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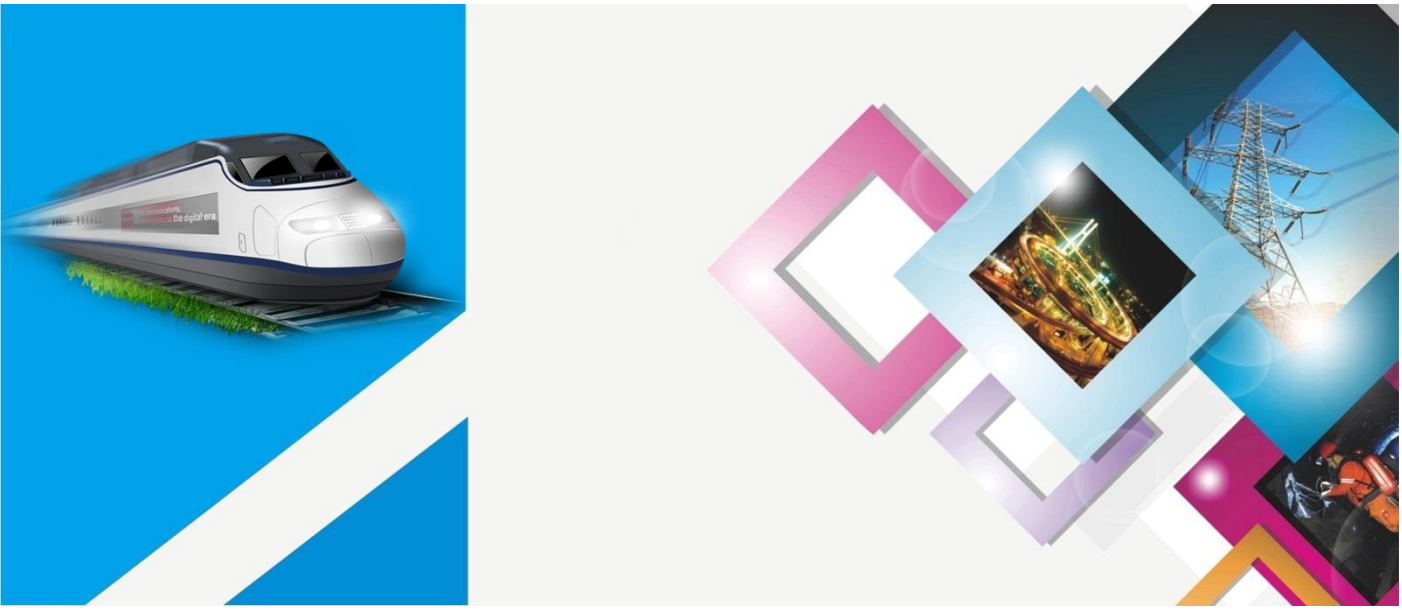

# IES6220 Series
# Managed Industrial Ethernet Switch
# （Optional POE）
# User Manual

Version 01

Issue Date: 2019-03-04

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# Preface

Managed Industrial Ethernet Switch User Manual has introduced this series of switches:

- Product feature
- Network management method
- Network management relative principle overview

## Readers

This manual mainly suits for engineers as follows:

- Network administrator responsible for network configuration and maintenance
- On-site technical support and maintenance staff
- Hardware engineer

## Text Format Convention

| Format | Description |
|---|---|
| “” | Words with "" represent the interface words. e.g.: "The port number". |
| > | 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 | Represent the words click to achieve hyperlink. Font color as: "Light blue". |
| About This Chapter | The "About This Chapter" section provides links to each section and corresponding principles / operating chapters in this chapter. |

## Icon Convention

| Format | Description |
|---|---|
| Notice | Reminder the announcements in the operation, improper |

| Format | Description |
|---|---|
| | 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. |
| Tips | Pay attention to the operation or information to ensure success device configuration or normal working. |

# Revision Record

| Version NO. | Revision Date | Revision Description |
|---|---|---|
| 01 | 2019-03-04 | Product release |

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# The First Part: Operation

# 1 Log in the Web Interface

## 1.1 WEB Browsing System Requirements

While using managed industrial Ethernet switches, the system should meet the following conditions.

| Hardware and Software | System Requirements |
|---|---|
| Resolution | Above 1024x768 |
| Color | Above 256 color |
| Browser | Above Internet Explorer 6.0 |
| Operating System | • Windows XP<br>• Windows 7<br>• Windows 10 |

## 1.2 Setting IP Address of PC

The switch default management as follows:

| IP Setting | Default Value |
|---|---|
| IP Address | 192.168.1.254 |



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| IP Setting | Default Value |
|---|---|
| Subnet Mask | 255.255.255.0 |

While configuring the switch via Web:

- Before remote configuration, please make sure the route between computer and switch is reachable.
- Before local configuration, please make sure the computer IP address is on the same subnet as the one of switch.

Notes:
While first configuring the switch, if it is a local configuration mode, please make sure that the network segment of current PC is 1.

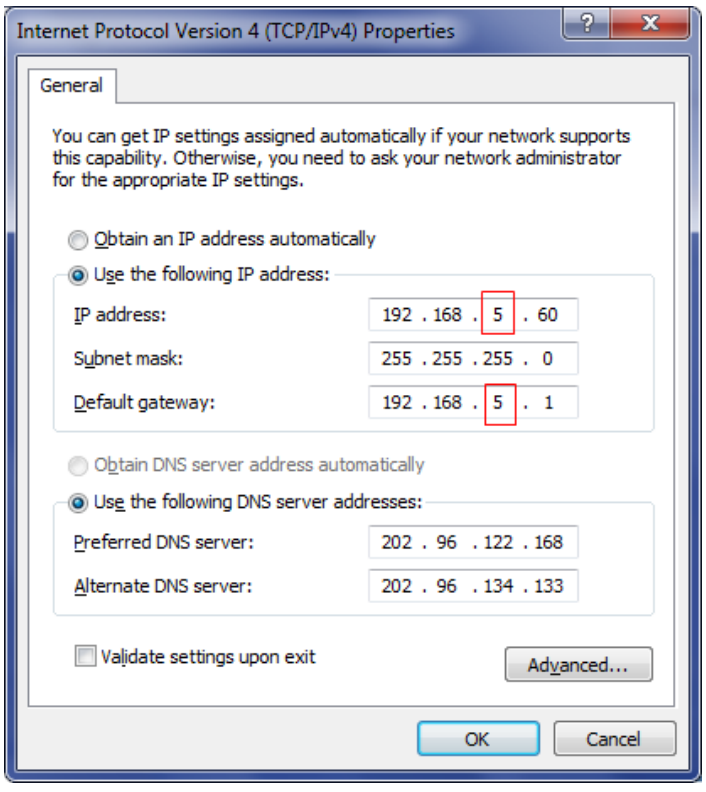
E.g.: Assume that the IP address of the current PC is 192.168.5.60, change the network segment "5" of the IP address to "1".

## Operation Steps

Amendment steps as follows:

**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".



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**Step 3** Click “OK”, IP address modifies successfully.

**Step 4** End.

Notice

In windows system, if user adopts the advanced configuration function of IP address and accesses the switch device via setting IP dummy address, the following managed functions can't be achieved: IEEE 802.1x polling.

## 1.3 Log in the Web Configuration Interface

### Operation Steps

Login in the web configuration interface as follow:

**Step 1** Run the computer browser.

**Step 2** On the browser's address bar, type in the switch addresses "http://192.168.1.254 ".

**Step 3** Click the “Enter” key.

**Step 4** Pop-up a window as the figure below, enter the user name and password on the login window.

Notes:

- The default username and password are “admin”, please strictly distinguish capital and small letter while entering.
- Default username and password have the administrator privileges.
- WebServer will provide 3 times opportunities to enter username and password. If enter the error information for 3 times, the browser will display a "Access denied" to reject access message. Refresh the page and try again.

**Step 5** Click "OK".



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**Step 6** End.

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

Notes:

After login in the device, modify the switch IP address for usage convenience.



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# 2 System Configuration

## 2.1 System Information

### Function Description

In "System Information" page, user can check "Device Information" and "Port Info".

### Operation Path

Open in order: "Main Menu > System Config > System Information".

### Interface Description

System information interface as follows:



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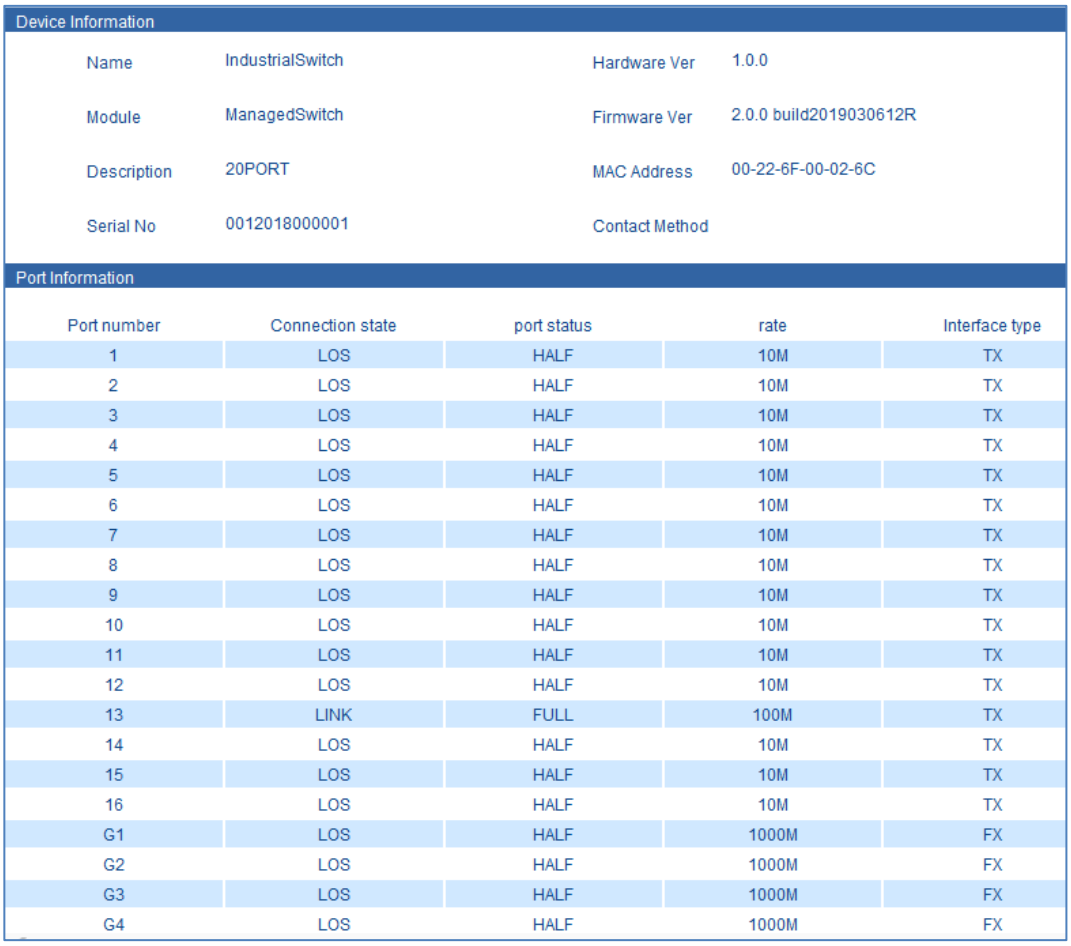

Device Information

| | | | |
|---|---|---|---|
| Name | IndustrialSwitch | Hardware Ver | 1.0.0 |
| Module | ManagedSwitch | Firmware Ver | 2.0.0 build2019030612R |
| Description | 20PORT | MAC Address | 00-22-6F-00-02-6C |
| Serial No | 0012018000001 | Contact Method | |

Port Information

| Port number | Connection state | port status | rate | Interface type |
|---|---|---|---|---|
| 1 | LOS | HALF | 10M | TX |
| 2 | LOS | HALF | 10M | TX |
| 3 | LOS | HALF | 10M | TX |
| 4 | LOS | HALF | 10M | TX |
| 5 | LOS | HALF | 10M | TX |
| 6 | LOS | HALF | 10M | TX |
| 7 | LOS | HALF | 10M | TX |
| 8 | LOS | HALF | 10M | TX |
| 9 | LOS | HALF | 10M | TX |
| 10 | LOS | HALF | 10M | TX |
| 11 | LOS | HALF | 10M | TX |
| 12 | LOS | HALF | 10M | TX |
| 13 | LINK | FULL | 100M | TX |
| 14 | LOS | HALF | 10M | TX |
| 15 | LOS | HALF | 10M | TX |
| 16 | LOS | HALF | 10M | TX |
| G1 | LOS | HALF | 1000M | FX |
| G2 | LOS | HALF | 1000M | FX |
| G3 | LOS | HALF | 1000M | FX |
| G4 | LOS | HALF | 1000M | FX |

The main element configuration description of system information interface:

| Interface Element | Description |
|---|---|
| Name | Display the device name. |
| Module | Display the device model. |
| Description | Display characters description of the device. |
| Serial No. | SN code, product serial number. |
| Hardware Ver | Current hardware version information, pay attention to the hardware version limits in software version. |
| Firmware Ver | Current using software version information, updated software version has more functions. |
| MAC Address | Hardware address of device factory configuration. |
| Contact Method | Display the contact information of the device maintenance personnel. |



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| Interface Element | Description |
|---|---|
| Port number | Display the number of the switch port. |
| Link status | Port connection state, display state as follows:<br>• "LINK" represents connected port;<br>• "LOS" represents disconnected port. |
| Port state | Port work state, display state as follows:<br>• "HALF" represents the corresponding port is in half-duplex state;<br>• "FULL" represents corresponding port is in full duplex state. |
| Speed | Display the current port link rate after port connection. |
| Interface type | Interface type, display port type as follows:<br>• TX;<br>• FX |

Note

"Module", "Name", "Description" and "Contact Method" can be modified in "Main Menu > System Config > System Information".



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# 3 Port Configuration

## 3.1 Port Setting

### Function Description

The "Port Setting" page mainly includes:

- Check the port type: copper port or fiber port
- Configure the rate mode and duplex mode
- Port enable
- Flow control

Note

- Speed, duplex, flow control will take effect when the port is enabled.
- After selecting automated negotiation, speed and duplex will be gained via automated negotiation.

### Operation Path

Open in order: "Main Menu > Port Config > Port Setting".

### Interface Description

Port setting interface as follows:



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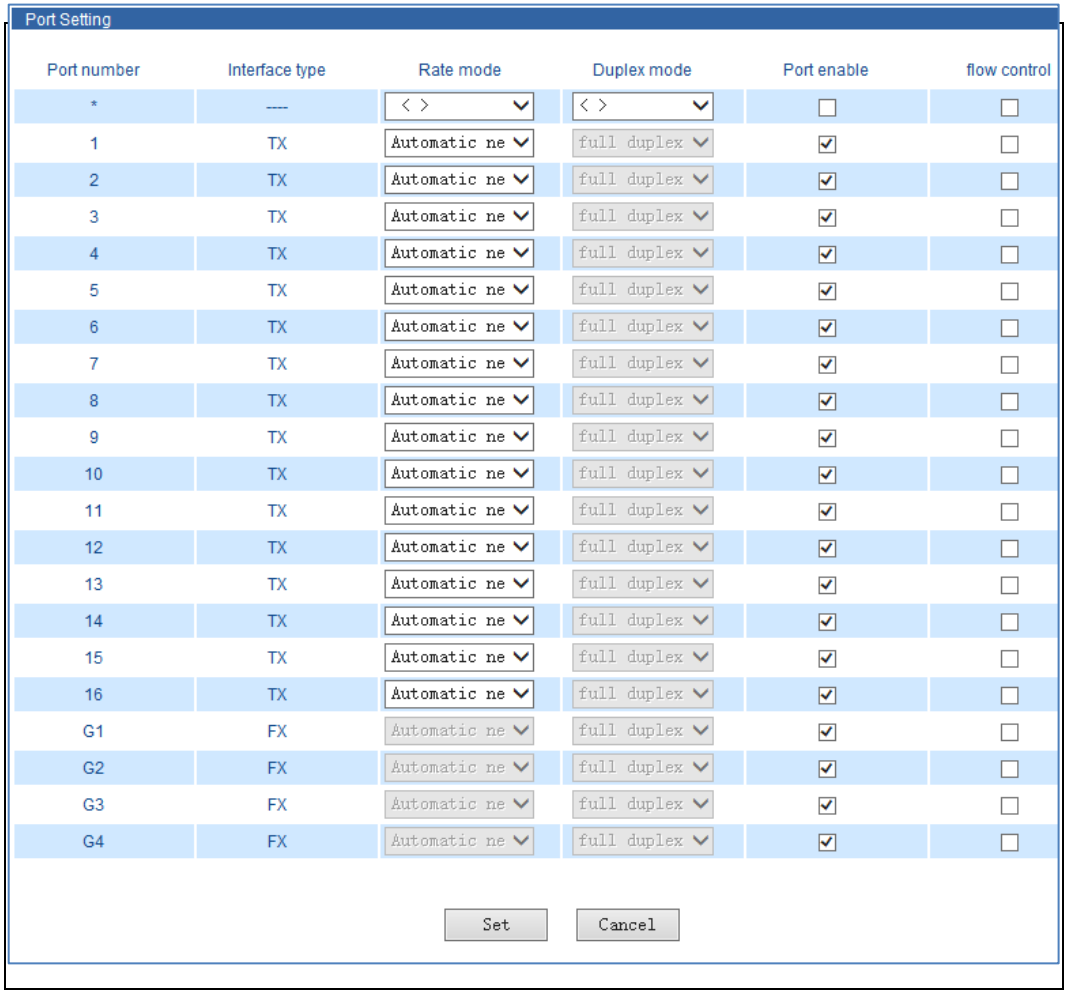


The main element configuration description of port setting interface:

| Interface Element | Description |
|---|---|
| Port number | Display the device port number. |
| Interface type | Support two kinds of interface types:<br>• TX;<br>• FX. |
| Rate mode | Click the drop-down list box of “Rate mode” to select the port speed mode.<br>• Automatic negotiation: the port can automatically adjust the transmission speed of the opposite port.<br>• 10M rate: support the maximum rate of 10Mbit/s.<br>• 100M rate: support the maximum rate of 100Mbit/s.<br>• 1000M rate: support the maximum rate of 1000Mbit/s. |



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| Interface Element | Description |
|---|---|
| | Notes:<br>• All copper ports of the switch are MDI/MDIX self-adapting ports, and support automated negotiation speed mode.<br>• 1000M rate only suits for the Gigabit ports of the switch. |
| Duplex | Click the drop-down list box of “Duplex” to select corresponding duplex mode of the port.<br>Options as follows:<br>• Half duplex: the interface can only receive or send data at any time.<br>• Full duplex: the interface can receive or send data at the same time.<br>Notes:<br>When the speed mode is “AUTO”, the port will automatically match the opposite port mode, “Duplex” mode is disabled. |
| Enable | Enable Ethernet port.<br>Note:<br>If user doesn't check the port "Enable" checkbox, the port won't be connected to use. |
| Flow control | Tick the check box to enable the flow control function of the port.<br>• Under full duplex mode, flow control method is IEEE 802.3x flow control.<br>• Under half duplex mode, flow control method is back pressure flow control. |

## Examples: Port Settings

For example: configure the port 1, port 2 and port 3 as follows:

- “Rate mode” of port 1 is “Automatic negotiation”.
- “Rate mode” of port 2 is “100M”, “duplex mode” is “full duplex”.
- “Rate mode” of port 3 is “100M”, “duplex mode” is “full duplex”, and enable “flow control”.

## Operating Steps

**Step 1** Access to "Main Menu > Port Config > Port Setting".



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**Step 2** Configure the parameters of port 1:

1. Tick the check box of “Port enable”.
2. Select “Rate mode” as “Automatic negotiation”.

Notes:

The default configuration of “Rate mode” is “Automatic negotiation”.

**Step 3** Configure the parameters of port 2:

1. Tick the check box of “Port enable”.
2. Select “Rate mode” as “100M”.
3. Select “duplex mode” as “full duplex”.

**Step 4** Configure the parameters of port 3:

1. Tick the check box of “Port enable”.
2. Select “Rate mode” as “10M”.
3. Select “duplex mode” as “half duplex”.
4. Tick the check box of “flow control”.

**Step 5** Click “set”.

**Step 6** End.

## 3.2 PoE Configuration

PoE (Power over Ethernet) means supplying power through Ethernet. It’s a wired Ethernet power supply technology that enables electric power to transmit to terminal device through data line or free line.

PoE power supply system includes:

- PSE (Power-sourcing Equipment): PoE device that supplies powered device with power through Ethernet.
- PD (Powered Device): powered device like wireless AP (Access Point), POS machine, camera and so on.
- PoE power supply: PoE power supply powers the whole PoE system. The quantity of PD that connects to PSE is limited by the power of PoE power supply.

### Function Description

The "PoE Config" page mainly includes:

- PoE total power settings;
- PoE port power settings;



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- Priority settings;
- PoE port enablement.

## Operation Path

Open in order: "Main Menu > Port Config > PoE Config".

## Interface Description

PoE configuration interface as follows:

The main element configuration description of PoE configuration interface:

| Interface Element | Description |
|---|---|
| POE total power | The total power of all PoE ports that supply power. |
| Port | The PoE port number of the device. |
| State | The power state of PoE port. |
| Class | The PoE power class. |
| Electricity (mA) | The current size of PoE port power. |
| Voltage (V) | The voltage size of PoE port power. |
| Power (W) | The power size of PoE port power. |
| Max power (W) | The maximum output power limitation of configuring PoE port. |
| Enabled | Check the box to enable port PoE power function. |



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| Interface Element | Description |
|---|---|
| Priority | The priority configuration of PoE port power supply. Port power distribution priority with the constraint of gross power.<br>• High: high priority;<br>• Medium: medium priority;<br>• Low: low priority.<br>Note:<br>When the switch supplies power at nearly full capacity, it would first supply power to the PD device that connects to the port with High priority; then the PD device that connects to port with Medium priority. |

# 3.3 Bandwidth Management

### Function Description

On the page of “Bandwidth Management”, user can limit the ingress and egress bandwidth speed of the port.

### Operation Path

Open in order: “Main Menu > Port Configuration > Bandwidth Management”.

### Interface Description

Bandwidth management interface as below:



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The main element configuration description of bandwidth management interface:

| Interface Element | Description |
|---|---|
| Bandwidth configuration | Enable/disable bandwidth configuration. |
| Port | Port number of the device. |
| Ingress | Ingress speed is the limited port speed during data receiving. |
| Egress | Egress speed is the limited port speed during data transmitting. |

### Instance: bandwidth settings

For example: set both of the egress and ingress bandwidth of Port 1 to “4M”.



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### Operating steps

**Step 1** Enter “Main Menu > Port Configuration > Bandwidth Management”.

**Step 2** In the area of “Bandwidth Configuration”, click the option box of “Enable”.

**Step 3** In the area of “Egress”, choose “4M” as the egress speed of Port 1.

**Step 4** In the area of “Ingress”, choose “4M” as the ingress speed of Port 1.

**Step 5** Click “Apply”.

**Step 6** End.

Note

- Flow control should be enabled when using port speed limit, otherwise the speed between devices would not be stable.
- Unless flow control is disabled, the packet loss should not happen when using port speed limit.
- Port speed limit has high requirements on network cable quality, otherwise lots of conflict packets and broken packet would appear.

## 3.4 Storm Suppression

### Function Description

On the page of "Storm Suppression", user can achieve suppression of port broadcast storm.

### Operation Path

Open in order: "Main Menu > Port Configuration > Storm Suppression".

### Interface Description

Storm suppression interface as follows:



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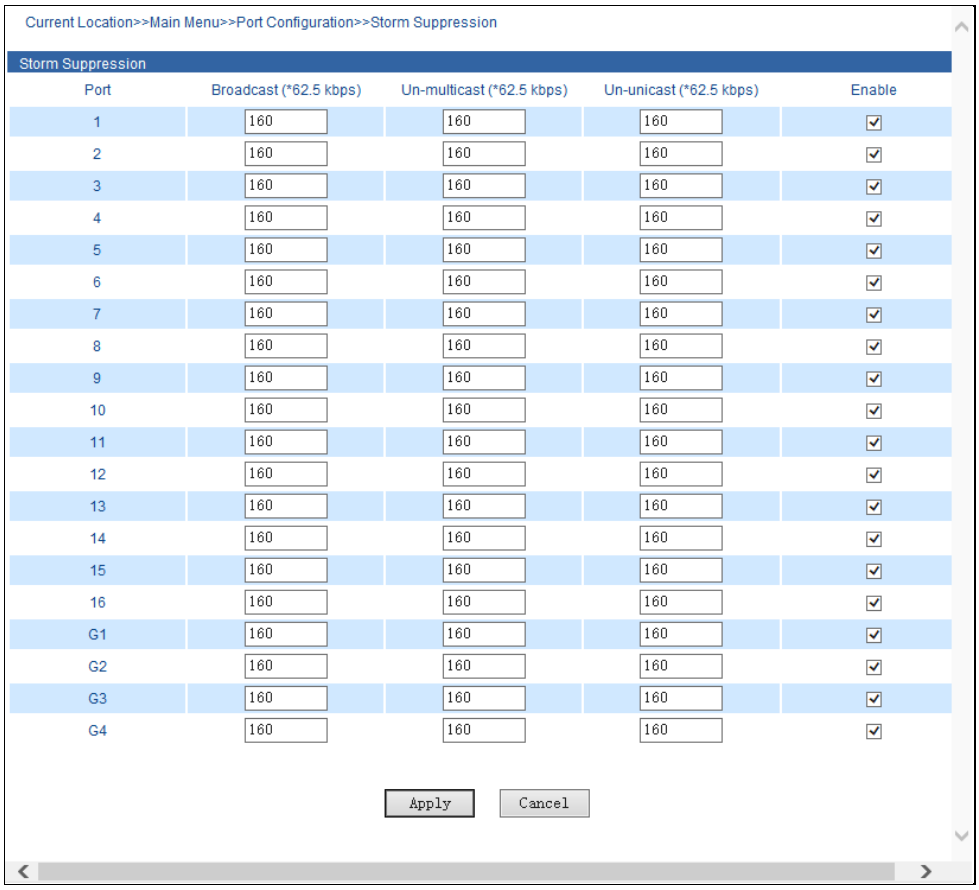


Main elements configuration description of storm suppression interface:

| Interface Element | Description |
|---|---|
| Port | Display all Ethernet ports number of the device. |
| Broadcast (*62.5Kbps) | The device procedure can suppress the transmission speed of broadcast packet<br>Notes:<br>Broadcast packet, namely, the data frame with the destination address of FF-FF-FF-FF-FF-FF. |
| Un-multicast (*62.5kbps) | Port suppression to the transmission speed of unknown multicast data packet.<br>Notes:<br>Multicast packet, namely, data frame with the destination address of XX-XX-XX-XX-XX-XX, the second X is odd number (1, 3, 5, 7, 9, B, D, F). |
| Un-unicast (*62.5kbps) | Port suppression to the transmission speed of unknown unicast data packet.<br>Notes:<br>Unknown unicast packet, that is MAC address of the data frame doesn't exist in the internal index table of the device, |



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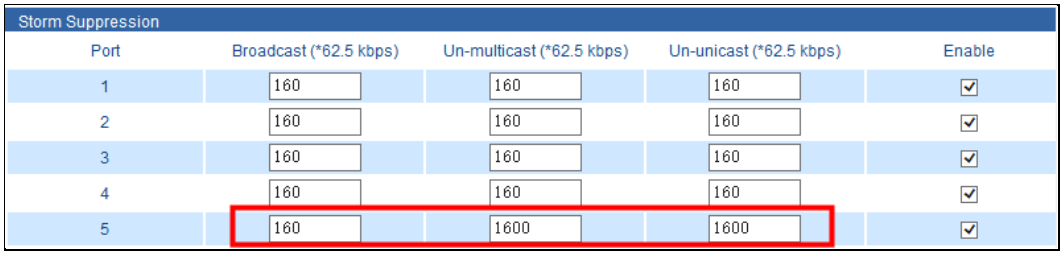
| | |
|---|---|
| | which needs to be forwarded to all ports. |
| Enable | Tick the check box to enable storm suppression function of the port. |

## Example: Only Enable Broadcast Storm Suppression

For example:

- The broadcast speed is 160*62.5kbps=10000kbps=10Mbps.
- Under default configuration, the broadcast/unknown multicast/unknown unicast of each port are all in enabling suppression status, and the suppression speed is unified to 10Mbps.
- Only enable the "Broadcast Storm" suppression of port 5.




## Operation Steps

**Step 1** Click "Main Menu > Port Configuration > Storm Suppression".

**Step 2** Tick corresponding "Enable" check box of port 5.

**Step 3** Enter "160" in corresponding "Broadcast" text box of port 5.

**Step 4** Enter "1600" in corresponding "Un-multicast" and "Un-unicast" text box of port 5. "Un-multicast" and "Un-unicast" will be uncontrolled.

**Step 5** Click "Apply" to seperately enable the "Broadcast Storm" suppression of port 5.

**Step 6** End.



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# 4 Layer 2 Features

## 4.1 VLAN

VLAN (Virtual Local Area Network) is a communication technology that logically divides a physical LAN into multiple broadcast domains. Hosts in VLAN can directly communicate with each other, but two VLAN can't directly communicate with each other, which can limit the broadcast message in a VLAN. Using VLAN can bring following benefits to users.

- Limit the broadcast domain;
- Increase the security of LAN;
- Improve the network stability;
- Flexiblely construct virtual working team.

### Port VLAN

Port VLAN adopts different identifications to distinguish different VLAN. Adopting the same ID identification will cause internal member groups being replaced, new ID identification will establish new forwarding rules, and all ports must belong to one or more VLAN.

### IEEE802.1Q VLAN

Under the provisions of IEEE 802.1Q protocol, the device can add 4 bytes VLAN tag (Tag for short) between Source address and Length/Type fields of Ethernet data frame, identifying the VLAN information. As the picture below:



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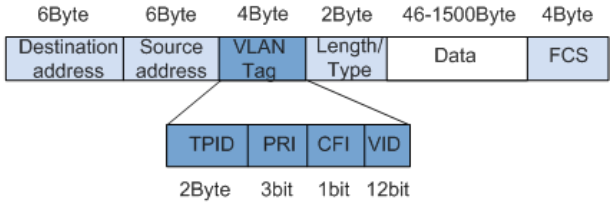



- TPID: Tag Protocol Identifier represents the data frame type, when the value is 0x8100, it represents the VLAN data frame of IEEE 802.1Q.
- PRI: Priority represents the 802.1p priority of data frame. Value range is 0-7, larger value represents higher priority. During network congestion, the switch will preferentially send data frame with higher priority.
- CFI: Canonical Format Indicator represents whether MAC address is packaged in standard format in different transmission media. 0 represents that MAC address is packaged in standard format.
- VID: VLAN ID represents the VLAN number of the data frame. VLAN ID value range is 0-4095. 0 and 4095 are reserved values of the protocol, so the valid value range of VLAN ID is 1-4094.

## Function Description

On the VLAN page, user can configure the following functions:

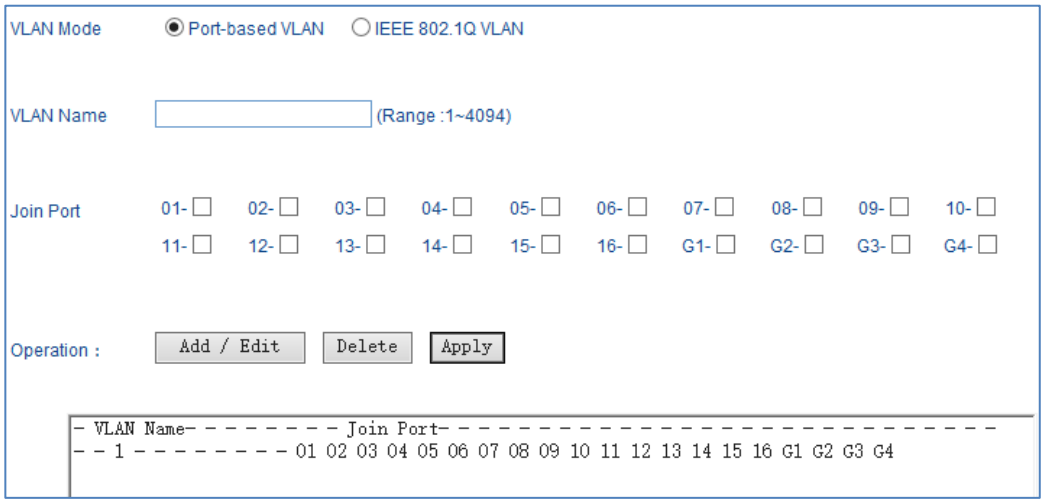
- Configure the port PVID;
- Create VLAN entry;
- Configure the port member type.

## Operation Path

Open in order: "Main Menu > L2 Feature > VLAN".

## Interface Description 1: Port-based VLAN

Port-based VLAN interface as follows:



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The main elements configuration description of port-based VLAN interface:

| Interface Element | Description |
|---|---|
| VLAN Mode | Choose VLAN type, options are:<br>• Port-based VLAN<br>• IEEE 802.1Q VLAN |
| VLAN name | Enter VLAN number in digital form.<br>Note:<br>Input range is 1~4094. |
| Join port | Choose VLAN member. |
| Operation | Add/edit, delete or save VLAN configuration information. |

### Instance: create port-based VLAN.

The steps of configuring port-based VLAN:

**Step 1** Open “Main Menu > L2 Feature > VLAN”.

**Step 2** On the option box of “VLAN Mode”, select “Port-based VLAN”.

**Step 3** Enter VLAN table items in the textbox of “VLAN Name”, such as fill in the figure “3” to represent VLAN3.

**Step 4** Select VLAN member on the check box of “Join Port”, such as select port 2 and port 3.

**Step 5** Click “Add/Edit”.

**Step 6** Click “Apply”, port 2 and port 3 are divided into VLAN3, port 2 and port 3 that belong to the same VLAN can transmit data to each other.

### Interface Description: VLAN based on 802.1Q

Interface screenshot of VLAN based on 802.1Q as follows:



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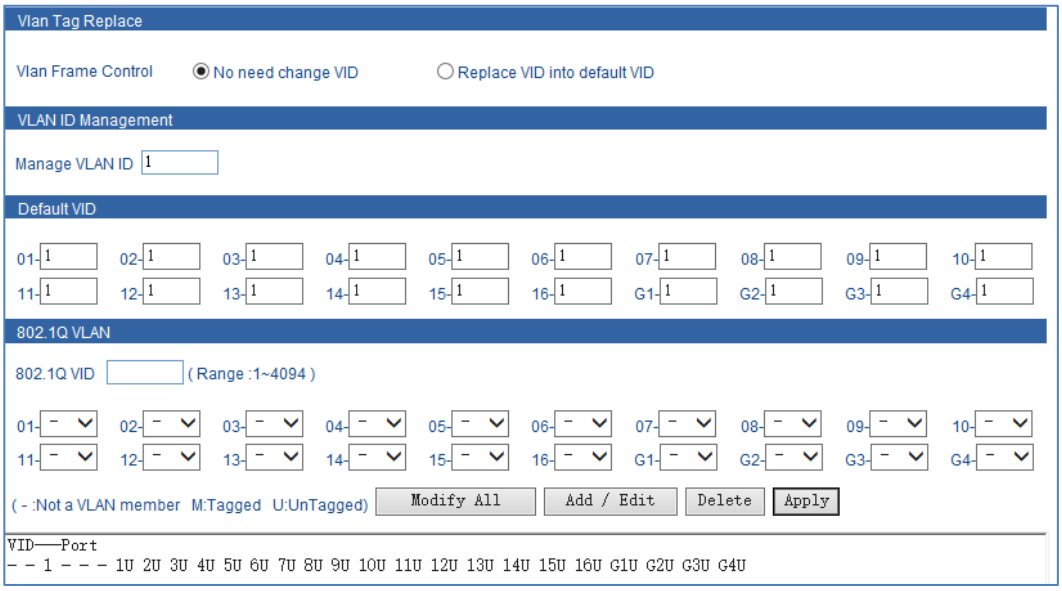


The main element configuration description of 802.1Q Vlan interface:

| Interface Element | Description |
|---|---|
| VLAN mode | Choose VLAN mode, options are:<br>• Port-based VLAN:<br>• IEEE 802.1Q VLAN. |
| **VLAN tag replace** | **The configuration bar of VLAN tag replace** |
| VLAN frame control | Choose VLAN tag replace configuration, options are:<br>• No need change VID;<br>• Replace VID into default VID. |
| **VLAN ID management** | **The configuration bar of VLAN ID management** |
| Manage VLAN ID | Manage the VLAN ID of the device. Its value range is 1-4094. |
| **Default VID** | **The configuration bar of default VID** |
| 802.1Q VID | VLAN ID number. Its value range is 1-4094. |
| Member type | There are three types of data frame laber that the port sends:<br>• —: no forwarding, which is not as a member of this VLAN ID;<br>• M: forward and keep VLAN tag;<br>• U: forward but remove VLAN tag. |
| Modify all | Quickly modify all member type at the same time. |



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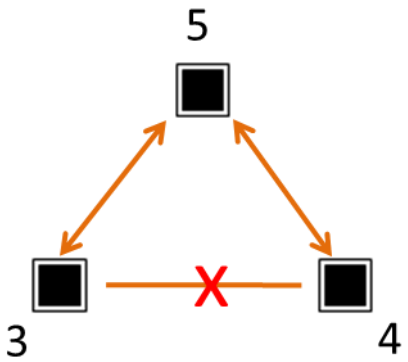
| Interface Element | Description |
|---|---|
| Add/edit | Add configurated VLAN to the list of VLAN member. |
| Delete | Delete one of the VLAN items in the selected member list. |
| Apply | Save VLAN configuration information. |

## 4.1.1 Instance: typical VLAN configuration

### Instance

Suppose that the switch port 3, 4 and 5 have the following requirements: Port 3 and Port 5 can communicate with each other. Port 4 and Port 5 can communicate with each other. But port 3 and Port 4 can't communicate with each other, as the picture below. Do not consider other ports, how to set the VLAN?




### Example Analysis

Configure the “Type” of Port3, Port4 and Port5 as Access. Port3, Port 4 and Port 5 are set with different forwarding entries; forwarding entries can enable the communication between two ports.

Analyse the port forwarding entries design as below:

- Port 3

  Port3 and Port5 can communicate with each other. Port3 forwarding entries include Port3 and Port5. Therefore, a forwarding entry PVID3 is designed, including Port 3 and Port 5. Configure the "Type" of Port 3 and Port 5 to U.

- Port 4

  Port 4 and Port 5 can communicate with each other. Port 4 forwarding entries include Port 4 and Port 5. Therefore, a forwarding entry PVID4 is designed,



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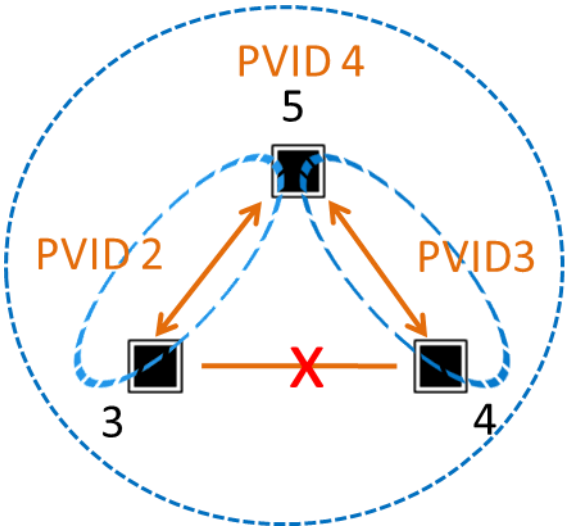
including Port 4 and Port 5. Configure the "Type" of Port 4 and Port 5 to U.

- Port 5

  Port 5 and Port 3, Port 4 can communicate with each other, Port 5 forwarding entries include Port 3, Port 4. Therefore, design a forwarding entry PVID5, including Port 3, Port 4. Configure the "Type" of Port 3 and Port 4 to U.

According to the forwarding entry analysis of Port 3, Port 4 and Port 5, forwarding entry design picture as follows:




## Operation Steps

**Step 1** Enter “Main Menu>Layer 2 Config>VLAN”.

**Step 2** Choose “IEEE 802.1Q VLAN” in the option box of “VLAN mode”.

**Step 3** Choose “Replace VID into default VID” in the option box of “VLAN frame control”.

**Step 4** In the “Default VID” area, enter 3, 4 and 5 respectly as the default VLAN “PVID” of Port3, Port4 and Port5.

**Step 5** Enter 3 in “802.1Q VID” textbox.

**Step 6** In the drop-down list of “member type”:

1. Set the member type of Port3 to U.
2. Set the member type of Port5 to U.

**Step 7** Click “Add/edit” button to add VLAN entry to the “member list”.

**Step 8** Enter 4 in “802.1Q VID” textbox.

**Step 9** In the drop-down list of “member type”:

1. Set the member type of Port4 to U.
2. Set the member type of Port5 to U.

**Step 10** Click “Add/edit” button to add VLAN entry to the “member list”.



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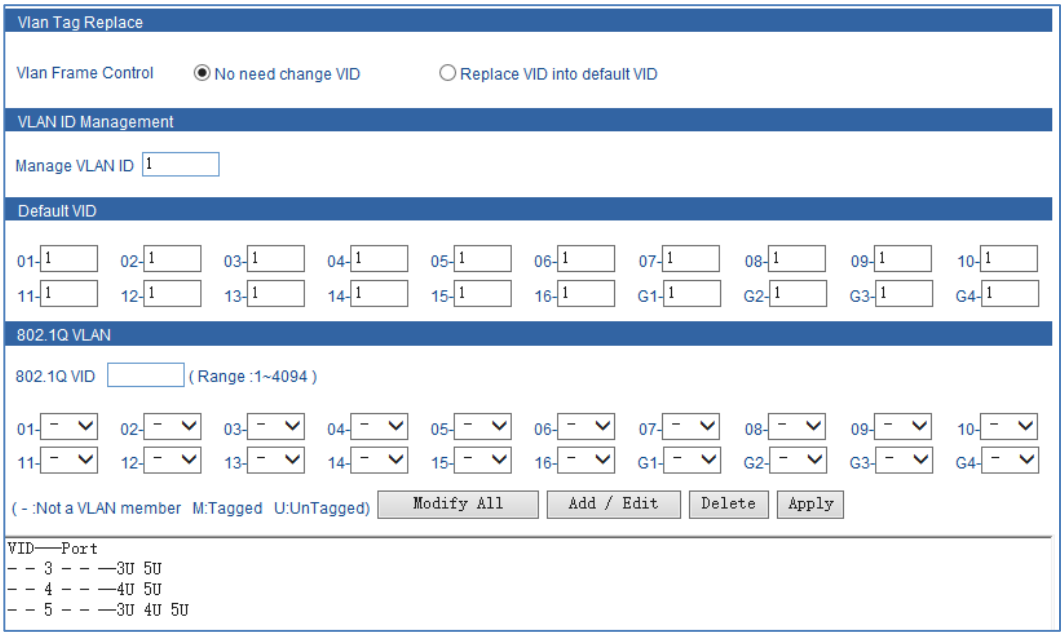
**Step 11** Enter 5 in “802.1Q VID” textbox.

**Step 12** In the drop-down list of “member type”:

1. Set the member type of Port3 to U.
2. Set the member type of Port4 to U.
3. Set the member type of Port5 to U.

**Step 13** Click “Add/edit” button to add VLAN entry to the “member list”.




**Step 14** Click “Apply” button.

**Step 15** End.

# 4.2 Multicast Filtering

## 4.2.1 Multicast Filtering

IGMP Snooping (Internet Group Management Protocol Snooping) is an IPv4 layer 2 multicast protocol. And it maintains the outcoming interface information of multicast packets via snooping the multicast protocol packets between layer 3 multicast device and user host. Then it can manage and control the forwarding of multicast data packets in the data link layer.

After configuring the IGMP Snooping, the layer 2 multicast device can snoop and analyze the IGMP packets between the multicast user and upstream router. User can



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establish layer 2 multicast forwarding items to control the forwarding of multicast data packets. It can prevent multicast data from being broadcast in the Layer 2 network.

IGMP snooping handles different packets in the following way:

- IGMP general query message: The IGMP querier periodically sends IGMP general queries to all hosts and routers on the local network segment to query which multicast groups are available on the network segment.
- IGMP report message: After receiving the IGMP general query message, the member responds to the IGMP report message. The member actively sends an IGMP report message to the IGMP querier to declare the join to the multicast group.
- IGMP Leave message: A member running IGMPv2 or IGMPv3 sends an IGMP Leave message to notify the IGMP querier that it has left a multicast group.

The GMRP Multicast Registration Protocol (GMRP) is an application of the Common Attribute Registration Protocol (GARP) for registering and deregistering multicast attributes. When a host wants to join an IP multicast group, it needs to send an IGMP join message, which is derived into a GMRP jion message. Once the GMRP join message is received, the switch will add the port that received the message to the appropriate multicast group. The switch sends the GMRP join information to all other hosts in the VLAN. One of the hosts serves as the multicast source. When the multicast source sends multicast information, the switch sends the multicast information via the port that joins in the multicast group.

## Function Description

On the page of “Multicast Filtering”, user can conduct the following operations:

- Enable/disable IGMP Snooping.
- Enable/disable GMRP.
- Enable/disable IGMP Snooping query.
- Set IGMP Snooping query time interval.

## Operation Path

Open in order: “Main Menu > L2 Feature > Multicast Configuration > Multicast Filtering”.



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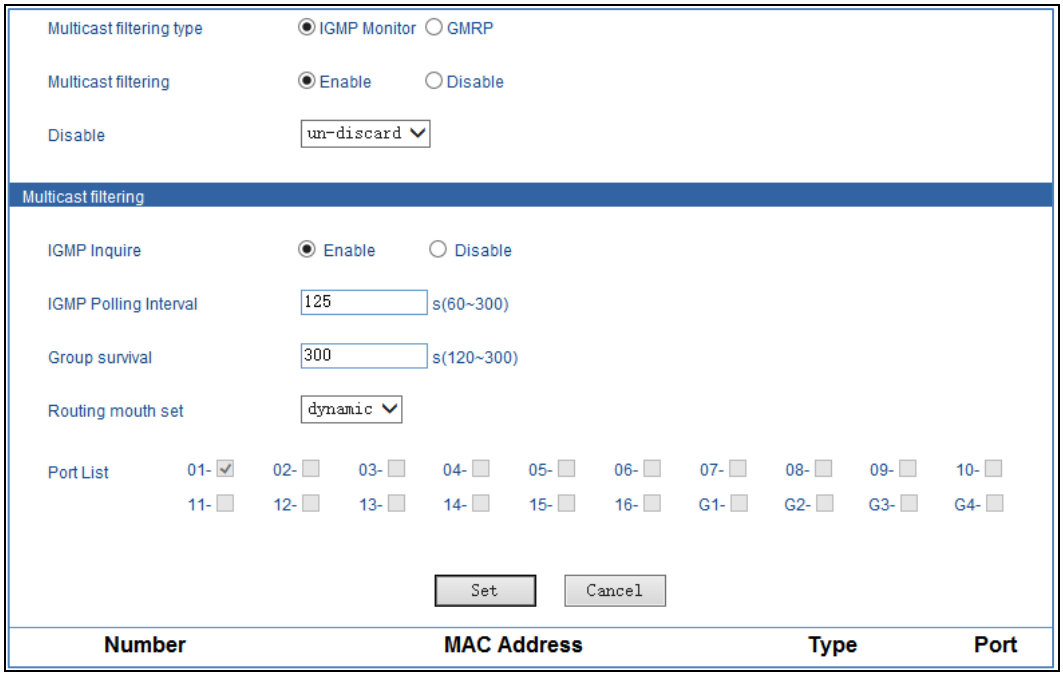
## Interface Description 1: IGMP snooping

IGMP Snooping interface as below:




The main element configuration description of IGMP Snooping interface:

| Interface Element | Description |
|---|---|
| Multicast filtering type | Choose multicast filtering type, options are:<br>• IGMP snooping;<br>• GMRP. |
| Multicast filtering | Enable/disable multicast filtering function. |
| Unknown multicast | Choose the processing mode of unknown multicast, options are:<br>• discard；<br>• un-discard。 |
| **Multicast filtering** | **The configuration bar of multicast filtering** |
| IGMP Query | The switch of IGMP query, options are:<br>• Enable<br>• Disable<br>Notes:<br>IGMP query means that router inquiring all hosts in subnet if they join some multicast groups. |
| IGMP query | IGMP query interval, unit: second.<br>Notes: |



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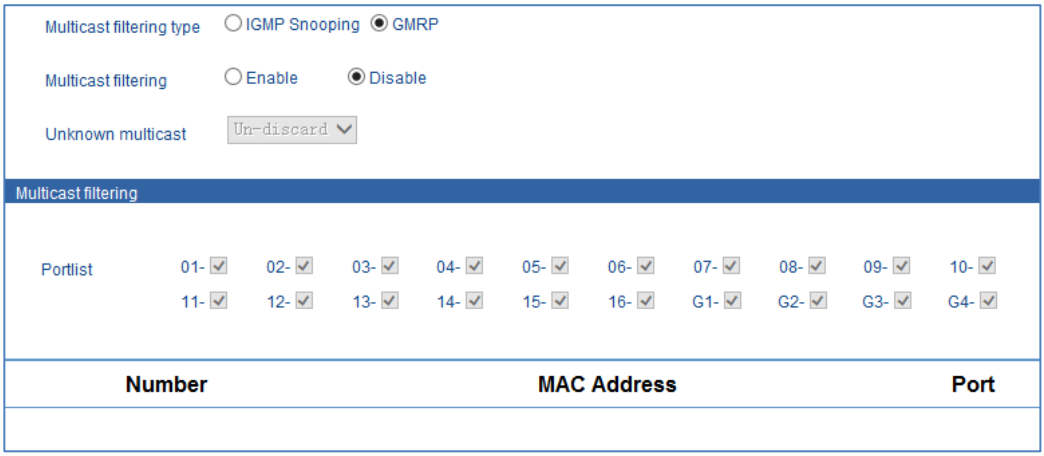
| | |
|---|---|
| interval | The time range that can be entered is 60-300s. |
| Group survival | The maximum time that multicast members in device can survive from existence to not receiving any response. Unit: second.<br>Notes:<br>• IGMP snooping needs to be enabled before using this function.<br>• The time range of group survival that can be set is 120-300s. |
| Routing mouth set | Choose the building mode of routing table, options are:<br>• Dynamic routing, routing ports are dynamically acquired though switch.<br>• Static routing, check the box of port in “port list” as routing port. |
| Port list | The selection list of static routing port. |

Note

- User needs to set multicast source and port in one VLAN first to enable IGMP Snooping function.
- Multiple IGMP inquirers should be avoided in network lest cause waste of resources. Please choose all ports if the forwarding relationship of unknown multicast group is uncertain.

### Interface Description 2: GMRP

GMRP interface as below:




The main element configuration description of GMRP interface:



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| Interface Element | Description |
|---|---|
| Multicast filtering type | Multicast filtering type, options are:<br>• IGMP snooping;<br>• GMRP. |
| Multicast filtering | The multicast filtering checkbox, options are:<br>• Enable;<br>• Disable. |
| Unknown multicast | Unknown multicast options are:<br>• discard；<br>• un-discard. |
| **Multicast filtering** | **The configuration bar of multicast filtering** |
| Port list | The checkbox of GMRP port list. |

## 4.2.2 Static Multicast

### Function Description

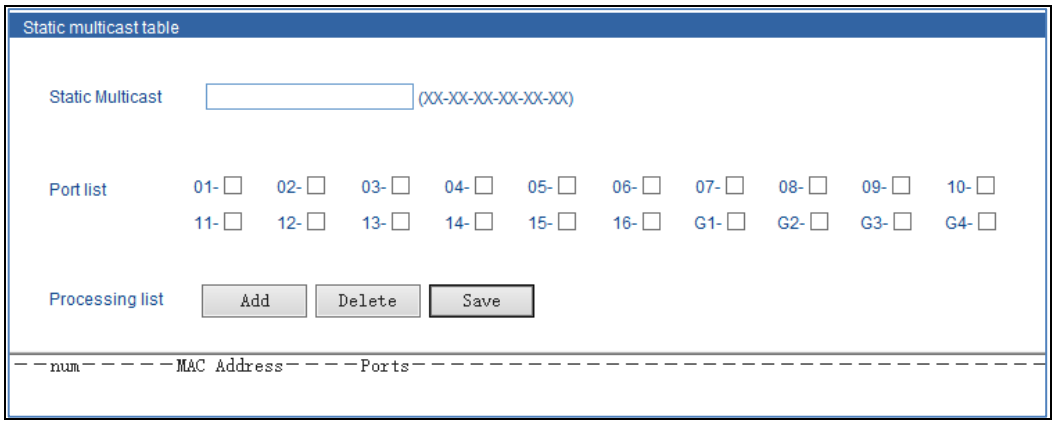
On the page of “Static Multicast”, user can configure the forwarding port list of static multicast.

### Operation Path

Open in order: “Main Menu > L2 Feature > Multicast Filtering > Static multicast table”.

### Interface Description

Static filtering interface as follows:




Main elements configuration description of static multicast table interface:



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| Interface Element | Description |
|---|---|
| MAC Address | Input "MAC Address", and the format should be "XX-XX-XX-XX-XX-XX".<br>Notes:<br>• Low-order of the highest byte of multicast MAC address is 1, please don't input non-multicast address.<br>• Space and other illegal characters are not allowed for address format, otherwise alarm message will pop up. |
| Join Port | Tick the check box of corresponding port, it represents that corresponding port joins in the static multicast MAC address. |
| Operation | Add, delete or apply the configuration information of static multicast filtering. |

Warning

- Static multicast filtering has a great impact on multicast data packets forwarding via network, please don't use it unless the added address is exactly right.
- Multicast addresses of 0180C20000xx and 01005E0000xx are reserved for the device or protocol, please don't use them.
- IGMP dynamic learning won't update statically typed multicast address, static multicast forwarding table is more of a security mechanism.

### Example: Static Multicast Filtering Configuration

For example: configure the filtering port of multicast address 01-00-00-00-00-01 as 01, 02 and 03.

Operation steps as follows:

**Step 1** Open "Main Menu > L2 Feature > Multicast Configuration > Static Multicast".

**Step 2** On the text box after "MAC Address", input "01-00-00-00-00-01".

**Step 3** On the row of "Join Port":

a) Tick the check box after "1-";

b) Tick the check box after "2-";

c) Tick the check box after "3-".

**Step 4** Click "Add".

**Step 5** Configured static filtering is displayed in the display frame on the bottom of the page, click "Apply".



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**Step 6** End.



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# 5 QoS

## 5.1 QoS Classification

### Function Description

On the page of QoS Classification, user can set:

- Queuing mechanism
- Enable ToS
- Enable CoS
- Port priority

### Operation Path

Open in order: “Main Menu > QoS > QoS Classification”.

### Interface Description

Screenshot of QoS Classification interface:



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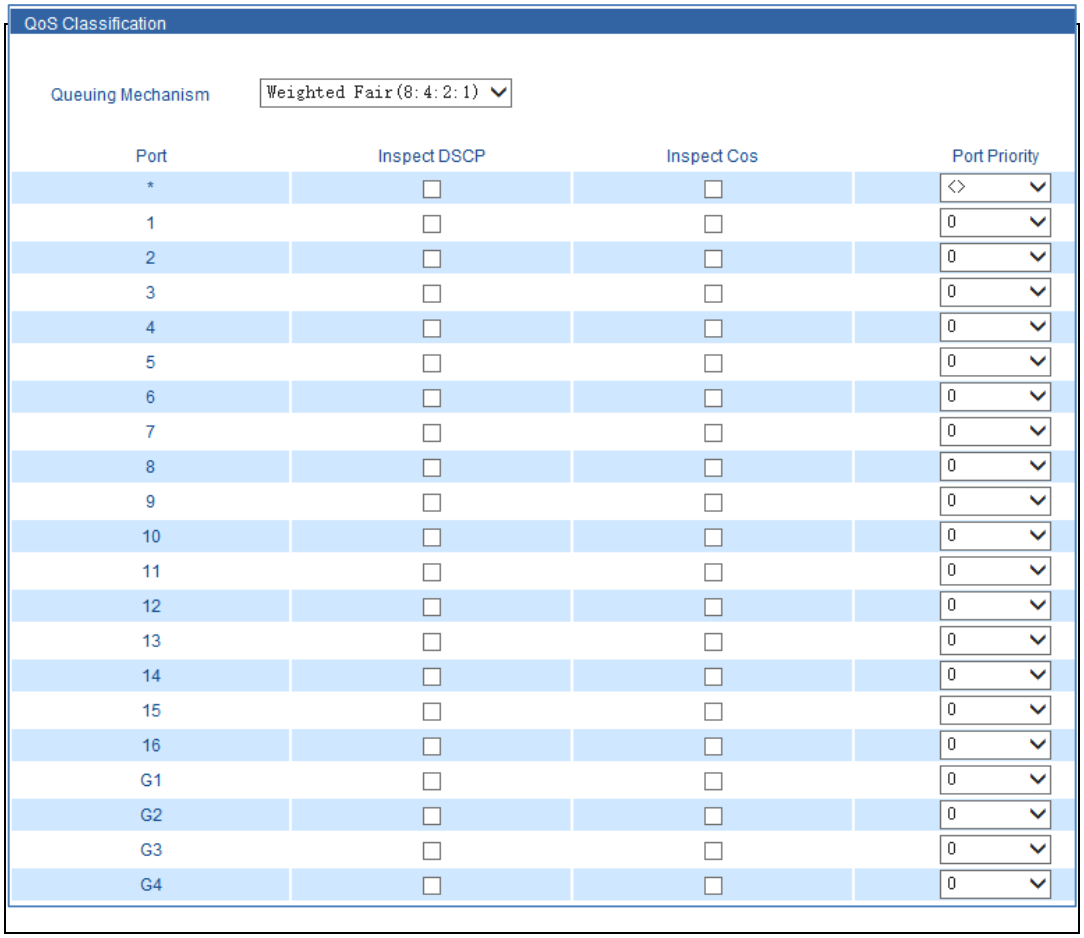


The main element configuration description of QoS classification interface:

| Interface Element | Description |
|---|---|
| Queuing mechanism | Queuing scheduling setting, options are:<br>• Weighted Fair (8:4:2:1): according to the queue's weighted value 8:4:2:1, weighted round-robin queue scheduling algorithm would schedule queues in turn to ensure that each queue can get some service time.<br>• Strict (Strict Priority): Strict priority queue scheduling algorithm includes 4 queues and schedules in the decreasing order of priority. When the queue with fairly high priority is empty, then it would send groupings of queue with fairly low priority. |
| Port | Port number of switch. |
| Inspect ToS | After checking the checkbox, the priority of ToS would be checked during queue scheduling. |



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| Interface Element | Description |
|---|---|
| Inspect CoS | After checking the checkbox, the priority of CoS would be checked during queue scheduling. |
| Default port priority | To configurate default port priority for ports that haven't enabled ToS and CoS priority. The value range is 0-7. The higher the value, the higher the priority.<br>Description:<br>By default, switch 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. |

Note

- When the ToS and CoS are not enabled, queuing and scheduling are in the order of port priority.
- When the ToS or CoS are enabled, queuing and scheduling according to ToS or CoS instead of considering port priority.
- If the ToS and CoS are enabled at the same time, queuing according to ToS priority. When the ToS values are the same, queuing according to CoS priority.

### Instance: QoS configuration

For example:

- Set port 1's queuing mechanism as "Weight Fair (8:4:2:1)", adopts ToS priority.

### Operation steps

**Step 1** Open "Main Menu > QoS > QoS Classification".

**Step 2** On the page of classification, choose "Weight Fair (8:4:2:1)" in queuing mechanism.

**Step 3** On the line of port 1, check the checkbox of "inspect ToS".

**Step 4** Click "apply".

**Step 5** Ends.

## 5.2 CoS Mapping

### Function Description

On the page of "CoS Mapping", user can configure the mapping relations between CoS value and priority queues.



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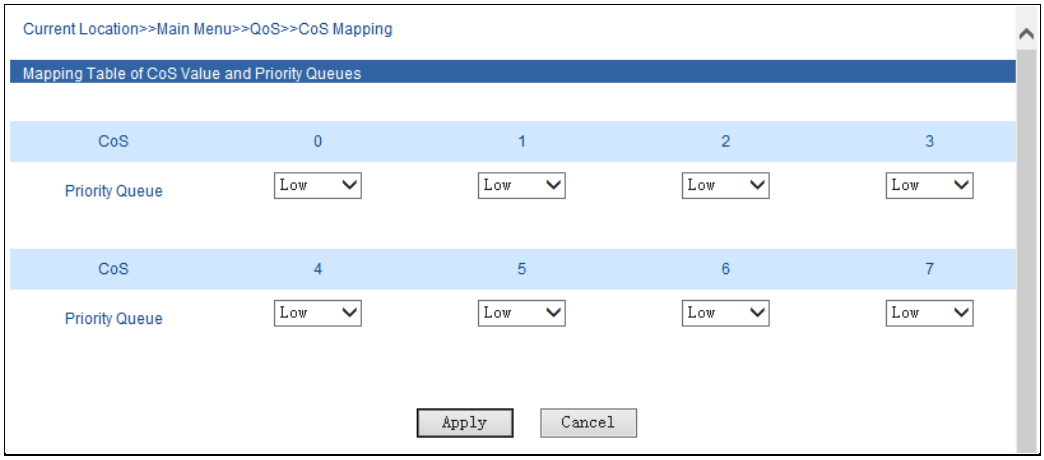
## Operation Path

Open in order: “Main Menu > QoS > CoS Mapping”.

## Interface Description

Screenshot of CoS Mapping interface:




The main element configuration description of CoS mapping interface:

| Interface Element | Description |
|---|---|
| CoS | Display CoS value. |
| Priority queue | Set the mapping between CoS value and priority queue, options as follows:<br>• Low: low priority queue<br>• Normal: normal priority queue<br>• Medium: medium priority queue<br>• High: high priority queue |

## Instance: CoS mapping configuration

For example:

- When the CoS value is set to 0 and 1, the corresponding priority queue is Low
- When the CoS value is set to 2 and 3, the corresponding priority queue is Normal
- When the CoS value is set to 4 and 5, the corresponding priority queue is Medium
- When the CoS value is set to 6 and 7, the corresponding priority queue is High

## Operation steps

**Step 1** Open “Main Menu > QoS > CoS Mapping”.

**Step 2** In the table of CoS value and priority queue mapping of CoS mapping page:



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1. When the CoS value is “0”，choose Low as the corresponding priority.
2. When the CoS value is “1”，choose Low as the corresponding priority.
3. When the CoS value is “2”，choose Normal as the corresponding priority.
4. When the CoS value is “3”，choose Normal as the corresponding priority.
5. When the CoS value is “4”，choose Medium as the corresponding priority.
6. When the CoS value is “5”，choose Medium as the corresponding priority.
7. When the CoS value is “6”，choose High as the corresponding priority.
8. When the CoS value is “7”，choose High as the corresponding priority.

**Step 3** Click “apply”

**Step 4** Ends.

## 5.3 DSCP Mapping

### Function Description

On the page of “DSCP Mapping”, user can configure the mapping relations between DSCP value and priority queue.

### Operation Path

Open in order: “Main Menu > QoS > DSCP Mapping”.

### Interface Description

Screenshot of DSCP Mapping interface:



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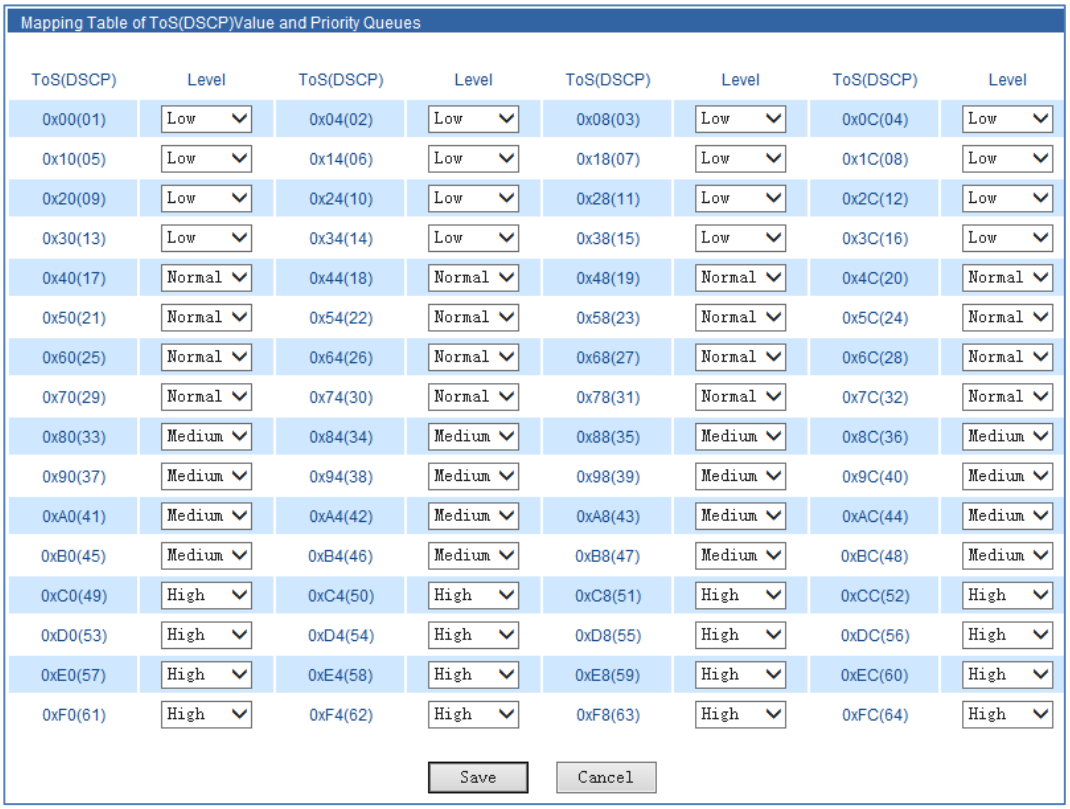


The main element configuration description of DSCP mapping interface:

| Interface Element | Description |
|---|---|
| ToS (DSCP) value | It displays ToS (DSCP) in hexadecimal and decimal format simultaneously. The value in the bracket is decimal. |
| Priority queue | Set mapping between ToS value and priority queue, options are as follows:<br>• Low: low priority queue<br>• Normal: normal priority queue<br>• Medium: medium priority queue<br>• High: high priority queue |

## Instance: ToS mapping configuration

For example:

- When the ToS value is set to 0x00~0x3C, the corresponding priority is Low.
- When the ToS value is set to 0x40~0x7C, the corresponding priority is Normal.
- When the ToS value is set to 0x80~0xBC, the corresponding priority is Medium.
- When the ToS value is set to 0xC0~0xFC, the corresponding priority is High.



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### Operation steps

**Step 1** Open “Main Menu > QoS > DSCP Mapping”.

**Step 2** In the table of ToS value and priority queue mapping of ToS mapping page:

1. When the “ToS value” is “0x00” ~ “0x3C”, choose Low as the corresponding priority.
2. When the “ToS value” is “0x40” ~ “0x7C”, choose Normal as the corresponding priority.
3. When the “ToS value” is “0x80” ~ “0xBC”, choose Medium as the corresponding priority.
4. When the “ToS value” is “0xC0” ~ “0xFC”, choose High as the corresponding priority.

**Step 3** Click “apply”.

**Step 4** Ends.



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# 6 Link Backup

## 6.1 Rapid Ring

### Function Description

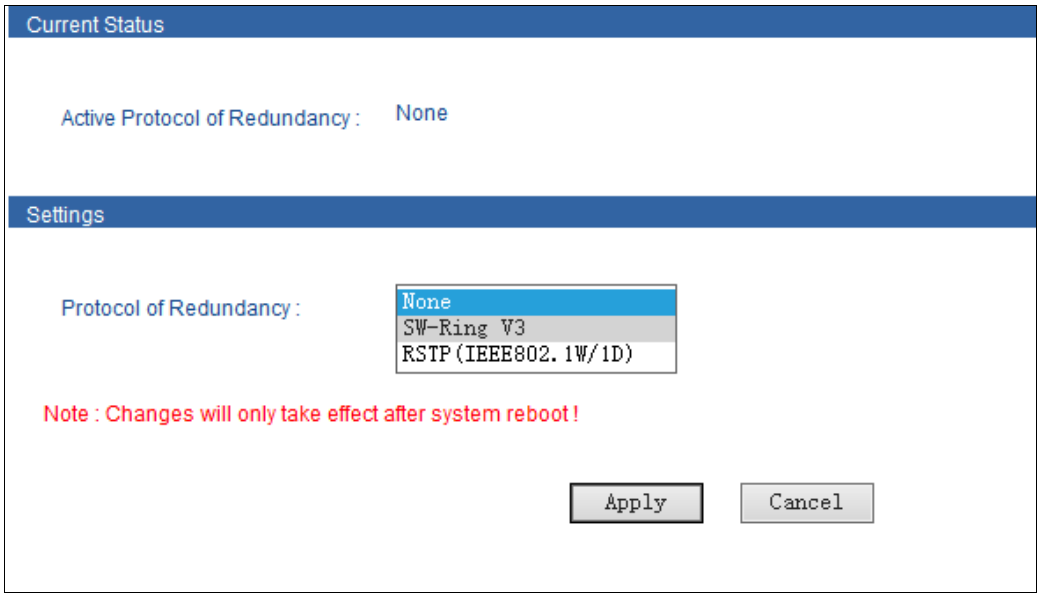
On the “Rapid ring” page, user can choose redundancy protocol and configure the ring network under this protocol quickly.

### Operation Path

Open in order: “Main Menu > Redundancy > Rapid Ring”.

### Interface Description

Initial rapid ring interface as follows:




The main element configuration description of initial rapid ring interface:



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| Interface Element | Description |
|---|---|
| **Current status** | **Current status bar** |
| Active protocol of redundancy | The current status of ring network protocol of the device. |
| **Settings** | **Settings bar** |
| Protocol of redundancy | Choose the corresponding redundancy protocol. Options are:<br>• None: it means that the ring network function is disabled.<br>• Ring V3: single ring, coupling ring, chain and Dual homing are supported.<br>• STP (IEEE 802.1W/1D): spanning tree. |

## Function description of Ring V3

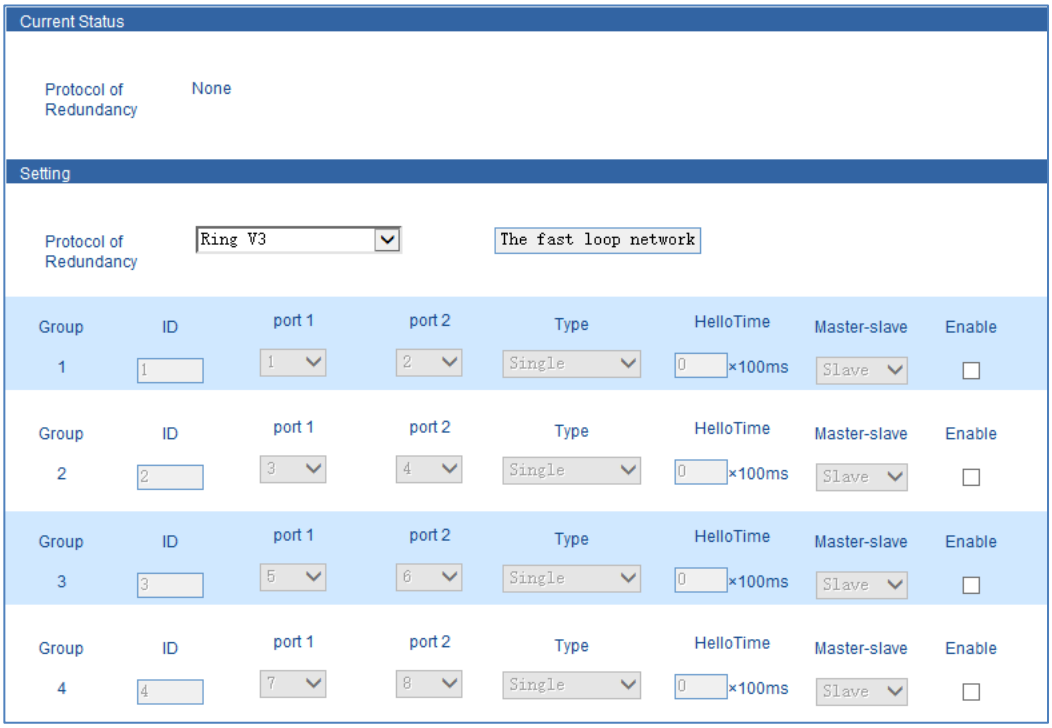
On the page of “rapid ring”, user can choose Ring V3 redundancy protocol and configure the ring network under this protocol quickly.

## Operation Path

Open in order: “Main Menu > Link Backup > Rapid Ring”.

## Interface Description

Initial rapid ring network interface as follows:




The main element configuration description of Ring network interface:



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| Interface Element | Description |
|---|---|
| Rapid ring state | Click “rapid ring state” to check the ring state of current ring network group configuration. |
| Group | Support Group 1-2 or Group 1-4, it means that the device supports up to 2 or 4 groups.<br>Notes:<br>Device with less than 10 ports supports up to 2 rings, device with more than 10 ports supports 4 rings. |
| ID | When multiple switches form a ring, the current ring ID would be network ID. Different ring network has different ID. |
| Port 1 | port 1 can be used for the formation of ring network in switch. |
| Coupling port | When the ring type is “Couple”, the coupling port would be the one connects different network ID. |
| Port 2 | Port 2 can be used for the formation of ring network in switch. |
| Control port | When the ring type is “Couple”, the control port would be the one in the link of the intersection of two rings. |
| Type | According to the requirement in the scene, user can choose different ring network.<br>• Single: single ring, using a continuous ring to connect all device together.<br>• Couple: couple ring is a redundant structure used for connecting two independent networks.<br>• Chain: chain can enhance user’s flexibility in constructing all types of redundant network topology via an advanced software technology.<br>• Dual-homing: two adjacent rings share one switch. User could put one switch in two different networks or two different switching equipments in one network. |
| HelloTime | Hello_time is the time interval of Hello packet transmission. It is a query packet sent to adjacent device via ring network port to confirm whether the connection is normal. |
| Master-slave | 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. |



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| Interface Element | Description |
|---|---|
| | Notes:<br>Some products don't support Master-slave option, so their ring network is non-master station structure. |
| Enable | Enable or disable the corresponding ring group. |

Click "rapid ring state" to check the ring state of current ring network group configuration.

Rapid ring state interface as follows:



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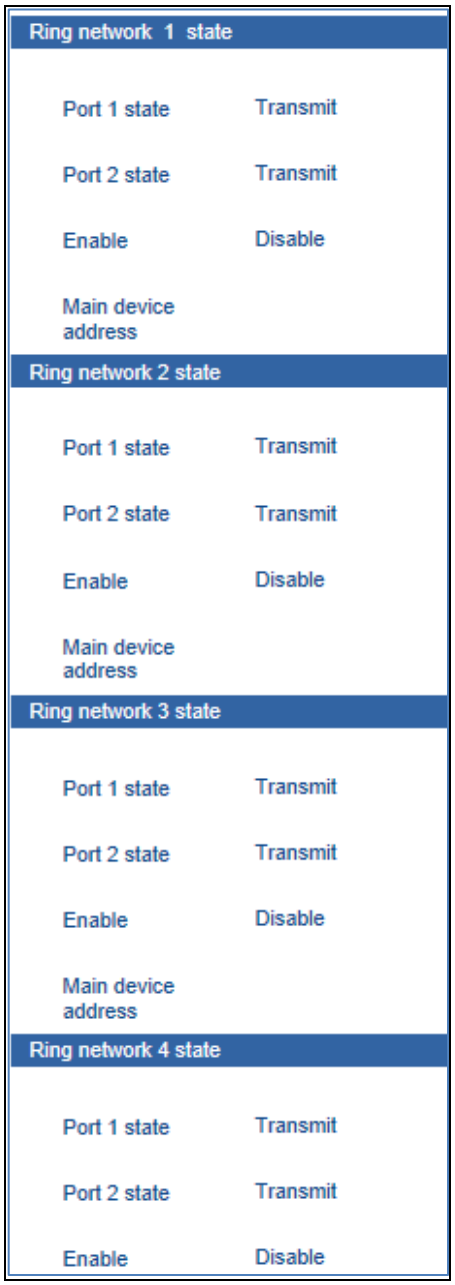


The main element configuration description of initial rapid ring interface

| Interface Element | Description |
|---|---|
| Ring group state | Display the current state of ring group, ring port and ring enable. |
| Ring port | Display the current state of ring port in the ring group. |
| Ring enable | Display the current state of ring enable. |

Now introduce the creation process respectively according to different ring network:



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- Create single ring
- Create coupling ring
- Create chain
- Create rapid spanning tree

## 6.1.1 Instance: create single ring

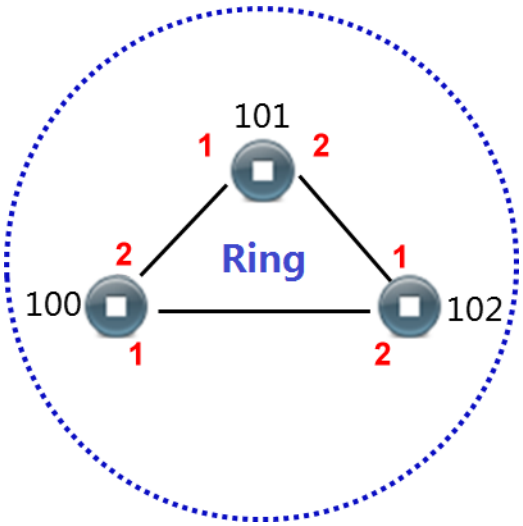
Single ring could be created when the redundant protocol is “Ring V1”, “Ring V2” or “Ring V3”. Here we take creating single ring in Ring V3 for example.

Note

Using Ring V1 and Ring V2 to create ring network is the same as using Ring V3.

### Instance

For example: create the following single ring:




### Instance analysis

The ring ports of Device 100, 101, and 102 are port 1 and port 2. Therefore, creating single ring is viable. Port 1 and port 2 are set as the ring ports of each device.

### Operation steps

Configuring Device 100, 101 and 102 in the following steps:

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the setting area of the “Rapid Ring” page, choose “Ring V3” as the “protocol of redundancy”.

**Step 3** Check the box of “Enable” in “Group 1”.

**Step 4** Choose “Single” in the drop-down list of “Type” of “Group 1”.



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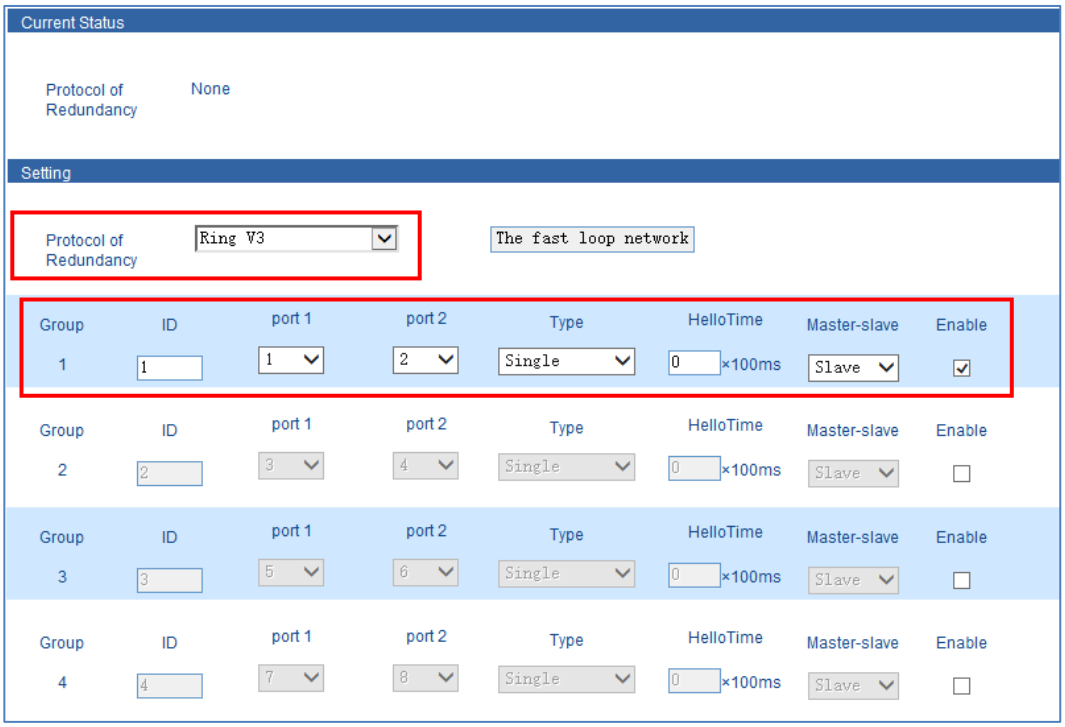


**Step 5** Enter “1” in the “ID” textbox of “Group1”.

**Step 6** Set “Port 1” as “01” and “Port 2” as “02” separately.

Note:

“Port 1” and “Port 2” cannot be set to the same port.

**Step 7** For Device 100 and 101, choose “Slave” in the drop-down list of “Master-slave” of “Group 1”.

**Step 8** For Device 102, choose “Master” in the drop-down list of “Master-slave” of “Group 1”.

**Step 9** Click “Apply”. Enter “Main Menu > System Management > Device Address”.

**Step 10** In the area of “reboot the device”, click “reboot”.

**Step 11** End.

> Notice
>
> If the device exists the option of “Master-slave”, the mode of one master multiple slaves is recommended to be used.

## 6.1.2 Instance: create coupling ring

Coupling ring could be created when the redundant protocol is “Ring V2” and “Ring V3”. Here we take creating coupling ring in Ring V3 for example.



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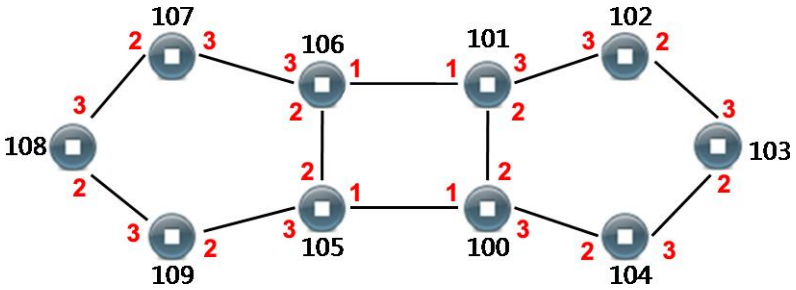
Note

When using Ring V2 to create coupling ring:

- "Port 1" represents "coupling port", no control port.
- The creation process of coupling ring is same as that of Ring V3.

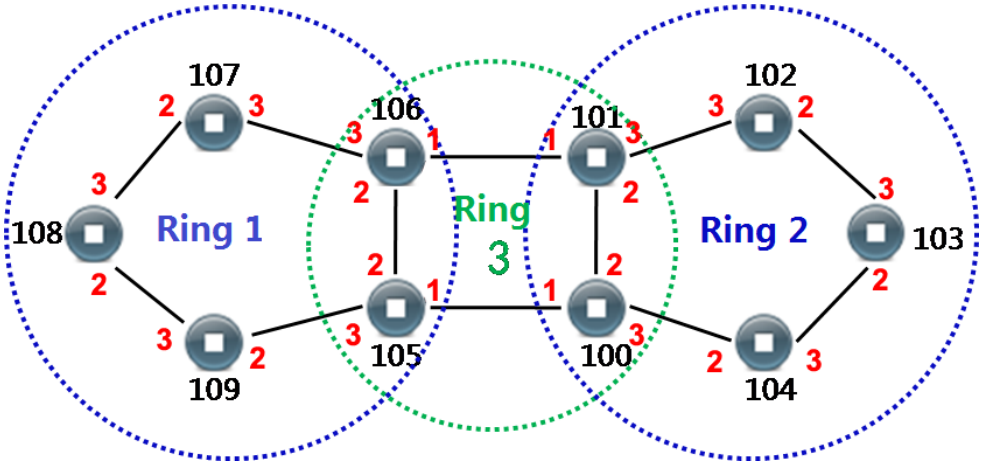
## Instance

For example: creating coupling ring. Its basic architecture is shown as below:




## Instance analysis

We can get the following picture by analyzing the coupling ring above.




There are three rings in coupling ring. Ring 1 and Ring 2 intersect Ring 3 respectively. When setting ring in WEB interface, we can set Ring 1 and Ring 2 as single ring, Ring 3 as coupling ring. In coupling ring, we set the port in the link where the two rings intersect as control port. The Port 2 of Device 105 in the picture above is the control port. The analyses of each switch are displayed as follows:

- 105, 106, 107, 108 and 109 are in Ring 1; ring network ports are Port 1 and Port 2; single ring; 105 is the master station, others are slave stations.
- 100, 101, 102, 103 and 104 are in Ring 2; ring network ports are Port 2 and Port 3;



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single ring; 100 is the master station, others are slave stations.

- 100, 101, 105 and 106 are in Ring 3. It is a coupling ring. Port 1 is coupling port. Port 2 is control port.

### Operation Step 1: configuring Ring 1 in WEB interface

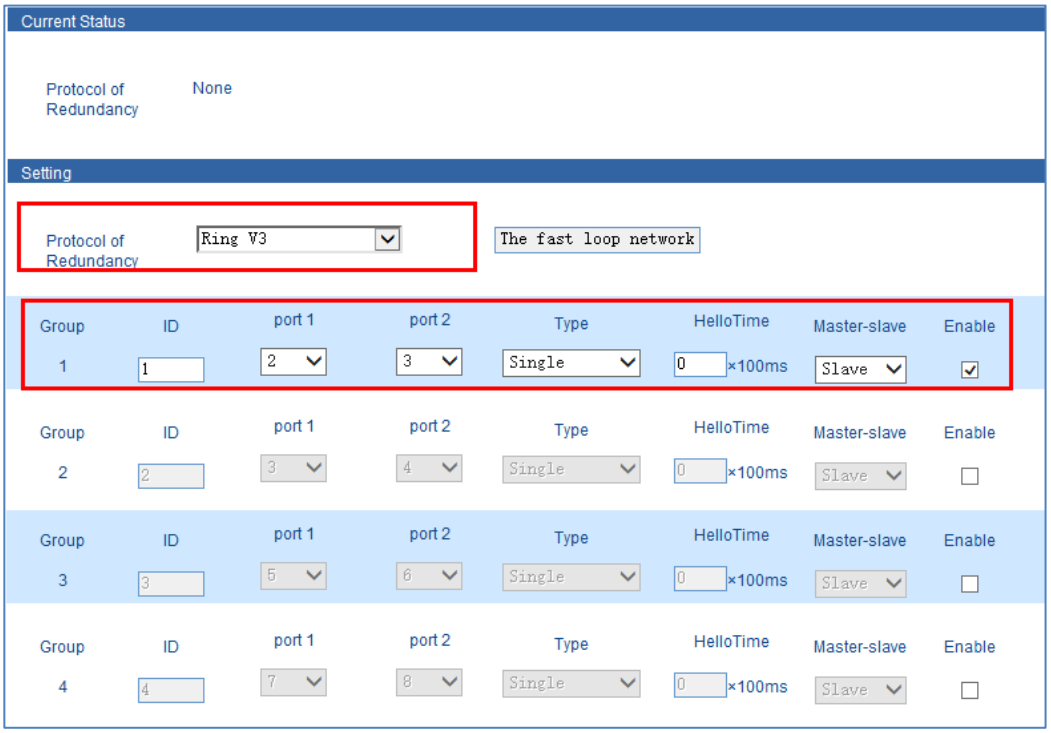
Configuring Device 105, 106, 107, 108 and 109 in the following steps respectively.

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the “Settings” area of “Rapid Ring” page, choose “Ring V3” as “Protocol of Redundancy”.

**Step 3** Check the “Enable” box in the “Group 1”.

**Step 4** Choose “Single” in the drop-down list of “Type” of “Group 1”.




**Step 5** Enter “1” into the “ID” textbox of “Group 1”.

**Step 6** Set “Port 1” and “Port 2” to “02” and “03” respectively.

Note:

“Port 1” and “Port 2” cannot be set to the same port.

**Step 7** For Device 106/107/108/109, choose “Slave” in the drop-down list of “Master-slave” of “Group 1”.

**Step 8** For Device 105, choose “Master” in the drop-down list of “Master-slave” of “Group 1”.

**Step 9** Click “Apply”. Enter “Main Menu > System Management > Device Address”.

**Step 10** In the area of “reboot the device”, click “reboot”.



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**Step 11** End.

### Operation Step 2: configuring Ring 2 in WEB interface

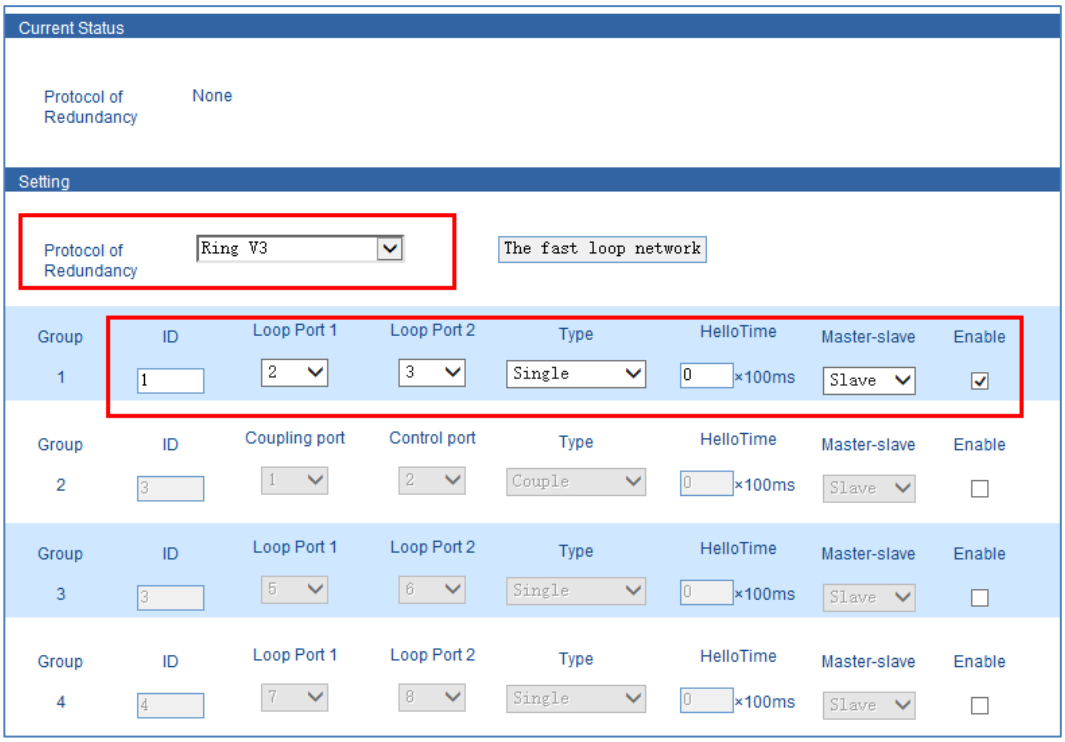
Configuring Device 100, 101, 102, 103 and 104 in the following steps respectively.

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the “Settings” area of “Rapid Ring” page, choose “Ring V3” as “Protocol of Redundancy”.

**Step 3** Check the “Enable” box in the “Group 1”.

**Step 4** Choose “Single” in the drop-down list of “Type” of “Group 1”.




**Step 5** Enter “2” into the “ID” textbox of “Group 1”.

**Step 6** Set “Port 1” and “Port 2” to “02” and “03” respectively.

Note:

“Port 1” and “Port 2” cannot be set to the same port.

**Step 7** For Device 101/102/103/104, choose “Slave” in the drop-down list of “Master-slave” of “Group 1”.

**Step 8** For Device 100, choose “Master” in the drop-down list of “Master-slave” of “Group 1”.

**Step 9** Click “Apply”. Enter “Main Menu > System Management > Device Address”.

**Step 10** In the area of “reboot the device”, click “reboot”.

**Step 11** End.



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## Operation Step 3: configuring Ring 3 in WEB interface

Configuring Device 100, 101, 105 and 106 in the following steps respectively.

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the “Settings” area of “Rapid Ring” page, choose “Ring V3” as “Protocol of Redundancy”.

**Step 3** Check the “Enable” box in the “Group 2”.

**Step 4** Choose “Couple” in the drop-down list of “Type” of “Group 2”.

**Step 5** Enter “3” into the “ID” textbox of “Group 2”.

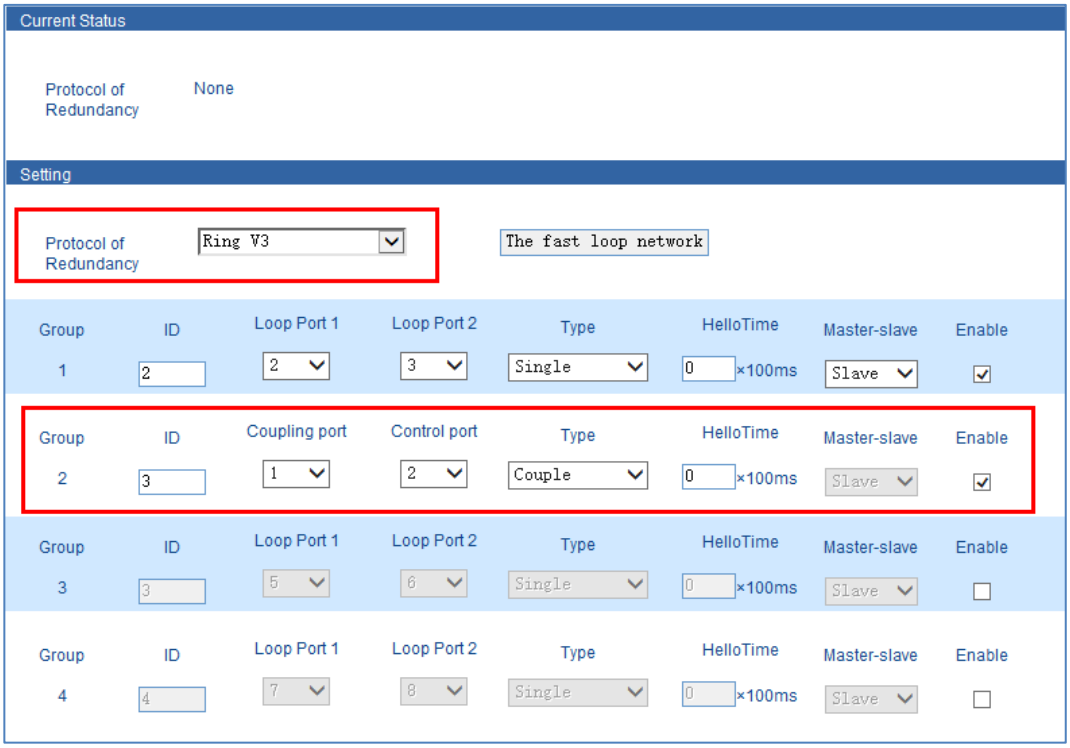
**Step 6** Choose “1” in the drop-down list of “Coupling Port” of “Group 2”.

**Step 7** Choose “2” in the drop-down list of “Coupling Ctrl Port” of “Group 2”.

**Step 8** Click “Apply”. Enter “Main Menu > System Management > Device Address”.

**Step 9** In the area of “reboot the device”, click “reboot”.

**Step 10** End.




Instance: creating chain

The chain could be created when the “Protocol of Redundancy” is “Ring V3”.

## Instance

For example: creating chain. Its basic architecture is shown as below:



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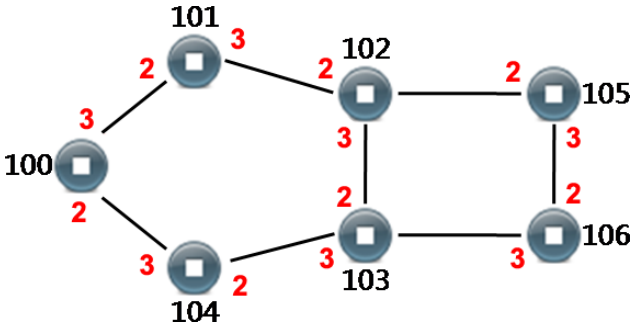
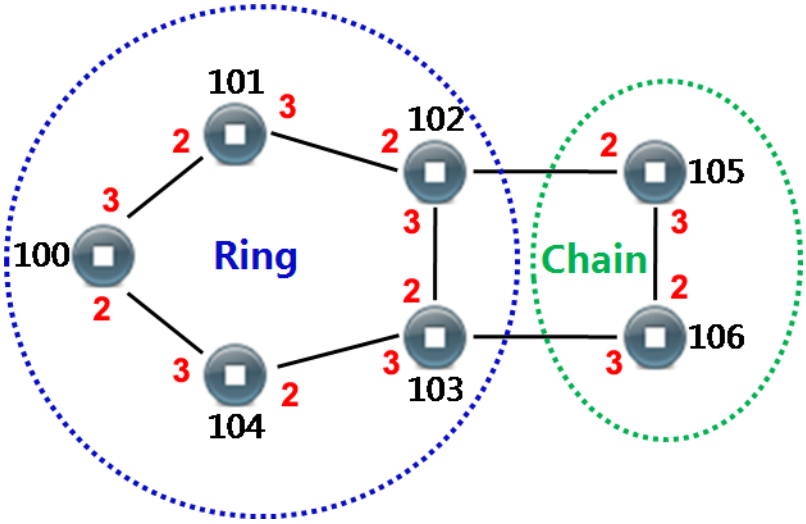



## Instance analysis

Basic framework, we can make the following analyses:

- 100, 101, 102, 103 and 104 are in the ring. The ring network ports are 2 and 3. Device 100 is the master station, others are slave stations.
- Device 105 and 106 are in the chain. The ring network ports are 2 and 3.




## Operation Step 1: creating ring

Configuring Device 100, 101, 102 and 103 in the following steps respectively.

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the “Settings” area of “Rapid Ring” page, choose “Ring V3” as “Protocol of Redundancy”.

**Step 3** Check the “Enable” box in the “Group 1”.

**Step 4** In the “settings” area of “Rapid Ring”:

1. Set “Type” to “Single”;
2. Set “ID” to “1”;
3. Set “Port 1” to “2”;



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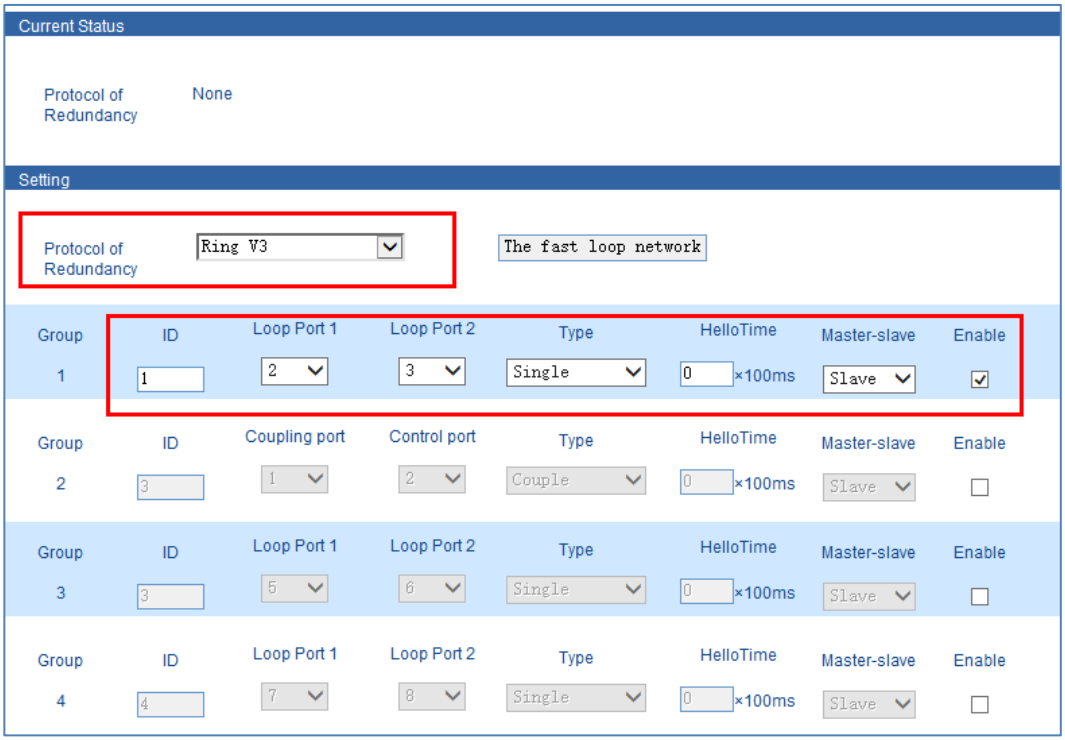
4. Set “Port 2” to “3”;




**Step 5** For Device 101/102/103/104, choose “Slave” in the drop-down list of “Master-slave” of “Group 1”.

**Step 6** For Device 100, choose “Master” in the drop-down list of “Master-slave” of “Group 1”.

**Step 7** Click “Apply”.

**Step 8** Enter “Main Menu > System Management > Device Address”.

**Step 9** In the area of “reboot the device”, click “reboot”.

**Step 10** End.

### Operation Step 2: creating chain

Configuring Device 105 and 106 in the following steps respectively.

**Step 1** Choose “Main Menu > Redundancy > Rapid Ring”.

**Step 2** In the “Settings” area of “Rapid Ring” page, choose “Ring V3” as “Protocol of Redundancy”.

**Step 3** Check the “Enable” box in the “Group 1”.

**Step 4** In the “Settings” area of “Rapid Ring” page, set the “Type” to “Chain”.

**Step 5** In the “Settings” area of “Rapid Ring” page, set the “ID” to “2”.

**Step 6** Set “Port 1” to “02” and set “Port 2” to “03”.



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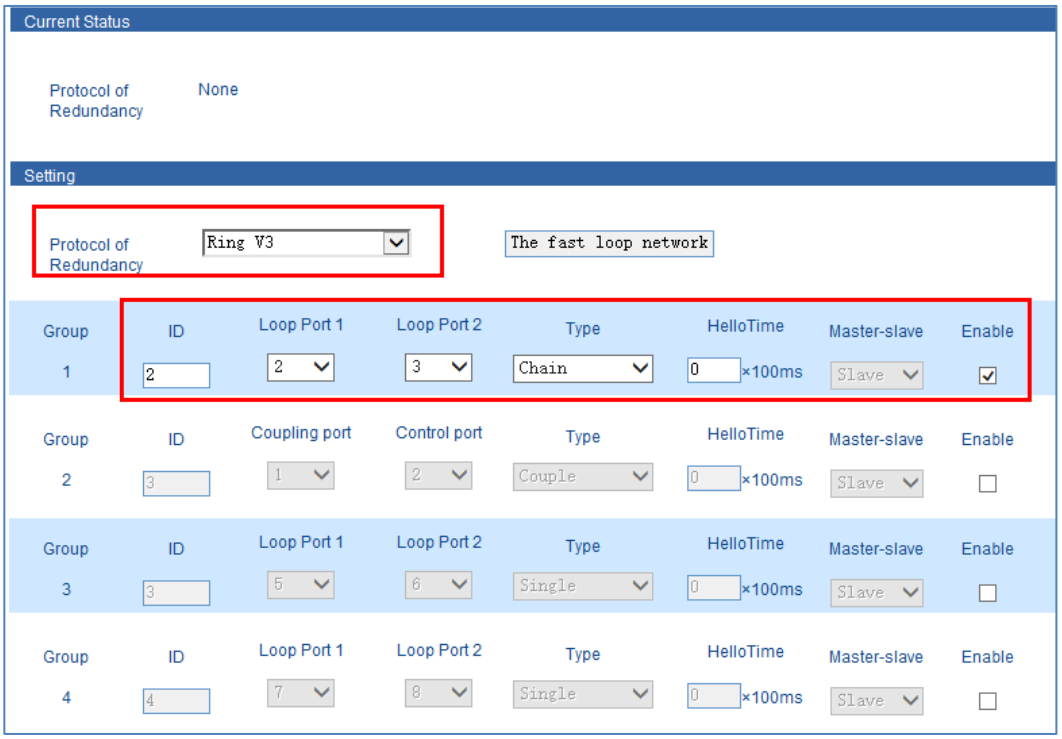


Note

The chain + single ring combination could be formed by using configured ring network port of chain ring device to connect the normal port of single ring device.

**Step 7** Click “Apply”.

**Step 8** Enter “Main Menu > System Management > Device Address”.

**Step 9** In the area of “reboot the device”, click “reboot”.

**Step 10** End.

Notice

- The port that has been set to port trunking could not be set as rapid ring port. One port can’t belong to multiple ring networks.
- The ID in the same single ring must be the same; otherwise it cannot form a ring and achieve normal communication.
- To ensure the communication of ring network, it’s recommended to set the “Type” of ports that have already been set as ring network to “Trunk” and “member relationship” to “Tagged”.
- When forming complicated ring networks like tangent ring, please make sure the ID conforms to the unity of single ring network ID. Network ID of different single ring must be different.



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# 6.1.3 Creating Spanning Tree

## Function description

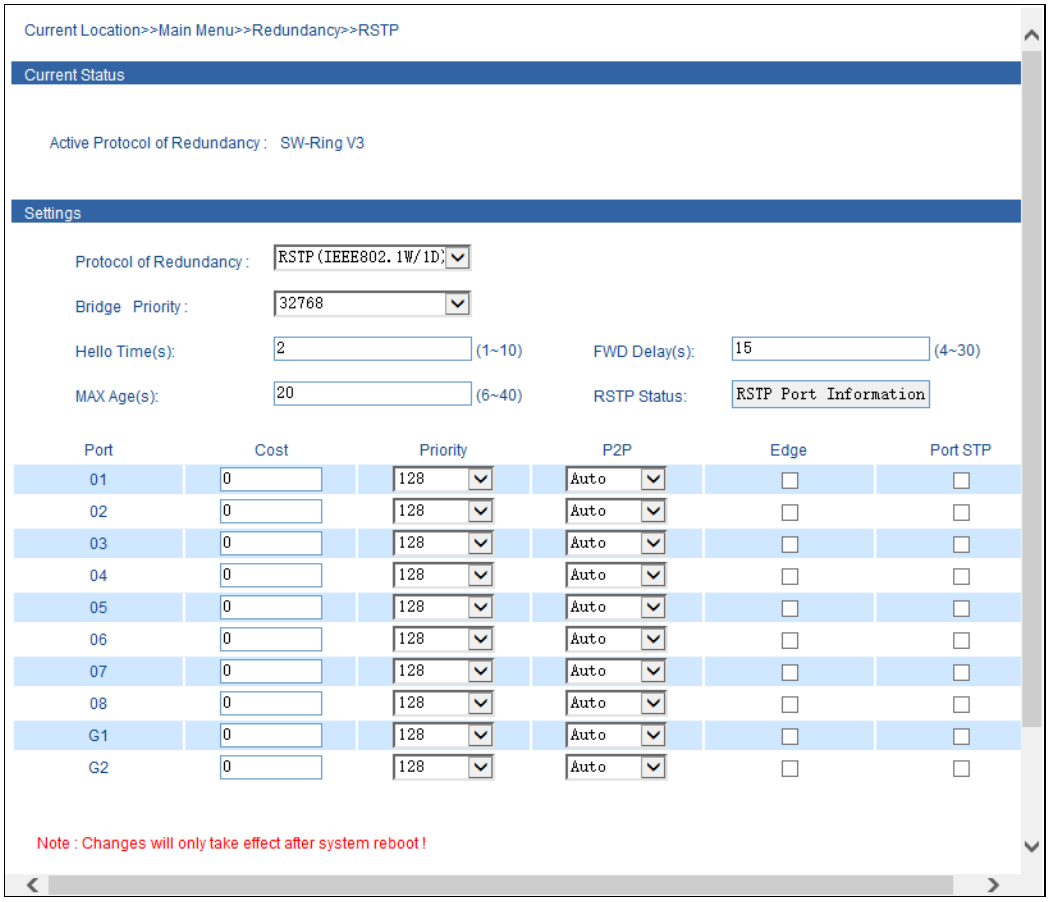
On the “Rapid ring” page, user can choose “RSTP (IEEE 802.1D/W)” as redundancy protocol to create spanning tree quickly.

## Operation Path

Open in order: “Main Menu > Redundancy > Rapid Ring > Protocol of Redundancy > STP (IEEE 802.1D/W)”.

## Interface Description

Spanning tree interface as follows:




The main element configuration description of RSTP interface:

| Interface Element | Description |
|---|---|
| Protocol of redundancy | Choose the algorithm of redundancy protocol, options are:<br>• None: represents disabling ring network function;<br>• Ring V1: supports single ring; |



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| | |
|---|---|
| | • Ring V2: supports single ring and coupling ring;<br>• Ring V3: supports single ring, coupling ring, chain and Dual_homing;<br>• RSTP (IEEE 802.1W/1D): rapid spanning tree. |
| Bridge priority | The priority of bridge.<br>Note:<br>In STP/RSTP network, the device with smallest bridge ID would be elected as root bridge. The bridge ID consists of bridge priority and bridge MAC address. |
| Hello time | The transmission time interval of the BPDU data packet.<br>Note:<br>The protocol message that STP/RSTP adopts is BPDU (Bridge Protocol Data Unit). |
| FWD delay | The forward delay time that the port of switch maintains in transition state (listening and learning).<br>Note:<br>STP/RSTP adopts a mechanism of state transition. The newly-selected root port and specified port have to go through twice the Forward Delay time to enter the forwarding state. |
| MAX age | The lifetime of BPDU packets. |
| RSTP status | Button, used for checking the current status of rapid spanning tree. |
| Port | Displays the port number of the device. |
| Cost | The path cost from network bridge to root bridge.<br>Note:<br>Path cost is a reference value for STP protocol to choose links. The path cost from a port to the root bridge is cumulated by the path cost it go through each port of each bridge. |
| Priority | The priority of ports in bridge. The smaller the value, the higher the priority.<br>Note:<br>PID (Port ID) consists of two parts. The high 4 digits are port priorities, the low 12 digits are port numbers. In the case of same root path cost, it would not block the port with the smallest PID value, but the one with greater PID value. |
| P2P | The directly connected switch port, options are:<br>• Yes;<br>• No;<br>• Auto: adopt negotiation mechanism that could implement quick conversion of port states. |
| Edge | The switch that is on the edge of network and connects to the terminal devices. |



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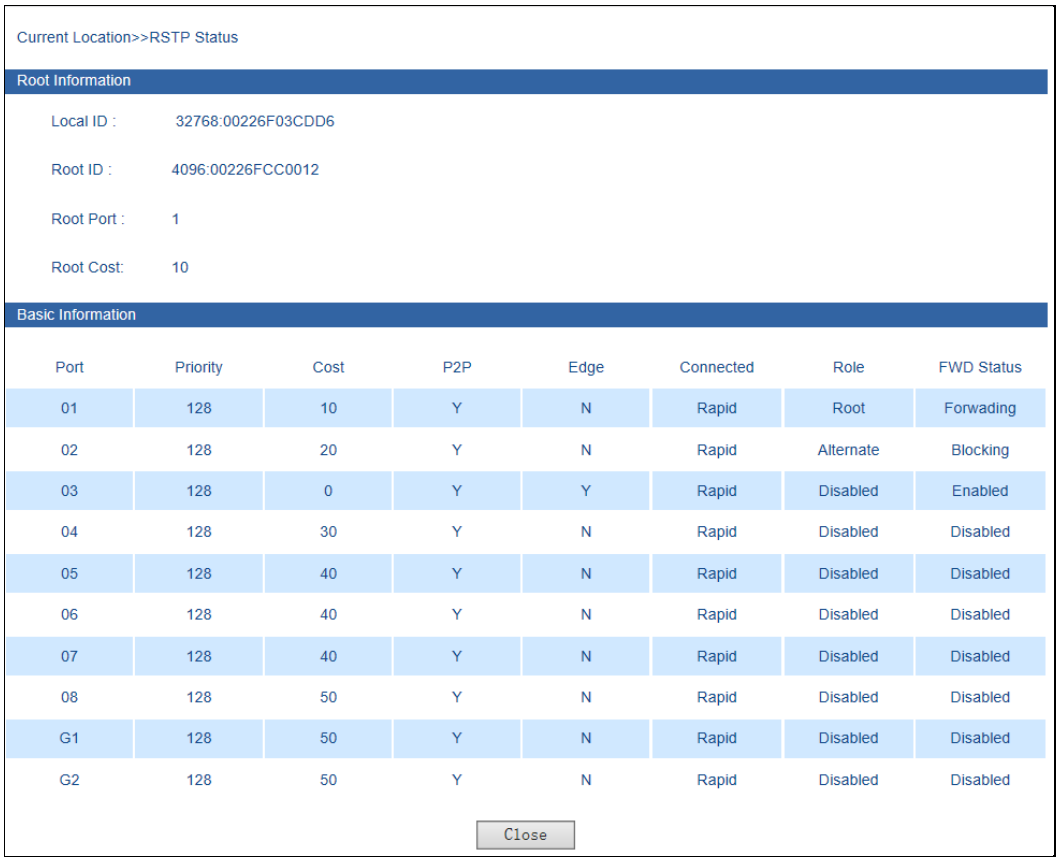
| | |
|---|---|
| Port STP | Checking this checkbox. It represents participating in the operation of spanning tree protocol. |

RSTP status interface as follows:




The main element configuration description of RSTP status interface:

| Interface Element | Description |
|---|---|
| **Root information** | **The display bar of root information table** |
| Local ID | It displays the priority of this switch and MAC address information ID. |
| Root ID | It displays the priority of the root switch and MAC address information ID. |
| Root port | The port of the switch, which is not in the root bridge but nearest to it, is in charge of communicating with the root bridge. The path cost from this port to the root bridge is the lowest. When the path costs of multiple ports are the same, the one with the highest priority would be the root port. |



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| | |
|---|---|
| Root cost | The root cost of a switch is the sum of root port cost and the root cost that data packet goes through all switches. The root cost of root bridge is zero. |
| **Basic information** | **The display bar of basic information table** |
| Port | It displays the port number of this device. |
| Priority | The priority of ports in network bridge. The values range from 0 to 240. The smaller the value, the higher the port priority. The higher the priority, the more likely it is to be a root port. |
| Cost | The path cost from network bridge to root bridge. |
| P2P | The directly connected switch port. |
| Edge | The port that directly connects to terminal instead of other switches. |
| Connected | It displays the network protocol of devices with connected ports. |
| Role | Root port, specified port, Alternate port and Backup port. |
| FWD status | It is divided by whether the port forwards user flow and learns MAC address.<br>• Discarding: neither forward user flow nor learn MAC address;<br>• Learning: doesn't forward user flow but learn MAC address;<br>• Forwarding: forward user flow and learn MAC address;<br>• Listening: neither forward user flow nor learn MAC address; but can receive and send configuration message;<br>• Blocking: port only receives and processes BPDU, doesn't forward user flow;<br>• Disabled: blocked or physically disconnected. |

Note

The settings of rapid spanning tree will take effect after rebooting the device.



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# 6.2 Port Trunking

## 6.2.1 Static Trunking

### Function Description

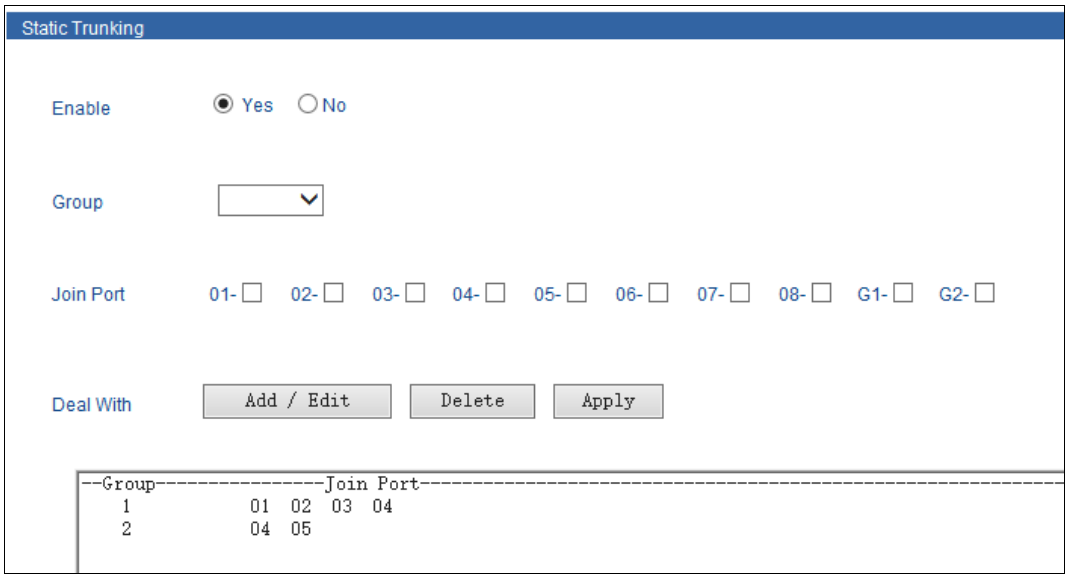
Binding multiple physical ports into one logical channel.

### Operation Path

Open in order: “Main Menu > Redundancy > Port Trunking > Static Trunking”.

### Interface Description

Static Trunking interface as follows:




The main element configuration description of static trunking interface:

| Interface Element | Description |
|---|---|
| Enable | Enable or disable trunking configuration. |
| Group | Choose trunking group. |
| Join port | Check the box of ports that join the trunking group. |
| Deal with | Add, edit, delete or apply the configuration of port trunking group. |



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### For instance: port trunking

For example: if the port 1 and port 2 of switch A and switch B share the same rates and duplex modes, we could improve bandwidth by grouping them into a Trunking group.

### Operation Steps

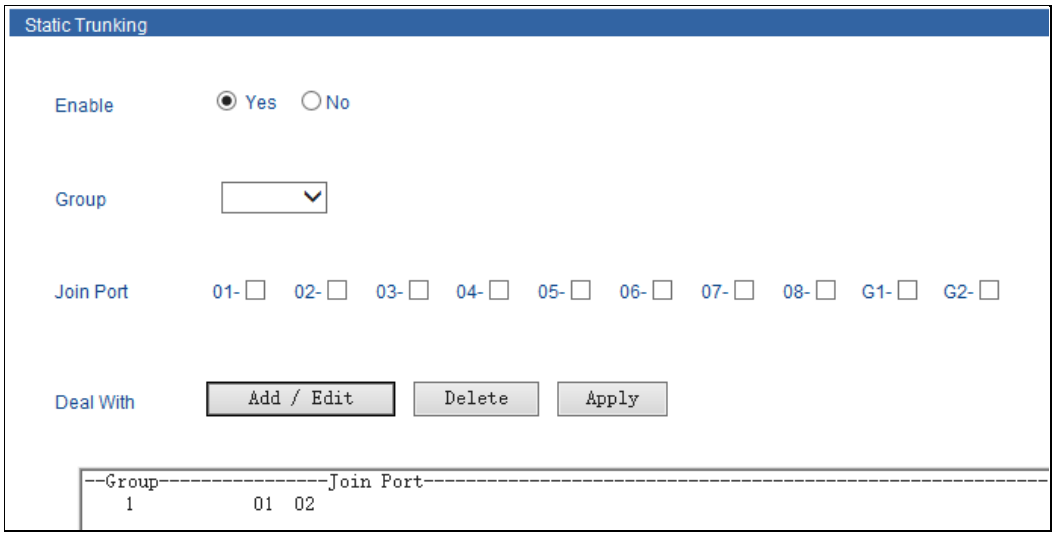
Configure switch A and switch B in the same way respectively.

**Step 1** Log in Web configuration page.

**Step 2** Choose “Main Menu > Redundancy > Port Trunking > Static Trunking”.

**Step 3** On the page of “Static Trunking”, check the box of “Yes” in the “Enable” bar.

**Step 4** Choose “1” in the droplist of “Group”.




**Step 5** Check the box of Port 1 and Port 2 in the “join port” bar.

**Step 6** Click “Add/Edit”.

**Step 7** Click “Apply”.

**Step 8** End.

Note

- All attributes of ports in trunking group should be the same, including rates and duplex modes, etc.
- Setting one port as both ring network port and trunking port is not supported.
- Each trunking group should have 2 ports at least, up to 4.
- One port can only join a trunking group.



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# 7 LLDP

## 7.1 Parameters Configuration

### Function Description

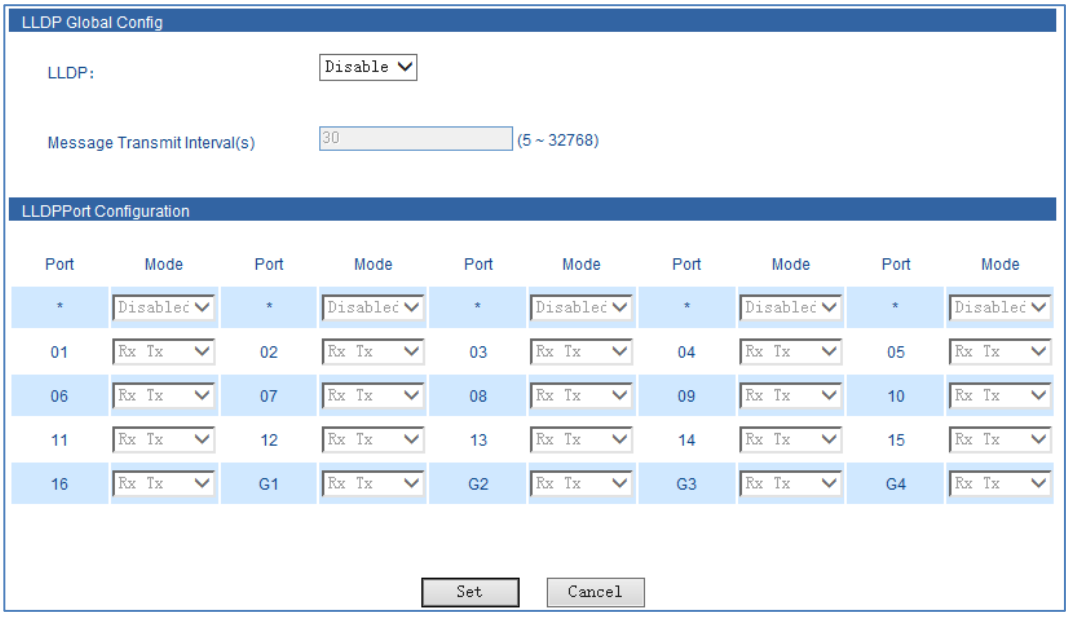
On the page of “Parameters Configuration”, user can configure LLDP function of the port and notify its device identity and performance in the local device.

### Operation Path

Open in order: “Main Menu > LLDP > Parameter Configuration”.

### Interface Description

Parameter configuration interface as follows:



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Main elements configuration description of parameter configuration interface:

| Interface Elements | Description |
|---|---|
| LLDP | Enable/disable LLDP function. |
| Message Transmit Interval | Interval time for messages sending is 5-32768s. For preventing abounding LLDP sending caused by frequent changes of local information, next message should be delayed to send out after sending a LLDP message. |
| Mode | • Disable: disable LLDP function.<br>• Tx Rx: send and receive LLDP message.<br>• Tx only: periodically send LLDP message to neighbor device.<br>• Rx only: conduct validity check to received LLDP and carried TLV, and configure the ageing time of neighbor device in the local device according to TTL (Time To Live) value in TLV. |

# 7.2 Neighbor Information

### Function Description

On the page of “Neighbor Information”, user can check the following items discovered by the local port:

- MAC address;
- Remote port;
- Port description;
- System name;
- System function;
- Management address.

### Operation Path

Open in order: “Main Menu > LLDP > Neighbor Information”.

### Interface Description

Neighbor information interface as follows:



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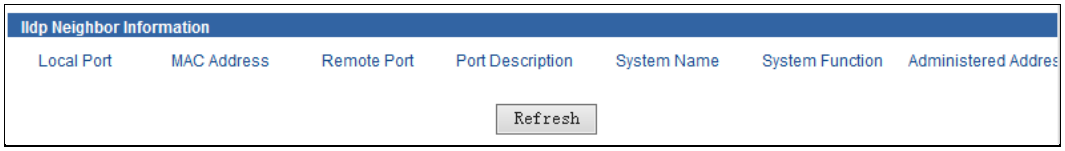


Main elements configuration description of neighbor information interface:

| Interface Elements | Description |
|---|---|
| Local port | Corresponding local port number of the device. |
| MAC address | Discover corresponding MAC address of the neighbor device. |
| Remote port | Port number of neighbor device. |
| Port description | Port description information of the neighbor device. |
| System Name | System name of the neighbor device. |
| System function | System functions of the neighbor device. |
| Management address | Management addresses information of the neighbor device. Management address is the address provided for network management system to identify and manage the network devices. Management address can definitely identify a device, which is convenient for the drawing of network topology and network management. Management address is released to public after being packaged in Management Address TLV of LLDP message. |



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# 8 Access Control

## 8.1 Login Settings

### Function Description

On the “Login Settings” page, user can configure the login name and password of logging in to WEB configuration page and other parameter information.

### Operation Path

Open in order: “Main Menu > Access control > Login settings”.

### Interface Description

Login settings interface as follows:



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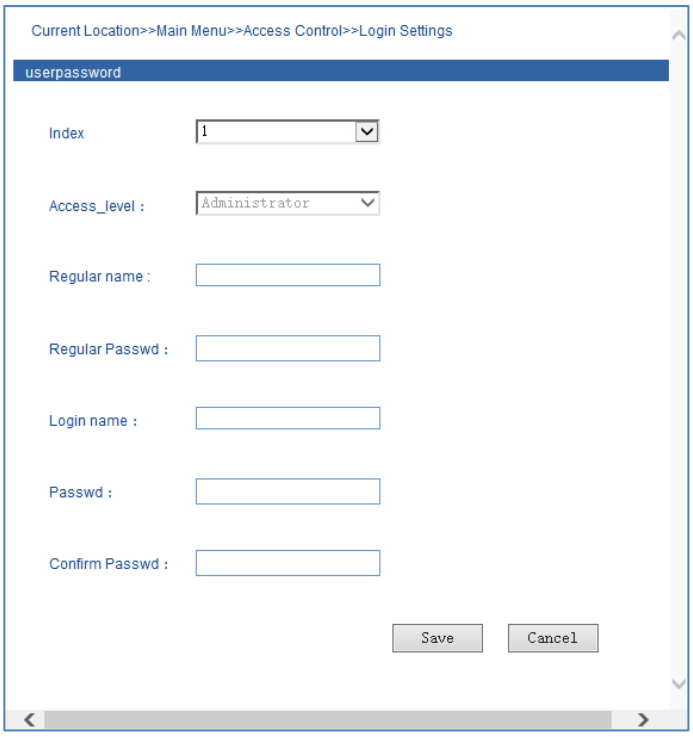


The main element configuration description of login settings interface:

| Interface Element | Description |
|---|---|
| Index | The index number is corresponding to the access level.<br>• 1: administrator<br>• 2: administrator or observer<br>• 3: administrator or observer |
| Access level | Access level setting, options:<br>• Administrator: check and modify permissions.<br>• Observer: check permissions. |
| Regular name | Login name for the current guest to log in to WEB configuration interface. |
| Regular password | Password for current guest to log in to WEB configuration interface.<br>Note:<br>The password should be a combination of letters less than 16 bytes. |
| Login name | Login name setting of WEB configuration interface. |
| Password | Login password setting of WEB configuration interface.<br>Note:<br>The password should a combination of letters that less than 16 bytes. |



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| | |
|---|---|
| Confirm password | Confirm password. |

Notice

Please keep the modified login name and password in mind. If you forget it, you can restore it to factory setting via DIP switch. Default login name and password of WEB configuration interface are “admin”.

### For instance: create administrator

For example: create a new administrator user “admin8” and set the management password to “admin8”.

### Operation Path

**Step 1** Log in to Web configuration interface.

**Step 2** Choose “Main Menu > Access Control > Login Settings”.

**Step 3** On the “Login settings” page:

1. Choose “1” as “Index” number
2. Choose “administrator” as “access level”
3. Enter “regular name”
4. Enter “regular password”
5. Enter “admin8” as “login name”
6. Enter “admin8” as “password”
7. Enter “admin8” as “confirm password”.

**Step 4** Click “apply”.

**Step 5** End.

## 8.2 DHCP Server

DHCP (Dynamic Host Configuration Protocol) is the technology that intensively configures and dynamically manages the IP addresses of users.

DHCP adopts the client/server communication mode. The DHCP Client sends configuration application to the DHCP Server, and the server sends back the configuration information distributed for the DHCP Client (including IP address, default gateway, DNS Server). All of these can realize IP addresses distribution and concentrated configuration management of other networks parameters.



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## Function Description

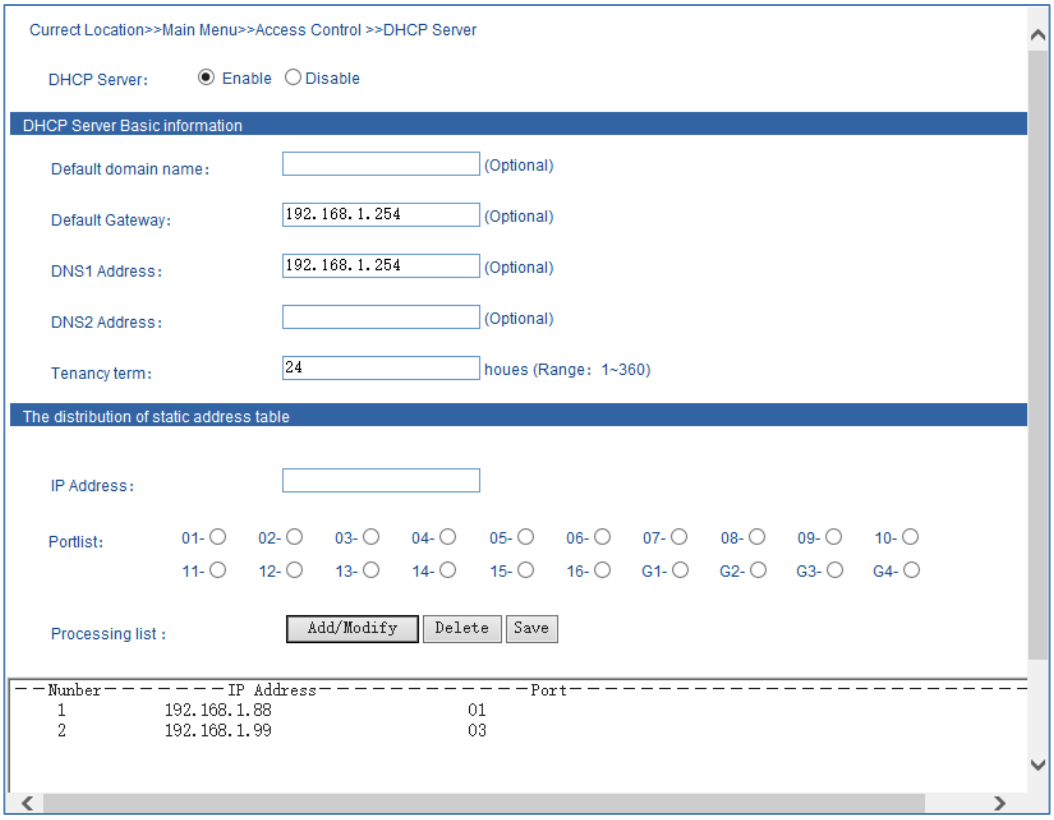
On the “DHCP Server” page, user can distribute network address statically.

## Operation Path

Open in order: “Main Menu > Access Control > DHCP Server”.

## Interface Description

DHCP Server interface as follows:




The main element configuration description of DHCP server interface:

| Interface Element | Description |
|---|---|
| DHCP Server | Enable/disable DHCP server function. |
| **DHCP Server Basic Information** | **The configuration bar of DHCP server basic information** |
| Default domain name | The domain name that can be captured by DHCP client automatically. |
| Default gateway | The gateway that can be captured by DHCP client automatically. |
| DNS address | The DNS address that can be captured by DHCP client |



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| | |
|---|---|
| | automatically. |
| Tenancy term | The valid time that DHCP client can capture address automatically. 1-360 hour (optional). |
| **The distribution of static address table** | **The configuration bar of static address distribution table**<br>Notes:<br>The IP address list that DHCP client can automaticcaly capture in different ports. |
| IP address | The IP address that can be captured by DHCP client automatically. |

# 8.3 MAC Port Lock

Physical MAC (Media Access Control) address has identified a terminal on the Internet, and the address is the global unique hardware address.

## Function Description

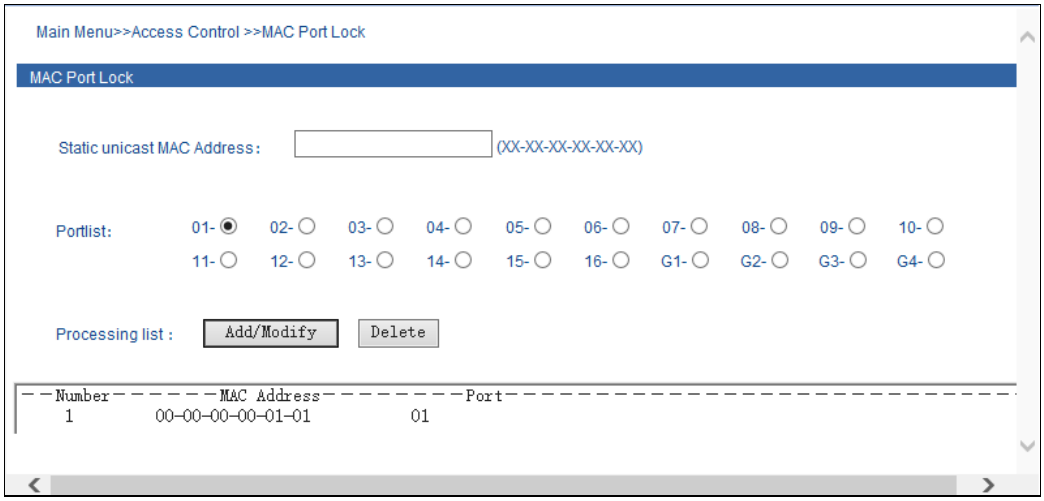
On the “MAC Port Lock” page, user can lock the MAC address of the port that connected to the device.

## Operation Path

Open in order: “Main Menu > Access Control > MAC Port Lock”.

## Interface Description

MAC port lock interface as follows:



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The main element configuration description of MAC port lock interface:

| Interface Element | Description |
|---|---|
| Static unicast MAC address | The MAC address of the device that needs to be locked. |
| Port list | Display the corresponding ports of the device. |
| Processing list | Display the MAC address information of the locked ports. |

Note

- Once it was added, the static address will remain in effect and be free from the limitation of maximum aging time until it is deleted.
- One MAC address corresponds to one port in static address table. If set, all data that send to this address will be forwarded to this port only.

# 8.4 Safety management

## 8.4.1 MAC Filter

### Function Description

On the “MAC filter” page, user can control the receiving/sending data authority of the host connected to the switch port by setting the list of MAC address rules that enables or disables access.

### Operation Path

Open in order: “Main Menu > Safety Management > MAC Filter”.

### Interface Description

MAC filter interface as follows:



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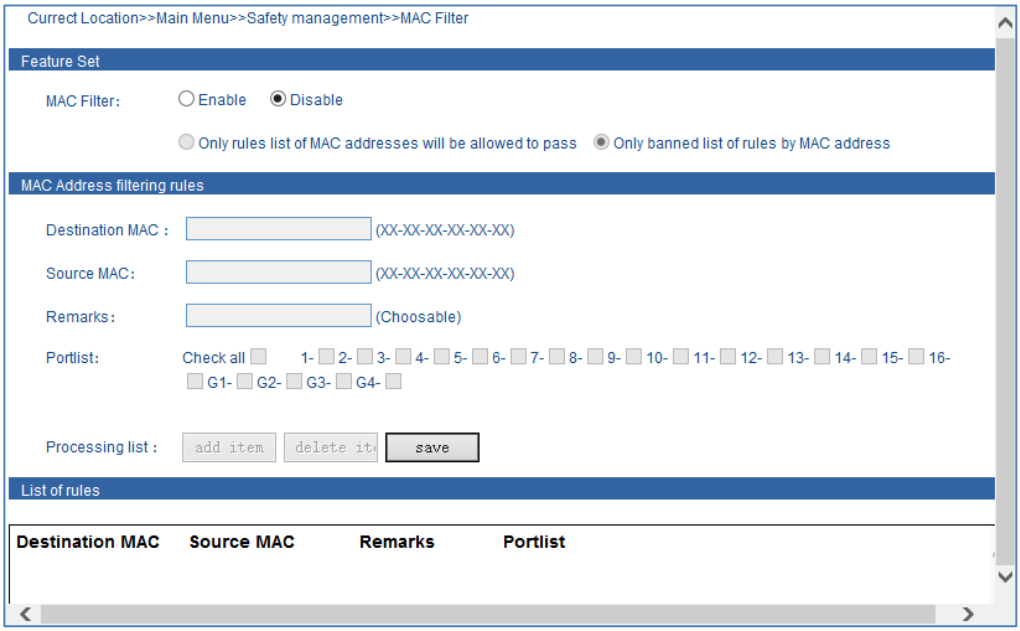


The main element configuration description of MAC filter interface:

| Interface Element | Description |
|---|---|
| **Feature set** | **Function setting area** |
| MAC filter | Enable or disable MAC address filtering. When the function is enabled, options are as follows:<br>• Only enable the MAC addresses in the list of rules to pass<br>• Only disable the MAC addresses in the list of rules to pass |
| **MAC address filtering rules** | **Configuration bar of MAC address filtering rules** |
| Destination MAC | Set the destination MAC address rules of MAC filtering:<br>• When the list of rules is enabled, the data that takes this address as destination MAC address could be sent<br>• When the list of rules is disabled, the data that takes this address as destination MAC address couldn't be sent |
| Sourse MAC | Set the sourse MAC address rules of MAC filtering:<br>• When the list of rules is enabled, the data that takes this address as sourse MAC address could be sent<br>• When the list of rules is disabled, the data that takes this address as sourse MAC address couldn't be sent |



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| | |
|---|---|
| Remarks | Add the remark information of the list of rules |
| Port list | Check the box of ports that apply to MAC filtering rules |
| Processing list | Set the processing scheme of rules:<br>• Add entry<br>• Delect entry<br>• Save configuration |
| List of rules | Display the list of rules that have been set up |

## 8.4.2 IP Filter

### Function Description

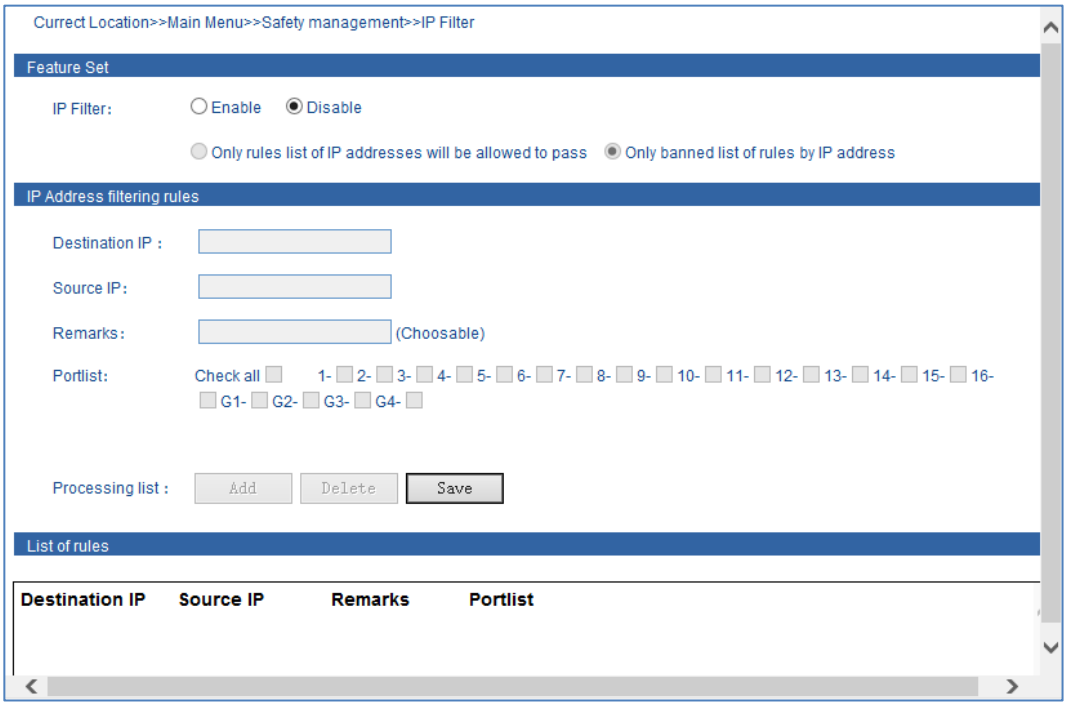
On the “IP filter” page, user can control the receiving/sending data authority of the host connected to the switch port by setting the list of IP address rules that enables or disables access.

### Operation Path

Open in order: “Main Menu > Safety Management > IP Filter”.

### Interface Description

IP filter interface as follows:



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The main element configuration description of IP filter interface:

| Interface Element | Description |
|---|---|
| **Feature set** | **Function setting area** |
| IP filter | Enable or disable IP address filtering. When the function is enabled, options are as follows:<br>• Only enable the IP addresses in the list of rules to pass<br>• Only disable the IP addresses in the list of rules to pass |
| **IP address filtering rules** | **The configuration bar of IP address filtering rules** |
| Destination IP | Set the destination IP address rules of IP filtering:<br>• When the list of rules is enabled, the data that takes this address as destination IP address could be sent<br>• When the list of rules is disabled, the data that takes this address as destination IP address couldn't be sent |
| Sourse IP | Set the sourse IP address rules of IP filtering:<br>• When the list of rules is enabled, the data that takes this address as sourse IP address could be sent<br>• When the list of rules is disabled, the data that takes this address as sourse IP address couldn't be sent |
| Remarks | Add the remark information of the list of rules |
| Port list | Check the box of ports that apply to IP filtering rules |
| Processing list | Set the processing scheme of rules:<br>• Add entry<br>• Delect entry<br>• Save configuration |
| List of rules | Display the list of rules that have been set up |



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# 9 Remote Monitoring

## 9.1 SNMP Configuration

### Function Description

On the page of "SNMP Configuration", user can conduct the following operations:

- Enable or disable SNMP configuration function;
- Configure SNMP V1/V2 read-only community name;
- Configure SNMP V1/V2 read-only community name;
- Configure SNMP gateway.

### Operation Path

Open in order: "Main Menu > Remote Monitoring > SNMP Configuration".

### Interface Description

Interface screenshot of SNMP configuration as follows:



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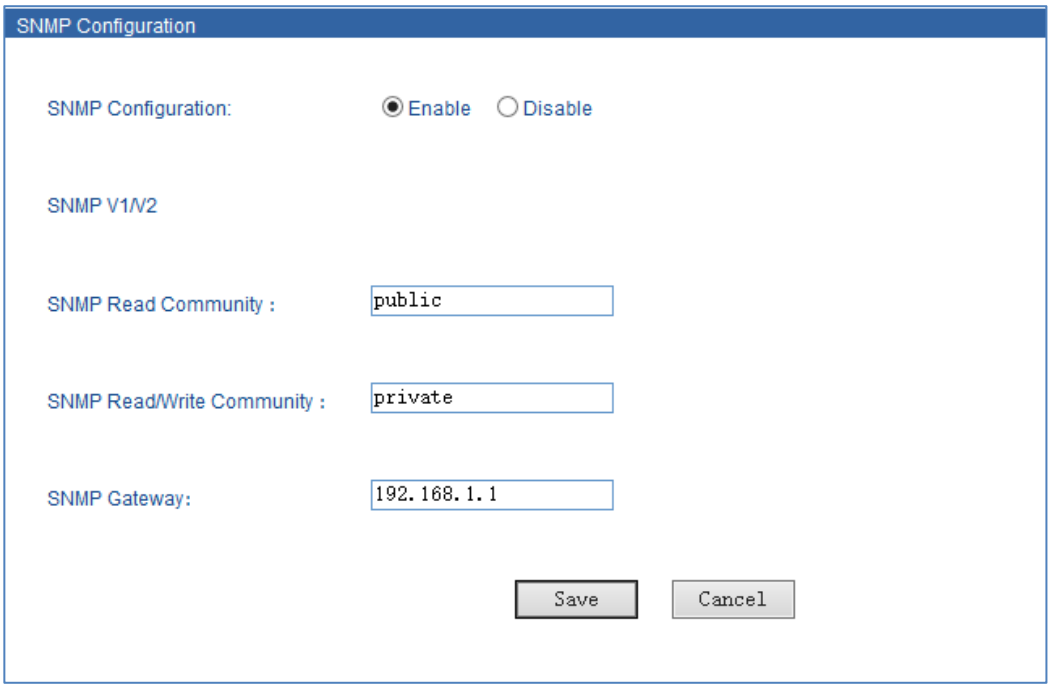


Main elements configuration description of SNMP configuration interface:

| Interface Element | Description |
|---|---|
| SNMP Configuration | SNMP configuration function, options as follows:<br>• Enable;<br>• Disable. |
| SNMP V1/V2 | SNMP supports the following version:<br>• SNMP V1: It adopts UDP protocol which can be used widely but exists security issue.<br>• SNMP V2: Semantics has been enhanced, and it supports TCP protocol. |
| SNMP Read Community | Configure the read-only SNMP community name with the only operation permission of Get. |
| SNMP Read/Write Community | Configure the Read/Write SNMP community name with the operation permission of Get and Set. |
| SNMP Gateway | The destination IP address sent out by Trap messages. |

Note

Please pay attention to the permission problem of read and write in the SNMP browser, user can check the permission of used "community name" if the permission of "write" is invalid.



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### Example: SNMP Configuration

For example: Enable SNMP configuration and configure the "Read-only community name" as "public", "Read-write community name" as "private", "SNMP gateway" as "192.168.1.1".

### Operation Steps

**Step 1** Log on to the Web configuration interface.

**Step 2** Select "Main Menu > Remote Monitoring > SNMP Configuration".

**Step 3** On the displayed page of "SNMP Configuration":

1. Select "enable" on the column of "SNMP Configuration";
2. Select "Read-only community name" as "public";
3. Select "Read/Write community name" as "private";
4. Select "SNMP gateway" as "192.168.1.1".

**Step 4** Click "Apply".

**Step 5** End.

## 9.2 Modbus_TCP

### Function Description

On the page of "Modbus_TCP", user can enable Modbus TCP monitoring function. Client can read the switch system, port, ring network, frame statistics and other parameters information via Modbus TCP protocol, which are convenient for various integrated systems to monitor and manage the device.

Note

- Switch with PoE function can acquire the switch's PoE information via Modbus TCP protocol.
- Please see the switch read-only register address information in the "Modbus TCP data sheet" of this section.

### Operation Path

Open in order: "Main Menu > Remote Monitoring > Modbus_TCP".

### Interface Description

Modbus_TCP screenshot:



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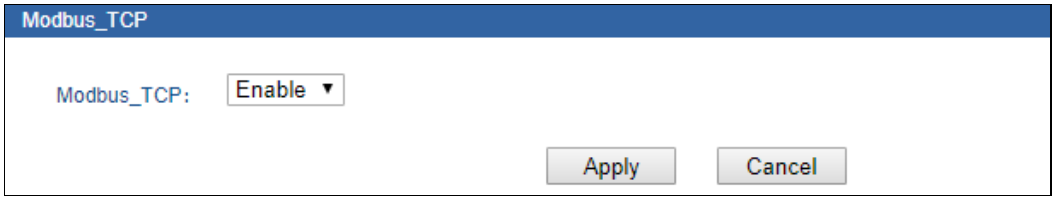


The main element configuration description of Modbus_TCP interface:

| Interface Element | Description |
|---|---|
| Modbus_TCP | "Enable" drop-down list of Modbus_TCP monitoring, options as follows:<br>• Disable: it defaults to disabled;<br>• Enable: After enabling Modbus_TCP monitoring function, client can read the switch device information via function code 4. |

## Modbus_TCP Data Sheet

Switch read-only register (support function code 4) address information and stored device information, as the table below:

Note

The following table address is hexadecimal format, please convert it into suitable format according to the demands of current debugging tool.

| Information Type | Address (HEX) | Data Type | Description |
|---|---|---|---|
| System Information | 0x0000 | 2 Words | Device ID (reserved) |
| | 0x0002 | 16 Words | Name (ASCII display) |
| | 0x0012 | 16 Words | Description (ASCII display) |
| | 0x0022 | 3 Words | MAC Address (HEX display) |
| | 0x0025 | 2 Words | IP address |
| | 0x0027 | 16 Words | Contact Information |
| | 0x0037 | 16 Words | Firmware Ver (ASCII display) |
| | 0x0047 | 16 Words | Hardware Ver (ASCII display) |
| | 0x0057 | 16 Words | Serial No. |
| | 0x0067 | 1 Word | Power supply 1 status:<br>• 0x0000: OFF<br>• 0x0001: ON |
| | 0x0068 | 1 Word | Power supply 2 status: |



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| Information Type | Address (HEX) | Data Type | Description |
|---|---|---|---|
| | | | • 0x0000: OFF<br>• 0x0001: ON |
| Port Information | 0x1000-0x101B | 1 Word | Port connection status:<br>• 0x0000: Link down<br>• 0x0001: Link up<br>• 0x0002: Disable<br>• 0xFFFF: No port |
| | 0x101D-0x1038 | 1 Word | Port operating mode:<br>• 0x0000: 10M-Half<br>• 0x0001: 10M-Full<br>• 0x0002: 100M-Half<br>• 0x0003: 100M-Full<br>• 0x0004: 1G-Half<br>• 0x0005: 1G-Full<br>• 0xFFFF: No port |
| | 0x1039-0x1054 | 1 Word | Port flow control status:<br>• 0x0000: OFF<br>• 0x0001: ON<br>• 0xFFFF: No port |
| | 0x1056-0x1071 | 1 Word | Port interface type:<br>• 0x0000: Copper port<br>• 0x0001: Fiber port<br>• 0x0002: Combo port<br>• 0xFFFF: No port |
| Frame Statistics | 0x2000-0x2037 | 2 Words | Quantity of sending packets of the port.<br>For example, sending packets quantity of port 1 is 0x44332211, namely: Word 1 is 0x4433, Word 2 is 0x2211 |
| | 0x2039-0x2070 | 2 Words | Quantity of receiving packets of the port.<br>For example, receiving packets quantity of port 1 is 0x44332211, namely: Word 1 is |



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| Information Type | Address (HEX) | Data Type | Description |
|---|---|---|---|
| | | | 0x4433, Word 2 is 0x2211. |
| | 0x2072-0x20A9 | 2 Words | Quantity of error packets sending of the port.<br>For example, sending error packets quantity of port 1 is 0x44332211, namely: Word 1 is 0x4433, Word 2 is 0x2211. |
| | 0x20AB-0x20E2 | 2 Words | Quantity of receiving error packets of the port.<br>For example, receiving error packets quantity of port 1 is 0x44332211, namely: Word 1 is 0x4433, Word 2 is 0x2211. |
| Ring Information | 0x3000 | 1 Word | Link redundancy algorithm category:<br>• 0x0000: None<br>• 0x0001: SW-Ring V1<br>• 0x0002: SW-Ring V2<br>• 0x0003: SW-Ring V3<br>• 0x0004: RSTP |
| | 0x3001 | 1 Word | Ring type of Ring group 1:<br>• 0x0000: Single Ring<br>• 0x0001: Coupling Ring<br>• 0x0002: Chain<br>• 0x0003: Dual_homing |
| | 0x3002 | 1 Word | Ring port 1 of Ring group 1 |
| | 0x3003 | 1 Word | Ring port 2 of Ring group 1 |
| | 0x3004 | 1 Word | Ring ID of Ring group 1 |
| | 0x3005 | 1 Word | HelloTime of Ring group 1 |
| | 0x3006 | 1 Word | Ring group 1 enable:<br>• 0x0000: Disable<br>• 0x0001: Enable |
| | 0x3007 | 1 Word | Ring type of Ring group 2:<br>• 0x0000: Single Ring |



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| Information Type | Address (HEX) | Data Type | Description |
|---|---|---|---|
| | | | • 0x0001: Coupling Ring<br>• 0x0002: Chain<br>• 0x0003: Dual_homing |
| | 0x3008 | 1 Word | Ring port 1 of Ring group 2 |
| | 0x3009 | 1 Word | Ring port 2 of Ring group 2 |
| | 0x300A | 1 Word | Ring ID of Ring group 2 |
| | 0x300B | 1 Word | HelloTime of Ring group 2 |
| | 0x300C | 1 Word | Ring group 2 enable:<br>• 0x0000: Disable<br>• 0x0001: Enable |
| PoE Information | 0x4000 – 0x401C | 1 Word | Port PoE status:<br>• 0x0000: Disconnect<br>• 0x0001: Connect<br>• 0xFFFF: No POE |
| | 0x401D - 0x4038 | 1 Word | Class of port PoE:<br>• 0x0000: Class 0<br>• 0x0001: Class 1<br>• 0x0002: Class 2<br>• 0x0003: Class 3<br>• 0x0004: Class 4<br>• 0x0005: Class Error<br>• 0xFFFF: No POE |
| | 0x4039 – 0x4071 | 1 Word | Current of port PoE (mA) |
| | 0x4072 – 0x40AA | 1 Word | Voltage of port PoE (V) |
| | 0x40AB – 0x40E3 | 1 Word | Power consumption of port PoE (W) |

### Example: MODBUS_TCP Configuration

Acquire the switch device name information via DebugTool analogue client, the switch information as follows:

- Switch default IP address: 192.168.1.254;
- Address of switch register that stores the device name information: 0x002;
- Number of switch register that stores the device name information: 16 words;



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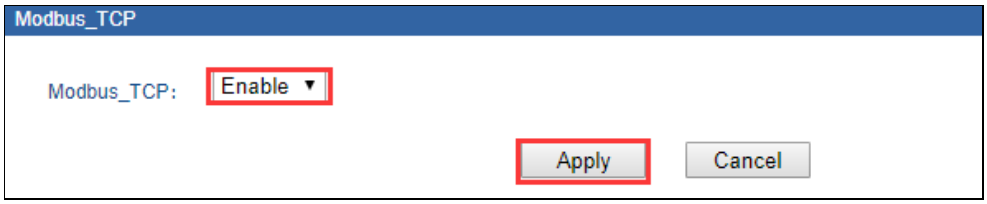
## Operation Steps

Configure the switch Modbus_TCP monitoring enable.

**Step 6** Log on to the Web configuration interface.

**Step 7** Select "Main Menu > Remote Monitoring > Modbus_TCP".

**Step 8** Select "Enable" on the drop-down list of "Modbus_TCP", as the picture below.




**Step 9** Click "Apply".

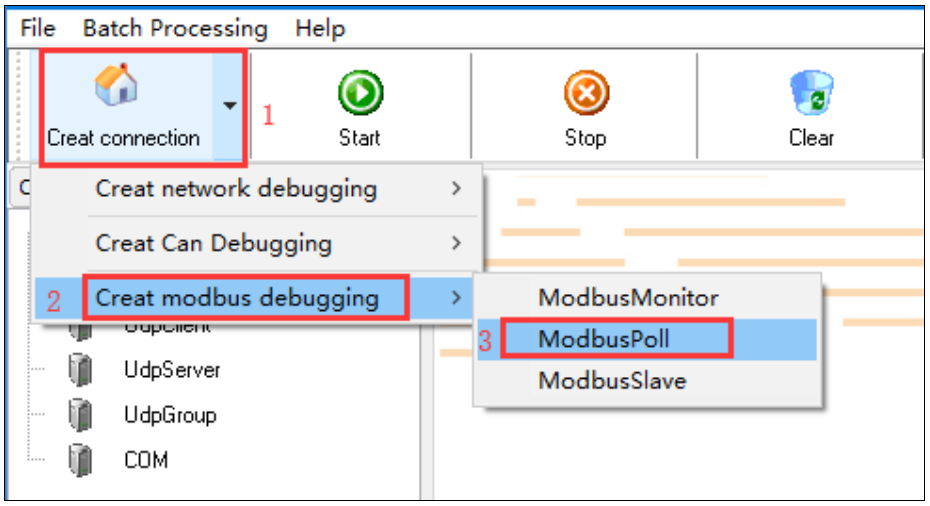
**Step 10** End.

Operate the debug tool software to acquire the device parameters.

**Step 11** Open "Debug Tool".

**Step 12** Click the drop-down list of "Creat connection".

**Step 13** Select "Creat Modbus debugging > ModbusPoll", as the picture below.




**Step 14** Configuration window of ModbusPoll parameters pops up, the configuration as the picture below:



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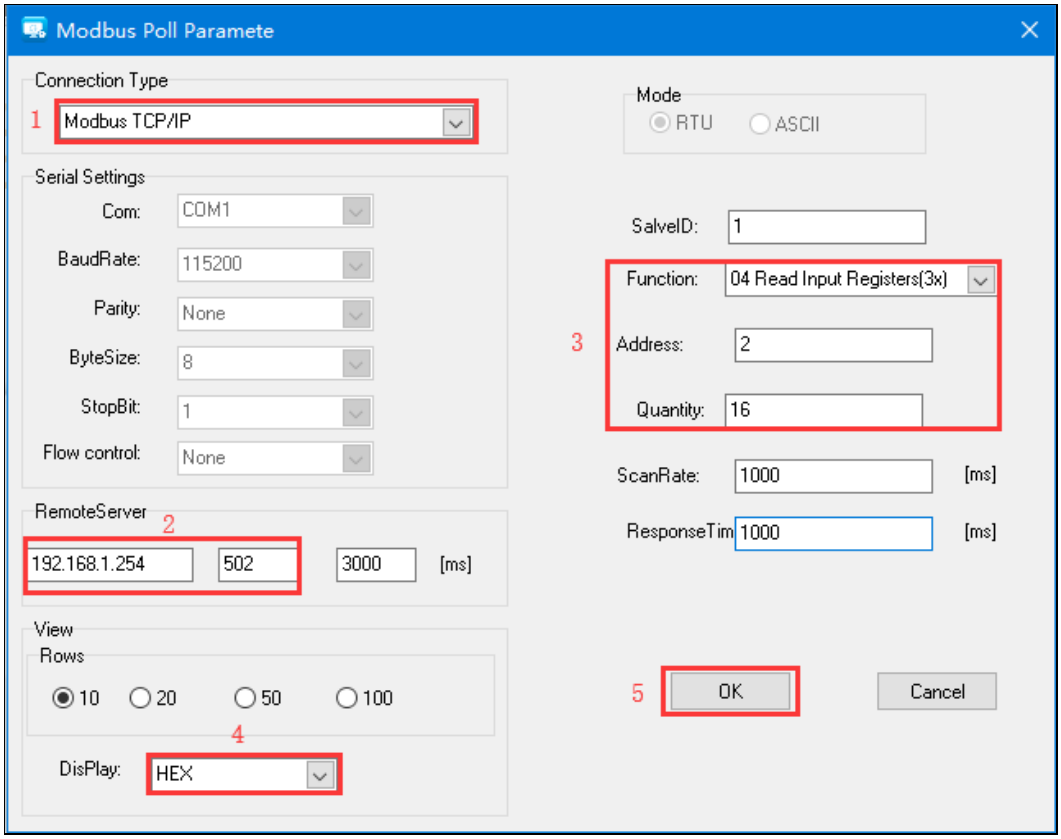


1. On the drop-down list of "Connection Type", select "Modbus TCP/IP";
2. Enter the switch IP address "192.168.1.254" and port number "502" on the column of "Remote Server";
3. Select "04 Read Input Registers (3x)" on the drop-down list of "Function";
4. Enter decimal device name register address "2" on the text box of "Address";

Note:

Here the start address is decimal format, so hexadecimal register address should be converted into decimal format.

5. Enter the register amount "16" on the text box of "Quantity";
6. Select "HEX" on the drop-down list of "Display";
7. Click "OK".

**Step 15** On the page of Debug Tool, select created ModbusPoll, and then click "Start";



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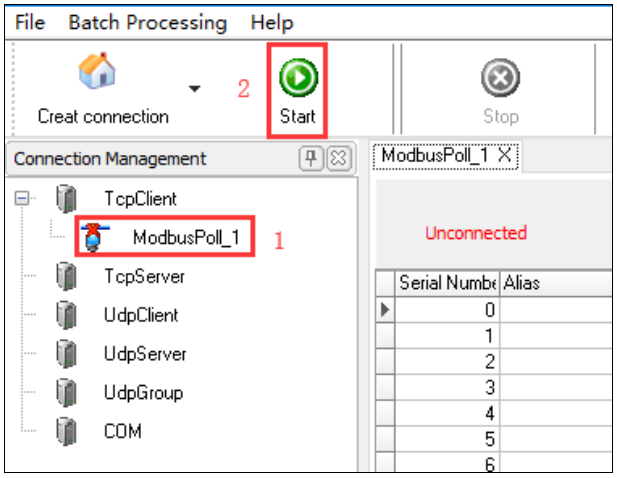
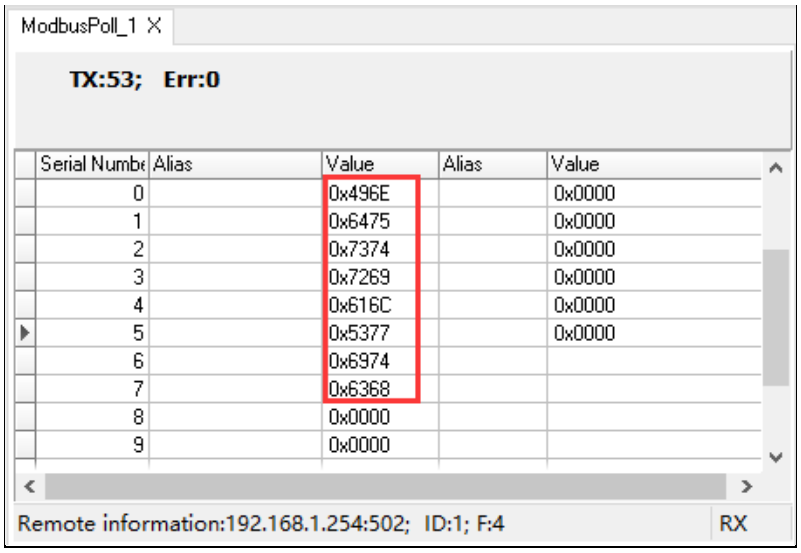



**Step 16** Check responsive data, and convert the hexadecimal value read by register into ASCII code, displayed as "Industrial Switch";




**Step 17** End.

Note

- Switch can establish 4 Modbus TCP monitoring connections at the same time.
- Switch Port Information, Frame Statistics and PoE Information. It supports the sequential read of port parameters of multiple registers. For example, address range of the register that stores port connection status information is 0x1000-0x101B, each register data is 1 word; when the start address of register is 0x1000, the register number is 1, it will read port 1 status; If the register quantity is 10, it will read the status from Port 1 to Port 10; If the port doesn't exist, then the read data will be 0xFFFF.



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# 9.3 E-mail Alarm

## Function Description

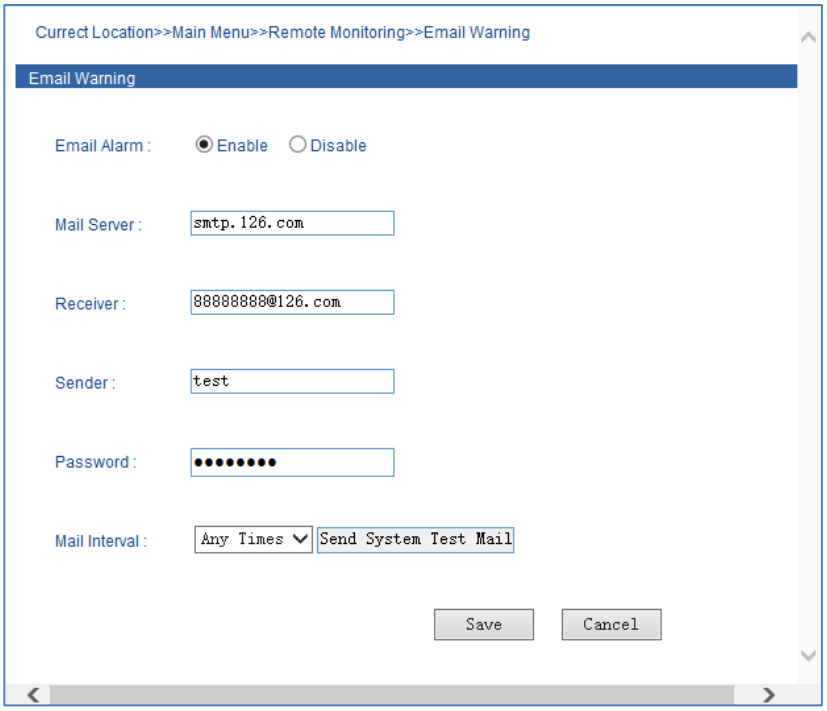
On the page of "E-mail Warning", user can enable remote alarm.

## Operation Path

Open in order: "Main Menu > Remote Monitoring > Email Warning".

## Interface Description

Interface screenshot of E-mail alarm configuration as follows:




Main elements configuration description of E-mail alarm configuration interface:

| Interface Element | Description |
|---|---|
| E-mail Alarm | Enable/disable E-mail alarm. |
| Mail Server | Server address of used E-mail should be filled according to the account of used E-mail address. The host IP address or used host name that provides E-mail delivery service for the device. |
| Receiver | E-mail address used by abnormal event receiver. |
| Sender | E-mail address of sender, account name used for logging in to |



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| | |
|---|---|
| | the E-mail server. |
| Password | E-mail password of sender, corresponding password used for logging in to the E-mail account. |
| Mail Interval | Interval time of sending E-mail. |

Notice

While using E-mail alarm, user must ensure that the switch is connected to network normally and the gateway of switch is same to the one of LAN.

# 9.4 Relay Warning

## Function Description

On the page of "Relay Warning", user can set power supply alarm, port alarm function; when the equipment is in abnormal state, it can promptly notify the administrator, and quickly repair the equipment status to avoid excessive losses.

## Operation Path

Open in order: "Main Menu > Remote Monitoring > Relay Warning".

## Interface Description

Relay warning interface as follows:



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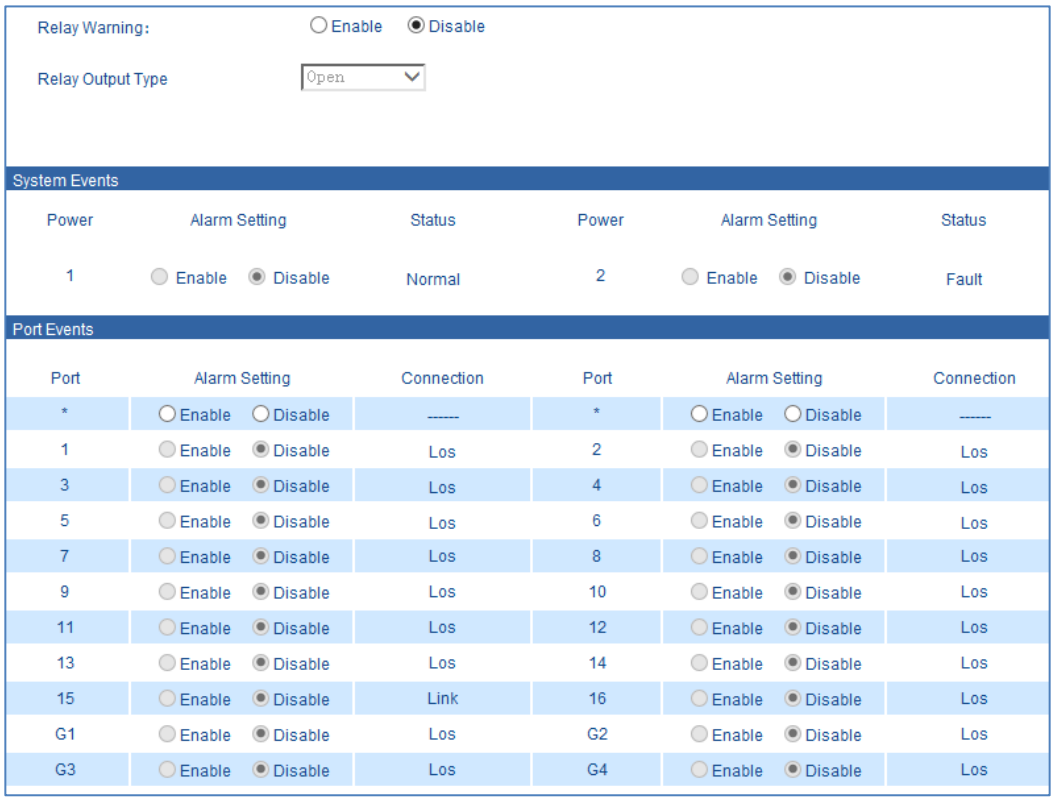


Main elements configuration description of relay warning interface:

| Interface Element | Description |
|---|---|
| System Events | Configure alarm settings. Options as follows:<br>• Enable;<br>• Disable. |
| Relay Output Type | Click the drop-down list of "Relay Output Type", options as follows:<br>• Normally open: when it's normal without alarm, relay is in closed status; when alarm occurs, relay is in open status;<br>• Normally closed: when it's normal without alarm, relay is in open status; when alarm occurs, relay is in closed status. |
| **System Events** | **System events column** |
| Power | Display the device power supply number. |
| Alarm Setting | Configure the power supply alarm function. Options as follows:<br>• Enable; |



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| Interface Element | Description |
|---|---|
| | • Disable.<br>Notes:<br>• DC provides 2 power supplies (AC without power supply alarm), when one power supply goes wrong, another power supply can provide electricity soon, dual power supply hot standby is supported.<br>• After enable power supply alarm, the device will output alarm signal to hint abnormal operation of power supply when power supply is abnormal status. |
| Status | Display current status of power supply:<br>• Fault;<br>• Normal. |
| **Port Events** | **Port events column** |
| Port | Display the device port number. |
| Alarm Setting | Configure the port alarm function. Options as follows:<br>• Enable;<br>• Disable.<br>Note<br>After enabling port alarm, when port is in abnormal status, such as connection or disconnection, the device will output a signal to hint the abnormal operation of device. |
| Connection | Display port connection status of the device:<br>• Unconnected;<br>• Connected. |

### Example: Alarm Configuration

For example: Enable alarm configuration, and enable power supply alarm for power 1, port alarm for port 1.

### Operation Steps

**Step 1** Log on to the Web configuration interface.

**Step 2** Click "Main Menu > Remote Monitoring > Relay Warning".

**Step 3** On the displayed page of "Relay Warning":

1. Select "enable" on the column of "Alarm Setting";
2. Select "Relay Output Type" as "open".

**Step 4** On the region of "System Events", select "Enable" the "Alarm Setting" of power 1.

**Step 5** On the region of "Port Events", select "Enable" the "Alarm Setting" of power 1.



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**Step 6** Click "Apply".

**Step 7** End.



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# 10 Port Statistics

## 10.1 Received Frames Statistics

### Function Description

On the page of “Rx Frame Statistics”, user can check frame statistics of data packets received by the port within a period of time.

### Operation Path

Open in order: “Main Menu > Port Statistics > Rx Frame”.

### Interface Description

Received frames statistics interface as follows:



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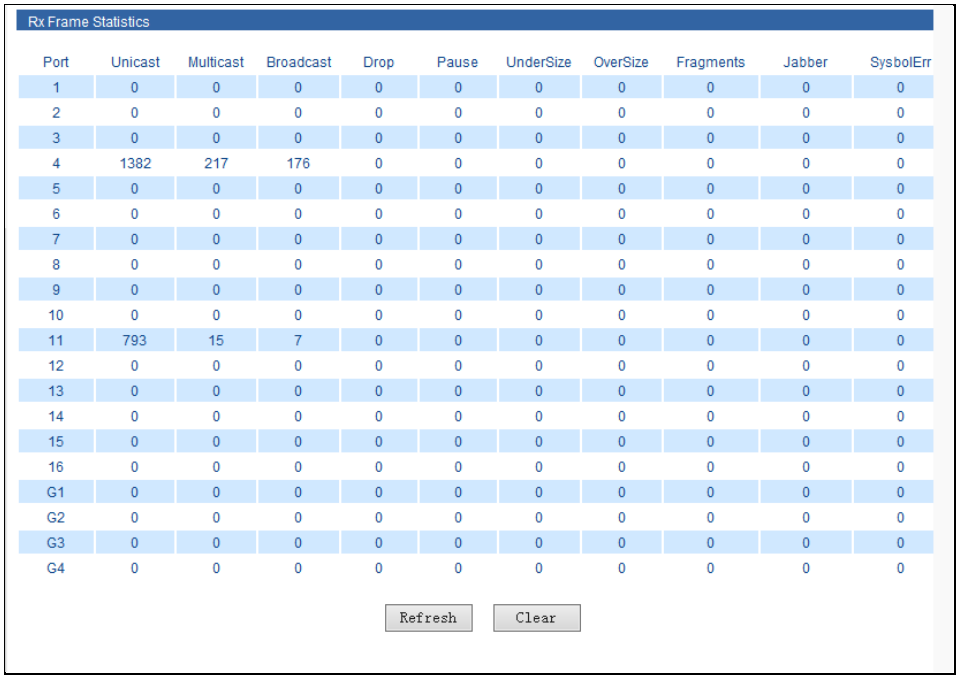


Main elements configuration description of received frames statistics interface:

| Interface Elements | Description |
|---|---|
| Unicast | Number of port received data packets whose address is unicast address. |
| Multicast | Number of port received data packets whose address is multicast address. |
| Broadcast | Number of port received data packets whose address is broadcast address. |
| Drop | Number of port received data packets which are normal but dropped due to security control. |
| Pause | Port received Ethernet control frames with the protocol of 0x8808, under the status of full duplex; the data packet is used for controlling the frequency of port data sending. |
| UnderSize | Number of port received data packets whose length is less than 64 bytes, including the length of FCS. |
| OverSize | Number of port received data packets whose length is more than 1518 or 1522 (enable VLAN) bytes, including the length of FCS. |
| Fragments | Number of port received data packets whose length is less |



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| Interface Elements | Description |
|---|---|
| | than 64 bytes, including the length of FCS. |
| Jabber | Number of port received data packets whose length is more than 1522 bytes, including the incorrect or deficient FCS. |
| SysbolErr | Number of port received data packets whose length is between 64 and 1518 or 1522 (enable VLAN) bytes, including the incorrect, deficient or invalid FCS. |
| Clear | Clear the counting of statistics frames. |

# 10.2 Transmitted Frame Statistics

## Function Description

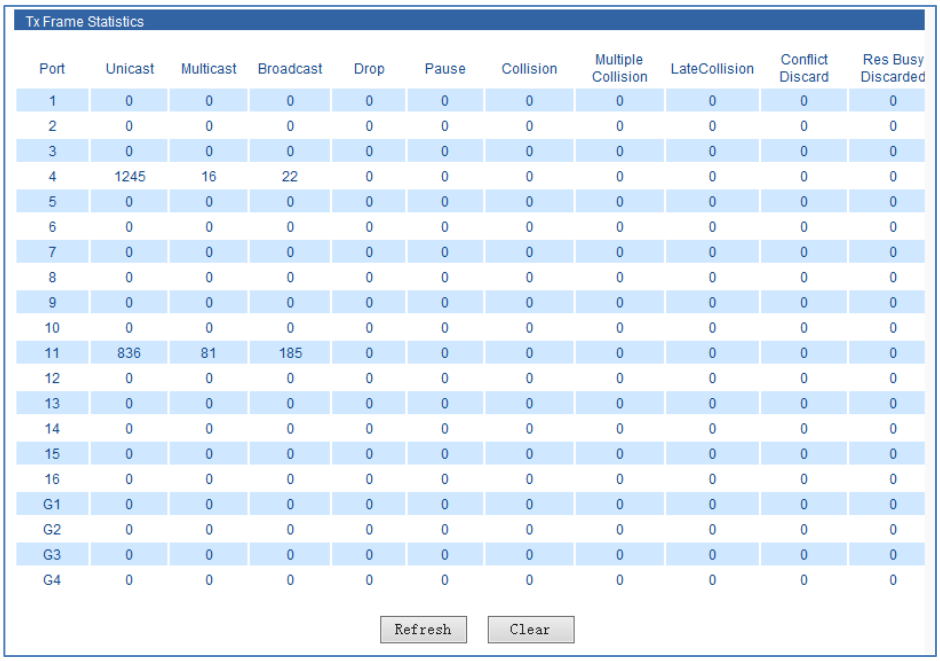
On the page of “Tx Frame Statistics”, user can check frame statistics of data packets transmitted by the port within a period of time.

## Operation Path

Open in order: “Main Menu > Port Statistics > Tx Frame”.

## Interface Description

Transmitted frames statistics interface as follows:



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Main elements configuration description of transmitted frames statistics interface:

| Interface Element | Description |
|---|---|
| Unicast | Number of port transmitted data packets whose address is unicast address. |
| Multicast | Number of port transmitted data packets whose address is multicast address. |
| Broadcast | Number of port transmitted data packets whose address is broadcast address. |
| Drop | Number of port transmitted data packets which are normal but dropped due to insufficient resources or no internal condition for analysis (excluding data packets that are dropped due to collision). |
| Pause | Port received Ethernet control frames with the protocol of 0x8808, under full duplex status; the data packet is used for controlling the frequency of port data transmission. |
| Collision | Collision frequency during port data transmission. |
| Multiple Collision | Number of successfully transmitted data packets with the collision frequency more than 1 during port data transmission. |
| LateCollision | Number of data packets with the detected collision during transmitting the data packets less than 64 bytes. |
| Res Busy Discarded | Number of data packets (Abundant data packets with low priority after enabling QoS) discarded due to deficient resources in the pop queue. |
| Clear | Clear the counting of statistics frames. |

## 10.3 Total Flow Statistic

### Function Description

On the page of “Total Flow Statistic”, user can query the frame number of the total port data packet in a certain time.



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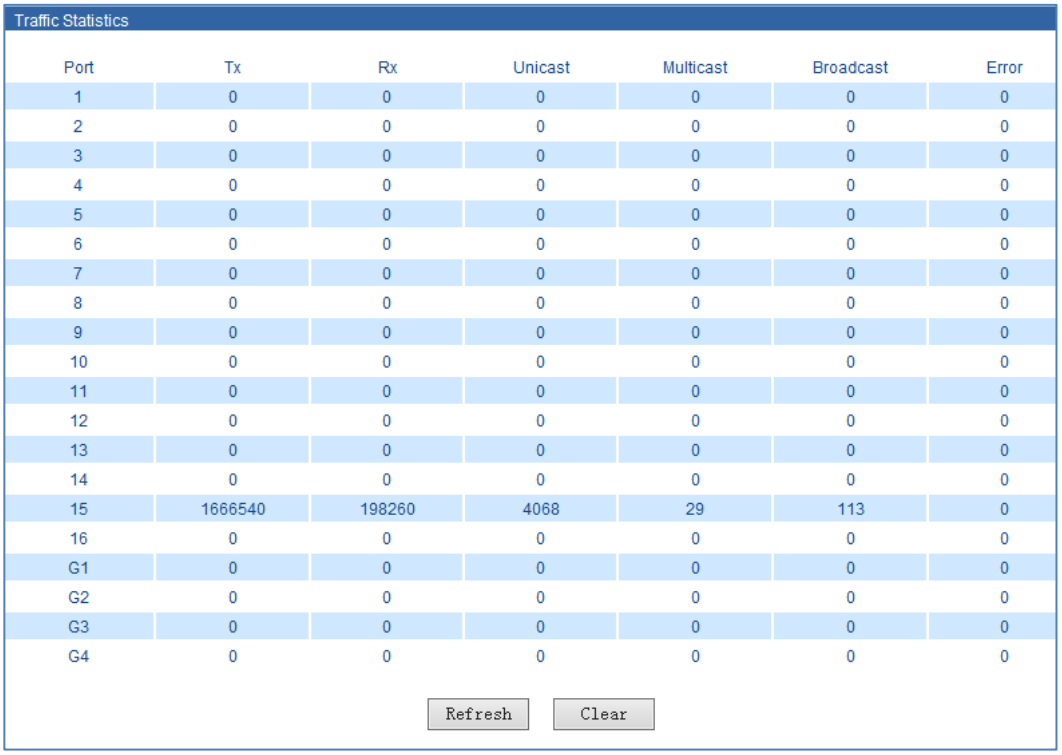
## Operation Path

Open in order: “Main Menu > Port Statistics > Traffic Statistics”.

## Interface Description

Total flow statistic interface as below:




The main element configuration description of total flow statistic interface:

| Interface Element | Description |
|---|---|
| Tx | The total bytes of all data packets sent by the port. |
| Rx | The total bytes of all data packets received by the port. |
| Unicast | The number of data packets with unicast address as its port sending and receiving address. |
| Multicast | The number of data packets with multicast address as its port sending and receiving address. |
| Broadcast | The number of data packets with broadcast address as its port sending and receiving address. |
| Error | The number of data packets with error caused by various reasons in port sending and receiving address. |
| Reset | Reset the number of statistic frame. |



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# 10.4 MAC Address Table

## Function Description

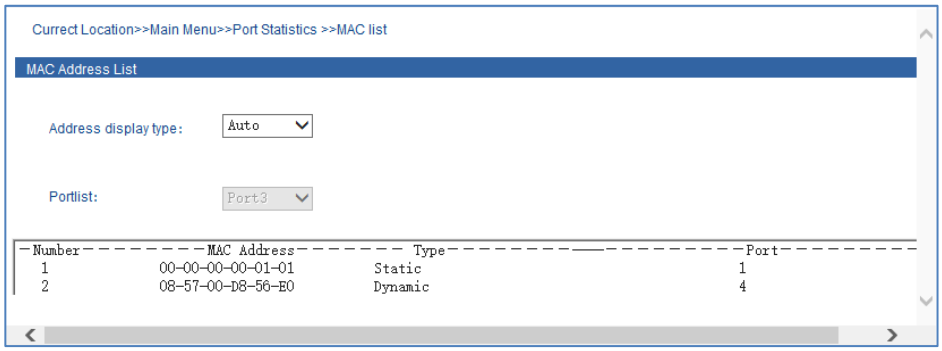
On the page of “MAC Address List”, user can check the port’s MAC address table information within a period of time.

## Operation Path

Open in order: “Main Menu > Port Statistics > MAC list”.

## Interface Description

Interface screenshot of MAC address table as follows:




Main elements configuration description of MAC address table interface:

| Interface Element | Description |
|---|---|
| Address display type | MAC address type:<br>• Port: display MAC address information of the designated port.<br>• Auto: automatically display MAC address information of all ports. |
| Port list | When the address display type is port, user can select designated port number via drop-down list to check MAC address information. |
| Number | Total number of bytes of all data packets received by the port. |



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Note

- Permanent static address is configured in the port list of static MAC address, corresponding table items need to be modified when the port changes.
- Multicast address table is displayed in the items of IGMP snooping table, this address table items are all unicast addresses.
- The ageing time of MAC address is 300 seconds, the device system will eliminate all relative port list when the port is disconnected and MAC address surpasses the ageing time.



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# 11 Network Diagnosis

## 11.1 Port Mirror

Port mirror refers to duplicate the packets from the appointed port (source port or mirror port) to another appointed port (destination port or collection port). In the process of network operation and maintenance, for the purpose of business monitoring and fault location, the network administrator analyzes the packets duplicated from the observed port via the network monitoring device and judges whether the business operated in the Internet is normal.

### Function Description

On the “Port Mirror” page, user can enable or configure the correspondence between ingress data mirror and egress data mirror.

### Operation Path

Open in order: “Main Menu > Diagnosis > Mirror”.

### Interface Description

Port mirror interface as follows:



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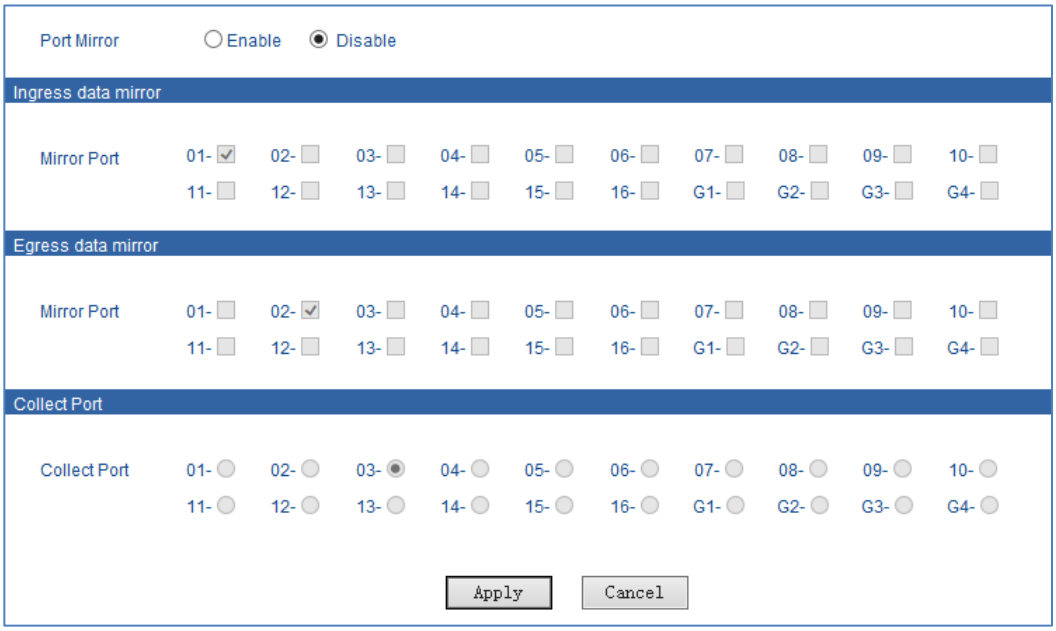


The main element configuration description of port mirror interface:

| Interface Element | Description |
|---|---|
| Port Mirror | Setting port mirror function, options are:<br>• Enable;<br>• Disable. |
| Ingress data mirror | Configuration column of ingress data mirror. |
| Mirror Port | Select the ingress data port that needs mirroring. |
| Egress data mirror | Configuration column of egress data mirror. |
| | |
| Mirror port | Choose the egress data port that needs mirroring. |
| Collect port | Configuration column of collect port. |
| Collect port | Configure the collect port after ingress/egress data mirror. |

## For instance: port mirror configuration

For example: use port 4 to collect ingress data and egress data of port 1, port 2 and port 3.

## Operation Steps

**Step 1** Log in to Web configuration interface.

**Step 2** Choose “Main Menu > Diagnosis > Mirror”.

**Step 3** On the “Mirror” page, choose “enable” in the “mirror”.



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**Step 4** In the option of “mirror port”, choose port “1”, “2” and “3”.

**Step 5** In the option of “collect port”, choose port “4”.

**Step 6** In the option of “watch direction”, choose “all”.

**Step 7** Click “apply”.

**Step 8** End.

## 11.2 Network Diagnosis

### Function Description

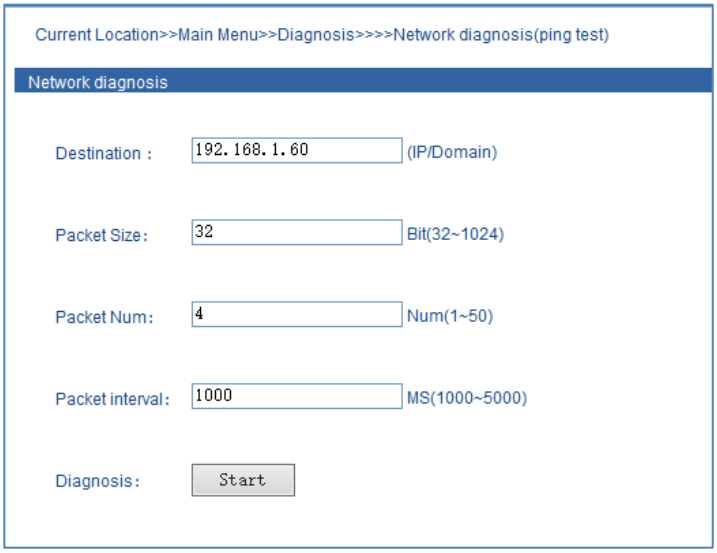
On the page of "Network diagnosis", user can use Ping test to Ping the IP or domain name of the opposite terminal, checking whether the network is connected.

### Operation Path

Open in order: "Main Menu > Diagnosis > Network diagnosis (ping test)"

### Interface Description

Network diagnosis interface screenshot as follows:




Main elements configuration description of network diagnosis interface:

| Interface Element | Description |
|---|---|
| Destination | IP address or domain name of devices whose connectivity needs to be tested. |
| Packet Size | The packet size of Ping command is 32~1024 bytes. |



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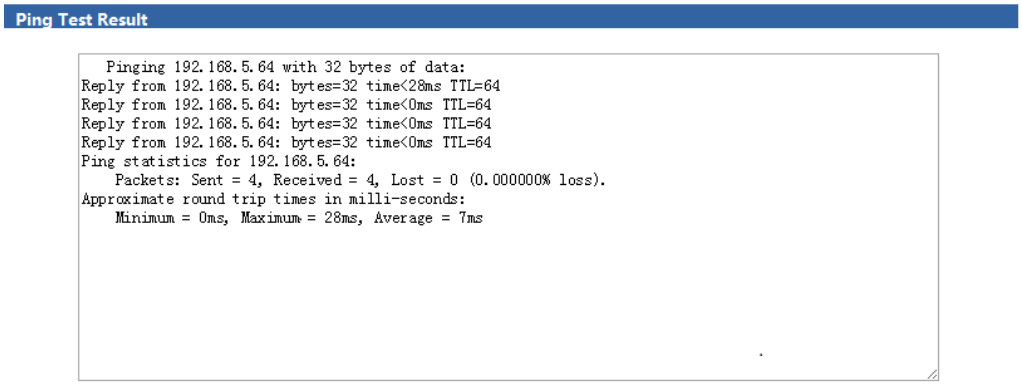
| | |
|---|---|
| Packet Num | Sending packets quantity of Ping command. |
| Packet interval | Packets transmission interval of Ping command. |
| Diagnosis | After filling in the destination, packet size, packet number and packet interval, user can click "Start" to initiate test. |

Screenshot of Ping test result as follows:




Main elements configuration description of network diagnosis interface:

| Interface Element | Description |
|---|---|
| Destination | IP address or domain name of devices whose connectivity needs to be tested. |
| Packet Size | The packet size of Ping command is 32~1024 bytes. |
| Packet Num | Sending packets quantity of Ping command. |
| Packet interval | Packets transmission interval of Ping command. |
| Diagnosis | After filling in the destination, packet size, packet number and packet interval, user can click "Start" to initiate test.<br>Notes:<br>Test results show that no packet drop or time delay represents good network environment between these two devices when the switch sends data to the opposite terminal device. |



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# 11.3 SFP DDM Monitor

## Function Description

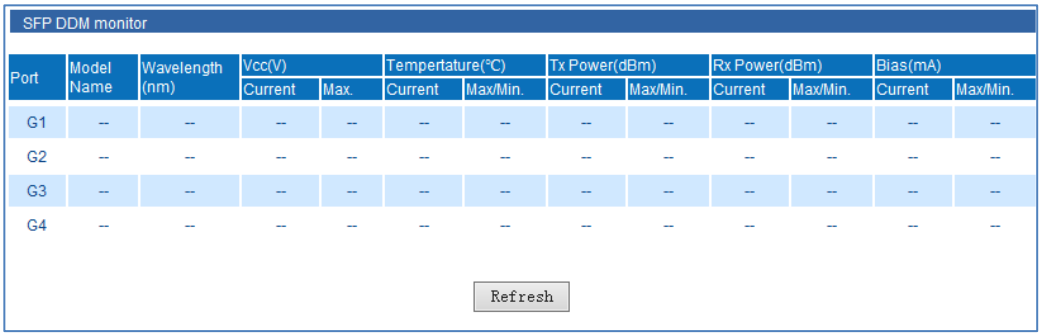
On the "SFP DDM" page, the DDM (Digital Diagnostic Monitor) function is supported. User can monitor SFP parameters in real time, which has greatly facilitated the troubleshooting process of fiber link and lowered the cost of on-site debugging.

## Operation Path

Open in order: " Main Menu > Port Configuration > SFP DDM Monitor".

## Interface Description

SFP DDM interface as follows:




The main element configuration description of SFP DDM interface:

| Interface Element | Description |
|---|---|
| Port | The corresponding name of this device's Ethernet port |
| Model Name | This device's SFP type |
| Wavelength | Transmission wavelength of SFP module of the device port, unit is: nm. |
| Vcc（V） | The voltage that this device offers SFP. Its unit is V. overvoltage could lead to the breakdown of CMOS device; under voltage would disable the normal operation of lasers. |
| Temperature | This device's SFP temperature. Its unit is ℃. The operating temperature of this SFP module should be within the temperature range of normal operation. |
| Tx Power | Optical output power, referring to the output power of optical source in the sending end of optical module. The unit is dBm |
| RX Power | Optical input power, referring to the lowest optical power of receiving in certain rate and bit error rate. The unit is dBm. |



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| Interface Element | Description |
|---|---|
| Bias | The bias current of laser. Its unit is mA. |



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# 12 System Management

## 12.1 Log Information

### Function Description

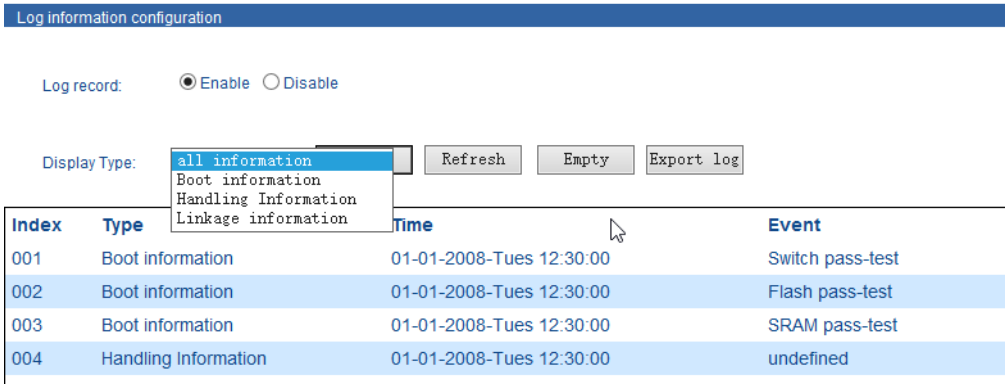
On the page of “Log information”, user can enable log record to check the device status information.

### Operation Path

Open in order: “Main Menu > Basic Settings > Log information”.

### Interface Description

Log information interface as follows:




Main elements configuration description of log information interface:

| Interface Elements | Description |
|---|---|
| Log record | Enable or disable log record. |
| Display Type | User can check the device booting, connection and |



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| Interface Elements | Description |
|---|---|
| | operation information. |

# 12.2 SNTP Configuration

## Function Description

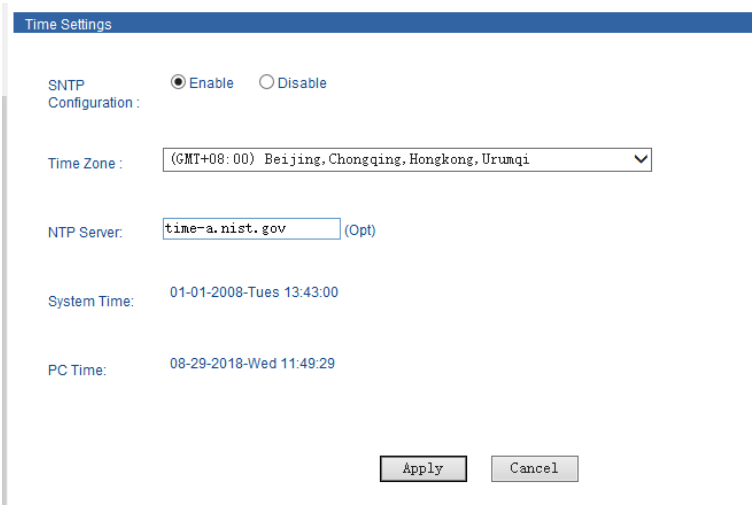
On the page of “Time Configuration”, user can check current PC time or system operation time, and select relative time zone.

## Operation Path

Open in order: “Main Menu > Basic Settings > SNTP”.

## Interface Description

Time configuration interface as follows:




Main elements configuration description of time configuration interface:

| Interface Elements | Description |
|---|---|
| SNTP Configuration | Enable or disable time configuration function. |
| Time Zone | Selection of standard time zone for countries in the world. |
| NTP Server | Host name or IP address that provides NTP timing and time service for user. |
| System Time | Time of the device itself, after powering on, press |



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| Interface Elements | Description |
|---|---|
| | "Tuesday, January 1, 2008" to manually or automatically use NTP updating. |
| PC Time | PC time of the visitor itself, the time display isn't relative to the switch itself. |

Note

- NTP server can be empty, the device adopts self-contained server updating and must ensure the correct configuration of DNS and gateway;
- NTP server can't be empty, it must be valid host name or legal IP address;
- Only the "administrator" has the privilege to manually configure the device time.

# 12.3 Device Address

## Function Description

On the page of "Network Settings", user can conduct following operations:

- Configure default IP address of the device;
- Configure netmask;
- Configure gateway address;
- Configure DNS server;
- Reboot the device.

## Operation Path

Open in order: "Main Menu > Basic Settings > Network Settings".

## Interface Description

Device address interface as follows:



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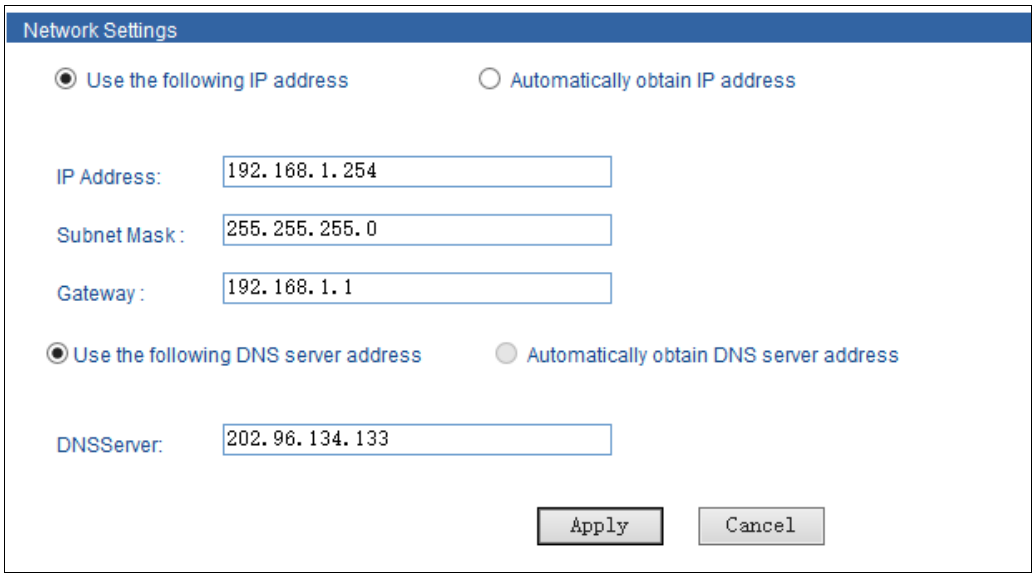


Main elements configuration description of device address interface:

| Interface Elements | Description |
|---|---|
| **Network Settings** | **Configuration column of the device address** |
| Use the following IP address | It represents that enabling manually configured IP address, netmask and gateway address. |
| Automatically obtain DNS server address | It represents that enabling the system automatical acquisition for the device IP address. |
| IP Address | Configure IP address of the device.<br>Notes:<br>Default configured IP address is 192.168.1.254. |
| Subnet Mask | Configure subnet mask of the device.<br>Notes:<br>Default configured subnet mask is 255.255.255.0. |
| Gateway | Configure gateway address of the device.<br>Notes:<br>Default configured gateway address is 192.168.1.1. |
| Use the following DNS server address | Configure the acquisition form of DNS server address as manual configuration.<br>Notes:<br>Default configured DNS server address is 202.96.134.133. |
| Automatically obtain DNS server address | Configure the acquisition form of DNS server address as automatic acquisition.<br>Notes:<br>When IP address is manual configuration, this option becomes gray and is not optional. |



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| Interface Elements | Description |
|---|---|
| DNS Server | Configure DNS server address. |
| Apply | Save the device address information.<br>Notes:<br>Some devices may automatically reboot after configuration, and the configuration will take effect after rebooting. |
| Cancel | Cancel the modification of device address information. |

### For Example: Manual Configuration

For example: Configure the device address information, IP address is 192.168.5.88, gateway address is 192.168.5.1.

### Operation Steps

**Step 1** Login to the Web configuration interface.

**Step 2** Select “Main Menu > Basic Settings > Network & Reboot”.

**Step 3** On the “Network Settings” region of displayed page of “Device Management”, select “Use the following IP address”.

a) Enter “192.168.5.88” in the textbox of “IP Address”.

b) Enter “192.168.5.1” in the textbox of “Gateway”.

**Step 4** Click “Apply”, system will automatically save the configuration.

**Step 5** End.

### For Example: Automatic Acquisition of IP

For example: configure the device IP address as automatic acquisition.

### Operation Steps

**Step 1** Login to the Web configuration interface.

**Step 2** Select “Main Menu > Basic Settings > Network & Reboot”.

**Step 3** On the “Network Settings” region of displayed page of “Device Management”, select “Automatically obtain IP address”.

**Step 4** Click “Apply”, system will automatically save the configuration.

**Step 5** End.

## 12.4 System Information

### Function Description

On the page of “System Identification”, user can configure the following options:

- Device model;
- Device name;



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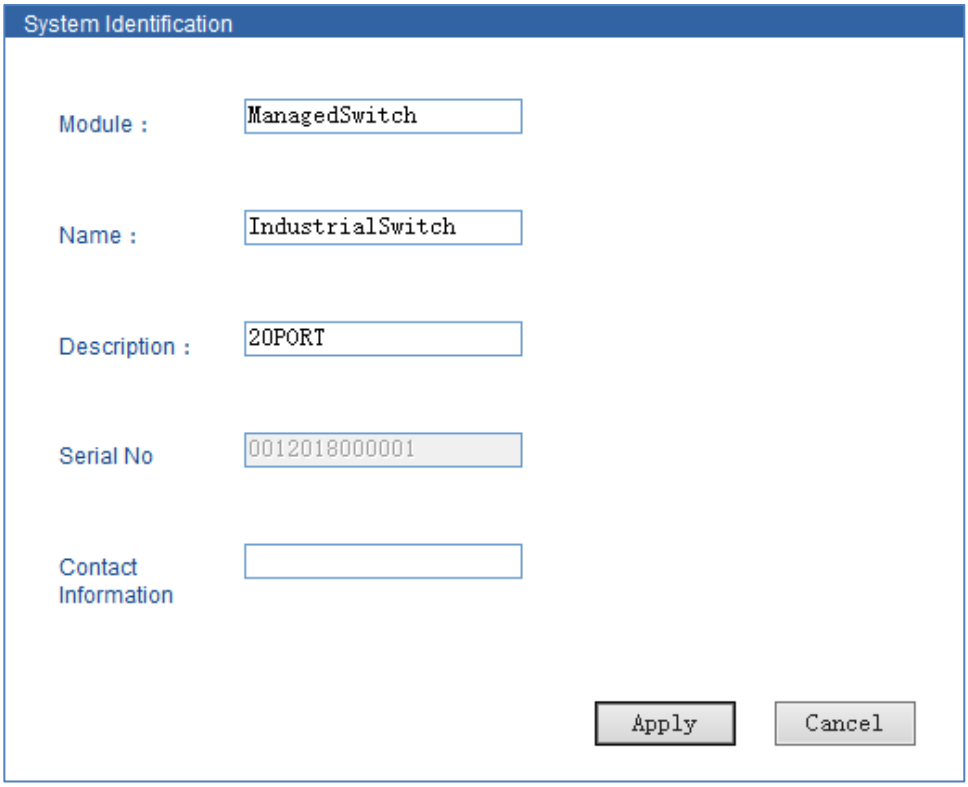
- Device description;
- Device number;
- Contact information.

### Operation Path

Open in order: “Main Menu > Basic Settings > System Identification”.

### Interface Description

System information interface as follows:




Main elements configuration description of system information interface:

| Interface Elements | Description |
|---|---|
| Module | Configure the device model. |
| Name | Configure the device name to identify each device in the network. |
| Description | Configure the device summary description. |
| Serial No. | Configure the device number.<br>Notes:<br>• The number can be used for describing the installation position of the device; |



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| | |
|---|---|
| | • The number length shouldn't be more than 30 bytes. |
| Contact Information | Configure the contact Information of the device maintenance personnel.<br>Notes:<br>• Support the entering of Chinese characters, English letters, number, characters like "-", "_", "@", ",", ".";<br>• The entering of blank space is not supported. |

### For Example: Device Information Configuration

For example: Configure the device according to following information:

- "Module" is "ManagedSwitch1";
- "Name" is "IndustrialSwitch";
- "Description" is "8ports".

### Operation Steps

**Step 1** Login to the Web configuration interface.

**Step 2** Select "Main Menu > Basic Settings > System Identification".

**Step 3** On the "Settings" region of displayed page of "System Identification":

a) Enter "Module" as "ManagedSwitch1";

b) Enter "Name" as "IndustrialSwitch";

c) Enter "Description" as "8ports".

**Step 4** Click "Apply" to save the configuration.

**Step 5** End.

## 12.5 File Management

### Function Description

On the page of "File Management", user can conduct following operations:

- Restore factory defaults;
- Upload and download configuration files;
- System upgrading.

### Operation Path

Open in order: "Main Menu > System Management > File Management".

### Interface Description

File management interface as follows:



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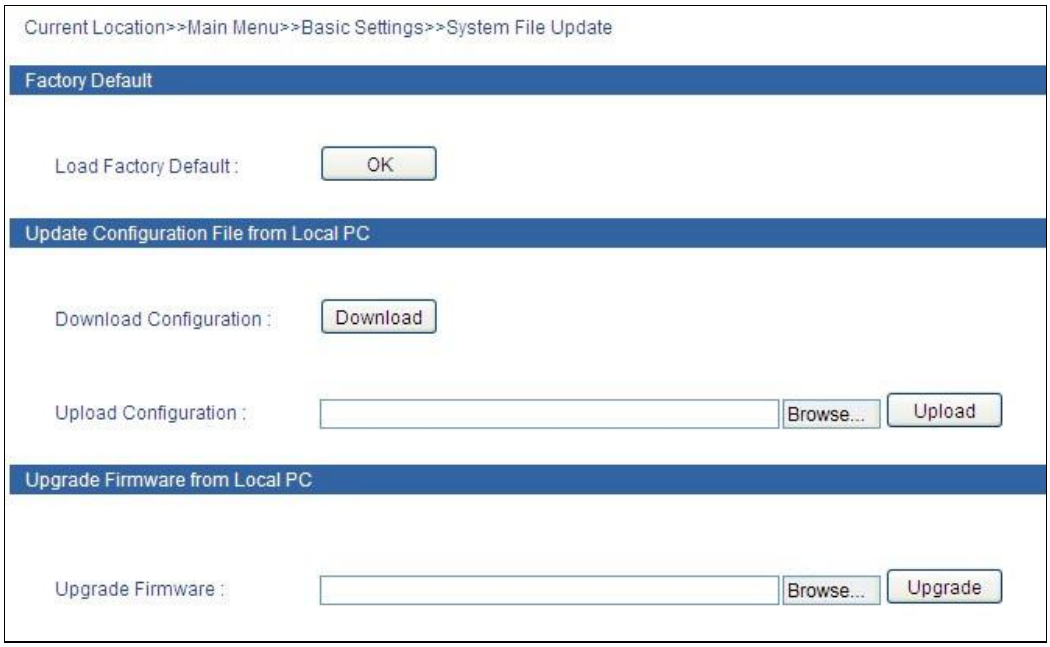


Main elements configuration description of file management interface:

| Interface Element | Description |
|---|---|
| **Factory Default** | **Configuration column of restore factory defaults** |
| Load Factory Default | Restore factory defaults of the switch.<br>Notes:<br>Restore factory defaults will cause all devices status to be in the factory status, default IP address is "192.168.1.254". |
| **Update Configuration File from Local PC** | **Configuration column of configuration files** |
| Download Configuration | Download the configuration information files of current switch.<br>Tips:<br>Downloaded configuration files can be uploaded to other homogeneous devices, achieving repeated usage after one-time configuration. |
| Upload Configuration | Configure the switch via uploading configuration files information. |
| **Upgrade Firmware from Local PC** | **Configuration column of system upgrade** |
| Upgrade Firmware | Upgrade operating system of the switch. |

Warning



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In the process of uploading configuration files or upgrading software, please don't click or configure other WEB page of the switch, or reboot the switch; otherwise, it will lead to failure of configuration files uploading or software upgrading, or even cause system breakdown of the switch.

### Example: Download Configuration Files

For example: Download configuration files.

### Operation Steps

**Step 1** Log on to the Web configuration interface.

**Step 2** Select "Main Menu > System Management > File Management".

**Step 3** On the region of "Update Configuration File from Local PC" of displayed page of "File Management", click "Download".

**Step 4** Click "Save (S)" on the pop-up dialog box of "File Download".

**Step 5** Select save path on the pop-up dialog box of "Save as".

**Step 6** Click "Apply".

**Step 7** End.

### Example: Upload Configuration

For example: Upload configuration files to the switch for updating the switch configuration.

### Operation Steps

Note

Please prepare the configuration files and then conduct uploading operation.

**Step 1** Log on to the Web configuration interface.

**Step 2** Select "Main Menu > System Management > File Management".

**Step 3** On the region of "Update Configuration File from Local PC" of displayed page of "File Management", click "Browse" after the label of "Upload Configuration".

**Step 4** Select prepared cfg configuration files on the pop-up "select files to load".

**Step 5** Click "Open".

**Step 6** Click "Upload".

**Step 7** Alarm information is displayed in the pop-up dialog box of "messages from the webpage", click "OK".

**Step 8** The device is rebooted automatically and its configuration is updated.

**Step 9** End.



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# 12.6 System Logout

## Function Description

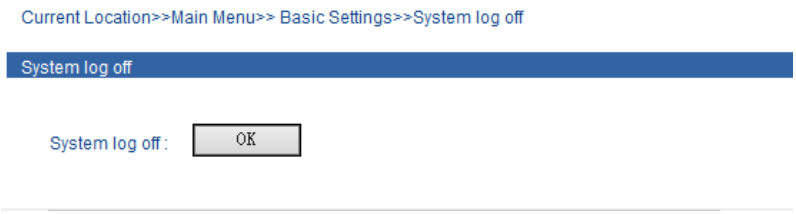
On the page of “System log off”, user can log off the login information of current user.

## Operation Path

Open in order: “Main Menu > Basic Settings > System log off”.

## Interface Description

System logout interface as follows:




Main elements configuration description of system logout interface:

| Interface Elements | Description |
|---|---|
| System log off | Log off the login information of current user. |

## For example: Log off and change administrator to login

For example: Log off current user, and then login again via entering “admin8” in the column of administrator and “admin8” in the column of password.

## Operation Steps

**Step 1** Login to the Web configuration interface.

**Step 2** Select “Main Menu > Basic Settings > System log off”.

**Step 3** Click “OK” on the displayed page of “System log off”.

**Step 4** Conduct following operations on the pop-up login dialog box:

a) Enter “admin8” on the option box of “User name”.

b) Enter “admin8” on the option box of “Password”.

**Step 5** Click “OK”.

**Step 6** Alarm information is displayed on the pop-up dialog box of “messages from the webpage”, click “OK”.

**Step 7** Login successfully to the WEB interface.

**Step 8** End.



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# The Second Part: Frequently Asked Questions

# 13 FAQ

## 13.1 Sign in Problems

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

   Before access the WEB, please eliminate IE cache buffer and cookies. Otherwise, the webpage will display abnormally.

2. **How about forget the login password?**

   For forgetting the login password, the password can be initialized by restoring factory setting, specific method is adopt BlueEyes_Ⅱ software to search and use restore factory setting function to initialize the password. Both of 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.



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## 13.2 Configuration Problem

1. **How to configure the device restore default setting via DIP switch?**
   Turn the DIP switch 2 to ON position, and restore default setting after power on again.

2. **Why the bandwidth can't be increased after configure Trunking (port aggregation) function?**
   Check whether the port attributes set to Trunking are consistent, such as rate, duplex mode, VLAN and other attributes.

3. **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.

4. **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:
   - Connected computer and switch ports keep invariant, change other network cable;
   - Connected network cable and switch port keep invariant, change other computers;
   - Connected network cable and computer keep invariant, change other switch port;
   - If the switch port faults are confirmed, please contact supplier for maintenance.

5. **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 in order from high to low, connect automatically in supported highest speed.



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## 13.3 Alarm Problem

1. **When the device alarms, except BlueEyes_II software nether alarm information display area will display alarm information, is there any other way to notify technical staffs?**

   When the device alarms, monitoring host computer buzzer will continue to emit alarm sounds.

## 13.4 Indicator Problem

1. **Power indicator isn't bright, what's the reason?**

   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. **Link/Act indicator isn't bright, what's the reason?**

   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 Combo 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



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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. **The switch halts after communicate for a period time, and returns to normal after reboot, what's the reason?**

   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.



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# 14 Maintenance and Service

Since the date of product delivery, our company provides five-year product warranty. According to our company's product specification, during the warranty period, if the product exists any failure or functional operation fails, our company will be free to repair or replace the product. However, the commitments above do not cover damage caused by improper usage, accident, natural disaster, incorrect operation or improper installation.

In order to ensure that consumers benefit from our company's managed switch products, consumers can get help and solutions in the following ways:

- Internet service;
- Call technical support office;
- Product repair or replacement;

## 14.1 Internet Service

More useful information and tips are available via our company website. Website: http://www.3onedata.com

## 14.2 Service Hotline

Users using our company products can call technical support office. Our company has professional technical engineers to answer the questions and help solve the products or usage problems ASAP. Free service hotline: **+86-400-880-4496**



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## 14.3 Product Repair or Replacement

As for the product repair, replacement or return, customers should firstly confirm with the company technical staff, and then contact the company salesmen and solve the problem. According to the company's handling procedure, customers should negotiate with our company's technical staff and salesmen to complete the product maintenance, replacement or return.



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Make network communication more reliable

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