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# Chapter 1 Introduction

## 1.1 Product Brief

### 1.1.1 Overview

S5750M-18X-P-SI switch is a 10-gigabit POE three-layer switch launched by Digital China Yunke Network. The whole machine can provide up to 370W PoE power output, and the maximum power output of each port is 90W..

### 1.1.2 Features and Benefits

#### ✧ Various Interfaces

S5750M-18X-P-SI switch provides 12 10Gb fixed ports of RJ-45 , 6 25Gb SFP28 ports.

#### ✧ Support 10Gb Ethernet

25Gb Ethernet which adopts full-duplex technology instead of low-speed, half-duplex CSMA/CD protocol, is a big leap in the evolution of Ethernet. 25Gb Ethernet can be deployed in star or ring topologies. With 10Gb Ethernet, S5750M-18X-P-SI switch provide broad bandwidth and powerful processing capacity. It is suitable for metropolitan networks and wide area networks. Using S5750M-18X-P-SI switch, users can simplify network structures and reduce cost of network construction.

#### ✧ Networking Protocols

S5750M-18X-P-SI switch support 802.1d/w/s, 802.1Q, 802.1p, 802.3ad, 802.3x, GVRP, DHCP and SNTP etc. The switches also support comprehensively the multicast protocols such as IGMP, DVMRP and PIM. Moreover, S5750M-18X-P-SI switch support RIPv1/2, OSPF and IPv6. All these protocols supported enable S5750M-18X-P-SI switch to meet the requirements of complex network constructions.

#### ✧ ACL

S5750M-18X-P-SI switch support comprehensively ACL policies. The traffic can be classified by source/destination IP addresses, source/destination MAC addresses, IP protocols, TCP/UDP, IP precedence, time ranges and ToS. And various policies can be conducted to forward the traffic. By implementing ACL policies, users can filter the virus packets such as "Worm.Blaster", "Worm.Sasser" and "Red Code" etc. S5750M-18X-P-SI switch also support IEEE802.1x port based access authentication, which can be deployed with RADIUS, to ensure the port level security and block illegal users.

### ✧ QoS

S5750M-18X-P-SI switch fully support DiffServ Module. Users can specify a queue bandwidth on each port. SP/SWRR scheduling is also supported. S5750M-18X-P-SI switch support the port security. Users can deploy trusted CoS, DSCP, IP precedence and port priority. User can also modify packets' DSCP and COS values. The traffic can be classified by port, VLAN, DSCP, IP precedence and ACL table. User can also modify packets' DSCP and IP precedence values. Users can specify different bandwidths for voice/data/video to customize different qualities of service.

### ✧ 3D-SMP Ready

S5750M-18X-P-SI switch is up to the mustard of Self-defending security region management strategy according to Digital China Network. It is supported interaction with some security system such as firewall, IDS, etc. It can defense the virus and aggress effectively from the extranet and internet. Thus enhance the security and stability of the network-wide.

### ✧ Perfect Web Management.

S5750M-18X-P-SI switch support SNMP, In-band and Out-of band Management, CLI and WEB interface and RMON. It can mail the correlative sensitive information to the administrator abide by SMTP protocol. S5750M-18X-P-SI switch support SSH protocol, ensure the configuration management security of the switch. It is adopted the Digital China centralized web management system 'DCLM' for unified management expediency and compactly.

## 1.2 Description of Hardware

### 1.2.1 Front Panel

#### 1. Front Panel Diagram

The front panel descriptions of S5750M-18X-P-SI switch in the following table.

Table 1-1 The front panel descriptions of S5750M-18X-P-SI switch

Type	RJ-45 port	SFP28 port	ETHERNET port	RJ45 Console port	USB2.0 connector	RESET Button
S5750M-18X-P-SI	12	6	1	1	1	1

The front panel of S5750M-18X-P-SI is shown below:



Figure 1-1 Front Panel of S5750M-18X-P-SI

## 2. Console description

S5750M-18X-P-SI switch provide a RJ-45 serial console port, the user perform the local and telnet configuration through this port.

The console port supports asynchronous mode, set the data bit as 8, the stop bit as 1, the parity bit as none, the default baud rate as 115200bps.

## 1.2.2 Back Panel

The back panel of S5750M-18X-P-SI is shown below, and there is a 220V AC power socket, one DC power socket, and one grounding screw hole.



Fig 1-2 Back panel of S5750M-18X-P-SI

## 1.2.3 Side Panel

The back panel of S5750M-18X-P-SI is shown below, and there are 4 fans on left side panel.



Fig 1-3 Left side panel of S5750M-18X-P-SI



Fig 1-4 Right side panel of S5750M-18X-P-SI

## 1.3 Status LEDs

The indicator light on front panel of S5750M-18X-P-SI has 12 port indicator light, 12 POE indicator light, 6 25Gb SFP28 port indicator light , 1 management Ethernet interface indicator light, 1 power supply indicator light, 1 RPS indicator light and 1 system automatic diagnoses LED. They are shown below and described in the following table.

Table 1-2 The explanation of indicator light of S5750M-18X-P-SI switch

Indicator light	Panel sign	State	Meanings
Management port Indicator Light	MGMT	Green solid	Port has connected with 10Mb/100Mb/1Gb speed
		Green blinking	Port is transmitting data
		Off	Power is off or system is abnormal
Power Indicator Light	PWR	Green solid	Power is normal
		Red solid	Power is abnormal
		Off	Power is off
Diag Indicator Light	DIAG	Green solid	System is booting
		Green blinking	System running normally
		Off	System is not running
Rps Indicator Light	RPS	Green solid	DC power has insterted
		Off	DC power has not inserted

Table 1-3 The explanation of the port indicator light

LED	State	Explanation
Indicator light of RJ-45 port	Green solid	10G/1G/100M Port Link.
	Green blinking	10G/1G/100M Port Link/Activity.
	Off	No Link.
Indicator light of POE	Orange solid	POE power supply
	Off	POE does not work
Indicator light of SFP28 port	Green solid	25G/10G/1G Port Link.
	Green blinking	25G/10G/1G Port Link/Activity.
	Off	No Link.

## 1.4 Port Description

Each port description in the following:

Table 1-4 S5750M-18X-P-SI switch port description

Port mode	Spec
RJ-45 port	<ul style="list-style-type: none"> <li>100/1000/2500/10000Mbps auto negotiation</li> <li>MDI/MDI-X cable mode auto negotiation</li> <li>5 kinds of UTP: 100 m</li> </ul>
SFP	<ul style="list-style-type: none"> <li>SFP-SX-L transceiver 1000Base-SX SFP(850nm,MMF,550m)</li> <li>SFP-LX-L transceiver 1000Base-LX SFP(1310nm, SMF, 10km)</li> <li>SFP-LX-40 transceiver 9/125um single mode fiber: 40km</li> <li>SFP-LH-70-L transceiver 9/125um single mode fiber: 70km</li> <li>SFP-LH-120-L transceiver 9/125um single mode fiber: 120km</li> </ul>
SFP-GT	<ul style="list-style-type: none"> <li>SFP-GT transceiver 1000Base-T SFP port transceiver,RJ45 port</li> </ul>
SFP+	<ul style="list-style-type: none"> <li>SFPX-SR transceiver 850nm, 62.5 <math>\mu</math> m MMF: 32m; 50 <math>\mu</math> m 500MHz/km MMF: 85m; 50 <math>\mu</math> m 2000MHz/km MMF: 300m</li> <li>SFPX-LR transceiver 1310nm, 9/125um single mode fiber:10km</li> <li>SFPX-ER transceiver 1550nm, single mode fiber:40km</li> <li>SFPX-ZR transceiver 1550nm, single mode fiber:80km</li> <li>DAC-SFPX-3M: 10 Gigabit copper cable 3M</li> </ul>

SFP28	<ul style="list-style-type: none"> <li>• SFP28-SR: SFP28-SR 25G Multimode fiber (MMF 850nm, OM4 100m) -LC port</li> <li>• SFP28-LR: SFP28-LR 25G Single mode fiber (1310nm, SMF, 10km) -LC port</li> <li>• DAC-SFP28-3M 25G copper cable: 3M</li> </ul>
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## 1.5 System Specifications

Table 1-5 System Specifications of S5750M-18X-P-SI switch

Type Attribute	S5750M-18X-P-SI
Dimension(W * D * H) (mm)	440×320×44
Weight	Less than 4.5kg
Fixed Port	12 10Gb ports of RJ-45, 6 25Gb SFP28
Management Port	1 RJ-45 serial console port; 1 Ethernet management port; 1 USB port
Power Input	AC:100~240V AC(50~60Hz) DC: 48~58Vdc
FAN	4 sytem fans, blow from the inside out
System Consumption	Empty load:Less than 35W Full load:Less than 440W(POE:370W)
POE output	Support(<=370W)
Operating Temperature	0°C~50°C
Storage Temperature	-40°C~70°C
Relative Humidity	5%~95%, no condensate

# Chapter 2 Device Installation

## 2.1 Installation Notice

To ensure the proper operation of series and your physical security, please read carefully the following installation guide.

### 2.1.1 Environmental Requirements

- The switch must be installed in a clean area. Otherwise, the switch may be damaged by electrostatic adherence.
- Maintain the temperature within 0 to 50 °C and the humidity within 5% to 95%, non-condensing.
- The switch must be put in a dry and cool place. Leave sufficient spacing around the switch for good air circulation.
- The switch must work in the range of AC power input: 100 ~ 240VAC (50/60Hz)
- The switch must be well grounded in order to avoid ESD damage and physical injury of people.
- The switch should avoid the sunlight perpendicular incidence. Keep the switch away from heat sources and strong electromagnetic interference sources.
- The switch must be mounted to a standard 19" rack or placed on a clean level desktop.

#### 2.1.1.1 Dust and Particles

Dust is harmful to the safe operation of switch. 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 value for dust content and particle diameter in the site is shown below:

Max Diameter (μm)	0.5	1	3	5
Max Density (particles/m <sup>3</sup> )	$1.4 \times 10^5$	$7 \times 10^5$	$2.4 \times 10^5$	$1.3 \times 10^5$

Table 2-1 Environmental Requirements: Dust

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 site should avoid harmful gases, such as SO<sub>2</sub>, H<sub>2</sub>S, NO<sub>2</sub>, NH<sub>3</sub> and Cl<sub>2</sub>, etc. The table below details the



threshold value.

Gas	Average (mg/m <sup>3</sup> )	Max (mg/m <sup>3</sup> )
SO <sub>2</sub>	0.2	1.5
H <sub>2</sub> S	0.006	0.03
NO <sub>2</sub>	0.04	0.15
NH <sub>3</sub>	0.05	0.15
Cl <sub>2</sub>	0.01	0.3

Table 2-2 Environmental Requirements: Particles

### 2.1.1.2 Temperature and Humidity

Although the switch is designed to use fans, the site should still 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. In the hot summer, it is recommended to use air-conditioners to cool down the site. And the cold winter, it is recommended to use heaters.

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 ~ 50°C	40 ~ 65%	5 ~ 95%

Table 2-3 Environmental Requirements: Temperature and Humidity

Caution!

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.

### 2.1.1.3 Power Supply

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

Caution!

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!

#### 2.1.1.4 Preventing Electrostatic Discharge Damage

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

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

#### 2.1.1.5 Anti-interference

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:

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

#### 2.1.1.6 Rack Configuration

The dimensions of the switch is designed to be mounted on a standard 19" rack, 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.

**Caution !**

If a standard 19" rack is not available, the switch 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.

## 2.1.2 Installation Notice

- Read through the installation instruction carefully before operating on the system. Make sure the installation materials and tools are prepared. And make sure the installation site is well prepared.
- During the installation, users must use the brackets and screws provided in the accessory kit. Users should use the proper tools to perform the installation. Users should always wear antistatic uniform and ESD wrist straps. Users should use standard cables and connectors.
- After the installation, users should clean the site. Before powering on the switch, users should ensure the switch is well grounded. Users should maintain the switch regularly to extend the lifespan of the switch.

## 2.1.3 A-level declarations

**Warning**

This is class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## 2.1.4 Security Warnings

- When using SFP transceiver, do not stare directly at the fiber bore when the switch is in operation. Otherwise the laser may hurt your eyes.
- Do not attempt to conduct the operations which can damage the switch or which can cause physical injury.
- Do not install, move or disclose the switch and its modules when the switch is in operation.
- Do not open the switch shell.
- Do not drop metals into the switch. It can cause short-circuit.
- Do not touch the power plug and power socket.
- Do not place the tinder near the switch.
- Do not configure the switch alone in a dangerous situation,
- Use standard power sockets which have overload and leakage protection.
- Inspect and maintain the site and the switch regularly.

- Have the emergence power switch on the site. In case of emergence, switch off the power immediately.

**Caution!**

Potential risk include: Electric leakage, Power supply arcing, Power line breakage, Imperfect earth, Overload circuit and Electrical short circuit. If electric shock, fire, electrical short circuit occurs, please cut off the electricity supply and alarm rapidly. Rescue the injured person in the contingency under inherently safe, give the injured person proper first aid treatment according to the injury state, and seek help from the Medical Emergency using various ways.

## 2.2 Installation Preparation

### 2.2.1 Verify the Package Contents

Please unpack the shipping package and verify carefully the contents inside.

### 2.2.2 Required Tools and Utilities

The required tools and utilities are shown below:

- Cross screwdrivers
- Flat-blade screwdriver
- ESD wrist strap
- Antistatic uniform

Caution!

Users should prepare the required tools and utilities by themselves.

## 2.3 Device Installation

### 2.3.1 Installing the Switch

Please mount switch on the 19" rack as below:

1. Attach the 2 brackets on the switch with screws provided in the accessory kit.



Figure 2-1 switch install sketch map on the rack using stock

2. Put the bracket-mounted switch smoothly into a standard 19" rack. Fasten the switch to the rack with the screws provided. Leave enough space around the switch for good air circulation.

Caution!

The brackets are used to fix the switch on the rack. They can't serve as a bearing. Because the device is heavy, we suggest installing the rack tray on the bottom of the switch. Do not place anything on top of the switch. Do not block the blowholes on the switch to ensure the proper operation of the switch. If there is no tray, add the lugs (The

device provides it) on the back of the switch to make it fix on the rack.

There is no back horn iron in standard configuration. If users bought it, the figure of installation is below:



Figure 2-2 The figure of switch installing on the rack by using the front and back horn iron  
Caution!

The brackets are used to fix the switch on the rack. They can't serve as a bearing. Please place a rack shelf under the switch. Do not place anything on top of the switch. Do not block the blowholes on the switch to ensure the proper operation of the switch.

### 2.3.2 Connecting Console

switch provide a serial RJ45 console port.



Fig 2-3 Connecting Console to switch

The connection procedure is listed below:

1. Find the console cable provided in the accessory kit. Attach the RJ45 end to console port of the switch.
2. Connect the other side of the console cable to a character terminal (PC).
3. Power on the switch and the character terminal. Configure the switch through the character terminal.

### 2.3.3 SFP/SFP+/SFP28 Transceiver Installation

Switch has multiple 25Gb interfaces and provides multiple 25GB or 1000Mb SFP or 10Gb SFP+ transceiver slots.

The procedure for installing the SFP/SFP+/SFP28 transceiver is shown below:

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

Step 2: Insert the SFP/SFP+/SFP28 transceiver to the guide rail inside the fiber interface line card. Do not put the SFP/SFP+/SFP28 transceiver up-side-down.

Step 3: Push the SFP/SFP+/SFP28 transceiver along the guide rail gently until you feel the transceiver snap into place at the bottom of the line card.

Note: the SFP/SFP+/SFP28 transceiver is hot swappable.

Caution!

Do not stare directly at the 2 fiber bore in the SFP/SFP+/SFP28 transceiver when the switch is in operation, otherwise the laser may hurt your eyes.

### 2.3.4 Copper Cable/Fiber Cable Connection

Copper cables should be connected as below:

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

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

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

Caution!

Please verify the sign above the port to ensure using the right port. Connecting to wrong ports might damage the switch.

Fiber cables should be connected as below:

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

Step 2: Attach one end of the fiber cable to the SFP/SFP+/SFP28 transceiver, and attach the other end to the transceiver of the other devices. Note: SFP/SFP+/SFP28 transceiver's TX port should be connected to RX port of other device, and SFP/SFP+/SFP28 transceiver's RX port should be connected to TX port of other device.

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

**Caution!**

Please verify the sign above the port to ensure using the other ports. Connecting to wrong ports might damage the transceiver or the other ports. When connecting other devices through a fiber cable to the switch, the output power of the fiber cable must not exceed the maximum received power of the corresponding modules. Otherwise, it will damage the fiber transceiver. Do not stare at the fiber bore when the switch is in operation. That may hurt your eyes.

### 2.3.5 Power Supply Connection

Switch uses 220V AC power. Please read the power input specification for the detailed information.

Power supply connection procedure is described as below:

1. Insert one end of the power cable provided in the accessory kit into the power source socket (with overload and leakage protection), and the other end to the power socket in the back panel of the switch.
2. Check the power status indicator in the front panel of the switch. The corresponding power indicator should light. Switch is self-adjustable for the input voltage. As soon as the input voltage is in the range printed on the switch surface, the switch can operate correctly.
3. When the switch is powered on, it executes self-test procedure and startups.

**Caution!**

The input voltage must be within the required range, otherwise the switch can be damaged or malfunction. Do not open the switch shell without permission. It can cause physical injury.

### 2.3.6 Ground Cable Connection

Grounding: The chassis of the equipment must be grounded properly so that the lightning can flow to the ground, which improves the capability of the chassis for resisting the electromagnetic interference.

1. Ensure that the grounding cable is connected correctly so that the equipment is protected against lightning and interference. The correct connection of the grounding cable is an important measure to ensure the human safety.
2. Connect the chassis to the ground by using a grounding cable. The grounding resistance must be smaller than 0.10 ohms and the gauge of the grounding cable must be greater than 10 AWG and the length is 50 cm.



3. Installation steps:

Step 1: Ensure the power switch is set to the off position.

Step 2: Use the screwdriver to turn the screws on the earth ground screw point.

Step 3: Strip one end of the ground wire to the ground hole of system.

Step 4: Connect the other end of the ground wire to a suitable grounding point of building at your side.