8 100M M12 + 2 Gigabit M12 Managed PROFINET Industrial Ethernet Switch

User Manual

Document Version: 01

Issue Date: 02/10/2023

Preface

This Switch User Manual has introduced:

- Product features
- Product network management configuration
- Overview of related principles of network management

Audience

This manual applies to the following engineers:

- Network administrators
- Technical support engineers
- Network engineer

Port Convention

The port number in this manual is only an example, and does not represent the actual port with this number on the device. In actual use, the port number existing on the device shall prevail.

Text Format Convention

Format	Description
" "	Words with “” represent the interface words. Such as: “Port No.”.
>	Multi-level path is separated by ">". Such as opening the local connection path description: Open "Control Panel> Network Connection> Local Area Connection".
Light Blue Font	It represents the words clicked to achieve hyperlink. The font color is as follows: ‘Light Blue’.
About this chapter	The section ‘about this chapter’ provide links to various

Format	Description
	sections of this chapter, as well as links to the Principles Operations Section of this chapter.

Symbols

Format	Description
 Notice	Remind the announcements in the operation, improper operation may result in data loss or equipment damage.
 Warning	Pay attention to the notes on the mark, improper operation may cause personal injury.
 Note	Make a necessary supplementary instruction for operation description.
 Key	Configuration, operation, or tips for device usage.
 Tip	Pay attention to the operation or information to ensure success device configuration or normal working.

Revision Record

Version No.	Date	Revision note
01	02/10/2023	Product release

Contents

Part One: Operation

1 Login to the Web Interface

1.1 System Requirements for WEB Browsing

Using this equipment, the system should meet the following conditions.

Hardware and Software	System requirements
CPU	Above Pentium 586
Memory	Above 128MB
Resolution	Above 1024x768
Color	256 color or above
Browser	Internet Explorer 6.0 or above
Operating system	Windows XP/7/8/10

1.2 Configure IP Address of the Device

The device has no IP address by default, so you can search and configure the IP address of the device through PROFINET configuration software such as STEP 7 and TIA Portal. Or use the command line to configure the IP address of the device through the CONSOLE port. If the IP address of the device is configured to 192.168.1.254, the command line operation is as follows:

```
User: admin
Password: admin
```

```
Switch> enable
Switch# configure terminal
Switch(config)# ip address 192.168.1.254/24
```

When logging into the CLI interface of the device, the default username and password are “admin”; please strictly distinguish capital and small letter while entering.

1.3 Setting IP Address of PC

When configuring a device through the Web:

- Before conducting remote configuration, please confirm the route between computer and device is reachable.
- Before making a local configuration, make sure that the IP address of the computer and the serial server are on the same subnet.

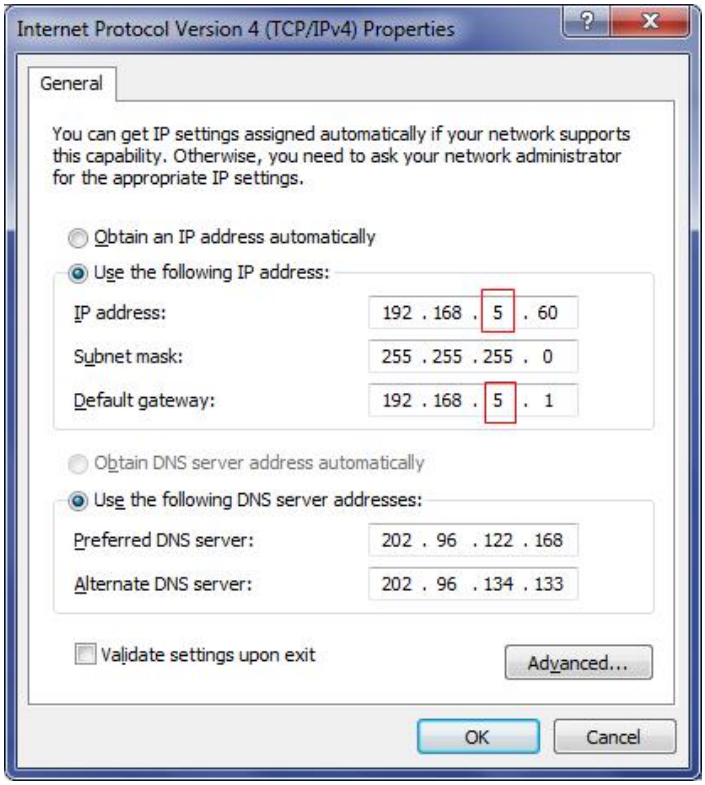
Eg: Assume that the IP address of the device is 192.168.1.254, the IP address of the current PC is 192.168.5.60, change the network segment "5" of the IP address of the PC to "1".

Operation Steps

Amendment steps as follow:

Step 1 Open "Control Panel> Network Connection> Local Area Connection> Properties> Internet Protocol Version 4 (TCP / IPv4)> Properties".

Step 2 Change the selected "5" in red frame of the picture below to "1".



Step 3 Click “OK”, IP address is modified successfully.

Step 4 End.

1.4 Log in the Web Configuration Interface

Operation Steps

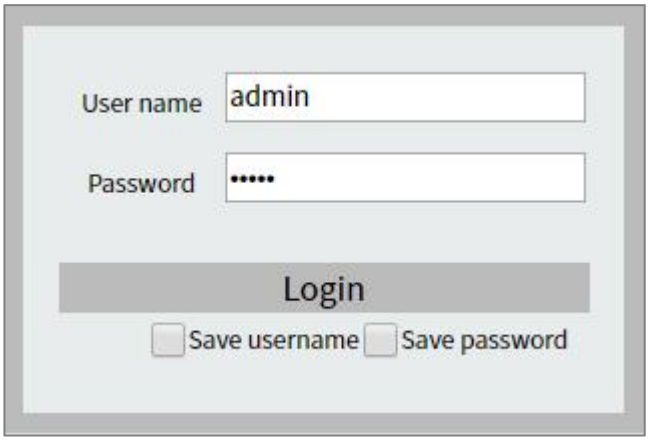
Login in the web configuration interface as follow:

Step 1 Run the computer browser.

Step 2 Enter device’s IP address in the address bar of the browser.

Step 3 Click the “Enter” key.

Step 4 Pop-up dialog box as shown below, enter the user name and password in the login window.



Note:

- The default username and password are “admin”; please strictly distinguish capital and small letter while entering.
- Default user account has the administrator privilege.

Step 5 Click "Login".

Step 6 End.

After login in successfully, user can configure relative parameters and information according to demands.

2 System Information

2.1 System Information

Function Description

On the “System Information” page, you can view port information, leakage current and system messages.

Operation Path

Click to open: “System Information”.

Interface Description

System information interface as follows:

The main element configuration description of state information interface:

Interface Element	Description
Port Information	**Port Information area box**
Overview	Port status information, such as port working status, IP address of the opposite end, port speed and duplex mode.
Netload	Port network load status.
Discards	Statistics on the number of port dropped data frames.
Errors	Statistics on the number of port error data frames.
Leakage	**Leakage current area box**
Peak	Peak leakage current between device port and shell ground.
RMS	The root mean square value of the leakage between the device port and the shell ground is the effective value.
Message	**Report Area Frame**
Message	Number of logs, click the report icon to view the log information content.
Delete messages	Delete button is used to delete the contents of log information.
Delete counter	Delete button is used to clear the number of logs.
Current time	Current system time information. Users can specify the time zone and server in “NTP Configuration”.
Running time	Current device running time after power on.
System voltage	Display the voltage of the current power, its unit V.

Interface Element	Description
value	
CPU usage	CPU usage of the current device. Note: When the CPU utilization rate and memory utilization rate are lower than 90%, the system is running normally.
Memory usage	Memory usage of the current device. Note: When the CPU utilization rate and memory utilization rate are lower than 90%, the system is running normally.

Note

Port information icon is as follows:

- No fault: the port communication is normal and has no fault;
- Alarm: the port has a fault, but it doesn't cause the abnormal communication. The alarm information can be processed locally;
- Fault: the port has a fault, and the port can't communicate normally, so the fault information should be dealt with in time;
- No connection/no communication: the port is not connected, and the device/network fails to communicate.

3 System Configuration

3.1 Function Preview

Function Description

On the "Function Preview" page, you can view device configuration information such as device information, basic settings, IP configuration, system configuration, port configuration, alarm configuration, layer 2 configuration, network security, advanced configuration and system maintenance, etc. You can enter the corresponding function configuration interface through the link button.

Operation Path

Open in order: "System Configuration > Function Preview".

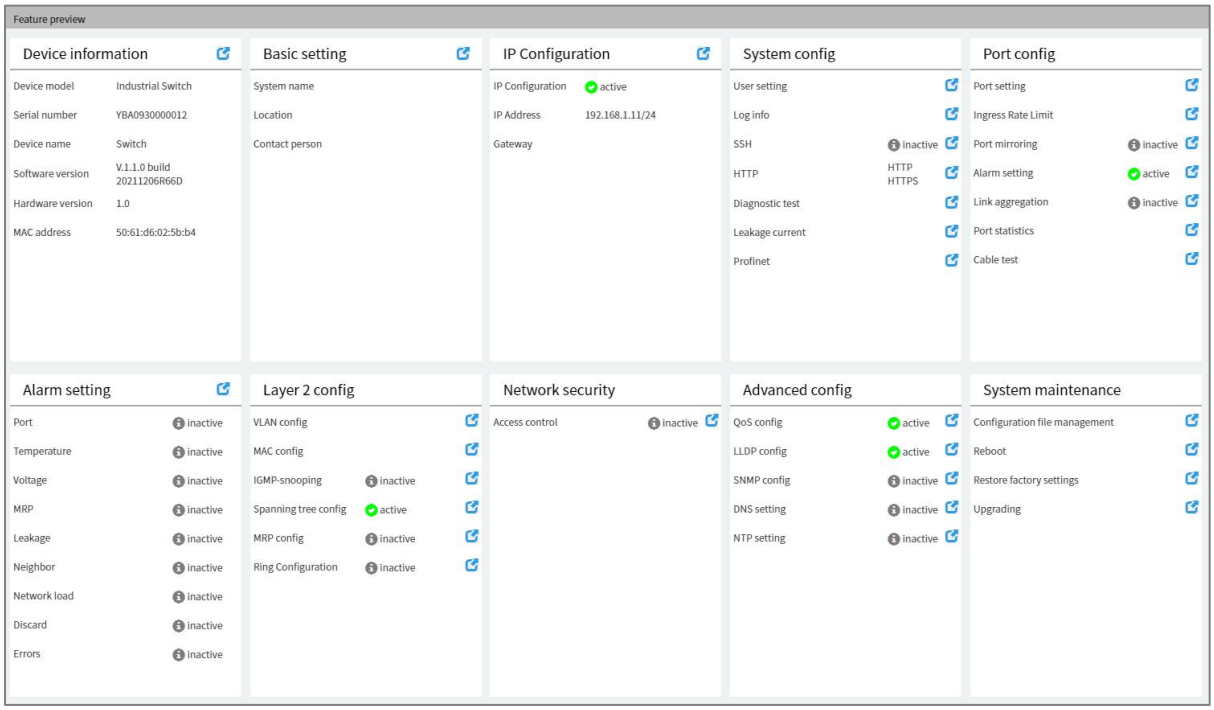
Interface Description

The function preview interface is as follows:

Note

The function status is shown as follows:

- Active: indicates that the corresponding function is active
- Standby: indicates that the corresponding function is inactive



The main elements configuration description of system configuration interface:

Interface Element	Description
Device information	**Device area box and edit button**
Device model	Equipment model name.
Serial number	SN code, product serial number.
Device name	Device type.
Software Version	Software version information currently in use.
Hardware Version	Hardware version information currently in use.
MAC Address	Hardware address of device factory configuration.
Basic Settings	**Basic Settings**
System Name	Device name.
Location	Device installation location.
Contact Person	Device contact information.
IP Configuration	**Configure IP area box and edit button**
IP Configuration	Current IP address status of the device.
IP Address	IP address and subnet mask information of the device.
Gateway	Current gateway information of the device.
System Configuration	**System Configuration area box**
System Configuration	System configuration functions and link button options are as follows:

Interface Element	Description

	• User Settings
	• Log Information
	• SSH: SSH service status
	• HTTP: HTTP or HTTPS status
	  - HTTP: HTTP enable
	  - HTTPS: HTTPS enable
	  - HTTP HTTPS: HTTP and HTTPS enabled
	• Diagnose Test
	• Leak current
	• Profinet

Port configuration	**Port configuration area box**
Port configuration	Port configuration functions and link button options are as follows: • Port • Temperature • Voltage • MRP • Leakage • Neighbor • Network Load • Discard • Errors
Layer 2 Configuration	**Layer 2 Configuration Area Box**
Layer 2 Configuration	Layer 2 configuration functions and link button options are as follows: • VLAN Configuration • MAC Configuration • IGMP-snooping • Spanning-tree Configuration • MRP Configuration • Ring Configuration
Network Security	**Network Security Area Box**
Network Security	Network security features and link button options are as follows: • Access Control
Advanced Configuration	**Advanced Configuration Area Box**
Advanced	Advanced configuration functions and link button options are

Interface Element	Description
Configuration	as follows: • QOS Configuration • LLDP Configuration • SNMP Configuration • DNS Configuration • NTP Configuration
System Maintenance	**System Maintenance Area Box**
System Maintenance	System maintenance functions and link button options are as follows: • Configuration file management • Reboot • Restore factory defaults • Upgrading

3.2 Basic Settings

Function Description

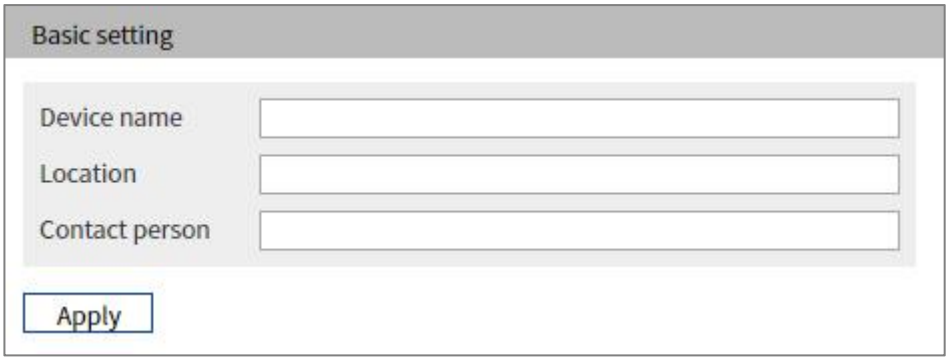
On the “Basic Settings” page, you can configure information such as the name, location and contact person of the device.

Operation Path

Open in order: "System Configuration > Basic Settings".

Interface Description

The basic settings interface as follows:



The main element configuration description of basic settings interface:

Interface Element	Description
Device name	Identification name of the device in the network.
Location	Installation position of device, which is convenient for locating.
Contact person	Device contact name.

3.3 Network Setting

Function Description

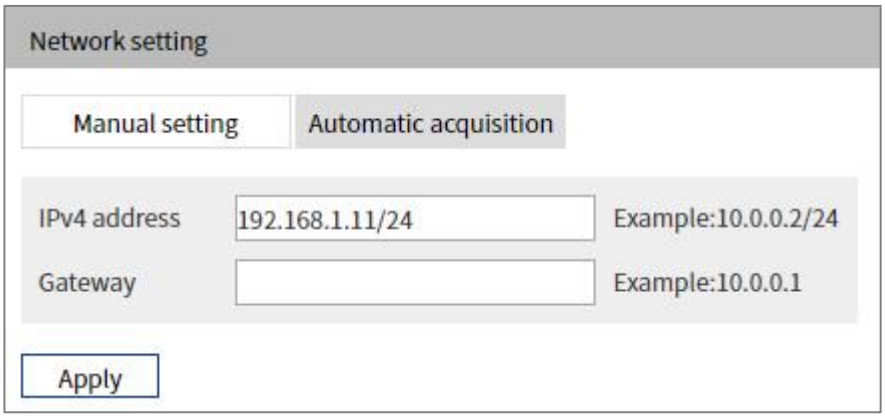
On the “Network Settings” page, user can set the IP address and gateway of this device. Network supports two modes, DHCP and manual settings.

Operation Path

Open in order: " System Configuration > Network Setting".

Interface Description

Network Setting interface as follow:



The main element configuration description of network setting interface:

Interface Element	Description
Network Setting	The access method of IPv4 address, manual configuration and DHCP. • "Auto-takeover", auto-acquisition means that the DHCP function is enabled. At this time, the IP address of the

Interface Element	Description
	device can be obtained through the HyperTerminal; • "Manual adjustment", that is entering static IP address. User needs to fill in IPV4 address and gateway manually.
IPv4 address	Manually enter the IP address and subnet mask information of the device, for example: 10.0.0.0/24.
Gateway	Fill in the gateway address information of the device, for example: 10.0.0.1.

3.4 User Settings

Function Description

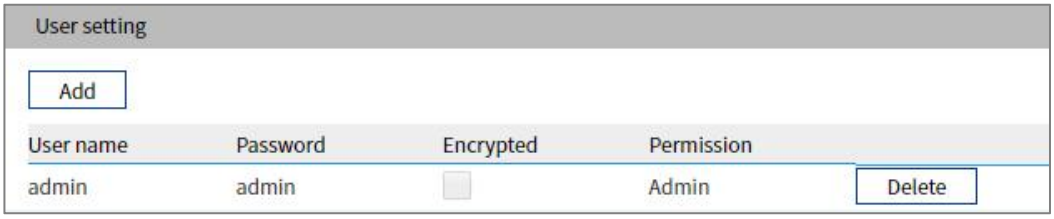
On the "User Settings" page, users can add and delete users freely. Users need to access the device by logging in with user name and password. The initial user name and password are admin.

Operation Path

Open in order: "System Configuration > User Settings".

Interface Description

User Settings interface as follows:



The main element configuration description of User Settings interface:

Interface Element	Description
Username	Visitor ID, cannot be empty. Note: • Both the username and password consist of uppercase and lowercase letters, numbers and underline; • Maximum 31 characters, if the user has existed in system, user should modify relative password and privilege.

Interface Element	Description
Password	Password for Visitor, cannot be empty, up to 31 characters. Note: • Both the username and password consist of uppercase and lowercase letters, numbers and underline;
Encrypted	Encryption mode check box: • Check: Use encrypted password • Uncheck: use cleartext password
Permission	The visitor's privilege: • User • Admin Note: • Privilege user: Only conduct read-only operation in the command line; • Privilege admin: It can conduct all operations. • In this device, these privileges only work when user adopts Telnet or HyperTerminal to access the device. Any privilege in the WEB interface can perform all operations.

3.5 Log Information

Function Description

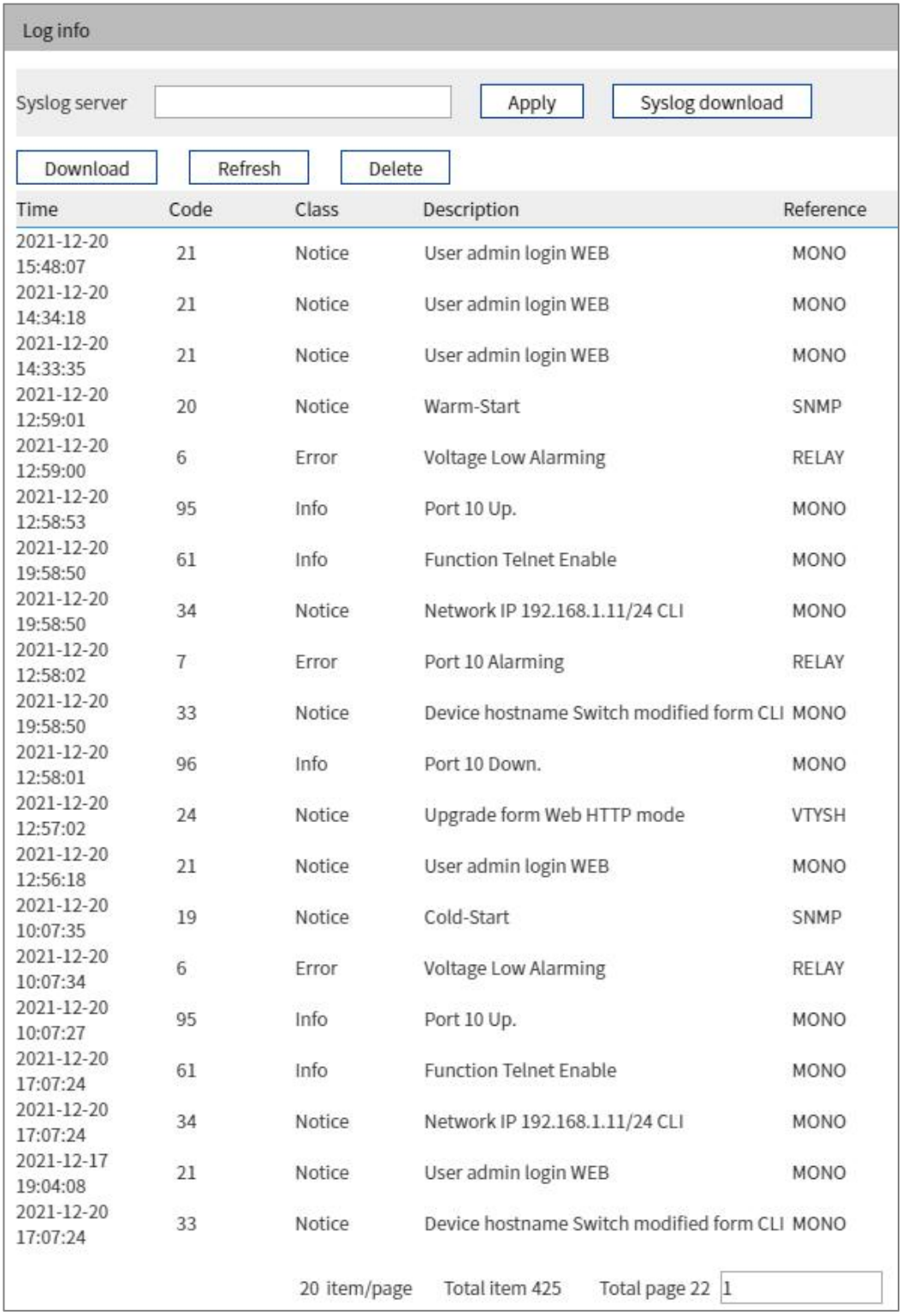
On the "Log Information" page, user can view the log information of the device and download the log information to the local host.

Operation Path

Open in order: “System Maintenance > Log Information”.

Interface Description

Log information interface as follow:



Main elements configuration description of log information interface:

Interface Element	Description
Syslog server	The IP address of the log server can remotely monitor the log information of the device system. Click the "Syslog download" button to download "sys.log" locally.

Interface Element	Description
Time	The date and time when the log information occurred.
Code	Please refer to the Appendix for the corresponding ID, specific description and level of the log events.
Description	Specific content or event description of log information.
Note	Description of log information events.
Reference	Log Information Module.
Operation	The operation button options are as follows: • Download: Download the current log information "user.log" file to the local host; • Refresh: Refresh the log information and reload the log list; • Delete: Clear all current log information.

3.6 SSH HTTP Settings

Function Description

On the “SSH HTTP Settings” page, you can enable/disable service functions such as SSH, TELNET, HTTP and HTTPS, and configure the port number corresponding to the protocol.

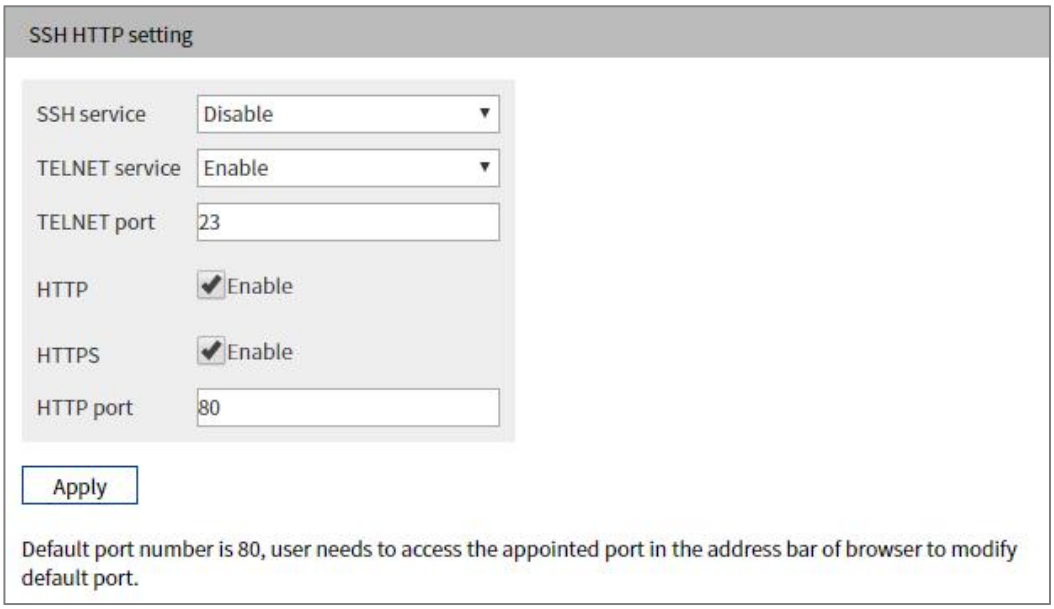
The full English name of SSH is Secure Shell. SSH is a security protocol based on application layer and transmission layer. SSH is a reliable protocol which provides security for remote login sessions and other network services. Using SSH protocol can effectively prevent information leakage in the process of remote management, and can also prevent DNS and IP spoofing. In addition, the transmitted data is compressed so that the transmission speed can be increased.

Operation Path

Open in order: "System Configuration > SSH HTTP Configuration".

Interface Description

SSH HTTP configuration interface is as follows:



The main element configuration description of SSH HTTP settings interface:

Interface Element	Description
SSH Service	SSH service function status, the options are as follows: • Disable; • Enable。
TELNET Service	TELNET service function status, the options are as follows: • Disable; • Enable。
TELNET Port	TELNET service port number, default port number is 23.
HTTP	Device HTTP protocol function status, enable check box. Note: When use HTTP to access, the format is: HTTP://192.168.1.254, and the address is the IP address of the corresponding device.
HTTPS	Device HTTPS protocol function status, enable checkbox. Note: HTTPS access format is: HTTPS://192.168.1.254, address is corresponding switch IP address.
HTTP Port	HTTP protocol service port number, the default port number is 80, if the default port is modified, specify the port number in the browser address bar while accessing.

3.7 Diagnostic Test

3.7.1 Ping

Function Description

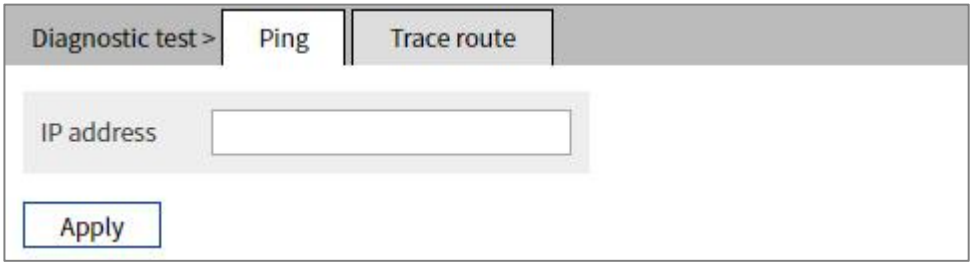
On the "Ping" page, users can use the Ping command to check whether the network is clear or the network connection speed. Ping utilizes the uniqueness of network machine IP address to send a data packet to the target IP address, and then ask the other side to return a similarly sized packet to determine whether two network machines are connected and communicated, and confirm the time delay.

Operation Path

Open in order: "System Config > Diagnosis > Ping".

Interface Description

The Ping interface is as follows:



The main elements configuration description of Ping configuration interface:

Interface Element	Description
IP Address	The IP address of the detected device, that is, the destination address. The device can check the network intercommunity to other devices via the ping command.

3.7.2 TRACEROUTE

Function Description

In the "Traceroute" page, users can test the network situation between the switch and the target host. Traceroute measures how long it takes by sending small packets to the destination device until they return. Each device on a path Traceroute returns three test results. Output result includes each test time (ms), device name (if exists) and the IP address.

Operation Path

Open in order: "System Config > Diagnosis > Traceroute".

Interface Description

TRACEROUTE interface as follows:

The main element configuration description of Traceroute interfaces:

Interface Element	Description
IP Address	IP address of the destination device, fill in the IP address of the opposite device that needs to be detected.

3.8 Leakage

Function Description

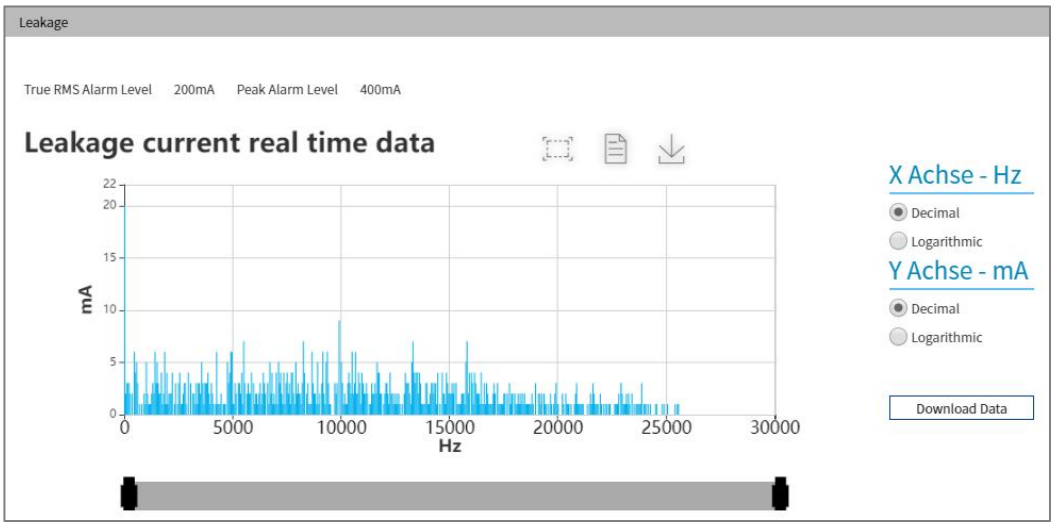
On the "Leakage" page, the user can detect the leak current of the shell.

Operation Path

Open in order: "System Configuration > Leakage".

Interface Description

The Leakage interface is as below:



Main elements configuration descriptions of Leak Current interface:

Interface Element	Description
X axis-Hz	X-axis is the collection frequency of leak current, unit: Hz, which can be expressed as follows: • Decimal system: decimal value; • Logarithm: Logarithmic value.
Y axis-mA	Y-axis is the current size of leakage current, in mA, which can be expressed as follows: • Decimal system: decimal value; • Logarithm: Logarithmic value.
Operation	• The icon in the upper right corner of the chart corresponds to the following functions: • Rectangular area selection: Enter the rectangular area selection mode. • Data view: Switch the spectrogram to data view. • Download: Download the leak current real-time data spectrum and save it in ".png" format. • Download Data: Download the current leak current data and save it in ".log" format.

3.9 Profinet

Function Description

On the "Profinet" page, users can configure DCP functions and download GSD configuration files.

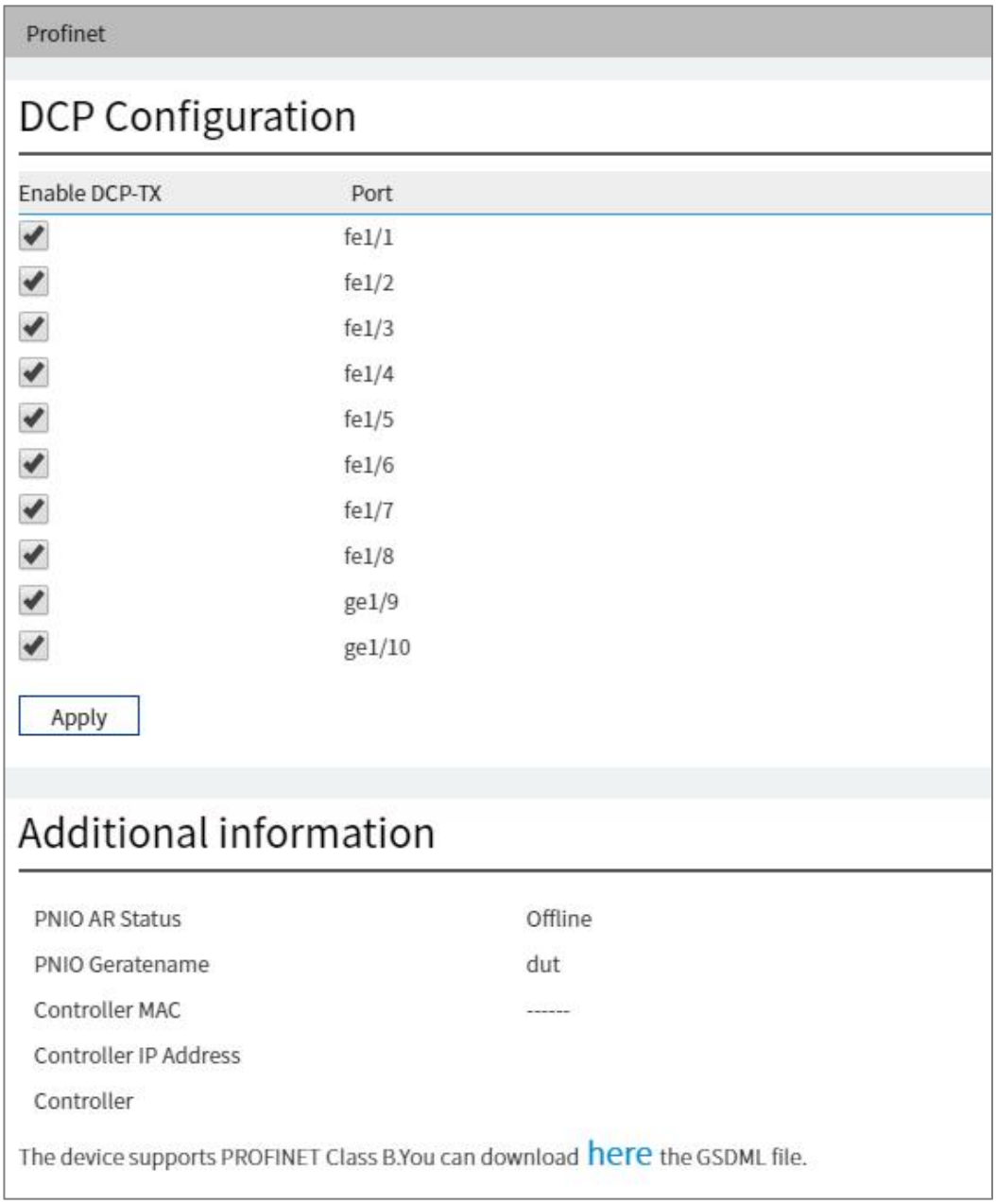
Profinet is an open industrial Ethernet technology based on Ethernet applicable to the real-time automation industry. This switch is a PROFINET IO device, which meets the consistency category CC-B, can connect to PC/PG/MHI devices, distributed IO devices and IO controllers, etc., and supports non-cyclic transmission of engineering configuration data, diagnostic data and interruption, as well as cyclic transmission of user data.

Operation Path

Open in order: "System Configuration > Profinet".

Interface Description

PROFINET interface is as below:



Main elements configuration descriptions of Profinet interface:

Interface Element	Description
DCP Configuration	**DCP Configuration Area Box**
Enable DCP TX	Check box, enable state configuration of port DCP.
Port	Device port name.
Additional Info.	**Additional information area box**
PNIO AR status	Profinet IO device application relationship status.
PNIO Geratename	The name of Profinet IO device.
Controller MAC	Controller MAC address information.
Controller IP address	Controller IP address.

Interface Element	Description
Controller	Controller name.

4 Port Configuration

4.1 Port Settings

Function Description

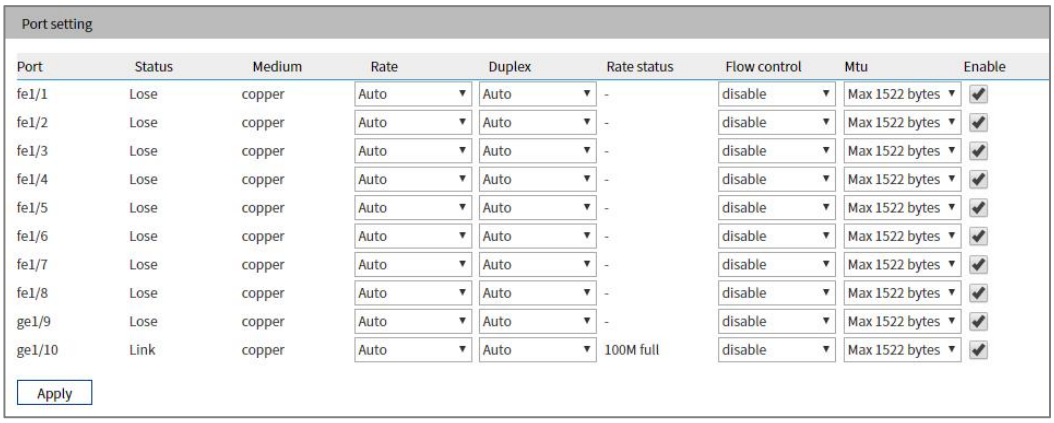
On the "Port Setting" page, user can check port type, rate and connection state, set rate mode, duplex mode, port enable, flow control and other parameters.

Operation Path

Open in order: "Port Configuration > Port Setting".

Interface Description

Port setting interface as follows:



Main elements configuration description of port settings interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Status	Ethernet port connection status, display status as follows:

Interface Element	Description
	• LOSE: represent the port is disconnected; • LINK: represent the port is connected.
Medium	Ethernet port connection type, display medium as follows: • COPPER: copper port; • FIBER: fiber port.
Rate	The working speed of current Ethernet port, optional speeds as follows: • Auto: self-adaption. • Force 10M. • Force 100M. • Force 1000M.
Duplex	• Duplex mode of Ethernet port, optional modes as follows: • Auto: full duplex and half duplex self-adaption. • Full duplex. • Half duplex
Rate Status	Port speed and duplex mode, the display status is as follows: • -: port is disconnected; • 1000M full: Gigabit full duplex; • 100M full: 100M full duplex; • 100M half: 100M half duplex; • 10M full: 10M full duplex; • 10M half: 10M half duplex;
Flow control	Port flow control status, options as follows: • Close: disable; • tx: enable the port to send data flow control; • rx: enable flow control of port data receiving; • All: Enable port data sending and receiving flow control.
Mtu	The maximum Ethernet data frame length passed through the port can be selected as follows: • Max 1522 bytes • Max 2048 bytes • Max 10240 bytes
Enable	Enable Ethernet port. Notice: If user doesn't check the port "Enable" checkbox, the port won't be connected to use.

4.2 Egress Rate Limit

4.2.1 Egress Rate Limit

Function Description

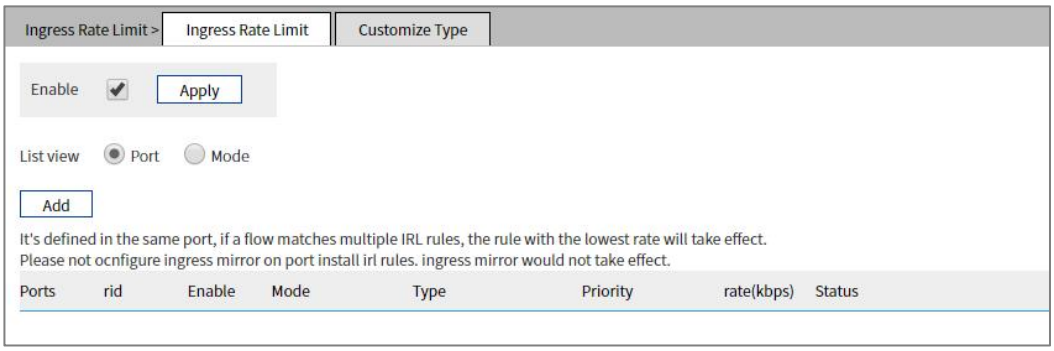
On the "Ingress Rate-Limit" page, user can limit the communication flow of each port or cancel the port flow limit. This device provides ingress speed limit based on port bandwidth, storm, protocol, custom, etc. User can select a fixed speed, the device will discard the packet or adopt flow control to limit the transmission speed or receiving speed of opposite device according to the flow control is enabled or not.

Operation Path

Open in order: "Port Configuration > Ingress Rate-Limit > Ingress Rate-Limit".

Interface Description

Ingress Rate-Limit interface as follows:



The main element configuration description of Ingress Rate-Limit interface:

Interface Element	Description
Enable	The ingress speed limit enable check box, after it is checked, click the "Apply" button to start adding speed limit rules.
List View	Ingress speed limit list display mode, the options are as follows: • Port: according to port classification, each speed limit rule is displayed. • Mode: according to the mode classification, each speed limit rule is displayed.
Port	The corresponding port name of the device Ethernet port.

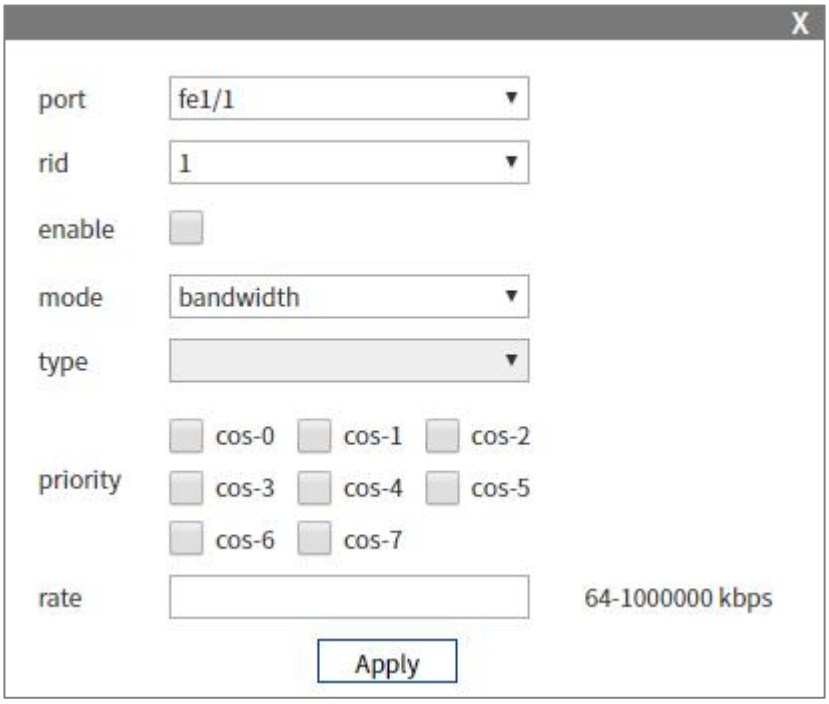
Interface Element	Description
Rule ID	Speed limit rule ID, the port can support multiple speed limit rules. Note: Making rules in the same port, if a flow matches multiple IRL rules, the rule with the lowest rate will take effect.
Enable	Speed limit rule enables configuration status.
Mode	Port speed limit is based on bandwidth, storm, protocol, custom and other modes.
Type	The data frame type of the speed limit.
Priority	CoS priority of speed-limited data frames.
Rate(kbps)	The port's limit value for the data transmission rate of the entrance, in kbps.
Status	Speed limit rule enable state.

Note

- Do not configure the ingress mirror on the speed-limited port, in which case the ingress mirror will not take effect.
- When using the port rate limit, flow control should be enabled, otherwise the rate between devices will no longer be a smooth curve;
- When using the port rate limit, packet loss should not occur unless the flow control is disabled. The representation of packet loss is the fluctuating transmission speed.
- Port speed limit has high requirements on network cable quality, otherwise lots of conflict packets and broken packet would appear.

Click "Add" button to add an ingress speed limit rule.

The interface of Add is as follows:



The main element configuration description of Add interface:

Interface Element	Description
Port	Port drop-down list, configure the port with speed limit.
Rid	The drop-down list of speed limit rule ID, which supports up to 4 speed limit rules.
Enable	Enable check box, and check it to enable the speed limit rule.
Mode	The drop-down list of Rate-Limit mode, options as follows: • Bandwidth: Limit the bandwidth of the port ingress. • Storm: Limit the ingress rate of broadcast frame. • Protocol: Limit the ingress rate of the specified protocol data frame. • Custom: Limit the ingress rate of custom data frames.

Type	Drop-down list of data frame type, options as follows:
	• When the mode is Storm, the following options are supported:
	  • -unknown-unicast.
	  • -unknown-multicast.
	  • - broadcast.
	  • -flood.
	• When the mode is Protocol, the following options are supported: arp, tcpData, tcpCtrl, udp, other, tcp, tcpudp,

Interface Element	Description
	arptcpudp. • When the mode is Custom, it is necessary to configure "Custom Type" in advance, and the following options are supported: Custom1, Custom2 or Custom3.
Priority	CoS priority check box, with values of 0-7.
Rate	Rate limit value, ranging from 64 to 100,000, unit: kbps.

4.2.2 Custom Type

Function Description

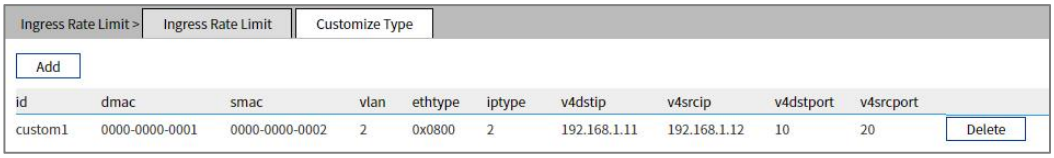
On the "Custom Type" page, users can customize the type of IPv4 data frame that needs speed limit.

Operation Path

Open in order: "Port Configuration > Ingress RateLimit > Custom Type".

Interface Description

The Customize type interface is as follow:



The main elements configuration description of Customize type interface:

Interface Element	Description
id	Custom type ID, support ID range 1-3.
dmac	The destination MAC address of the data frame, such as 0000-0000-0001.
smac	The source MAC address of the data frame, such as 0000-0000-0002.
vlan	The VLAN ID of the frame, ranging from 1 to 4094.
ethtype	The type of data frame, ranging from 0x1 to 0xfff.
iptype	The protocol type of the data frame, ranging from 1 to 255.

Interface Element	Description
V4dstip	The destination IP address of the frame.
V4srcip	The source IP address of the frame.
v4destport	The destination port number of the frame, ranging from 1-65535.
v4srcport	The source port number of the frame, ranging from 1-65535.

4.3 Port Mirroring

Function Description

On the "Port mirroring" page, user can copy the data from the origin port to appointed port for data analysis and monitoring.

Operation Path

Open in order: "Port Configuration > Port Mirroring".

Interface Description

Port mirror interface as follows:

The main element configuration description of port mirror interface:

Interface Element	Description
Switch	Port mirroring enable drop-down list, options are as follows: • Disable

Interface Element	Description
	• Enable
Source port	A set of monitored ports, which will collect data from these ports in the specified direction, and the mirror port can be one or more.
Destination port	A port for monitoring, and the device outputs data from the port to the specified direction.
Direction	This parameter specifies the direction of monitoring port data. Monitor can choose according to their own needs. • ingress: import data, the packet received by the port will be mirrored to the destination port; • egress: export data, the message sent by the port will be mirrored to the destination port; • Both: all data, mirror the port receiving and sending packets at the same time.

Note

- The function must be shut down in normal usage, otherwise all senior management functions based on port are not available, such as RSTP, IGMP, snooping, etc.
- Mirror function only deals with FCS normal packet; it cannot handle the wrong data frame

4.4 Alarm Settings

On the page of "Alarm Warning", user can configure alarm function; when the equipment runs abnormally, it can promptly notify the administrator, and quickly repair the equipment to avoid excessive loss.

4.4.1 Alarm Trigger

Function Description

The trigger events are as follows:

- Port Alarm;
- Temperature Alarm;

- Voltage Alarm;
- MRP Alarm;
- Leak current alarm;
- Neighbor Alarm;
- Network Load;
- Packet Loss Alarm;
- Error Frame Alarm;

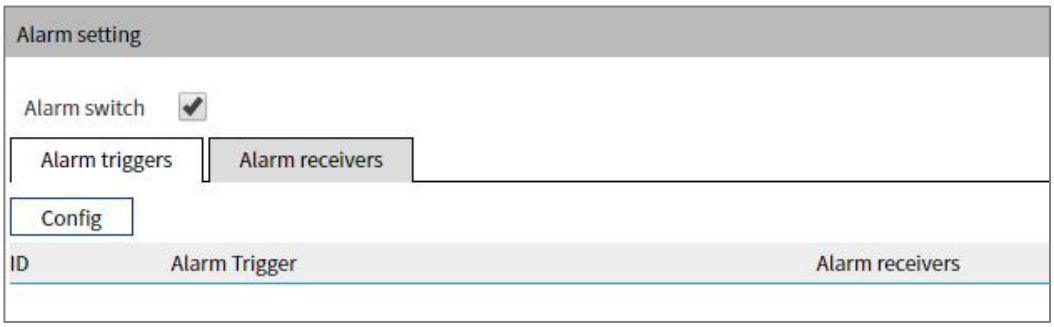
Operation Path

Open in order: "Port Config > Alarm Settings".

Click the “Alarm Trigger” tab.

Interface Description

Alarm Trigger interface as below:



The main element configuration description of Alarm Trigger interface:

Interface Element	Description
Alarm switch	Alarm status check box, when checked, the alarm function can be turned on.
ID	Alarm ID
Alarm Trigger	Trigger an alarm event, and support alarms such as port, temperature, MRP, leak current, neighbor, network load, packet loss, error, etc.
Alarm receivers	The alarm receiving mode supports SNMP Trap and e-mail.
Buttons	Configuration: Configure alarm triggering events. Edit: Edit the current alarm entry. Delete: delete the the current alarm entry.

4.4.1.1 Port Alarm

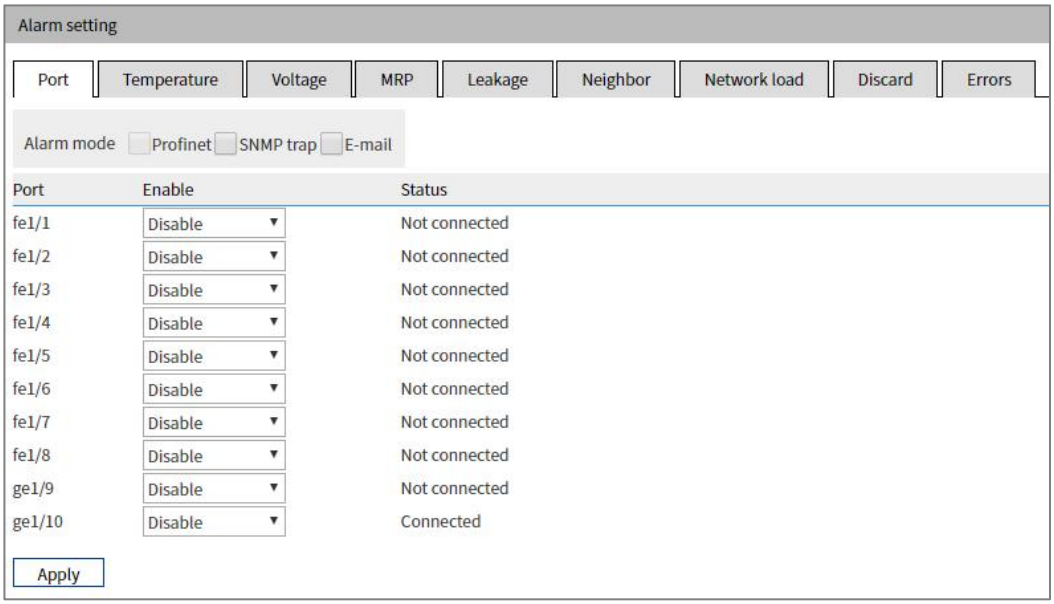
Operation Path

Open in order: "Port Config > Alarm Settings".

On the “Alarm Trigger” page, click the “Configure” button and click the “Port” tab.

Interface Description

Port interface as below:



The main element configuration description of port interface:

Interface Element	Description
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Port	The corresponding port name of the device Ethernet port.
Enable	Port alarm function status, options as follows: • Enable;

Interface Element	Description
	• Disable. Note: After enable port alarm, when port occurs abnormal status, such as connection break down, the device will output a signal to hint the abnormal operation of device.
Status	Port link status, display items as follows: • Not connected; • Connected.

4.4.1.2 Temperature Alarm

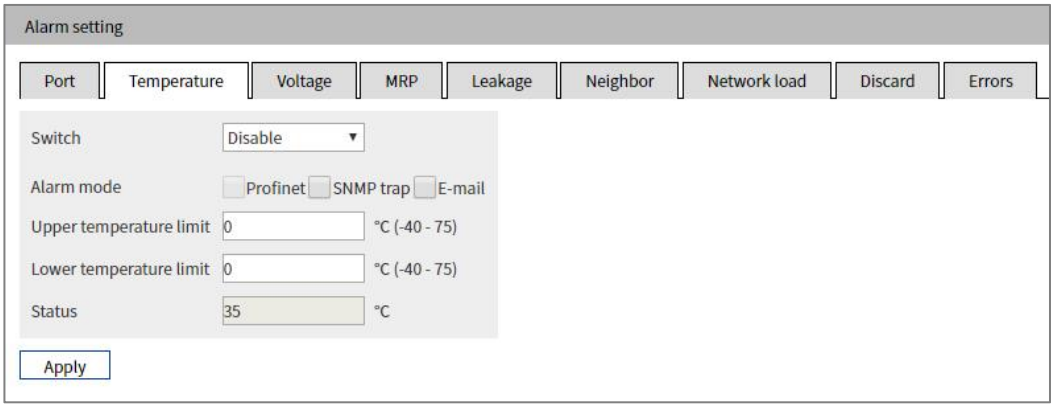
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Trigger page, click the Configure button and click the Temperature tab.

Interface Description

Temperature interface is as below:



Configuration description of main elements of the Temperature interface:

Interface Element	Description
Status	The drop-down list of Temperature alarm status. The options are as follows: • Disable; • Enable.
Alarm mode	Alarm mode check box, the options are as follows:

Interface Element	Description
	• Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Upper temperature limit	The upper limit alarm value of the working temperature of the device, unit: ℃.
Lower temperature limit	The lower limit alarm value of the working temperature of the device, unit: ℃.
Status	Current operation temperature of the device.

4.4.1.3 Voltage Alarm

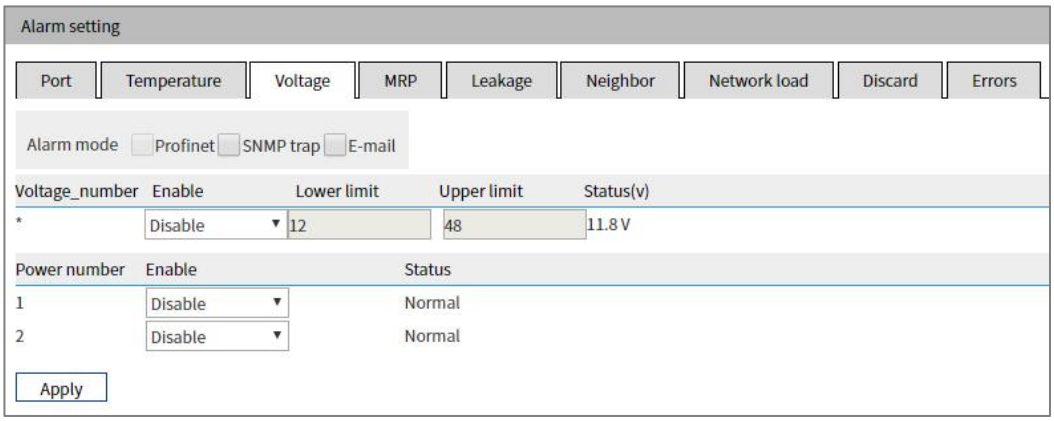
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Trigger page, click the Configure button and the Voltage tab.

Interface Description

Voltage interface is as below:



Configuration description of main elements of the Voltage interface:

Interface Element	Description
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Power number	The corresponding number of this device's power supply
Enable	The state of power supply voltage alarm function, options are as follows: • Disable • Enable
Lower limit	The lower limit value of the input voltage of the device, unit: V.
Upper limit	The upper limit value of the input voltage of the device, unit: V.
Status	The state of the input voltage of the power supply.
Power number	The corresponding number of this device's power supply
Enable	The state of power supply alarm function, options are as follows: • Disable • Enable Note: • DC provides 2 power supplies, when one power supply goes wrong, another power supply can supply electricity soon, dual power supply hot standby is supported. • After enabling power supply alarm, the device will output alarm signal to hint abnormal operation of power supply when power supply runs abnormally.
Status	The power supply status of the device.

4.4.1.4 MRP Alarm

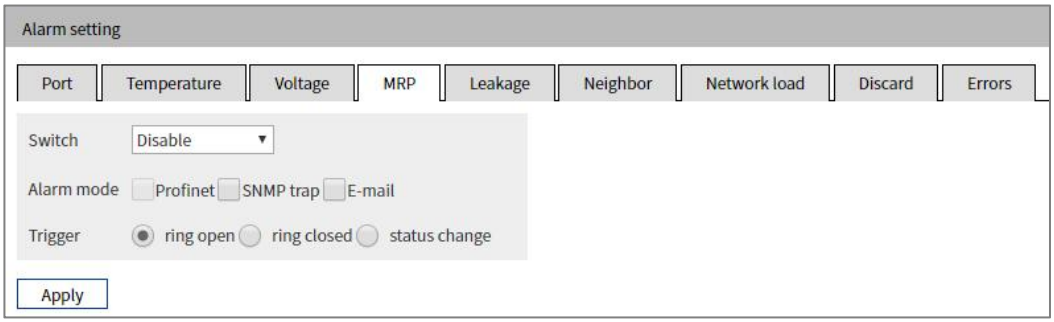
Operation Path

Open in order: "Port Config > Alarm Settings".

On the “Alarm Trigger” page, click the “Configure” button and click the “MRP” tab.

Interface Description

MRP interface is as below:



Main elements configuration descriptions of MRP interface:

Interface Element	Description
Status	The drop-down list of MRP alarm status. The options are as follows: • Disable; • Enable.
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Trigger	Trigger MRP alarm event, check box, and the optional events are as follows: • Open loop: the ring network is disconnected; • Closed loop: the ring network is closed; • State change: the state of the ring network has changed.

4.4.1.5 Leak Current Alarm

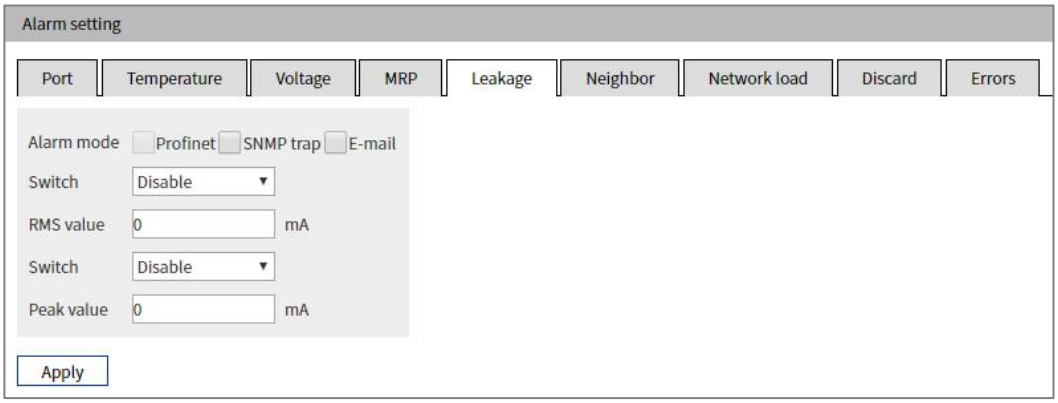
Operation Path

Open in order: "Port Config > Alarm Settings".

On the “Alarm Trigger” page, click the “Configure” button and the “Leak Current” tab.

Interface Description

The Leak Current interface is as below:



Main elements configuration descriptions of Leak Current interface:

Interface Element	Description
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Switch	The drop-down list of average value alarm status. The options are as follows: • Disable; • Enable.
RMS value	Root mean square value (RMS) of leakage current, and the unit is mA.

Interface Element	Description
Switch	The drop-down list of peak value alarm status. The options are as follows: • Disable; • Enable.
Peak value	Text input box of the peak value of leak current, unit: mA.

4.4.1.6 Neighbor Alarm

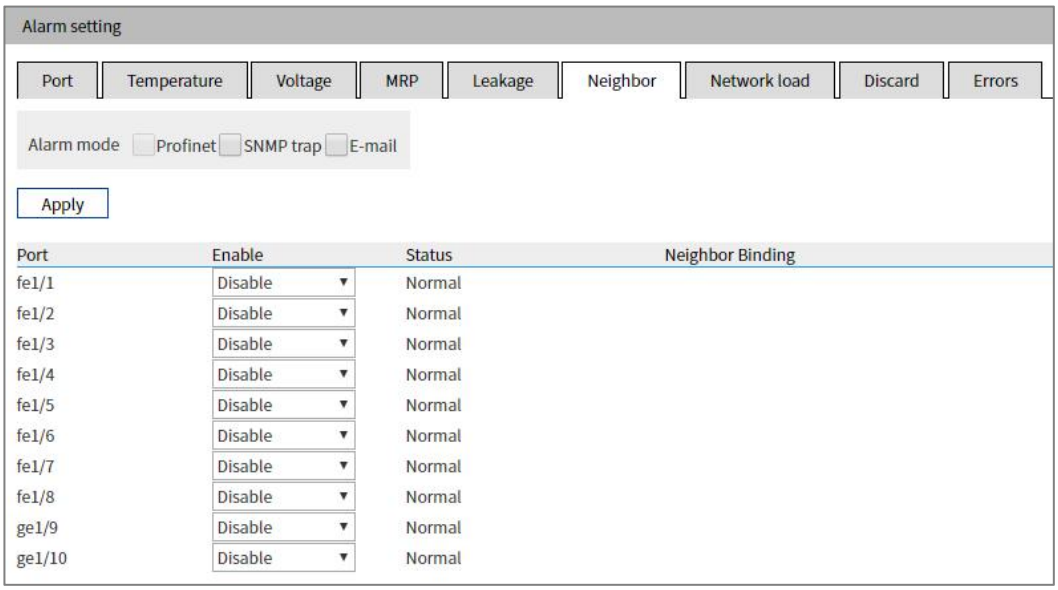
Operation Path

Open in order: "Port Config > Alarm Settings".

On the “Alarm Trigger” page, click the “Configure” button and click the “Neighbor” tab.

Interface Description

Neighbor interface is as follows:



Main elements configuration description of neighbor interface:

Interface Element	Description
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet

Interface Element	Description
	check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Port	The corresponding port name of the device Ethernet port.
Enable	Display the enable status of neighbor alarms. Note: Neighbor alarm enable is configured by configuration software, and this page supports alarm mode configuration and related information display.
Status	Display the status of neighbor alarms.
Neighbor Binding	Neighbor address of the port binding.

4.4.1.7 Network Load Alarm

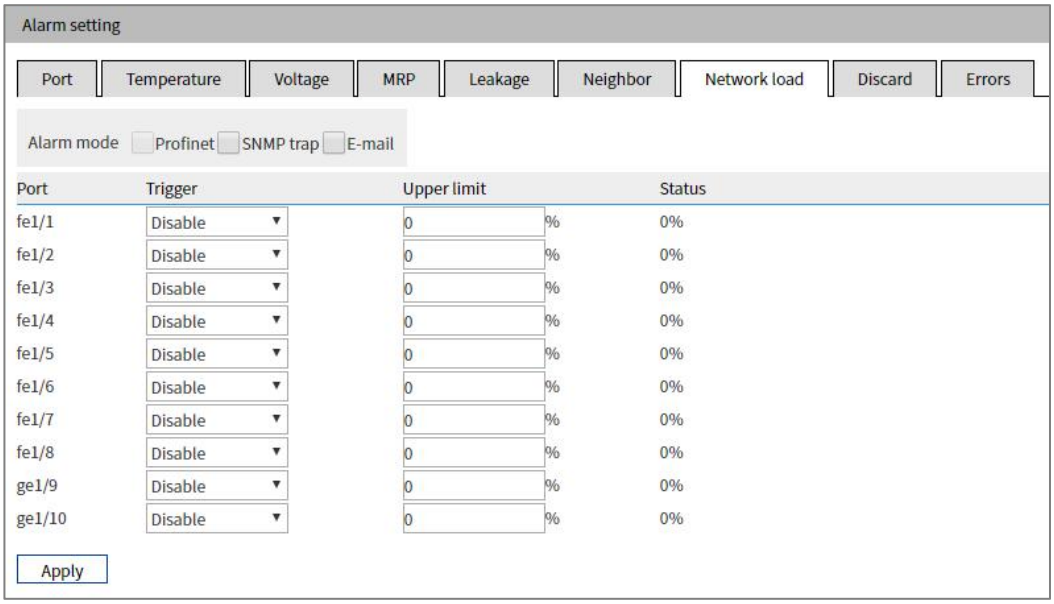
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Trigger page, click the Configure button and click the Network Load tab.

Interface Description

Network load interface is as follows:



The main element configuration description of network load interface:

Interface Element	Description
Alarm mode	Alarm mode check box, the options are as follows: • Profinet: display the alarm mode of Profinet. If the device is configured on the configuration software and related alarm items are configured, the corresponding Profinet check box will be checked. Display Checked, the page can't modify the related alarm items. • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.
Port	The corresponding port name of the device Ethernet port.
Trigger	Trigger the drop-down list of network load alarm enable. The options are as follows: • Enable • Disable
Upper limit	Percentage of upper limit value that triggers network load alarm.
Status	Network bandwidth load status.

4.4.1.8 Packet Loss Alarm

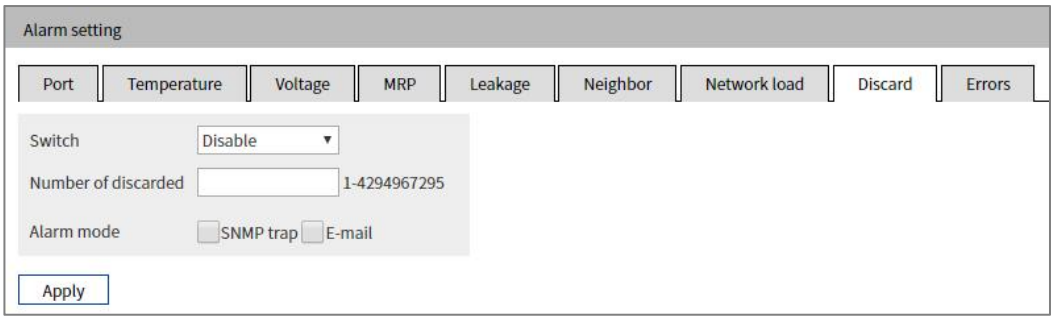
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Trigger page, click the Configure button and the Packet Loss tab.

Interface Description

Dropped Packets interface is as below:



Configuration description of main elements of the Dropped Packets interface:

Interface Element	Description
Status	The status of packet loss alarm, options: • Disable • Enable
Number of Discarded Packet	Number of dropped frames triggering packet loss alarm.
Alarm mode	Alarm mode check box, the options are as follows: • SNMP Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.

4.4.1.9 Error Alarm

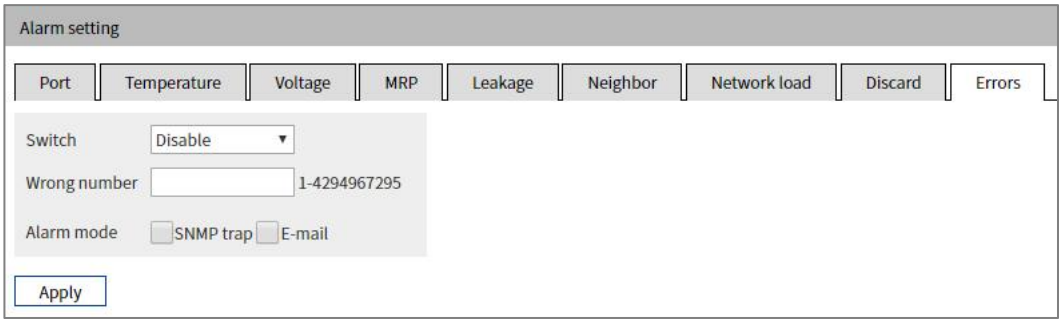
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Trigger page, click the Configure button and click the Error tab.

Interface Description

Error interface as follows:



The main element configuration description of the Error interface:

Interface Element	Description
Status	Frame alarm status, options: • Disable • Enable
Wrong number	The number of error frames that trigger an error alarm.
Alarm mode	Alarm mode check box, the options are as follows: • Trap: send Trap alarm information through SNMP protocol. • E-mail: Send alarm information by mail.

4.4.2 Alarm Receivers

Function Description

The alarm receiving mode is as follows:

- SNMP Trap
- E-mail

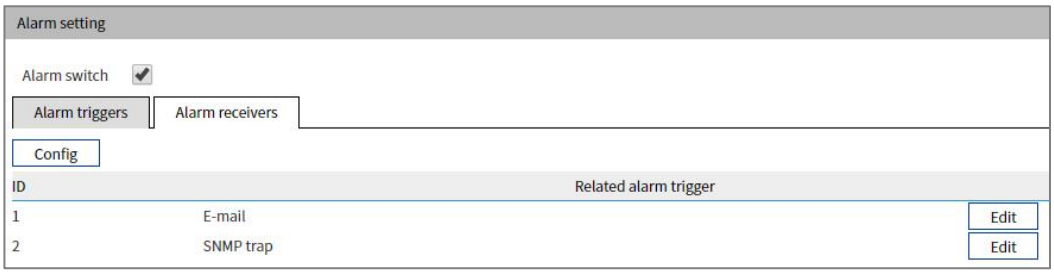
Operation Path

Open in order: "Port Config > Alarm Settings".

Click the Alarm Receiving tab.

Interface Description

Alarm receiving interface is as below:



The main element configuration description of the Alarm receiving interface:

Interface Element	Description
Alarm status	Alarm status check box, when checked, the alarm function can be turned on.
ID	Alarm ID
Alarm receiving	The alarm receiving mode and configuration information, it supports SNMP Trap and e-mail.
Related alarm triggering	Alarm triggering events supported by the alarm receiving mode, such as port, temperature, MRP, leak current, neighbor, network load, packet loss, error and other alarms.
Buttons	Configuration: Configure the alarm receiving mode. Edit: edit the current alarm receiving method.

4.4.2.1 Trap Settings

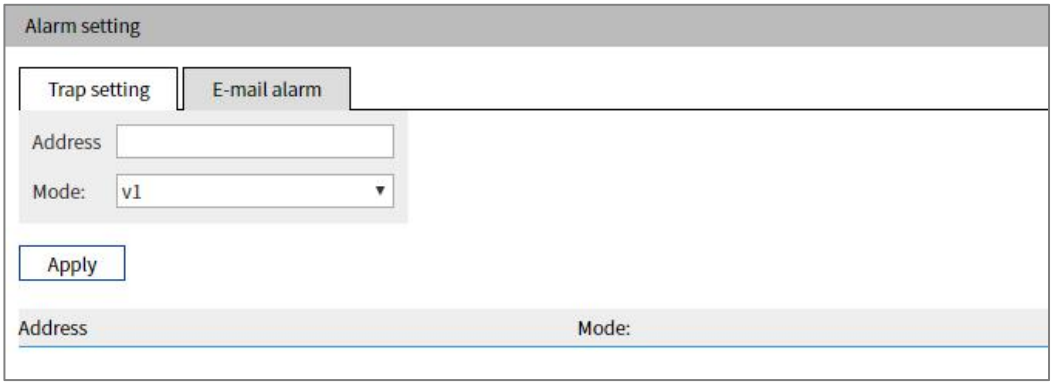
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Receiving page, click the Configure button and click the Trap Settings tab.

Interface Description

Trap settings interface as follows:



The main element configuration description of Trap settings interface:

Interface Element	Description
Address	Destination IP address of SNMP trap message
Mode	SNMP version drop-down list, the options are as follows: • v1 • v2c

4.4.2.2 Email Alarm

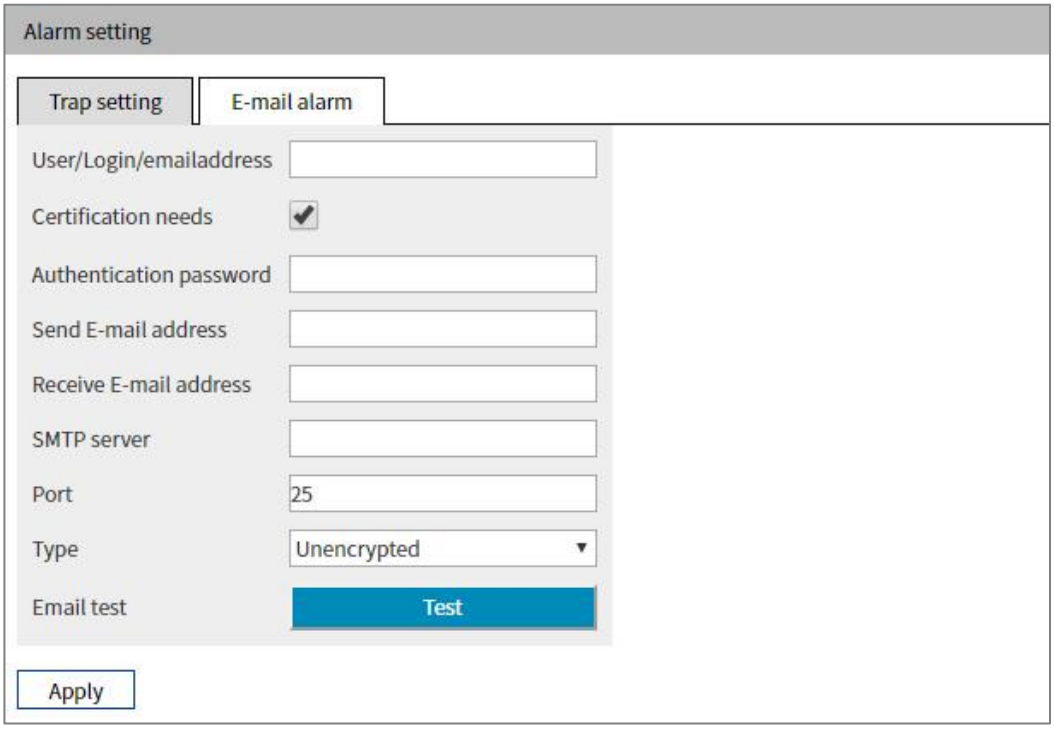
Operation Path

Open in order: "Port Config > Alarm Settings".

On the Alarm Receiving page, click the Configure button and click the E-mail Alarm tab.

Interface Description

E-Mail Alarm interface is as follows:



Main elements configuration description of E-mail alarm interface:

Interface Element	Description
User/login/email address	Address of the mailbox server.
Certification needs	Require authentication check box.
Authentication Password	Authentication information or login password of sender's mailbox server.
Send E-mail address	E-mail address of sender, account name used for logging in to the E-mail server.
Receive E-mail address	E-mail address used by abnormal event receiver.
SMTP server.	The SMTP email server address should be based on the used email account. The host IP address or used host name that provides E-mail delivery service for the device.
Port	Port number of SMTP server address.
Type	Encryption type, options: • Unencrypted • TLS • STARTTLS
Email test	The device sends an alarm email to the receiving mailbox through the sending mailbox, which is used to test whether the email is in normal communication.

4.5 Link Aggregation

Link aggregation is the shorter form of Ethernet link aggregation; it binds multiple Ethernet physical links into a logical link, achieving the purpose of increasing the link bandwidth. At the same time, these bundled links can effectively improve the link reliability by mutual dynamic backup.

The Link Aggregation Control Protocol (LACP) protocol based on the IEEE802.3ad standard is a protocol for implementing dynamic link aggregation. Devices running this protocol exchange LACPDU (Link Aggregation Control Protocol Data Unit, Link Aggregation Control Protocol Data Unit) to exchange link aggregation related information.

Based on the enabling or disabling of LACP protocol, the link aggregation can be divided into two modes, static aggregation and dynamic aggregation.

4.5.1 Static Link Aggregation

Function Description

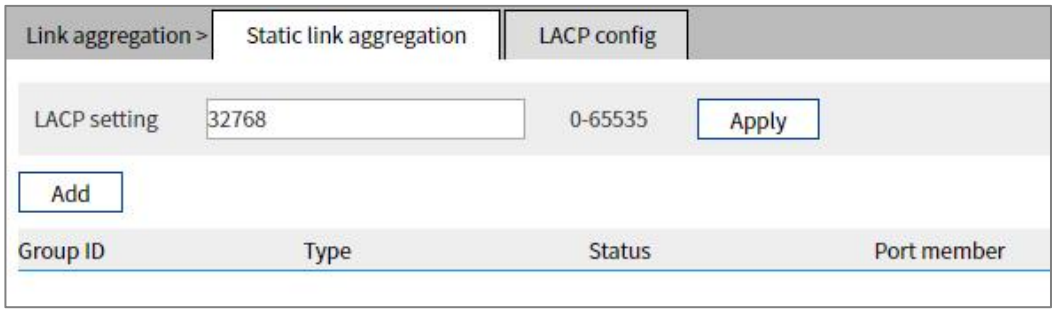
Under static aggregation mode, the member port in aggregation group disables LACP protocol, its port status is maintained manually.

Operation Path

Open in order: "Port Configuration > Link Aggregation > Static Link Aggregation".

Interface Description

Static Link Aggregation interface as below:



The main element configuration description of Static Link Aggregation interface:

Interface Element	Description
LACP setting	LACP priority level setting, LACP setting range 0-65535, defaults to 32768. Note: The smaller of interface LACP priority level value is, the higher priority level is, which is used for distinguishing the priority degree of selecting different ports as active port.
Group ID	Added port aggregation group ID number. The ID number of static aggregation link, support up to 14 groups, each group can configure up to 8 ports to join aggregation.
Type	Aggregation group mode: • Manual: Static aggregation; • LACP: Dynamic aggregation.
Status	Aggregation group connection state: • UP: Port member is connected; • DOWN: Port member is disconnected.
Port member	Port member in the aggregation group.

4.5.2 LACP Configuration

Function Description

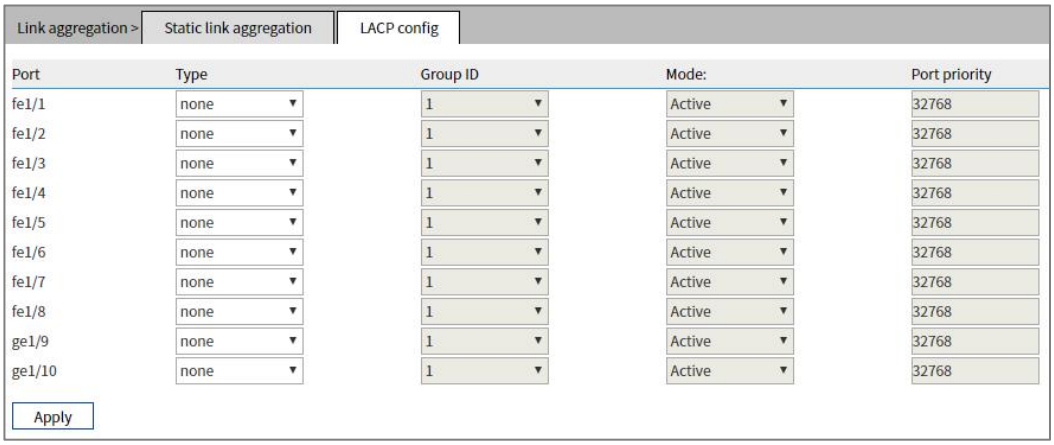
Dynamic aggregation is an aggregation method in which system automatically creates or deletes aggregation group, the port addition and deleting in the dynamic aggregation group is done automatically by LACP protocol. Only ports connected to the same device with same rate, duplex property, and basic configuration can create a dynamic aggregation. Even one port can also create dynamic aggregation, at this time, its single port aggregation. In dynamic aggregation, port LACP protocol is in enable state.

Operation Path

Open in order: "Port Config > Link Aggregation > LACP Config".

Interface Description

LACP configuration interface as follows:



The main element configuration description of LACP configuration interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Type	Setting port aggregation function: • None: Represent the port disabling link aggregation function; • Static: Represent the port is static aggregation mode; • Dynamic (LACP): Represent the port is dynamic aggregation mode.
Group ID	Group ID, the range is 1-16.
Mode	Mode refers to dynamic LACP negotiation mode, it's divided into: • Active: the port sends LACP message periodically; • Passive: the port doesn't send LACP message in normal time, once receiving the LACP message of opposite terminal, it will normally send LACP message.
Port priority	Dynamic LACP port priority, defaults to 32768.

4.6 Port Statistics

4.6.1 Port Statistics

Function Description

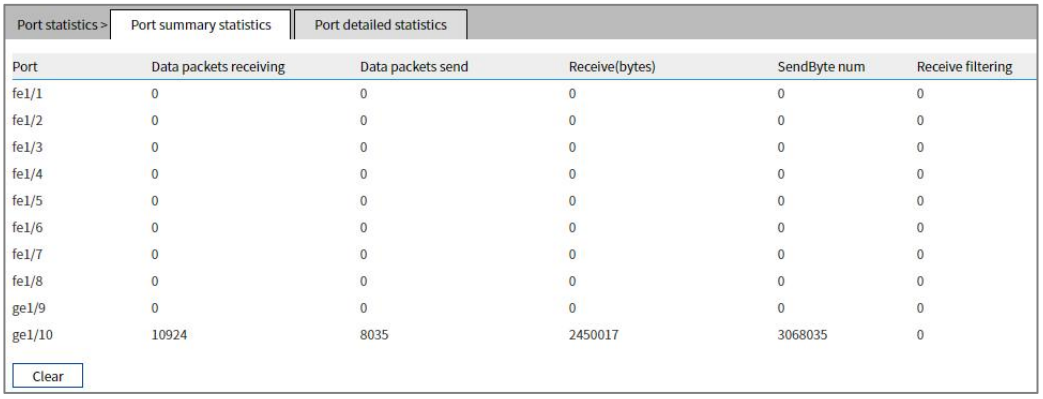
On the "Port Stats" page, user can check the data packet and byte number that each port sends or receives,

Operation Path

Open in order: "Port Configuration > Port Statistics > Port Statistics".

Interface Description

Port Statistics interface as follows:



4.6.2 Detail Port Stats

Function Description

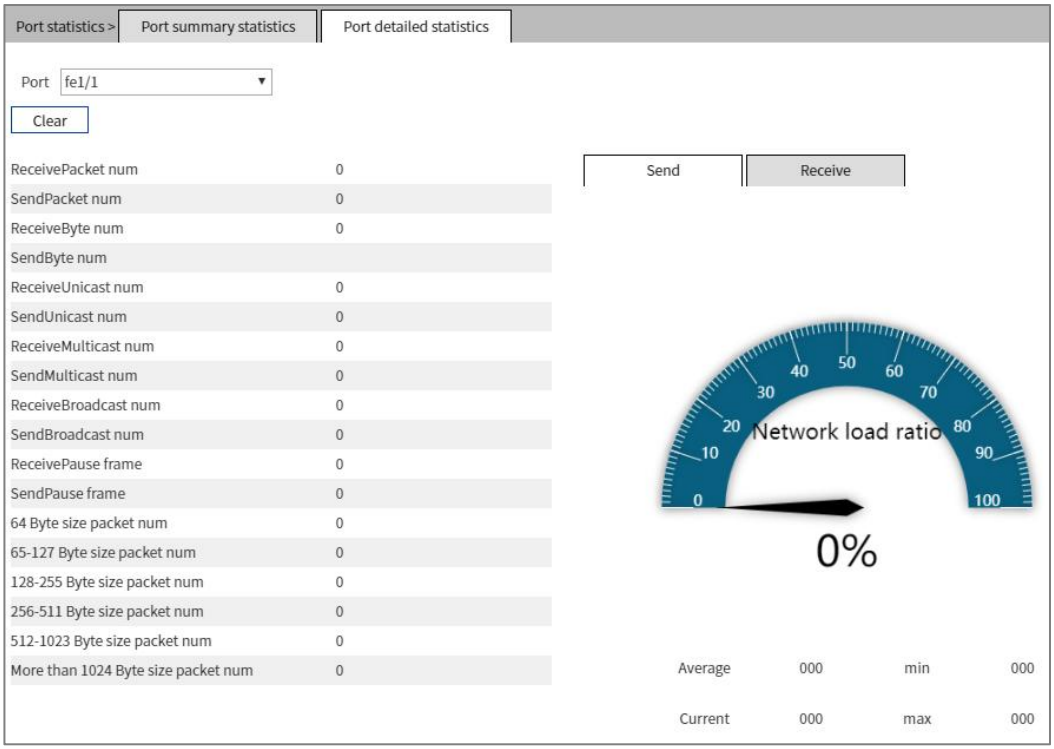
On the "Detail port stats" page, user can check the data sum and message size classified statistic that each port sends or receives, and network load diagrams for ports.

Operation Path

Open in order: "Port Config > Port statistics > Detail port stats".

Interface Description

Detail port stats interface as follows:



4.7 Cable Test

Function Description

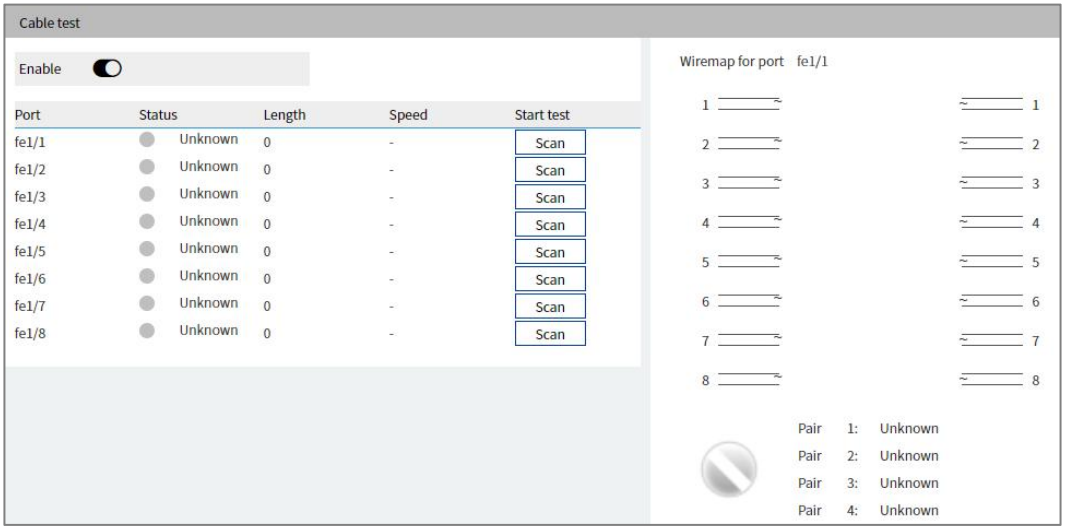
On the “Cable Test” page, user can check the physical status of network cable.

Operation Path

Open in order: "Port Configuration > Cable Test".

Interface Description

Cable Test interface is as below:



The main element configuration description of the Cable Test interface:

Interface Element	Description
Enable	Check the cable enable switch button, and the status is as follows: • : Enable • : Shutdown
Port	The corresponding port name of the device Ethernet port. Note: This port will be rebooted when Cable Test is enabled.
Status	The Cable Test status could be divided into the following types: • OK: Normal • Open: open circuit • Short: short circuit • Open/Short: open circuit or short circuit • Crosstalk • Unknow: Unknown
Length	The length of cable. Note: The length error range of test result: ±10m
Speed	Port transmission speed.
Start test	Click the "Scan" button to start detecting the port connection cable information.
Cable test result	Displays the cable status, the number of twisted pairs, and the status of each twisted pair.

5 Layer 2 Configuration

5.1 VLAN Configuration

VLAN is Virtual Local Area Network. VLAN is the data switching technology that logically (note: not physically) divides the LAN device into each network segment (or smaller LAN) to achieve the virtual working group (unit).

VLAN advantages mainly include:

- Port isolation. Ports in different VLAN, even in the same switch, can't intercommunicate. Such a physical switch can be used as multiple logical switches.
- Network security. Different VLAN can't directly communicate with each other, which has eradicated the insecurity of broadcast information.
- Flexible management. Changing the network user belongs to, don’t need to change ports or connection; only needs to change the software configuration.

That is, ports within the same VLAN can intercommunicate; otherwise, ports can't communicate with each other. A VLAN is identified with VLAN ID, and ports with the same VLAN ID belong to a same VLAN.

5.1.1 VLAN 802.1Q

Function Description

On the VLAN 802.1Q page, users can add 802.1Q VLAN entries.

Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > VLAN 802.1Q".

Interface Description

VLAN 802.1Q interface as below:

Main elements configuration descriptions of VLAN 802.1Q interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
VLAN Name	VLAN name information.
Untagged port	Untagged port member to conduct untagged process to sending data frame.
Tagged port	Tag port member to conduct tagged process to sending data frame.

5.1.2 PVLAN

Function Description

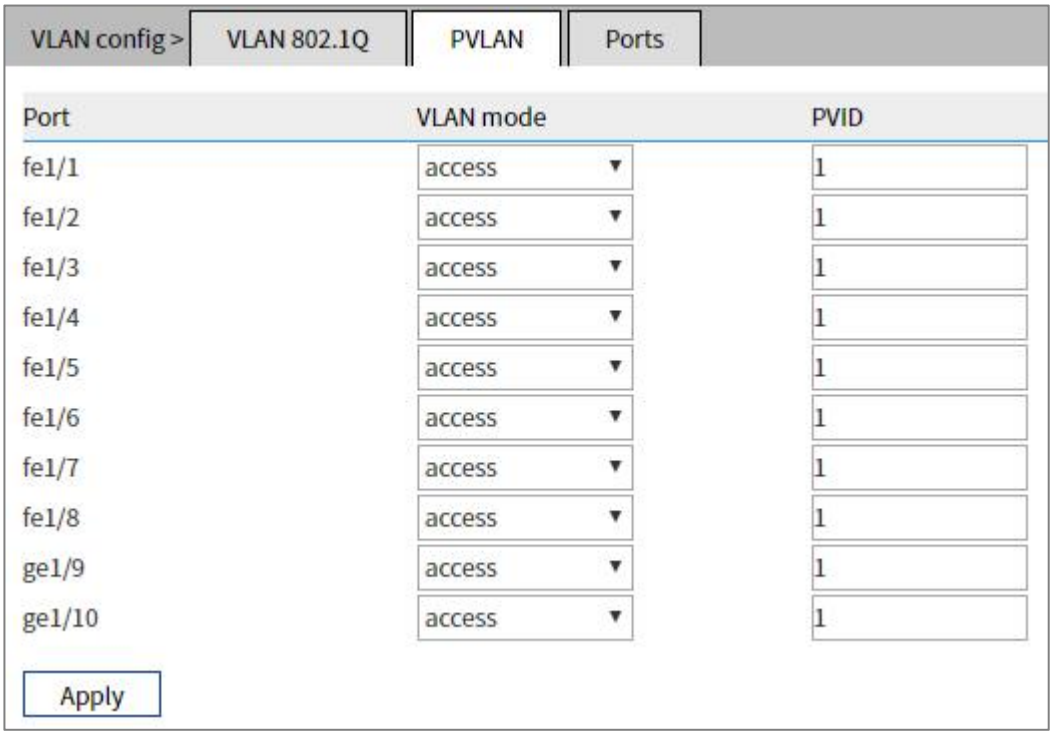
On the PVLAN page, users can configure the port type and port VLAN ID.

Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > PVLAN".

Interface Description

PVLAN interface is as below:



Main elements configuration descriptions of PVLAN interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
VLAN Mode	Port VLAN mode. Options are: • Access: The port can only belong to 1 VLAN (the default VLAN). When the Tag of the message received by the port is the same as the PVID, the message is received, otherwise it is discarded. Generally used to connect with terminal device. • Trunk: port can belong to multiple VLANs. When the Tag of the message received by the port is the VLAN ID to which the port belongs, the message is received; otherwise, it is discarded. Commonly used in the connection between network devices.
PVID	Default port VLAN ID number, value range is 1-4094. Each port has a PVID property, when the port receives Untag messages, it adds Tag mark on them according to PVID. When the port transmits data message with the same Tag mark as PVID, it would erase the Tag mark and then transmit the message.

5.1.3 Port

Function Description

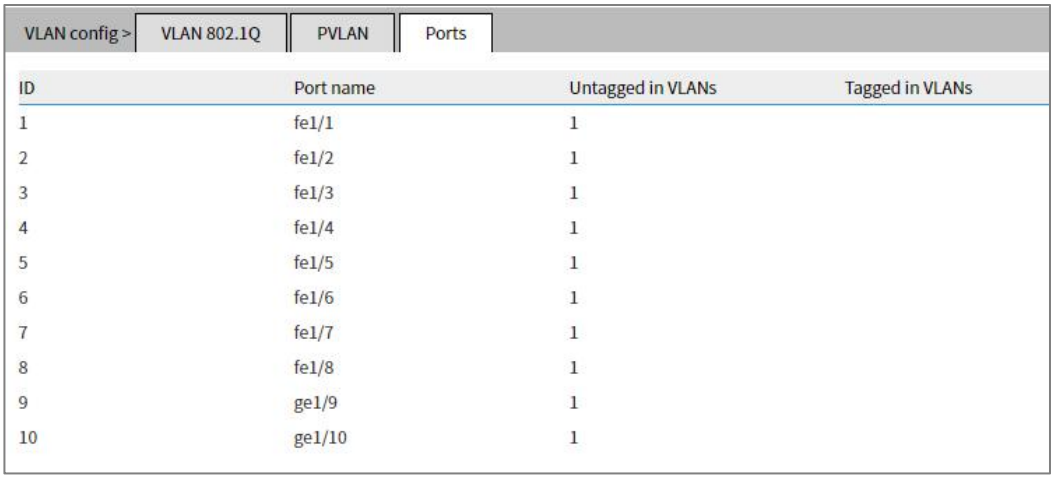
On the Port page, users can view the port VLAN configuration information.

Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > Port".

Interface Description

Port interface as below:



The main element configuration description of port interface:

Interface Element	Description
ID	Port entry ID.
Port name	The corresponding port name of the device Ethernet port.
Untagged in VLANs	The VLAN ID number that the port allows to pass without tags.
Tagged in VLANs	The VLAN ID number that the port allows to pass with tags.

5.2 MAC Configuration

MAC (Media Access Control) address is the hardware identity of network device; the switch forwards the message according to MAC address. MAC address has uniqueness, which has guaranteed the correct retransmission of message. Each

switch is maintaining a MAC address table. In the table, MAC address is corresponding to the switch port. When the switch receives data frames, it decides whether to filter them or forward them to the corresponding port according to the MAC address table. MAC address is the foundation and premise that switch achieves fast forwarding.

5.2.1 MAC Configuration

Each port in the switch is equipped with automatic address learning function, it stores the frame source address (source MAC address, switch port number) that port sends and receives in the address table. Ageing time is a parameter influencing the switch learning process; the default value is 300 seconds. When the timekeeping starts after an address record is added to the address table, if each port doesn't receive the frame whose source address is the MAC address within the ageing time, then these addresses will be deleted from dynamic forwarding address table (source MAC address, destination MAC address and their corresponding switch port number).

Function Description

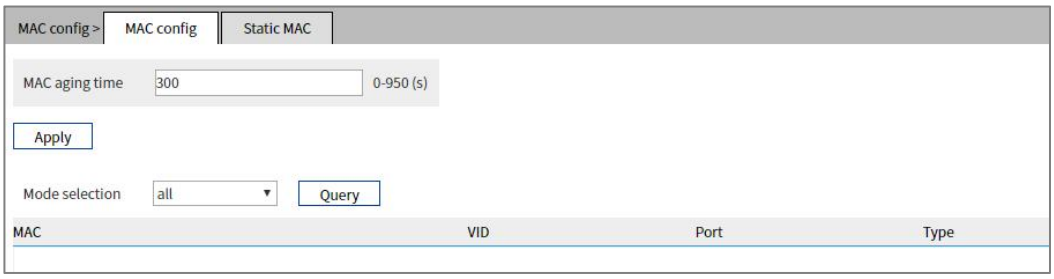
On the "MAC Config" page, user can configure the ageing time of dynamic MAC address and check static and dynamic MAC address information.

Operation Path

Open in order: "Layer 2 Configuration > MAC Configuration > MAC-config".

Interface Description

MAC configuration interface is as follows:



The main element configuration description of MAC configuration interface:

Interface Element	Description
MAC Aging Time	MAC address aging-time, unit is second, default value is

Interface Element	Description
	300, and range is 0~950.
Mode Selection	MAC table query mode, the options are as follows: • All • Based on VLAN • Port-Based • MAC-based
MAC	Access the device MAC address.
VID	VLAN ID number the data MAC address sending belongs to.
Port	Corresponding port number of the MAC address.
Type	MAC address type, dynamic MAC and static MAC address, display as follows: • Static; • Dynamic.

5.2.2 Static MAC

Function Description

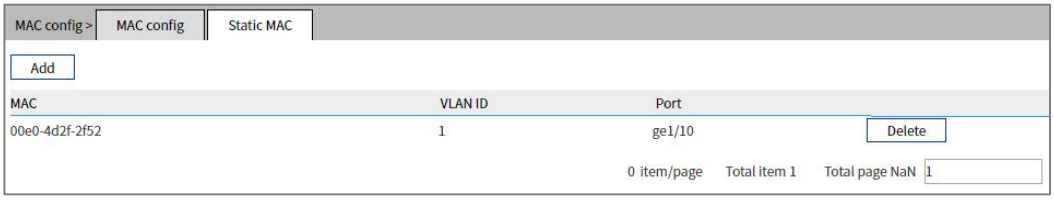
On the "Static Mac" page, user can manually configure the static MAC address and bind the source MAC address without aging.

Operation Path

Open in order: "Layer 2 Configuration > MAC Configuration > Static Mac".

Interface Description

Static MAC interface as follows:



The main element configuration description of static MAC interface:

Interface Element	Description
MAC	Static MAC address bound to the interface, for example:

Interface Element	Description
	0001-0001-0001.
VLAN ID	The VLAN ID number to which the data sent by this MAC address belongs, for example, 1-4094. Note: Input VLAN ID is the existing ID.
Port	Select the binding port number via the drop-down arrow.

Note

- The function is a sort of security mechanism, please carefully confirm the setting, otherwise, part of the devices won't be able to communicate.
- Please don't adopt multicast address as the entering address.
- Please don't enter reserved MAC address, such as the local MAC address.

5.3 IGMP Snooping

IP host applies for joining (or leaving) multicast group to nearby routers through the Internet Group Management Protocol (IGMP). IGMP Snooping is a multicast suppression mechanism that manages and controls multicast group by listening and analyzing IGMP messages exchanged between host and multicast devices.

The working process of IGMP Snooping: The switch snoops the messages between user host and router, as well as tracking multicast information and the ports that have been applied for. When the switch intercepts the IGMP Report (request) sent by the host toward router, the switch adds the port to multicast forwarding table. When the switch intercepts the IGMP Leave message sent by the host, the router sends a Group-Specific Query message of the port. If other hosts need the multicast, they will respond with the IGMP Report message. If the router can't receive any response from the host, the switch deletes the port from the multicast forwarding table. The router sends IGMP Query message periodically. When switch receives IGMP Query message, it would delete this port from multicast table if it doesn’t receive IGMP Report message from the host in a given period time.

5.3.1 IGMP Snooping

Function Description

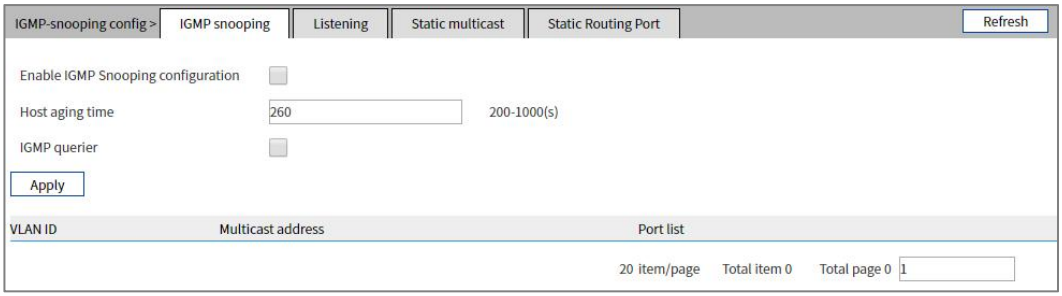
On the "IGMP-snooping" page, users can enable/disable IGMP and configure the host aging time.

Operation Path

Open in order: "Layer 2 Configuration > IGMP-snooping > IGMP-Snooping".

Interface Description

IGMP Snooping interface as below:



The main element configuration description of IGMP Snooping interface:

Interface Element	Description
Enable IGMP-snooping configuration	Enable IGMP-snooping configuration checkbox.
Host aging time	Host aging time, value range is 200-1000s.
IGMP querier	Enable IGMP Querier, the device can join in IGMP Querier election. It would send query message and receive report message of the member to maintain the relationship of multicast group member.
VLAN ID	Port number VLAN ID number.
Multicast address	Multicast IP address.
Port list	The corresponding port name of the device Ethernet port.

5.3.2 IGMP Monitoring-VLAN

Function Description

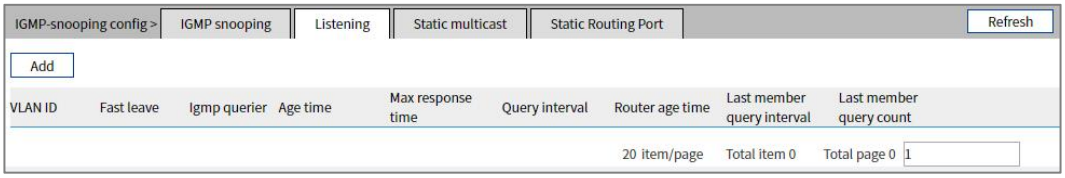
On the page of "IGMP monitoring-VLAN", you can configure the basic functions of VLAN-based IGMP Snooping, and the device can establish and maintain the layer 2 multicast forwarding table to realize the on-demand distribution of multicast data messages in the data link layer.

Operation Path

Open in order: "Layer 2 Configuration > IGMP-snooping > IGMP-snooping-VLAN".

Interface Description

IGMP-snooping VLAN configuration interface as follows:



The main element configuration description of IGMP-snooping-VLAN configuration interface:

Interface Element	Note (Click "Add" to add snooping entry)
VLAN ID	The VLAN ID monitored by IGMP, with a value of 1-4094.
Fast Leave	Fast Leave allows the member ports in VLAN to leave the multicast group quickly.
Igmp Querier	IGMP Snooping query function of VLAN.
Age time	Aging time of dynamic member ports in VLAN, in integer form, ranging from 1 to 255, and the unit is seconds.
MAX response time	The maximum response time of IGMP universal group query message in VLAN, an integer ranging from 1 to 25 in seconds. The default value is 10s.
Query interval	IGMP universal group query message sending time interval, in integer form, ranging from 2 to 300, and the unit is seconds.
Router age time	Dynamic router port aging time in VLAN, in integer form, ranging from 2 to 300, and the unit is seconds.
Last member	The last member query time interval in VLAN, that is, the

Interface Element	Note (Click "Add" to add snooping entry)
query interval	sending time interval of IGMP specific group query message, is in integer form, with the value range of 1-5 and the unit of seconds.
Last member query count	IGMP robustness coefficient, that is, the number of times Query messages are sent in integer form, and the value range is 1-255.

5.3.3 Static Multicast

Function Description

On the "Static multicast" page, user can add or delete static multicast.

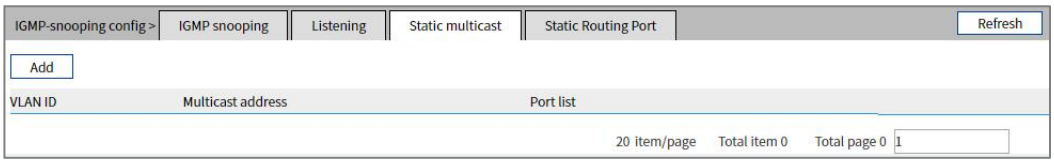
Main function of static multicast: Add certain ports to a multicast group; these ports can receive data when data is sent to this multicast address.

Operation Path

Open in order: "Layer 2 Configuration > IGMP-snooping > Static Multicast".

Interface Description

Static multicast interface as follows:



The main element configuration description of static multicast interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
Multicast address	Multicast IP address information, such as: 225.1.2.3.
Port list	The display device ports form multicast group.

5.3.4 Static Routing Port

Function Description

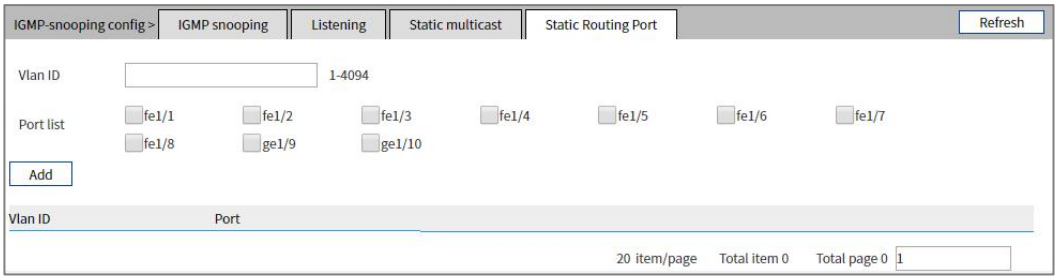
On the "Static Routing Port" page, user can configure the port of multicast router.

Operation Path

Open in order: "Layer 2 Config > IGMP Snooping > Static Routing Port".

Interface Description

The static routing port interface as follows:



The main elements configuration description of static routing port configuration interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
Port list	Check the checkbox of port list, select device port as the static router port that connects router.

5.4 Spanning-tree Configuration

Spanning-tree protocol is a sort of layer 2 management protocol; it can eliminate the network layer 2 circuit via selectively obstructing the network redundant links. At the same time, it has link backup function. Here are three kinds of spanning-tree protocols:

- STP (Spanning Tree Protocol);
- RSTP (Rapid Spanning Tree Protocol);
- MSTP (Multiple Spanning Tree Protocol).

Spanning-tree protocol has two main functions:

- First function is utilizing spanning-tree algorithm to establish a spanning-tree that takes a port of a switch as the root to avoid ring circuit in Ethernet.
- Second function is achieving the convergence protection purpose via spanning-tree protocol when Ethernet topology changes.

Compared to STP, RSTP, MSTP can converge the network more quickly when network structure changes; MSTP is compatible with STP and RSTP, and is better than STP and RSTP. It can not only quickly converge but also send different VLAN along each path to provide better load sharing system for redundant link.

5.4.1 Bridge Configuration

Function Description

On the "Bridge Configuration" page, user can configure relative parameters of spanning-tree.

Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Bridge Configuration".

Interface Description

Bridge settings interface as follows:

The main element configuration description of bridge settings interface:

Interface Element	Description
Spanning Tree	Check to enable Spanning-tree.
Mode	Three modes for spanning-tree protocol choice: • STP: Spanning-tree; • RSTP: Rapid spanning tree; • MSTP: Multiple spanning-trees.
Priority	Bridge priority level, value range is 0-61440. Note: Smaller the priority level value is, higher the priority level is.
Maxage	The maximum lifetime of the message in the device, range is 6-40. It's used to determine whether the configuration message times out.
Hello Time	Message sending cycle, value range is 1-10. Note: The spanning tree protocol sends configuration information every Hello time to check whether the link is faulty.
Forward delay	Port state transition delay, value range is 4-30.
Max Hop	The maximum hop in MST region, value range is 1-40. Note: The maximum hop in MST region has limited the size of MST region. The maximum hop configured on a domain root will be used as the maximum hop in MST region.
Revision	MSTP revision level, value range is 0-65535. Note: When the MST region name, revision level, instance-to-VLAN mapping relation are the same, the two or more bridges will belong to a same MST region.

Interface Element	Description
Name	MST domain name, up to 31 characters.

5.4.2 Instance Configuration

Function Description

On the "Instance Configuration" page, user can configure instance-to-VLAN mapping.

Multiple Spanning Tree Regions (MST Regions) are composed of multiple devices in the switched network and the network segments between them.

In a MST region, multiple spanning trees can be generated through MSTP. Each spanning tree is independent to others and corresponding to special VLAN. Each spanning tree is called an MSTI (Multiple Spanning Tree Instance).

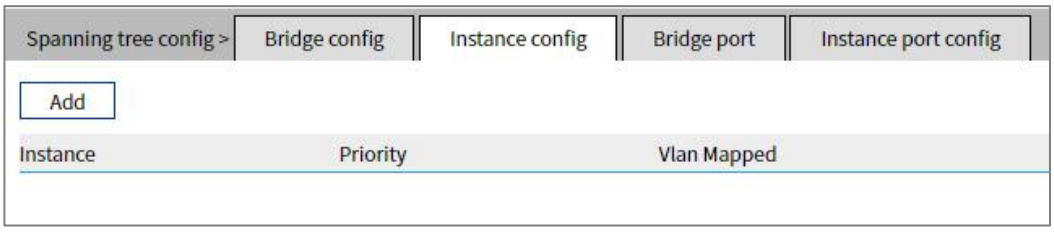
VLAN mapping table is an attribute of MST region, and it's used to describe the mapping relation between VLAN and MSTI.

Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Instance Configuration".

Interface Description

Instance configuration interface as follows:



The main element configuration description of instance configuration interface:

Interface Element	Description
Instance	Multiple Spanning-tree instance ID number.
Priority	Device priority level, value range is 0-61440, default to 32769, step is 4096. Note: The priority of a device participates in spanning tree calculation.

Interface Element	Description
	Its size determines whether the device can be selected as the root bridge of a spanning tree.
VLAN Mapped	VLAN mapping table is separated by commas, such as: 4, 5, 6, 7; "-" represents range, such as: 4-7. Note: VLAN mapping table is an attribute of MST region, and it's used to describe the mapping relation between VLAN and MSTI. MSTP achieves load balancing based on the VLAN mapping table.

5.4.3 Bridge Ports

Function Description

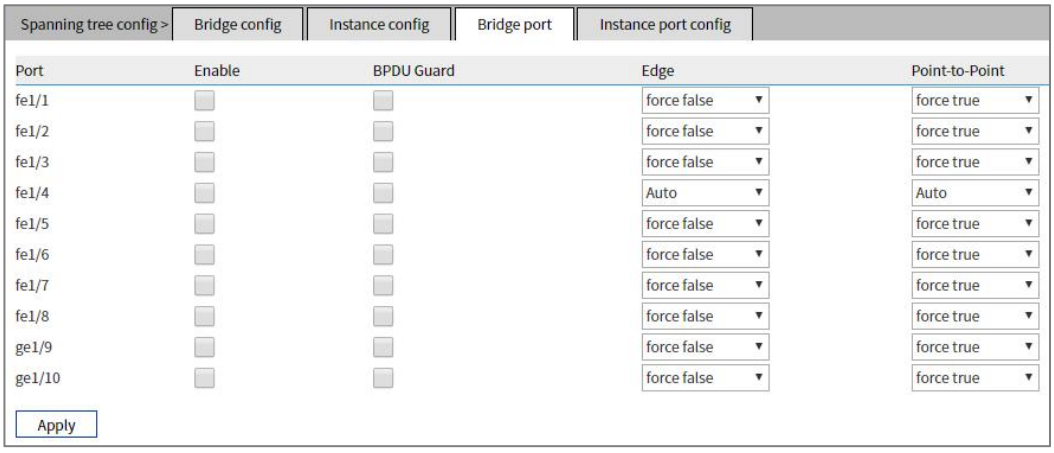
On the "Bridge Port" page, user can enable port to participate in spanning-tree and configure port type, link type and BPDU protection function.

Operation Path

Open in order: "Layer 2 Config > Spanning-tree > Bridge Ports".

Interface Description

Bridge ports interface as follows:



The main element configuration description of bridge ports interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Enable	Check to enable check box and participate in spanning-tree.

Interface Element	Description
BPDU Guard	BPDU (Bridge Protocol Data Unit) protection function.
Edge	Configure port type: • Auto: Automatic system detection; • Force true: edge port; • Force false: non-edge port.
Point-to-Point	Port link type: • Auto: Automatic system detection; • Force true: point-to-point link; • Force false: Non point-to-point link.

5.4.4 Instance Port Configuration

Function Description

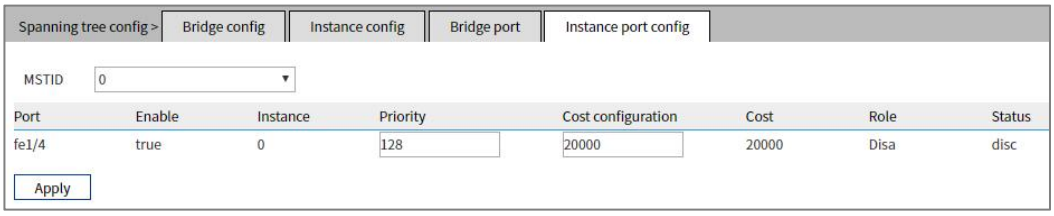
On the "Inst Port Config" page, user can configure port priority level and cost.

Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Inst Port Configuration".

Interface Description

Instance port configuration interface as follows:



The main element configuration description of instance port configuration interface:

Interface Element	Description
MSTID	Choose multiple Spanning-tree ID number.
Port	The corresponding port name of the device Ethernet port.
Enable	Port enable status: • true: enable, participate in spanning-tree; • no: not enabled, not participate in spanning-tree.
Instance	Instance ID number port belongs to.

Interface Element	Description
Priority	Port priority Note: Port priority level in bridge, port priority level is higher when the value is smaller. The higher the priority, the more likely it is to be a root port.
Cost configuration	The path cost from network bridge to root bridge.
Cost	Cost from current port to root bridge.
Role	Port role. • unkn: Unknown; • root: Root port; • desg: Designated port; • altn: Alternate port; • back: Backup port; • disa: Disable port.
Status	Port status in spanning-tree: • Disable: Port close status; • Blocking: Blocked state; • Listening: Monitoring state. • Learning: Learning state; • Forwarding: Forwarding state;

5.5 MRP Configuration

MRP (Media Redundancy Protocol), in MRP ring network, one device is regarded as redundancy manager, and the others are redundancy client. MRP supports up to 50 devices, and when the loop network is interrupted, the loop reconfiguration time is less than 200ms.

5.5.1 Global Configuration

Function Description

On the "Global Configuration" page, user can enable the MRP media redundancy ring network.

Operation Path

Open in order: "Layer 2 Config > MRP Config > Global Config".

Interface Description

Global configuration interface is as follows:

The main element configuration description of global configuration interface:

Interface Element	Description
Ring setting	Check box of MRP ring network enable.

5.5.2 Node Configuration

Function Description

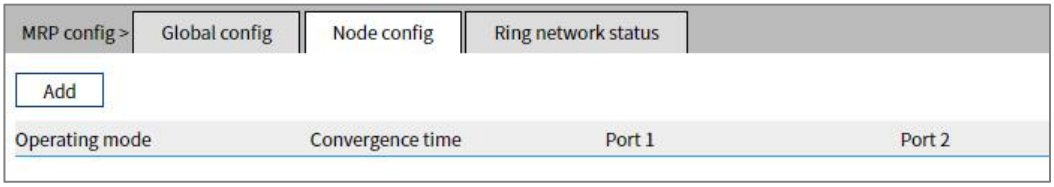
On the "Node Configuration" page, user can configure MRP ring network parameters.

Operation Path

Open in order: "Layer 2 Config > MRP Config > Node Config".

Interface Description

Node configuration interface as follows:



The main element configuration description of node configuration interface:

Interface Element	Description
Operation mode	The work modes of the device, and the options are as follows: • MRM: media redundancy manager; • MRC: media redundancy client.
Convergence time	When the MRP ring network is disconnected, the ring network

Interface Element	Description
	reconfiguration time. The options are as follows: • 200ms； • 500ms。
Port 1	MRP ring port1.
Port 2	MRP ring port2.

5.5.3 Ring Network State

Function Description

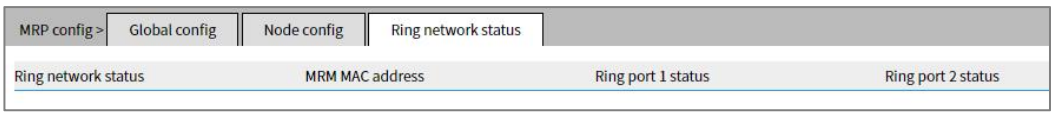
On the “Ring Network Status” page, users can view the MRP ring network status.

Operation Path

Open in order: "Layer 2 Configuration > MRP Configuration > Ring Network Status".

Interface Description

Ring network state interface as follow:



The main element configuration description of ring network state interface:

Interface Element	Description
Ring Network Status	The MRP ring network status can be displayed as follows: • Enable; • Disable
MRM MAC Address	The MAC address of MRM device in this ring network.
Ring port 1 status	The ring network status of device ring network port 1 is displayed as follows: • Forward: the port is forwarding; • Blocking: the port is blocking.
Ring port 2 status	The ring network status of device ring network port 2 is displayed as follows: • Forward: the port is forwarding;

Interface Element	Description
	• Blocking: the port is blocking.

5.6 Ring Configuration

Ring provides automatic recovery and reconnection mechanism for the disconnected Ethernet network, which has link redundancy and self-recovery ability in case of network interruption or network failure.

The core of Ring technology adopt non-master station setting. In a multi-ring network of up to 250 switches, the network self-recovery time is less than 20 milliseconds. Each port in this device can be used as a ring port and connected with other devices. When an interruption occurs in the network connection, the Ring redundant mechanism enables the backup link to quickly recover the network communication.

5.6.1 Global Configuration

Function Description

On the "Local Configuration" page, user can enable/disable the ring network.

Operation Path

Open in order: "Layer 2 Config > Ring Config > Global Config".

Interface Description

Global configuration interface is as follows:

The main element configuration description of global configuration interface:

Interface Element	Description

Interface Element	Description
Ring Configuration	Ring setting checkbox, enable Ring network function after checking.

5.6.2 Node Configuration

Function Description

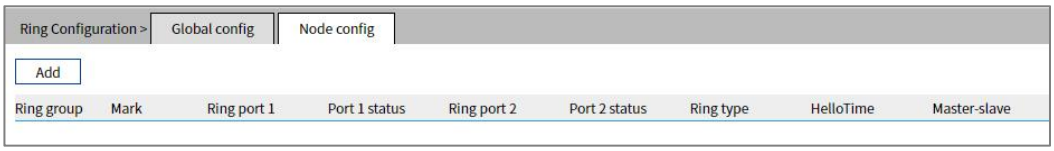
On the "Node Configuration" page, user can configure ring network port and related parameters.

Operation Path

Open in order: "Layer 2 Config > Ring Config > Node Config".

Interface Description

Node configuration interface as follows:



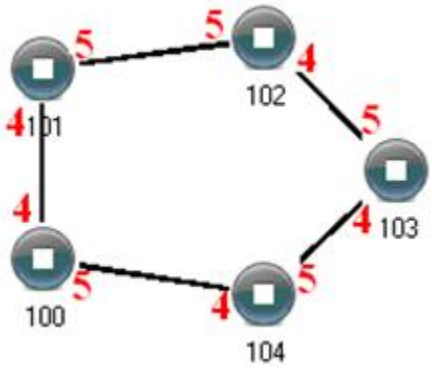
The main element configuration description of node configuration interface:

Interface Element	Description
Ring group	Support ring group 1-4, it can create 4 ring networks at the same time.
Mark	When multiple switches form a ring, the current ring ID would be network ID. Different ring network has different ID.
Ring port 1	The network port 1 on the switch device used to form a ring. Note: When the ring network type is "Couple", it displays "Coupled Port". Coupling port is the port that connects different network identities.
Port 1 Status	Display the current state of ring port1 in the ring group.
Ring port 2	The network port 2 on the switch used to form a ring. Note: When the ring network type is “Couple”, it displays “console port”. Console port is the port in the chain where two rings intersect.
Port 2 Status	Display the current state of ring port2 in the ring group.

Interface Element	Description
Ring Type	According to the requirement in the scene, user can choose different ring type. • Single: single ring, using a continuous ring to connect all device together. • Couple: couple ring is a redundant structure used for connecting two independent networks. • Chain: chain can enhance user's flexibility in constructing all types of redundant network topology via an advanced software technology. • Dual-homing: Two adjacent rings share a device; users can carry the same device on two different networks or two different switching devices on the same network.
Hello Time	Hello_time is the sending time interval of Hello packet; via the ring port, CPU sends information packet to adjacent device for confirming the connection is normal or not.
Master-slave	Master-slave mode, options as follows: • Master: the master device of the ring network; • Slave: the slave device of the ring network; Note: Single ring has master/slave device option. One-Master Multi-Slave mode is recommended in one single ring. When the device is set as master device and one end of it is backup link, it can enable backup link to ensure the normal operation of the network when failure occurs in ring network.

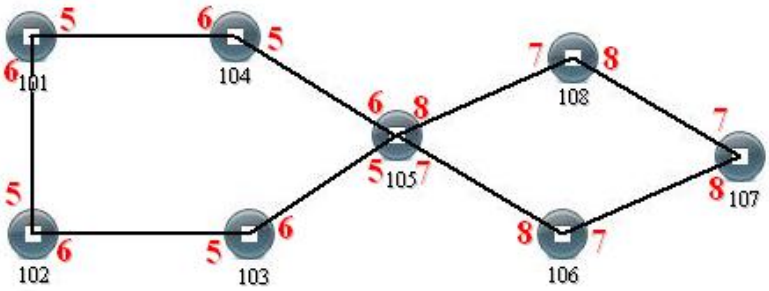
Single Ring Configuration

Enable Single, enable ring group 1 (other ring group is OK), Set the device port 4 and port 5 to ring port, and set other switches to the same configuration as the switch above, Enable these devices, and adopt network cable to connect port 4 and port 5 of the switch, then search it via network management software, the ring topology structure picture as below:



Double Ring Configuration

Double ring as shown below, in the figure, double ring is the tangency between two rings, and the point of tangency is NO. 105 switch.



Configuration Method:

Step 1 Adopt single ring configuration method to configure port 5 and port 6 of NO. 101, 102, 103, 104, 105 switches as the ring port, and the ring group is 1;

Step 2 Adopt single ring configuration method to configure port 7 and port 8 of NO. 105, 106, 107 and 108 switches as the ring ports and the ring group 2;

Step 3 Adopt network cable to connect the ring group 1;

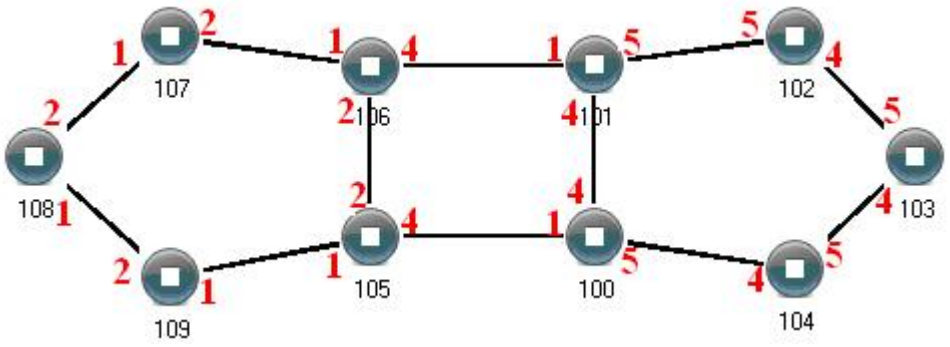
Step 4 Adopt network cable to connect the ring group 2;

Step 5 Search the topology structure picture via network management software;

Since NO. 105 devices belong to two ring groups, the network IDs of the two ring groups cannot be the same.

Coupling Ring Configuration

Coupling ring basic framework as the picture below:



Operation method:

Step 1 Enable ring network group 1 and 2: (Hello_time could be disabled, but the time could not be set to make Hello packet send too fast, otherwise it would effect CPU processing speed seriously);

Step 2 Set the ring port of NO. 105, 106 device ring group to port 1 and port 2, network identification to 1, ring type to Single; Set the coupling port of ring group 2 to port 4, console port to 2, ring identification to 3, ring type to Coupling.

Step 3 Set the ring port of NO. 100, 101 device ring group 1 to port 4 and port 5, network identification to 2, ring type to Single; Set the coupling port of ring group 2 to port 1, console port to port 4, ring identification to 3, ring type to Coupling.

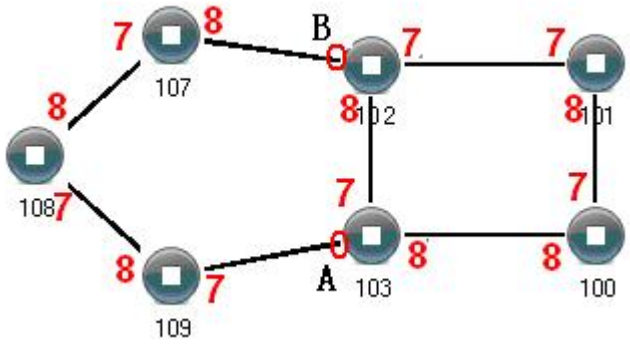
Step 4 Set the ring port of NO. 107, 108 and 109 device ring group 1 to port 1 and port 2, network identification to 1, ring type to Single; Set the ring port of NO. 102, 103 and 104 device ring group 1 to port 4 and port 5, network identification to 2, ring type to Single.

Step 5 Connect the port 4 and port 5 of five devices NO. 100-104 to the single ring in turn, adopt network cable to connect the port 1 and port 2 of four devices NO. 105-109 to the single ring in turn, Then adopt Ethernet cable to connect port 4 of NO. 106 device to port 1 of NO. 101 device, port 4 of NO. 105 device to port 1 of NO. 100 device, coupling ring combination is completed.

Console ports are two ports connected to NO. 105 device and NO. 106 device in the above picture. The two ports connected to NO. 100 device and NO. 101 device are also called console ports.

Chain Configuration

Chain basic framework as the picture below:



Operation method:

Step 1 Enable ring group1: (Hello_time could be disabled, but the time shouldn't be set to send Hello packet too fast, otherwise it would affect the processing speed of CPU seriously).

Step 2 Set the ring port of NO. 100, 101, 102 and 103 device ring group 1 to port 7 and port 8, network identification to 1, ring type to Single. Set the ring port of NO. 107, 108 and 109 devices ring group 1 to port 7 and port 8, network identification to 2, ring type to Chain.

Step 3 Adopt network cable to connect the port 7 and port 8 of three devices NO. 107-109, adopt network cable to connect the port 7 and port 8 of four devices NO. 100-103 to the single ring in turn, Then adopt network cable to connect port 7 of NO. 107 device and port 7 of NO. 109 device to normal ports of NO. 102 and 103 device, chain combination is complete.

Note

- Port that has been set to port aggregation can't be set to rapid ring port, and one port can't belong to multiple rings;
- Network identification in the same single ring must be consistent, otherwise it cannot form a normal ring or normal communicate;
- Network identification in different ring must be different;
- When forming double ring and other complex ring, user should notice whether the network identification in the same single ring is consistent, and network identification in different single ring is different.

6 Network Security

6.1 Access Control

Function Description

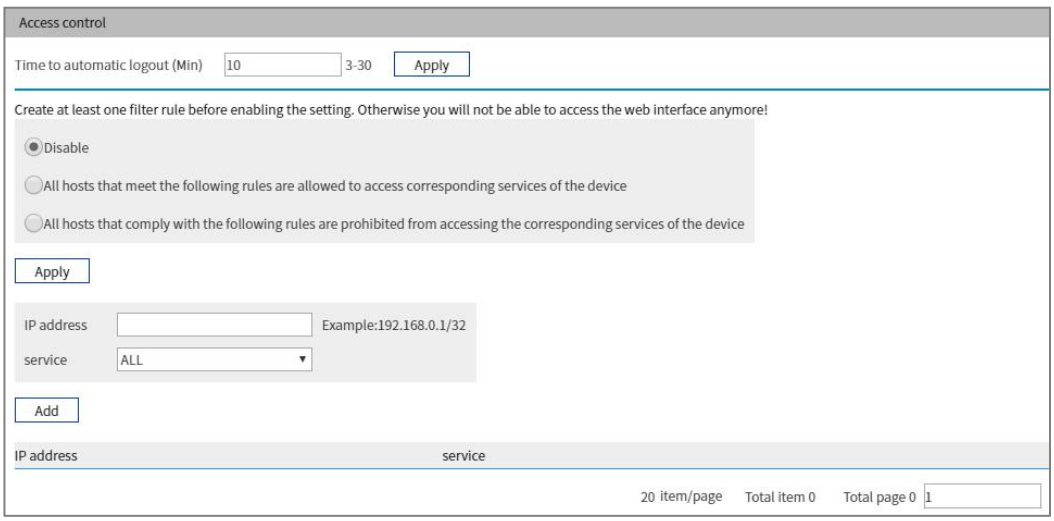
On the "Access Control" page, user can configure access rules and filtering rule.

Operation Path

Open in order: "Network security > Access Control".

Interface Description

Access control interface as follows:



The main element configuration description of access control interface:

Interface Element	Description
Time to automatic logout (min)	Set the time of automatic logout, unit: minutes, default value: 10, value range: 3-30.

Interface Element	Description
Filtering rule	Set filtering rule, default to disable, that is disable access filtering function. Options as follows: • Disable; • Hosts that meet the following rules are allowed to access the equipment corresponding service; • Hosts that meet following rules are forbidden to access the equipment corresponding service.
IP Address	Enable/disable device to access the device IP address.
Service	Methods of enabling/disabling device to access the device. Options as follows: • ALL: support HTTP, TELNET, SSH and SNMP access management; • HTTP: Support WEB interface access; • TELNET: Support Telnet client command line access; • SSH: Support SSH client access; • SNMP: Support SNMP network management.

 Notice

Please first add the client list, and then set the access rules, otherwise it may cause the current web can't be accessed.

7 Advanced Configuration

7.1 QOS Configuration

Quality of Service (QoS) is the service quality. As for network business, service quality includes transmission bandwidth, transfer delay, data packet loss rate and so on. In network, user can improve the service quality by ensuring the transmission bandwidth, reducing transfer delay, data packet loss rate, delay jitter and other measures.

Network resources are always limited, as long as there exists the case of snatching network resources, there will be service quality requirements. Quality of service is relative to the network business, while ensuring the service quality of a certain type of business; it may damage the service quality of other businesses. For example, in the case of total network bandwidth is fixed, if a type of business occupies more bandwidth, other businesses will be able to use less bandwidth, which may influence the usage of other businesses. Therefore, network managers need to make rational planning and distribution of network resources according to the characteristics of various businesses, so that network resources can be efficiently utilized.

QoS function provides 8 internal queues, each queue supports 8 different levels traffic, High-priority data packets stay on the device for a short period of time, and some latency-sensitive traffic supports lower latency. According to 802.1p priority level tag, IP TOS, the device can classify packets to a certain level.

Function Description

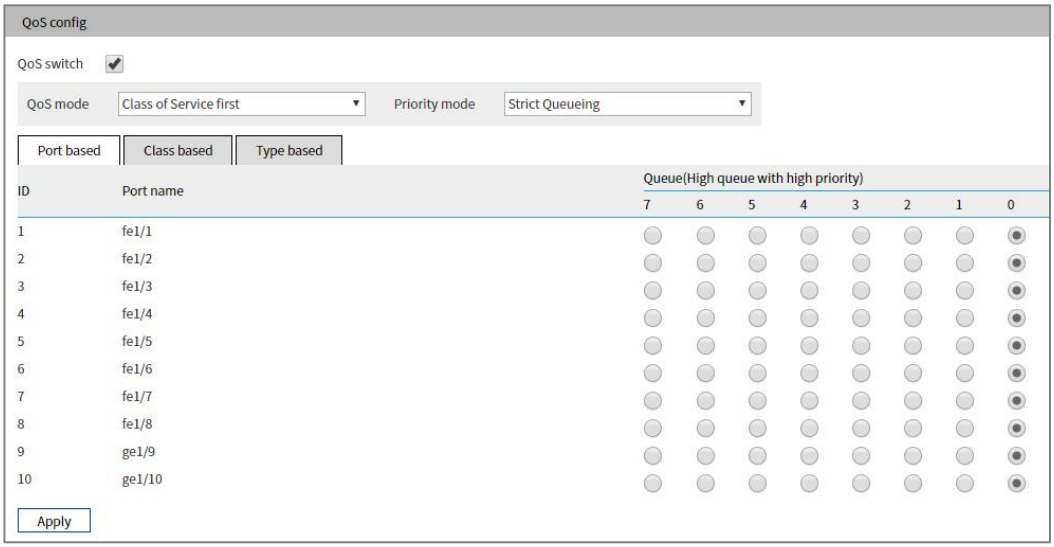
On the “QoS Configuration” page, you can configure QoS mode, priority mode, etc.

Operation Path

Open in order: "Advanced Configuration > QoS Configuration".

Interface Description 1: Port-based

Check QoS-Port-based configuration interface as below:



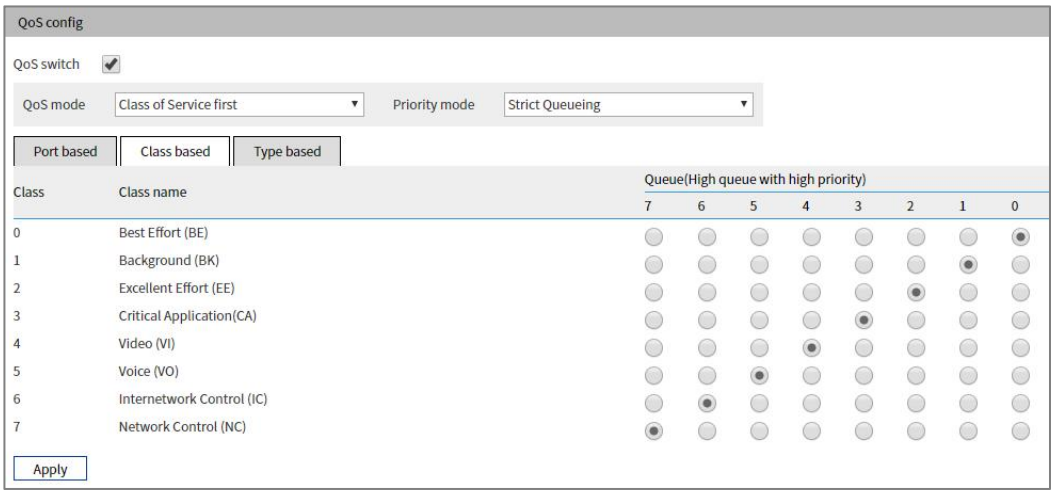
The main element configuration description of QoS-Port-based configuration interface:

Interface Element	Description
QoS switch	Check to enable QoS function
QoS mode	The drop-down box of QoS mode: • Port-based only • Service level only • Service type only • CoS first • ToS first
Priority mode	The drop-down box of priority mode: • Strict Queueing: sends the higher-priority queues strictly according to the priority level from high to low. Queue 7 has the highest priority level and queue 0 has the lowest priority level. • 3-25-17-12-6-3-2-1 weighted fair queening. Each queue is configured with a weighted value of 33-25-17-12-6-3-2-1, and how many messages are dispatched by each queue can be configured, and the queues are scheduled in turn, thus avoiding the

Interface Element	Description
	disadvantage that messages in low priority queues may not be served for a long time when strict priority queues are adopted.
Port-Based	**Port-Based Configuration bar** Note: This function can only be configured when port-based only, CoS first or ToS first is selected in QoS mode.
ID	Port-based ID number.
Port name	The corresponding port name of the device Ethernet port.
Queue (High queue with high priority)	Mapping relationship between ports and queues. Note: By default, device would use port priority in place of the 802.1p priority the port comes with when receiving message to control the quality of service the messages deserve. The range of priority is 0-7. By default, the port priority is 0. The higher the value, the higher the priority.

Interface Description: Class based

QoS Config-class-based interface is as follows:



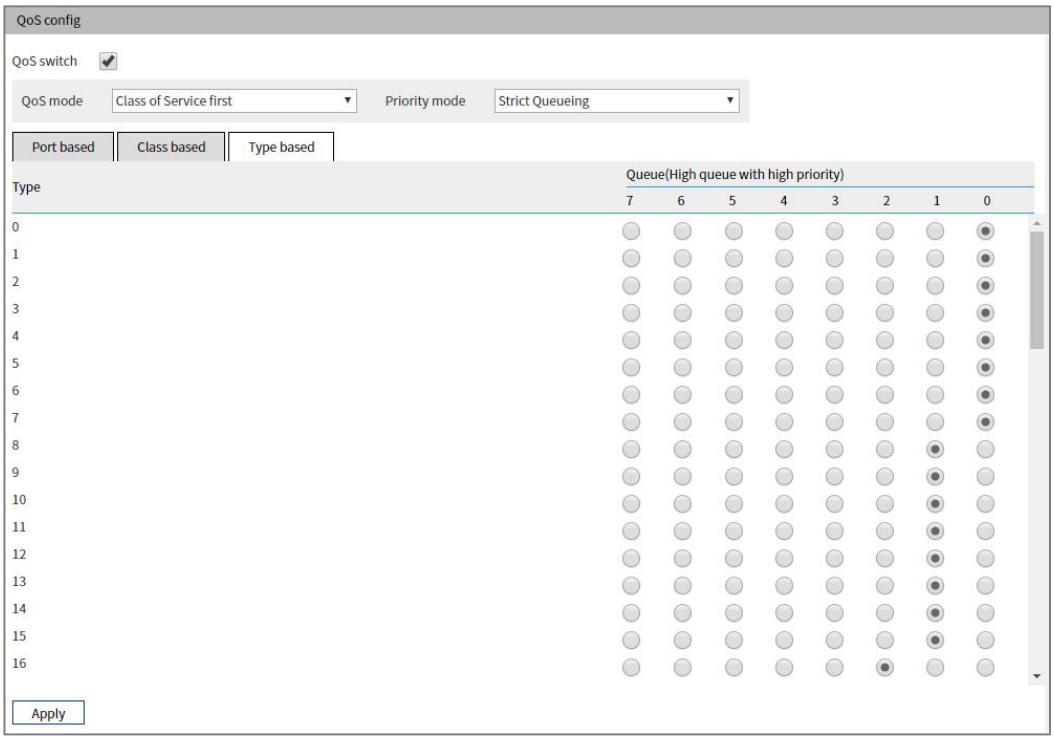
The main element configuration description of QoS Config-class-based interface:

Interface Element	Description
QoS switch	Check to enable QoS function
QoS mode	The drop-down box of QoS mode: • Port-based only • Service level only

Interface Element	Description
	• Service type only • CoS first • ToS first
Priority mode	The drop-down box of priority mode: • Strict Queueing: sends the higher-priority queues strictly according to the priority level from high to low. Queue 7 has the highest priority level and queue 0 has the lowest priority level. • 3-25-17-12-6-3-2-1 weighted fair queening. Each queue is configured with a weighted value of 33-25-17-12-6-3-2-1, and how many messages are dispatched by each queue can be configured, and the queues are scheduled in turn, thus avoiding the disadvantage that messages in low priority queues may not be served for a long time when strict priority queues are adopted.
Class-based	**Class-based configuration bar** Note: This function can only be configured when CoS only, CoS first or ToS first is selected in QoS mode.
Class	802.1Q CoS business service level.
Class name	Class name corresponding to service class: • Best Effort (BE) • Background (BK) • Excellent Effort (EE) • Critical Application(CA) • Video (VI) • Voice (VO) • Internetwork Control (IC) • Network Control (NC)
Queue (High queue with high priority)	Mapping relationship between service class and queues.

Interface Description: Type based

QoS Config-class-based configuration interface is as follows:



The main element configuration description of QoS Config-class-based interface:

Interface Element	Description
QoS switch	Check to enable QoS function
QoS mode	The drop-down box of QoS mode: • Port-based only • Service level only • Service type only • CoS first • ToS first
Priority mode	The drop-down box of priority mode: • Strict Queueing: sends the higher-priority queues strictly according to the priority level from high to low. Queue 7 has the highest priority level and queue 0 has the lowest priority level. • 3-25-17-12-6-3-2-1 weighted fair queening. Each queue is configured with a weighted value of 33-25-17-12-6-3-2-1, and how many messages are dispatched by each queue can be configured, and the

Interface Element	Description
	queues are scheduled in turn, thus avoiding the disadvantage that messages in low priority queues may not be served for a long time when strict priority queues are adopted.
Type-based	**Class-based Configuration** Note: This function can only be configured when ToS only, CoS first or ToS first is selected in QoS mode.
Type	IP DSCP value is 0-63, 63 is the highest priority level, 0 is the lowest priority level.
Queue (High queue with high priority)	Mapping relationship between DSCP and queues.

7.2 LLDP Configuration

LLDP is a layer 2 topology discovery protocol, its basic principle is: Devices in network send the status information message to adjacent device, and each port in the device stores its own information, if there is change in the status of local device, it can also send updated information to the adjacent device directly connected to it. Adjacent devices will store the information in standard SNMP MIB bank. The network management system could inquiry the connection status of current layer 2 from SNMP MIB bank. It should be noted that LLDP is only a remote device status information discovery protocol, which cannot complete the network device configuration, port control and other functions.

Function Description

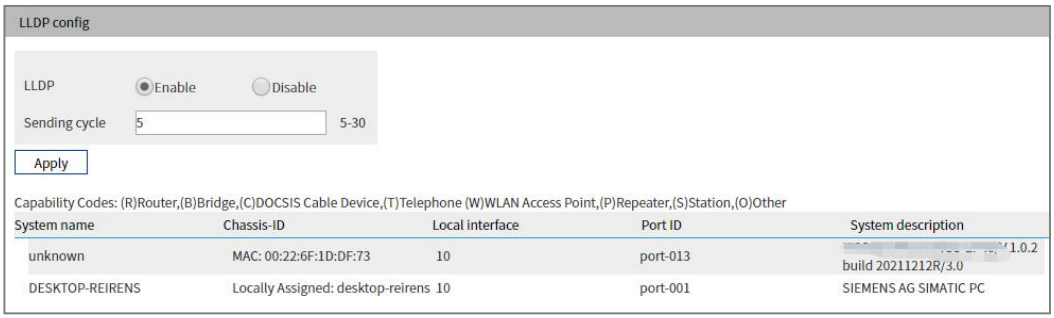
On the "LLDP Config" page, user can configure the relevant parameters of LLDP.

Operation Path

Open in order: "Advanced Configuration > LLDP Configuration".

Interface Description

LLDP configuration interface is as follows:



The main element configuration description of LLDP configuration interface:

Interface Element	Description
LLDP	LLDP function status, options as follows: • Enable; • Disable.
Sending cycle	The range of LLDP sending period is 5-30. Note: When no device status changes, the device periodically sends LLDP packets to its adjacent nodes. The interval is called the period for sending LLDP packets.
System name	System Name is the name advertised by the neighbor unit.
Chassis-ID	The chassis ID is the identification of the neighbor LLDP frame.
Local interface	The interface on which the LLDP frame was received.
Port ID	The port ID is the identification of the neighbor port.
System description	System Capabilities describes the neighbor unit's capabilities.The shorthand code corresponds to the following: • R: Router; • B: Bridge; • C: DOCSIS cable device; • T: Telephone; • W: WLAN access point; • P: repeater; • S: station; • O: Others.

7.3 SNMP Configuration

SNMP Introduction

Now, the broadest network management protocol in network is SNMP (Simple Network Management Protocol). SNMP is the industrial standard that is widely accepted and comes into use, it's used for guaranteeing the management information transmission between two points in network, and is convenient for network manager search information, modify information, locate faults, complete fault diagnosis, conduct capacity plan and generate a report. SNMP adopts polling mechanism and only provides the most basic function library, especially suit for using in minitype, rapid and low price environment. SNMP implementation is based on connectionless transmission layer protocol UDP, therefore, it can achieve barrier - free connection to many other products.

SNMP Working Mechanism

SNMP is divided into NMS and Agent:

- Network Management Station (NMS) is the work station that runs client procedure, at present, common network management platforms include Quid View, Sun Net Manager and IBM Net View. Agent is the server software that runs in network device.
- NMS can send Get Request, Get Next Request and Set Request messages to Agent, after receiving these request messages from NMS, Agent will conduct Read or Write operation, generate Response message and return messages to NMS according to the message type. When the device appears abnormal situation or the state changes (such as device resets), Agent will forwardly send Trap message to NMS and report occurred event to NMS.

SNMP supports three basic operations:

- Get operation: manager adopts the operation to inquire a variable value of Agent;
- Set operation: manager adopts the operation to set a variable value of Agent;
- Trap operation: Agent adopts the operation to send abnormal alarm information to manager.

SNMP Protocol Version

At present, SNMP Agent in the device supports SNMP V1 version, SNMP V2C and SNMP V3 version. SNMP V1, SNMP V2C adopt community name authentication, SNMP message of community name without device authentication will be discarded. SNMP community name is used for defining the relationship of SNMP, NMS and

SNMP Agent. Community name plays a role similar to password, and can limit SNMP NMS to access SNMP Agent in device. User can choose and appoint one or more characters relative to community name:

- Define MIB view that community name can access.
- Configure MIB object access privilege of community name as read-write privilege or read-only privilege. Community name with read-only privilege can only inquire the device information; community name with read-write privilege can configure the device.
- Set the basic access control list appointed by community name.

7.3.1 Global Configuration

Function Description

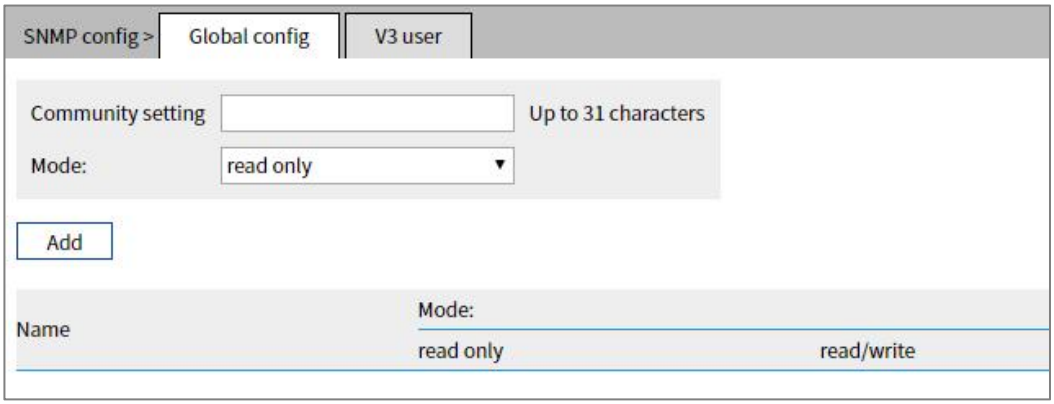
On the "Global Configuration" page, user can add/delete SNMP community. Define MIB view that community name can access, set MIB object access privilege of community name as read-write privilege or read-only privilege.

Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > Global Configuration".

Interface Description

Global configuration interface is as follows:



The main element configuration description of global configuration interface:

Interface Element	Description
Community setting	SNMP community name definition, support 31 characters

Interface Element	Description
	input.
Mode	Community mode setting, the options are as follows: • Read-only: Read-only mode community. • Read-write: Read-write mode community.
Name	Display community name.
Mode-read-only	Display community read-only mode.
Mode-read-write	Display the community read-write mode.

7.3.2 V3 User

SNMPv3 adopts User-Based Security Model (USM) authentication mechanism. Network manager can configure authentication and encryption function. Authentication is used to verify the validity of the packet sender and prevent unauthorized users from accessing it. Encryption encrypts the transmission packet between NMS and Agent to prevent eavesdropping. It adopts authentication and encryption function to provide higher security for the communication between NMS and Agent.

Function Description

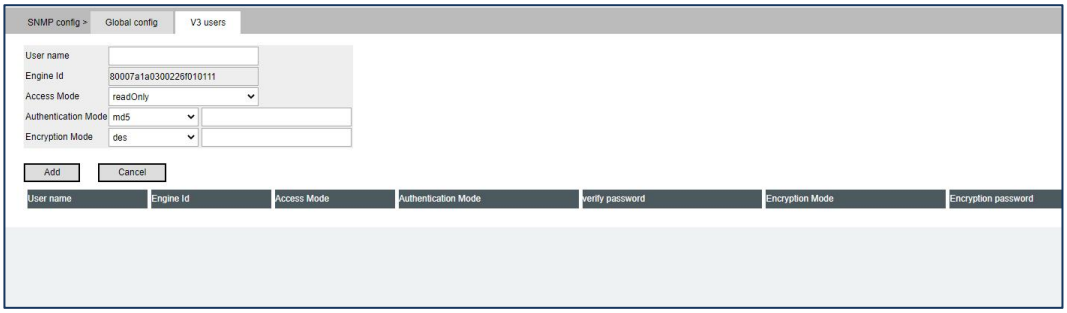
On the "V3 User" page, user can configure SNMP V3 user information.

Operation Path

Open in order: " Main Menu > Advanced Config > SNMP Config > V3 User".

Interface Description

V3 user interface as follows:



The main element configuration description of V3 user interface:

Interface Element	Description
User name	SNMP v3 version user name definition, combination of letters and numbers, and support 48 characters input.
Engine ID	SNMP protocol engine identification. There is a one-to-one correspondence between the engine identification and SNMP entity. It is in charge of SNMP protocol operation, providing service for each type of SNMP applications. Note: The main function of SNMP engine includes: send and receive message, authenticate and encrypt message, control access toward managed object.
Access Mode	Access mode, options as follows: • ReadOnly: Read-only mode. • ReadWrite: ReadWrite mode.
Authentication Mode	Authentication method and authentication password information, two authentication methods are optional: • Md5: Information abstract algorithm 5; • Sha: Secure hash algorithm.
Encryption Mode	V3 user data encryption algorithm and encryption password information, encryption algorithm options are as follows: • Des: Adopt data encryption algorithm; • Aes: Adopt advanced encryption standard; • None: No encryption.

7.4 DNS Settings

DNS, full Name Domain Name System. DNS helps users find paths in the Internet. Every computer on the Internet has a unique address called an "IP address" (Internet protocol address). Because IP addresses (a string of Numbers) are hard to remember, DNS allows users to replace them with a common string of letters (" Domain Names ").

DNS refers to the Domain Name Server. On the Internet, there is a one-to-one correspondence between domain names and IP addresses. Although domain names are easy for people to remember, machines can only know each other's IP addresses. The conversion between them is called domain name resolution which needs to be done by a dedicated domain name resolution server, DNS is the server for domain name resolution.

Function Description

On the DNS Settings page, you can configure main DNS and backup DNS.

Operation Path

Open in order: "Advanced Configuration > DNS Configuration".

Interface Description

DNS setting interface as follows:

DNS settings interface main element configuration instructions

Interface Element	Description
Primary DNS	DNS Sever IP address, for example: 202.96.133.5.
Reserved DNS	DNS Sever backup IP address, for example: 202.96.133.5.

7.5 NTP Configuration

The full name of NTP protocol is Network Time Protocol. Its destination is to transmit uniform and standard time in international Internet. Specific implementation scheme is appointing several clock source websites in the network to provide user with timing service, and these websites should be able to mutually compare to improve the

accuracy. It can provide millisecond time correction, and can be confirmed by the encrypted way to prevent malicious protocol attacks.

Function Description

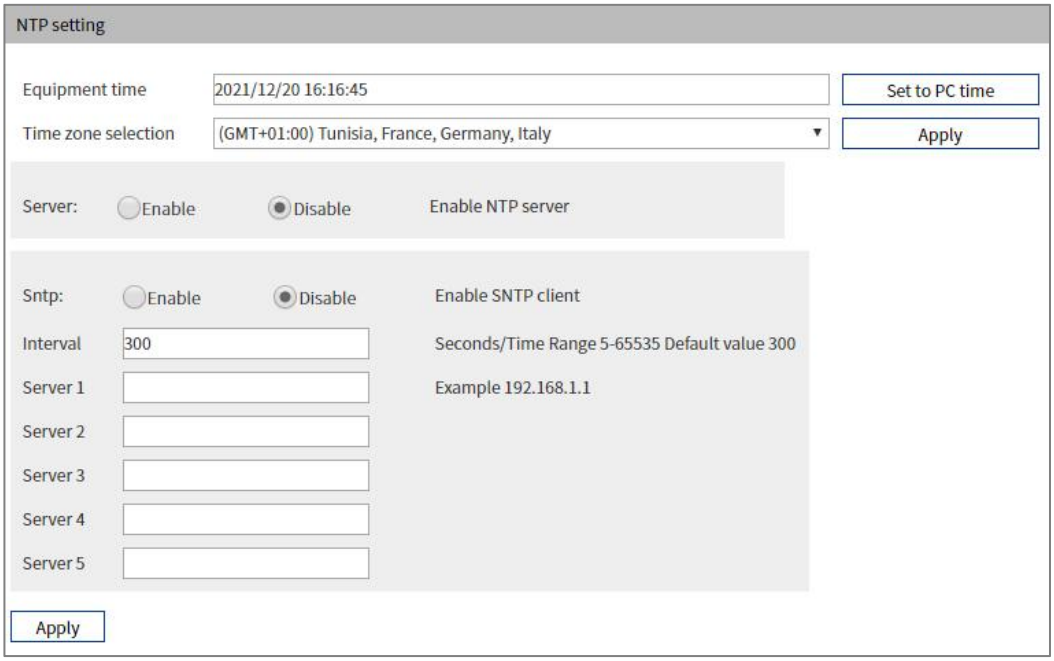
On the "NTP Config" page, user can configure the device time and NTP server information.

Operation Path

Open in order: "Advanced Configuration > NTP Configuration".

Interface Description

NTP configuration interface as follows:



The main element configuration description of NTP configuration interface:

Interface Element	Description
Equipment time	The device own time, which can be synchronized to current computer time.
Timezone selection	Time standard of different global regions.
Server	The options of enabled status of the server: • Enable; • Disable.

Interface Element	Description
Mode	The status of NTP automatic time synchronization function, options as follows: • Enable; • Disable.
Interval	Time hack interval, values range from 5 to 65535, the default value is 300 seconds/time.
Server 1	IP address of NTP-sync server 1, for example: 192.168.1.1.
Server 2	IP address of NTP-sync server2, for example: 192.168.1.1.
Server 3	IP address of NTP-sync server3, for example: 192.168.1.1.
Server 4	IP address of NTP-sync server4, for example: 192.168.1.1.
Server 5	IP address of NTP-sync server5, for example: 192.168.1.1.

8 System Maintenance

8.1 Configuration File Management

8.1.1 Global Configuration

Function Description

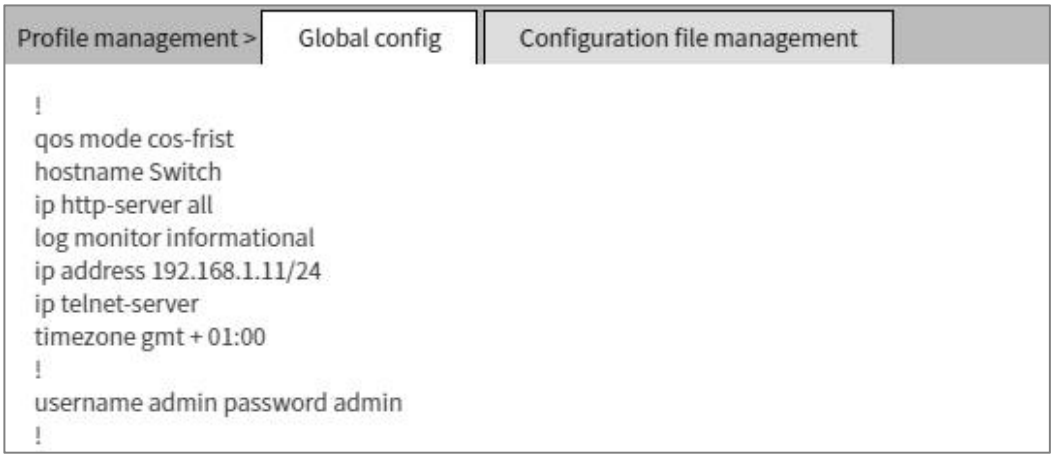
On the "Global Configuration" page, user can view current configuration information.

Operation Path

Open in order: "System Management > Configuration File Settings > Global Configuration".

Interface Description

Global configuration interface is as follows:



8.1.2 Manage Configuration File

Function Description

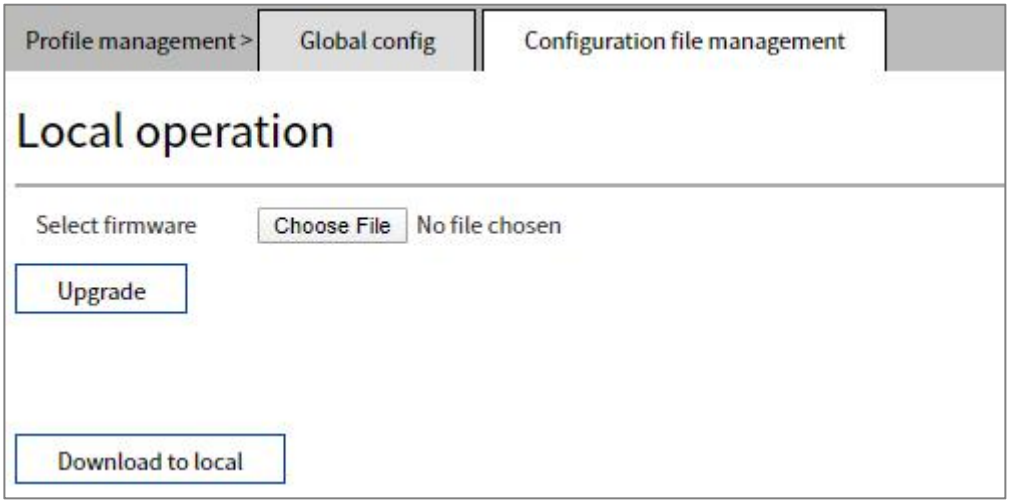
On the "Manage Configuration File" page, user can download and upload configuration file.

Operation Path

Open in order: "System Management > Configuration File Settings > Manage Configuration File".

Interface Description

Configuration file management interface is as follows:



The main elements configuration description of configure file management interface:

Interface Element	Description
Local operation	**Local operation configuration bar**
Select Firmware	Click the "Select File" button to select the configuration upgrade file locally.
Upgrade	Click the "Upload" button to upload the configuration file.
Download to local	Download the configuration file of current device to the local PC, format: .conf.

Note

After the update is completed, a new page will be automatically opened to "system status". The device needs to be restarted before the uploaded profile will take effect.

8.2 Restore Factory Settings

Function Description

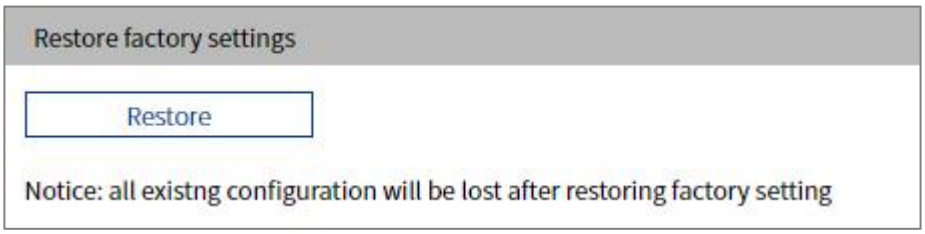
On the "Restore" page, user can restore the device to default settings.

Operation Path

Open in order: "System management > Restore".

Interface Description

Restore Factory Settings interface is as follows:



The main element configuration description of restore factory settings interface:

Interface Element	Description
Restore	Click this button and the device will lose all existing configurations and reverts to factory settings. Note: After the factory settings are restored, the IP address configuration of the device will also be lost, and it will be in an IP-free state.

8.3 Upgrade

8.3.1 TFTP

Function Description

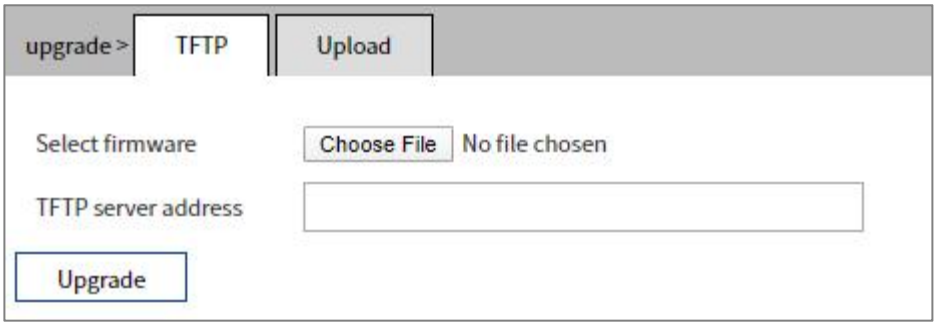
On the "TFTP" page, user can update and upgrade the device procedure via TFTP server.

Operation Path

Open in order: "System Maintenance > Upgrade> TFTP".

Interface Description

TFTP interface is as below:



Main elements configuration descriptions of TFTP interface:

Interface Element	Description
Select firmware	The name of the TFTP server to store the upgrade file.
TFTP server address	The IP addresses of TFTP server that stores upgrade files.

8.3.2 Upload

Function Description

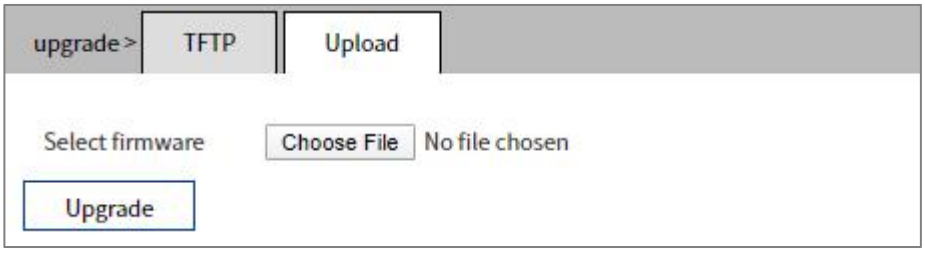
On the "Upload" page, user can update and upgrade the device procedure via local browser.

Operation Path

Open in order: “System Maintenance > Upgrade> Upload”.

Interface Description

Upload interface is as below:



Configuration description of main elements of the Upload interface:

Interface Element	Description
Select Firmware	Select update file stored in the local host by clicking “select file” button. After clicking “upgrade” button, it starts updating firmware.

Warning

Do not click on or configure other WEB pages of the device or restart the switch when uploading configuration files or upgrading software. Otherwise, the configuration file upload or software update will fail, or the device system will crash.

The Second Part: Frequently Asked Questions

9 FAQ

9.1 Sign in Problems

1. **Why the web page display abnormally when browsing the configuration via WEB?**

   Before accessing the WEB, please eliminate IE cache buffer and cookies. Otherwise, the web page will display abnormally.

2. **What should I do if I forget my login password?**

   IF you forget the login password, you can initialize the password by restoring factory settings. The specific method is to search by BlueEyes_Ⅱ software and use restore factory setting function, then the password will be initialized. The initial user name and password are "admin".

3. **Is configuring via WEB browser same to configuring via BlueEyes_Ⅱ software?**

   Both configurations are the same, without conflict.

9.2 Configuration Problem

1. **Why the bandwidth can't be increased after configuring Trunking (port aggregation) function?**

   Check whether the port attributes set to Trunking are consistent, such as rate, duplex mode, VLAN and other attributes.

2. **What's the difference between RING V2 and RING V3?**

   RING V2 and RING V3 are our company's ring patents. RING V2 only supports single ring and coupling ring. RING V3 supports single ring, coupling ring, chain and Dual_homing, and Hello_Time can be set to detect port connection status.

3. **How to deal with the problem that part of switch ports are impassable?**

   When some ports on the switch are impassable, it may be network cable, network adapter and switch port faults. User can locate the faults via following tests:

   - Keep connected computer and switch ports unchanged, change other network cables;
   - Keep connected network cable and switch port unchanged, change other computers;
   - Keep connected network cable and computer unchanged, change other switch port;
   - If the switch port faults are confirmed, please contact supplier for maintenance.

4. **How about the order of port self-adaption state detection?**

   The port self-adaption state detection is conducted according to following order: 1000Mbps full duplex, 100Mbps full duplex, 100Mbps half-duplex, 10Mbps full duplex, 10Mbps half-duplex, detect from high to low, connect automatically in supported highest speed.

9.3 Indicator Problem

1. **Why is the power supply indicator off?**

Possible reasons include:

- Not connected to the power socket; troubleshooting, connected to the power socket.
- Power supply or indicators faults; troubleshooting, change the power supply or device test.
- Power supply voltage can't meet the device requirements; troubleshooting, configure the power supply voltage according to the device manual.

2. **Why is the Link/Act indicator off?**

Possible reasons include:

- The network cable portion of Ethernet copper port is disconnected or bad contact; troubleshooting, connect the network cable again.
- Ethernet terminal device or network card works abnormally; troubleshooting, eliminate the terminal device fault.
- Not connected to the power socket; troubleshooting, connected to the power socket.
- Interface rate doesn't match the pattern; troubleshooting, examine whether the device transmission speed matches the duplex mode.

3. **Ethernet copper port and fiber port indicator are connected normally, but can't transmit data, what's the reason?**

When the system is power on or network configuration changes, the device and switch configuration in the network will need some time. Troubleshooting, after the device and switch configuration are completed, Ethernet data can be transmitted; if it's impassable, power off the system, and power on again.

4. **Why does the communication crashes after a period of time, namely, it cannot communicate, and it returns to normal after restarting?**

Reasons may include:

- Surrounding environment disturbs the product; troubleshooting, product grounding adopts shielding line or shields the interference source.
- Site wiring is not normative; Troubleshooting, optical fiber, network cable, optical cable cannot be arranged with power line and high-voltage line.

- Network cable is disturbed by static electricity or surge; Troubleshooting, change the shielded cable or install a lightning protector.
- High and low temperature influence; troubleshooting, check the device temperature usage range.

10 Appendix: Description of Log ID

The detailed description and corresponding level of the code are as follows:

ID	Note	Level
1	Power Alarming	Error
2	Port Alarming	Error
3	Temperature Alarming	Error
4	Mrp Alarming!ring state open.	Error
5	Leakage Current Alarming	Error
6	Netload Alarming	Error
7	Warning Neigborhood Alarming	Error
8	Sdcard Alarming!SD card can not detect. Alarming	Error
9	DSP warning!	Error
10	AR Disconnect!	Error
11	Upgrade form Web TFTP mode	Notice
12	Upgrade form Web HTTP mode	Notice
13	Upgrade form sdCard	Notice
14	Download configuration to Web TFTP mode	Notice
15	Download configuration to SD card	Notice
16	Upgrade configuration by Web TFTP mode	Notice
17	Upgrade configuration by SD card	Notice
18	System reboot	Notice
19	System restore	Notice
20	Save running configuration	Notice
21	AR Connect	Notice
22	Time sync form server	Notice
23	User log clear	Notice

ID	Note	Level
24	Test Mail send failed	Notice
25	Netload reset	Notice
26	Leakage current reset	Notice
27	DSP self-Saving	Notice
28	Dhcp server offering.	Notice
29	Dhcp server no offering.	Notice
30	Function Port mirror enable	Information
31	Function IGMP-Snooping enable	Information
32	Function STP enable	Information
33	Function MRP enable	Information
34	Function ACL enable	Information
35	Function NTP enable	Information
36	Function NTP disble	Information
37	Function NTP server enable	Information
38	Function NTP server disable	Information
39	Port Up	Information
40	Port Download	Information
41	Power on	Information
42	Power off	Information