycast RP, IPv6 Static multicast Routing, IPv6 boundary multicast Routing, IPv6 multicast tunnel etc. Support IPv6 ACL, IPv6 QOS
Strengthen ARP/NDP Safety function	Support ARP/NDP Spoofing Prevention, ARP/NDP Scanning Prevention
MPLS	MPLS, LDP, MPLS VPN, MPLS TE, Access public network technology
QoS	Carry out by hardware completely, have no effect for performance. Each port has 8 queues. Support SP, WRR, SWRR queue scheduling algorithm. Support traffic class base on 802.1p, ToS, port, DiffServ Class traffic by ACL; configure the COS, TOS, DSCP bases class result. Class traffic by high-layer content for ACL-X's 80 bytes Support SP, WRR, SWRR etc. Provide different service quality requested for speech, data and video transmit at the same network. Support Traffic Shaping Support priority Mark/Remark

ACL	Carry out by hardware completely, have no effect for forwarding performance. Support Standard ACL and Extended ACL Support IP ACL, base on IP-subnet ACL, MAC ACL, IP-MAC ACL , Support IP or MAC based on source/destination, Layer 3 IP protocol type, TCP/UDP layer 4 port number, IP priority (DSCP, ToS, Precedence), base on VLAN, Tag/Untag, CoS etc. Support REDIRECT based on ACL, Traffic statistic based on ACL
ACL-X	Support to transfer security policy automatically base on time. ACL's deepness content can be used for QoS sort standard, the deepness can extend 80 bytes.
DCSCMv4/v6	Support IPv4/IPv6 Multicast Source Controllable, Prevent lawless Multicast Source Support IPv4/IPv6 multicast user Controllable Support IPv4/IPv6 policy multicast

Port Function	Support MAC+ port binding, IP+ MAC+ port binding, IP+ port binding Support MAC filter Support Port Limit(bandwidth management) Support Port Loopback Detection Support Port Mirror(CPU Port Mirror, ingress or egress unilateralism/ bidirectional, one-to-one, many-to-one, stride board, stride equipment), Support Flow Control: HOL prevent head-packet block, half-duplex back pressure, full-duplex IEEE802.3x Support Port aggregation IEEE802.3ad(LACP), port-to-port GEC/FEC, each trunk can up to 8 ports, support load equipoise
DHCPv4/v6	Support IPv4/IPv6 DHCP Client, IPv4/IPv6 DHCP Relay, IPv4/IPv6 DHCP Snooping Inside-install IPv4/IPv6 DHCP Server, DHCP Option82
Security Access	Support IEEE 802.1x, DCSM
AAA Authentication	Support IPv4/IPv6 RADIUS

Security Function Configuration	Support IPv4/IPv6 syslog Support the unite for IPv4/IPv6 HTTP and SSL Support the user IP security inspection for IPv4/IPv6 SNMP Support MIB and TRAP Support IPv4/IPv6 FTP/TFTP Support IPv4/IPv6 NTP Support RMOM 1, 2, 3, 9 four group Support the RADIUS authentication for IPv4/IPv6 telnet user name and password Support IPv4/IPv6 SSHs The right configuration for users can adopt radius server's shell management Support the function for timing-reset bases needs
sFlow Function	Support network flow analysis , Support RFC3176 , can realize the flow monitoring and statistic based on protocol or address
IPFIX	A standard protocol can measure the flow information of the IETE network
Exception monitoring and fault check-up	Monitoring the Task exception, Memory exception, CPU utilance, Stack exception, Switching-chip exception, board temperature exception etc. And giving an alarm
Centralized Web Management Software	It is adopted the DIGISOL centralized web management software 'LinkManager' for unified management.

1.5 Physical Specifications

- **Management Port**

- One RJ-45 serial port for each management module

- **AC Power Input**

- Input: 90 ~ 264V, 50 ~ 60Hz
- Built-in Universal Power Supply

- **DC Power Input**

- Input: -36V~ -72VDC
- Built-in Universal Power Supply

- **Power Consumption**

- DG-CS7004: 400W Max
- DG-CS7010: 1200W Max

- **Operating Temperature**

- 0□C ~ 45□C

- **Storage Temperature**

- -40□C ~ 70□C

- **Relative humidity**

- 10% ~ 90% with no condensate

- **Dimension**

- DG-CS7004 440mm×266mm×421mm (W x H x D)

- DG-CS7010 436mm×797mm×478mm (W x H x D)

  - **Weight**

- DG-CS7004: 30kg (max. full configuration weight)
- DG-CS7010: 65kg (max. full configuration weight)

  - **Mean Time Before Failure**

- Min. 80,000 Hours MTBF

1.6 Hardware Components

DG-CS7004 consists of the chassis, power supply system, ventilation system, system board, etc.

1.6.1.1 DG-CS7004 Chassis

The DG-CS7004 uses a 19-inch Rack Mountable Chassis, with the standard dimensions of 440mm (W) x 266mm (H) x 421mm (D). The chassis consists of functional block and power supply block. The function module block is a board rack, which is the supporting structure for DG-CS7004 system boards (4 boards max). The fan block is located on the left side of the board rack, allowing one fan tray (4 axial fans for each fan tray). Dust gauze is provided on the right of the board rack for filtering air circulation through the rack. The power block upper the dust gauze provides power to the system, supporting up to two power modules. The power modules insert into the power slots from the front, with the distribution box at the back of the rack for maintenance.

In addition, there is an ESD Wrist Strap Connectors on the board rack, located on the left side of the upper.

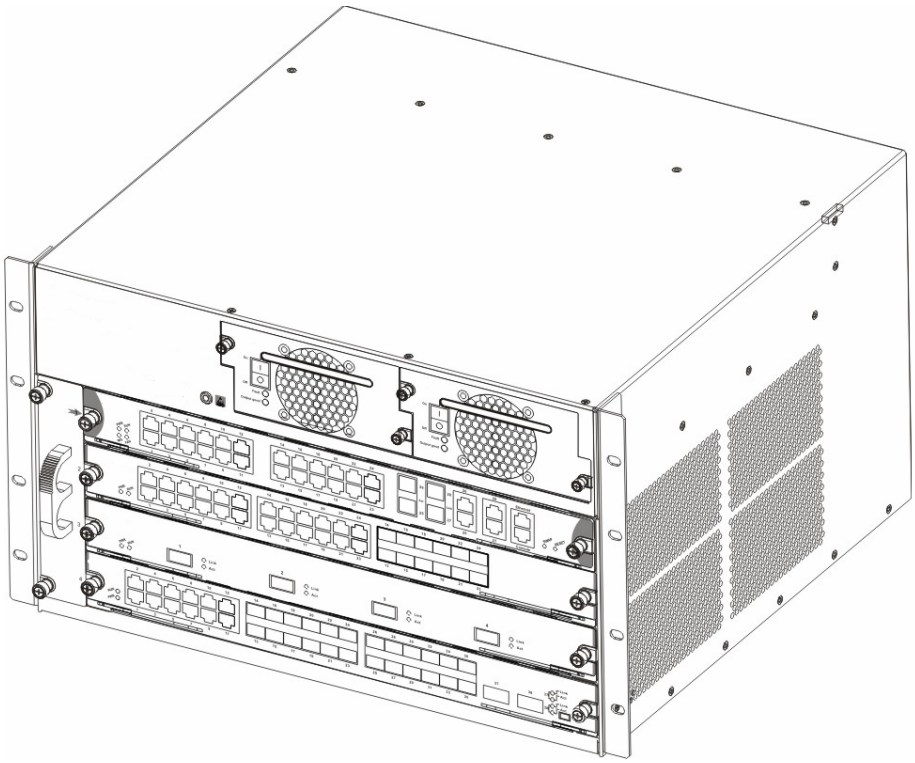

Fig 1-3 DG-CS7004 Module Outlook

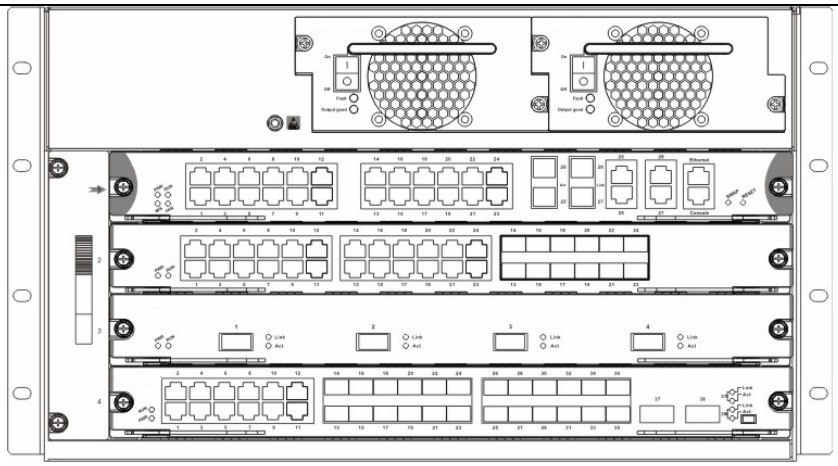

Fig 1-4 DG-CS7004 Front Panel View

① Management slot: It supports two management slots. DG-CS7004-MM-12GC12GX1XFP can be inserted in to the Management slots. The second slot can also be used as I/O slot for configuring various I/O modules.

② Network slot: 2 network slots are provided. Various network modules can be added to the network slots. Such as DG-CS7000-4XFP and DG-CS7000-12GC12GT etc.

③ Power slot: Used for system power supply modules. Support up to two 400W AC/DC modules.

④ Fan tray slot: Supports up to one system fan assemblies, each assembly consists of four axial fans.

⑤ Dust gauze slot: Exterior air inlet for the ventilation subsystem.

⑥ Distribution box slot: For system distribution box use, works in AC mode based on the power modules.

1.6.1.1.1 Board Rack

The board rack consists of board slots and a system board.

The boards are inserted vertically into the DG-CS7004 4 unit boards are provided. There are four slots in DG-CS7004 from number 1 to number 4 in order of top to down. The first slot is

used to install management module; the second slot is used to management module under 1+1 redundant backup mode or install various I/O interface modules.

A reset button (printed on the panel as ***Reset***), hot swap button (printed on the panel as ***SWAP***), board power indicator (printed on the panel as ***PWR***) and board running status indicator (printed on the panel as ***RUN***) are provided for each board. On the Main Control cards there is Master-Slave indicator (printed on the panel as ***M/S***) There is also a power module status indicator (printed on the panel as ***Power***), fan assembly status indicator (printed on the panel as ***Fan***), and interface status indicators for corresponding management interfaces and network interfaces (printed on the panel as ***Link*** and ***Act***).

The DG-CS7004 system board is an essential part of the switch, located inside the switch and providing interconnectivity between the management switch modules (short for *management card*) and network interface modules (*line card*), and for all management and control signals.

1.6.1.1.2 Power Supply

When using A.C. power supply, we shall adopt power supply of 110V/220V and corresponding A.C. distribution box. The permissible range of power supply is 90～264VAC, 50～60Hz. The maximum output power of single power supply module is 400W.

When using D.C. power supply, we shall adopt power supply of -48V and corresponding D.C. distribution box. The permissible range of power supply is -36V～-72VDC. The maximum output power of single power supply module is 400W.

1.6.1.1.3 Ventilation and Cooling System

The operating ambient temperature of the DG-CS7004 is 0 ~ 45□C, the thermal design of the equipment can ensure that the surface temperature of the device will not exceed 50-80% of the highest temperature allowable.

The switch uses fan assemblies to disperse heat, with the air flow being drawn in through the right section and out through the left section to facilitate air circulation, so that the switch can maintain normal operation under specified environmental conditions. The fan tray is attached to the fan tray slots left the board rack, and ventilation is provided via 4 axial fans that pump out air. Fan trays are hot swappable for maintenance, their status are indicated by the FAN indicators on the main switch panel. In addition, dust gauze is provided on the right of the board rack for filtering the air circulating through the rack. The dust gauze can be unplugged and removed through the back for maintenance.

1.6.1.2 DG-CS7010 Chassis

The DG-CS7010 uses a 19-inch Rack Mountable Chassis, with the standard dimensions of 436mm (W) x 797mm (H) x 478mm (D). The chassis consists of functional block, thermal block, and power supply block. The function module block is a board rack, which is the supporting structure for DG-CS7010 system boards (10 boards max). Ten wiring clips are provided in the upper and lower parts of the board rack respectively, for the positioning of all kinds of cables. In addition, there are two ESD Wrist Strap Connectors on the board rack, located on the left side of the upper and lower rack respectively. The thermal block is located on the upper part of the board rack, allowing three fan trays (2 axial fans for each fan tray). Dust gauze is provided under the board rack for filtering air circulation through the rack. The power block under the dust gauze provides power to the system, supporting up to three power modules. The power modules insert into the power slots from the front, with the distribution box at the back of the rack for maintenance. Closely beside the distribution box, a grounding post has been provided on each side of the rack for grounding connections.

In addition, on both sides of the lower section of the chassis, a handler is provided for easier transport.

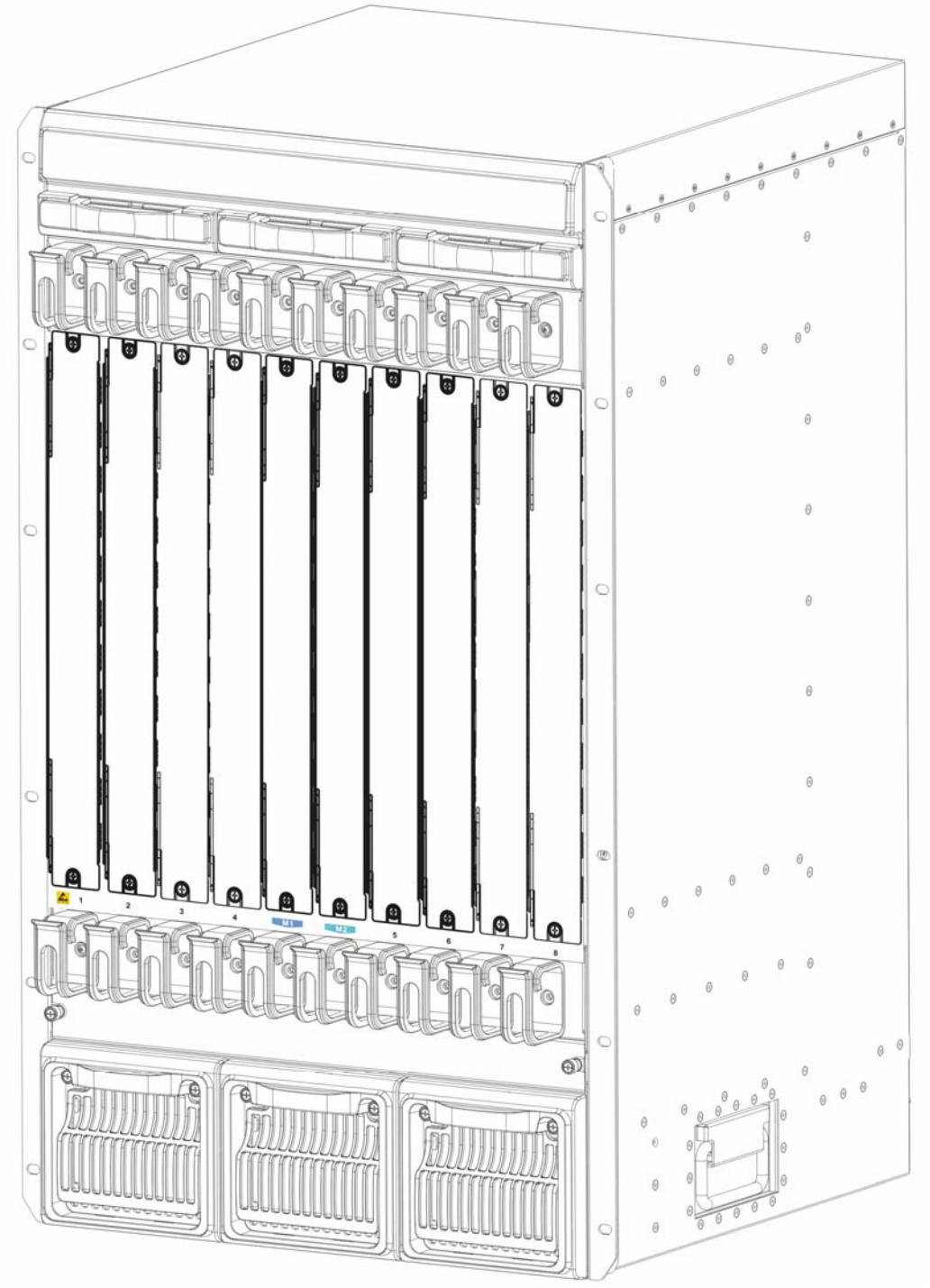

Fig 1-5 DG-CS7010 Module Outlook

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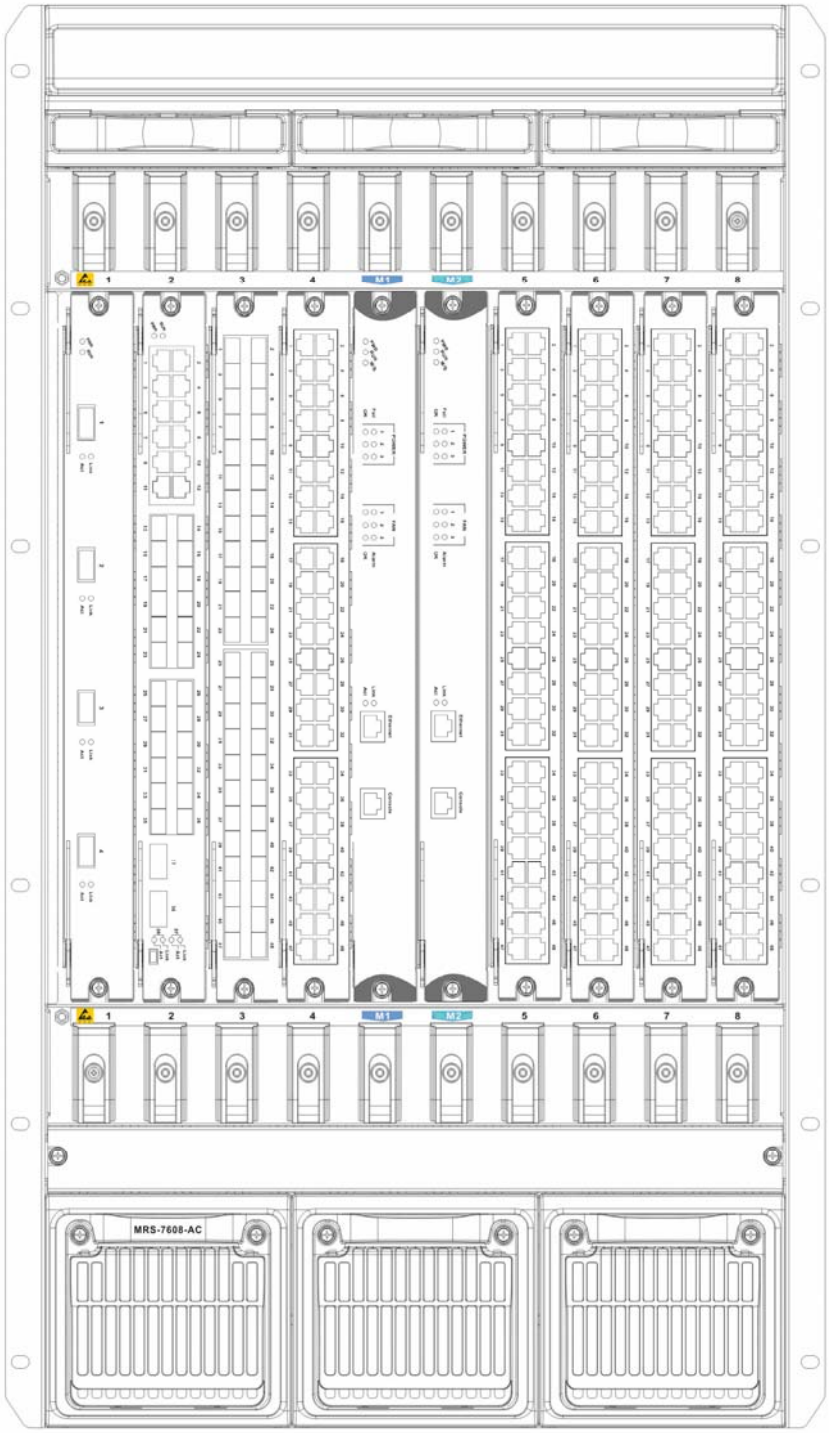

Fig 1-6 DG-CS7010 Front Panel view

Management slot: 2 management slots are provided. One or two management switching modules DG-CS7010-MM-I can be inserted in to the Management slots.

② Network slot: 8 network slots are provided. Various network modules can be added to the network slots, such as DG-CS7000-48GX, DG-CS7000-4XFP, etc.

③ Power slot: Used for system power supply modules. Supports up to three 600W AC modules or three 600W DC modules.

④ Fan tray slot: Supports up to three system fan assemblies, each assembly consists of two axial fans.

⑤ Dust gauze slot: exterior air inlet for the ventilation subsystem.

⑥ Distribution box slot: For system distribution box use, works in AC/DC mode based on the power modules.

1.6.1.2.1 Board Rack

The board rack consists of board slots and a system board.

The boards are inserted vertically into the DG-CS7010 10 unit boards are provided. These include 2 management slots in the middle for management switch modules, marked specially in red as M1 and M2. The other eight board slots are network slots for various network interface modules, sequenced as 1 to 8 from left to right.

A reset button (printed on the panel as ***Reset***), hot swap button (printed on the panel as ***SWAP***), board power indicator (printed on the panel as ***PWR***) and board running status indicator (printed on the panel as ***RUN***) are provided for each board. On the Main Control cards there is Master-Slave indicator (printed on the panel as ***M/S***) There is also a power

module status indicator (printed on the panel as ***Power: Fail/OK***), fan assembly status indicator (printed on the panel as ***Fan: Alarm/OK***), and interface status indicators for corresponding management interfaces and network interfaces (printed on the panel as ***Link*** and ***Act***).

The DG-CS7010 system board is an essential part of the switch, located inside the switch and providing interconnectivity between the management switch modules (short for *management card*) and network interface modules (*line card*), and for all management and control signals.

1.6.1.2.2 Power Supply

When powered by AC sources, the 110V/220 VAC input power supplies and corresponding AC distribution box should be used. The acceptable input power ranges from 90 ~ 264 VAC at 50 ~ 60 Hz. The maximum output power of each power module is 600W.

When powered by DC sources, the -48 VDC input power supply and corresponding DC distribution box should be used. The acceptable input power ranges from -36 V ~ 72 VDC. The maximum output power of each power module is 600W.

1.6.1.2.3 Ventilation and Cooling System

The operating ambient temperature of the DG-CS7010 is 0 ~ 45□C, the thermal design of the equipment can ensure that the surface temperature of the device will not exceed 50-80% of the highest temperature allowable.

The switch uses fan assemblies to disperse heat, with the air flow being drawn in through

the bottom section and out through the upper section to facilitate air circulation, so that the switch can maintain normal operation under specified environmental conditions. Three fan trays are attached to the fan tray slots above the board rack, and ventilation is provided via 6 axial fans that pump out air. Fan trays are hot swappable for maintenance, their status are indicated by the FAN indicators on the main switch panel. In addition, dust gauze is provided under the board rack for filtering the air circulating through the rack. The dust gauze can be unplugged and removed through the front for maintenance.

Introduction to DG-CS7000 Series Cards

The following eleven cards for the DG-CS7000 series are currently available:

- Main control card (DG-CS7010-MM-I): The central switching and controlling module for the DG-CS7010. System status control, switch management, user access control and administration, and network operation maintenance are performed here.
- 12 Gigabit Combo ports and 12 copper GT ports (DG-CS7000-12GC12GT): supporting 12 Gigabit Combo ports and 12 copper GT ports for layer 2 and layer 3 switching and routing and ipv6 wire speed forward.
- Dual 10G XFP ports, 12 Gigabit Combo ports and 12 copper Gb ports (DG-CS7000-12GC12GT2XFP): supporting dual 10G XFP ports, 12 Gigabit Combo ports and 12 copper GT ports for layer 2 and layer 3 switching , routing and IPv6 wire speed forward.
- 48 copper GT ports line card (DG-CS7000-48GT): supporting 48 1000Base-T copper ports for layer 2 and layer 3 switching and routing and IPv6 wire speed forward.
- Main control card (DG-CS7004-MM-12GC12GT1XFP): The central switching and controlling module for the DG-CS7004, System status control, switch management, user access control and administration, and network operation maintenance are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy, and supports IPv6 wire speed transmission function.

12-port 1G optical-electronic combo, 12-port 1G electronic and 1-port 10G XFP interface.

- 40G XFP interface line card (DG-CS7000-4XFP): implements 2-layer and 3-layer wire-speed switching and routing function of 4 10,000Mbps XFP interfaces and IPv6 wire-speed transmission.
- 48 SFP GT ports line card (DG-CS7000-48GX): implements 2-layer and 3-layer wire-speed switching and routing function of 48 1000Mbps optical interfaces and IPv6 wire-speed transmission.
- Main control card (DG-CS7004-MM-12GC12GX1XFP): is switching module for the DG-CS7004. System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy. It supports 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combos, 12 1000Mbps opticals and 1 10,000Mbps XFP interfaces, IPv6 wire-speed transmission.
- 12 1000Mbps optical-electronic combo, 12 1000Mbps optical interfaces line card(DG-CS7000-12GC12GX): The switching module of the 76 series switch and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combo, 12 1000Mbps optical interfaces, IPv6 wire-speed transmission.
- 12 1000Mbps optical-electronic combo, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces line card (DG-CS7000-12GC12GX2XFP): The switching module of the 76 series switch and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combo, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces, IPv6 wire-speed transmission.
- Main control card (DG-CS7010-MM-II): The second generation central switching and controlling module for the DG-CS7010. System status control, switch management, user access control and administration, and network operation maintenance are performed here.
- 12 1000Mbps electronic interfaces, 24 1000Mbps optical interfaces line card (DG-CS7000-12GT24GX): The switching module for the 7600E series switch, which supports MPLS VPN function and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps electronic interfaces, 24 1000Mbps optical interfaces, IPv6 wire-speed transmission.

- 12 1000Mbps electronic interfaces, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces line card (DG-CS7000-12GT24GX2XFP): The switching module for the 7600E series switch , which supports MPLS VPN function and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps electronic interfaces, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces, IPv6 wire-speed transmission.
- Dual 10G XFP ports , 12 Gigabit Combo ports and 12 copper Gb ports (DG-CS7000-12GC12GT2XFP(R2)): The switching module for the DG-CS7004(R2), supporting dual 10G XFP ports, 12 Gigabit Combo ports and 12 copper GT ports for layer 2 and layer 3 switching , routing and IPv6 wire speed forward.
- 12 Gigabit Combo ports and 12 copper Gb ports (DG-CS7000-12GC12GT(R2)): The switching module for the DG-CS7004(R2), supporting 12 Gigabit Combo ports and 12 copper GT ports for layer 2 and layer 3 switching , routing and IPv6 wire speed forward.
- 48 copper GT ports line card (DG-CS7000-48GX (R2)): The switching module for the DG-CS7004 (R2), implements 2-layer and 3-layer wire-speed switching and routing function of 48 1000Mbps optical interfaces and IPv6 wire-speed transmission.
- Main control card (DG-CS7004-MM-12GC12GT1XFP (R2)): The central switching and controlling module for the DG-CS7004 (R2), System status control, switch management, user access control and administration, and network operation maintenance are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy, and supports IPv6 wire speed transmission function. 12-port 1G optical-electronic combo, 12-port 1G electronic and 1-port 10G XFP interface.
- Main control card (DG-CS7010-MM-I (R2)): The central switching and controlling module for the DG-CS7010 (R2). System status control, switch management, user access control and administration, and network operation maintenance are performed here.

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1.6.1.3 DG-CS7010-MM-I

The DG-CS7010-MM-I is switching module for the DG-CS7010. System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into M1 or M2 slots of the chassis for Master-Slave redundancy.

1.6.1.3.1 Front Panel

The DG-CS7010-MM-I comes with 1 Console port (control console) and 1 10/100Base-Tx Ethernet port (management port).

The Front Panel view is shown below:

Fig 1-7 DG-CS7010-MM-I Front Panel view

1.6.1.3.2 Front Panel - Indicator

The following table describes the front panel indicators of DG-CS7010-MM-I:

Table 1-1 DG-CS7010-MM-I indicators description

LED	Panel Symbol	Status	Description
Power Indicator	PWR	On (Green)	Card powered
		Off	Card powered off
Operation indicator	RUN	On (Green, blink at 1 Hz)	Cards operating normally
		On (Green, blink at 8 Hz)	System is loading
		On (Yellow, blink at 8 Hz)	System is shutting down
		On (Red, blink at 8 Hz)	Cards malfunction
		Off	Cards are powered off and can be removed
Master-Slave indicator	M/S	On (Green)	Master
		Off	Slave
Power Supply Module Status indicator: POWER	OK	On (Green)	Power Supply Module operating normally
		Off	Power supply module malfunctioning or not present (with **Fail** off)
	Fail	On (Yellow)	Power Supply Module malfunction
		Off	Power supply module operating normally or not present (with ***OK*** off)
Fan Assembly Status	OK	On (Green)	Fan operating normally
		Off	Fan malfunctioning or not present (with ***Alarm*** off)
	Alarm	On (Yellow)	Fan malfunction

indicator: FAN		Off	Fan operating normally or not present (with *OK* off)

1.6.1.3.3 Front Panel – Console Port

The DG-CS7010-MM-I provides a RJ-45 (receptacle) Console serial port. Users can connect to hosts via this port to perform system debugging, configuration, maintenance, management and host software loading.

Table 1-2 DG-CS7010-MM-I Console description

Property	Specification
Connector	RJ-45 (receptacle)
Connector type	RS-232
Baud rate	9600bps (default)
Supporting service	● Connects to character terminals ● Connects to PC serial port and running terminal emulator on PC.

1.6.1.3.4 Front Panel – Management Port

The DG-CS7010-MM-I provides a RJ-45 (receptacle) Ethernet port. Users can connect through this management port to hosts for program loading or to connect to remote devices for remote management (e.g., a managing workstation). Note: when connecting to the host, a cross-over cable should be used.

Table 1-3 DG-CS7010-MM-I management port description

Property	Specification
Connector	RJ-45 (Receptacle)
Connector type	• 10/100Mbps auto sensing • Cat 5 UTP: 300 m

1.6.1.3.5 Front Panel – Reset Button

DG-CS7010-MM-I provides a RESET button for resetting the board.

1.6.1.4 DG-CS7000-12GC12GT and DG-CS7000-12GC12GT2XFP

12-port optical-electronic combo and 12-port electronic interface line card (DG-CS7000-12GC12GT): to implement the layer2 and layer3 wire speed exchange and routing function of 12-port 1G optical-electronic combo and 12-port 1G electronic interface and IPv6 wire speed transmission function.

Double 10G and 12-port optical-electronic combo and 12-port electronic interface line card (DG-CS7000-12GC12GT2XFP): to implement the layer2 and layer3 wire speed exchange and routing function of 12-port 1G optical-electronic combo, 12-port 1G electronic and 2-port 10G XFP interface, and IPv6 wire speed transmission function.

1.6.1.4.1 Front Panel Diagram

DG-CS7000-12GC12GT provides twelve 1G SFP ports, twenty four 1G electronic ports, where the twelve 1G optical ports and the last twelve 1G electronic ports are combo ports.

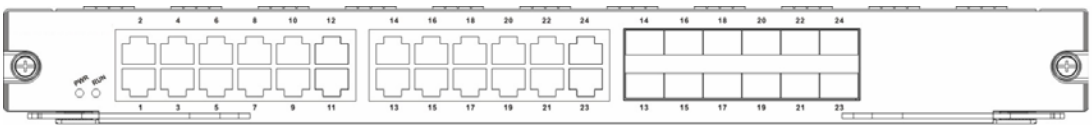

Fig 1-8 DG-CS7000-12GC12GT front panel view

DG-CS7000-12GC12GT2XFP provides two 10G XFP ports, twelve 1G optical SFP ports, twenty four 1G electronic SFP ports, where the twelve 1G optical ports and the last twelve 1G electronic ports are combo ports.

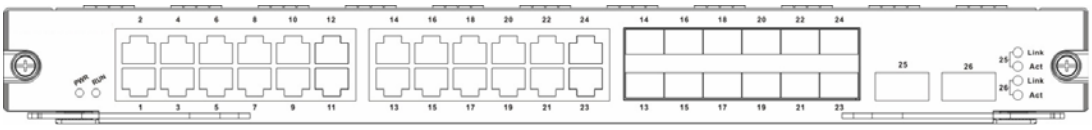

Fig 1-9 DG-CS7000-12GC12GT2XFP front panel view

1.6.1.4.2 Front Panel Indicator

The description of front panel indicator of DG-CS7000-12GC12GT and DG-CS7000-12GC12GT2XFP is as follows:

Table 1-4 DG-CS7000-12GC12GT and DG-CS7000-12GC12GT2XFP indicator description

LED Indicator	Panel Sign	Status	Meanings
Power Indicator	PWR	On (Green)	Network Interface Card power on
		Off	Network Interface Card power off
Running Indicator	RUN	On (Green 1Hz flash)	Network Interface Card running in normal status
		On (Green 8Hz flash)	System loading (Network Interface Card Booting after hot plug in)
		On (Yellow 8Hz flash)	System shutting down

		On (Red 8Hz flash)	Running status is in failure
		Off	Network Interface Card is off and can be pulled out
RJ-45 Interface indicator			
Status Indicator	Shared	On (Green)	RJ-45 Interface Network Connection is normal
		Off	There is not network connection at RJ-45 interface
Transmission Indicator		On (Yellow)	Sending or receiving data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface
Transmission Indicator	"Right Light"	Flashes (Green)	Sending or receiving data
XFP interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	Flashes (Green)	Sending or receiving data

1.6.1.4.3 Front Panel Interface Description

DG-CS7000-12GC12GT and DG-CS7000-12GC12GT2XFP provide twelve SFP 1G optical fiber transceivers and twenty four RJ-45 1G electronic port slots.

DG-CS7000-12GC12GT2XFP provides two XFP 10G optical ports.

1.6.1.5 DG-CS7000-48GT

48GT electronic interface line card (DG-CS7000-48GT): to implement the layer2 and layer3 wire speed exchange and routing function of 48GT electronic interface and IPv6 wire speed transmission function.

1.6.1.5.1 Front Panel Diagram

DG-CS7000-48GT provides 48-Port 10/100/1000M Ethernet electronic ports,

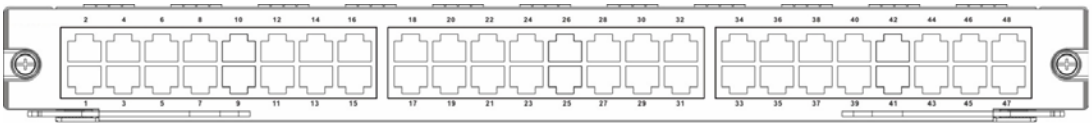

Fig 1-10 DG-CS7000-48GT front panel view

1.6.1.5.2 Front Panel Indicator

The description of front panel indicator of DG-CS7000-48GT as follows:

Table 1-5 DG-CS7000-48GT indicator description

LED Indicator	Panel Sign	Status	Meanings
RJ-45 Interface indicator			
Status Indicator	Shared	On (Green)	RJ-45 Interface Network Connection is normal
		Off	There is not network connection at RJ-45 interface
Transmission Indicator		On (Yellow)	Sending or receiving data

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1.6.1.5.3 Front Panel Interface Description

DG-CS7000-48GT provides 48-port 10/100/1000M RJ-45 electronic port.

1.6.1.6 DG-CS7004-MM-12GC12GT1XFP

The DG-CS7004-MM-12GC12GT1XFP is switching module for the DG-CS7004. System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy. 12-port 1G optical-electronic combo, 12-port 1G electronic and 2-port 10G XFP interface, and IPv6 wire speed transmission function.

1.6.1.6.1 Front Panel Diagram

DG-CS7004-MM-12GC12GT1XFP provides 2-port 1G optical-electronic combo, 12-port 1G electronic and 1-port 10G XFP interface. It implements 2-layer and 3-layer wire-speed switching, routing function and IPv6 transmission. The front 12 ports are 1000M electronic ports and the last 12 ports are combo ports.

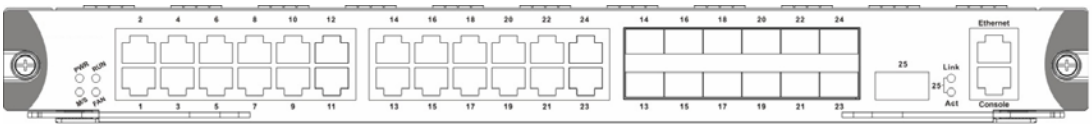

Fig 1-11 DG-CS7004-MM-12GC12GT1XFP front panel view

1.6.1.6.2 Front Panel Indicator

The description of front panel indicator of DG-CS7004-MM-12GC12GT1XFP as follows:

Table 1-6 DG-CS7004-MM-12GC12GT1XFP indicator description

LED Indicator	Panel Sign	Status	Meanings
Power Indicator	PWR	On (Green)	Network Interface Card power on
		Off	Network Interface Card power off
Master-Slave indicator	M/S	On (Green)	Master
		Off	Slave
FAN indicator	FAN	On(Green)	Fan present and operating normally
		On(Red)	Fan not present or operating abnormally
		Off	Fan not present
Running Indicator	RUN	On (Green 1Hz flash)	Network Interface Card running in normal status
		On (Green)	System loading (Network Interface Card Booting after hot plug in)
		Off	Network Interface Card running abnormally
RJ-45 Interface indicator			
Status Indicator		On (Green)	RJ-45 Interface Network Connection is normal
		Off	There is not network connection at RJ-45 interface
		On (Orange)	Sending or receiving data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface

Transmission Indicator	"Right Light"	Flashes (Green)	Sending or receiving data
XFP interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	Flashes (Green)	Sending or receiving data

1.6.1.6.3 Front Panel Interface Description

DG-CS7004-MM-12GC12GT1XFP provides 12-port 1G optical-electronic combo, 24-port 1G electronic and 1-port 10G XFP interface.

1.6.1.7 DG-CS7000-4XFP

DG-CS7000-4XFP implements 2-layer and 3-layer wire-speed switching and routing function of 4 10,000Mbps XFP interfaces and IPv6 wire-speed transmission.

1.6.1.7.1 Front Panel Diagram

The following is the sketch map of its front panel:

Fig 1-12 the Sketch Map of the Front Panel of DG-CS7000-4XFP

1.6.1.7.2 Front Panel Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7000-4XFP.

Table 1-7 the Instruction of Indicator Lamps of DG-CS7000-4XFP

LED Indicator	Panel Sign	State	Explanation
Power Indicator Lamp	PWR	On(green)	The boardcard is power-on
		Off	The boardcard is power-off
Run Operating Indicator	RUN	On(green, glittering at the frequency of 1 HZ)	The boardcard is operating normally
		On(green, glittering at the frequency of 8 HZ)	The system is booting(Booting after the boardcard is hot-plugged in)
		Off	The boardcard is operating abnormally
XFP Interface Indicator Lamps			
State Indicator Lamp	Link	On(green)	The network connection of XFP Transceiver is normal.
		Off	There is no network connection on XFP Transceiver
Transmission Indicator Lamp	Act	On(green)	Receiving or sending data.

1.6.1.7.3 Front Panel Interfaces Description

DG-CS7000-4XFP provides 4 10,000Mbps XFP electric interfaces.

1.6.1.8 DG-CS7000-48GX

48-port 1000Mbps optical line card (DG-CS7000-48GX): Implements 2-layer and 3-layer wire-speed switching and routing function of 48 1000Mbps optical interfaces, and IPv6 wire-speed transmission.

1.6.1.8.1 Front Panel Diagram

DG-CS7000-48GX provides 48 1000Mbps optical interfaces.

The following is the sketch map of its front panel:

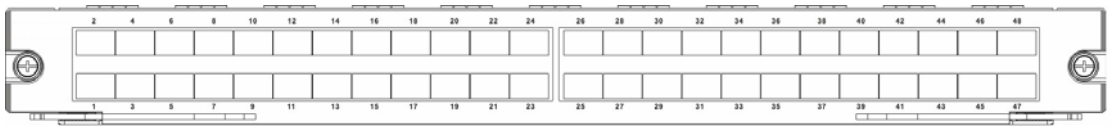

Fig 1-13 the Sketch Map of the Front Panel of DG-CS7000-48GX

The ports in the above chart are port GB1 - GB48 from the bottom-left corner to the top-right corner. The indicator lamps of ports having odd index number are on the left side of the port array, while the indicator lamps of ports having even index number are on the right side. The lamps are green indicator lamps.

1.6.1.8.2 Front Panel Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7000-48GX.

Table 1-8 the Instruction of Indicator Lamps of DG-CS7000-48GX

LED Indicator	Panel Sign	State	Explanation
SFP Interface Indicator Lamps			
State Indicator Lamp		On(green)	The network connection of SFP interface is normal.
		Off	There is no network connection on SFP interface
Transmission Indicator Lamp		On(green)	SFP is receiving or sending data.

1.6.1.8.3 Front Panel Interface Description

DG-CS7000-48GX provides 48 SFP 1000Mbps optical transceiver interfaces.

1.6.1.9 DG-CS7004-MM-12GC12GX1XFP

The DG-CS7004-MM-12GC12GX1XFP is switching module for the DG-CS7004. System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy. DG-CS7004-MM-12GC12GX1XFP supports 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combos, 12 1000Mbps opticals and 1 10,000Mbps XFP interfaces, IPv6 wire-speed

transmission.

1.6.1.9.1 Front Panel Diagram

DG-CS7004-MM-12GC12GX1XFP provides 12-port 1G optical-electronic combo, 12-port 1G optical and 1-port 10G XFP interface. 12-port 1G optical-electronic are combo at the front, 12-port are 1G optical interface at the back.

The following is the sketch map of its front panel:

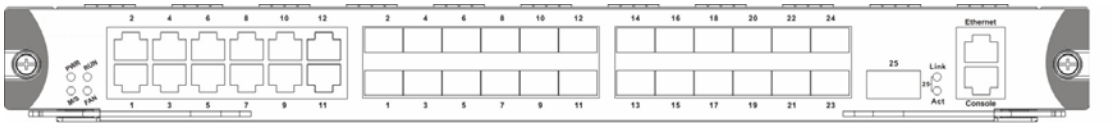

Fig 1-14 the Sketch Map of the Front Panel of DG-CS7004-MM-12GC12GX1XFP

1.6.1.9.2 Front Panel Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7004-MM-12GC12GX1XFP.

Table1-9 DG-CS7004-MM-12GC12GX1XFP indicator description

LED	Panel Symbol	Status	Description
Power Indicaor	PWR	On(Green)	Card Powered
		Off	Card Powered off
Master-Slave Indicator	M/S	On(Green)	Master
		Off	Slave
Fan Indicator	FAN	On(Green)	Fan operating normally
		Off	Fan not present or operating abnormally
Operation	RUN	On(Green, blink at 1 Hz)	Cards operating normally

Indicator		On(Green, blink at 8 Hz)	System is loading (Booting after the boardcard is hot-plugged in)
		Off	Operating malfunctioning
RJ-45 Interface Indicator			
Port Indicator		On(Green)	The network connection of RJ-45 interface is normal
		Off	There is no network connection on RJ-45 interface
		On(Orange)	Receiving or sending data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface
Transmission Indicator	"Right Light"	On (Green)	Sending or receiving data
XFP Interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	On (Green)	Sending or receiving data

1.6.1.9.3 Front Panel Interface Description

DG-CS7004-MM-12GC12GX1XFP provides 24 SFP 1000Mbps optical fibre transceivers, 12 RJ-45 1000Mbps electronic port slots and 1 XFP 10,000Mbps electronic port.

1.6.1.10 DG-CS7000-12GC12GX and DG-CS7000-12GC12GX2XFP

The DG-CS7000-12GC12GX is switching module for the 76 series switch and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combo, 12 1000Mbps optical interfaces, IPv6 wire-speed transmission.

The DG-CS7000-12GC12GX2XFP is switching module for the 76 series switch and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps optical-electronic combo, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces, IPv6 wire-speed transmission.

1.6.1.10.1 Front Panel Diagram

DG-CS7000-12GC12GX provides 12 1000Mbps optical-electronic combo and 12 1000Mbps optical interfaces. 12 1000Mbps electronic ports are combo ports at the front, 12 ports are 1000Mbps optical port at the back.

The following is the sketch map of its front panel:

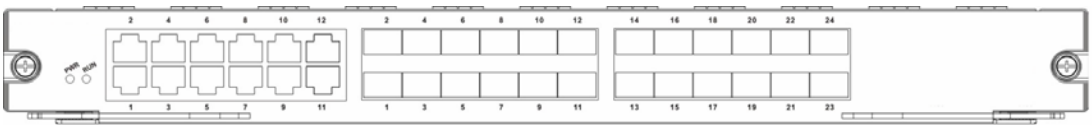

Fig 1-15 the Sketch Map of the Front Panel of DG-CS7000-12GC12GX

The DG-CS7000-12GC12GX2XFP provides 12 1000Mbps optical-electronic combo, 12 1000Mbps optical interfaces and 2 10,000Mbps XFP interfaces. 12 1000Mbps electronic ports are combo ports at the front, 12 ports are 1000Mbps optical ports at the back.

The following is the sketch map of its front panel:

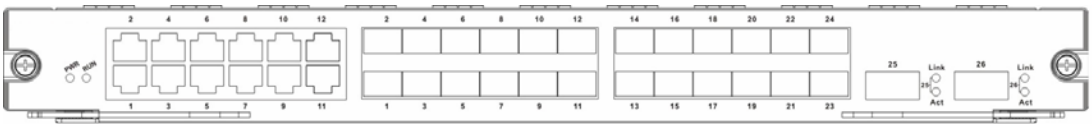

Fig 1-16 the Sketch Map of the Front Panel of DG-CS7000-12GC12GX2XFP

1.6.1.10.2 Front Panel Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7000-12GC12GX and DG-CS7000-12GC12GX2XFP.

Table1-10 DG-CS7000-12GC12GX and DG-CS7000-12GC12GX2XFP indicator description

LED	Panel Symbol	Status	Description
Power Indicaor	PWR	On(Green)	Card Powered
		Off	Card Powered off
Operation Indicator	RUN	On(Green, blink at 1 Hz)	Cards operating normally
		On(Green, blink at 8 Hz)	System is loading (Booting after the boardcard is hot-plugged in)
		Off	Operating malfunctioning
RJ-45 Interface Indicator			
Port Indicator		On(Green)	The network connection of RJ-45 interface is normal
		Off	There is no network connection on RJ-45 interface
		On(Orange)	Receiving or sending data
SFP Interface Indicator			
Status Indicator	“Left Light”	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at

			SFP interface
Transmission Indicator	"Right Light"	On (Green)	Sending or receiving data
XFP Interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	On (Green)	Sending or receiving data

1.6.1.10.3 Front Panel Interface Description

DG-CS7000-12GC12GX and DG-CS7000-12GC12GX2XFP provides 24 SFP 1000Mbps optical fibre transceivers, 12 RJ-45 1000Mbps electronic port slots.

DG-CS7000-12GC12GT2XFP provides 2 XFP 10,000Mbps optical ports.

1.6.1.11 DG-CS7010-MM-II

The DG-CS7010-MM-II is main switching module for the DG-CS7010, the important functions such as system status control, route management, user access control and management, network maintenances are performed here. The board can be inserted into M1 or M2 slots of the chassis switch and support Master-Slave redundancy.

1.6.1.11.1 Front Panel Diagram

The DG-CS7010-MM-II provide 1 Console port (control platform), and 1 10/100/1000Base-Tx Ethernet port (management port).

The Front Panel is shown as below:

Fig 1-17 DG-CS7010-MM-II Front Panel

1.6.1.11.2 Front Panel Indicator

The following table describes the front panel indicators of DG-CS7010-MM-II:

Table1-11 DG-CS7010-MM-II indicator description

LED	Panel Symbol	Status	Description
Power Indicaor	PWR	On(Green)	Card Powered
		Off	Card Powered off
Operation Indicator	RUN	On(Green, blink at 1 Hz)	Cards operating normally
		On(Green, blink at 8 Hz)	System is loading when the card is hot plugged
		On(Yellow, blink at 8 Hz)	System is shutting down
		On(Red, blink at 8 Hz)	Cards malfunction
		Off	Cards are powered off and can be removed
Master-Slave indicator	M/S	On(Green)	Master
		Off	Slave
Power Supply Module	OK	On(Green)	Power Supply Module operating normally
		Off	Power supply module malfunctioning or not present (with *Fail* off)

Status indicator: **POWER**	Fail	On(Yellow)	Power Supply Module malfunction
		Off	Power supply module operating normally or not present (with ***OK*** off)
Fan Assembly Status indicator **FAN**	OK	On(Green)	Fan operating normally
		Off	Fan malfunctioning or not present (with ***Alarm*** off)
	Alarm	On(Yellow)	Fan malfunction
		Off	Fan operating normally or not present (with ***OK*** off)

1.6.1.11.3 Front Panel Console

The DG-CS7010-MM-II provides a RJ-45 (receptacle) Console serial port. Users can connect to background terminal computers via this port to perform system debugging, configuration, maintenance, management and host software loading.

Table1-12DG-CS7010-MM-II Console Port Description

Property	Specification
Connector	RJ-45(receptacle)
Connector type	RS-232
Baud rate	9600bps(default)
Supporting Service	● Connects to character terminals ● Connects to PC serial port and running terminal emulator on PC

1.6.1.11.4 Front Panel Management Port

The DG-CS7010-MM-II provides a RJ-45 (receptacle) Ethernet port. Users can connect through this management port to background terminal computer for program loading or to connect to remote devices for remote management (e.g., a managing workstation). Note: when connecting to the host, a cross-over cable should be used.

Table1-13 DG-CS7010-MM-II Management Port description

Property	Specification
Connector	RJ-45(receptacle)
Connector type	● 10/100/1000Mbps adapting ● Cat 5(UTP): 300m

1.6.1.12 DG-CS7000-12GT24GX and DG-CS7000-12GT24GX2XFP

The DG-CS7000-12GT24GX is switching module for the 7600E series switch, which supports MPLS VPN function and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps electronic interfaces, 24 1000Mbps optical interfaces, IPv6 wire-speed transmission.

The DG-CS7000-12GT24GX2XFP is switching module for the 7600E series switch, which supports MPLS VPN function and implements 2-layer and 3-layer wire-speed switching and routing function of 12 1000Mbps electronic interfaces, 12 1000Mbps optical and 2 10,000Mbps XFP interfaces, IPv6 wire-speed transmission.

1.6.1.12.1 Front Panel

The DG-CS7000-12GT24GX provides 12 1000Mbps electronic interfaces and 24 1000Mbps optical interfaces.

The Front Panel view is shown below:

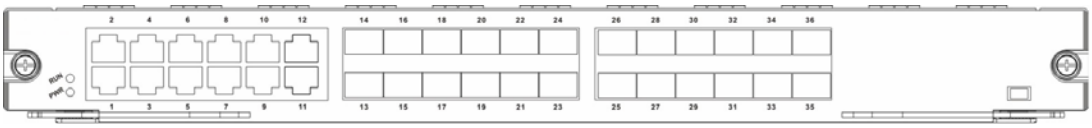

Fig 1-18 DG-CS7000-12GT24GX Front Panel View

DG-CS7000-12GT24GX2XFP provides 12 1000Mbps electronic interfaces, 24 1000Mbps optical and 2 10,000Mbps XFP interfaces.

The Front Panel view is shown below:

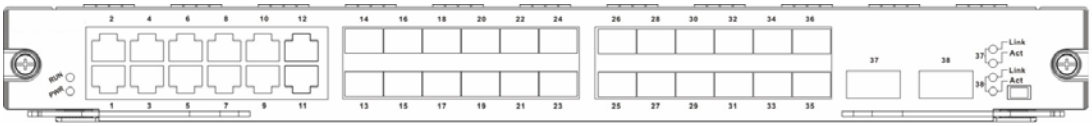

Fig 1-19 DG-CS7000-12GT24GX2XFP Front Panel View

1.6.1.12.2 Front Panel - Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7000-12GT24GX and DG-CS7000-12GT24GX2XFP.

Table1-14 DG-CS7000-12GT24GX and DG-CS7000-12GT24GX2XFP indicator description

LED	Panel Symbol	Status	Description
Power Indicaor	PWR	On(Green)	Card Powered
		Off	Card Powered off

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Operation Indicator	RUN	On(Green, blink at 1 Hz)	Cards operating normally
		On(Green, blink at 8 Hz)	System is loading (Booting after the boardcard is hot-plugged in)
		Off	Operating malfunctioning
RJ-45 Interface Indicator			
Port Indicator		On(Green)	The network connection of RJ-45 interface is normal
		Off	There is no network connection on RJ-45 interface
		On(Orange)	Receiving or sending data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface
Transmission Indicator	"Right Light"	On (Green)	Sending or receiving data
XFP Interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	On (Green)	Sending or receiving data

1.6.1.12.3 Front Panel Interface Description

DG-CS7000-12GT24GX provides 12 1000Mbps electronic interfaces and 24 1000Mbps optical interfaces.

DG-CS7000-12GT24GX2XFP provides 12 1000Mbps electronic interfaces, 24 1000Mbps optical and 2 10,000Mbps XFP interfaces.

1.6.1.13 DG-CS7000-12GC12GT (R2) and DG-CS7000-12GC12GT2XFP (R2)

12-port optical-electronic combo and 12-port electronic interface line card (DG-CS7000-12GC12GT(R2)): The switching module for the DG-CS7004(R2), to implement the layer2 and layer3 wire speed exchange and routing function of 12-port 1G optical-electronic combo and 12-port 1G electronic interface and IPv6 wire speed transmission function.

Double 10G and 12-port optical-electronic combo and 12-port electronic interface line card (DG-CS7000-12GC12GT2XFP(R2)): The switching module for the DG-CS7004(R2), implement the layer2 and layer3 wire speed exchange and routing function of 12-port 1G optical-electronic combo, 12-port 1G electronic and 2-port 10G XFP interface, and IPv6 wire speed transmission function.

1.6.1.13.1 Front Panel Diagram

DG-CS7000-12GC12GT (R2) provides twelve 1G optical combo ports, twelve 1G electronic ports, where the twelve 1G optical ports and the last twelve 1G electronic ports are combo ports.

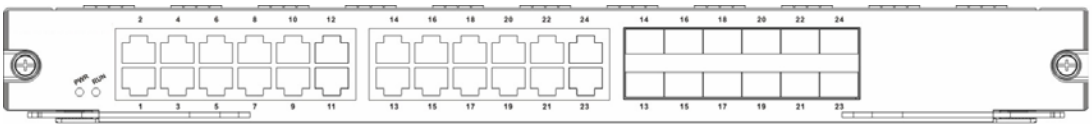

Fig 1-20 DG-CS7000-12GC12GT (R2) front panel view

DG-CS7000-12GC12GT2XFP (R2) provides two 10G XFP ports, twelve 1G optical SFP ports, twelve 1G electronic SFP ports, where the twelve 1G optical ports and the last twelve 1G electronic ports are combo ports.

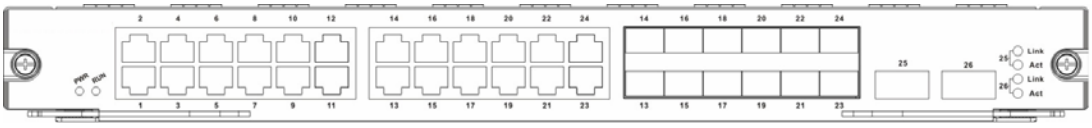

Fig 1-21 DG-CS7000-12GC12GT2XFP (R2) front panel view

1.6.1.13.2 Front Panel Indicator

The description of front panel indicator of DG-CS7000-12GC12GT (R2) and DG-CS7000-12GC12GT2XFP (R2) is as follows:

Table 1-15 DG-CS7000-12GC12GT (R2) and DG-CS7000-12GC12GT2XFP (R2) indicator description

LED Indicator	Panel Sign	Status	Meanings
Power Indicator	PWR	On (Green)	Network Interface Card power on
		Off	Network Interface Card power off

Running Indicator	RUN	On (Green 1Hz flash)	Network Interface Card running in normal status
		On (Green 8Hz flash)	System loading (Network Interface Card Booting after hot plug in)
		Off	Running status is in failure
RJ-45 Interface indicator			
Interface Indicator		On (Green)	RJ-45 Interface Network Connection is normal
		Off	There is not network connection at RJ-45 interface
		On (Orange)	Sending or receiving data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface
Transmission Indicator	"Right Light"	On (Green)	Sending or receiving data
XFP interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	On (Green)	Sending or receiving data

DG-CS7000-12GC12GT (R2) and DG-CS7000-12GC12GT2XFP (R2) provide 24 SFP

1.6.1.13.3 Front Panel Interface Description

1G optical fibre transceivers and 12 RJ-45 1G electronic port slots.

DG-CS7000-12GC12GT2XFP (R2) provides two XFP 10G optical ports.

1.6.1.14 DG-CS7000-48GX (R2)

48-port 1000Mbps optical line card (DG-CS7000-48GX (R2)): The switching module for the DG-CS7004 (R2), implement 2-layer and 3-layer wire-speed switching and routing function of 48 1000Mbps optical interfaces, and IPv6 wire-speed transmission.

1.6.1.14.1 Front Panel Diagram

DG-CS7000-48GX (R2) provides 48 1000Mbps optical interfaces.

The following is the sketch map of its front panel:

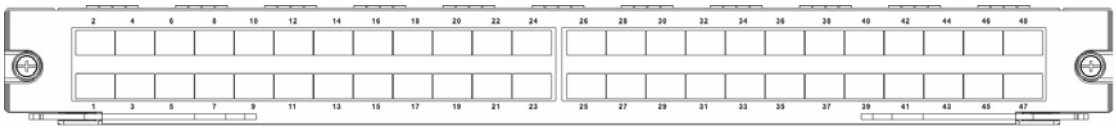

Fig 1-22 the Sketch Map of the Front Panel of DG-CS7000-48GX(R2)

The ports in the above chart are port GB1 - GB48 from the bottom-left corner to the top-right corner. The indicator lamps of ports having odd index number are on the left side of the port array, while the indicator lamps of ports having even index number are on the right side. The lamps are green indicator lamps.

1.6.1.14.2 Front Panel Indicator

The following is the instruction of the indicator lamps on the front panel of DG-CS7000-48GX (R2).

Table 1-16 the Instruction of Indicator Lamps of DG-CS7000-48GX(R2)

LED Indicator	Panel Sign	State	Explanation
SFP Interface Indicator Lamps			
State Indicator Lamp		On(green)	The network connection of SFP interface is normal.
		Off	There is no network connection on SFP interface
Transmission Indicator Lamp		On(green)	SFP is receiving or sending data.

1.6.1.14.3 Front Panel Interface Description

DG-CS7000-48GX (R2) provides 48 SFP 1000Mbps optical transceiver interfaces.

1.6.1.15 DG-CS7004-MM-12GC12GT1XFP (R2)

The DG-CS7004-MM-12GC12GT1XFP (R2) is switching module for the DG-CS7004 (R2). System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into first or second slots of the chassis for Master-Slave redundancy. 12-port 1G optical-electronic combo, 12-port 1G electronic and 2-port 10G XFP interface, and IPv6 wire speed transmission function.

1.6.1.15.1 Front Panel Diagram

DG-CS7004-MM-12GC12GT1XFP (R2) provides 12-port 1G optical-electronic combo, 12-port 1G electronic and 1-port 10G XFP interface.

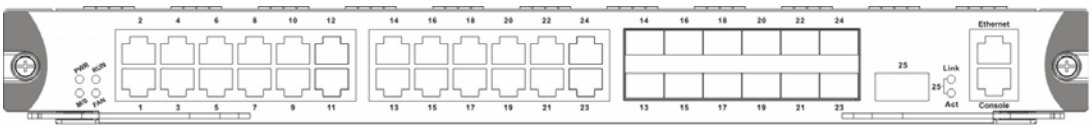

Fig 1-23 DG-CS7004-MM-12GC12GT1XFP (R2) front panel view

1.6.1.15.2 Front Panel Indicator

The description of front panel indicator of DG-CS7004-MM-12GC12GT1XFP (R2) as follows:

Table 1-17 DG-CS7004-MM-12GC12GT1XFP (R2) indicator description

LED Indicator	Panel Sign	Status	Meanings
Power Indicator	PWR	On (Green)	Network Interface Card power on
		Off	Network Interface Card power off
Master-Slave indicator	M/S	On(Green)	Master
		Off	Slave
Fan Indicator	FAN	On(Green)	Fan operating normally
		On(Red)	Fan operating abnormally
		Off	Fan not present
Running Indicator	RUN	On (Green 1Hz flash)	Network Interface Card running in normal status
		On (Green)	System loading (Network Interface Card Booting after hot plug in)
		Off	Running status is in failure

RJ-45 Interface indicator			
Status Indicator	Shared	On (Green)	RJ-45 Interface Network Connection is normal
		Off	There is not network connection at RJ-45 interface
Transmission Indicator		On (Yellow)	Sending or receiving data
SFP Interface Indicator			
Status Indicator	"Left Light"	On (Green)	SFP transceiver network connection is normal
		Off	There is not network connection at SFP interface
Transmission Indicator	"Right Light"	Flashes (Green)	Sending or receiving data
XFP interface Indicator			
Status Indicator	Link	On (Green)	XFP transceiver network connection is normal
		Off	There is not network connection at XFP transceiver
Transmission Indicator	Act	Flashes (Green)	Sending or receiving data

1.6.1.15.3 Front Panel Interface Description

DG-CS7004-MM-12GC12GT1XFP (R2) provides 12-port 1G optical-electronic combo, 12-port 1G electronic and 2-port 10G XFP interface.

1.6.1.16 DG-CS7010-MM-I (R2)

The DG-CS7010-MM-I (R2) is switching module for the DG-CS7010(R2). System status control, switch management, user access control and management, and network maintenances are performed here. The board can be inserted into M1 or M2 slots of the chassis for Master-Slave redundancy.

1.6.1.16.1 Front Panel

The DG-CS7010-MM-I (R2) comes with 1 Console port (control console), 1 10/100Base-Tx Ethernet port (management port) and 1 CF card port.

The Front Panel view is shown below:

Fig 1-24 DG-CS7010-MM-I(R2) Front Panel view

1.6.1.16.2 Front Panel - Indicator

The following table describes the front panel indicators of DG-CS7010-MM-I (R2):

Table 1-18 DG-CS7010-MM-I (R2) indicators description

LED	Panel Symbol	Status	Description
Power Indicator	PWR	On (Green)	Card powered
		Off	Card powered off
Operation indicator	RUN	On (Green, blink at 1 Hz)	Cards operating normally

		On (Green, blink at 8 Hz)	System is loading
		Off	Cards malfunction
Master-Slave indicator	M/S	On (Green)	Master
		Off	Slave
Power Supply Module Status indicator: POWER	POWER _OK	On (Green)	Power Supply Module operating normally
		Off	Power supply module malfunctioning or not present
	POWER_Fail	On (Yellow)	Power Supply Module alarm
		Off	Power supply module not alarm or not present
Fan Assembly Status indicator: FAN	FAN_OK	On (Green)	Fan operating normally
		Off	Fan malfunctioning or not present
	FAN_ALARM	On (Yellow)	Fan alarm
		Off	Fan operating not alarm or not present
Ethernet management port indicator	ACT	On (Green)	Ethernet port Sending or receiving data
		Off	Ethernet port Sending or receiving no data
	LINK	On (Green)	Ethernet port link successfully
		Off	Ethernet port link unsuccessfully
CF card status indicator	CF-STATUS	On (Green)	CF card is in position and can work
		Off	CF card not present

1.6.1.16.3 Front Panel – Console Port

The DG-CS7010-MM-I (R2) provides a RJ-45 (receptacle) Console serial port. Users can connect to hosts via this port to perform system debugging, configuration, maintenance, management and host software loading.

Table 1-19 DG-CS7010-MM-I(R2) Console description

Property	Specification
Connector	RJ-45 (receptacle)
Connector type	RS-232
Baud rate	9600bps (default)
Supporting service	• Connects to character terminals • Connects to PC serial port and running terminal emulator on PC.

1.6.1.16.4 Front Panel – Management Port

The DG-CS7010-MM-I (R2) provides a RJ-45 (receptacle) Ethernet port. Users can connect through this management port to hosts for program loading or to connect to remote devices for remote management (e.g., a managing workstation). Note: when connecting to the host, a cross-over cable should be used.

Table 1-20 DG-CS7010-MM-I (R2) management port description

Property	Specification
Connector	RJ-45 (Receptacle)
Connector type	• 10/100Mbps auto sensing • Cat 5 UTP: 100 m

1.6.1.16.5 Front Panel – CF Card Interface

DG-CS7010-MM-I (R2) provides a standard CF card slot, and supports hot-swapping. CF card content supports 256MB/512MB/1GB, it can be save edition, configuration files and so on, so as to conveniency switch software update. **Notice:** It is suggested to ues DIGISOL CF card, it is not assure the compatibility with other CF card.

Interface description

DG-CS7000 series provide 1000Mbps SFP electric interfaces, RJ-45 (receptacle) Console serial ports and 10,000Mbps XFP electric interfaces.

Interface description as follow:

Table 1-21 DG-CS7000 series interface description

Interface Format	Specs
RJ-45 port	• 10/100/1000Mbps self-adapting • MDI/MDI-X network wire type self-adapting • 5 kinds of Unshielded Twisted Pair(UTP): 100 metres
SFP	• SFP-SX-L transceiver 1000Base-SX SFP(850nm,MMF,550m) • SFP-LX-L transceiver 1000Base-LX SFP(1310nm, SMF, 10km or MMF, 550m) • SFP-LX-20-L transcever 1310nm lightwave, 9/125um single-mode fiber: 20km • SFP-LX-40 transceiver

	9/125um single-mode fiber: 40km • SFP-LH-70-L transceiver 9/125um single-mode fiber: 70km • SFP-LH-120-L transceiver 9/125um single-mode fiber: 120km
SFP-GT	• SFP-GT module: 1000Base-T SFP interface card module, RJ-45 interface
XFP	• XFP-SR transceiver 10GBase-SR XFP (850nm, 62.5μm MMF 32m, 50μm 500MHz/km MMF 85m, 50μm 2000MHz/km MMF 300m) • XFP-LR transceiver 10GBase-LR XFP (1310nm, SMF,10km) • XFP-ER transceiver 1550nm SMF, 40km • XFP-ER-70 transceiver 1550nm SMF, 70km

Power supply

1.6.1.17 DG-SA-RPS-7004AC

DG-CS7004 uses 1 +1 redundant power supplies, and supplies agile power supply weave, to realize high reliability for users by least cost.

1.6.1.17.1 DG-SA-RPS-7004AC (Alternating Current Power Module for 400W)

DG-SA-RPS-7004AC is an Alternating Current Power module for 400W, which support hot plug and redundance backup.

1.6.1.17.2 Power module Front Panel

The front panel of DG-SA-RPS-7004AC is equipped with power supply switches, power supply indicators as well as ventilating and cooling port and a handle for inserting and pulling out the modules.

The Front Panel view is shown below:

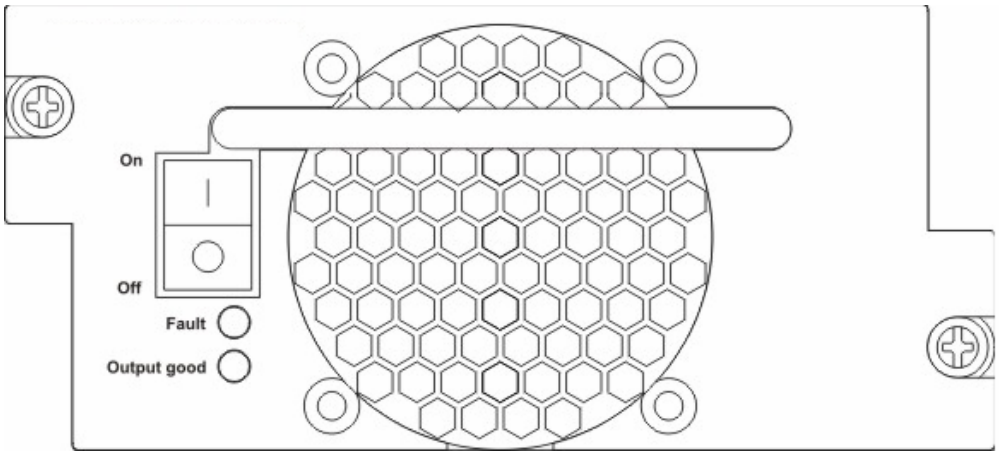

Fig 1-25 DG-SA-RPS-7004AC Front Panel View

1.6.1.17.3 LED

The LED description of DG-SA-RPS-7004AC is as follows

Table 1-22 The Description of DG-SA-RPS-7004AC LED

LED	Panel Label	Status	Description
Output LED	Output Good	On Green	Power Module Output Status is okay
		Off	Power Module has no output
Abort LED	Fault	On Yellow	Faulty Power Module /Not turning-on The Output Switch
		Off	Power Module Working Fine

1.6.1.17.4 Switch of power supply for front panel

DG-SA-RPS-7004AC provides a power supply switch for controlling the power output of control module. Under normal operation conditions, the switches for power supply modules shall be turned on currently. When the switch of one power supply module is turned on and another is turned off, the FAULT indicator of the module will be on to suggest the users to turn on the switch so as to utilize 1+1 redundant backup.

1.6.1.18 DG-SA-RPS-7004DC

DG-CS7004 uses 1 +1 redundant DC power supplies. But not suggest that the AC power and DC power be used mixed.

1.6.1.18.1 DG-SA-RPS-7004DC (Direct Current Power Module for 400W)

DG-SA-RPS-7004DC is a Direct Current Power module for 400W, which support hot plug and redundance backup.

1.6.1.18.2 Power module Front Panel

The front panel of DG-SA-RPS-7004DC is equipped with power supply switches, power supply indicators as well as ventilating and cooling port and a handle for inserting and pulling out the modules. On panel's right hand is DC connector, supports -48VDC input. The power supply DC connector has three input terminal, they are RTN, -48V and PG from the top down, and the meanings are shown below:

RTN： power supply reflow

-48V： -48V input

PG： plane ground

The Front Panel view is shown below:

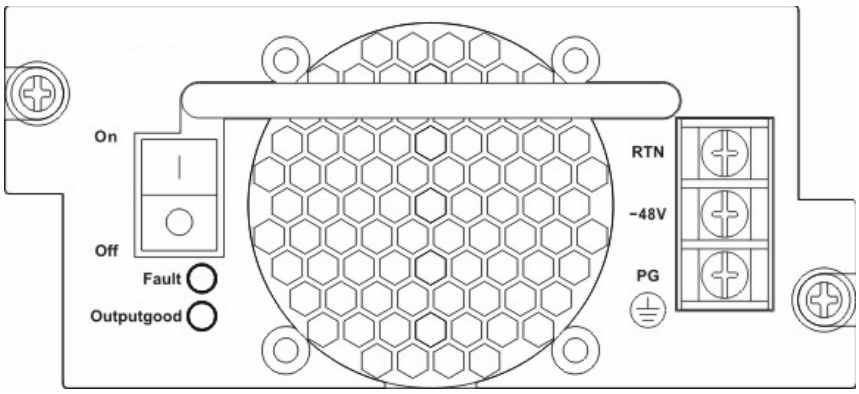

Fig 1-26 DG-SA-RPS-7004DC Front Panel View

1.6.1.18.3 LED

The LED description of DG-SA-RPS-7004DC is as follows:

Table 1-23 the Description of DG-SA-RPS-7004DC LED

LED	Panel Label	Status	Description
Output LED	Output Good	On Green	Power Module Output Status is okay
		Off	Power Module has no output
Abort LED	Fault	On Yellow	Faulty Power Module /Not turning-on The Output Switch
		Off	Power Module Working Fine

1.6.1.18.4 Switch of power supply for front panel

DG-SA-RPS-7004DC provides a power supply switch for controlling the power output of control module. Under normal operation conditions, the switches for power supply modules shall be turned on simultaneous. When the switch of one power supply module is turned on and another is turned off, the FAULT indicator of the module will be on to suggest the users to turn on the switch so as to utilize 1+1 redundant backup.

1.6.1.19 DG-SA-RPS-7010AC

DG-CS7010 uses 2 +1 redundant power supplies, three power modules can act as backups for each other. During normal operation, all three power modules each take one third of the load. If one of the modules fails or is not present, the other two power modules will supply power for the whole switch, and the corresponding POWER/Fail warning indicator for

the failed/missing module will illuminate, prompting the replacement of the failed module. The warning indicator will turn off after the failed module is replaced or recovers.

The DG-CS7010 power module is installed in the lower section of the chassis, and connects to the power board of the switch. All the power modules attach to the chassis with 2 screws, respectively. When replacing the power modules, the chassis need not to be opened, just remove the 2 fastening screws to take out the power module requiring replacement.

1.6.1.19.1 DG-SA-RPS-7010AC

When powered by AC inputs, the AC power module DG-SA-RPS-7010AC and corresponding AC distribution box should be used in the DG-CS7010. The input voltage of the DG-SA-RPS-7010AC is 110V/220 VAC, with ranges between 90 ~ 264 VAC and frequency between 50 ~ 60 Hz, the maximum output power is 600W.

1.6.1.19.2 Power module Front Panel

There are vents (with dust gauzes), 2 fastening screws and handle for replacing the modules on the front panels of DG-SA-RPS-7010AC.

The Front Panel view is shown below:

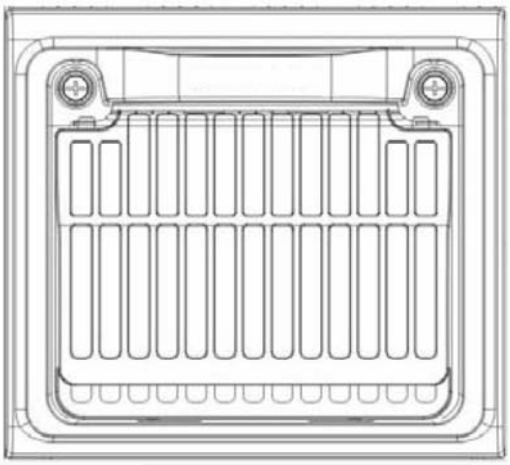

Fig 1-27 DG-SA-RPS-7010AC Front Panel view

Power Distribution Box

1.6.1.20 DG-CS7004 Power Distribution Box

There is a special A.C. distribution box on the backboard of DG-CS7004 switch.

In generally, the enterprises users usually ask for the 220VAC access. The panel of A.C. distribution box is equipped with two 220VAC socket for provide power supply to the equipment. At the same time, it provides power supply to the two power supply modules. After the D.C. output is disposed on the backplane, it provides power supply to the modules and fan tray. The lower part of the power supply socket is equipped with a locking ring, which is used to fix the power supply lines to prevent unexpected disconnection and make the wiring more convenient. The distribution box is equipped with a grounding terminal at its lower right part, which is used for grounding the switch.

The Front Panel view is shown below:

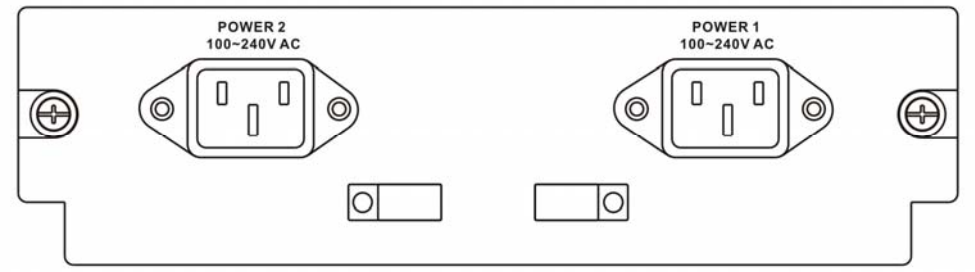

Fig 1-28 DG-CS7004 Power Distribution Box Panel view

1.6.1.21 DG-CS7010 Power Distribution Box

There is a dedicated AC distribution box or DC distribution box in the lower section of DG-CS7010 backplane, distributing power supply for the corresponding AC or DC power module. A grounding post is provided on the chassis on both sides of the distribution box for switch grounding. There is also an extraction handle, which is intended for the installation and removal of the distribution box only. **Never lift or move the switch with this handle!**

1.6.1.21.1 AC Power Distribution Box

Enterprise network users usually require equipment to have 220 VAC input, the AC power modules and AC distribution box can satisfy this application. Three 220V/110 VAC power input sockets are provided on the panel of the DG-CS7010 AC distribution box. Input AC power will first pass through protective circuits, such as the AC filter, lightning protection tube, and then provide power for the three AC power modules. The other modules and fan trays are powered only after the DC output from the power modules are equalized and coupled. A wiring clip is provided above each 220V/110 VAC input socket for the positioning

of power cords and easier wiring. In addition, on the left side of the AC distribution panel is a power supply switch used to control the modules' power output . Please turn this power supply switch on during normal operation of the DG-CS7010.

The Front Panel view is shown below:

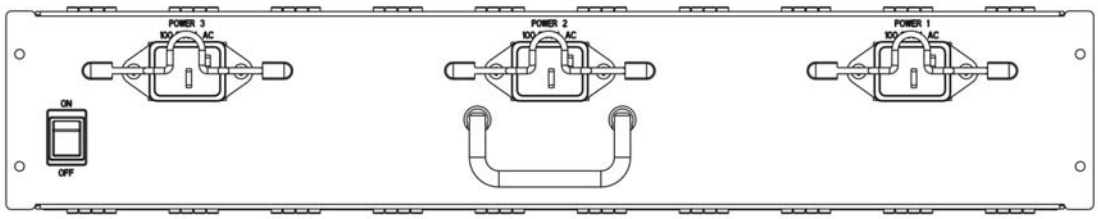

Fig 1-29 DG-CS7010 AC Power Distribution Box

System Backplane

The system board of DG-CS7004 serial switch is located inside the switch, providing interconnectivity in the high speed data links between management switching modules, network interface modules and between all management and control signals of various cards. A backplane has been installed in the unit chassis. The backplane provides the following functions:

- Provides communication channel for cards to achieve interconnectivity of various signals
- The backplane is powerless
- Supports the hot-swapping of various cards
- Supports Mainboard Master-Slave swap

- Auto identification of all slots
- Distributed power supplies
- Introduction of monitoring signals for fans and power supplies

Fan Tray

1.6.1.22 DG-CS7004 Fan Tray

Three fan assemblies (MRS-7604E-FAN) can be configured in the DG-CS7004, and installed in a horizontal configuration into the fan module slots in the switch's upper front panel. The three fan assemblies cover the entire board area, ensuring sufficient ventilation for the devices, hence enhancing the stability of devices even under high temperature environments. Each fan assembly consists of 2 axial fans, which are protected by the fan tray to prevent bodily injury. Please note that the fan blades still spin at a high speed when disconnected from the device during operation, to avoid bodily injury ***do not*** touch the spinning blades.

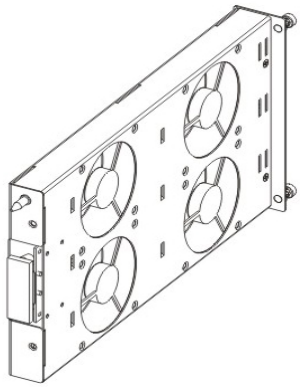

Fig 1-30 MRS-7604E-FAN Outlook

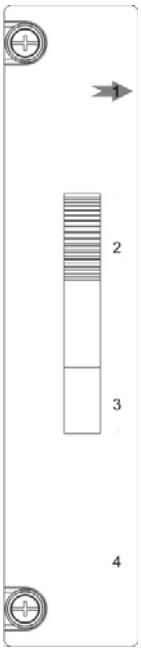

Fig 1-31 MRS-7604E-FAN Front Panel View

1.6.1.23 DG-CS7010 Fan Tray

Three fan assemblies (MRS-7608E-FAN) can be configured in the DG-CS7010, and installed in a horizontal configuration into the fan module slots in the switch's upper front panel. The three fan assemblies cover the entire board area, ensuring sufficient ventilation for the devices, hence enhancing the stability of devices even under high temperature environments. Each fan assembly consists of 2 axial fans, which are protected by the fan tray to prevent bodily injury. Please note that the fan blades still spin at a high speed when disconnected from the device during operation, to avoid bodily injury ***do not*** touch the spinning blades.

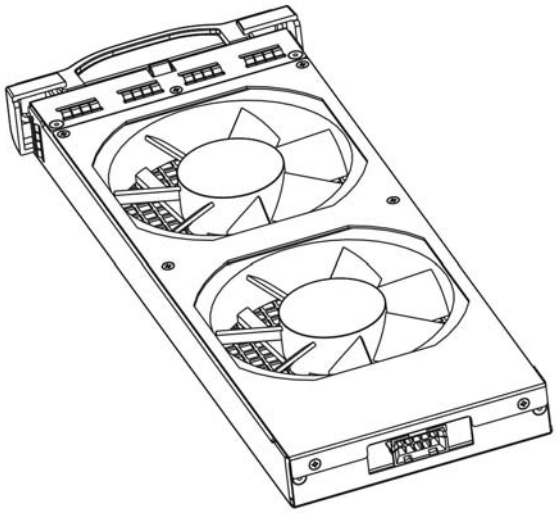

Fig 1-32 MRS-7608E-FAN Outlook

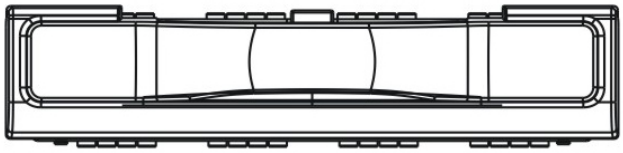

Fig 1-33 MRS-7608E-FAN Front Panel View

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helpdesk@digisol.com sales@digisol.com www.digisol.com

Dust Gauze

1.6.1.24 DG-CS7004 Dust Gauze

The DG-CS7004's dust gauze lies under the board rack and prevents large particles in the air from entering the switch. The dust gauze should be inserted from the front of the DG-CS7004 in a horizontal position.

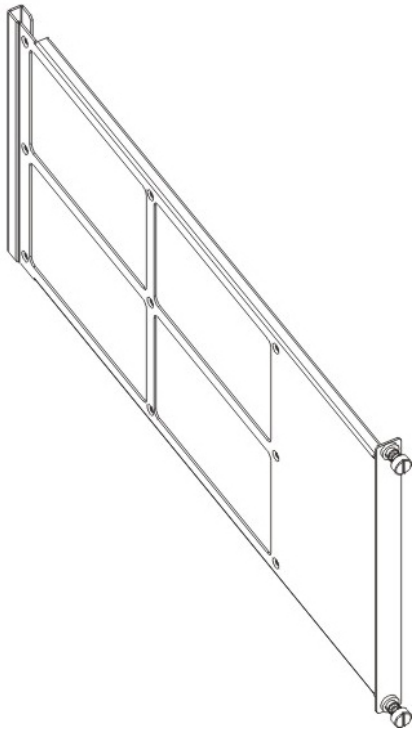

Fig 1-34 DG-CS7004 Dust Gauze Outlook

1.6.1.25 DG-CS7010 Dust Gauze

The DG-CS7010's dust gauze lies under the board rack and prevents large particles in the air from entering the switch. The dust gauze should be inserted from the front of the DG-CS7010 in a horizontal position.

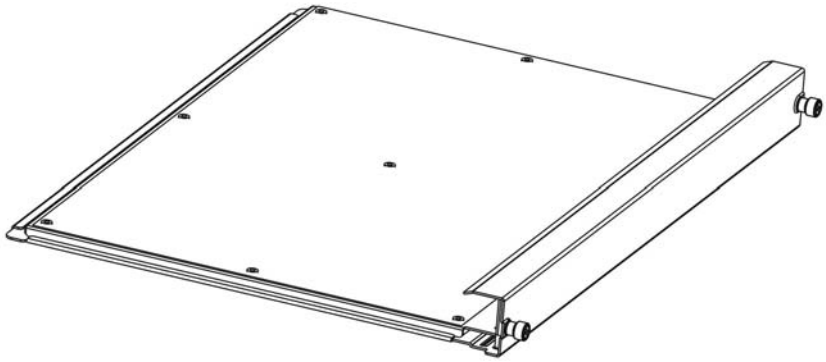

Fig 1-35 DG-CS7010 Dust Gauze Outlook

Rear Panel

1.6.1.26 DG-CS7004 Rear Panel

The rear panel of the DG-CS7004 covers the switch backplane. To ensure safe operation of the switch, please do not open the rear panel. There are two reversible handles on the rear panel; they are used only for the installation and removal of the rear panel. Never lift or move the switch with these handles! The rear panel is shown below:

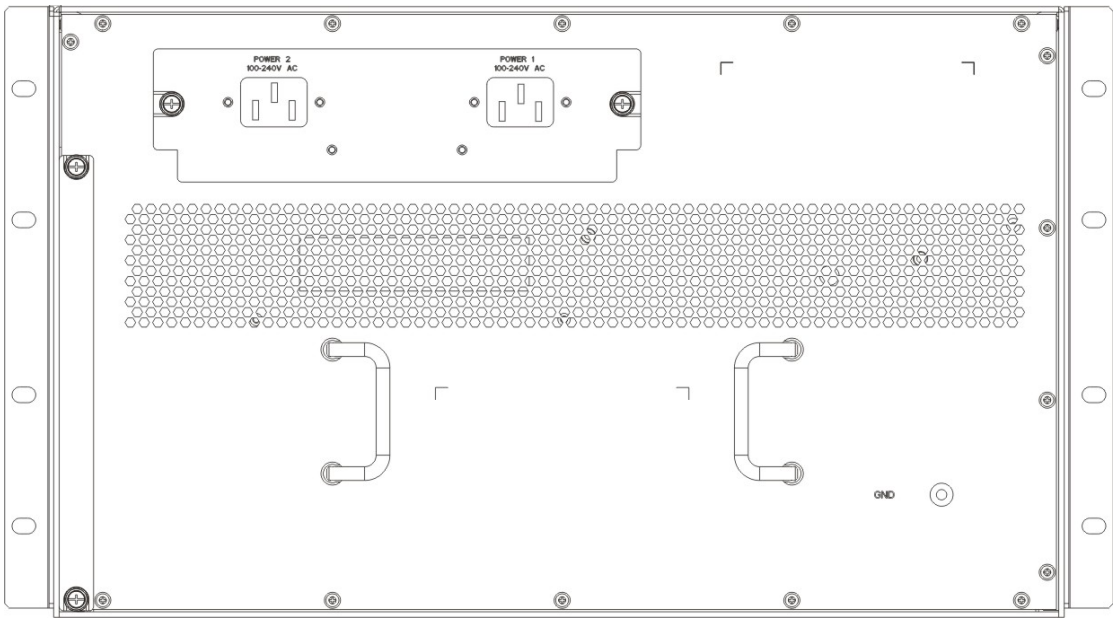

FIG 1-36 DG-CS7004 Rear Panel View

1.6.1.27 DG-CS7010 Rear Panel

The rear panel of the DG-CS7010 covers the switch backplane. To ensure safe operation of the switch, please do not open the rear panel. There are two reversible handles on the rear panel; they are used only for the installation and removal of the rear panel. Never lift or move the switch with these handles! The rear panel is shown below:

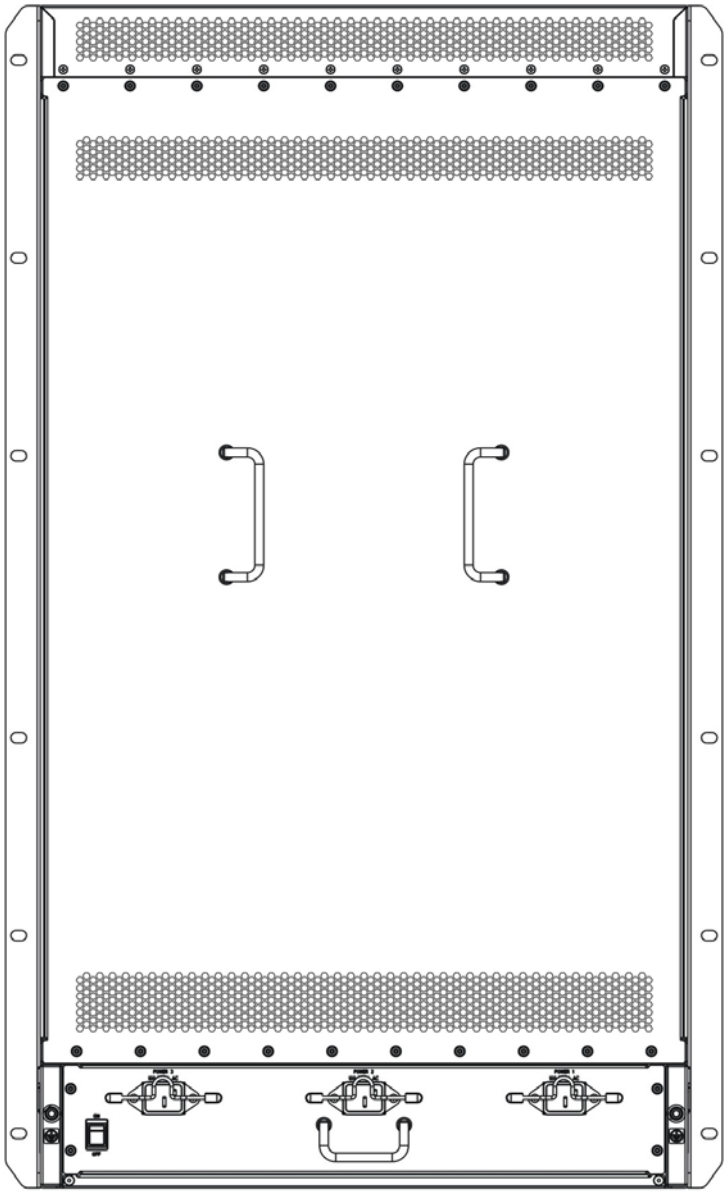

FIG 1-37 DG-CS7010 Rear Panel View

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helpdesk@digisol.com sales@digisol.com www.digisol.com

Side Panels

1.6.1.28 DG-CS7004 Side Panels

There are several rows of ventilation openings in the left and right sides of the switch, as shown above.

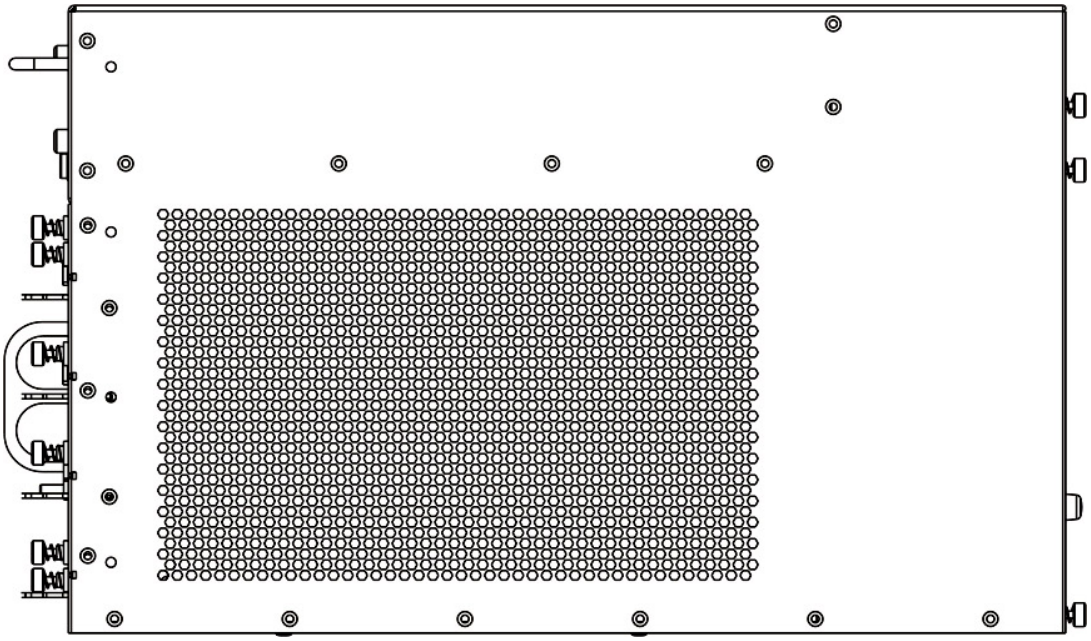

FIG 1-38 DG-CS7004 Side Panels View

Please do not block the ventilation openings and ensure that enough clearance is left on both sides of the switch for air circulation. Failure to do so can cause the chassis to overheat and the system to fail, or damage to components.

1.6.1.29 DG-CS7010 Side Panels

There are several rows of ventilation openings in the left and right sides of the switch, as shown below.

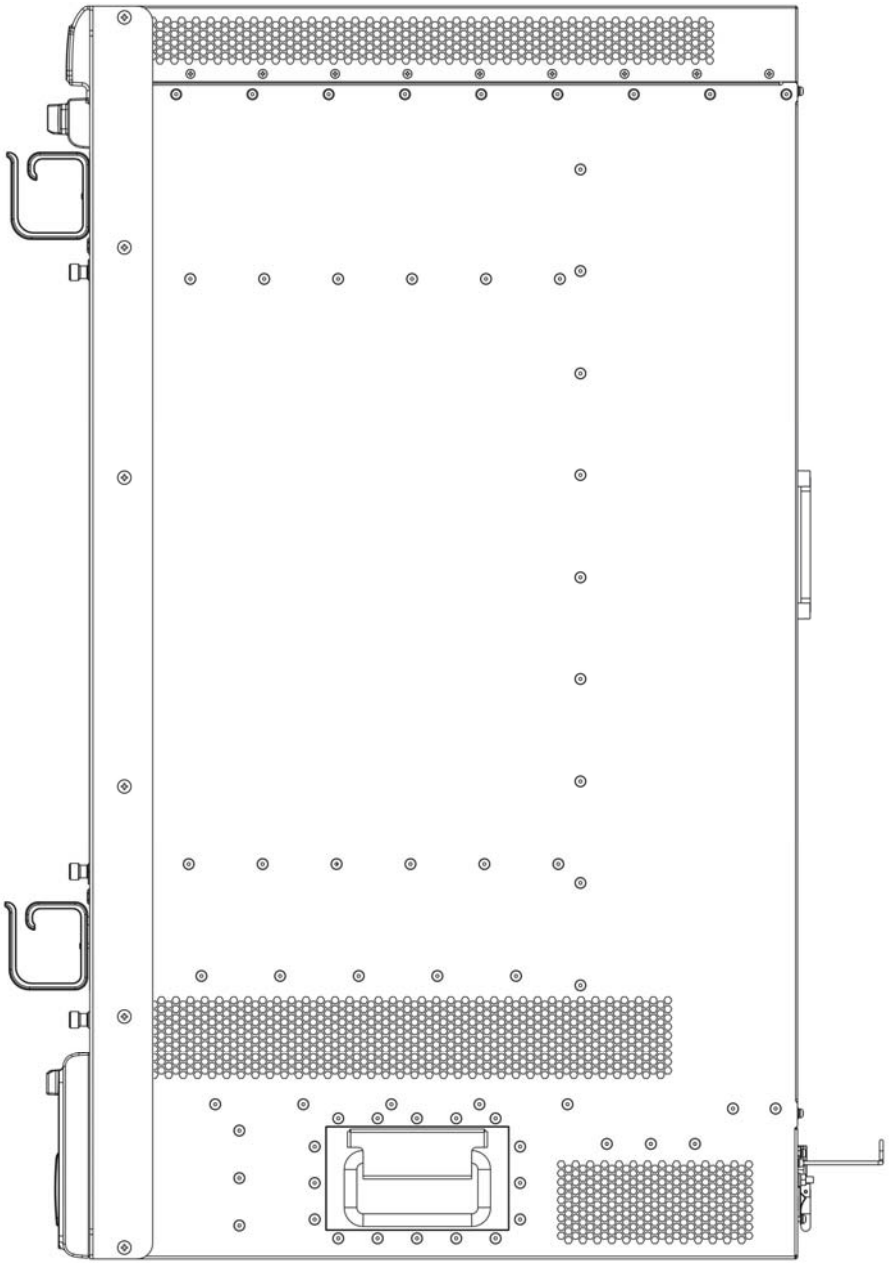

FIG 1-39 DG-CS7010 Side Panels View

Please do not block the ventilation openings and ensure that enough clearance is left on both sides of the switch for air circulation. Failure to do so can cause the chassis to overheat and the system to fail, or damage to components.

1.7 System Features

DG-CS7004 System Features

Table 1-24 DG-CS7004 System Features

Basic Configuration	4 slots
Hot swap	Yes
Failover design	Core part redundant hot swapping
	Power supplies redundant hot swapping
Status indicator	Port: Traffic, LINK General: Power status, system status, hot-swap indicator
Weight	30KG (Max full configuration weight)
Physical Dimensions	440mm x266mm x421mm (W x H x D)
Relative humidity	10% ~ 90% with no condensing
Operating Temperature	0□C ~ 45□C
Power Supplies	Nominal Input Voltage AC: 90 ~ 264 VAC, 50 ~ 60Hz DC: -36 ~ -72VDC (supporting 1+1 redundant backup of power modules)
Power Consumption	≤ 400 W

DG-CS7010 System Features

Table 1-25 DG-CS7010 System Features

Basic Configuration	10 slots
Hot swap	Yes
Failover design	Core part redundant hot swapping
	Power supplies redundant hot swappable
Status indicator	Port: Traffic, LINK General: Power status, system status, hot-swap indicator
Weight	65KG (Max full configuration weight)
Physical Dimensions	436mm x 797mm x 478mm (W x H x D)
Relative humidity	10% ~ 90% with no condensing
Operating Temperature	0□C ~ 45□C
Power Supplies	Nominal Input Voltage AC: 90 ~ 264 VAC, 50 ~ 60Hz (supporting 2+1 redundant backup of power modules)
Power Consumption	≤ 1200 W

2 Hardware Installation

1.8 Installation Notice

During the installation and use of the DG-CS7000 Switch, please follow the safety guidelines listed below.

Basic Requirements

1.8.1.1 Site Requirements

The DG-CS7000 series Switch must be used indoors, and have the following requirements: Ambient temperature: 0 ~ 40°C

Humidity: 10% ~ 90%, non-condensing

The DG-CS7000 series is equipped with a fan assembly for providing the switch with an appropriate level of cooling; you can place the switch on a workbench or rack. Ensure the following:

- The rack or workbench should be well ventilated. For sufficient air circulation, it is recommended to mount the switch on a 19″ standard rack with sufficient spacing. Air conditioning is recommended in areas with high temperatures in the summer.
- To cool the internal circuits, the switch comes with internal fan assemblies. To

maintain proper air circulation through the switch chassis, we recommend that you maintain a minimum 100mm separation between the chassis air intake or the chassis air exhaust and any walls. Make sure that all air intakes and exhausts on the system remain unobstructed. Do not stack heavy items on the switch.

- Make sure the rack or workbench is strong enough to support the weight of a fully configured switch.
- Make sure the rack or workbench is well grounded; if the workbench is not grounded, it should be placed near a grounding conductor to provide easy ground connection for the switch.

1.8.1.2 Temperature and Humidity Requirements

To maximize the switch's performance and lifespan, the site should maintain a desirable temperature and humidity. High-humidity conditions can cause electrical resistance degradation or even electric leakage, degradation of mechanical properties and corrosion of internal components. Extreme low relative humidity may cause the insulation spacer to contract, making the fastening screw insecure. Furthermore, in dry environments, static electricity is liable to be produced and cause harm to internal circuits. Temperature extremes can cause reduced reliability and premature aging of insulation materials, thus reducing the switch's working lifespan. The recommended temperature and humidity are shown below:

Temperature:		Relative humidity	
Long term condition	Short term condition	Long term condition	Short term condition
15 ~ 30°C	0 ~ 40°C	40 ~ 65%	10 ~ 90%

Notice

A sample of ambient temperature and humidity should be taken at 1.5m above the floor and 0.4m in front of the switch rack, with no protective panel covering the front and rear of the rack.

Short term working conditions refer to a maximum of 48 hours of continued operation and an annual cumulative total of less than 15 days.

Formidable operation conditions refers to the ambient temperature and relative humidity value that may occur during an air-conditioning system failure, and normal operation conditions should be recovered within 5 hours.

1.8.1.3 Dust and Particles

Dust is harmful to the safe operation of the DG-CS7000 series. Dust can lead to electrostatic adherence, especially likely under low relative humidity, causing poor contact of metal connectors or contacts. Electrostatic adherence will result in not only reduced product lifespan, but also increased chance of communication failures. The recommended values for dust content and particle diameter in the site are shown below:

Max. Diameter (μm)	0.5	1	3	5
Max. Density (particles/m³)	1.4×10^7	7×10^5	2.4×10^5	1.3×10^5

In addition, salt, acid and sulfide in the air are also harmful to the switch. Such harmful gases will aggravate metal corrosion and the aging of some parts. The chosen site should avoid harmful gases, such as SO_2, H_2S, NO_2, NH_3 and Cl_2, etc. The table below details the threshold values.

Gas	Average (mg/m³)	Max (mg/m³)
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
Cl_2	0.01	0.3

1.8.1.4 Preventing Electrostatic Discharge Damage

Static electric discharges can cause damage to internal circuits, even the entire switch. Follow these guidelines for preventing ESD damage:

1. Ensure proper earth grounding of the device
2. Perform regular cleaning to reduce dust
3. Maintain proper temperature and humidity
4. Always wear an ESD wrist strap and antistatic uniform when in contact with circuit boards

1.8.1.5 Anti-interference Requirements

All sources of interference, whether from the device/system itself or the outside environment, will affect operations in various ways, such as capacitive coupling, inductive coupling, electromagnetic radiation, common impedance (including the grounding system) and cables/lines (power cables, signal lines, and output lines). The following should be noted:

1. Precautions should be taken to prevent power source interruptions
2. Provide the system with a dedicated grounding, rather than sharing the grounding with electronic equipment or lightning protection devices
3. Keep away from high power radio transmitters, radar transmitters, and high frequency strong circuit devices
4. Provide electromagnetic shielding if necessary

1.8.1.6 Rack Configuration

The dimensions of the DG-CS7000 are designed to be mounted on a standard 19'' rack, DG-CS7004's dimensions are 440mm x 266mm x 421mm (W x H x D). DG-CS7010's dimensions are 436mm x 797mm x 478mm (W x H x D). Please ensure good ventilation for the rack.

- Every device in the rack will generate heat during operation, therefore vent and fans must be provided for an enclosed rack, and devices should not be stacked closely,.
- When mounting devices in an open rack, care should be taken to prevent the rack frame from obstructing the switch ventilation openings. Be sure to check the positioning of the switch after installation to avoid the aforementioned.

Notice

If a standard 19'' rack is not available, the DG-CS7000 series can be placed on a clean level desktop, leave a clearance of 100mm around the switch for ventilation, and do not place anything on top of the switch.

1.8.1.7 Power Supply Requirements

The DG-CS7000 is designed to use modular switching power supplies. The power input specification is shown below:

Nominal Input Voltage:

AC: 90 ~ 264 VAC, 50 ~ 60Hz

DC: -36 ~ -72VDC

DCR-7604E total power consumption: ≤400W

DCR-7608E total power consumption: ≤1200W

Before installing the power modules, please check the power input to ensure proper grounding of the power supply system. The input source for the switch should be reliable and security, a voltage adaptor can be used if necessary. The building's circuit protection system should include in a fuse or circuit-breaker of no greater than 240V, 10A. It is recommended to use a UPS for more reliable power supply.

Notice

Improper power supply system grounding, extreme fluctuation of the input source, and transients (or spikes) can result in larger error rate, or even hardware damage.

Safety Guidelines

1 . Disconnect power supplies from the chassis before disassembly or moving the switch.

2 . Install the switch in a clean area, ensuring proper temperature and humidity conditions.

3 . Keep the device accessories in a safe place.

4 . When handling modules, always handle the modules by the edge, avoid contact with integrated components and printed circuits. Prevent electrostatic discharge damage to the integrated components and printed circuits.

5 . Keep maintenance tools in a safe place.

6 . Do not wear loose clothing that may catch on devices, also remember to fasten ties or scarves and roll up your sleeves.

7 . If the environment may cause harm to eyes, be sure to wear a pair of protective goggles.

8 . Do not perform any operation that may result in bodily injury or damage to the device.

9 . When cleaning the switch, do not use a damp cloth to wipe the switch and never wash the switch with liquids.

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Safety Warning

1. Safety warnings appear throughout this publication, referring to operations **that may harm you if performed incorrectly**.
2. Read through the installation instruction carefully before operating the system.
3. Only trained and qualified personnel should be allowed to install, replace, or service the switch.
4. Disconnect power supplies from the chassis before disassembly or moving the switch.
5. The final configuration of the product must abide by all national laws and codes.
6. The final configuration of the product must abide by in point national laws and codes.

Hot Line Work Safety Guidelines

1. Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, watches and bracelets). Metal objects will cause short circuits and damage the device when in contact with both powered items and the ground.
2. An improper connection between the device and power sockets may be hazardous.
3. Only trained and qualified personnel should be allowed to operate and maintain

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the device.

4. Reading through the installation guidelines before powering on the system.

Notice:

! Watch out for potential dangers, e.g. wet floors, ungrounded power lines, and worn power lines;

! Have an emergency switch installed inside the workshop, so that power can be cut off promptly should an accident occur;

! Do not work alone if potential dangers are present;

! On the event of an accident, take the following measures.

Measure1: Power down the system;

Measure2: Make emergency calls if required;

Measure3: Determine whether the victim requires immediate treatment and take appropriate action;

Measure4: If possible, send someone for medical help; otherwise, consider the damage and seek help.

1.9 Preparing for Installation

After verifying site requirements, please check the contents of the switch container and accessory kit. (If you are concerned that any item is missing or an incorrect item has been supplied, please contact your dealer as soon as possible.)

Checking Switch Hardware Configuration and Accessories

Unpack the container to verify the accessory by incasement bill.

Required Tools and Fixings

Required tools	● cross screwdrivers
	● Flat-blade screwdriver
	● ESD-preventive wrist strap
Connection cables	● Serial port cable
	● Multi-mode fiber cable
	● Single-mode fiber cable
	● Category 5 cable with RJ-45 connector

1.10 Hardware Installation

The installation of the DG-CS7000 includes the following:

- Switch mounting
  - Desktop installation
  - Rack-mounting the switch
- Switch grounding

- Cards and modules installation
- Connecting to the Console
  - Connecting to the Console port
- Connecting to the Management Port
  - Connecting to the Ethernet port
- SFP transceiver installation
  - Install the SFP transceiver in the SFP slot
- XENPAK transceiver installation
  - Install the XENPAK transceiver in the XENPAK slot
  - Copper Cable/Fiber cable connection
  - Ethernet cable connection
  - Fiber cable connection
- Power supply connection

Switch Installation

1.10.1.1 Desktop installation

- **Note:**
  - Choose a smooth level workbench
  - Verify that the workbench is strong enough to support the DG-CS7004's fully configured weight
  - Plan a good position for your DG-CS7004 that is easy to operate and has an appropriate power source and grounding point.

- Place the DG-CS7004 safely on the workbench, avoid obstructions on any side of the switch.

Notice

To avoid damage, do not place any weight on the switch.

1.10.1.2 Rack-mounting DG-CS7000 series

- **Note:**

Before mounting the DG-CS7000 series into the rack, verify that the mounting positions of the rack are correct. Preposition of the mounting points may result in inadequate spacing between the switch front panel and the rack front door, and the rack front door may be unable to be closed with cables and fiber cables connected. Please keep a 10 mm spacing between the switch front panel and the rack front door.

Verify the following before installation: the rack is stably positioned; all modules inside the chassis are fully installed; no obstructions are present inside or around the rack; the switch is situated near the rack for ease of installation.

- **Installation Steps**

Step 1: Attach the 2 hangers on the DG-CS7000 series with screws provided in the accessory kit.

Be sure to attach the hangers in the correct direction, otherwise the switch will not be able to mount into a standard rack.

Note that the hangers are not weight bearing. They are used to fasten the

switch. The mounting Shelf or sliding rails (bolt to the rack) will support the switch. The figure below shows the steps for mounting the hangers:

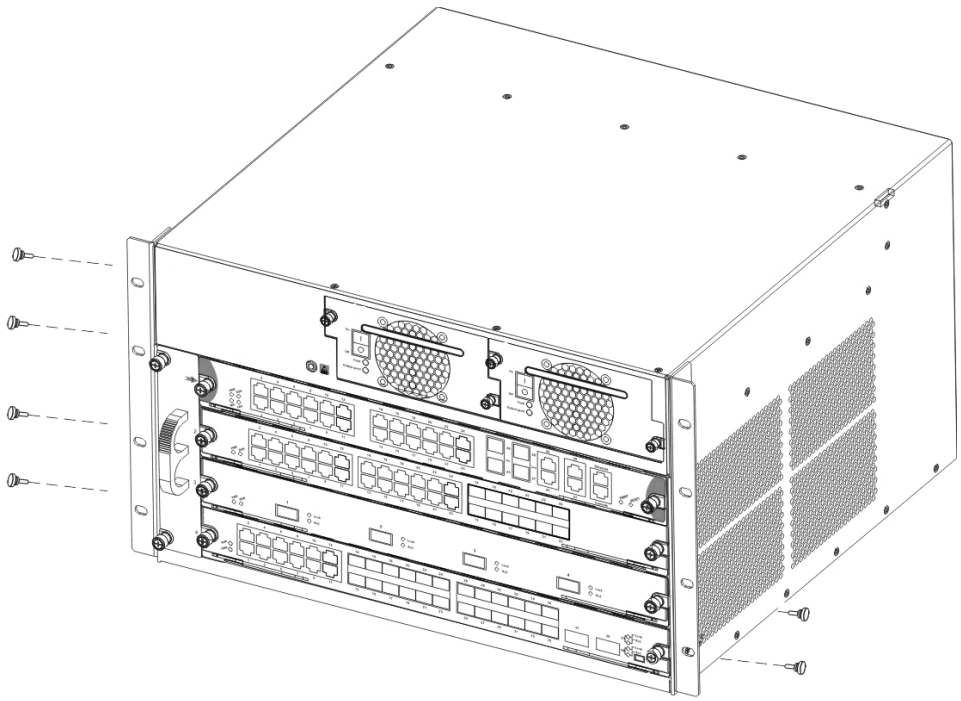


Fig 2-1 Installing DG-CS7004 Switch Hangers

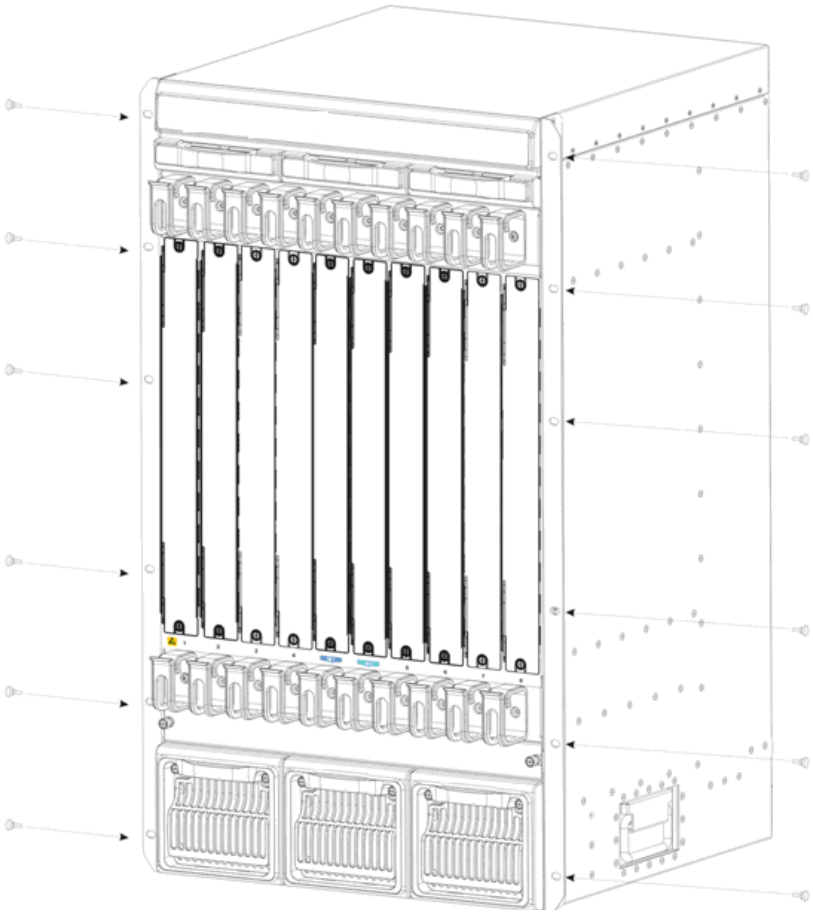


Fig 2-2 Installing DG-CS7010 Switch Hangers

Step 2: Put the hanger-mounted switch smoothly into a standard 19'' rack.

Because of the size and weight of a DG-CS7000 series, 2 people are required to complete the installation. With a person standing on each side of the chassis, grasp the chassis handle in the lower side panel with one hand, and use the other hand near the top of the chassis for balance. Slowly lift the chassis in unison and carry it to the rack. Lift the DG-CS7000 series to a position a little higher than the mounting shelf or sliding rails, resting the chassis on the shelf/rails, and then carefully slide the chassis

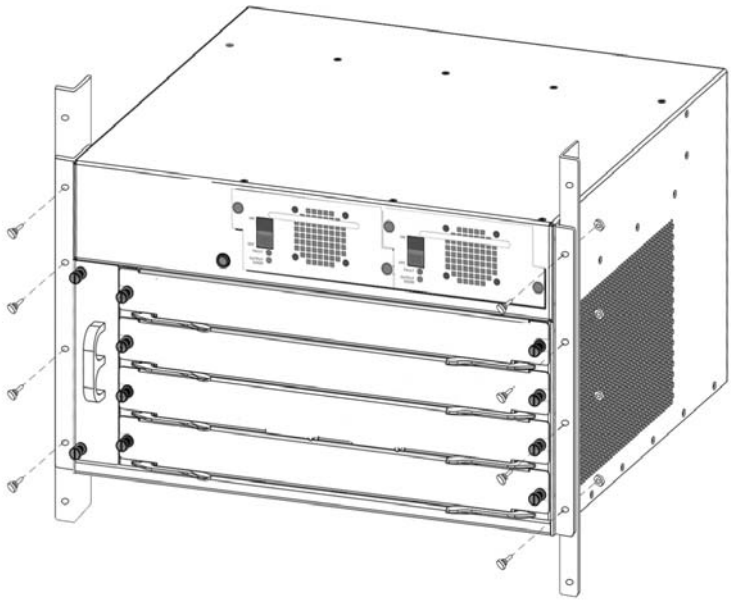
into the rack. Be sure to align the hangers and mounting holes in the rack column.

Step 3: Fasten the DG-CS7000 series to the rack with the screws provided.

Bolt the hangers to the matching holes in the rack column with the screws provided. Be sure to tighten the screws smoothly. The DG-CS7000 series should now be securely attached to the equipment rack.

The procedure is shown below:

Fig2-3 Rack-mounting DG-CS7004



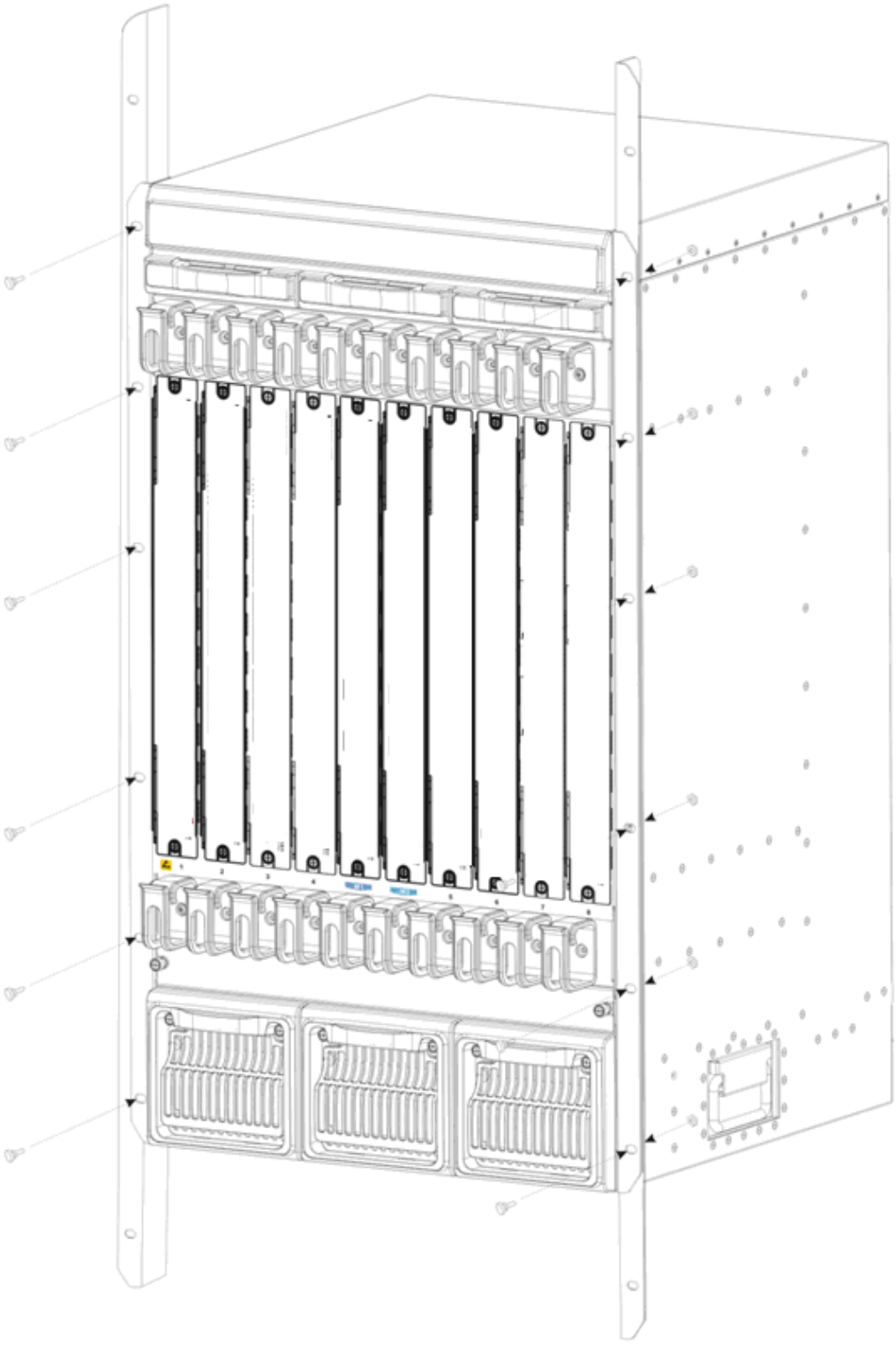


Fig2-4 Rack-mounting DG-CS7010

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1.10.1.3 Wearing an ESD Wrist Strap

An ESD Wrist Strap must be worn during the installation of the switch. To prevent any damage occurring to the device, avoid contact between the printed circuit boards and your clothing. Avoid bodily contact with components on the circuit boards if possible.

To wear an ESD Wrist Strap:

Step 1: place your hand into the ESD wrist strap.

Step 2: tighten the fastener and ensure that it makes maximum contact with the skin.

Step 3: Insert the equipment end of the strap into the antistatic socket (indicated by an ESD symbol) in the switch front panel.

Switch grounding

A good grounding system is the groundwork for the smooth and safe operation of the DG-CS7000 series, and an excellent way to prevent lightning strikes and resistance interference. Please follow the switch grounding specification instructions, verify the installation site's grounding condition and ensure proper grounding accordingly.

- **Proper grounding**

  When using an AC power source, the device must be grounded with the green and yellow ground cables; otherwise, shock hazards may occur when insulation resistance between the internal power supply and the chassis degrades.

- **Lightning protection grounding**

The lightning protection system is an independent system consisting of a lightning rod, conductor and connection joint with the grounding system. The grounding system usually is shared with the power reference grounding and green and yellow ground cable grounding. Lightning protection grounding is a building requirement, not a specific requirement of the switch.

- **Electromagnetic compliance grounding**

This refers to the grounding to comply with switch electromagnetic compatibility requirements, including shielded grounding, filter grounds, noise, and interference control and level reference. The overall grounding requirements are the sum total of the above. Ground resistance value should be less than 1 ohm.

The DG-CS7000 series provides chassis grounding post in the lower rear chassis, marked as “GND”. Chassis protection grounding should be properly connected to the rack grounding connector

The ground cabling procedures are listed below:

Step 1: remove the nuts from the rear chassis grounding posts

Step 2: wrap one end of the green and yellow grounding cable to the grounding posts

Step 3: attach the grounding post nut and tighten well

Step 4: attach the other end of the grounding cable to the rack grounding connector

Note:

- The grounding cable should be made of a good conductor, and the diameter should be determined by the possible maximum current that may pass through.
- Bare conductor cabling is forbidden.
- Ground resistance value: the combined grounding resistance should be less than 1 ohm.

Card and module installation

The DG-CS7000 series is a rack-mounting device, various cards and modules are available.

Basic configuration: chassis, power supply modules (optional 1 +1 redundant), system backplane, fan tray, dust gauze, distribution box. The above parts have been mounted upon shipment; please verify they are properly locked before installation.

1.10.1.4 Removing and Installing the Cards

The installation procedure is the same for all cards, as shown below:

Step 1: Power down the switch (Hot-swapping is supported by optional cards for the switch. However, for better convenience, it is recommended to power down the switch before installing the cards, if no module in the switch is running.)

Step 2: Ensure proper grounding of the switch

Step 3: Put on an ESD wrist strap before contact with the switch circuit, and make sure

the ESD wrist strap is connected securely to the ESD connector in the switch's front panel.

Step 4: Loosen the panel fasteners locking back plate counterclockwise and remove the back plate.

Step 5: Insert the optional module into the slot, you can use the metal handle on the front plate of the module to ensure good contact. Then lock the module with panel fasteners in the front plate.

1.10.1.5 Removing and installing the Dust Gauze

Dust gauze is provided in the right section of the DG-CS7000 series, which can be installed and removed from the back of the switch. The dust gauze is meant to prevent large debris or particles in the air from being ingested into the switch. Please perform cleaning on a regular basis according to the site conditions.

- Loosen the 2 panel fasteners in the dust gauze
- Draw the dust gauze out smoothly by holding the 2 screws
- Clean the dust gauze with a brush (never wash with any liquid)
- Insert the gauze back to its original position in the switch
- Tighten the panel fasteners.

Note: The dust gauze is installed on switch chassis shipment.

The installation and removal of the dust gauze is shown below:

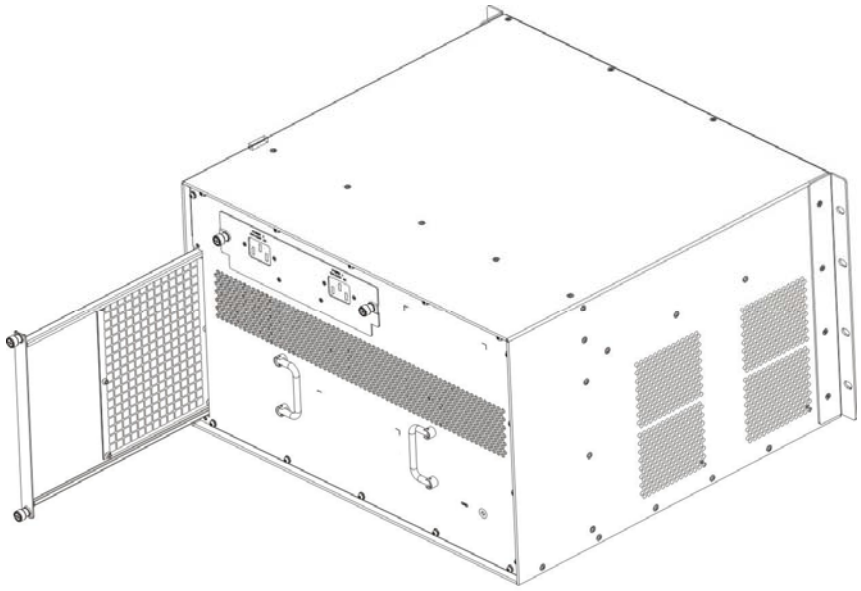

Fig2-5 Installation and removal of the DG-CS7004 dust gauze

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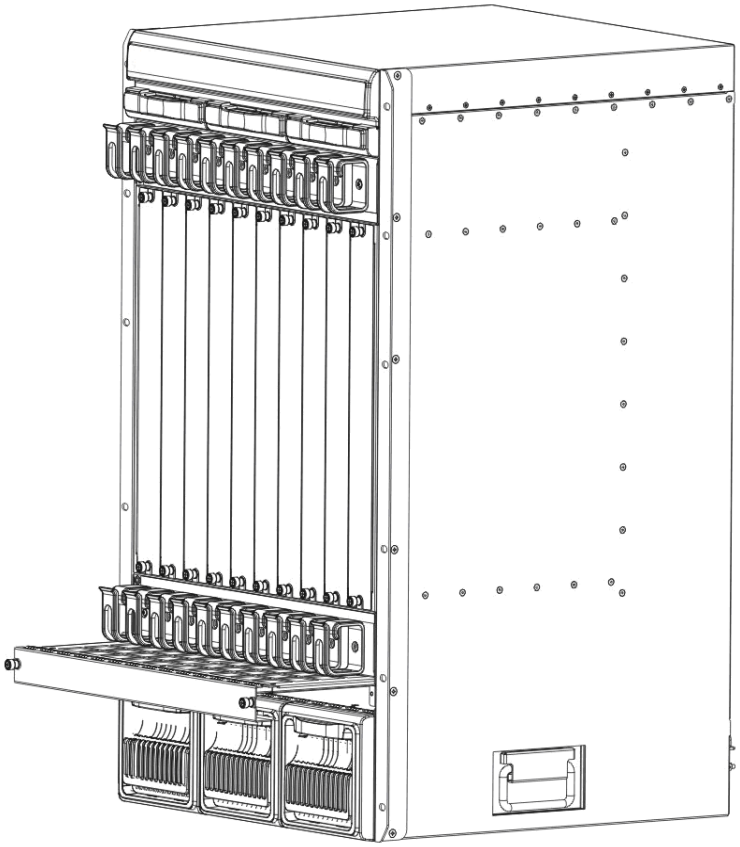

Fig2-6 Installation and removal of the DG-CS7010 dust gauze

1.10.1.6 Removing and Installing the Fan Tray

1.10.1.6.1 Removing and Installing the DG-CS7004 Fan Tray

The DG-CS7004 has two fan trays in the left section of the switch, and can be serviced from the front. The installation and removal of the fan tray is relatively simple. To install, just hold the fan tray in the correct direction, align with the corresponding slot and push to secure. Tighten the panel fasteners in the font panel. Upon removal, first loosen

the 2 screws in the front panel of the fan tray, hold the handle in the front panel of fan tray with your middle and ring fingers, press the locker slightly down, and the fan tray can be drawn out smoothly.

Note: The fan trays are installed on switch chassis shipment.

The installation and removal of a fan tray is shown below:

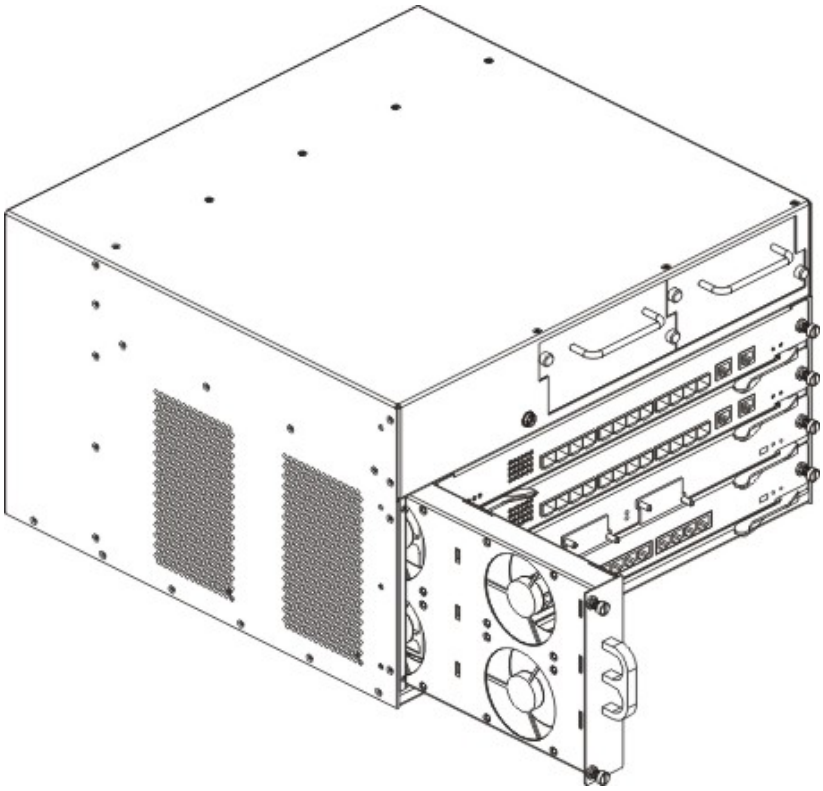

Fig2-7 The installation and removal of DG-CS7004 fan tray

1.10.1.6.2 Removing and Installing the DG-CS7010 Fan Tray

The DG-CS7010 has three fan trays in the upper section of the switch, and can be serviced from the front. The installation and removal of the fan tray is relatively simple. To install, just hold the fan tray in the correct direction, align with the corresponding slot and push to secure. The locker in the front panel of the fan tray will lock automatically. Upon removal, hold the handle in the front panel of fan tray with your middle and ring fingers, press the locker slightly down, and the fan tray can be drawn out smoothly.

Note: The fan trays are installed on switch chassis shipment.

The installation and removal of a fan tray is shown below:

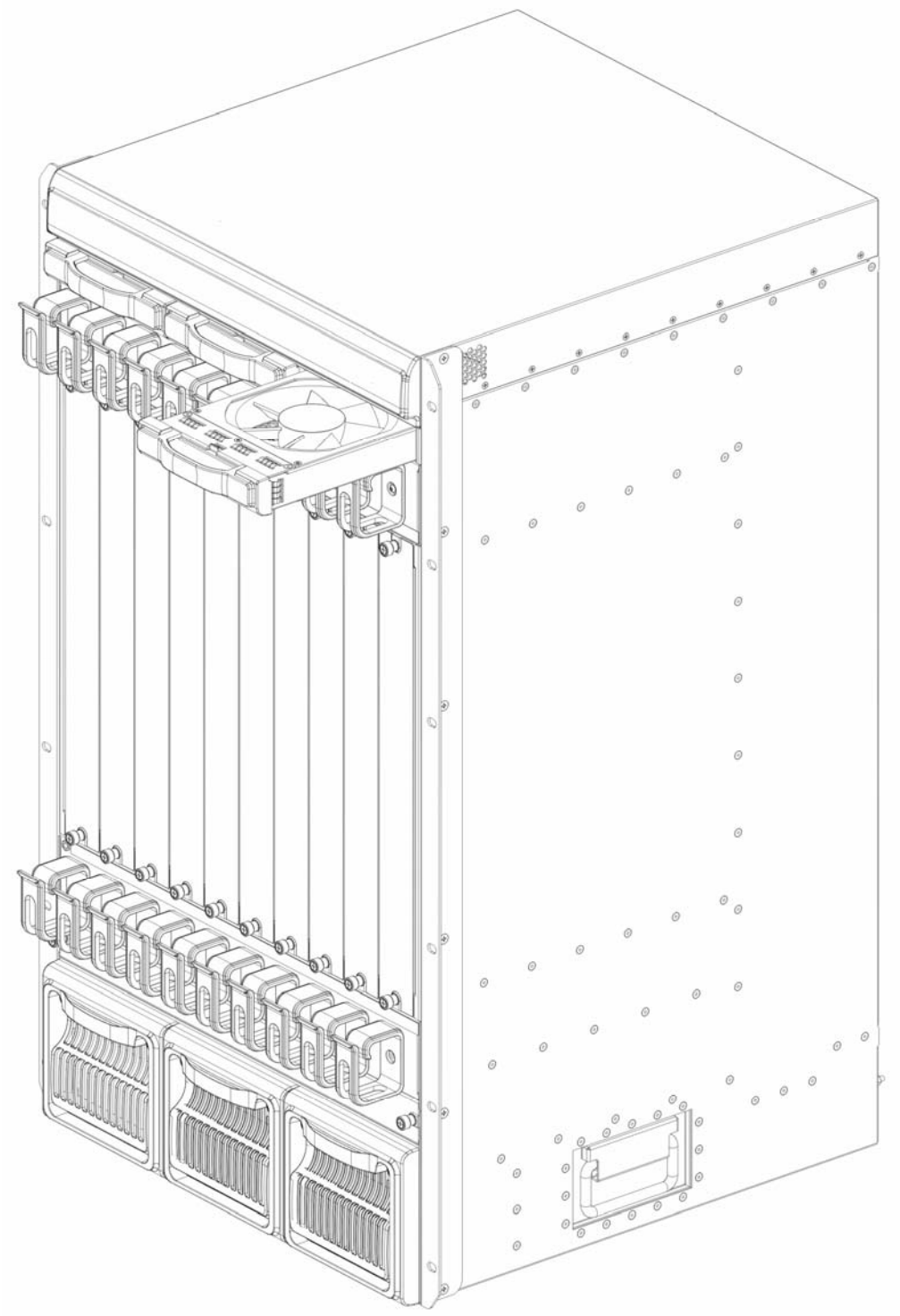

Fig2-8 The installation and removal of DG-CS7010 fan tray

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1.10.1.7 Removing and Installing Power Supply Modules

1.10.1.7.1 Removing and Installing DG-CS7004 Power Supply Modules

The DG-CS7004 employs a 1 +1 redundant power supply module combination; all two modules will work during normal operation. In case one module fails, it can be replaced while the system is operating without presenting an electrical hazard or damage to the system. The procedures are provided below:

Step 1: First, turn off the switch in the front panel of the power supply module to be replaced

Step 2: Loosen the 2 panel fasteners in the front panel of the power supply module to be replaced by turning the screwdriver counter clockwise

Step 3: Hold the handle in the upper front panel of the power supply module, and draw out the power supply module firmly and smoothly

Step 4: Turn off the switch in the front panel of the new power supply module, use the new power supply module and replace the failed module. Tighten the panel fasteners in the font panel

Step 5: Turn on the switch in the front panel of the power supply module, successful replacement will be indicated by the green OUTPUT GOOD indicator on the front panel of the power supply module being illuminated and by the yellow Fail indicator not illuminating.

Installation of a power supply module is shown below:

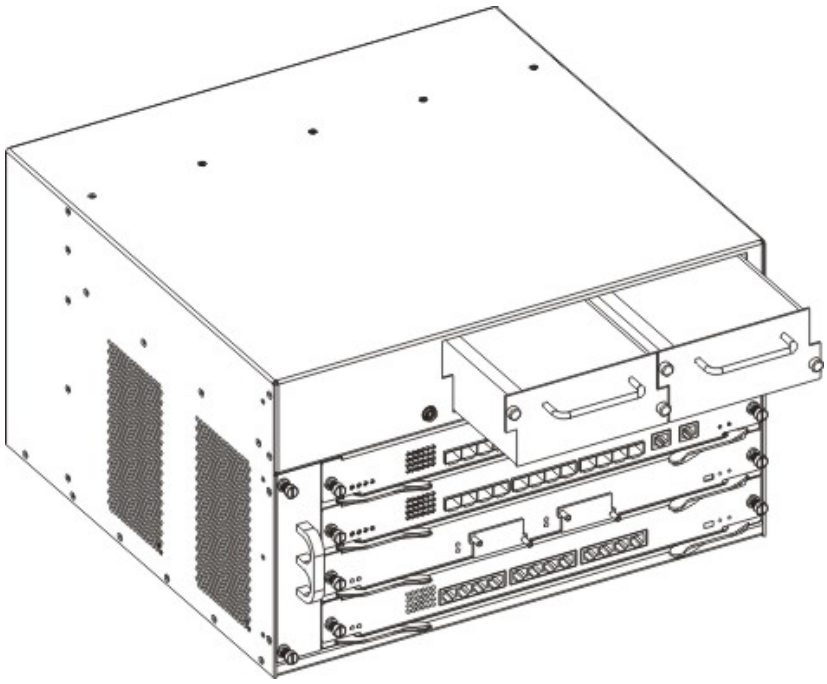

Fig 2-9 The installation and removal of DG-CS7004 power supply modules

1.10.1.7.2 Removing and Installing DG-CS7010 Power Supply Modules

The DG-CS7010 employs a 2 +1 redundant power supply module combinations, all three modules will work during normal operation. In case one module fails, it can be replaced while the system is operating without presenting an electrical hazard or damage to the system. The procedures are provided below:

Step 1: Loosen the 2 panel fasteners in the front panel of the power supply module to be replaced by turning the screwdriver counter clockwise

Step 2: hold the handle in the upper front panel of the power supply module, and draw out the power supply module firmly and smoothly

Step 3: Use a new power supply module and replace the failed module

Step 4: Tighten the panel fasteners in the font panel

Step 5: Successful replacement will be indicated by the green Power OK indicator being illuminated and by the yellow Fail indicator not illuminating.

Installation of a power supply module is shown below:

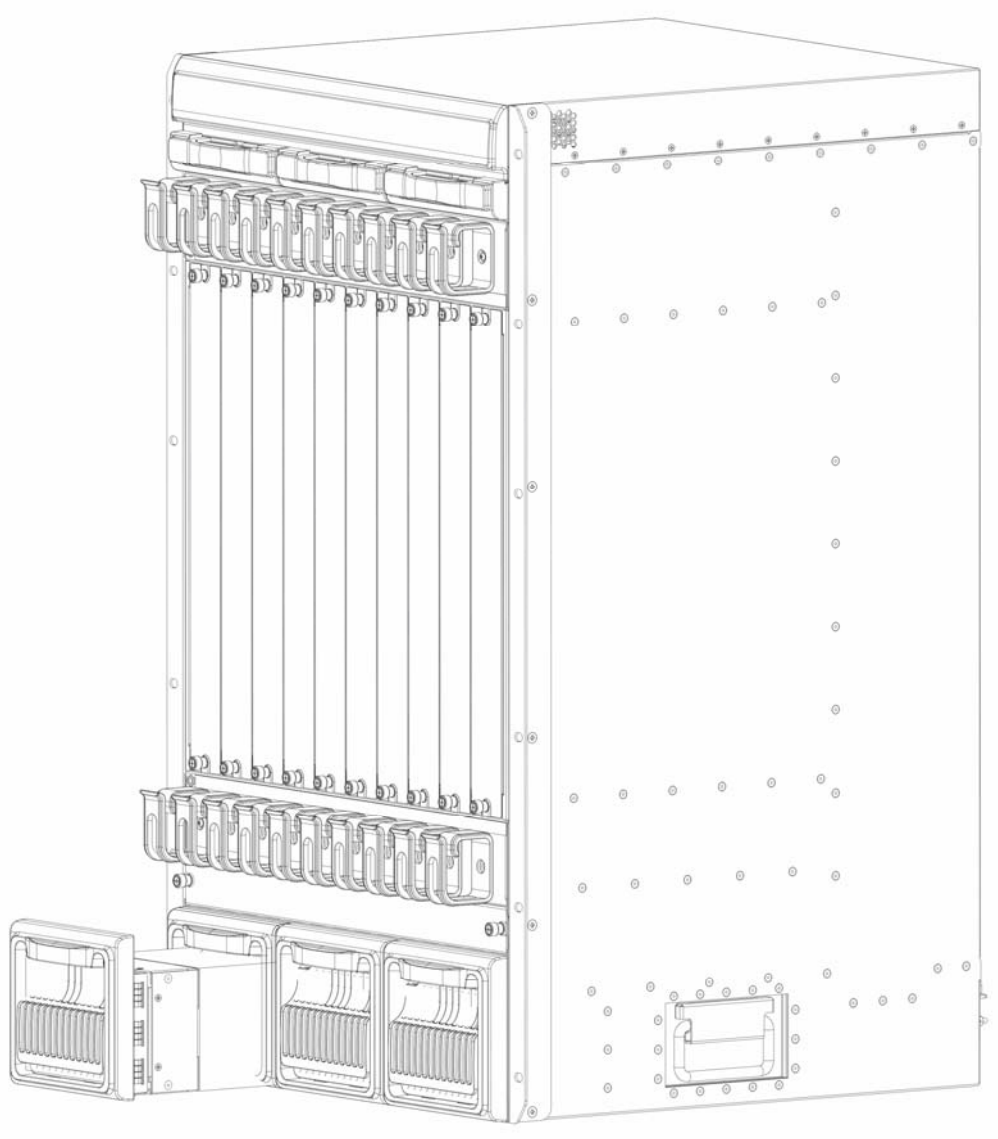

FIG 2-10 The installation and removal of DG-CS7010 power supply modules

- Clean power module dust gauze :

Power module dust gauze is provided in the front panel of the DG-SA-RPS-7010AC and DG-SA-RPS-7010AC power modules, which can be removed and installed easily. It can prevent large debris or particles in the air from being ingested into the power supply module. Please perform cleaning on a regular basis according to the site conditions.

- Pulling the lower dust gauze front panel, draw the dust gauze and front panel out
- Clean the dust gauze with a brush (never wash with any liquid)
- Insert the gauze back to its original position in the power supply module
- Push dust gauze and front panel back to power module
- Press the lower dust gauze front panel and lock it

The installation and removal of the dust gauze is shown below:

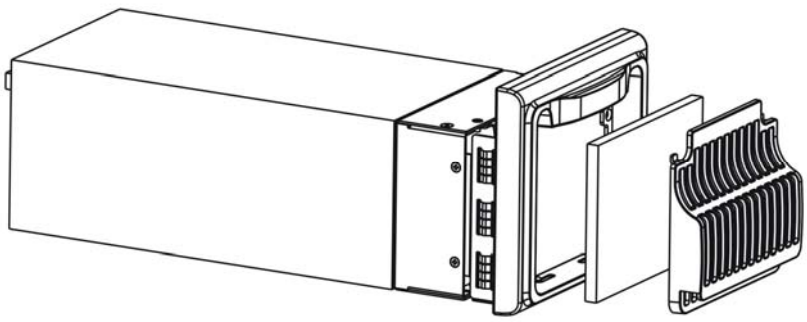

FIG 2-11 The installation and removal of Power module dust gauze

Connecting to the Console

The DG-CS7000 provides a RS-232 port as the local console. Users can configure the switch through a character terminal (usually a PC) with RS-232 ports. The connection procedures are listed below:

Step 1: Find a character terminal or a PC with a RS-232 serial port.

Step 2: Connect the RS-232 serial port of character terminal to the configuration port of the switch, ensuring at least one of them is powered down.

Notice

Upon connection, please verify the sign above the port to avoid using the wrong port.

Connecting to the Management Port

Each main control card provides a RJ-45 (female) Ethernet port. Users can connect to this administration port through a backend host with Ethernet interface for program loading, or use this port to connect to remote devices (e.g., an administrative workstation) for remote administration. The connection procedure is listed below:

- Connecting to a back-end PC

  Step 1: Find a PC with Ethernet Interface.

  Step 2: Connect the PC to the RJ-45 Ethernet port of the switch with a twisted-pair

crossover cable.

- Remote Administration of the device

Step 1: Connect the administrative Ethernet port in the main controlling board to a HUB with a standard network cable.

Step 2: Connect the Hub to an administrative workstation in the local area network.

Or:

Step 1: Connect the administrative Ethernet port in the main controlling board to a Router with a crossover network cable.

Step 2: Connect the router to an administrative workstation in the wide area network.

SFP transceiver installation

In the DG-CS7000, each line card with a 1000BASE fiber interface provides several SFP 1000BASE transceiver slots.

The procedure for installing the SFP 1000BASE fiber transceiver is shown below:

Step 1: Put on a ESD wrist strap (or antistatic gloves)

Step 2: Insert the SFP transceiver onto the guide rail inside the 1000BASE fiber interface line card Do not put the SFP transceiver up-side-down.

Step 3: Push the SFP transceiver along the guide rail gently until you feel the transceiver snap into place at the bottom of the line card.

Note: the SFP 1000BASE fiber transceiver is hot swappable.

Notice

Do not stare directly at the 2 fiber bore in the SFP 1000Base fiber transceiver when the switch is in operation. The laser may hurt your eyes.

Copper Cable/Fiber Cable Connection

Ethernet cable connection:

Step 1: Insert one end of the Ethernet cable into the RJ-45 Ethernet port in the switch copper cable line card;

Step 2: Insert the other end of the Ethernet cable into the RJ-45 Ethernet port of the other device;

Step 3: Check all status indicators for the corresponding ports, a lighted LINK indicates the link has been established, otherwise the link is not ready and the cable should be examined;

Notice

Upon connection, please verify the sign above the port to avoid use of other ports, which might damage to the modules or the switch.

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The connection procedure for fibers is listed below:

Step 1: Remove the protective dust plug from the SFP/XENPAK fiber transceiver bore; take out the fiber cable and remove the protective cap from one end of the fiber cable. Keep the fiber end clean and neat.

Step 2: Immediately attach the end of the fiber cable to the SFP/XENPAK transceiver, and the other end to the transceiver of the corresponding device. Note: Upon connection, the SFP/XENPAK transceiver's TX port should be connected to the RX port of the corresponding device, and vice versa.

Step 3: Check the fiber port status indicator, a lighted LINK indicates that the link has been established, otherwise the link is not ready and should be examined.

Notice

Upon connection, please verify the sign above the port to avoid using other ports, which might damage the transceiver or the other ports.

When connecting the other device through fiber cable to the switch, the output power of the fiber must not exceed the maximum received power of the corresponding modules, otherwise, it will damage the switch. Do not stare at the fiber bore when the switch is in operation to avoid harm.

Power supply connection

Connection procedures for the AC power supply module are described below:

Step 1: Insert one end of electrical line into the power supply socket and another end into the corresponding socket of the switch; when connecting electrical lines, it shall be confirmed that the power supply modules are power off.

Step 2: It shall be examined whether or not the fan on the power supply module operates normally. If the fan fails to operate, please examine whether the power supply socket is power on and whether the power supply module are inserted and locked properly.

Step 3: Turn on the power supply modules (if there are two power supply modules, both of them shall be turned on.), and examine whether or not the indicator of the indicator of the front panel is normal. If the OUTPUT GOOD indicator fails to be on, please turn off the power supply without delay and examine the status of power supply and each inserting plate.

Notice

If the Power OK indicator does not illuminate after repeating the above steps, please contact the dealer. Do not open the switch chassis by yourself. Please contact the dealer in the case of any failure.

This product comes with One Year warranty. For further details about warranty policy and Product Registration, please visit support section of **www.digisol.com**

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