GTL-2660

26-Port L2 Managed Gigabit Ethernet Fiber Switch, 2 Ports SFP Plus 10-Gigabit Ethernet, 4 Ports SFP/RJ45 Combo

User Manual

V1.0

Digital Data Communications Asia Co., Ltd.
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Table of Contents

Introduction

Tip: In order to achieve the best results, it is proposed to upgrade your Windows Internet Explorer browser to Version 6.0 or above.

0.1 Manual Description

GTL-2660 10 Gigabit fiber switch of LevelOne is described in this manual, with the information of its installation, configuration (WEB-based interface) provided. Please read this manual carefully before use.

Product Profile:

Chapter I Product Overview: This chapter describes the key characteristics, physical specifications, appearance, etc., of a switch.

Chapter II Hardware Installation: This chapter introduces the considerations for installation of switches, and installation steps, etc.

Chapter III Management of WEB: This chapter describes how to manage the switch via the WEB interface.

0.2 Fundamental Conventions

1. Conventions on the Handbook Symbols

✧ Meaning of basic parameter, describing the basic meaning of the parameters.

➢ Meaning of buttons, describing the acts of operation.

Mean tips, pointing out the priorities, considerations.

2. Meaning of commonly used operation buttons

Below is a brief description of the commonly used buttons in the switch WEB interface, which will not be provided elsewhere in the manual.

Button	Function
Save	Save the currently made configurations

Refilling	Restore to the configuration parameters before modification
Add a new entry	Add an appropriate entry
Delete	Delete the appropriate configuration entries
Refresh	Refresh the related information on the current page
☑Automatic refreshing	The current page will automatically refreshed every 3 seconds
Clear	Clear the page statistics
|<<	Go to the first page of the list
<<	Go to the previous page of the list
>>	Go to the next page of the list
>>|	Go to the last page of the list

Table 0-1 Introduction to the Commonly Used Buttons

0.3 Factory configuration

1. The switch's management IP address is configured as 192.168.1.1 before delivery.
2. The switch's login name is admin, and its password is admin (both are case-sensitive) in factory configuration.

0.4 Contact Us

If you have any questions during installation or use, please contact us in the following manners.

- Customer service: 0800-011-110
- Levelone discussions: http://www.level1.com
- E-mail support: support@level1.com

Chapter 1. Product Overview

1.1 Product Profile

The GTL-2660 is a 10 Gigabit fiber switch providing 24 Gigabit SFP ports, four Combo ports (RJ-45/SFP), as well as two 10 Gigabit SFP+ ports. This high-performance intelligent managed gigabit switch provides high capacity data transfer for high volume deployments such as data centers, government facilities and internet cafes. An expansion slot supports two 10 Gigabit SFP+ ports, with each RJ45 interface supporting adaptive positive and negative lines as well as auto MDI/MDI-X. GTL-2660 offers eight 10/100/1000M auto-negotiation ports and 16 SFP combo ports.

1.2 Key characteristics

- Supports management of MAC address tables
- Supports MAC/Port binding
- Supports the port-based VLAN and isolation VLAN
- Supports multiple spanning-tree protocols
- Supports static port aggregation and LACP
- Support QoS (Port priority)
- Provides the statistics of port traffics
- Supports unidirectional/bi-directional data monitoring
- Supports SNMP (including v1, v2c and v3 versions)
- Provides system log information
- Supports CPU real-time monitoring
- Supports Ping test
- Support changing the administration password
- Supports device access restrictions
- Provides the WEB interface management

1.3 Physical specifications

Item	Description
Physical dimensions	440mm x 230mm x 44.5mm (L x W x H)
Number of ports	24 Gigabit SFP ports 4 Gigabit Combo ports (optical multiplexing ports) 2 10 Gigabit SFP+ ports 1 10 Gigabit expansion slot (only GTL-2660 supported)
Media types	10Base-T: Categories 3/4/5 twisted pairs 100Base-TX: Category 5 twisted pairs 1000Base-T: Super Category 5 twisted pairs Multi modes: 50/125 μm multimode fiber, equipped with LC plugs, transmission distance: 550m Single mode and short distance: 9/125 μm single mode fiber, equipped with LC plugs, transmission distance: 10km Single mode and middle distance: 9/125 μm single mode fiber, equipped with LC plugs, transmission distance: 40km Single mode and long distance: 9/125 μm single mode fiber, equipped with LC plugs, transmission distance: 70km
Input voltage	100V～240V AC, 50/60Hz
Power consumption	75W (full load)
Operating temperature	0°C~40°C
Storage temperature	-40°C~70°C
Operating humidity	10%~90%, no condensation
Storage humidity	5%~90%, no condensation

Table 1-1 Physical specifications

1.4 Product appearance

GTL-2660 front panel consists of LEDs, ports, Reset button and Console port. Here is a detailed description of the appearance of the switch with GTL-2660 as the example (as shown in Figure 1-1).

Front panel ports 1~24 are all Gigabit SFP ports, among which SFP ports 21~24 (referred to as optical ports) are multiplexed with RJ-45 ports 21~24 (referred to as electric ports). The default optical ports have a higher priority, that is, when the optical

ports and the electrical ports are plugged in by a certain medium, the optical port takes effect but the electrical port does not; Ports 25 and 26 are 10 Gigabit SFP+ ports;

Figure 1-1 GTL-2660 front panel

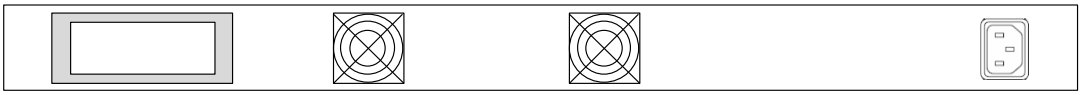


Figure 1-2 GTL-2660 rear panel

1. LED description

LED	Description	Function
PWR	Power indicator	It is constantly on when the power supply is working properly.
SYS	System status indicator	It flashes slowly after normal startup of the system, and the system may fail if it is not on or does not flash.
Link/Act	Port status indicator	When a device is properly connected to a port, the status LED that corresponds to the port stays lit, and it will flash if there is flow.

Table 1-2 LED description

2. Reset button

Reset button is a reset button used to restore the factory configuration of the switch. How to operate: Press and hold this button for about 2~3 seconds during the operation of the device, and then release this button, the switch configuration will be restored to factory defaults.

3. Console port

Console port is located on the right side of the front panel of the switch, which is a kind of asynchronous communication serial port complying with the RS232 standard. Management PC can manage the switch via the Console port.

4. Power interface

Power interface is located on the right side of the rear panel of the switch, and connected to the power supply of 100V~240V AC, 50/60Hz AC.

Chapter 2. Hardware Installation

2.1 Precaution for installation

Before installing the switch, you must ensure that the switch is powered off. And follow the precaution for installation:

- Make sure to install the working table and standard rack in a stable manner;
- Do not place any heavy objects on the top of the switch;
- Make sure that the switch has a good ventilation environment;
- Make sure that the switch is stored in a dry place, and kept far away from sources of ignition;
- Avoid to expose the switch directly to the sunshine and keep it far away from heating elements;
- Mount the switch away from the places with high power radio transmitters, radar transmitters as far as possible;
- Please use the power cord for this switch as it may cause the switch to malfunction or be damaged if other power cords are used.

2.2 Installed on the working table

You can install the switch on a stable working table, and the installation steps are as follows:

1. Place the switch with its bottom up on a sufficiently large, stable and properly-grounded working table;
2. Remove the adhesive protective paper from the foot pad, and stick the 4 pads in the 4 round slots at the bottom of the casing respectively;
3. Flip over the switch, and place it on the working table stably;

2.3 Install on the standard rack

Install the switch on a 19-inch standard rack, and the installation steps are as follows:

1. Check the grounding and stability of the rack;
2. Install the two L-shaped brackets in the accessories on both sides of the switch panel, and fix them with the screws in the accessories;
3. Place the switch in the appropriate location of the rack, and support it using a tray;

4. Secure the L-shaped brackets on the guide slots (as shown in the figure below) fixed at both ends of the rack, to ensure that the switch can be mounted on the rack in a stable, horizontal manner;

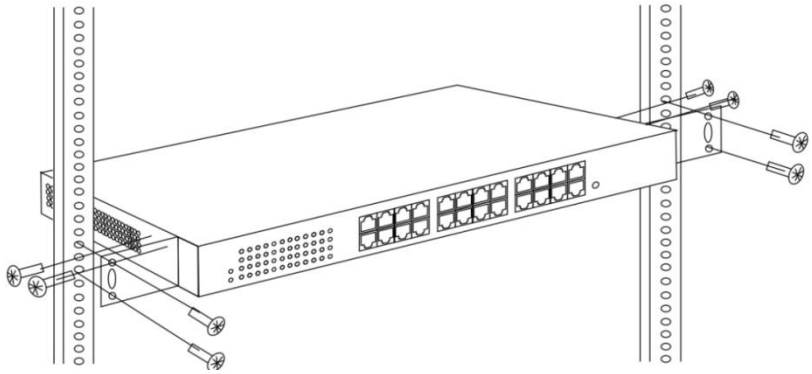


Figure 2-1 Rack Installation

2.4 To establish a network connection

To establish network connection: Insert the appropriate media into the ports of the device to establish a connection between networks.

Tip:

The electrical ports of the switch can automatically detect the crossover cables, so users can either connect a network card orrouter using a straight-through network cable or using a crossover cable.

2.5 Connect the power cord

The switch uses 100~240V, 50/60HZ AC power supply. Before power on, you must ensure a normal power supply, connections and grounding, as it may cause exceptions or damage to the system.

The connection procedures are as following:

1. Plug one end of the switch power cord into the AC power socket on the rear panel of the switch, and the other end into the AC power socket;

2. Check that the switch's power indicator (PWR) is on, and if so, it indicates that the power supply is connected properly.

After connecting the power supply, the switch enters into the self-test stage. In this process, the LED description as shown in Table 1-2 can be referred to judge if the system runs normally or not.

Chapter 3. WEB Management

3.1 Log in to the management page

With the WEB interface, you can manage and maintain the GTL-2660 switch in a very intuitive manner. Before the configuration of the switch via the WEB interface, confirm the following points.

1. The switch is powered on and started normally, and any of its ports is connected to the management host.

2. The network properties for managing the host have been configured correctly, and its IP address is on the same network segment with the switch management IP address.

3. The browser of version IE 6.0 or above has been installed on the management host.

3.1.1 Configuring the network properties of the management host

Before entering the WEB interface to manage the switch, the IP address of the internal network management host must be configured in the same subnet as the IP address of the switch. The default management IP address of the switch is 192.168.1.1, and its subnet mask is 255.255.255.0.

Below is a description of how to configure the local computer with Windows XP as an example, and the configuration steps are as follows:

1. Start the computer with Windows XP;
2. Click Start> Setting> Control Panel> Network and Internet connections in turn;
3. In the "Network connections" window, right click "Local connection", and select "Properties";
4. In the "Local connection Properties" page, select "Internet Protocol (TCP/IP)" and click "Properties";
5. In the "Internet Protocol (TCP/IP)" page, set the IP address of the management host to one of the free addresses 192.168.1.2 - 192.168.1.254, and the subnet mask is 255.255.255.0;
6. Click "OK" and save the modifications to the management host's network property.

3.1.2 Log into the WEB interface

When you log on for the first time, use the default management IP address, user name, and password of the switch. Open the browser, and type the management IP address of the switch 192.168.1.1 in the address bar, and type the user name and password (whose default is admin) of the administrator in the popped up logon interface, and then click "OK".

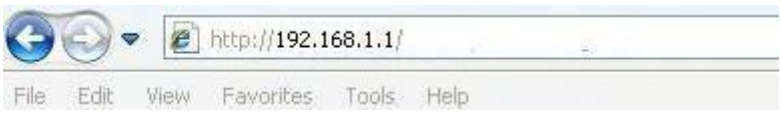


Figure 3-1 Enter your login address

Figure 3-2 Enter the user name and password

3.2 Introduction of WEB interface

Tips: The features in this manual are described with the WEB management interface of GTL-2660. For example; the management interface for GTL-2660 is similar, and is not described here.

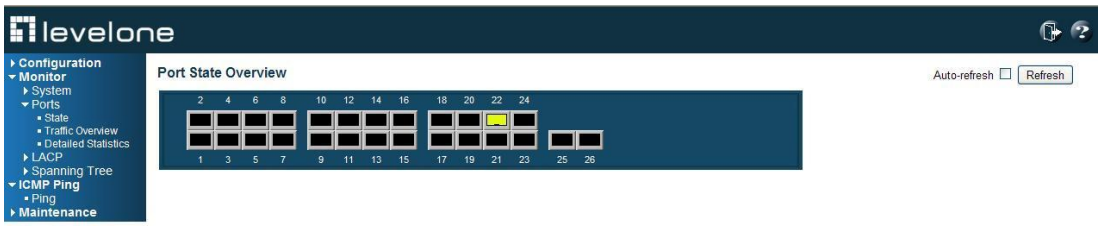


Figure 3-3 Home of WEB interfaces

If the logon user name and password are correct, you can access the device's WEB page, and the Home page for logon is the port status overview page, as shown in Figure 3-3.

1. Structure of WEB management interface

1. The device-related information is provided above the WEB page, including: Hiper logo hyperlink, device model, version, etc. Click on "Help" link to enter the online help page, and view the meaning of functional parameters of the device.
2. The menu bar is on the left of the WEB page.
3. The right side of the WEB page is the main operation page, on which you can configure various functions, view the configuration information, status information, statistics and other information.

2. Description of the menus and features

Figure 3-4 Function menu

The menu bar of the WEB interface contains five Level 1 menus, configuration, monitoring, diagnosis, maintenance, and exiting the system. The following table lists the secondary menus contained under each Level 1 menus, and makes an overview of the functions of each of Level 2 menus. With this table, you can quickly find the contents that you want to configure and view.

Level-1 menu	Level-2 menu	Page functions
Configuration	System	Configure and view the system information of the device, including contacts, IP, time, etc.
	Ports	Configure, view the status, operating mode, flow control, etc. of the ports.
	Security	Modify the login password of the device, and configure access restrictions, SNMP management functions, etc.
	Aggregation	Configure static port aggregation and LACP.
	Spanning Tree	Configure the rapid spanning-tree protocol.
	MAC Table	Configure the MAC address table aging time, MAC/Port binding, etc. of the device.
	VLANs	Configure VLAN.
	QoS	Configure the port priority and incoming port supervision.
	Mirroring	Configure the port mirroring function.
Monitoring	System	Display the resource status and basic information of the system.

	Ports	Display the traffic statistics of all ports.
	LACP	Display the status of LACP ports, statistics of port packets and other information.
	Spanning Tree	Display the status of STP ports, statistics of port packets and other information.
ICMP Ping	Ping test	Test the network connectivity.
Maintenance	Restart Device	Restart the switch.
	Factory Defaults	Restore the switch to its factory configuration.
	Firmware Update	Upgrade the firmware of the switch.
	Configuration	Import, export the switch's configuration files.

Table 3-1 Description of the menus for the WEB interface

3.3 Configuration

In Level 1 menu "Configuration", you can configure the following functions of the switch:

System
Ports
Security
Aggregation
Spanning Tree
MAC Table
VLANs
QoS
Mirroring

3.3.1 System information

3.3.1.1 Information

Page Wizard: Configuration—> System—> Information

This page allows you to configure some basic parameters of the switch.

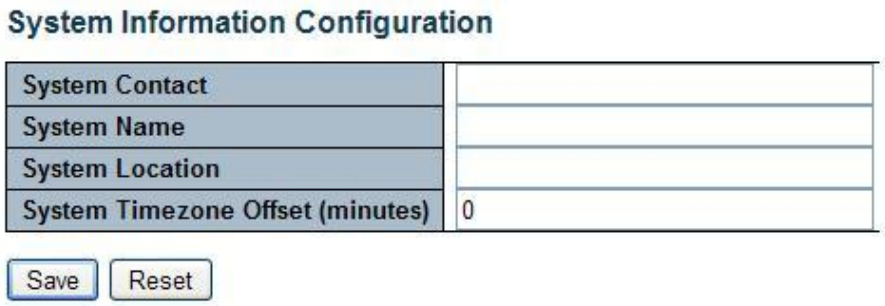


Figure 3-5 Configuration of system information

- **System Contact:** Sets the Administrator's contact information, such as name, contact information, etc. System contacts may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 255 characters in length. Decimal ASCII code table can be found in Appendix A. System contacts can be left empty.
- **System Name:** Sets the host name of the switch. When there are multiple switches in the network, you can set a name for the switch for easy identification and facilitate management. The host name must contain only the digits (0-9), English lowercase letters (A-Z, a-z) and hyphen (-). Other symbols, punctuation characters or spaces are not allowed. Also, the first character must be a letter, and the last character must not be a hyphen (-).
- **System Location:** Sets the actual geographical location of the switch, which may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 255 characters in length. System location can be left empty.
- **System Timezone Offset (minutes):** To set the difference between local time and Greenwich mean time (in minutes). Value range is -720 to 720 minutes.

3.3.1.2 IP & Time

Page Wizard: Configuration—> System—> IP & Time

This page allows you to configure the IP address of the switch and other information.

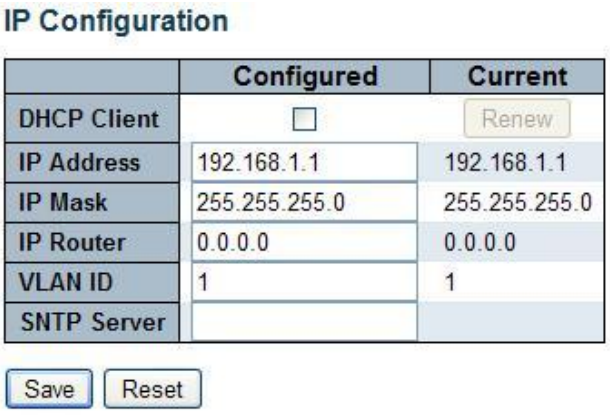


Figure 3-6 IPand time configuration

In the settings column, you can configure, view and modify the parameters, such as IP address, in the current column, you can view the currently running values.

- **DHCP Client:** To enable/disable the DHCP client functions of the switch. After enabling this function, the switch will obtain the IP address from the existing DHCP server of the network. If it fails to get the IP address successfully, and the IP address is set to 0.0.0.0, then the switch (as a DHCP client) will again initiate a

DHCP request; if it receives no response from the DHCP server within about 35 seconds, and the IP address is set to a non-zero value, the switch will disable the DHCP client function, and directly use the configured IP address. In addition, the switch as a DHCP client will also announce its own host name (that is, the configured system name) on the local network for use in DNS query.

- **IP Address:** To set the switch's management IP address.
- **IP Mask:** To set the switch's subnet mask.
- **IP Router:** To set the IP address of the default gateway of the switch.
- **VLAN ID:** To set the ID number of the switch's management VLAN, ranging 1~4095.
- **SNTP Server:** To set the IP address of the SNTP server. After the SNTP server has been set correctly, the switches will automatically synchronize time with the set SNTP server after it is connected to the Internet; the Internet-provided SNTP servers include 192.43.244.18, 129.6.15.28, etc., for more knowledge and servers of SNTP, please visit http://www.ntp.org.

➢ **Renew:** After the DHCP client function is enabled, clicking on this button can immediately update the DHCP lease (updating the lease time, or get a new IP address).

Tip:

After modifying the switch's IP address, you must use a new IP address to log into the device, and the IP for logging in to the host is on the same network segment!

3.3.2 Port configuration

Page Wizard: Configuration—> Ports

In this page, you can configure and view port parameters, and view the current port status information.

Port Configuration

Port	Link	Speed		Flow Control			Maximum Frame Size	Excessive Collision Mode	Power Control
		Current	Configured	Current Rx	Current Tx	Configured			
*			<>			☐	10056	<>	<>
1		Down	Auto				10056		
2		Down	Auto				10056		
3		Down	Auto				10056		
4		Down	Auto				10056		
5		Down	Auto				10056		
6		Down	Auto				10056		
7		Down	Auto				10056		
8		Down	Auto				10056		
9		Down	Auto				10056		
10		Down	Auto				10056		
11		Down	Auto				10056		
12		Down	Auto				10056		
13		Down	Auto				10056		
14		Down	Auto				10056		
15		Down	Auto				10056		
16		Down	Auto				10056		
17		Down	Auto				10056		
18		Down	Auto				10056		
19		Down	Auto				10056		
20		Down	Auto				10056		
21		Down	1000-X_AMS	✗	✗	☐	10056	Discard	Disabled
22		100fdx	1000-X_AMS	✗	✗	☐	10056	Discard	Disabled
23		Down	1000-X_AMS	✗	✗	☐	10056	Discard	Disabled
24		Down	1000-X_AMS	✗	✗	☐	10056	Discard	Disabled
25		Down	10Gbps FDX	✗	✗	☐	10056		
26		Down	10Gbps FDX	✗	✗	☐	10056		

Figure 3-7 Port configuration

- **Port:** Displays the port number of the switch.
- **Link:** To graphically display the port's connection status. Green means the port is connected, Red means the port is not connected or is disabled.
- **Speed:** To set the transmission rate and duplex mode of ports. With different types of ports, the operation mode options allowed to be set also differ. The options are:
  - Disable: To disable a port.
  - Auto: To set the operating mode of a copper cable port to auto-negotiation. Auto-negotiation is used for exchanging the information (transmission rate, duplex mode and flow control, etc.) of operation modes between a port and the peer port, and the both sides finally automatically negotiate as the best operation mode.
  - 10Mbps HDX: To force a copper cable port to work in 10M half-duplex mode.
  - 10Mbps FDX: To force a copper cable port to work in 10M full-duplex mode.
  - 100Mbps HX: To force a copper cable port to work in 100M half-duplex mode.
  - 100Mbps FDXfull-duplex: To force a copper cable / fiber port to work in 100M full-duplex mode.
  - 1Gbps FDX: To force a copper cable port to work in 1000M full-duplex mode.

- 1000-X: To set a Combo port to enforce SFP optical port, and the working mode to 1000M full duplex. At this point, the corresponding port is disabled.
- 1000-X_AMS: To set a Combo port to working in the AMS mode and SFP optical port in priority, and the working mode of the SFP optical port to 1000M full duplex, and that of the electrical port to the auto-negotiation mode (the default working mode for the Combo port).
- 10G full duplex: This mode is only valid for the 10 Gigabit ports.

✧ Flow control: Checking the "Settings" check box of a port is to enable the port flow control. This setting is related to the setting of working modes. When the operating mode of a port is set to auto-negotiation, this parameter is used to specify the flow control capability of the port announced to the peer port. When both transmission rate and duplex mode are manually set, this parameter is used to open or close the flow control function of the port.

The "Currently Receive" column shows whether the port is capable of receiving and processing PAUSE frames currently, and the "Currently Send" column shows whether the port is currently able to send PAUSE frames. When the working mode of the port is auto-negotiation, the values of "Currently Receive" and "Currently Send" are determined by the results of the last auto-negotiation.

✧ Max frames: To set the maximum frame length (including the FCS fields) that the switch ports allow to pass.

✧ Excessive conflict processing: To set the way of processing excessive conflicts of ports during transmission.

- Discard: The frame is discarded when it fails to be retransmitted for up to 16 times.
- Retransmission: The restart and exiting process when it fails to be retransmitted for up to 16 times.

✧ Power-saving mode: To set the power saving mode of the ports.

- ActiPHY: To enable the ActiPHY automatic power-saving mode. The switch can detect the unused Ethernet ports, and then adjust these ports to sleeping mode.
- PerfectReach: To enable PerfectReach intelligent power-saving mode. The switches can automatically adjust the desired power levels according to cable length.
- Enable: To enable both the PerfectReach intelligent power-saving mode and the ActiPHY automatic power-saving mode.
- Disable: Not enable any power-saving mode.

3.3.3 Security

3.3.3.1 Password

Page Wizard: Configuration—> Security—> Password

This page allows you to modify the device's login, and the login password is admin (case sensitive) by default. Requirements for typing password: The password may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 31 characters in length, and the password can be left empty.

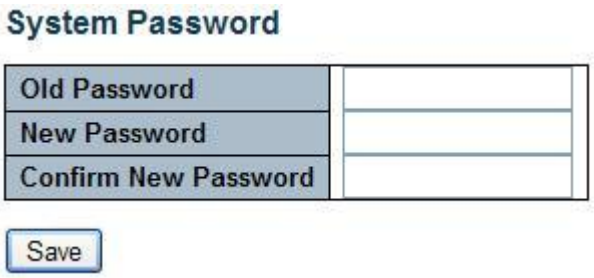


Figure 3-8 Settings of logon password

3.3.3.2 Access Manage

Page Wizard: Configuration—> Security—> Access Manage

This page allows you to configure the access restrictions of the switch. In the list of access restrictions, you can create up to 16 entries. After the access restrictions of the switch are enabled, only the hosts (based on IP address ranges) added into the access restrictions list to access the switch in a specified manner.

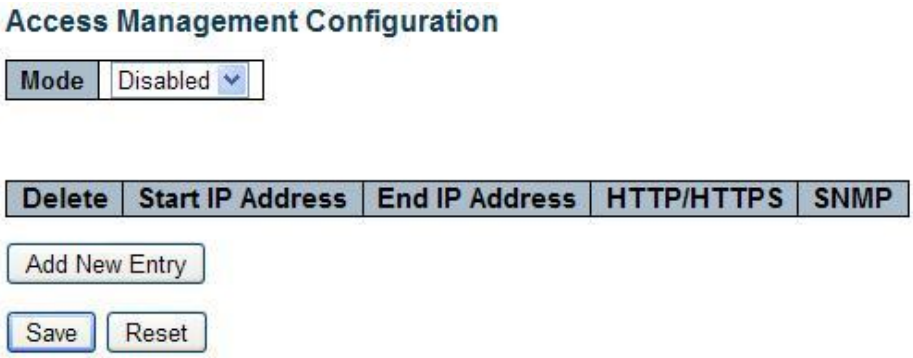


Figure 3-9 Management access configuration

- **Mode:** To enable or disable the access restrictions function of switches.
- **Start IP Address:** To allow access to the starting IP address within the IP address range of the switch.
- **End IP Address:** To allow access to the ending IP address within the IP address range of the switch.
- **HTTP/HTTPS:** Checking it means a host within the IP address range can access the switch through HTTP/HTTPS.
- **SNMP:** Checking it means a host within the IP address range can access the switch through SNMP.

3.3.3.3 SNMP

Page Wizard: Configuration—> Security—> SNMP

In this page, you can configure the SNMP function.

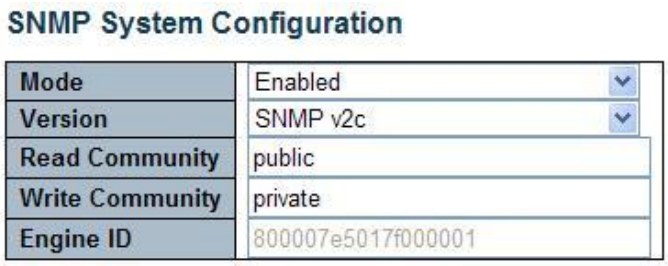


Figure 3-10 SNMP system configuration

- **Mode:** To enable or disable the SNMP functions of the switch.
- **Version:** To set the SNMP version number the system enables, and the options include: SNMP v1, SNMP v2c, SNMP v3.
- **Read Community:** To set the community name with read-only permissions. SNMP network management software uses the community name only for reading the switch information. Read community name may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 255 characters in length. Read community name can be left empty. This parameter applies only to the SNMPv1 and SNMPv2c versions.
- **Write Community:** To set the community name with read-write permissions. SNMP network management software uses the community name for reading the switch information and modifying the configuration. Write community name may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 255 characters in length. Write community name can be left empty. This parameter applies only to the SNMPv1 and SNMPv2c versions.
- **Engine ID:** To set the engine ID of the local SNMP entity. This parameter applies only to SNMPv3. Local engine ID is a hexadecimal number string, whose length must be an even number from 10 to 64, but not all 0 or all F. If the local engine ID is modified, all of the created SNMPv3 users will be deleted.

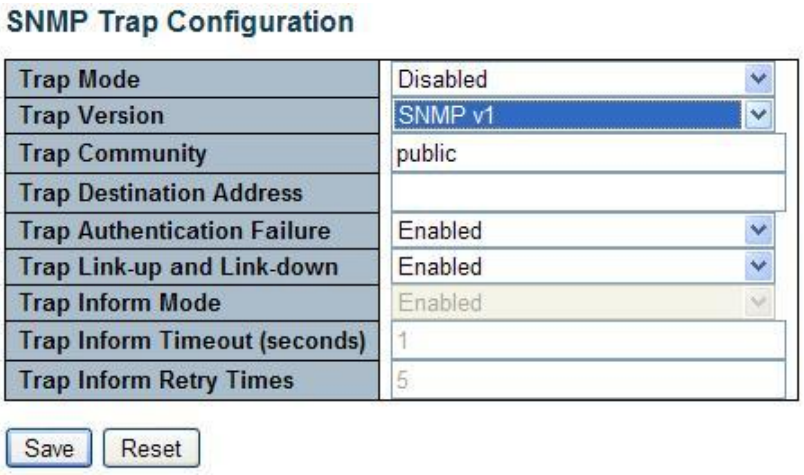


Figure 3-11 SNMPTrap configuration (1)

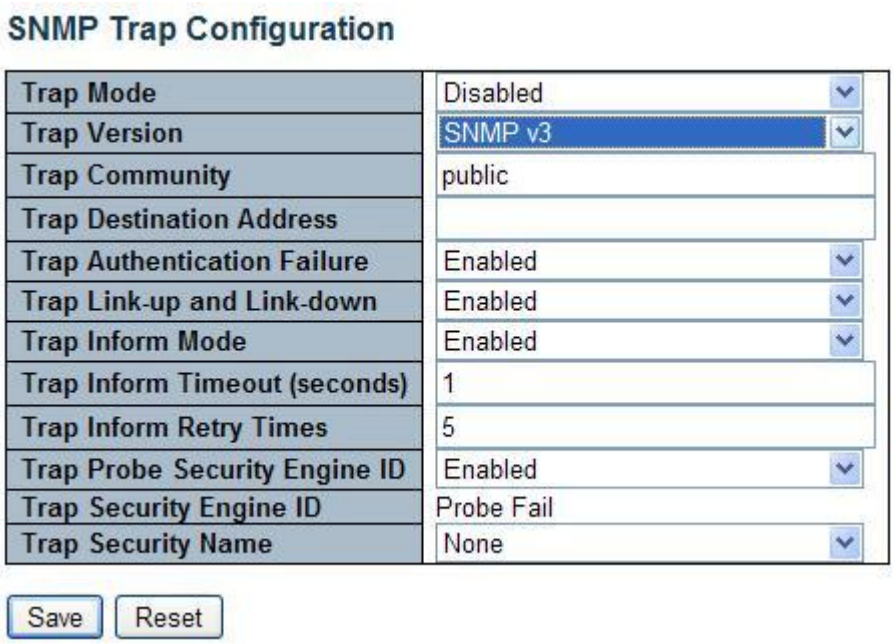


Figure 3-12 SNMPTrap configuration (2)

- **Trap Mode:** To enable or disable the SNMP Trap function.
- **Trap Version:** To specify which version of SNMP Trap messages the switch sends.
- **Trap Community:** To set the community name that a switch uses to send Trap messages to the SNMP network management software. The community name may only contain printable ASCII characters (codes from 32 to 126), and they cannot exceed 255 characters in length.
- **Trap Destination Address:** To set the host address that receives SNMP Trap messages.
- **Trap Authentication Failure:** To enable or disable authentication failure Trap event; enabling means to send the Trap messages when the SNMP authentication fails; disabling means to forbid sending Trap messages for SNMP authentication failure.
- **Trap Link-up and Link-down:** To enable or disable link state Trap event; enabling means to send the Trap messages of link Down or link Up when the connection status of the port changes (Up is changed into Down, Down to Up); disabling means to forbid sending Trap messages of link Down/Up.
- **Trap Inform Mode:** To enable or disable the Inform notification modes. Note that SNMP v1 does not support Inform notification mode.
- **Trap Inform Timeout (seconds):** The time intervals for waiting for response from the Inform notification messages. If the switch fails to receive any response within the specified time interval, it will resend the notification message. Range of values is 0~2147.
- **Trap Inform Retry Times:** The maximum times for repeatedly sending the Inform notification messages, ranging 0~255.
- **Trap Probe Security Engine ID:** To enable or disable the auto-detection function of the SNMP Trap security engine.
- **Trap Security Engine ID:** To set the SNMP Trap security engine ID. SNMP v3 uses the authentication and encryption mechanisms of USM (User-Based Security Model). When the switch sends an SNMPv3 Trap or Inform notification message, a unique engine ID must be used. When enabling the "Trap security engine ID

detection", the system will automatically detect and use the engine ID, otherwise, the system will use the value set here. Trap security engine ID is a hexadecimal number string, whose length must be an even number from 10 to 64, but not all 0 or all F.

- **Trap Security Name:** set SNMP Trap security name. When the SNMPv3 Trap is enabled, it is required to set a unique Trap security name, which is used to send an SNMPv3 Trap or Inform notification message.

3.3.4 Aggregation

Tips: LACP and static aggregation cannot be made on the same port.

3.3.4.1 Static aggregation

Page Wizard: Configuration—> Aggregation—> Static

In this page, you can configure the load balancing algorithm and the static aggregation group used in static aggregation. The switch supports the use of the different combinations between the source MAC address, destination MAC address, IP address and TCP/UDP port numbers as the basis for calculating the used load-balancing mode.

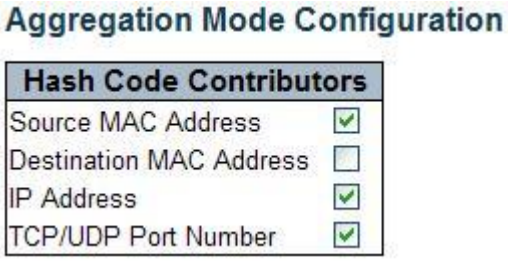


Figure 3-13 Aggregation mode configuration

- **Source MAC Address:** Choose whether the source MAC address is used as the basis for load balancing. By default, enable the source MAC address as the basis for load balancing.
- **Destination MAC Address:** Choose whether the destination MAC address as the basis for load balancing. By default, disable the source MAC address as the basis for load balancing.
- **IP Address:** Choose whether the IP address is used as the basis for load balancing. By default, enable the IP address as the basis for load balancing.
- **TCP/UDP Port Number:** Choose whether the TCP / UDP port number as the basis for load balancing. By default, enable the TCP / UDP port number as the basis for load balancing.

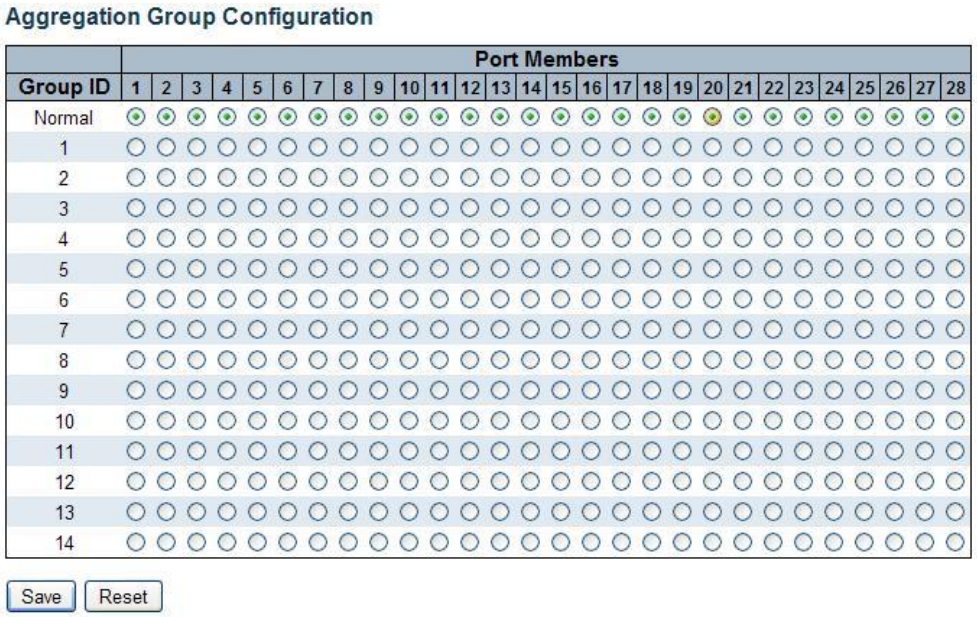


Figure 3-14 Configuration of Aggregation Groups

- **Group ID:** Displays the aggregation group ID. The ports in "Normal" group are normal ports, which means not for port aggregation. A switch port can only belong to one aggregation group.
- **Port Members:** To determine the number of aggregation groups and the members of each aggregation group by selecting a check box. By default, all ports are normal ports. Only the ports in the full duplex mode can achieve port aggregation, and all the ports in the same aggregation group must run at the same rate.

3.3.4.2 LACP

Page Wizard: Configuration—> Aggregation—> LACP

LACP (Link Aggregation Control Protocol) is a protocol based on the standard IEEE802.3ad and able to achieve the dynamic link aggregation and de-aggregation. LACP protocol allows two switches to be connected in parallel via two or more ports, to achieve dynamic aggregation. A switch supports a maximum of 12 dynamic aggregation groups.

Figure 3-15 LACP port configuration

- **Port:** Displays the port number of the switch.
- **LACP Enabled:** To enable or disable a port to enable the LACP.
- **Key:** To set the management Key of the LACP ports, whose value ranges 1~65535.

The management Key can be generated automatically by the system, or manually configured. It is automatic by default, which means that the switch will automatically set Key values according to the physical link rate of ports, in which the Key values corresponding to the rates 10M, 100M and 1000M are 1, 2 and 3 respectively; upon selecting "Manual", the Key value is entered manually by the user. Note that the ports in the same aggregation group must be set the same management Key.

- **Role:** To select the aggregation mode of the LACP port. The ports in the Active mode will initiate the LACP packet negotiation (one LACP packet sent per second), and those in the passive mode will not initiate negotiation but giving a response to the incoming LACP packet.
- **Timeout:** To set the timeout of LACP port, and the options are: short timeout (1 seconds) and long timeout (30 seconds). After the LACP timeout is tripled, if the member port of the local port still fails to receive the LACP DU packets from the peer, it is deemed that the member port of the peer has become invalid.
- **Prio:** To set the aggregation priority of the LACP port. The port LACP priority is used to identify the level of priority for the member ports to become active ports (that is, the ports involved in data forwarding). The smaller the priority value is, the higher the priority becomes.

3.3.5 Spanning Tree

3.3.5.1 Bridge Settings

Page Wizard: Configuration—> Spanning Tree—> Bridge Settings

This page allows you to configure STP global configuration parameters.

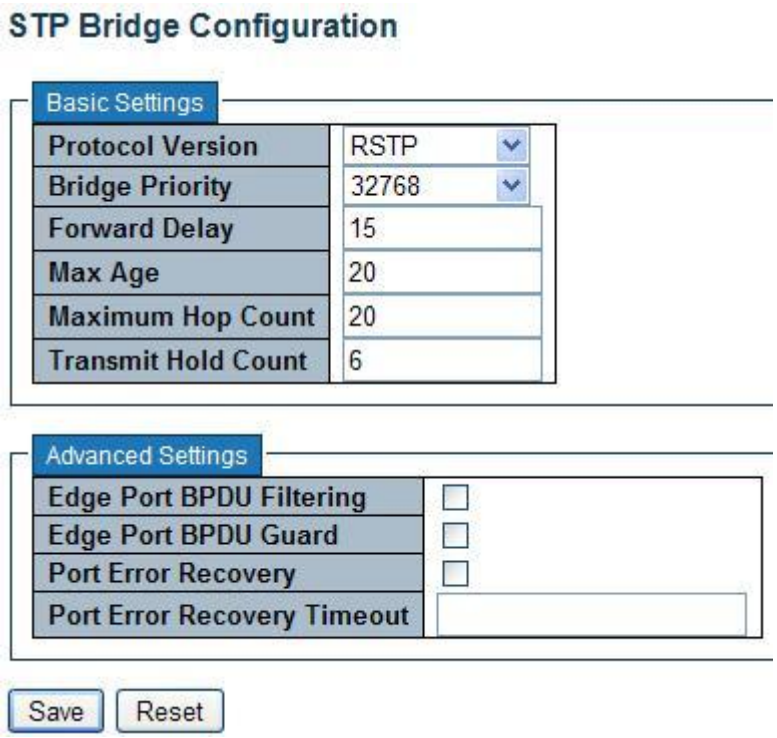


Figure 3-16 Configuration of STP Network Bridge

- **Protocol Version:** To set the versions of the spanning tree protocol that the system enables. The switch supportsSTP**,** RSTP.

- **Bridge Priority:** To set the switch of the network bridge priority. The smaller the value is, the higher the priority is. The network bridge priority and the MAC addresses of switches form a network bridge ID. After an exchange of BPDU, the devices with the smallest network bridge ID will be selected as the root bridge.
- **Forward Delay:** The time for maintaining the monitoring and learning status before the network bridge sends packets, which ranges from 4~30 seconds.
- **Max Age:** The maximum lifetime of BPDU packets. If, after the aging time is exceeded, a root-port has not received the updated BPDU messages, then the switch will assume the network topology changes, and send TCN BPDU packet to the root switch (topology change notification), whose value range is 6~40 seconds. Note that the values of the aging time and forwarding delay should satisfy the following formula: Max. aging time (forwarding delay-1) x 2.
- **Maximum Hop Count:** The maximum hop count of the MST domain, whose values range 6~40. This parameter determines how many devices a BPDU packet passes in an MST domain before being discarded, thus limiting the scale of the MST domain.
- **Transmit Hold Count:** It is used to control the maximum transmission rate for the switch to send BPDU packets, namely, the maximum number of BPDU packets to be sent per second. When this limit is exceeded, it will send BPDU by delay. Value range is 1~10 packets.
- **Edge Port BPDU Filtering:** After BPDU filtering is enabled, the ports set to edge ports will not participate in spanning tree calculation, that is, the port neither receives nor sends out the BPDU packet.
- **Edge Port BPDU Guard:** After BPDU protection is enabled, if the ports set to edge ports receive a BPDU, they will enter the Error-Disabled status to show configuration errors, while the port is closed.
- **Port Error Recovery:** It refers to the ports with BPDU protection enabled, which can be automatically recovered as Open status in a certain period of time after entering into the Error-disabled status and is shut down by the switch. If the Auto-Recovery function is not enabled, you must manually activate the ports (first disable, then enable). In addition, resetting the switch can also restore the ports to their normal status.
- **Port Error Recovery Timeou**t: The time interval that a port is recovered from the Error-disabled (error-disabled) status to the Open status. Value range is 30~86400 seconds (24 hours).

3.3.5.2 Bridge Ports

Page Wizard: Configuration—> Spanning Tree—> Bridge Ports

Port configuration page provides port aggregation configuration and general port configuration, and its function is as follows:

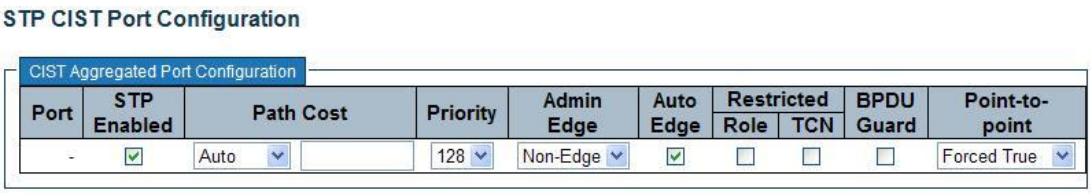


Figure 3-17 STP port configuration

- **Port:** Displays the port number of the switch.
- **STP Enabled:** To enable or disable STP on the port.
- **Path Cost: T**o set path overhead of the port link. The sum of the port path overhead values determines the total path overhead reaching the root bridge. When there are multiple paths to choose, the system will choose the path with the lowest overhead, and blocks other redundant paths. The path overhead of the port can be calculated automatically by the system, or manually configured. It is automatic by default, which means that the system will adopt the IEEE 802.1D standard, and automatically calculate the path overhead according to the physical link rate of the

port. Upon selecting "Manual", the user can manually enter the path overhead value. If there are no special needs, it is not necessary to modify it. Value range is 1~200000000.

- **Priority:** To set the port priority. When the path overhead is the same, the ports with higher priorities will be selected as the root port. The smaller the priority value is, the higher the priority becomes.
- **Admin Edge:** Select whether or not to set a port to the edge port. In the case of no BPDU protection enabled, if the ports set to edge ports receive BPDU, the actual running status can also change into non-edge ports.
- **Auto Edge:** Select whether to enable the automatic detection function of the edge ports. This function can automatically identify a port as edge port or non-edge port through the operation of the protocol without the need of manual configuration.
- **Restricted:** This function is also called Root Guard. When this function is enabled on a port, you can force the port role of this port on all instances as the specified port, even though it has the highest priority of configuration information, it cannot be selected as root port. Root Guard is to ensure that the ports with root guard enabled become specified ports, thus protecting the status of the current root switch, and preventing other switches from becoming the root switches. Note that after enabling this function, temporary interruption of the network connection may be resulted when the network topology changes.
- **Restricted TCN:** After restricted TCN (topology change notification) function is enabled on a port, the ports will block the TC-BPDU packets it receives or generates itself, preventing the TC packets from spreading to other ports, to avoid frequent deletion of MAC address table entries, thus making it possible to effectively prevent possible TC attacks, and maintaining network stability. If this function is enabled, however, the switch may not be able to learn the MAC address correctly, thus causing temporary interruption of the network connection when the network topology changes. Therefore, make sure that this function will not be enabled unless TC-BPDU packets are attacked in the network.
- **BPDU Guard:** After the BPDU protection is enabled on a port, it will enter into Error-disabled (error-disabled) status and be shut down by the switch if the port receives BPDU. Note that the BPDU protection for a single port has nothing to do with the fact that the port is an edge port or not. This is its difference from the global BPDU function (which is configured in STP network bridge page via the "Edge port BPDU protection" parameter). The port that enters into the Error-disable status through this setting will also be subject to the settings of "Portautomaticrecovery" parameter on the STP network bridge page.
- **Point-to-point:** This parameter is used to set whether the links connected with the port are point-to-point links or not. The two ports connected with the point-to-point links can be quickly migrated to the forwarding status, thus reducing the time of unnecessary forwarding latency. Auto: The system will automatically detect if the port is connected to a point-to-point link; Enabled: used to identify the link connected to the port is a point-to-point link; Disabled: Used to identify the link connected to the port is not a point-to-point link, but the shared link.

3.3.6 MAC Table

Page Wizard: Configuration—> MAC Table

The operations on the MAC address table configuration page include: set the aging time of dynamic MAC address, set the MAC address learning function of switch ports, and set the static MAC address.

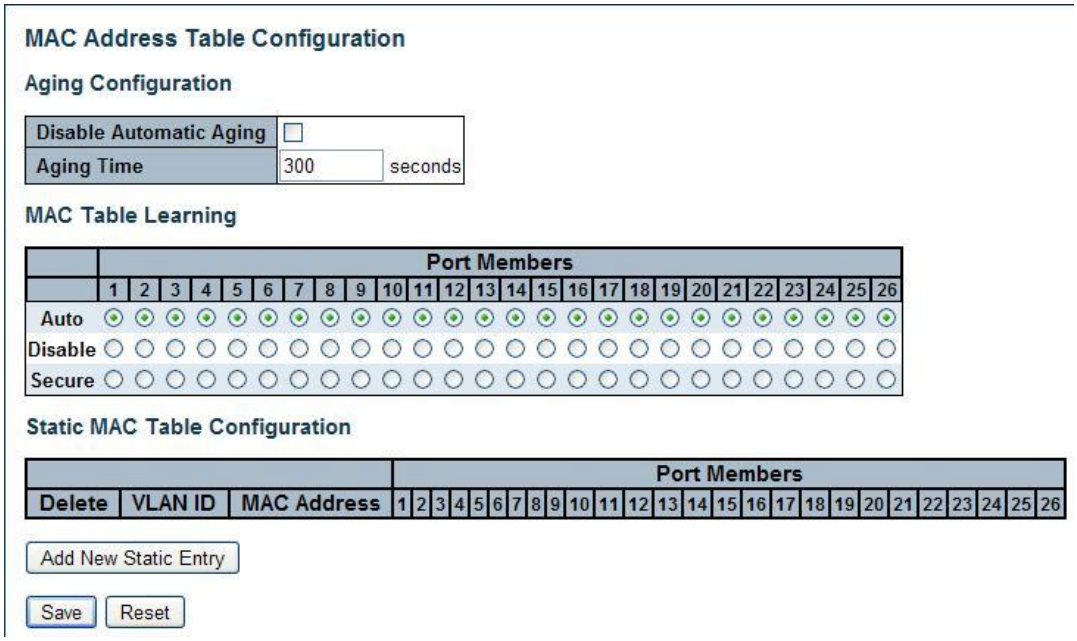


Figure 3-18 Configuration of MAC address table

- **Disable Automatic Aging:** Checking means the MAC addresses learned by the switch will not be aged.
- **Aging Time:** To set the aging time of MAC addresses, whose value range is 10~1000000 seconds. After learning a new MAC address, the switch will delete the MAC address from the address table if it fails to again receive the packets with this MAC address as the source address within the aging time (300 seconds by default).
- **MAC Table Learning:** When some other functions are enabled on a port, it is prohibited to modify the learning mode of the port here, at this time, the corresponding option will become gray. In the list of MAC address learning, you can set the MAC address learning function for the ports.
  - **Auto:** Default, which means to enable the MAC address auto-learning function of the port. At this point, the switch establishes the mapping of the address with the receiving port based on the source MAC address in the received data frames, and write it into the MAC address table.
  - **Disable:** Selecting this item means to close the MAC address learning function of the port, and the port will directly forward to other ports upon receipt of the data frame.
  - **Secure:** Checking this option will enable the port security function. At this point, the switch will disable the port from learning the MAC addresses dynamically, but allow the source MAC address to pass the port for the data frames of the static MAC address bound on the port.

    Note: Before port security is enabled on the switch port connected to the management host, make sure that the host's MAC address is statically bound (that is to add relevant entries into the static MAC address table) with the port; otherwise, the network connection between the management host and the switch will be interrupted, and at this time, the management host can only be connected to the switch through the other switch ports or serial ports.
- **Static MAC Table Configuration:** With this table, you can view all of the static MAC address entries. At most 64 static MAC address entries can be configured. The MAC address table is sorted first according to VLAN ID, and then sorted according to the MAC address when VLAN ID is the same.
- **VLAN ID:** To set the VLAN ID for binding the MAC address.
- **MAC Address:** To set the MAC address for static binding.

✧ Port: To select the port bound by the MAC address.

3.3.7 VLANs

3.3.7.1 Port VLAN

Page Wizard: Configuration—>VLANs—> Port VLAN

The Port VLAN page allows you to view and modify the port VLANconfiguration of the switch, including: create or delete a port VLAN, and add or delete member ports for the port VLAN. This switch supports a maximum of 28 VLANs. The system has a default VLAN (VLAN 1, whose name is Default), and it contains all physical ports by default. In addition, the newly established VLAN contains no ports by default.

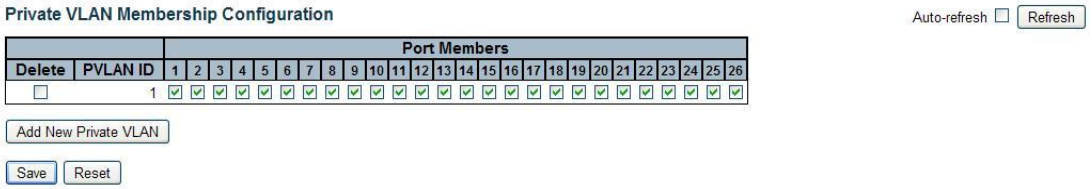


Figure 3-19 Configuration of the VLAN Members

✧ **PVLAN ID:** For identifying a port VLAN, and the ID number must not be duplicated.

✧ **Port Members:** For determining the member port for each port VLAN by selecting the check box. A port can belong to more than one VLAN. If a port is to be added to a VLAN, tick the appropriate check box; if a port is prohibited to be added to a VLAN, then put a cross in the corresponding check box. If a port is to be deleted from a VLAN, make sure that the check box is not selected.

3.3.7.2 Port Isolation

Page Wizard: Configuration—>VLANs—> Port Isolation

The Port isolation configuration page allows you to set private VLAN. The ports that port isolation is enabled cannot communicate with each other, even if they belong to the same VLAN. Port isolation can implement the port isolation within the VLAN, to increase network security.

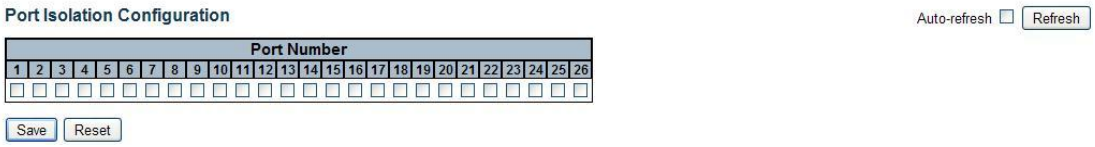


Figure 3-20 Configuration of port isolation

✧ **Port Number:** Each port corresponds to a check box. When a check box is selected, it means that the port isolation function is enabled on the corresponding port. When a check box is not selected, it means that the port isolation function is disabled on the corresponding port. By default, port isolation is disabled on all ports.

3.3.8 QoS

3.3.8.1 Port Category

Page Wizard: Configuration—>QoS—> Port Category

The QoS ingress port classification page allows you to configure QoS entry flow

parameters for each port on the switch.

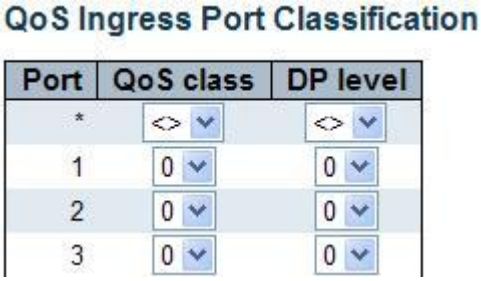


Figure 3-21 QoS ingress port classification

- **Port:** Displays the port number of the switch.
- **QoS class:** To set the default QoS class of the port, which will be classed into this category after receiving a data frame. The mapping between QoS category, queue and priority is in one-to-one correspondence. The value range of QoS category is 0~7, QoS category 0 has the lowest priority, therefore QoS category 7 has the highest priority.
- **DP level:** To set the default discard precedence of the port, and the data frames received by the port will be assigned with this discard precedence value. Discard precedence is a parameter referenced when the data frame is to be discarded, and the data frames with higher discard precedence values will discarded first.

3.3.8.2 Port supervision

Page Wizard: Configuration—>QoS—> Port Isolation

The QoS ingress port supervision page allows you to configure QoS entry supervision parameters for each port on the switch.

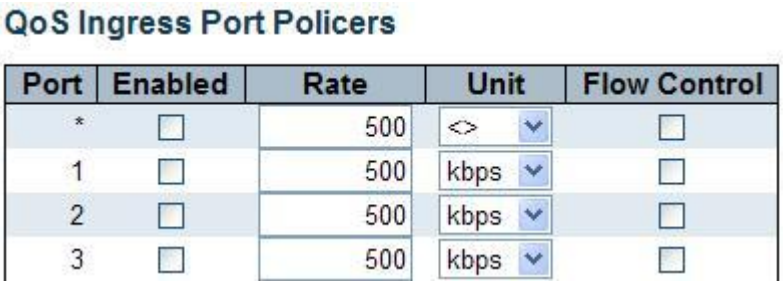


Figure 3-22 QoS ingress port supervision

- **Port:** Displays the port number of the switch.
- **Enabled:** To select whether to enable flow control function.
- **Rate:** To set the control rate of the port (namely, the maximum rate that the port receives), the default value is 500. The value ranges from 100~1000000 Kbps/FPS, 1-13200 Mbps/kfps.
- **Unit:** To set the units of the control rate. Options include: kbps, Mbps, fps and kfps. The default value is "kbps".
- **Flow Control:** Select whether to enable the flow control function on the port. When the flow control function is enabled at both ends of the link, the sending end will be notified by the sent Pause frames to slow down the packet transmission rate, thus avoiding packet loss.

3.3.9 Mirroring

Page Wizard: Configuration—> Mirroring

In the monitoring configuration page, you can set the port mirroring function. With the port mirroring function, you can copy the flow of the monitoring port to the monitoring port, to provide the detailed information on the transmitting status of the monitored ports, allowing network managers to make traffic monitoring, performance analysis and troubleshooting.

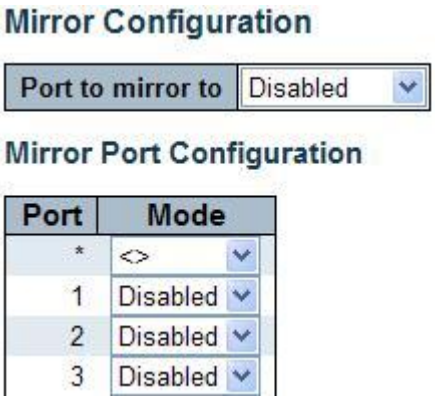


Figure 3-23 Port mirroring

- **Port to mirror to:** To specify a port as the monitoring port, the packets received or sent by the monitored port will be copied to this port; default is disabled, which means the port mirroring function of the switch is not to be enabled. Note: The host under monitoring ports are not able to make data communications through this switch but only receive the data sent by the monitored ports.

  Mirror Port Configuration: In the monitored port list, you can select one or more ports as monitored port, and set the monitoring modes for the ports.

- **Port:** Displays the port number of the switch.

- **Mode:** To set the monitoring mode of the appropriate ports, and the options include: input monitoring, output monitoring, bi-directional monitoring, disabling.

  - Rx only: Only the packets received by the port can be copied to the monitoring port.
  - Tx only: Only the packets sent by the port can be copied to the monitoring port.
  - Enable: The packets received and sent by the port will be copied to the monitoring port.
  - Disable: This port is not to be monitored.

Note: For a port, a packet is usually sent only once. So, the packets sent by the monitoring port cannot be copied. Because of this, the monitoring mode of the monitoring port can only be set to disabled or output control.

3.4 Monitor

In Level 1 menu "Monitor", you can view, monitor the following information:

- System
- Ports
- LACP
- Spanning Tree

3.4.1 System

3.4.1.1 Information

Page Wizard: Monitoring—> System—> Information

This page allows you to view the system information of the switch.

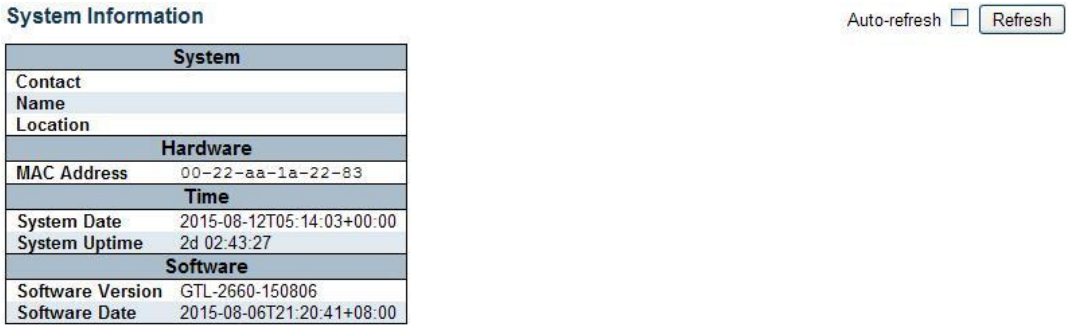


Figure 3-24 Basic Information of the system

- ✧ Contact: Displays the system contacts of the switch, which is set in **Configuration—>System—>Information** Page.
- ✧ Name: Displays the host name of the switch, which is set in **Configuration—>System—>Information** Page.
- ✧ Location: Displays the system location of the switch, which is set in **Configuration—>System—>Information** Page.
- ✧ MAC address: Displays the MAC address of the switch.
- ✧ System Date: Displays the current date and time information (displaying the GMT time) of the system. If an SNTP server has been set up on the switch, the device can get the system time by accessing the SNTP server.
- ✧ System Uptime: Displays the time that the switch has run after startup this time.
- ✧ Software version: Displays the version information about the currently running software of the switch.
- ✧ Software Date: Displays the generation date of the currently running software of the switch.

3.4.1.2 CPU Load

Page Wizard: Monitor—> System—> CPU Load

This page provides CPU mean load change curve.

Average CPU load change curves use the CPU load averages per 100 milliseconds, 1 second and 10 seconds respectively as the statistical data, and for dynamic data updates, the latest 120 data generated is to be taken each time. And, the load averages within the past 100 millisecond, 1 second and 10 seconds are displayed respectively above the graph in text form.

Only when your browser supports SVG format can this page be displayed properly. What calls for special attention is that the versions before IE9 do not support SVG, so Adobe SVG Viewer Plug-in needs to be installed before they can properly display SVG graphics.

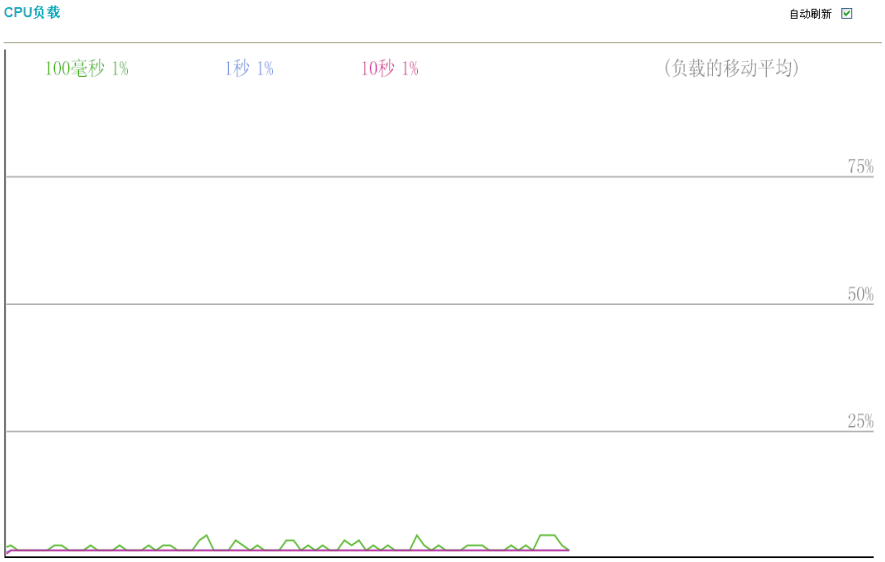


Figure 3-25 CPU loading

3.4.2 Ports

3.4.2.1 State

Page Wizard: Monitor—> Ports—> State

This page provides the diagram of the front panel ports of the switch, visually displaying the current status of each switch port. The port displayed as gray indicates the port is disabled; the port displayed as black indicates the port is not connected; the port displayed as other colors indicates the port is connected.

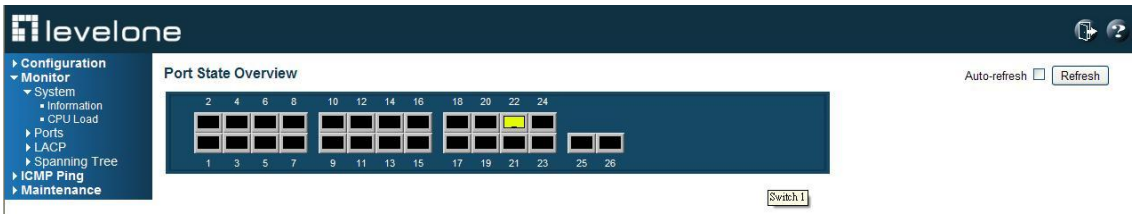


Figure 3-26 Port status

When you move the cursor over the appropriate port, the page will display the connection status or mode of each port. Clicking on the port will enter the detailed statistical information page of the corresponding port, to view the information about the port's receiving/sending packets.

Status	Disable	Not connected	Connected
RJ45 port			
SFP port			

Table 3-2 Description of port status

3.4.2.2 Traffic Overview

Page Wizard: Monitor—> Ports—> Traffic Overview

This page displays the summary of traffic statistics of all ports.

Port Statistics Overview

Auto-refresh ☐ Refresh Clear

Port	Packets		Bytes		Errors		Drops		Filtered
	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0
22	3289	5029	664178	665093	0	0	10	0	10
23	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0

Figure 3-27 Port flow overview

- **Port:** Displays the port number of the switch.
- **Packets:** Displays the number of incoming/outgoing packets from / to the corresponding ports.
- **Bytes:** Displays the number of incoming/outgoing bytes from / to the corresponding ports.
- **Errors:** Displays the number of error data frames received by the corresponding port, or the number of data frames failed to be sent.
- **Drops:** Displays the number of data frames discarded due to the blocked entry or exit of the corresponding ports.
- **Filtered:** Displays the number of data frames received by the corresponding port and filtered by the forwarding process.

3.4.2.3 Detailed Statistics

Page Wizard: Monitor—> Ports—> Detailed Statistics

This page can display detailed flow statistics for each port. Select a port number from the drop down box, to view the detailed statistics for this port. Statistical information is divided into three categories: Statistics of the total number of received/sent data packets, statistics of the length range of received/sent data frames, as well as statistics of sent/received errors.

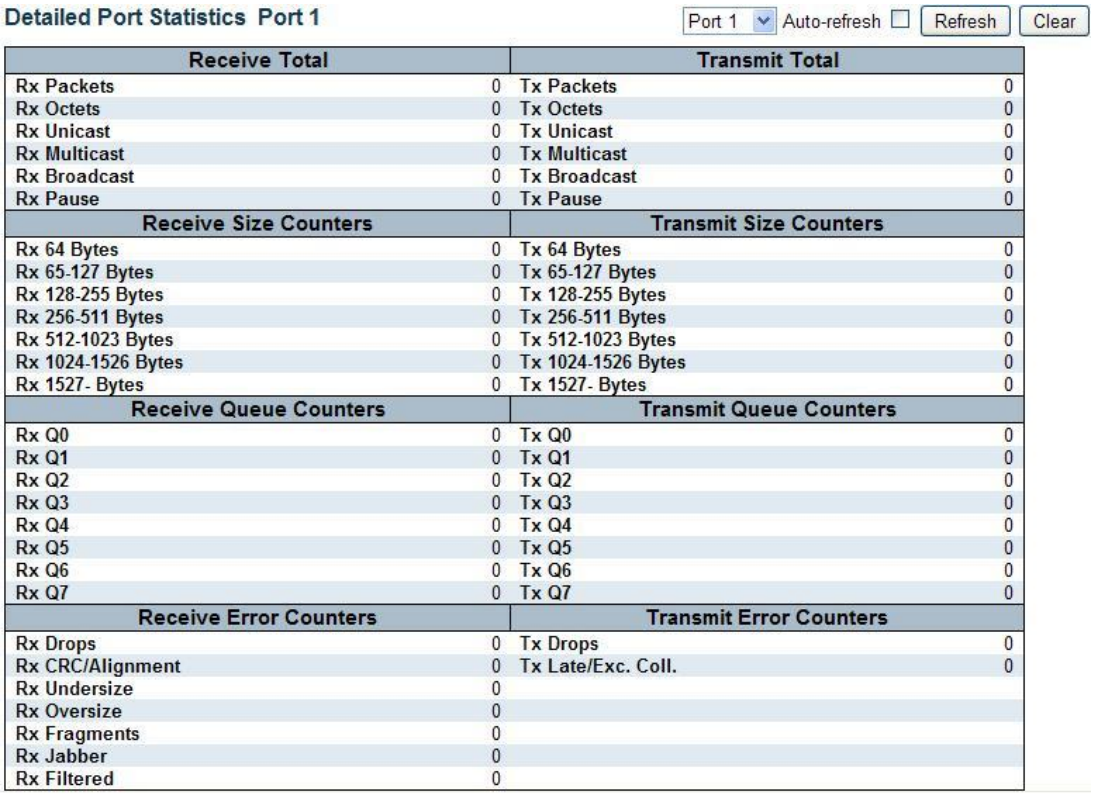


Figure 3-28 Statistics of port data

- Port: To select the port that needs to view detailed statistics.
- **Rx Packets:** Displays the number of incoming/outgoing packets from / to the port.
- **Rx Octets:** Displays the number of incoming/outgoing bytes from / to the port, including bad packets and FCS fields, but excluding framing bits.
- **Rx Unicast:** Displays the number of incoming/outgoing unicast packets (including error packets) from / to the port.
- **Rx Multicast:** Displays the number of incoming/outgoing multicast packets (including error packets) from / to the port.
- **Rx Broadcast:** Displays the number of incoming/outgoing broadcast packets (including error packets) from / to the port.
- **Rx Pause:** Displays the number of incoming/outgoing pause frames from / to the port.
- **Receive / Transmit Size Counters:** Displays the number of incoming/outgoing packets (including error packets) within the corresponding length ranges from / to the port.
- **Receive / Transmit Queue Counters:** Displays the number of incoming/outgoing packets from / to the port through the input / output queue.
- **Rx Dro**ps: Displays the number of data frames discarded by the port for such reasons as lack of buffer space for reception.
- **Rx CRC/Alignment:** Displays the number of CRCs or alignment error frames received by the port.
- **Rx Undersize:** Displays the number of data frames less than 64 bytes in length and with correct CRC received by the port.
- **Rx Oversize:** Displays the number of data frames received by the port, whose length is more than the allowable maximum frame length of the port and with correct CRC.
- **Rx Fragments:** Displays the number of data frames less than 64 bytes in length and with CRC checksum error received by the port.
- **Rx Jabber:** Displays the number of data frames received by the port, whose length is more than the allowable maximum frame length of the port and with CRC checksum error.
- **Rx Filtered:** Displays the number of data frames received by the port and filtered by the forwarding process.
- **Tx Drops:** Displays the number of data frames discarded by the port due to the lack

of buffer space for transmission.

- **Tx Late/Exc. Coll.:** Displays the number of data frames discarded by the port because of lag or excessive conflicts.

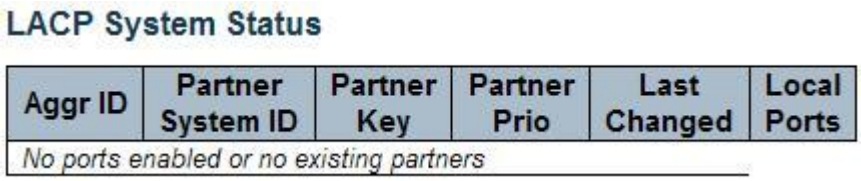
Tip: Refresh, clear button actions will only affect the currently selected port.

3.4.3 LACP

3.4.3.1 System Status

Page Wizard: Monitor—>LACP—> System Status

This page allows you to view the summary information for all the current dynamic aggregation groups.


LACP System Status

Aggr ID	Partner System ID	Partner Key	Partner Prio	Last Changed	Local Ports
No ports enabled or no existing partners					

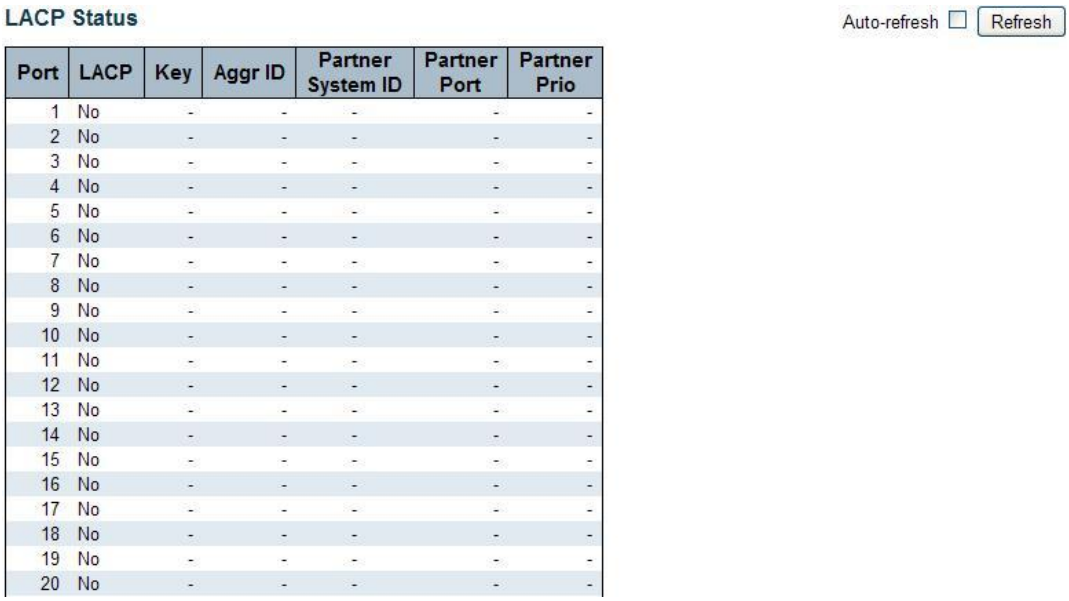
Figure 3-29 LACP system status information

- **Aggr ID:** Displays the aggregation group ID, which is assigned by the system automatically.
- **Partner System ID:** Displays the system ID of the peer device. Note that only the terminal device's MAC address is to be displayed.
- **Partner Key:** Displays the operation of the equipment assigned to the gathered group Key.
- **Partner Prio:** Displays the port priority of the peer port.
- **Last Changed:** Displays the elapsed time since the last time when the aggregation group changes.
- **Local Ports:** Displays the member ports at the local end of the aggregation group.

3.4.3.2 Port Status

Page Wizard: Monitor—>LACP—> Port Status

On this page, you can view the LACP port status information.


LACP Status

Auto-refresh Refresh

Port	LACP	Key	Aggr ID	Partner System ID	Partner Port	Partner Prio
1	No	-	-	-	-	-
2	No	-	-	-	-	-
3	No	-	-	-	-	-
4	No	-	-	-	-	-
5	No	-	-	-	-	-
6	No	-	-	-	-	-
7	No	-	-	-	-	-
8	No	-	-	-	-	-
9	No	-	-	-	-	-
10	No	-	-	-	-	-
11	No	-	-	-	-	-
12	No	-	-	-	-	-
13	No	-	-	-	-	-
14	No	-	-	-	-	-
15	No	-	-	-	-	-
16	No	-	-	-	-	-
17	No	-	-	-	-	-
18	No	-	-	-	-	-
19	No	-	-	-	-	-
20	No	-	-	-	-	-

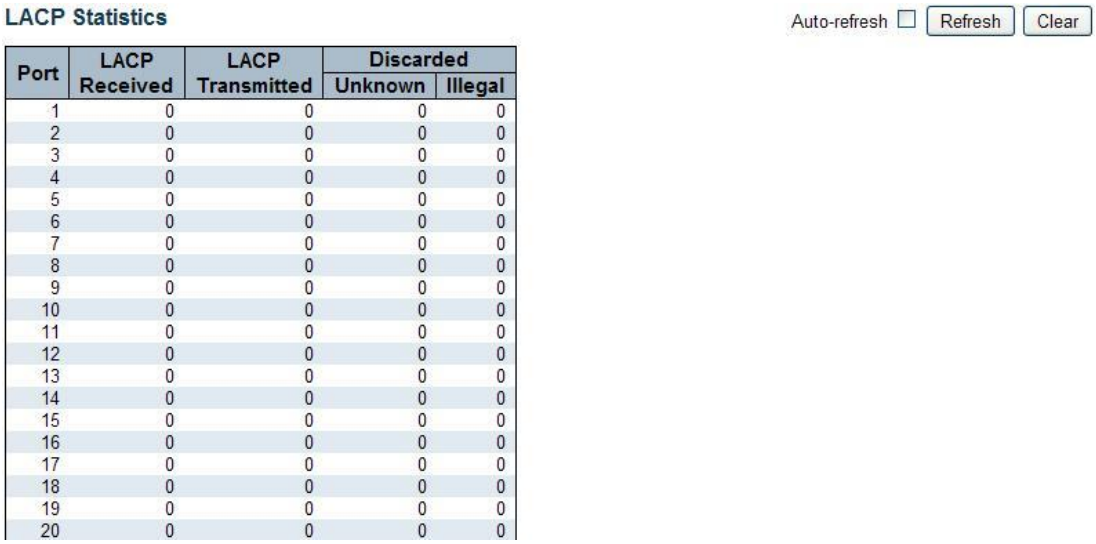
Figure 3-30 LACP port status information

- **Port:** Displays the port number of the switch.
- **LACP:** Displays the working status of the LACP on the port. "Enable" indicates that the protocol is enabled on the port, and the port link is Up. "Disable" indicates that the LACP Protocol is not enabled on the port or the port link is Down. "Standby" indicates that the port currently cannot join the aggregation group, but once there are other ports leaving the aggregation group, then it can join. Meanwhile, the LACP Protocol is disabled on this port.
- **Key:** Displays the port's operation Key. Only the ports with the same operation Key can be dynamically aggregated together.
- **Aggr ID:** Displays the aggregation group ID to which the port belongs.
- **Partner System ID:** Displays the system ID of the peer device. Note that only the terminal device's MAC address is to be displayed.
- **Partner port:** Displays the port number of the peer end of the link.
- **Partner Prio:** Displays the port priority of the peer port.

3.4.3.3 Port Statistics

Page Wizard: Monitor—>LACP—> Port statistics

This page allows you to display the LACP protocol packet statistics of the ports.


LACP Statistics

Auto-refresh ☐ Refresh Clear

Port	LACP Received	LACP Transmitted	Discarded	
			Unknown	Illegal
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0

Figure 3-31 Statistics of LACP port status

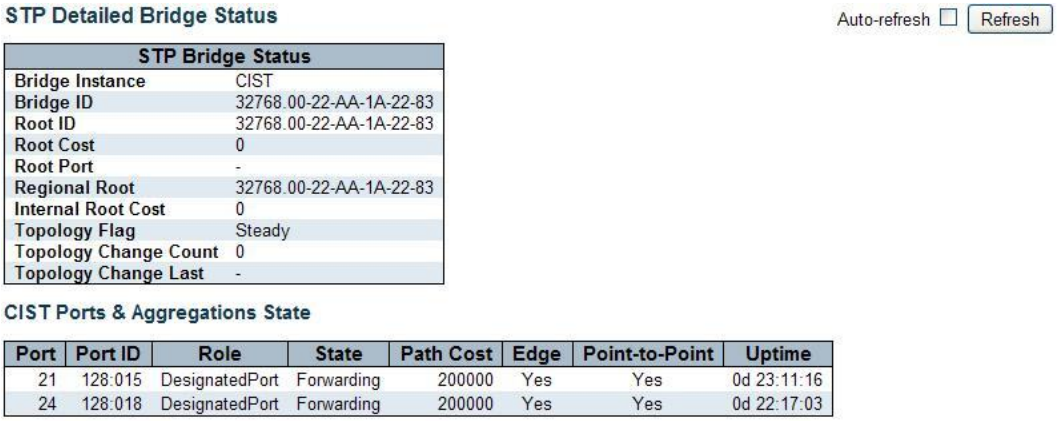
- **Port:** Displays the port number of the switch.
- **LACP Received:** Displays the number of the LACP packets received by the ports.
- **LACP Transmitted:** Displays the number of the LACP packets sent by the ports.
- **Discarded:** Displays the number of unknown and illegal LACP packets discarded by the ports.

3.4.4 Spanning Tree

3.4.4.1 Bridge Status

Page Wizard: Monitor—> Spanning Tree—> Bridge Status

This page allows you to view the detailed status information of a single instance of STP network bridge, and the status information about all the active ports associated with the network bridge instance.


STP Detailed Bridge Status

Auto-refresh ☐ Refresh

STP Bridge Status	
Bridge Instance	CIST
Bridge ID	32768.00-22-AA-1A-22-83
Root ID	32768.00-22-AA-1A-22-83
Root Cost	0
Root Port	-
Regional Root	32768.00-22-AA-1A-22-83
Internal Root Cost	0
Topology Flag	Steady
Topology Change Count	0
Topology Change Last	-

CIST Ports & Aggregations State

Port	Port ID	Role	State	Path Cost	Edge	Point-to-Point	Uptime
21	128:015	DesignatedPort	Forwarding	200000	Yes	Yes	0d 23:11:16
24	128:018	DesignatedPort	Forwarding	200000	Yes	Yes	0d 22:17:03

Figure 3-32 Detailed STP network bridge status information

STP Bridge Status

- **Bridge Instance:** Displays the specific network bridge instance viewed currently: CIST, MSTI, …
- **Bridge ID:** Displays the bridge ID of the network bridge instance.
- **Root ID:** Displays the bridge ID currently selected as the root bridge.
- **Root Cost:** Displays the root path overhead. For the root bridge, this value is 0.

For other network bridges (switches), the value is the sum of all port path overheads on the best path (that is, the shortest path) to the root bridge.

- ✧ **Root port:** Displays the port number selected as the root port.
- ✧ **Regional Root:** Displays the network bridge ID currently selected as the zone root bridge (located within the MSTP domain of this network bridge) .This parameter only applies to the CIST instances.
- ✧ **Internal Root Cost:** Displays the zone root path overhead. For the zone root bridge, this value is 0. For other network bridges located on the CIST instances of the same MSTP domain, the value is the sum of all port path overheads on the best path (that is, the shortest path) to the zone root bridge. This parameter only applies to the CIST instances.
- ✧ **Topology Flag:** Displays the current status of topology change signature of network bridge instances. "Steady," indicates the topology is stable; "Changing" indicates the topology is in change.
- ✧ **Topology Change Count:** Displays the total number of changes that STP topology have occurred.
- ✧ **Topology Change Last:** Displays the elapsed time since the last time when the topology changes.

CIST Ports & Aggregations State

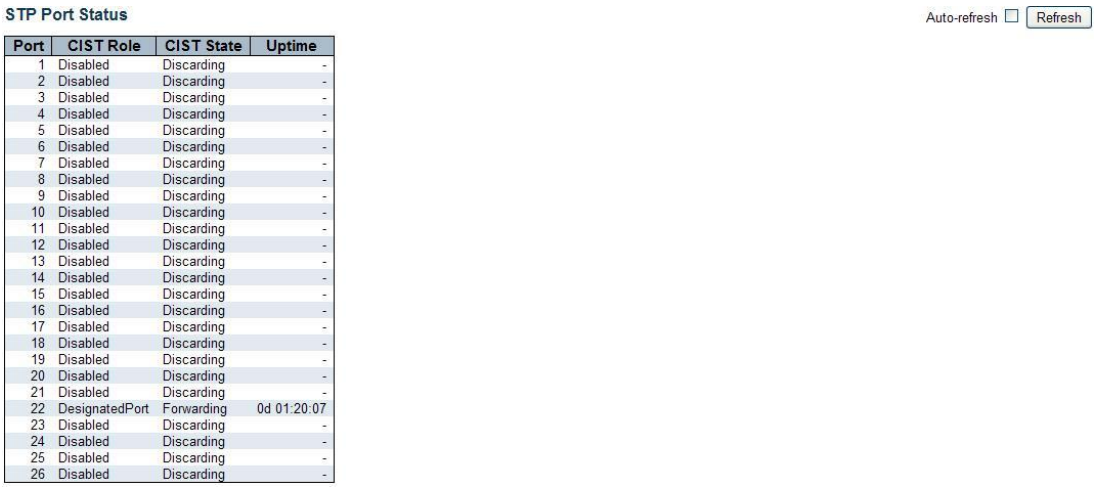
- ✧ **Port:** Displays the port number of the switch.
- ✧ **Port ID:** Displays the port ID, which consists of port priority and logical port index.
- ✧ **Role:** Displays the role that the port currently plays. Possible port roles may include: Alternate Port, Backup Port, Root Port, Designated Port or Disable port.
- ✧ **State:** Displays the current working status of the port. Possible port status includes: Discarding, Learning or Forwarding.
- ✧ **Path Cost:** Displays the current path overhead values of the port. This value can be calculated automatically by the system or may be manually configured by the user.
- ✧ **Edge:** Displays whether the port is currently as an edge port. This value can be identified automatically by the system or may be manually configured by the user. Edge ports are those directly connected to the user terminal, but not connected to the other switches. Since the changes in the edge port status will not cause a loop, so you can directly enter the forwarding status without any delay.
- ✧ **Point-to-Point:** Displays whether the port is currently connected to a point-to-point link. It can be detected and determined automatically by the system or may be manually configured by the user. The two ports connected with the point-to-point links can be quickly migrated to the forwarding status, thus reducing the time of unnecessary forwarding latency.
- ✧ **Uptime:** Displays the time since the port has been initialized last time.

3.4.4.2 Port Statistics

Page Wizard: Monitor—> Spanning Tree—> Port Statistics

This page allows you to view the STP port status information of the switch.

- ✧ **Port:** Displays the port number of the switch.
- ✧ **CIST Role:** Displays the role that the port currently plays in the spanning tree. Port roles may include: Alternate Port, Backup Port, Root Port, Designated Port or Disable port.
- ✧ **CIST State:** Displays the working status of the port. Port status may include: Discarding, Learning or Forwarding.
- ✧ **Uptime:** Displays the time since the port has been initialized last time.


STP Port Status

Auto-refresh ☐ Refresh

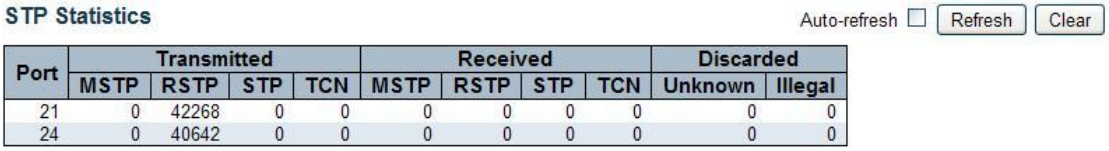
Port	CIST Role	CIST State	Uptime
1	Disabled	Discarding	-
2	Disabled	Discarding	-
3	Disabled	Discarding	-
4	Disabled	Discarding	-
5	Disabled	Discarding	-
6	Disabled	Discarding	-
7	Disabled	Discarding	-
8	Disabled	Discarding	-
9	Disabled	Discarding	-
10	Disabled	Discarding	-
11	Disabled	Discarding	-
12	Disabled	Discarding	-
13	Disabled	Discarding	-
14	Disabled	Discarding	-
15	Disabled	Discarding	-
16	Disabled	Discarding	-
17	Disabled	Discarding	-
18	Disabled	Discarding	-
19	Disabled	Discarding	-
20	Disabled	Discarding	-
21	Disabled	Discarding	-
22	DesignatedPort	Forwarding	0d 01:20:07
23	Disabled	Discarding	-
24	Disabled	Discarding	-
25	Disabled	Discarding	-
26	Disabled	Discarding	-

Figure 3-33 Port Statistics

3.4.4.3 Port Statistics

Page Wizard: Monitor—> Spanning Tree—> Port Statistics

This page allows you to view the STP port statistics of the switch.


STP Statistics

Auto-refresh ☐ Refresh Clear

Port	Transmitted				Received				Discarded	
	MSTP	RSTP	STP	TCN	MSTP	RSTP	STP	TCN	Unknown	Illegal
21	0	42268	0	0	0	0	0	0	0	0
24	0	40642	0	0	0	0	0	0	0	0

Figure 3-34 Port Statistics

- **Port:** Displays the port number of the switch.
- **RSTP:** Displays the number of configuration BPDU packets of the RSTP received / sent by the ports.
- **STP:** Displays the number of configuration BPDU packets of the STP received / sent by the ports.
- **TCN:** Displays the number of TCN (Topology Change Notification) BPDU packets received / sent by the ports.
- **Unknown:** Displays the number of the unknown BPDU packets discarded after being received by the ports.
- **Illegal:** Displays the number of the illegal BPDU packets discarded after being received by the ports.

3.5 ICMP Ping

Page Wizard: ICMP Ping—>Ping

This page provides the ICMP Ping testing function, through which you can detect network connectivity and locate network failures.

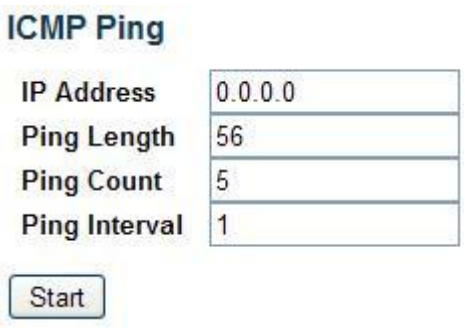


Figure 3-35 ICMP Ping

- **IP address:** To set the IP address of the destination node to be detected.
- **Ping Length:** To set the length of the ICMP packet (excluding the IP and ICMP headers) to be sent. Value range is 2~1452 bytes.
- **Ping Count:** To set the number of times that ICMP packets are sent, whose range of value is 1~60 times.
- **Ping Interval:** To set the time intervals for sending ICMP packets. Value range is 0~30 seconds.
- Start: Click on the button, and the device begins to send ICMP packets.
- Ping again: Click this button to continue to perform the Ping diagnosis.

Click on the "Start" button to begin performing the Ping test, which proceeds as follows: The switch will send an ICMP echo request (ECHO-REQUEST) packet to the target device, and if network connection is normal, the switch will receive the ICMP echo reply (ECHO-REPLY) from the target end within the timeout time, and output the related statistical information to the WEB page (as shown in Figure 3-38). If the network connection is exceptional, it will output the prompt information such as destination address cannot be reached or time-out occurs, etc. Throughout the process, the system will automatically refresh the page until all the ICMP response packets are received or until time-out occurs.

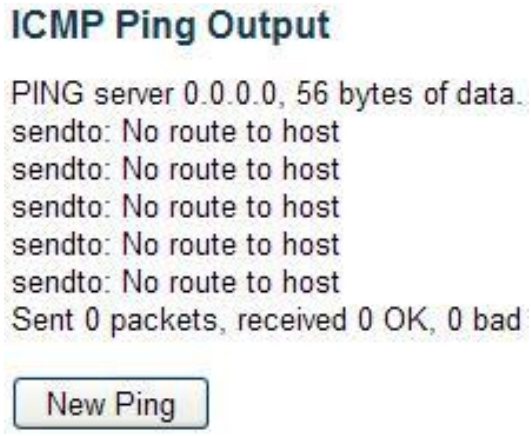


Figure 3-36 ICMP Ping Output

3.6 Maintenance

3.6.1 Restart Device

Page Wizard: Maintenance—> Restart Device

On this page, you can restart the switch. If you are sure to reboot the device, please click "Yes" button.

Figure 3-37 Restart Device

3.6.2 Factory Defaults

Page Wizard: Maintenance—> Factory Defaults

In this page, you can restore the switch to its factory configuration. If you determine to restore the device to its factory configuration, please click "Yes" button, and reset the configuration to take effect immediately, but need not to restart it. The factory default management IP address of the switch is: 192.168.1.1.

Figure 3-38 Factory Defaults

Note: Restoring the factory defaults may also be looped back to Port 1 and Port 2 physically within the first one minute after the switch restarts Within the first one minute after startup, the "Echo" packet will be sent to Port 1, and if Port 2 also receives the "Echo" packet, the switch will restore to its factory defaults.

3.6.3 Firmware Update

Page Wizard: Maintenance—> Firmware Update

In this page, you can upgrade firmware for the switch.

Figure 3-39 Firmware Update

After starting the upgrade process, this page will display the status of firmware update, and the upgrade process will take about one minute. Switch will automatically restart after the upgrade is complete.

Warning: During the upgrade, the LED on the front panel will flash green (10 times per second). In the meantime, do not do anything on the WEB page, or else the firmware

upgrades may be interrupted; do not disconnect the power, shut down or reboot the switch, otherwise it will cause damage to the switch, making it fail to work properly.

- Upgrade: first, click on "Browse" to select the upgrade files, and then click on "Upgrade" again.

3.6.4 Configuration management

Page Wizard: Maintain—> Configuration management—> Import / Export

This page allows you to export/import the configuration file (XML format) of the switch.

- **Save:** Click on this button to export the configuration files of the switch and save them to your local computer.
- **Upload:** First select the configuration files to be imported, then click "Import" button, to import the profiles into the switch.

3.7 Log out

If you are sure you want to exit your system, please go to this page and click on "Yes".

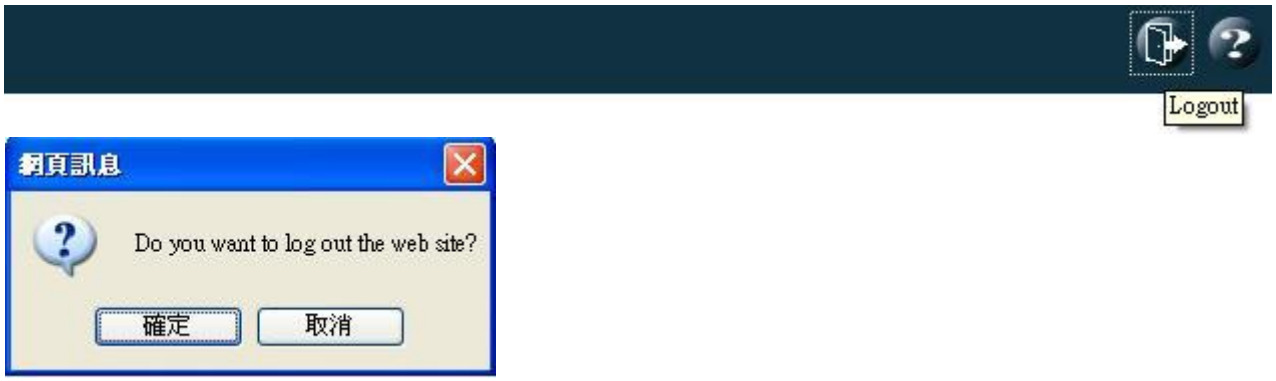


Figure 3-40 Exit the system

Appendix A Decimal ASCII code table

DEC	32	33	34	35	36	37	38	39	40	41	42	43
Characters	Space	!	"	#	$	%	&	'	(	)	*	+
DEC	44	45	46	47	48	49	50	51	52	53	54	55
Characters	,	-	.	/	0	1	2	3	4	5	6	7
DEC	56	57	58	59	60	61	62	63	64	65	66	67
Characters	8	9	:	;	<	=	>	?	@	A	B	C
DEC	68	69	70	71	72	73	74	75	76	77	78	79
Characters	D	E	F	G	H	I	J	K	L	M	N	O
DEC	80	81	82	83	84	85	86	87	88	89	90	91
Characters	P	Q	R	S	T	U	V	W	X	Y	Z	[
DEC	92	93	94	95	96	97	98	99	100	101	102	103
Characters	\	]	^	_	`	a	b	c	d	e	f	g
DEC	104	105	106	107	108	109	110	111	112	113	114	115
Characters	h	i	j	k	l	m	n	o	p	q	r	s
DEC	116	117	118	119	120	121	122	123	124	125	126	
Characters	t	u	v	w	x	y	z	{	|	}	~	

Appendix B Figure Index