

# **SM3100-28TP-AC Installation Manual**



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Maipu values and appreciates comments you may have concerning our products or this document. Please address comments to:

Maipu Communication Technology Co., Ltd

No. 16, Jiuxing Avenue

Hi-tech Park

Chengdu, Sichuan Province

People's Republic of China - 610041

**Tel:** (86) 28-85148850, 85148041

**Fax:** (86) 28-85148948, 85148139

**URL:** [http:// www.maipu.com](http://www.maipu.com)

**Email:** [overseas@maipu.com](mailto:overseas@maipu.com)

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## Chapter 1 Product Introduction

SM3100-28TP-AC series switches become the latest generation of intelligent carrier-class Ethernet access Maipu SM3100-28TP-AC Series switches. SM3100-28TP-AC series applies to various Ethernet access scenarios. Based on high-performance hardware of a new generation and the intelligent CPU, the SM3100-28TP-AC provides abundant and flexible service features, ensuring operability, manageability, and expansibility. SM3100-28TP-AC withstands lightning strikes and bears excellent security features. It also supports strong ACL functions, QinQ, and 1:1 and N:1 VLAN switch to flexibly deploy VLANs



**Picture1-1 SM3100-28TP-AC switch**

### 1.1 Product Features and Advantages

#### **1:** Strong stability of the equipment

Low-power with no fans, can work in -15 °C ~ +55 °C environment, 1-4 port built-in increased hardware, lightning protection over 6KV, power surge can prevent the 2KV about Ethernet ring protection, GERP/ERRP healing time <50ms, backup link FlexLink and dynamic link aggregation LACP

#### **2: Comprehensive security features**

1K L2-L4 basic/extended/ defined ACL 802.1x and MAC user authentication, Quad user bound DHCP Snooping and IP Source Guard EI version supports user-based dynamic ARP inspection and protection

#### **3: Abundant service Capability**

Support port / flexible QinQ function, 1:1 and N:1 VLAN changes over 1K multi-cast ,  
IGMP SnoopingV1/V2/V3

Fast Leave, Inter-VLAN multicast and multicast control

DHCP Option82 and PPPoE+ users report physical location

#### **4: Perfect maintenance and management**

NMP/Telnet/ Cluster, EI version also supports SSH/WEB

VCT Physical cable detection, 802.3ah link layer OAM

Loopback detection, LLDP Neighbor detection, real-time traffic statistics based on Telnet  
port utilization.

## **1.2 Hardware Features**

### **1.2.1 Front Board of SM3100-28TP-AC Switch**



**Picture 1-2 The front board of SM3100-28TP-AC**

As above , picture 1-2 shows the front board of SM3100-28TP-AC, light meanings:

1. 24\*10/100BASE-TXPOE and LINK/ACT light switch
2. RJ-45 Console
3. 2\*100/1000Base-X SFP
4. 2\*100/1000Base-X SFP(Combo)
5. 2\*10/100/1000Base-T(Combo)
6. 24\*10/100Base-TX(POE)
7. 2\*100/1000Base-X SFP LINK/ACT light indicator
8. 2\*100/1000Base-X Combo LINK/ACT light indicator
9. 2\*100/1000Base-X LINK/ACT light indicator or POE power indicator, a common light per SWAP switch on POE.
10. When remark 10 shows POE lights on, the lights remark 9 mean

24\*10/100Base-TX(POE) power indicators, otherwise POE lights off, the lights remark 9 mean LINK/ACT

11. Power indicators

12. System indicators

The meaning of indicator in front board of SM3100-28TP-AC Ethernet Switch

is as in following table:

Indicator	Panel indicator	Status	Meaning
System operating indicator(12)	SYS	Flicker	System operation normal
		Always on/off	System operation abnormal
Power indicator(11)	PWR	On	Power on
		Off	Power off
POE Power indicator(10) (per SWAP switch)	POE	On	Remark 9 as POE power indicator
		Off	Remark 9 as LINK/ACT light indicator
down port light indicator (9)	POE lights on	On	port can supply PD
		Off	port can't supply PD
	POE lights on	Off	Disconnection
		On	Normal connection
		Flicker	Sending/receiving data
uplink Combo light	25X, 26X	Off	Disconnection

indicator(8)		On	Normal connection
		Flicker	Sending/receiving data
uplink Combo light indicator(8)	27X, 28X	Off	Disconnection
		On	Normal connection
		Flicker	Sending/receiving data

Table 1-1 Indicator in front board of SM3100-28TP-AC

### 1.2.3 SM3100-28TP-AC Switch System Features

**Table 1-2 System features of SM3100-28TP-AC Fast Ethernet Switch**

Item	Description
Console	RJ45, EIA/TIA-232
100M Ethernet interface	100M Ethernet interface(RJ45)
Combo	2 extended uplink module
FLASH	4Mbytes
SDRAM	32Mbytes
Size(W×D×H)	440×160×44mm
Weight	1.5Kg
Input voltage	AC: 176-265V, 47/63Hz,
	0-50℃
Humidity	5-95%
Rated power supply	over 18W(3.3V output power)
Max power consumption	13.5W
POE	24*100M ports support POE power supply function



	support 802.3af and 802.3at, single-port maximum power:37W
--	--

### 1.3 Service Features

**Table 1-3 Service features of SM3100-28TP-AC**

Service	Realization
VLAN	port-based VLAN and IEEE 802.1Q VLAN
	support GVRP VLAN Registration Protocol
	support 4K IEEE 802.1Q VLAN
MAC	8K MAC address
	support manual add/delete the MAC address table
	Support manual configuration MAC address aging time
	Supports port disable MAC address learning function
	support the quantity of MAC address
	support port MAC address filtering
Multicast	1K entries
	support GMRP
	support IGMP-SNOOPING
Broadcast storm suppression	Broadcast packet number can be configured
STP	STP/RSTP/MSTP
Port aggregation	Support 31 groups port aggregation

	support 8*10/100Base-Tadaptive port binding
	Support gigabit port aggregation
Mirror	Support interface and traffic mirroring
Fast filtering	support
QoS	8 QoS queues per port;
ACL	Support ACL-based VLAN and VLAN convert
	Supports packet redirection
Upgrading	Support Xmodem, FTP and TFTP protocol to realize upgrading
Management	Supports command-line interface(CLI)
	Support Telnet remote configuration
	Support console configuration
	Supports SNMP management
Security	Support password gathering authentication of administrator
Maintenance	Supports debug information output
	Support PING

## Chapter 2 Preparations for Installation

### 2.1 Security Notice

To avoid device damaging and bodily injured caused by unsuitable operation, please follow these notices:

- **Before cleaning switch, pull out the plug of switch. Do not wipe it with wet cloth and liquid.**
- **Do not locate switch near water or humid place, and prevent water and humidity entering switch.**
- **Do not locate switch on unstable case or desk. Falling may cause severe damage to switch.**
- **Keep the ventilation of the room and the switch.**
- **Switch can work normally under correct power pressure. Please affirm the power pressure of switch is the same as that marked.**
- **To avoid the danger of electricity attacking, do not open the cabinet shell though the switch is power off.**

### 2.2 Environment

SM3100-28TP-AC series switches must be used indoors, in order to ensure normal operation and extend the life of the switch, use the site should meet the following requirements.

#### 2.2.1 Temperature/Humidity

To guarantee normal working and life span of the switch, certain temperature and humidity can be maintained in the equipment room. If the humidity is too high, the insulating of insulating material may be not good, even creepage and sometimes may cause the change of mechanical performance and rustiness of metal parts. If the related

humidity is low, the insulated gasket will be shrinkable which will cause the looseness of captive screw. In the dry climate, electrostatics may be caused which is harmful for the CMOS circuit of switch. The higher the temperature is, the more dangerous it is. It will greatly reduce the reliability of the switch, and long-term high temperature will affect the life span of the switch. Over high temperature may accelerate the aging of the insulated materials.

**Table 2-1 The temperature and humidity requirements**

Temperature		Humidity	
Long-term	Short-term	Long-term	Short-term
15°C-30°C	0°C-50°C	40%-65%	10%-90%

**Note:**

- 1. short-term means working no more than 48h less than 15 days a year;**
- 2. The critical working environment means the possible temperature and humidity when there is no air-conditional. It should be recovered in 5h.**

**2.2.2 Neatness**

Dust is harmful for the operation of the switch. The dust in the room fell on the equipment may cause the absorption of the electrostatics, which may influence the life span of the switch and cause the communication failure. The requirement for the dust and the grin size is as following:

**Table 2-2 The requirement for the dust in switching room**

The maximum diameter(um)	0.5	1	3	5
The maximum thickness (the number of grain per m <sup>3</sup> )	1.4×10 <sup>7</sup>	7×10 <sup>5</sup>	2.4×10 <sup>5</sup>	1.3×10 <sup>5</sup>

Besides dust, switching room also strictly requires the content of salt, acid and sulfide. This harmful gas may accelerate the rusting and aging of some parts. Such harmful gas must be prevented as SO<sub>2</sub>, H<sub>2</sub>O, NO<sub>2</sub>, NH<sub>3</sub> and CL<sub>2</sub>. The restricted value is as following:

**Table 3-3 The limitation of harmful gas**

Gas	Average(mg/m <sup>3</sup> )	Maximum(mg/m <sup>3</sup> )
SO <sub>2</sub>	0.2	1.5
H <sub>2</sub> S	0	0.03
NO <sub>2</sub>	0.04	0.15
NH <sub>3</sub>	0.05	0.15
Cl <sub>2</sub>	0	0.3

### 2.2.3 Static Free

SM3100-28TP-ACC makes a lot of consideration in anti-static, but static electricity over a certain tolerance limit will disruptive the circuit even the whole switch.

In the network connected by the switch, electrostatic induction mainly from two aspects: the outdoor high-voltage power lines, lightning and other external electric field; indoor environment, flooring materials, the whole structure of the internal system. In order to prevent electrostatic damage, we should:

Equipment and floor ground connection;

Anti-Indoor dust;

Maintain proper temperature and humidity conditions;

When touch the circuit board, user should wear anti-static wrist strap and overalls;

The demolition of the circuit board face up on an anti-static working surface or an anti-static bag;

Avoid direct touching circuit components.

### 2.2.4 Anti-Jamming

Switch may receive the jamming from exterior system. This jamming influences devices through capacitance coupling, inductance coupling, electromagnetic wave radiation, common impedance (including grounding system) coupling and conducting wire (power wire, cable and outputting wire). Pay attention to the followings:

- **AC power supply uses TN system, and the plug adopts single-phase three-line power supply with protecting earth wire (PE) for filtering circuit to filtrate the jamming of electricity network.**

■ **The location the switch works must be far away from high power wireless launcher, radar launcher and high frequency and current devices.**

■ **Adopts electromagnetism shield when necessary, such as adopting shield cable to be interface cable.**

### **2.2.5 Anti-Lightning**

SM3100-28TP-ACC makes a lot of consideration in anti-lightning, but lightning over a certain tolerance limit will disruptive the circuit even the whole switch.

Users should:

- Ensure chassis is well connected to the ground
- AC power outlet is well connected to the ground

## **2.3 Check Device and Accessories**

Under the Confirm the required Installation environment, you can open the box. However, before the formal installation, you need to carefully check the packing list of the device within the box of equipment and accessories are complete.

## **2.4 Tools for Installation**

Tools needed:

- **Cross screwdriver**
- **Antistatic wrist strap**
- **Wire stripper**

Cable needed:

- **Power cable**
- **Console cable**
- **RJ-45 connector reticle**

Device needed:

- **Configuration terminal (can be PC)**

## Chapter 3 Installation

### 3.1 Preparing for Installation

#### 3.1.1 Preparation Tools

- **Cross screwdriver**
- **Antistatic wrist strap**
- **Wire stripper**

Cable needed:

- **Power cable**
- **Console cable**
- **RJ-45 connector reticle**

Device needed:

- **Configuration terminal (can be PC)**

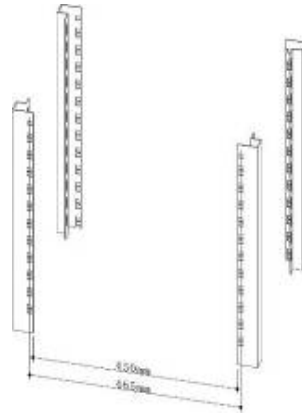
#### 3.1.2 Check Cabinet

Maipu company equipment can be installed in the cabinet and properly fixed; Please leave enough space for empty slot before installation of equipment;

**Picture 3-1 Horizontal mounting hole center distance and horizontal space for installation**

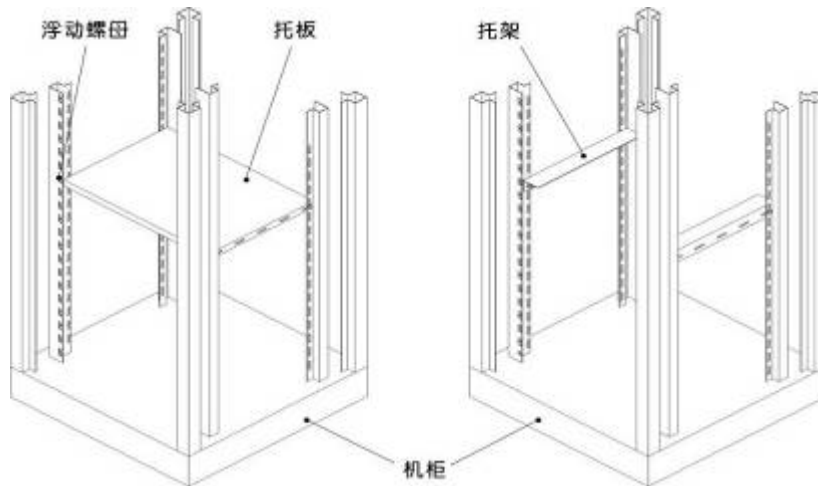
Use a ruler or tape measure the level of the cabinet mounting hole center distance and horizontal installation of the net space。 Size shows as picture 3-1:





Check the cabinet on the pallet bracket, floating nuts, screws, cabinet air baffles, etc. Pallet bracket, floating nuts, screws, etc are rack cabinet air baffle standard accessories, different size or shape of the cabinet accessories exist differences. So Cabinet accessories add should contact the provider of the original cabinet accessories;

Equipment must be installed in the pallet rack or bay (in pairs) above. So Please install the equipment before the pallet or tray pre-installed in the cabinet, as shown in Figure 3-2.



**Picture 3-2 Pallets or pre-installed bracket diagram**

No recommended that place multiple devices overlap.

### 3.1.3 Inspect Equipment and Accessories

After confirming Installation environment to meet the requirements, open the box and control equipment packing equipment, carefully check the packing list inside the equipment and accessories are complete or not.

If you find any items within the box are missing or damaged, immediately contact the dealer or sales of the equipment sales contact, feedback timely;

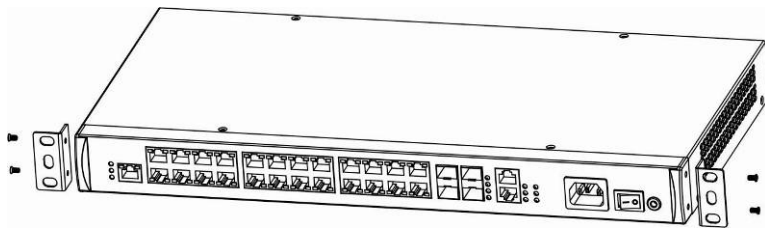
### 3.2 Installation Steps

The process of SM3100-28TP-AC installation is as following:

Step 1: Examine grounding and stability of the cabinet. Use screw to fasten hanger to the two sides of the front board and back board of the switch;

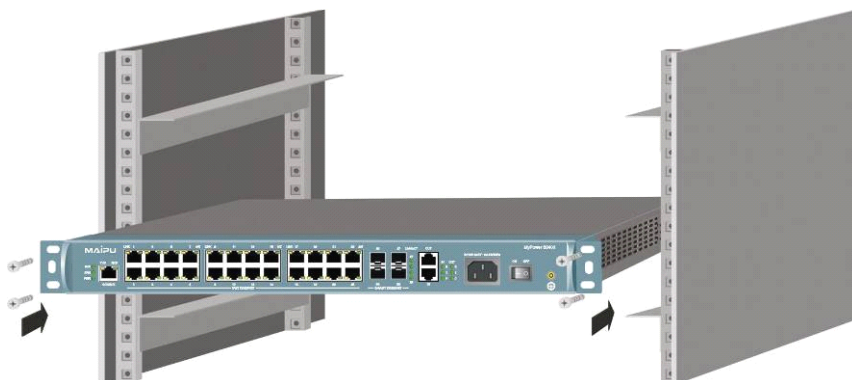
Step 2: Locate switch on the salver of the cabinet. Move it to the suitable location along with the slide of the switch. Keep some space between switch and the slide.

Step 3: Fasten hanger to the fixed slide of the cabinet to guarantee the bracket of each slot and hanger of the switch are fastened to the cabinet



**Picture 3-3 Installation Picture**

Step 4: The hanger of the switch is not used to bear the load but fasten. Switch is installed in a 19" cabinet. There must be slides in chassis (fastened in frame) to support switch



**Note:**

- **The heaviest device should be installed near the bottom of the cabinet.**
- **For cooling, there should be 1U distance between two installed devices.**

## 3.3 Connect to Ground

This section describes SM3100-28TP-AC Series switch access to the network approach including: connect the switch console port

### 3.3.1 Connect to Switch Port

SM3100-28TP-AC switch provides a EIA/TIA-232 asynchronous serial console port. Through this port, user can configure With RS-232 serial ASCII terminal(a normal PC). Detailed connectivity and configuration see the following sections.

Through terminal switch, please connect as below steps:

Step 1: find a character terminal, this terminal can be a character with standard RS-232 serial terminal, but also a normal PC, more commonly the latter.

Step 2: Verify that the switch or character terminal which is under the power. The RS232 serial port and port of the switch is connected through character terminal configuration cable

#### **Note:**

**Please confirm connections on the interface identifier so as to avoid into the other connector**

## 3.4 Connect to Ground Wire

The primary protection of SM3100-28TP-AC switch about the normal ground connection is necessary of lightning protection, anti-interference Users should be careful to correctly connect the ground wire.

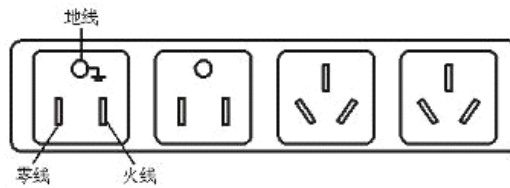
Use a thick wire and connect the points with the earth and requires grounding resistance with less than 4 ohms. If the switch is installed in the cabinet, the cabinet also needs to connect to the ground

### 3.5 Connect to Power

SM3100-28TP-AC switches use stable power supply system ,less requirement about AC input power, support 100V and 240V, DC frequency 50/60Hz It may distinguish based on different power supply quality from different places, SM3100-28TP-AC switch has a greater range of input power

Input power: AC (100-240V, 50/60Hz)

As below shows AC power outlet shape



**Picture 3-5 normal AC power outlet shape**

Follow these steps to connect and connected to the power supply:

1: For AC

Step 1: Connect chassis ground wire which switch takes along with to one end of grounding column from switch rear panel ,the other side connects the ground nearby.

Step 2: Connect power wire which switch takes along with to one end of power socket from switch front panel ,the other side connects the AC socket.

Step 3: Check indicator lights of the switch on the front panel power. Light on means the correct connection.



Caution: Cut off the electricity before installing 48V power wire. The above operation with electricity is forbidden.

## Chapter 4 Cable Description

### 4.1 Ethernet interface cable

SM3100-28TP-AC switch cable is 8-core unshielded twisted pair. 1, 2 is for sending and 3, 6 is for receiving.

**Table 4-1 RJ45 through line Cat5**

RJ45	Signal	Direction	RJ45	Description	Length
1	TX0+	—>	1	1 twisted	2m
2	TX0-	—>	2	pair	
3	RX0+	<—	3	2 twisted	
6	RX0-	<—	6	pair	
4	48V	—>	4	3 twisted	
5	48V	—>	5	pair	
7	0V	<—	7	4 twisted	
8	0V	<—	8	pair	

**Table 4-2 RJ45 crosswire Cat5**

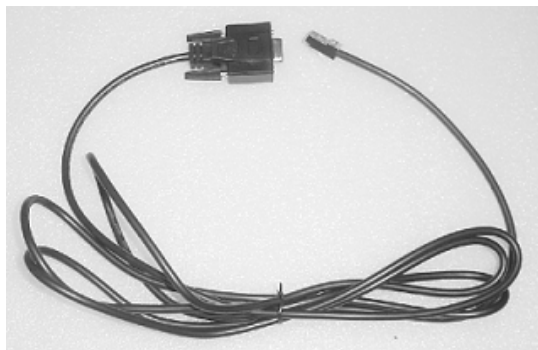
RJ45	Signal	Direction	RJ45	Description	Length
1	TX+	—>	3	1 twisted pair	2m
2	TX-	—>	6		
3	RX+	<—	1	2 twisted pair	
6	RX-	<—	2		
4	48V	—>	7	3 twisted pair	
5	48V	—>	8		
7	0V	<—	4	4 twisted pair	
8	0V	<—	5		

## 4.2 Ethernet Optical Interface Cable

SM3100-28TP-AC fiber is SM or MM LC interface.

## 4.3 Console Cable

Console cable is a shield cable of 9 cores. One end is crimped RJ-45 connector, which is inserted to Console interface; the other end is a connector with DB-9 (holes). The Console cable is as the following picture:



Picture 4-1 The picture of Console cable

**Table 4-3 Connecting of Console**

RJ45	Signal	Direction	DB9	Length
1	CTS	—>	8	3m
2	DSR	—>	6	
3	RXD	—>	2	
4	GND	---	5	
5	---	---	---	
6	TXD	<—	3	
7	DTR	<—	4	
8	RTS	<—	7	
	---	---	1	
	---	---	9	

## Chapter 5 Troubleshooting

### 5.1 Power System Failure

SM3100-28TP-AC Fast Ethernet Switch can check the power system failure according to the power indicator on the front board: when the power system works normally, the power indicator keeps on; if it is off, please examine as following:

- The correct connection of power wire.
- The matching of power supply of switch and power required.

### 5.2 Configuration System Failure

After the power of SM3100-28TP-AC Fast Ethernet Switch is on, if the system works normally, the booting information will be displayed in configuration terminal; if there is failure in configuration system, it will display nothing or illegible characters.

### 5.3 Troubleshooting on No Displaying

After the power is on, if the configuration terminal displays nothing, please examine the device as following:

- **The power works normally.**
- **The correct connection of Console cable**

If there is no problem in above examination, maybe there is something wrong with the parameter configuration of the terminal (such as hyper terminal) or the configuration cable.

### 5.4 Troubleshooting on Displaying Illegible Characters

If illegible characters are displayed, parameter configuration of terminal (such as hyper terminal) is incorrect. Please affirm parameter configuration of terminal (such as hyper terminal): baud rate is "9600", data bit is "8", and parity check is "none", stop bit is "1",

flow control is “none”, and choose terminal emulation as “auto-detect”.