BLACK BOX®

Industrial Managed Gigabit Ethernet Switch

User Manual

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Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Instrucciones de Seguridad
(Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    - A: El cable de poder o el contacto ha sido dañado; u
    - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    - C: El aparato ha sido expuesto a la lluvia; o
    - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    - E: El aparato ha sido tirado o su cubierta ha sido dañada.

Table of Contents

1. Specifications

Technology

Address Table Size	8K
Distance	Copper Ethernet ports: 328 ft. (100m); SFP: Depends on SFP
Forwarding and Filtering Rate	14,880 pps for 10 Mbps, 148,810 pps for 100 Mbps, 1,488,810 pps for 1000 Mbps
Packet Buffer Memory	2 Mbits
Priority Queues	(4)s
Processing Type	Store-and-Forward; Half-duplex back-pressure; IEEE 802.3x full-duplex flow control
Management	RS-232 console (RJ-45), Telnet, SNMP v1, v2, and v3, RMON, Web browser, and TFTP management
Security	Port-based network access control (802.1x); VLAN (802.1Q) to segregate and secure network traffic; Radius centralized password management; SNMPv3 encrypted authentication and access security
Switch Properties	
Switching Latency	7 µs
Switching Bandwidth	16 Gbps
Maximum Number of Available VLANs	4096
IGMP Multicast Groups	1024
Port Rate Limiting	User-defined
Interface	
Connectors	(4) RJ-45 10/100/1000, auto MDI/MDI-X ports; (4) 100/100BASE-X RJ-45 with SFP combo ports
Console Port	(1) RJ-45 RS-232
Physical	
Alarm Contact	(1) Relay output with current 1A @ 24 VDC
Enclosure	IP-30 aluminum
Indicators	(3) Power LEDs: Power Status, Power 1, Power 2, (1) Ring Master LED, (1) Ring Enabled LED, (1) Fault LED, (4) SFP Link/Act LEDs for fiber uplink ports, (4) RJ-45 Link/Act LEDs, (4) Speed LEDs for LAN ports;
Power	Power input: (2) power inputs on 6-pin terminal blocks: 12 to 48 VDC; Consumption: 21 watts *NOTE: The switch supports overload current protection and reverse polarity protection.*
Environmental	Temperature: Operating: -40 to +158° F (-40 to +70° C); Storage: -40 to +185° F (-40 to +85° C)
Dimensions	6.05"H x 2.93"W x 4.3"D (15.36 x 7.43 x 10.92 cm)
Weight	2.36 lb. (1.08 kg)

Approvals	Standards: IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-T, 100BASE-FX, IEEE 802.3ab 1000BASE-T, IEEE 802.3z 1000BASE-SX/LX, IEEE 802.3x for flow control, IEEE 802.3ad for LACP (Link Aggregation Control Protocol), IEEE 802.1D for STP (Spanning Tree Protocol), IEEE 802.1p for COS (Class of Service), IEEE 802.1Q for VLAN tagging, IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol), IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol), IEEE 802.1x for Authentication, IEEE 802.1AB for LLDP (Link Layer Discovery Protocol); LPH2000 Series also has: IEEE 802.3at PoE specification (up to 30 watts for PSE), IEEE 1588v2 clock synchronization; Compliance: EMI: FCC Part 15, Class A EN61000-6-4, EN55022, EN61000-3-2, EN61000-3-3 EMS: EN61000-4-2 (ESD), EN61000-4-3 (radiated RFI), EN61000-4-4 (burst), EN61000-4-5 (surge), EN61000-4-6 (induced RFI), EN61000-4-8 (magnetic field), IEC60068-2-32 (free fall)

2. Overview

2.1 Introduction

The LEH2004A-4GSFP is a powerful Industrial Managed Gigabit Ethernet Switch. The switch can work in a wide range of temperatures, dusty environments, and humid conditions. You can manage the switches via Web, Telnet, console, or third-party SNMP software, or via the included software utility. Configure multiple switches at the same time and monitor their status.

2.2 Features

2.2.1 Software

- World's fastest redundant Ethernet ring: recovery time is less than 20 ms with more than 250 units connected.
- Supports ring coupling, dual homing over redundant Ethernet ring technology.
- Supports SNMPv1/v2c/v3 and RMON and port-based/802.1Q VLAN network management.
- Notifies you of events via email, SNMP trap, and relay output.
- Web-based, Telnet, console, CLI configuration.
- Enable/disable ports, MAC based port security.
- Port based network access control (802.1x).
- Uses VLAN (802.1q) to segregate and secure network traffic.
- Radius centralized password management.
- SNMPv3 encrypted authentication and access security.
- RSTP (802.1w).
- Quality of Service (802.1p) for real-time traffic.
- VLAN (802.1q) with double tagging and GVRP supported.
- IGMP Snooping for multicast filtering.
- Port configuration, status, statistics, mirroring, security.
- Remote Monitoring (RMON).

2.2.2 Hardware Features

- Has three redundant DC power inputs.
- Operating temperature is -40 to +158° F (-40 to +70° C), storage temperature is -40 to +185° F (-40 to +85° C).
- Operating humidity is 5% to 95%, non-condensing.
- Casing: IP-30.
- (4) RJ-45 10/100/1000, auto MDI/MDI-X ports;
  (4) 100/100BASE-X RJ-45 with SFP combo ports

2.3 What's Included

- (1) Industrial Managed Gigabit Ethernet Switch (LEH2004A-4GSFP)
- (8) dust covers (RJ-45)
- (4) dust covers (SFP)
- (5) M3 flat screws
- (1) 6-pin terminal block
- (1) wallmount plate
- (1) console cable RJ-45 to DB9
- (1) 66-mm DIN rail kit (attached)
- (1) Quick Start Guide

To download this user manual from our Web site:

1. Go to www.blackbox.com
2. Enter the part number (LEH2004A-4GSFP) in the search box:
3. Click on the "Resources" tab on the product page, and select the document you wish to download.

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2.4 Hardware Description

2.4.1 Industrial Managed Gigabit Ethernet Switch - 4-Port RJ-45, 4-Port Combo RJ-45/SFP (LEH2004A-4GSFP)

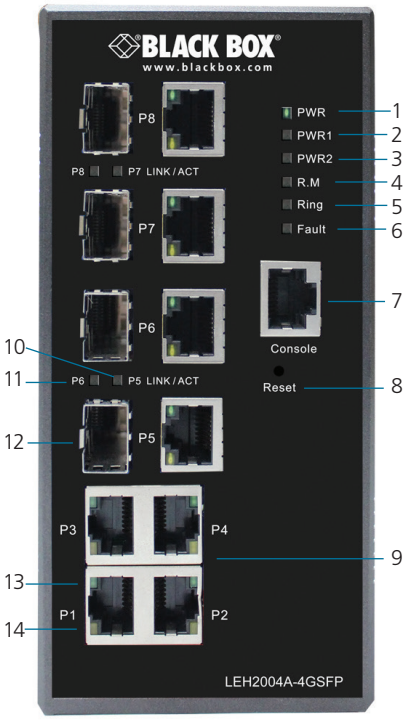


Figure 2-1. LEH2004A-4GSFP front panel.

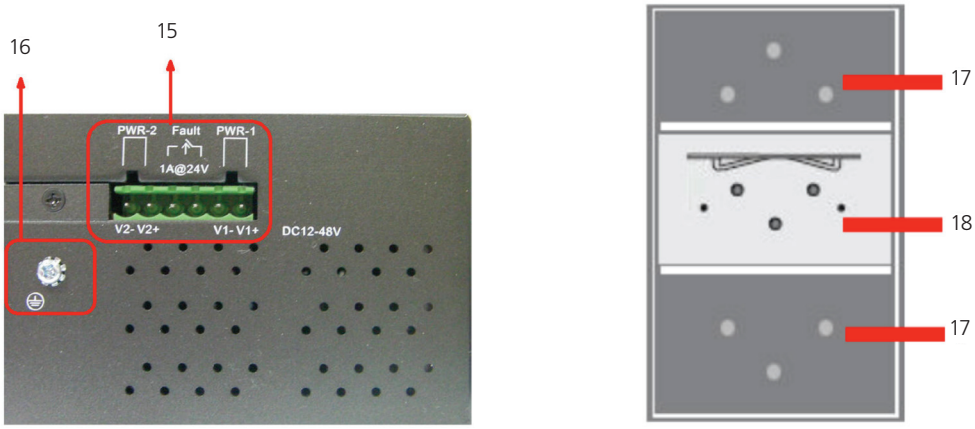


Figure 2-2. LEH2004A-4GSFP top panel and back panel.

Table 2-1. LEH2004A-4GSFP components.

Number in Figure 2-1 and 2-2	Component	Description
1	PWR status LED	Lights green when the power module is ON.
2	PWR1 LED	Lights green when the DC power module 1 is ON.
3	PWR2 LED	Lights green when the DC power module 2 is ON.
4	Ring Master status LED	Lights green when Ring Master is ON.
5	Ring status LED	Blinks green slowly when the switch has only one link. Blinks green fast when the ring is working correctly.
6	Fault relay LED	Lights amber when the power fails or the port is down.
7	RJ-45 console port	Links to an RS-232 serial console to manage switch.
8	Reset button	Push the button 3 seconds for reset; 5 seconds for factory default.
9	(4) Gigabit LAN ports	10/100/1000BASE-T(X) RJ-45 fast Ethernet ports support auto-negotiation. Default Settings: Speed: auto Duplex: auto Flow control: disable
10	Link/Act LED for SFP ports	Lights green ON when the port link is up. Blinks green when data is transmitted.
11	Link/Act LED for Gigabit LAN ports	Lights green ON when the port link is up. Blinks green when data is transmitted.
12	(4) Gigabit combo ports	10/100/1000Base-T(X) RJ-45 + 100/1000Base-X SFP Ports
13	Indicators for LAN ports	
14	Speed LED for LAN ports	Lights amber ON when the port is working under 100 Mbps.
15	Terminal block	Includes PWR1, PWR2 (48-VDC)
16	Ground wire	
17	Screw holes for wallmount kit	Use to mount the switch on a wall.
18	DIN rail kit	Use to mount the switch on a DIN rail.

3. Hardware Installation

3.1 Installing the Switch on a DIN Rail

The switch includes a DIN rail kit. To install the switch on a DIN rail, follow these steps.

Step 1: Slant the switch and mount the metal spring to the DIN rail.

Figure 3-1. Mount the switch on a DIN rail, step 1.

Step 2: Push the switch toward the DIN rail until you hear a “click” sound.

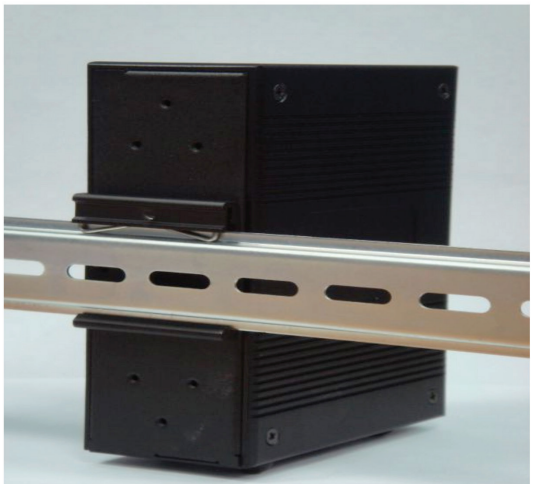


Figure 3-2. Mount the switch on a DIN rail, step 2.

3.2 Installing the Switch on a Wall

The switch includes a wallmount panel. Follow these steps to install the switch on a wall.

Step 1: Remove the DIN rail kit from the back of the switch.

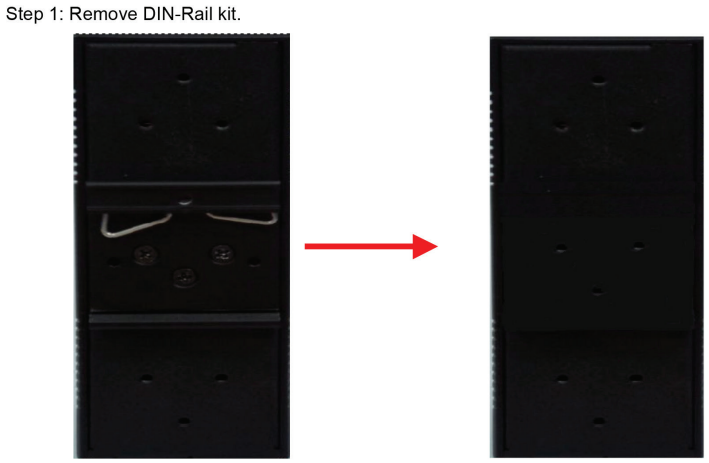


Figure 3-3. Install the switch on a wall, step 1.

Step 2: Use six screws (included) to install the wall mount panel.

Figure 3-4. Wallmount panel.

The screws are shown in the following pictures. To protect the switches from damage, use the M3 screws provided.

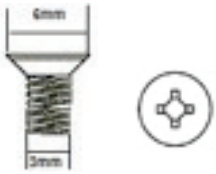


Figure 3-5. Screws.

3.3 Cables

3.3.1 Ethernet Cables

The LEH2004A-4GSFP switches have standard Ethernet ports. According to the link type, the switches use CAT 3, 4, 5, 5e UTP cables to connect to any other network device (PCs, servers, switches, routers, or hubs). Refer to the following table for cable specifications.

Table 3-1. Cable types and specifications.

Cable	Type	Max. Length	Connector
10BASE-T	CAT3, 4, 5, 100-ohm	UTP 328 feet (100 meters)	RJ-45
100BASE-TX	CAT5, 100-ohm UTP	UTP 328 feet (100 meters)	RJ-45
1000BASE-TX	CAT5, 5e, 100-ohm UTP	UTP 328 feet (100 meters)	RJ-45

1000BASE-T/100BASE-TX/10BASE-T Pin Assignments

With 100BASE-TX/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 are used for receiving data.

Table 3-2. 10/100BASE-TX RJ-45 pin assignments.

Pin Number	Assignment
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used

The LEH2004A-4GSFP switches support auto MDI/MDI-X operation. You can use a straight-through cable to connect a PC to the switch. The following table shows the 10BASE-T/100BASE-TX MDI and MDI-X port pinouts.

Table 3-3. 10/100BASE-TX MDI/MDI-X pins assignments.

Pin Number	MDI Port	MDI-X Port
1	TD+ (transmit)	RD+ (receive)
2	TD- (transmit)	RD- (receive)
3	RD+ (receive)	TD+ (transmit)
4	Not used	Not used
5	Not used	Not used
6	RD- (receive)	TD- (transmit)
7	Not used	Not used
8	Not used	Not used

NOTE: The "+" and "-" represent the polarity of the wires that make up each wire pair.

Table 3-4. 1000BASE-TX MDI/MDI-X Pin Assignments

Pin Number	MDI Port	MDI-X Port
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

NOTE: "+" and "-" signs represent the polarity of the wires that make up each wire pair.

3.3.2 Console Cable

The Industrial Managed Gigabit Ethernet Switches can be managed via an RJ-45 console port. A DB9 to RJ-45 cable is included in the package.

You can connect the switch to a PC via a RS-232 cable with a DB9 female connector. The other end (RJ-45 connector) connects to the console port on the switch.

Table 3-5. Console Cable pinouts.

PC pin out (male) assignment	RS-232 with DB9 female connector	DB9 to RJ-45
Pin #2 RD	Pin #2 TD	Pin #2
Pin #3 TD	Pin #3 RD	Pin #3
Pin #5 GD	Pin #5 GD	Pin #5

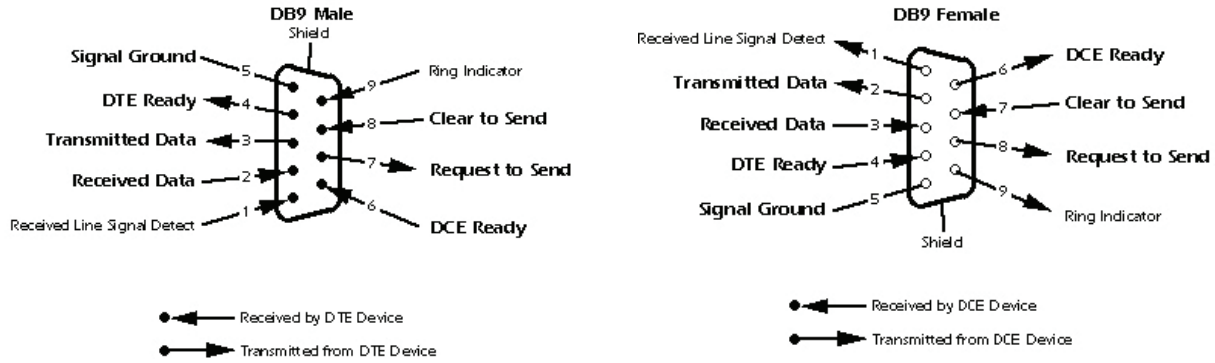


Figure 3-6. Console cable pinout.

3.4 Compatible SFPs

The switch has fiber optic ports with SFP connectors. These ports operate uisng multimode (0 to 550 m, 850 nm with 50/125 µm, 62.5/125 µm fiber) cable and in single-mode with LC connector. Remember that the TX port of Switch A should be connected to the RX port of Switch B.

Table 3-6. SFP Modules.

Product Code	Description
LFP401	SFP, 155-Mbps Fiber with Extended Diagnostics, 850-nm Multimode, LC, 2 km
LFP402	SFP, 155-Mbps Fiber with Extended Diagnostics, 1310-nm Multimode, LC, 2 km
LFP403	SFP, 155-Mbps Fiber with Extended Diagnostics, 1310-nm, Single-Mode, LC, 30 km
LFP404	SFP, 155-Mbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, Plus, LC, 60 km
LFP411	SFP, 1.25-Gbps Fiber with Extended Diagnostics, 850-nm Multimode, LC, 300 m
LFP412	SFP, 1.25-Gbps Fiber with Extended Diagnostics, 1310-nm Multimode, LC, 2 km
LFP413	SFP, 1.25-Gbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, LC, 10 km
LFP414	SFP, 1.25-Gbps Fiber with Extended Diagnostics, 1310-nm Single-Mode, LC, 30 km
LFP416	SFP with SGMII Interface, 1.25 Gbps, Copper, 10/100/1000BASE-T, Extended Diagnostics

4. Web-Based Browser Management

Figure 4-1. Warning.

4.1 Configuration by Web Browser

This section introduces the configuration by Web browser.

4.1.1 About Web-based Management

Inside the CPU board of the switch, an embedded HTML web site resides in flash memory. It contains advanced management features and allows you to manage the switch from anywhere on the network through a standard browser such as Microsoft Internet Explorer.

The Web-Based Management supports Internet Explorer 5.0. It is based on Java Applets with an aim to reduce network bandwidth consumption, enhance access speed and present an easy viewing screen.

NOTE: By default, IE5.0 or later version does not allow Java Applets to open sockets. You need to explicitly modify the browser setting to enable Java Applets to use network ports.

Preparing for Web Management

The default value is as below:

IP Address: 192.168.10.1

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.254

User Name: admin

Password: admin

System Login

1. Launch Internet Explorer.

2. Type http:// and the IP address of the switch. Press "Enter."

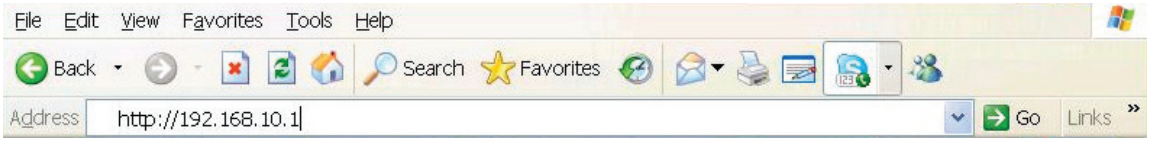


Figure 4-2a. Address bar.

3. The login screen appears.

4. Key in the username and password. The default username and password is "admin."

5. Click the "Enter" or "OK" button, and the main interface of the Web-based management appears.

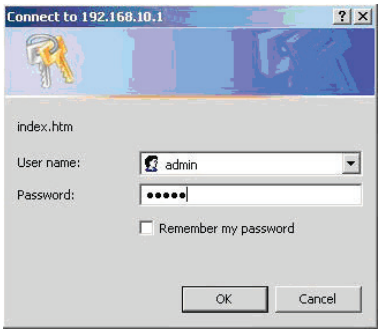


Figure 4-2b. Login screen.

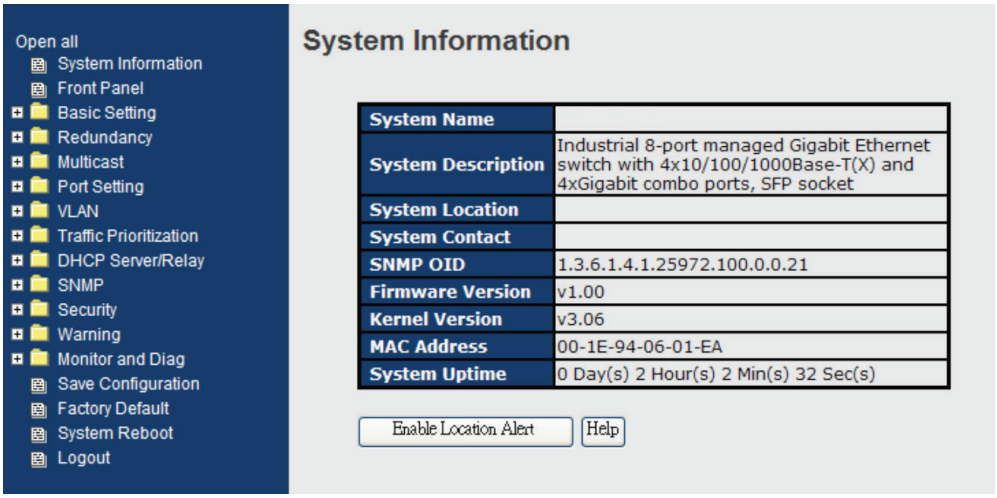
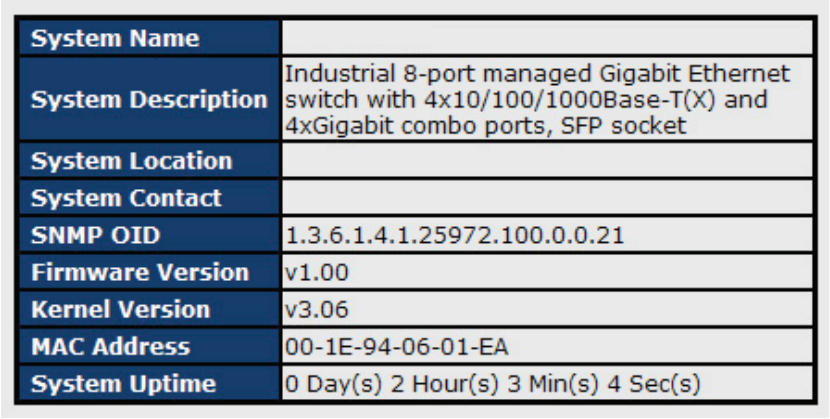


Figure 4-3. Main Interface screen.

4.1.2 System Information



System Name	
System Description	Industrial 8-port managed Gigabit Ethernet switch with 4x10/100/1000Base-T(X) and 4xGigabit combo ports, SFP socket
System Location	
System Contact	
SNMP OID	1.3.6.1.4.1.25972.100.0.0.21
Firmware Version	v1.00
Kernel Version	v3.06
MAC Address	00-1E-94-06-01-EA
System Uptime	0 Day(s) 2 Hour(s) 3 Min(s) 4 Sec(s)

Figure 4-4. System Information screen.

System Information

The system information will display the configuration of the Basic Setting/Switch Setting page.

Enable Location Alert

When you click the Enable Location Alert button, PWR1, PWR2, and PWR3 LEDs on the switch begin flashing. When you click "Disable Location Alert," the LEDs stop flashing.

4.1.3 Front Panel

The screen shows the front panel of the LEH2004A-4GSFP. Click "Close" to close the panel on the Web.

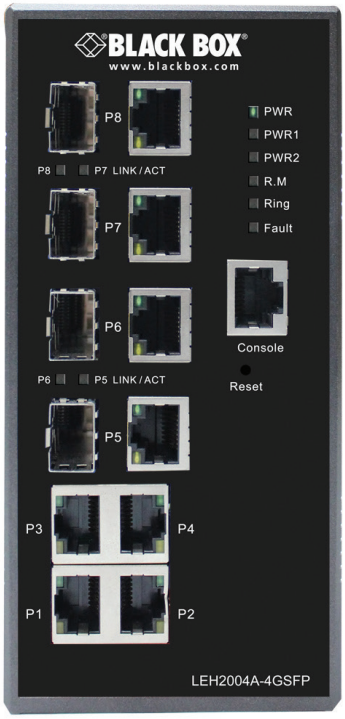


Figure 4-5. Front panel of the switch.

4.1.4 Basic Setting

4.1.4.1 Switch Setting

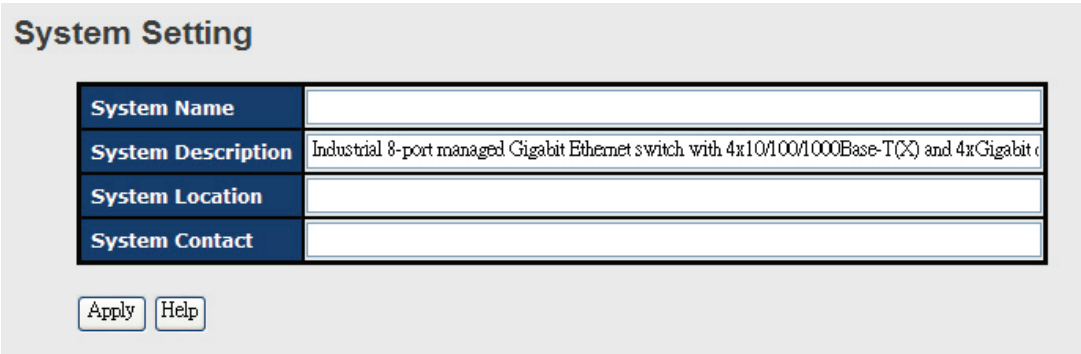


Figure 4-6. Switch setting interface screen.

Table 4-1. Switch setting interface screen components.

Field	Description
System Name	Assign the name of switch. The maximum length is 64 bytes.
System Description	Display the switch description.
System Location	Assign the switch physical location. The maximum length is 64 bytes.
System Contact	Enter the name of contact person or organization.

4.1.4.2 Admin Password

Change the Web management login username and password for security.

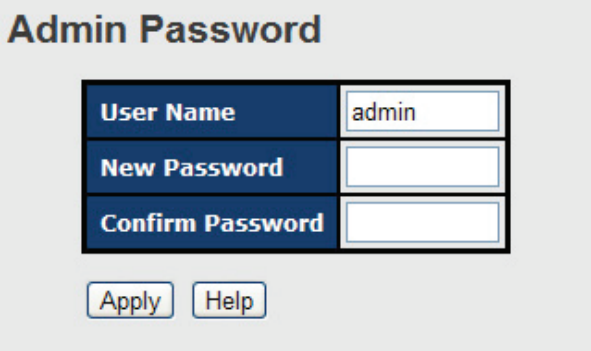


Figure 4-7. Admin Password screen.

Table 4-2. Admin password interface screen components.

Field	Description
User name	Key in the new username (The default is "admin.")
New Password	Key in the new password (The default is "admin.")
Confirm password.	Re-type the password.
Apply	Click "Apply" to set the configuration.

4.1.4.3 IP Setting

You can configure the IP Settings and DHCP client function through the IP configuration.

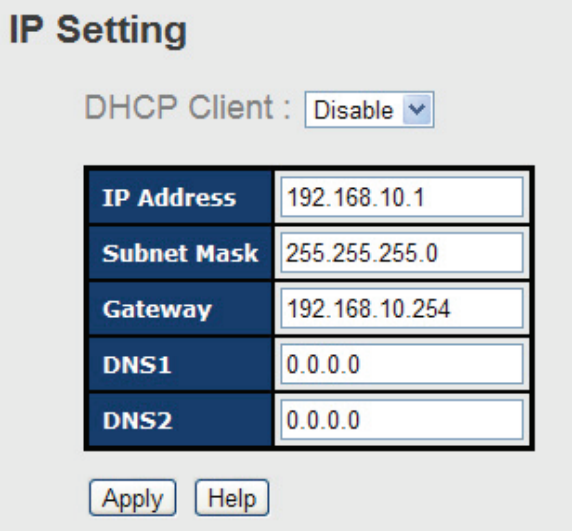


Figure 4-6. IP Setting interface screen.

Table 4-3. IP setting interface screen components.

Field	Description
DHCP Client	Enable or disable the DHCP client function. When DHCP client function is enabled, the switch will be assigned the IP address from the network DHCP server. The default IP address will be replaced by the IP address that the DHCP server has assigned. After clicking the "Apply" button, a popup dialog appears when the DHCP client is enabled. A new IP will be assigned to the DHCP server.
IP Address	Assign the IP address that the network is using. If the DHCP client function is enabled, you do not need to assign the IP address. The network DHCP server will assign the IP address for the switch and it will display in this column. The default IP is 192.168.10.1.
Subnet Mask	Assign the subnet mask of the IP address. If DHCP client function is enabled, you do not need to assign the subnet mask.
Gateway	Assign the network gateway for the switch. The default gateway is 192.168.10.254.
DNS1	Assign the primary DNS IP address.
DNS2	Assign the secondary DNS IP address.
Apply	Click "Apply" to set the configuration.

4.1.4.4 Time Setting

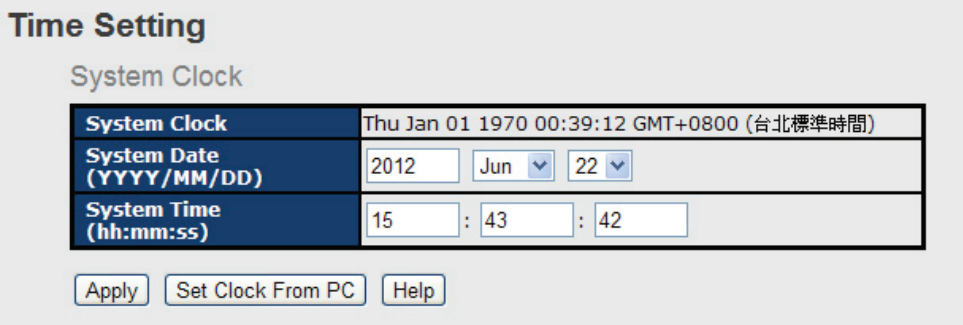


Figure 4-9. Time Setting screen.

Table 4-4. Time setting screen fields.

Field	Description
System clock	This field shows the current system time. The time stamp could be assigned by manual configuration or by SNTP server.
System Date	Specify the year, month, and day of system clock (YYYY/MM/DD). Year 2006-2015. Month Jan-Dec. Day 1–31 (28).
System Time	Specify the hour, minute, and second of the system clock (hh:mm:ss). Hour 0–24, Minute: 0–59, Second: 0–59

SNTP

The SNTP (Simple Network Time Protocol) settings allow you to synchronize switch clocks in the Internet.

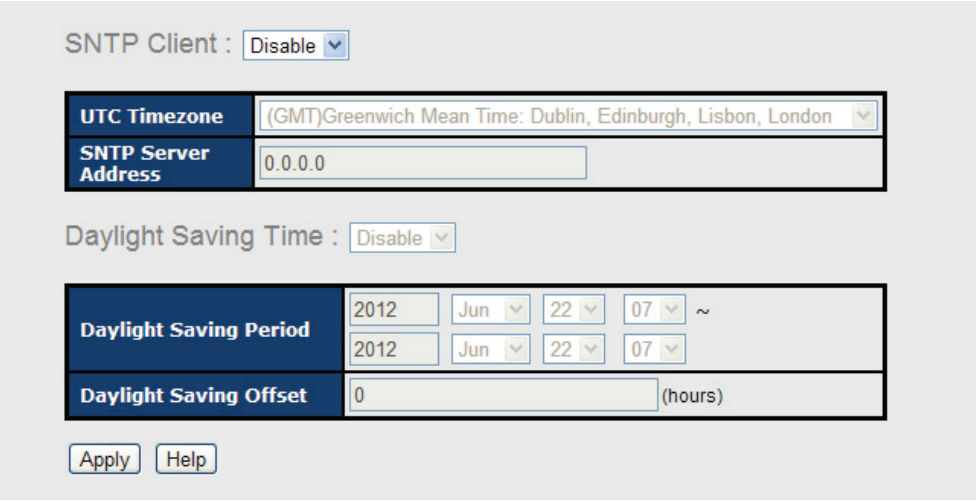


Figure 4-10. SNTP Configuration interface screen.

Table 4-5. SNTP parameters.

Field	Description
SNTP Client	Enable or disable SNTP function to get the time from the SNTP server.
Daylight Saving Time	Enable or disable daylight saving time function. When daylight saving time is enabled, you need to configure the daylight saving time period.
UTC Time zone	Set the switch location time zone. The following table lists the different location time zone for your reference.

Table 4-6. Time zones.

Local Time Zone	Conversion from UTC	Time at 12:00 UTC
November Time Zone	- 1 hour	11 am
Oscar Time Zone	-2 hours	10 am
ADT - Atlantic Daylight	-3 hours	9 am
AST - Atlantic Standard EDT - Eastern Daylight	-4 hours	8 am
EST - Eastern Standard CDT - Central Daylight	-5 hours	7 am
CST - Central Standard MDT - Mountain Daylight	-6 hours	6 am
MST - Mountain Standard PDT - Pacific Daylight	-7 hours	5 am
PST - Pacific Standard ADT - Alaskan Daylight	-8 hours	4 am
ALA - Alaskan Standard	-9 hours	3 am
HAW - Hawaiian Standard	-10 hours	2 am
Nome, Alaska	-11 hours	1 am
CET - Central European FWT - French Winter MET - Middle European MEWT - Middle European Winter SWT - Swedish Winter	+1 hour	1 pm
EET - Eastern European, USSR Zone 1	+2 hours	2 pm
BT - Baghdad, USSR Zone 2	+3 hours	3 pm
ZP4 - USSR Zone 3	+4 hours	4 pm
ZP5 - USSR Zone 4	+5 hours	5 pm
ZP6 - USSR Zone 5	+6 hours	6 pm
WAST - West Australian Standard	+7 hours	7 pm
CCT - China Coast, USSR Zone 7	+8 hours	8 pm
JST - Japan Standard, USSR Zone 8	+9 hours	9 pm
EAST - East Australian Standard GST Guam Standard, USSR Zone 9	+10 hours	10 pm
IDLE - International Date Line NZST - New Zealand Standard NZT - New Zealand	+12 hours	Midnight

Table 4-7.

Field	Description
SNTP Sever IP Address	Set the SNTP server IP address.
Daylight Saving Period	Set up the Daylight Saving beginning time and Daylight Saving ending time. Both will be different each year.
Daylight Saving Offset	Set up the offset time.
Switch Timer	Display the switch current time.
Apply	Click "Apply" to set the configuration.

PTP Client

The Precision Time Protocol (PTP) is a time-transfer protocol defined in the IEEE 1588-2002 standard that allows precise synchronization of networks (e.g., Ethernet). Accuracy within the nanosecond range can be achieved with this protocol when using hardware generated timestamps.

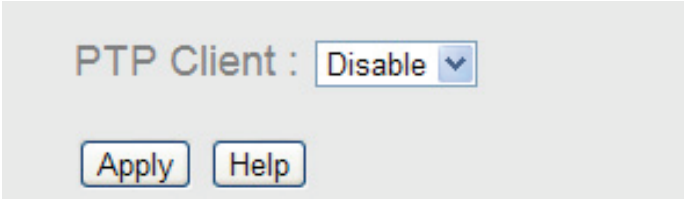


Figure 4-11. PTP Client screen.

Table 4-8. PTP Client screen setting.

Field	Description
PTP Client	Enable/Disable PTP Client

4.1.4.5 LLDP

LLDP (Link Layer Discovery Protocol) function allows the switch to advertise its information to other nodes on the network and store the information it discovers.

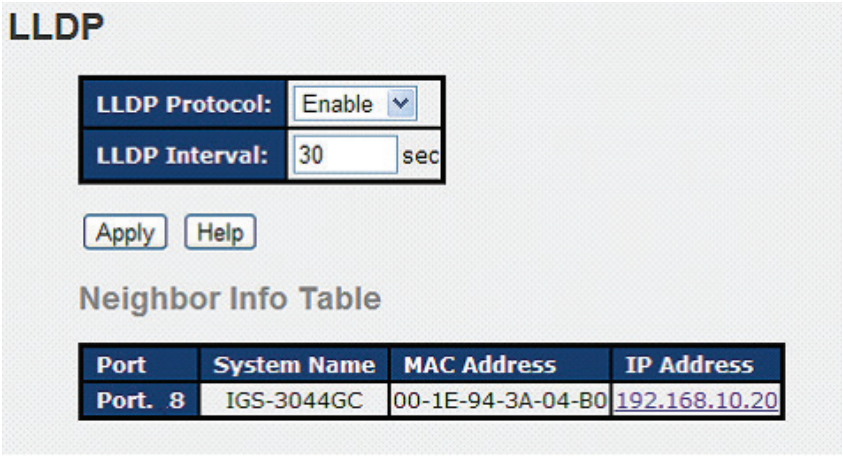


Figure 4-12. LLDP configuration interface screen.

Table 4-9. LLDP Configuration screen components.

Field	Description
LLDP Protocol	"Enable" or "Disable" LLDP function.
LLDP Interval	The time interval that the switch waits before it resends LLDP (the default setting is 30 seconds).
Apply	Click "Apply" to activate the configuration.
Help	Display the help file.
Neighbor info table	Can show neighbor device information.

4.1.4.6 Modbus TCP

The switch supports Modbus TCP. For more information about Modbus, go too http//www.modbus/org.

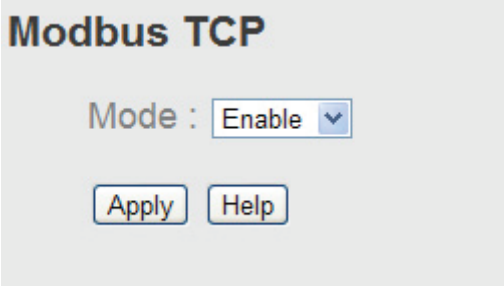


Figure 4-13. Modbus TCP screen.

Table 4-10. Modbus TCP screen.

Field	Description
Mode	Enable or Disable Modbus TCP function.
Apply	Click to apply the setting.
Help	Click to view the help screen.

4.1.4.7 Auto Provision

Auto Provision allows you to update the switch firmware automatically. You can put firmware or configuration file on TFTP server. When you reboot the switch, it will upgrade automatically. Before updating, make sure you have your TFTP server ready and the firmware image and configuration file is on the TFTP server.

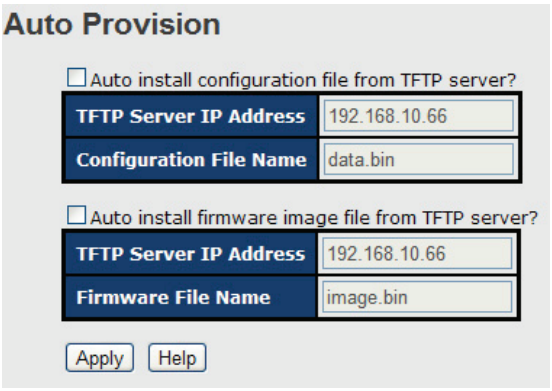


Figure 4-14. Auto Provision interface screen.

4.1.4.8 Backup and Restore

You can save the current EEPROM value from the switch to the TFTP server, then go to the TFTP restore configuration page to restore the EEPROM value.

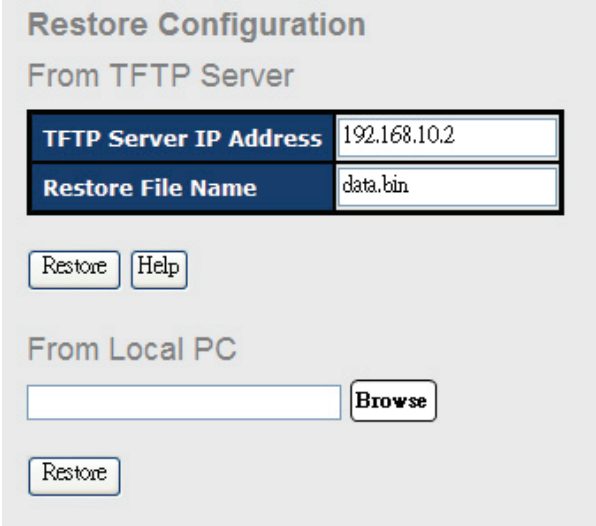


Figure 4-15. Restore Configuration interface screen.

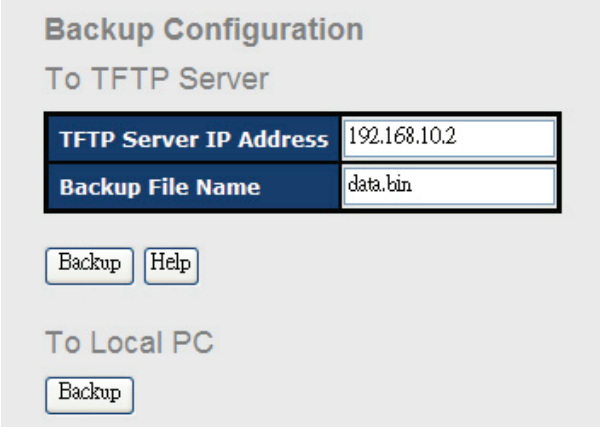


Figure 4-16. Backup Configuration interface screen.

Table 4-11. Backup and Restore interface screen components.

Field	Description
TFTP Server IP Address	Fill in the TFTP server IP.
Restore File Name	Fill in the file name.
Restore	Click "restore" to restore the configurations.
From Local PC	Select restore without needing an TFTP server.
Restore File Name	Fill in the file name.
Backup button	Go back to the previous setting.
Help	Click on this button for help.

4.1.4.9 Upgrade Firmware

Upgrade Firmware allows you to update the switch firmware. Before updating, make sure you have your TFTP server ready and the firmware image is on the TFTP server.

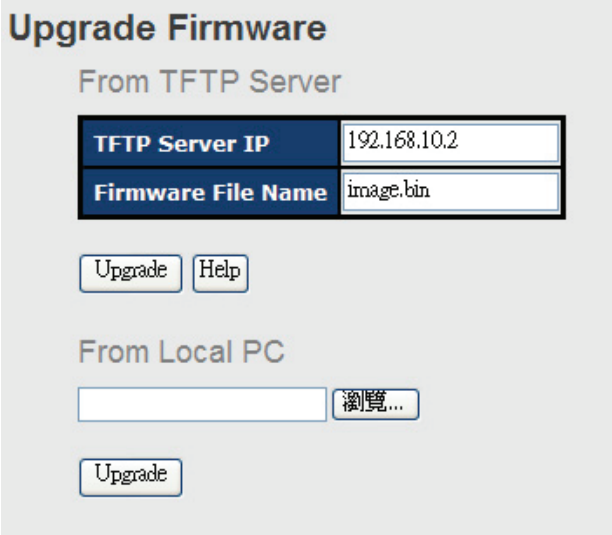


Figure 4-17. Upgrade Firmware interface screen.

4.1.5 Redundancy

4.1.5.1 MRP

MRP (Media Redundancy Protocol) Ring (IEC 62439) of up to 50 devices typically transforms back to a line structure within 80 ms (adjustable to max. 200 ms/500 ms).

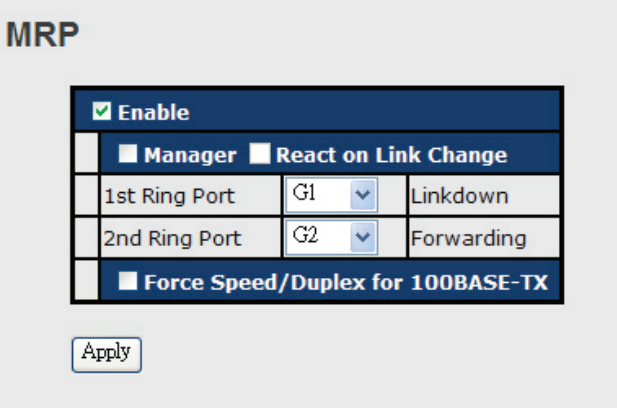


Figure 4-18. MRP screen.

Table 4-12. MRP screen fields.

Field	Description
Enable	Enable the MRP function.
Manager	For every MRP topology, you need to set one device as Manager. If you set two or more switches to as Manager, this MRP topology will fail.
React on Link Change (Advanced mode)	If you select this mode, the switch will converge faster. Only the MRP manager switch can be set to Advanced mode.
1st Ring Port	Choose the port that will connect to the MRP ring.
2nd Ring Port	Choose the port that will connect to the MRP ring.
Force Speed/Duplex for 100BASE-TX	The default setting for port speed/duplex is auto negotiation mode. When you enable this function, the MRP ring port duplex will automatically change to “Full” mode.

4.1.5.2 B-Ring

B-Ring recovery time is less than 20 ms. It can reduce unexpected damage caused by network topology changes. B-Ring Supports a 3-Ring topology: B-Ring, Coupling Ring, and Dual Homing.

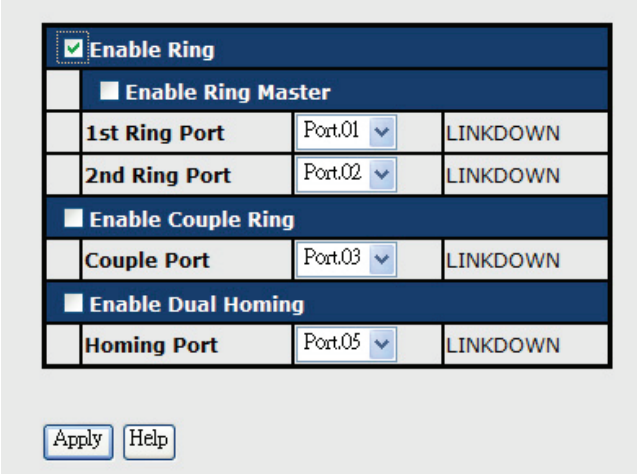


Figure 4-19. B-Ring interface screen.

Table 4-13. B-Ring interface screen components.

Field	Description
Redundant Ring	Mark to enable B-Ring.
Enable Ring Master	There should be one and only one Ring Master in a B-Ring. However, if there are two or more switches that set Ring Master to enable, the switch with the lowest MAC address will be the actual Ring Master and others will be Backup Masters.
1st Ring Port	The primary port when this switch is Ring Master.
2nd Ring Port	The backup port when this switch is Ring Master.
Enable Coupling Ring	Mark to enable Coupling Ring. Coupling Ring can be used to divide a big ring into two smaller rings to avoid affecting all switches when a network topology changes. It is a good application for connecting two Rings.
Coupling Port	Link to Coupling Port of the switch in another ring. Coupling Ring needs four switch to build an active and a backup link. Set a port as coupling port. The coupled four ports of four switches will run in active/backup mode.
Control Port	Link to the control port of the switch in the same ring. This port is used to transmit control signals.
Enable Dual Homing	Mark to enable Dual Homing. When you select Dual Homing mode, the Ring will be connected to normal switches through two RSTP links (ex: backbone Switch). The two links work in active/back-up mode, and connect each Ring to the normal switches in RSTP mode.
Apply	Click "Apply" to set the configuration.

NOTE: We do not recommend that you set one switch as a Ring Master and a Coupling Ring at the same time because of a heavy load.

4.1.5.3 B-Ring

B-Ring technology can be applied for another vendor's proprietary ring. You can add B-Ring switches into the network constructed by another ring technology and enable B-Ring to co-operate with another vendor's managed switch.

Click "Connect to other vendor's ring….." to join the ring constructed by another vendor.

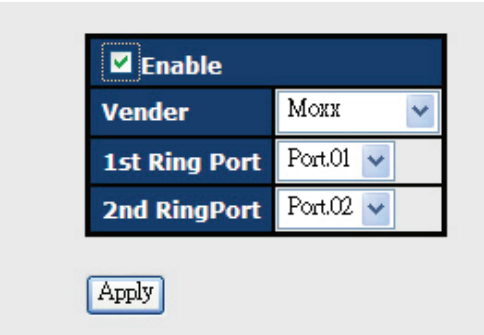


Figure 4-20. B-ring interface screen.

Table 4-14. B-ring interface screen components.

Field	Description
Enable	Enable the B-Ring function.
Vendor	Choose the vendor whose ring you want to join.
1st Ring Port	Choose the primary port that will connect to the ring.
2nd Ring Port	Choose the backup port that will connect to the ring.
Apply	Click on this button to apply the settings.

An application of B-Ring is shown below.

Figure 4-21. B-Ring connection.

4.1.5.4 B-Chain

B-Chain provides an add-on network redundancy topology for any backbone network that's easy to use and swiftly recovers faults. This topology allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound network topology—it creates multiple redundant networks beyond the limitations of current redundant ring technology.

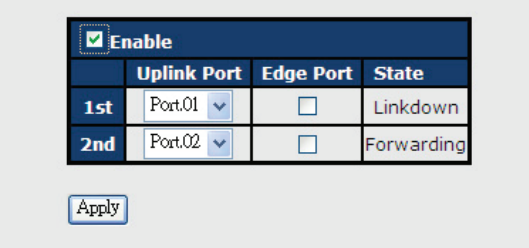


Figure 4-22. B-Chain screen.

Table 4-15. B-Chain screen fields.

Field	Description
Enable	Enable the B-Ring function.
1st Ring Port	Choose the port that you want to connect to the ring.
2nd Ring Port	Choose the port that you want to connect to the ring.
Edge Port	In a B-Chain application, the head and tail of two switch ports must start the edge MAC. The smaller MAC switch will be the backup and the RM LED will light.
Apply	Click on this button to apply the settings.

Figure 4-x. B-Chain topology.

4.1.5.5 RSTP—Repeater

RSTP—Repeater is a simple function. It can pass an RSTP BPDU packet to another repeater.

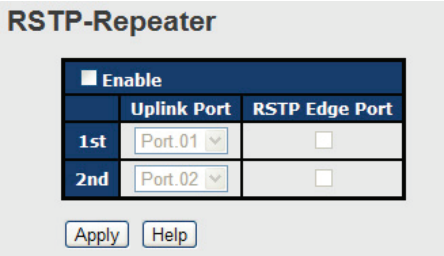


Figure 4-24. RSTP-Repeater interface screen.

Table 4-16. RSTP-Repeater screen components.

Field	Description
Enable	Enable the RSTP-Repeater.
1st Ring Port	Choose the port that you want to connect to the RSTP.
2nd Ring Port	Choose the port that you want to connect to the RSTP.
Edge Port	Only the edge device needs to have an edge port. The user must specify the edge port that conforms to the topology of the network.
Apply	Click on this button to apply the settings.

4.1.5.6 Fast Recovery

The Fast Recovery Mode can be set to connect multiple ports to one or more switches. Fast Recovery mode supports five priorities, the first priority will be the active port, the other ports configured with other priorities will be the backup ports.

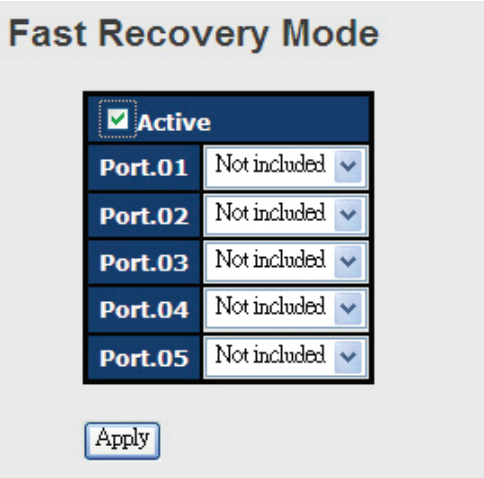


Figure 4-25. Fast Recovery Mode interface screen.

Table 4-17. Fast Recovery Mode interface screen fields.

Field	Description
Active	Activate the Fast Recovery mode.
Port	Port can be configured as 5 priorities. Only the port configured with first priority will be the active port.
Apply	Click on this button to apply the settings.

4.1.5.7 RSTP

The Rapid Spanning Tree Protocol (RSTP) is an evolution of the Spanning Tree Protocol. It provides faster spanning tree convergence after a topology change. The system also supports STP, and the system will auto detect the connected device that is running STP or RSTP protocol.

RSTP setting

You can enable/disable the RSTP function, and set parameters for each port.

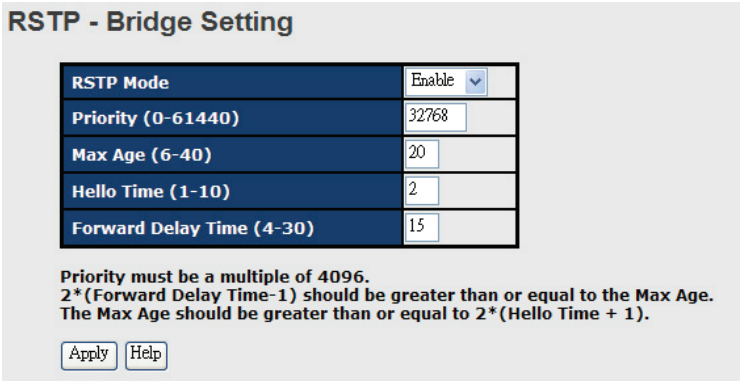


Figure 4-26. RSTP Setting interface screen.

Table 4-18. RSTP Setting Interface screen components.

Field	Description
RSTP mode	You must enable or disable the RSTP function before configuring the related parameters.
Priority (0–61440)	A value used to identify the root bridge. The bridge with the lowest value has the highest priority and is selected as the root. If the value changes, you must reboot the switch. The value must be a multiple of 4096 according to the protocol standard rule.
Max Age (6–40)	The number of seconds a bridge waits without receiving Spanning-tree Protocol configuration messages before attempting a reconfiguration. Enter a value between 6 through 40.
Hello Time (1–10)	The time that the control switch sends out the BPDU packet to check RSTP current status. Enter a value between 1 through 10.
Forwarding Delay Time (4–30)	The number of seconds a port waits before changing from its Rapid Spanning-Tree Protocol learning and listening states to the forwarding state. Enter a value between 4 through 30.
Apply	Click on this button to set the configurations.

NOTE: Follow the rule to configure the Max age, Hello time, and Forward Delay time.

2 x (Forward Delay Time Value - 1) > = Max. age value >= 2 x (Hello Time value +1)

Show RSTP algorithm result at this table.

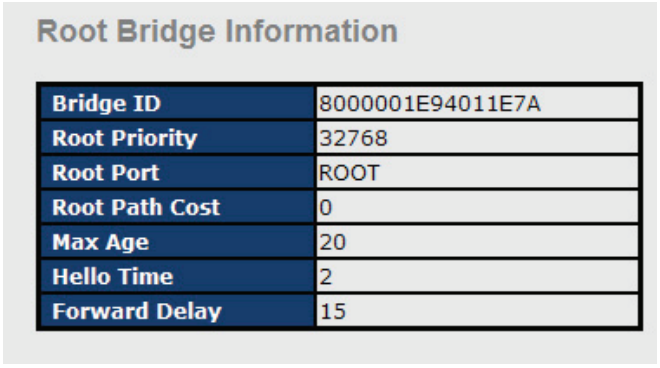


Figure 4-27. Root Bridge information.

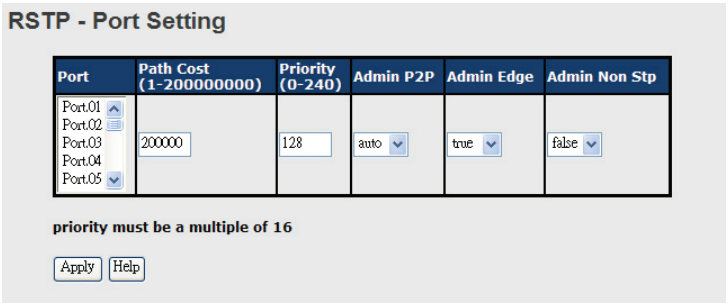


Figure 4-28. RSTP Port Setting screen.

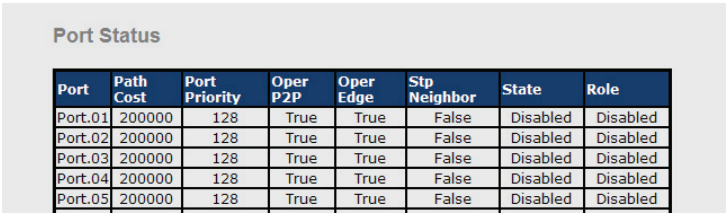


Figure 4-29. Port Status screen.

Table 4-19. Port Status screen options.

Field	Description
Path Cost (1–200000000)	The cost of the path to the other bridge from this transmitting bridge at the specified port. Enter a number 1 through 200000000.
Priority (0–240)	Decide which port should be blocked by priority in LAN. Enter a number 0 through 240. The value of priority must be the multiple of 16.
Admin P2P	Some of the rapid state transactions that are possible within RSTP depend upon whether the port concerned can only be connected to exactly one other bridge (i.e., It is served by a point-to-point LAN segment), or it can be connected to two or more bridges (i.e., It is served by a shared medium LAN segment). This function allows the P2P status of the link to be manipulated administratively. True means P2P enabling. False means P2P disabling.
Admin Edge	This is the port directly connected to end stations, and it cannot create a bridging loop in the network. To configure the port as an edge port, set the port to "True."
Admin Non STP	Whether or not the port includes the STP mathematical calculation. True is not including the STP mathematical calculation. False is including the STP mathematic calculation.
Apply	Click "Apply" to set the configuration.

4.1.5.8 MSTP

Multiple Spanning Tree Protocol (MSTP) is a standard protocol base on IEEE 802.1s. The function is that several VLANs can be mapping to a reduced number of spanning tree instances because most networks do not need more than a few logical topologies. It supports load balancing scheme and the CPU is sparer than PVST (Cisco proprietary technology).

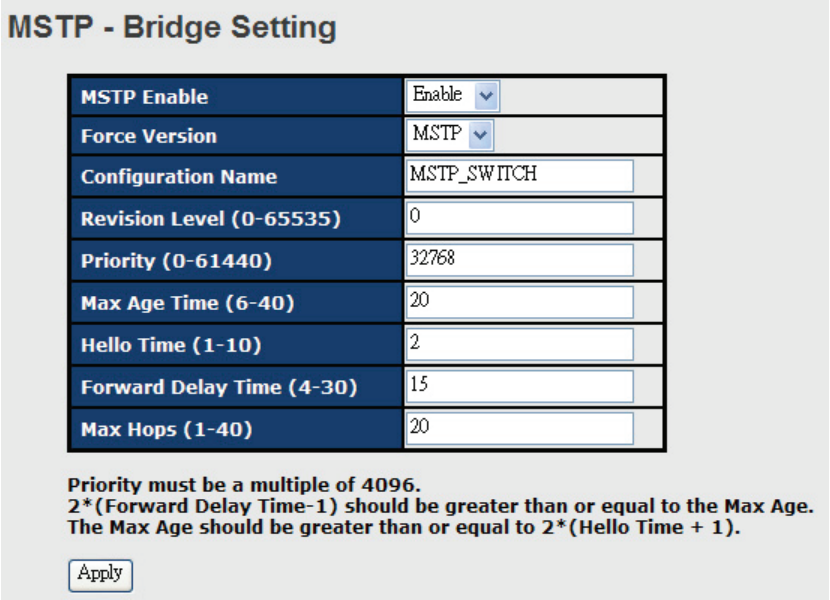


Figure 4-31. MSTP Bridge Setting interface screen.

Table 4-20. MSTP Bridge setting interface screen fields.

Field	Description
MSTP Enable	You must enable or disable the MSTP function before configuring the related parameters.
Force Version	Use the Force Version parameter to force a VLAN Bridge that supports RSTP to operate in an STP-compatible manner.
Configuration Name	The same MST Region must have the same MST configuration name.
Revision Level (0–65535)	The same MST Region must have the same revision level.
Priority (0–61440)	A value used to identify the root bridge. The bridge with the lowest value has the highest priority and is selected as the root. If the value changes, You must reboot the switch. The value must be multiple of 4096 according to the protocol standard rule.
Max Age Time (6–40)	The number of seconds a bridge waits without receiving Spanning-tree Protocol configuration messages before attempting a reconfiguration. Enter a value between 6 through 40.
Hello Time (1–10)	The setting follows the rule below to configure the MAX Age, Hello Time, and Forward Delay Time the controlled switch sends out the BPDU packet to check RSTP current status. Enter a value between 1 through 10. 2 x (Forward Delay Time value –1) ≥ Max Age value ≥ 2 x (Hello Time value +1)
Forwarding Delay Time (4–30)	The number of seconds a port waits before changing from its Rapid Spanning-Tree Protocol learning and listening states to the forwarding state. Enter a value between 4 and 30.
Max Hops (1–40)	This parameter is additional to those specified for RSTP. A single value applies to all Spanning Trees within an MST Region (the CIST and all MSTIs) for which the Bridge is the Regional Root.
Apply	Click “Apply” to activate the configurations.

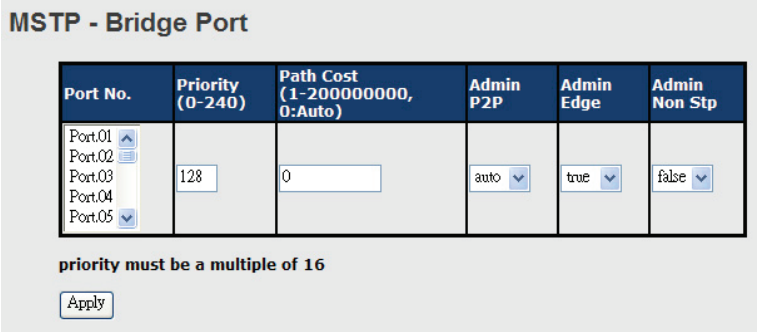


Figure 4-32. MSTP Bridge Port interface screen.

Table 4-21. MSTP Bridge Port interface screen fields.

Field	Description
Port No.	Select the port that you want to configure.
Priority (0–240)	Decide which port should be blocked by priority in LAN. Enter a number from 0 through 240. The value of priority must be a multiple of 16.
Path Cost (1–200000000)	The cost of the path to the other bridge from this transmitting bridge at the specified port. Enter a number 1 through 200000000.
Admin P2P	Some of the rapid state transactions that are possible within RSTP depend upon whether the port concerned can only be connected to exactly one other bridge (i.e. It is served by a point-to-point LAN segment), or it can be connected to two or more bridges (i.e. It is served by a shared medium LAN segment). This function allows the P2P status of the link to be manipulated administratively. True means P2P is enabled. False means P2P is disabled.
Admin Edge	True or False.
Admin Non STP	True or False.
Apply	Click "Apply" to activate the configuration.

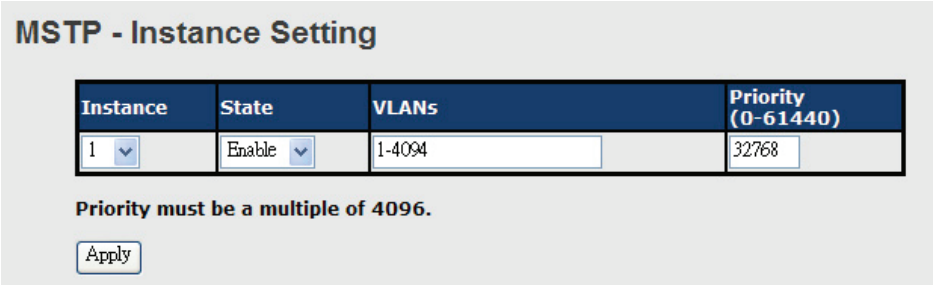


Figure 4-33. MSTP Instance Setting interface screen.

Table 4-22. MSTP Instance Setting interface screen fields.

Field	Description
Instance	Set the instance from 1 to 15.
State	Enable or disable the instance.
VLANs	Set which VLAN will belong to which instance.
Proprietary (0–61440)	A value used to identify the root bridge. The bridge with the lowest value has the highest priority and is selected as the root. If the value changes, you must reboot the switch. he value must be a multiple of 4096 according to the protocol standard rule.
Apply	Click "Apply" to activate the configuration.

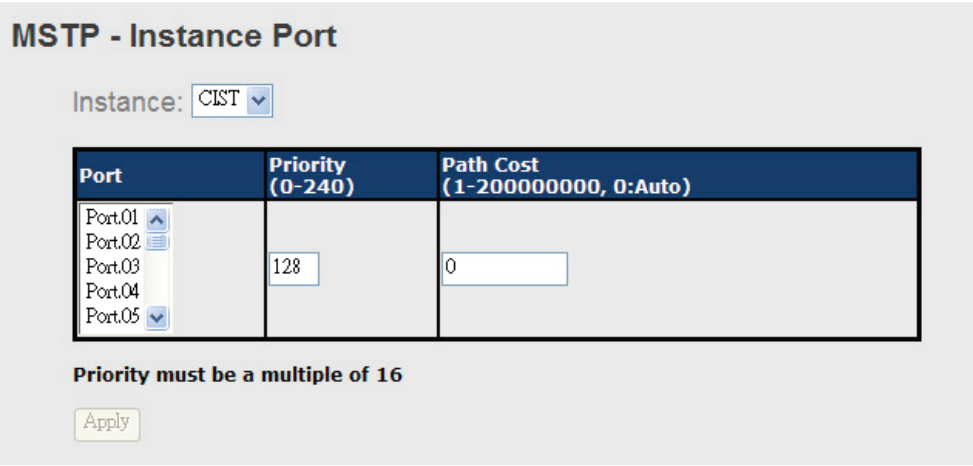


Figure 4-34. MSTP Instance Port interface screen.

Table 4-23. MSTP Instance Port interface screen fields.

Field	Description
Instance	Set the instance's information (except CIST).
Port	Select the port that you want to configure.
Priority (0–240)	Decide which port should be blocked by priority in LAN. Enter a number 0 through 240. The value of priority must be a multiple of 16.
Path Cost (1–200000000)	The cost of the path to the other bridge from this transmitting bridge at the specified port. Enter a number from 1 through 200000000.
Apply	Click "Apply" to set the configuration.

4.1.6 Multicast

4.1.6.1 IGMP Snooping

Internet Group Management Protocol (IGMP) is used by IP hosts to register their dynamic multicast group membership. IGMP has three versions: IGMP v1, v2, and v3. Refer to RFC 1112, 2236 and 3376. IGMP Snooping improves the performance of networks that carry multicast traffic. It provides the ability to prune multicast traffic so that it travels only to those end destinations that require that traffic and reduces the amount of traffic on the Ethernet LAN.

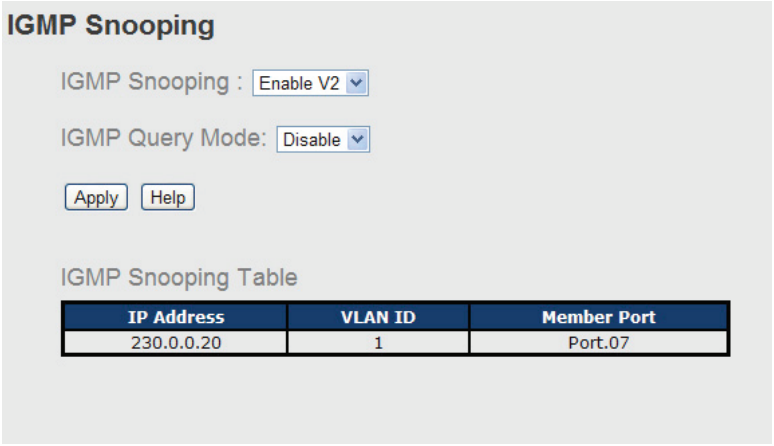


Figure 4-35. IGMP Snooping interface screen.

Table 4-24. IGMP Snooping interface screen fields.

Field	Description
IGMP Snooping	Enable/Disable IGMP snooping.
IGMP Query Mode	Select the switch that will be the IGMP querier. There should exist one and only one IGMP querier in an IGMP application. The "Auto" mode means that the querier is the one with lower IP address.
IGMP Snooping Table	Show the current IP multicast list.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.6.2 MVR

The MVR function can enable different VLAN users to receive an MVR mode VLAN multicast packet.

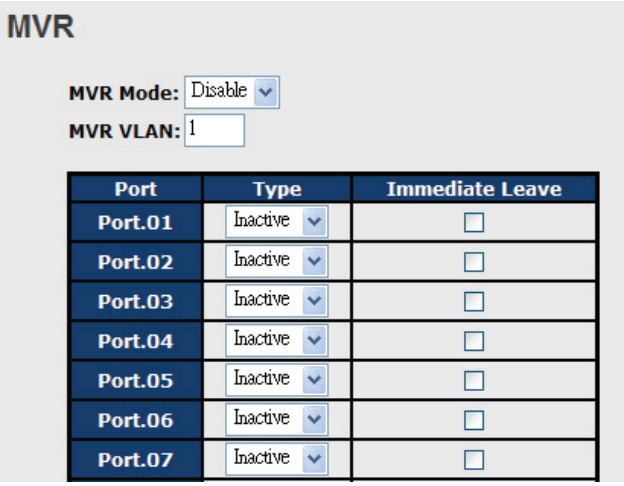


Figure 4-36. MVR screen.

Table 4-25. Components in the MVR screen.

Field	Description
MVR Mode	Enable or Disable MVR Mode
MVR VLAN	Set MVR VLAN
Type	Set Port Type to inactive receiver source.
Immediate Leave	Enable or disable immediate leave.

4.1.6.3 Static Multicast Filtering

Static Multicast filtering is the system by which end stations only receive multicast traffic if they register to join specific multicast groups. With multicast filtering, network devices only forward multicast traffic to the ports that are connected to registered end stations.

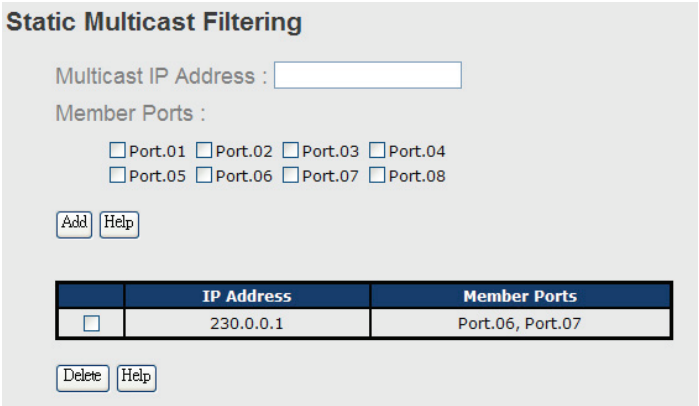


Figure 4-37. Static Multicast Filtering screen.

Table 4-26. Static Multicast Filtering screen options.

Field	Description
IP Address	Assign a multicast group IP address in the range of 224.0.0.0—239.255.255.255
Member Ports	Tick the check box beside the port number to include them as the member ports in the specific multicast group IP address.
Add	Show current IP multicast list.
Delete	Delete an entry from the table.
Help	Show the help file.

4.1.7 Port Setting

4.1.7.1 Port Control

With this function, you can set the state, speed/duplex, flow control, and security of the port.

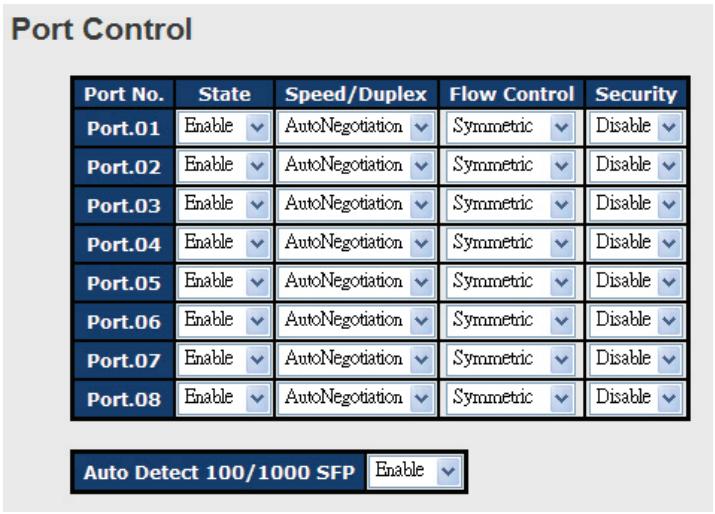


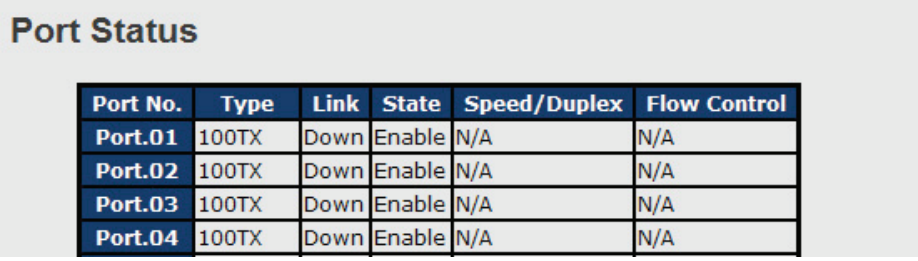
Figure 4-38. Port Control interface screen.

Table 4-27. Port Control interface screen components.

Field	Description
Port No.	Port number for setting.
State	Enable/Disable the port.
Speed/Duplex	You can set Autonegotiation,100 full, 100 half,10 full,or 10 half mode.
Flow Control	Support symmetric and asymmetric modes to avoid packet loss when congestion occurs.
Security	Support port security function. When this function is enabled, the port will STOP learning MAC address dynamically.
Auto Detect 100/1000	Auto Detect SFP port SFP module speed (100 Mbps/1000 Mbps)
Apply	Click “Apply” to set the configuration.

4.1.7.2 Port Status

The following information provides the current port status information



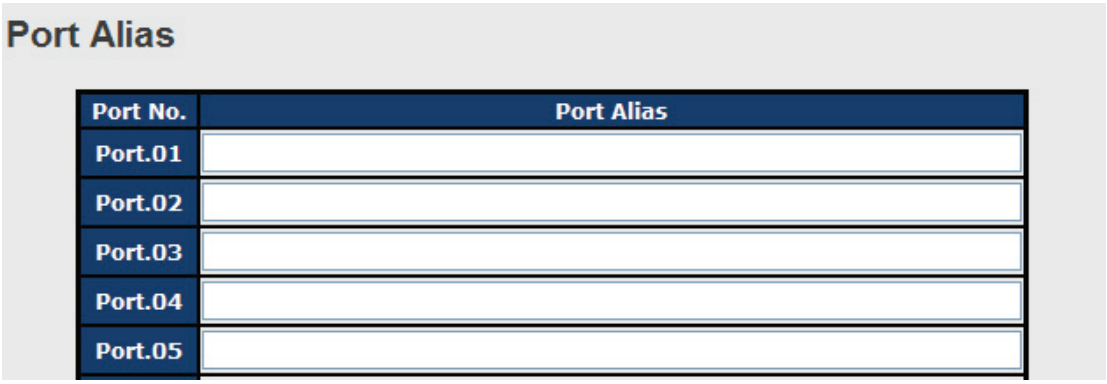
Port Status

Port No.	Type	Link	State	Speed/Duplex	Flow Control
Port.01	100TX	Down	Enable	N/A	N/A
Port.02	100TX	Down	Enable	N/A	N/A
Port.03	100TX	Down	Enable	N/A	N/A
Port.04	100TX	Down	Enable	N/A	N/A

Figure 4-39. Port Status interface screen.

4.1.7.3 Port Alias

The user can define the name of every port for convenient management.



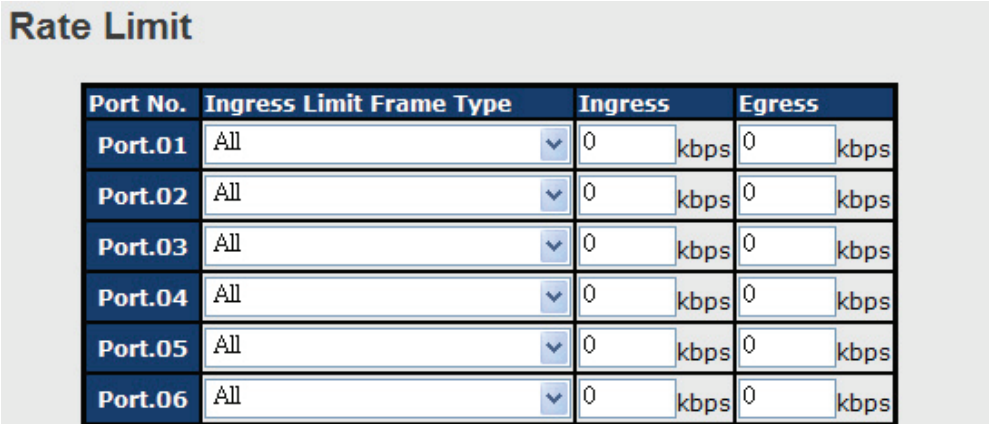
Port Alias

Port No.	Port Alias
Port.01	
Port.02	
Port.03	
Port.04	
Port.05	

Figure 4-40. Port Alias screen.

4.1.7.4 Rate Limit

With this function, you can limit traffic on all ports, including broadcast, multicast, and flooded unicast. You can also set "Ingress" or "Egress" to limit traffic received or transmitted bandwidth.



Rate Limit

Port No.	Ingress Limit Frame Type	Ingress	Egress
Port.01	All	0 kbps	0 kbps
Port.02	All	0 kbps	0 kbps
Port.03	All	0 kbps	0 kbps
Port.04	All	0 kbps	0 kbps
Port.05	All	0 kbps	0 kbps
Port.06	All	0 kbps	0 kbps

Figure 4-41. Rate Limit interface screen.

Table 4-28. Rate Limit interface screen components.

Field	Description
Ingress Limit Frame Type	You can set "all," "Broadcast only," "Broadcast/Multicast," or "Broadcast/Multicast/Flooded Unicast" mode.
Ingress	The switch port received traffic.
Egress	The switch port transmitted traffic.
Immediate Leave	Enable or disable immediate leave.
Apply	Click "Apply" to set the configuration.

4.1.7.5 Port Trunk

Port Trunk – Setting

You can select static trunk or 802.3ad LACP to combine several physical link with a logical link to increase the bandwidth.

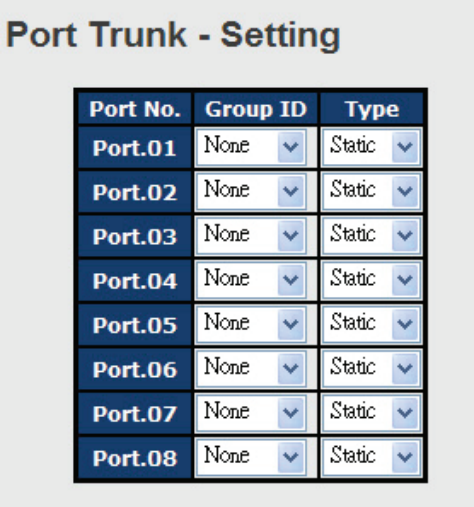


Figure 4-42. Port Trunk—Setting interface screen 1.

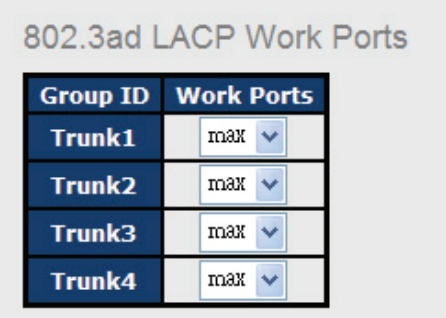


Figure 4-43. Port Trunk—Setting interface screen 2.

Table 4-29. Port Trunk —Setting Interface screen options.

Field	Description
Group ID	Select a port to join a trunk group.
Type	Support static trunk and 802.3ad LACP.
Work Port	Select the number of active ports in dynamic group (LACP). The default value of work ports is the maximum number of the group. If the number is not the maximum number of ports, the other inactive ports in dynamic group will be suspended (no traffic). Once the active port is broken, the suspended port will be active automatically.
Apply	Click "Apply" to set the configuration.

Port Trunk – Status

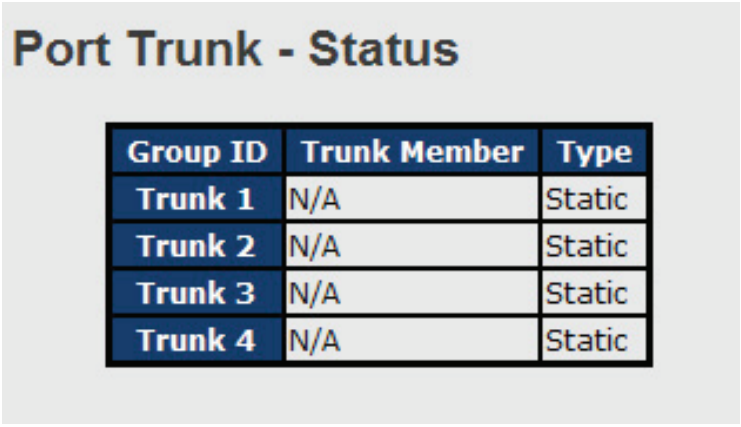


Figure 4-44. Port Trunk—Status interface screen.

Table 4-30. Port Trunk—Status interface screen options.

Field	Description
Group Key	Trunk Group number
Port Member	Show Group port info.

4.1.7.6 Loop Guard

This feature prevents a loop attack when a port receives a loop packet. This port will auto disable, and prevent the loop attack from affecting other network devices.

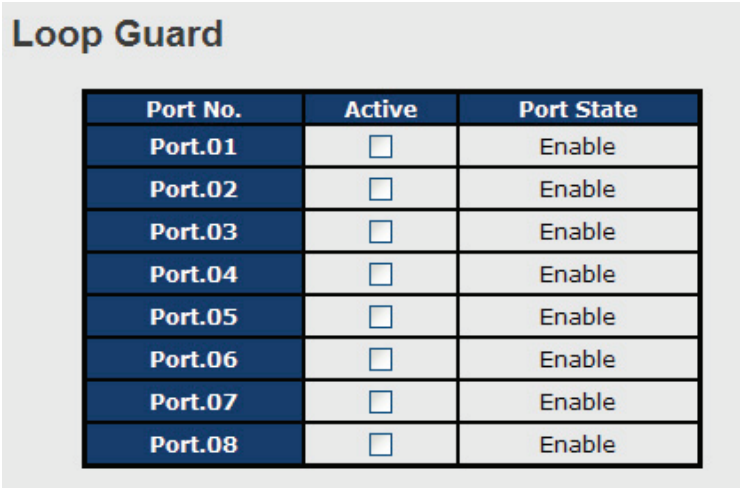


Figure 4-45. Loop Guard screen.

Table 4-31. Loop Guard screen options.

Field	Description
Active	Loop Guard Enable or Disable
Port Status	Port work status

4.1.8 VLAN

A Virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain, which allows you to isolate network traffic. Only the members of the VLAN will receive traffic from the same members of VLAN. Basically, creating a VLAN from a switch is logically equivalent to reconnecting a group of network devices to another Layer 2 switch. However, all the network devices are still plugged into the same switch physically. The switch supports port-based and 802.1Q (tagged-based) VLAN. The default configuration of VLAN operation mode is "802.1Q."

4.1.8.1 VLAN Configuration — IEEE 802.1Q

Tagged-based VLAN is an IEEE 802.1Q specification standard, and it is possible to create a VLAN across devices from different switch vendors. IEEE 802.1Q VLAN uses a technique to insert a "tag" into the Ethernet frames. Tag contains a VLAN Identifier (VID) that indicates the VLAN numbers.

You can create Tag-based VLAN, and enable or disable GVRP protocol. There are 256 VLAN groups to provide configure. Enable 802.1Q VLAN, the all ports on the switch belong to default VLAN, VID is 1. The default VLAN cannot be deleted.

GVRP allows automatic VLAN configuration between the switch and nodes. If the switch is connected to a device with GVRP enabled, you can send a GVRP request by using the VID of a VLAN defined on the switch; the switch will automatically add that device to the existing VLAN.

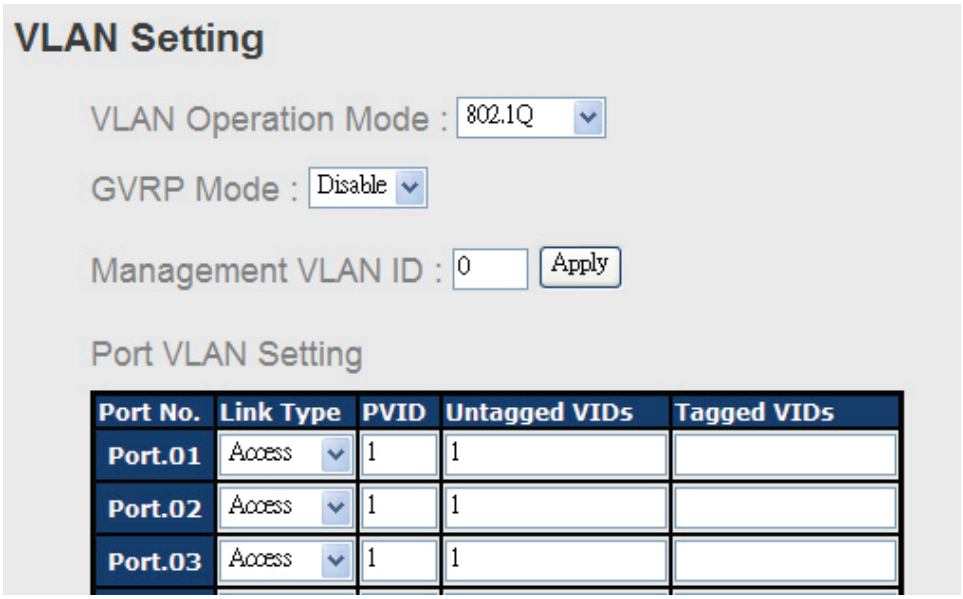


Figure 4-46. VLAN Configuration – 802.1Q interface screen.

Table 4-32. VLAN Configuration – 802.1Q interface screen fields.

Field	Description
VLAN Operation Mode	Configure VLAN Operation Mode: disable, Port Base, 802.1Q
GVRP Mode	Enable/Disable GVRP function.
Management VLAN ID	Management VLAN can provide network administrator with a secure VLAN to management Switch. Only the devices in the management VLAN can access the switch.
Port	Select the port to configure.
Link type	There are three types of links: • Access Link: single switch only, allows you to group ports by setting the same VID. • Trunk Link: extended application of Access Link, allows you to group ports by setting the same VID with 2 or more switches. • Hybrid Link: Both Access Link and Trunk Link are available.
Untagged VID	Set the port default VLAN ID for untagged devices that connect to the port. The range is 1 to 4094.
Tagged VIDs	Set the tagged VIDs to carry different VLAN frames to other switches.
Apply	Click “Apply” to set the configuration.

4.1.8.2 VLAN Configuration – Port Based

Traffic is forwarded to the member ports of the same vlan group. vlan port based startup, set in the same group of the port, can be a normal transmission packet, without restricting the types of packets.

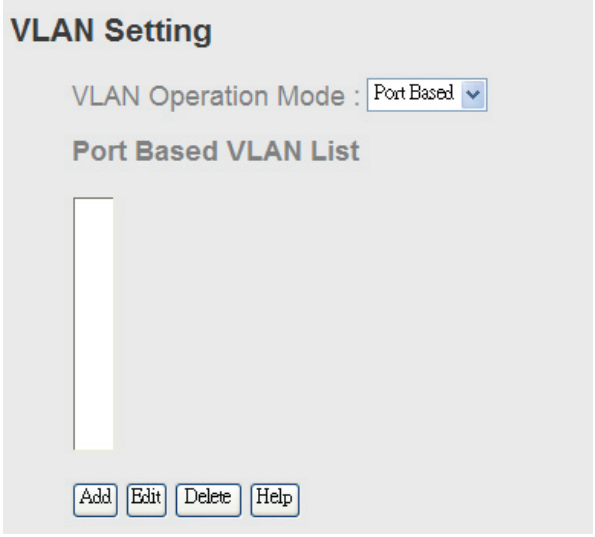


Figure 4-47. VLAN Setting screen.

Table 4-33. VLAN setting screen fields.

Field	Description
Add	Click "add" to enter the VLAN add interface.
Edit	Edit an existing VLAN.
Delete	Delete an existing VLAN.
Help	Show the help file.

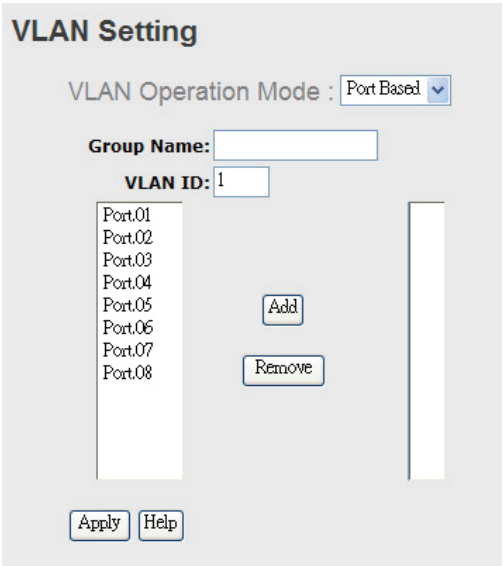


Figure 4-48. VLAN Configuration – Port-based interface screen.

Table 4-34. VLAN Configuration — Port-based interface screen components.

Field	Description
Group Name	VLAN name.
VLAN ID	Specify the VLAN ID.
Add	Select a port to join the VLAN group.
Remove	Remove port from the VLAN group.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.9 Traffic Prioritization

Traffic Prioritization includes 3 modes: port base, 802.1p/COS, and TOS/DSCP. By traffic prioritization function, you can classify the traffic into four classes for differential network application. LEH2004A-4GSFP support 4 priority queues.

4.1.9.1 QoS policy

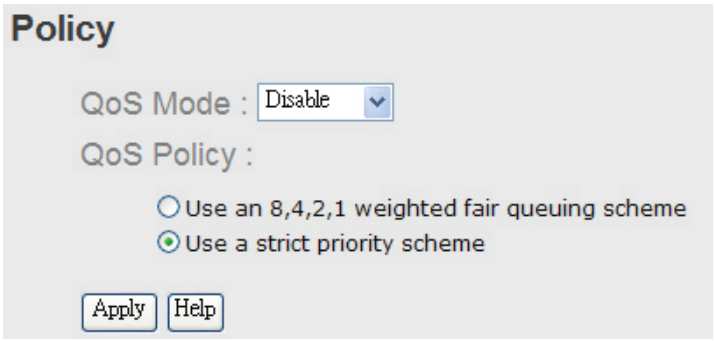


Figure 4-49. Traffic Prioritization interface screen.

Table 4-35. Traffic Prioritization interface screen fields.

Field	Description
QOS Mode	• Port-based: the output priority is determined by the ingress port. • COS only: the output priority is determined by COS only. • TOS only: the output priority is determined by TOS only. • COS first: the output priority is determined by COS and TOS, but COS first. • TOS first: the output priority is determined by COS and TOS, but TOS first.
QOS policy	• Using the 8,4,2,1 weight fair queue scheme: the output queues will follow 8:4:2:1 ratio to transmit packets from the highest to lowest queue. For example: 8 high queue packets, 4 middle queue packets, 2 low queue packets, and the one lowest queue packets are transmitted in one turn. • Using the strict priority scheme: always the packets in higher queue will be transmitted first until higher queue is empty.
Apply	Click "Apply" to set the configurations.

4.1.9.2 Port-based Priority

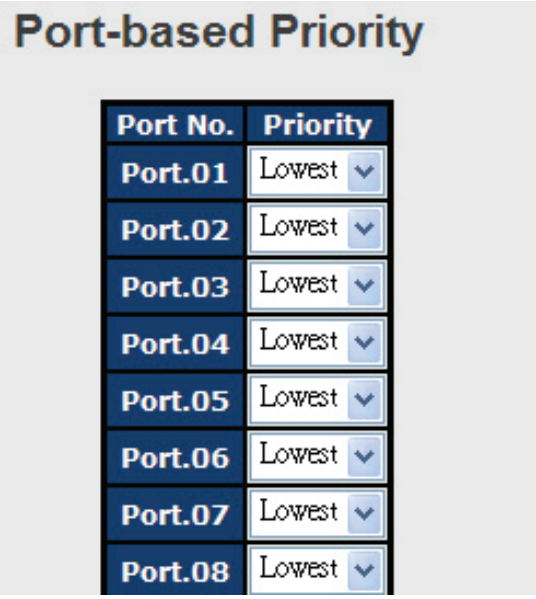


Figure 4-50. Port-based Priority interface screen.

Table 4-36. Port-based Priority interface screen fields.

Field	Description
Port-based Priority	Assign Ports with a priority queue. Four priority queues can be assigned: High, Middle, Low, and Lowest.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.9.3 COS/802.1p

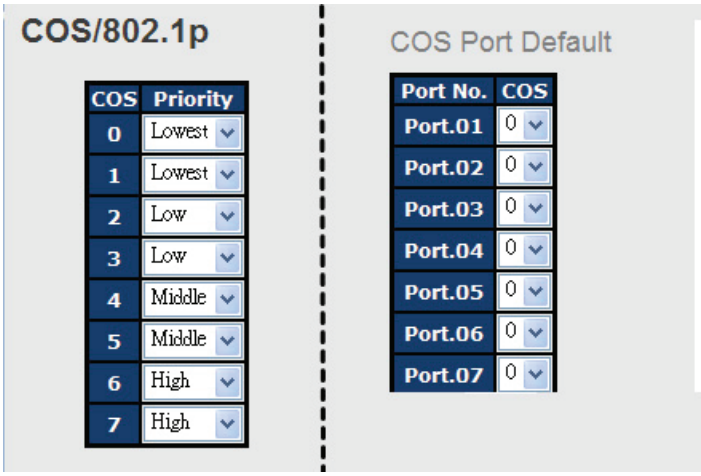


Figure 4-51. COS/802.1p interface screen.

Table 4-37. COS/802.1p interface screen components.

Field	Description
COS/802.1p	COS (Class Of Service) is well known as 802.1p. It describes the output priority of a packet that is determined by user priority field in 802.1Q VLAN tag. The priority value supports 0 to 7.The COS value maps to four priority queues: High, Middle, Low, and Lowest.
COS Port Default	When an ingress packet has no VLAN tag, a default priority value is assigned and determined by the ingress port.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.9.4 TOS/DSCP

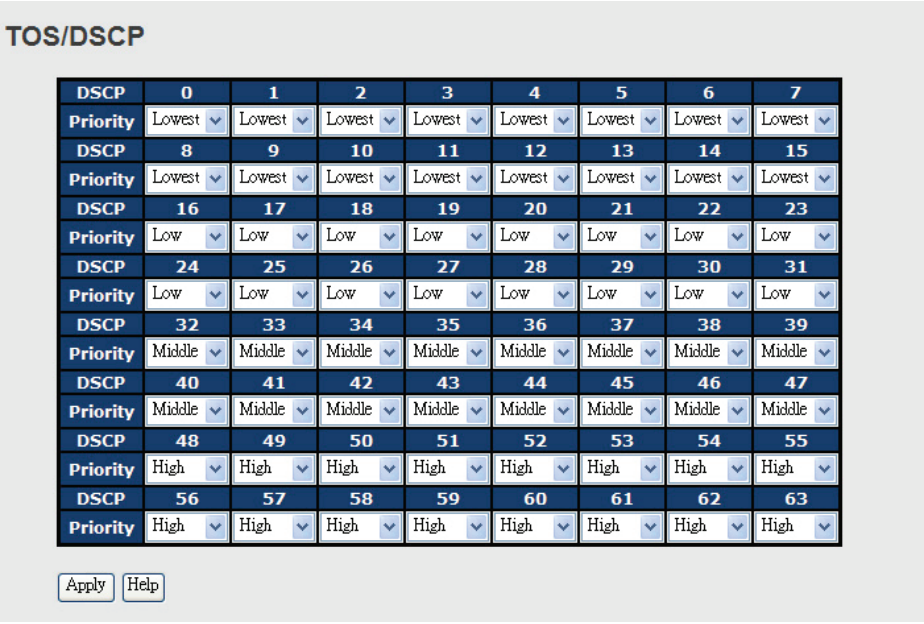


FIgure 4-52. TOS/DSCP interface screen.

Table 4-38. TOS/DSCP interface screen components.

Field	Description
TOS/DSCP	TOS (Type of Service) is a field in the IP header of a packet. This TOS field is also used by Differentiated Services and is called the Differentiated Services Code Point (DSCP). The output priority of a packet can be determined by this field and the priority value supported ranges from 0 to 63. DSCP value maps to 4 priority queues: High, Middle, Low, and Lowest.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.10 DHCP Server

4.1.10.1 DHCP Server – Setting

The system provides the DHCP server function. Enable the DHCP server function, and the switch system will be a DHCP server.

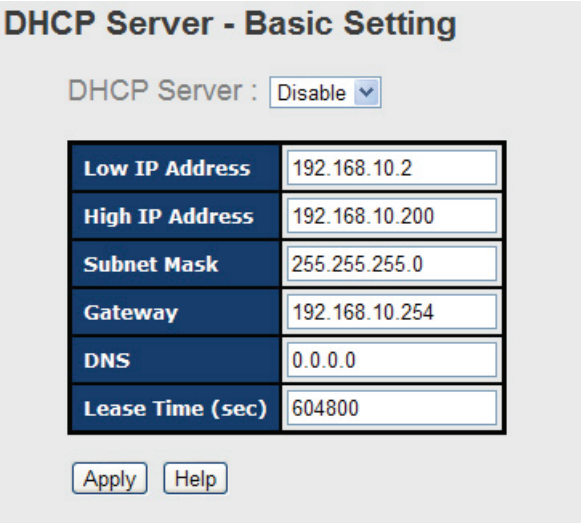


Figure 4-53. DHCP Server Configuration interface screen.

Table 4-39. DHCP Server Setting screen components.

Field	Description
DHCP server	Enable or Disable the DHCP Server function. If you select "Enable," the switch will be the DHCP server on your local network.
Start IP Address	The dynamic IP assigned range. Low IP address is the beginning of the dynamic IP assigned range. For example: dynamic IP assigned range is from 192.168.1.100 to 192.168.1.200. 192.168.1.100 will be the Start IP address.
End IP Address	The dynamic IP assigned range. High IP address is the end of the dynamic IP assigned range. For example: dynamic IP assigned range is from 192.168.1.100 to 192.168.1.200. 192.168.1.200 will be the End IP address.
Subnet Mask	The dynamic IP assigned range subnet mask.
Gateway	The gateway in your network.
DNS	Domain Name Server IP Address in your network.
Lease Time (Hour)	The period that system will reset the assigned dynamic IP to ensure the IP address is in used.
Apply	Click "Apply" to set the configuration.

4.1.10.2 DHCP Server – Client List

When the DHCP server function is activated, the system will collect the DHCP client information and display in here.

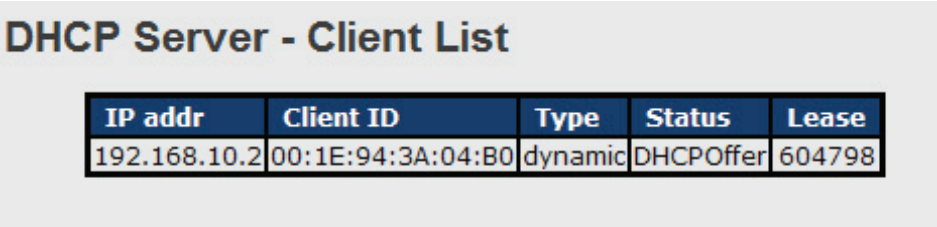


Figure 4-54. DHCP Server Client Entries interface screen.

4.1.10.3 DHCP Server – Port and IP bindings

You can assign the specific IP address, which is in the assigned dynamic IP range to the specific port. When the device is connecting to the port and asks for dynamic IP assignment, the system will assign the IP address that has been assigned before in the connected device.

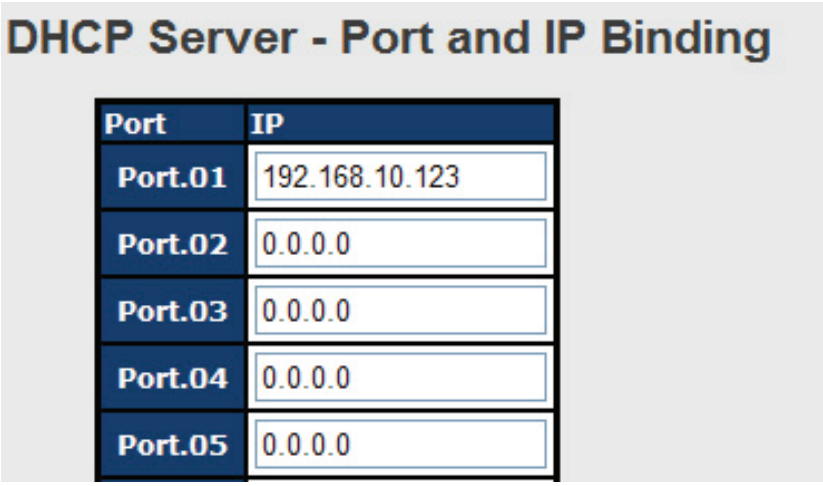


Figure 4-55. DHCP Server - Port and IP Binding screen.

4.1.10.4 DHCP Server—DHCP Relay Agent

The DHCP relay agent relays DHCP messages between clients and servers for DHCP on different subnet domains. DHCP relay agent uses Option 82 to insert specific information into a request that is being forwarded to a DHCP server, and according to Option 82, to remove the specific information from reply packets when forwarding server DHCP sends packets to a DHCP client.

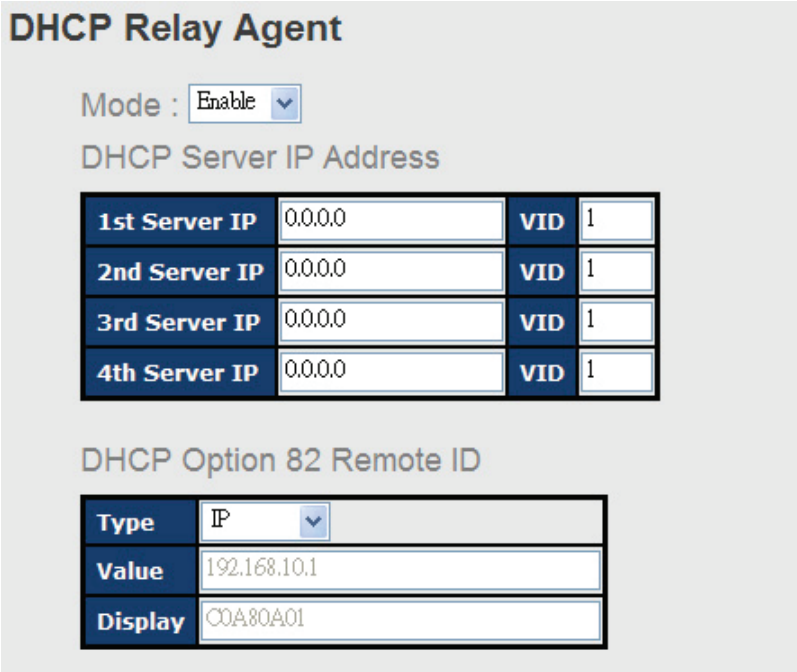


Figure 4-56. DHCP Relay Agent screen, diagram 1.

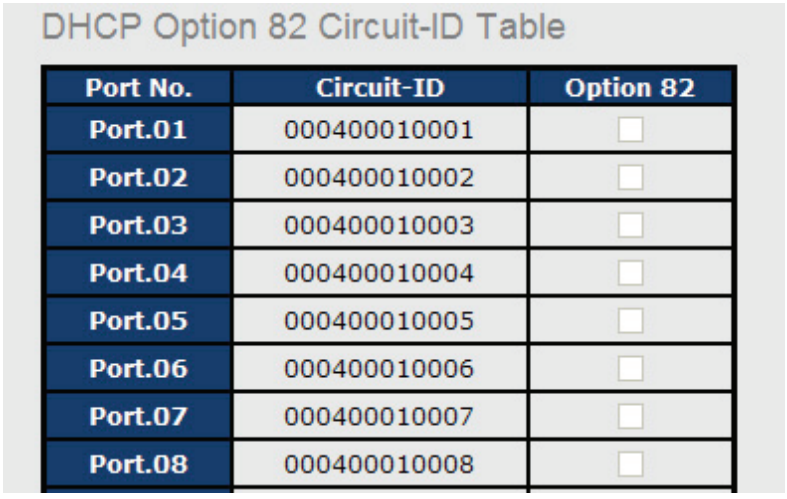


Figure 4-57. DHCP Relay Agent screen, diagram 2.

Table 4-40. DHCP Relay Agent screen components.

Field	Description
DHCP Relay	Enable/Disable DHCP Relay Agent.
DHCP Server IP Address and VID	Specify the IP address and VID of DHCP server. Keep "0.0.0.0" means the server is inactive.
DHCP Option 82 Remote ID	"Option 82 Remote ID" provides a identifier for the remote server. There are 4 types supported: IP, MAC, Client-ID, and Other.
DHCP Option 82 Circuit-ID Table	"Option 82 Circuit-ID" encodes an agent-local identifier of the circuit from which a DHCP client-to-server packet was received. It is intended for use by agents in relaying DHCP responses back to the proper circuit.
Apply	Click "Apply" to set the configuration.

4.1.11 SNMP

Simple Network Management Protocol (SNMP) is the protocol developed to manage nodes (servers, workstations, routers, switches, and hubs, etc.) on an IP network. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth. Network management systems learn of problems by receiving traps or change notices from network devices implementing SNMP.

4.1.11.1 SNMP – Agent Setting

You can set SNMP agent related information via the Agent Setting Function.

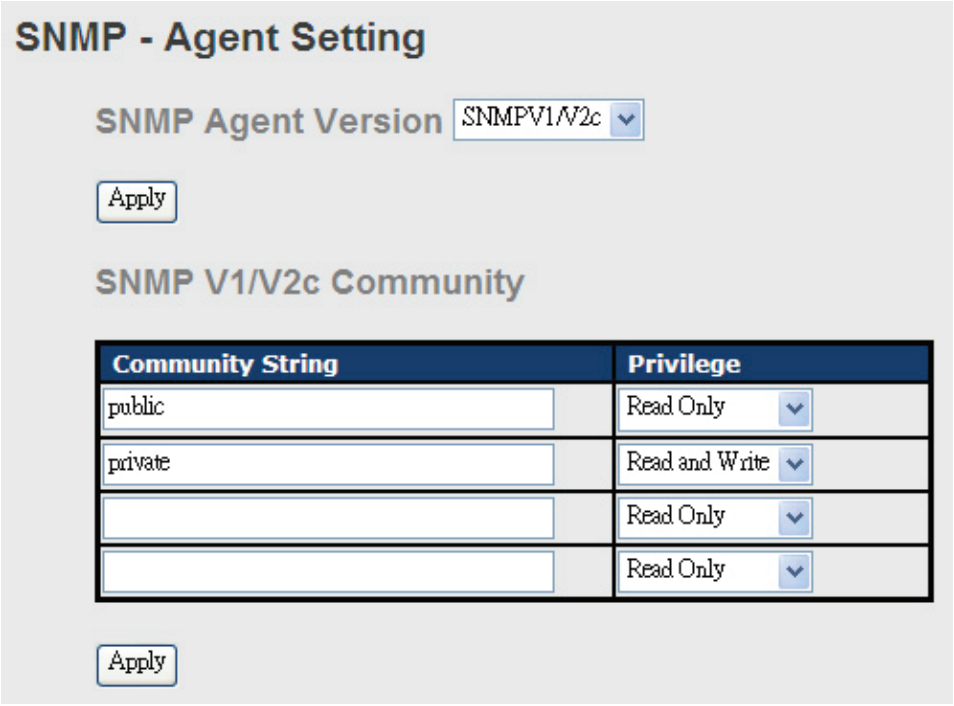


Figure 4-58. SNMP Agent Setting interface screen.

Table 4-41. SNMP Agent Setting interface screen fields.

Field	Description
SNMP agent Version	Three SNMP versions are supported, including SNMP V1, SNMP V2c, and SNMP V3. SNMP V1 and SNMP V2c agent versions use a community string match for authentication, that means SNMP servers access objects with read-only or read/write permissions with the community default string public/private. SNMP V3 requires an authentication level of MD5 or DES to encrypt data to enhance data security.
SNMP V1/V2c Community	SNMP Community should be set for SNMP V1/V2c. Four sets of "Community String/Privileges" are supported. Each Community String is maximum 32 characters. To remove a Community string, keep this field empty.
SNMPv3User	If SNMP V3 agent is selected, the SNMPv3 you profiled should be set for authentication. The Username is necessary. The Auth Password is encrypted by MD5 and the Privacy Password which is encrypted by DES. There are maximum of 8 sets of SNMPv3 User names with a maximum of 16 characters in username and password.
Apply	Click “Apply” to set the configuration.
Help	Show the help file.

When SNMP V3 agent is selected, you can:

1. Input SNMPv3 username only.

2. Input SNMPv3 username and Auth Password.

3. Input SNMPv3 username, Auth Password and Privacy Password, which can be different than Auth Password.

To remove a current user profile:

1. Input the SNMPv3 user name you want to remove.

2. Click the "Remove" button.

Current SNMPv3 User Profile

Show all SNMPv3 user profiles.

Apply

Click “Apply” to set the configuration.

Help

Show the help file.

4.1.11.2 SNMP—Trap Setting

A trap manager is a management station that receives traps, the system alerts generated by the switch. If no trap manager is defined, no traps will be issued. Create a trap manager by entering the IP address of the station and a community string. To define a management station as a trap manager, enter the SNMP community string and select the SNMP version.

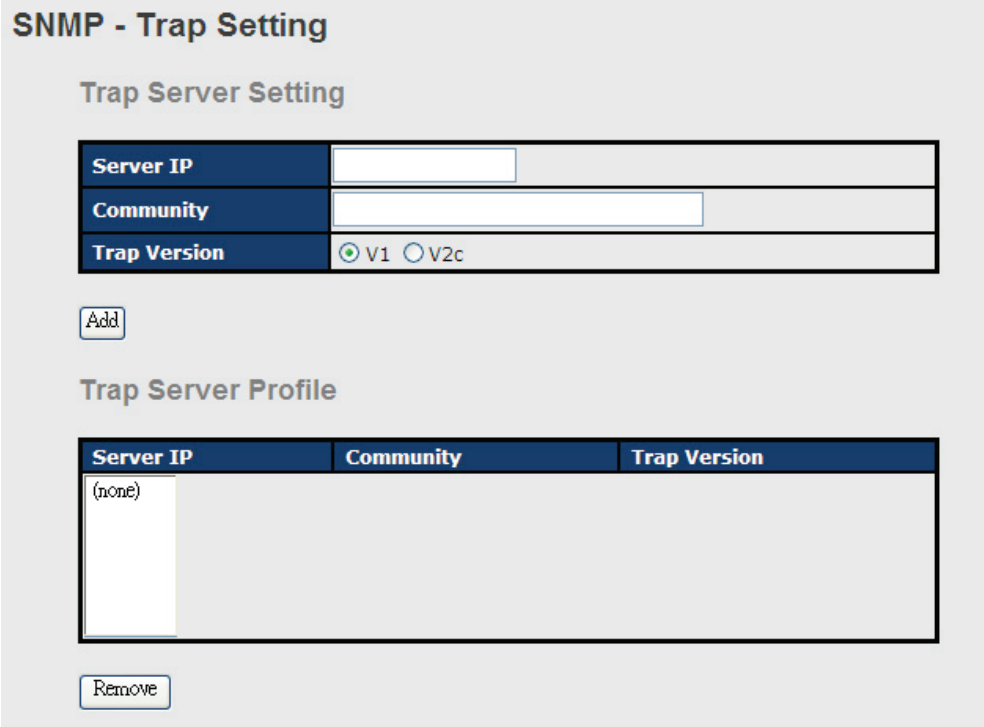


Figure 4-59. SNMP Trap Setting interface screen.

Table 4-42. SNMP Trap Setting interface screen components.

Field	Description
Server IP	The server IP address to receive the Trap.
Community	Community for authentication.
Trap Version	Trap Version supports V1, V2c, and V3.
Add	Add a trap server profile.
Remove	Remove a trap server profile.
Help	Show the help file.

4.1.11.3 SNMPV3

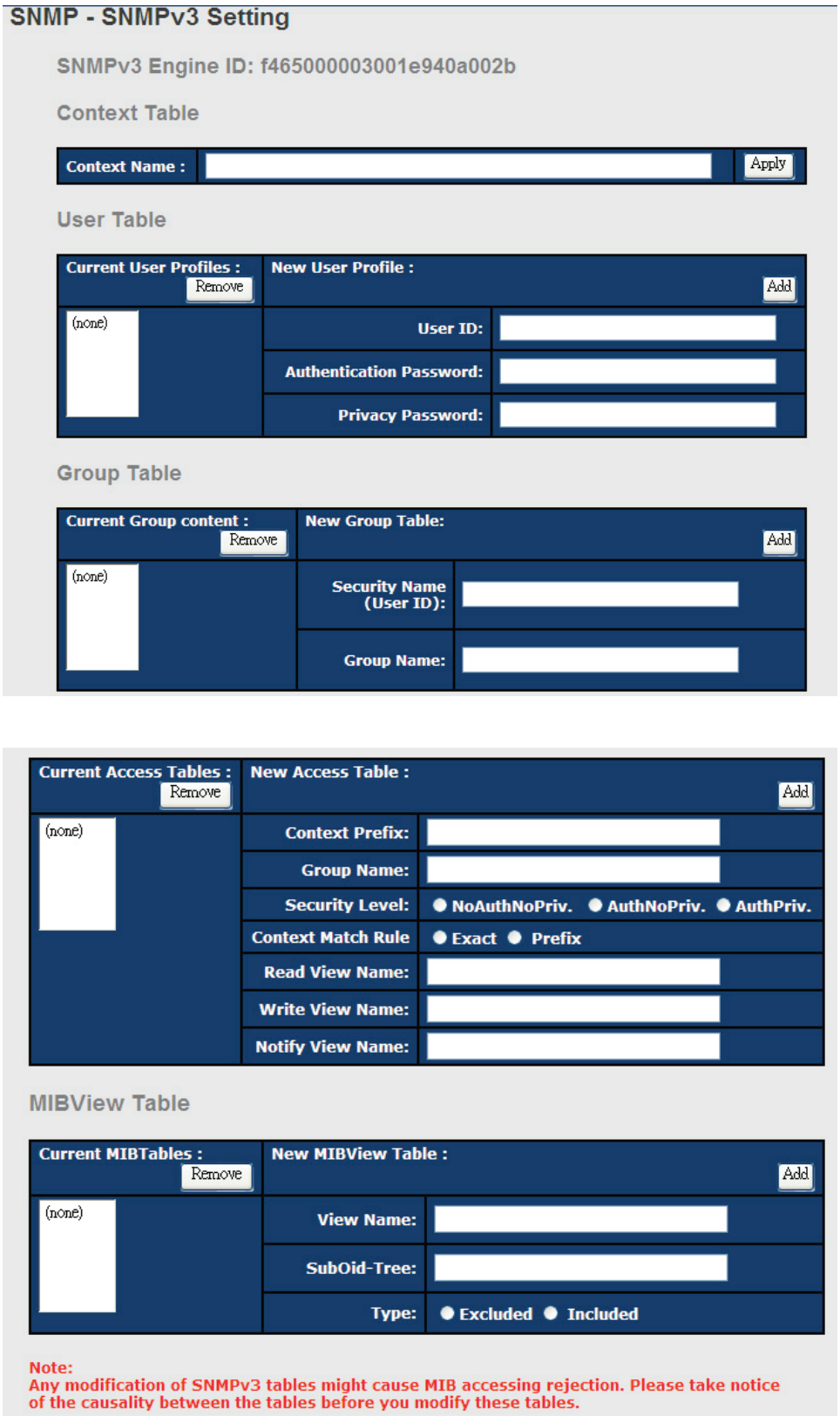


Figure 4-60. SNMP V3 setting screen.

Table 4-43. SNMP V3 Setting screen options.

Field	Description
Context Table	Configure SNMP v3 context table. Assign the context name of the context table. Click "Apply" to change the context name.
User Table	1. Configure SNMP v3 user table. 2. User ID: set up the user name. 3. Authentication Password: set up the authentication password. 4. Privacy Password: set up the private password. 5. Click "Add" to add a context name. 6. Click "Remove" to remove an unwanted context name.
Group Table	1. Configure the SNMP v3 group table. 2. Security Name (User ID): assign the user name that you have set up in the user table. 3. Group Name: set up the group name. 4. Click "Add" to add the context name. 5. Click "Remove" to remove an unwanted context name.
Access Table	1. Configure the SNMP v3 access table. 2. Context Prefix: set up the context name. 3. Group Name: set up the group. 4. Security Level: select the access level. 5. Context Match Rule: select the context match rule. 6. Read View Name: set up the read view. 7. Write View Name: set up the write view. 8. Notify View Name: set up the notify view. 9. Click "Add" to add a context name. 10. Click "Remove" to remove an unwanted context name.
MIBview Table	1. Configure MIB view table. 2. ViewName: set up the name. 3. Sub-Oid Tree: fill the Sub OID. 4. Type: select the type —exclude or included. 5. Click "Add" to add context name. 6. Click "Remove" to remove unwanted context name.
Help	Show the help file.

4.1.12 Security

Five useful functions can enhance the security of the switch: IP Security, Port Security, MAC Blacklist, MAC address Aging, and 802.1x protocol.

4.1.12.1 Management Security

Only an IP in the Secure IP List can manage the switch through your defined management mode (Web, Telnet, SNMP).

Figure 4-61. IP Security interface screen.

Table 4-44. IP Security screen parameters.

Field	Description
IP security MODE	Enable/Disable the IP security function.
Enable WEB Management	Mark the blank to enable WEB Management.
Enable SNMP Management	Mark the blank to enable MPSN Management.
Apply	Click “Apply” to set the configurations.
Help	Show the help file.

4.1.12.2 Static MAC Forwarding

Static MAC Forwarding adds static MAC addresses to hardware forwarding database. If port security is enabled at the Port Control page, only the frames with MAC addresses in this list will be forwarded; otherwise, they will be discarded.

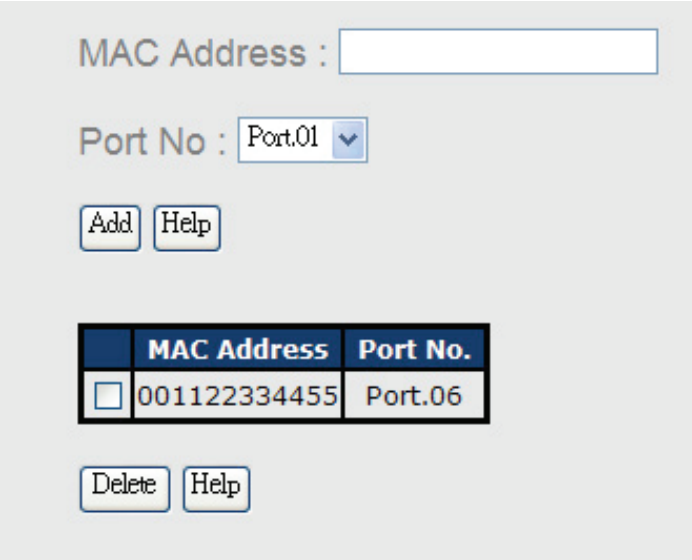


Figure 4-62. Port Security interface screen.

Table 4-45. Port Security interface screen fields.

Field	Description
MAC Address	Input a MAC Address to a specific port.
Port No.	Select a port on the switch.
Add	Type in a MAC address and select a port number from the drop down box, then click on the Add button.
Delete	Delete the entry.
Help	Show the help file.

4.1.12.3 MAC Blacklist

MAC Blacklist can eliminate the traffic forwarding to specific MAC addresses in list. Any frames forwarded to MAC addresses in this list will be discarded. Thus the target device will never receive any frame.

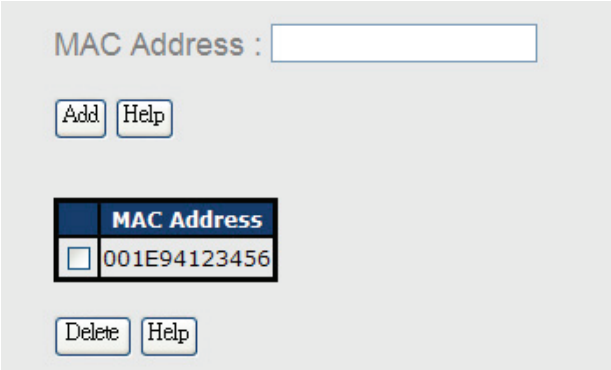


Figure 4-63. MAC Blacklist interface screen.

Table 4-46. MAC Blacklist interface screen options.

Field	Description
MAC Address	Input a MAC Address to add to the MAC Blacklist.
Port No.	Select a switch port.
Add	Add an entry to the Blacklist table.
Delete	Delete the entry.
Help	Show the help file.

4.1.12.4 802.1x

802.1x uses the physical access characteristics of IEEE802 LAN infrastructures to provide authenticated and authorized devices attached to a LAN port. Refer to IEEE 802.1X—Port Based Network Access Control.

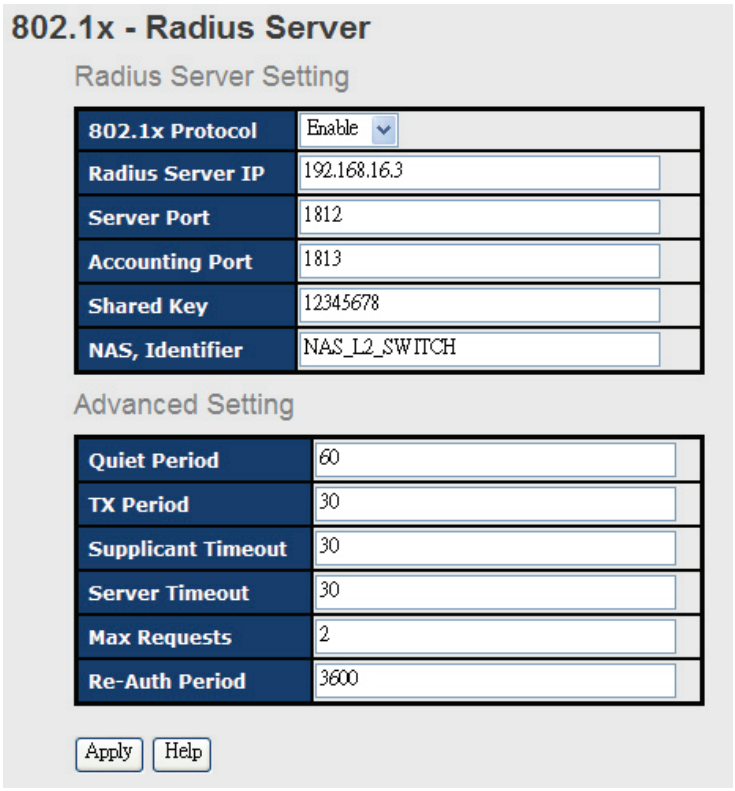


Figure 4-64. 802.1x Radius Server interface.

Table 4-47. 802.1x Radius Server interface screen parameters.

Field	Description
802.1x Protocol	Enable or Disable 802.1x Radius server function.
Radius Server IP	The IP address of the authentication server.
Server port	Set the UDP port number used by the authentication server to authenticate.
Account port	Set the UDP destination port for accounting requests to the specified Radius Server.
Shared Key	A key shared between this switch and authentication server.
NAS, Identifier	A string used to identify this switch.
Quiet Period	Set the time interval between authentication failure and the start of a new authentication attempt.
Tx Period	Set the time that the switch can wait for response to an EAP request/identity frame from the client before resending the request.
Supplicant Timeout	Set the period of time the switch waits for a supplicant response to an EAP request.
Server Timeout	Set the period of time the switch waits for a Radius server response to an authentication request.
Max Requests	Set the maximum number of times to retry sending packets to the supplicant.
Re-Auth Period	Set the period of time after which clients connected must be re-authenticated.
Apply	Click “Apply” to set the configuration.
Help	Show the help file.

802.1x-Port Authorized Mode

Set the 802.1x authorized mode of each port.

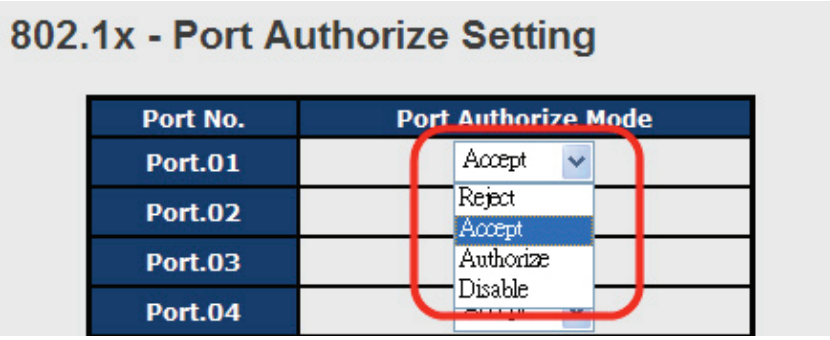


Figure 4-65. 802.1x Port Authorize interface screen.

Table 4-48. 802.1x Port Authorize interface screen parameters.

Field	Description
Port Authorized Mode	• Reject: Force this port to be unauthorized. • Accept: Force this port to be authorized. • Authorize: The state of this port was determined by the outcome of the 802.1x authentication. • Disable: This port will not participate in 802.1x.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

802.1x-Port Authorized Mode

Show 802.1x port authorized state.

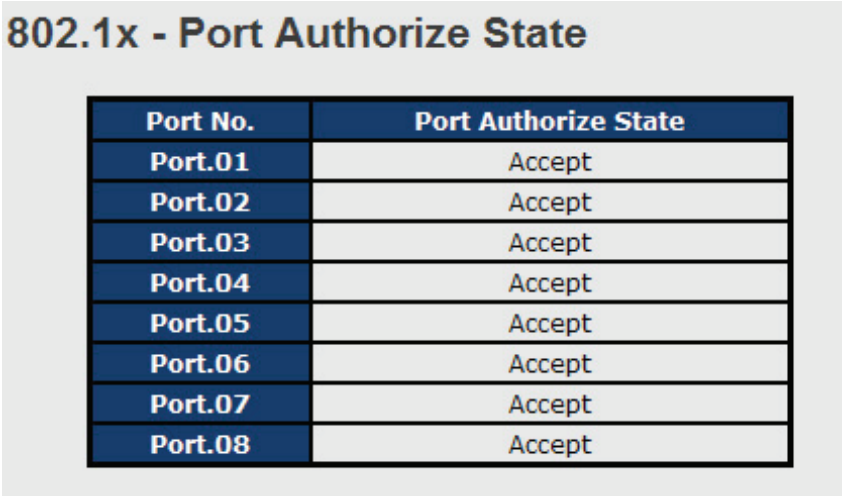


Figure 4-66. 802.1x Port Authorize State interface screen.

4.1.12.5 IP Guard

IP Guard – Port Setting

This page allows you to configure port configuration of IP Guard. IP Guard is an intelligent and easy use function for IP security. It could protect the network from unknown IP(the IP not in allowed list) attack. The illegal IP traffic will be blocked.

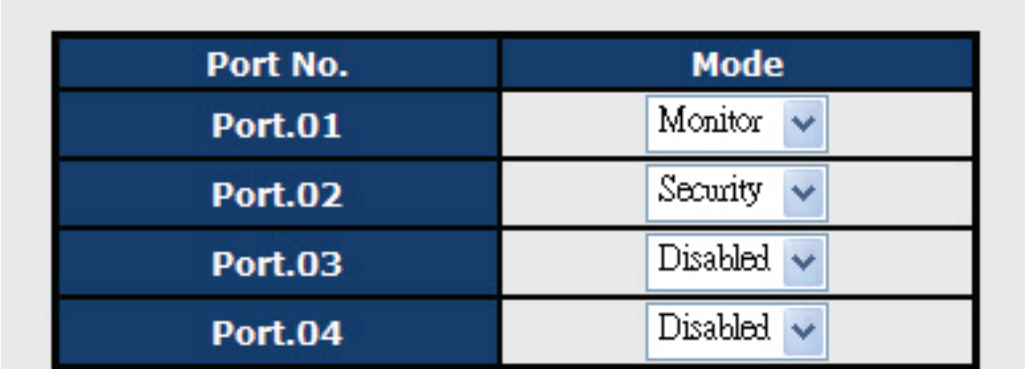


Figure 4-67. IP Guard—Port Setting State interface.

The following table describes the labels in this screen.

Table 4-49.

Field	Description
Mode	• Disable mode: function is totally disabled. • Monitor mode: function is disabled, but keeps monitor the IP traffic. • Security mode: function is enabled, the illegal IP traffic will be blocked.
Apply	Click "Apply " to set the configurations.
Help	Show help file.

IP Guard – Allow List

IP Guard is an intelligent and easy use function for IP security. It could protect the network

from unknown IP(the IP not in allowed list) attack. The illegal IP traffic will be blocked.

This page allows you to configure IP Guard allowed list. The IP traffic will be blocked, if it was not in allowed list

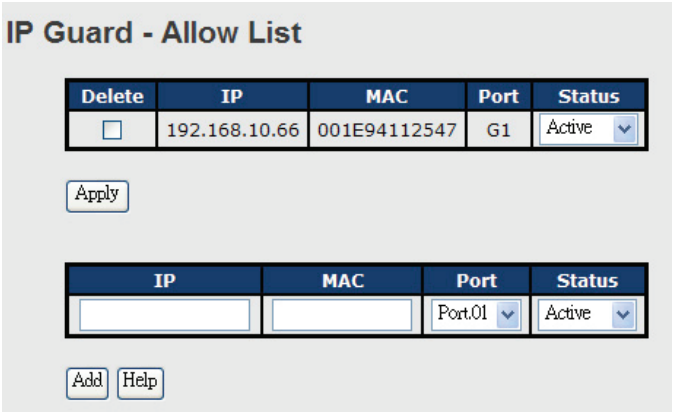


Figure 4-68. IP Guard – Allow List State interface.

Table 4-50. IP Guard – Allow List State interface fields.

Field	Description
IP	IP address of the allowed entry
MAC	MAC address of the allowed entry
Port	Port number of the allowed entry
Status	If you believe some allowed IP traffic is abnormal, you can use this field to block the traffic. • Active: Allow the IP traffic. • Suspend: Block the IP traffic.
Delete	If you want to delete the entry, check this box and apply it.

IP Guard – Super-IP List

IP Guard is an intelligent and easy use function for IP security. It could protect the network from unknown IP(the IP not in allowed list) attack. The illegal IP traffic will be blocked.

This page allows you to configure IP Guard Super-IP list. Super-IP entry has a special priority, the IP has no limited of MAC address and port binding. Any IP traffic are allowed, when the IP is in the Super-IP list.

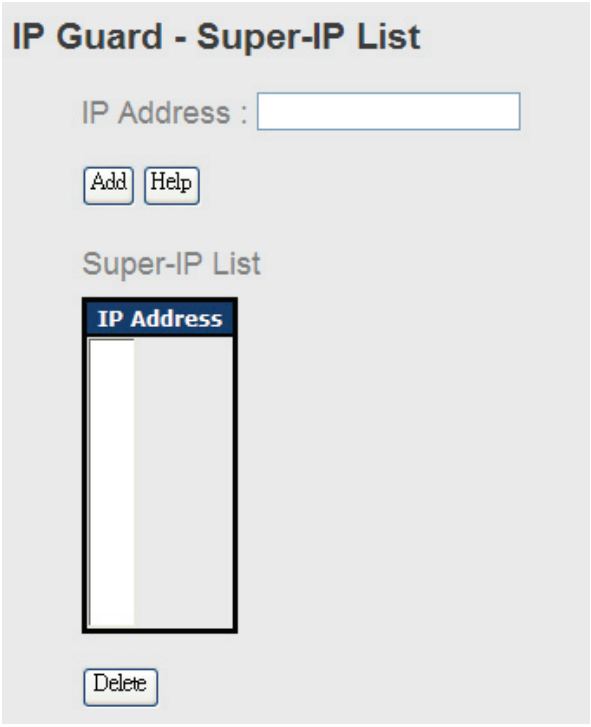


Figure 4-69. IP Guard Super List State interface screen.

IP Guard – Super-IP List

IP Guard is an intelligent and easy use function for IP security. It could protect the network from unknown IP(the IP not in allowed list) attack. The illegal IP traffic will be blocked.

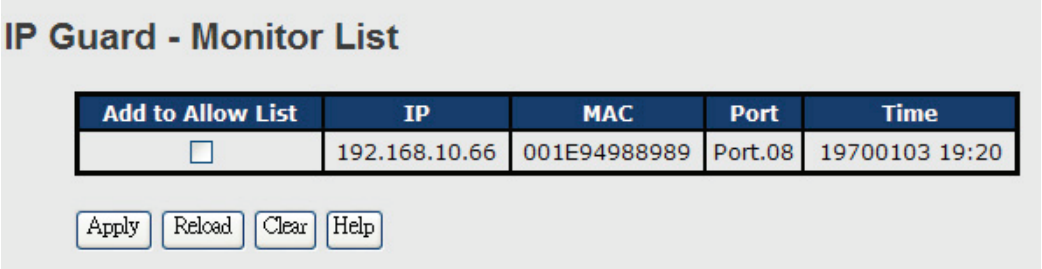


Figure 4-70. IP Guard—Monitor List.

The following table describes the labels in this screen.

Table 4-51. IP Guard—Monitor List fields.

Field	Description
IP	IP address of entry
MAC	MAC address of entry
Port	Port number of entry
Time	The logged time
Add to Allow List	If you want to allow the IP traffic, check this box and apply it.

4.1.13 Warning

The Warning function is very important for managing the switch. You can manage the switch via SYSLOG, E-MAIL, and Fault Relay. You can monitor the switch status on a remote site. When events occur, the warning message will be sent to your appointed server, E-MAIL, or relay fault to switch panel.

4.1.13.1 Fault Alarm

When a fault event happens, the Fault LED in switch panel will light and the electric relay will signal at the same time.

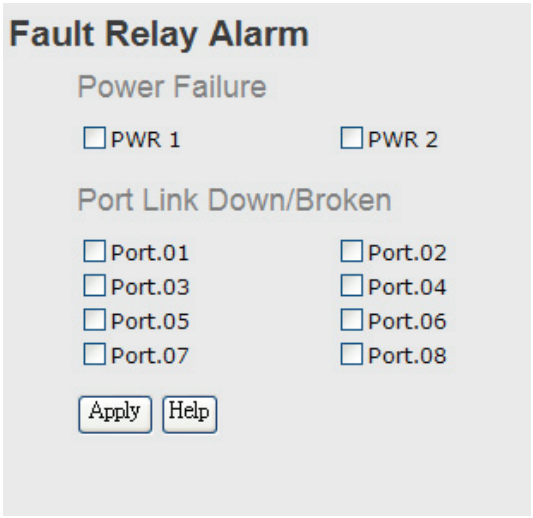


Figure 4-71. Fault Alarm interface screen.

Table 4-52. Fault Alarm interface screen parameters.

Field	Description
Power Failure	Check the box to monitor PWR 1 or PWR 2.
Port Link Down/Broken	Check the box to monitor port 1 to port 8.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.13.2 System Alarm

System alarm supports two warning modes: 1. SYSLOG. 2. E-MAIL. You can monitor the switch via selected system events.

System Warning – SYSLOG Setting

The SYSLOG is a protocol to transmit event notification messages across networks. Refer to RFC 3164—The BSD SYSLOG Protocol.

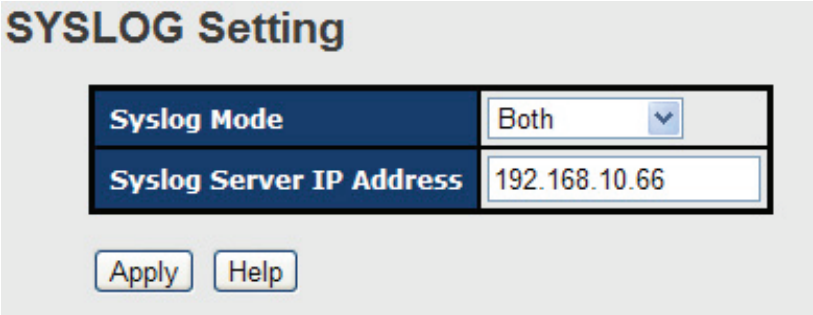


Figure 4-72. System Warning—SYSLOG Setting interface screen.

Table 4-53. System Warning – SYSLOG Setting interface screen settings.

Field	Description
SYSLOG Mode	• Disable: disable SYSLOG. • Client Only: login to local system. • Server Only: login to a remote SYSLOG server. • Both: login to both local and remote server.
SYSLOG Server IP Address	The remote SYSLOG Server IP address.
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

System Warning—SMTP Setting.

The SMTP is Short for Simple Mail Transfer Protocol. It is a protocol for e-mail transmission across the Internet. Refer to RFC 821—Simple Mail Transfer Protocol.

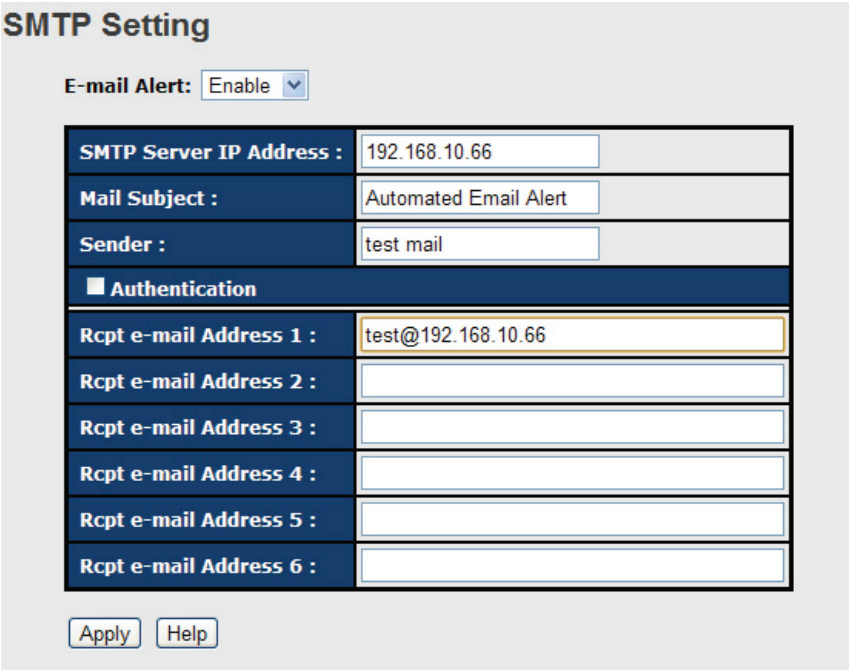


Figure 4-73. System Warning – SMTP Setting interface screen.

Table 4-54. System Warning—SMTP Setting interface screen parameters.

Field	Description
E-mail Alert	Enable/Disable transmission system warning events by e-mail.
SMTP Server IP Address	The mail server IP address.
Mail Subject	The subject of the mail.
Authentication	• Username: the authentication username. • Password: the authentication password. • Confirm Password: re-enter password.
Recipient E-mail Address	The recipient's E-mail address. It supports six recipients for a mail.
Apply	Click "Apply" to set the configurations.
Help	Show help file.

System Warning—Event Selection

SYSLOG and SMTP are the two warning methods that supported by the system. Check the corresponding box to enable system event warning method you wish to choose. Please note that the checkbox can not be checked when SYSLOG or SMTP is disabled.

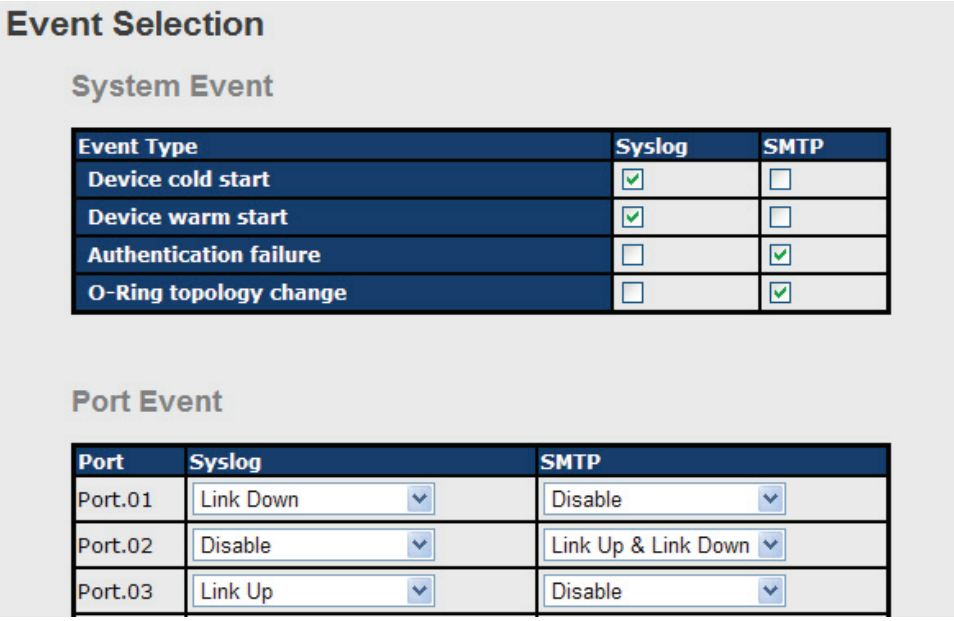


Figure 4-74. System Warning—Event Selection interface.

Table 4-55. System Warning—Event Selection interface screen.

Field	Description
Device cold start	The system will issue a log event upon cold start.
Device warm start	The system will issue a log event upon warm start.
Authentication Failure	Alert when SNMP authentication fails.
B-Ring Topology Change	Alert when B-Ring topology changes.
Port Event	• Disable • Link Up • Link Down • Link Up & Link Down
Apply	Click "Apply" to set the configuration.
Help	Show the help file.

4.1.14 Monitor and Diag

4.1.14.1 System Event Log

If system log client is enabled, the system event logs will be shown in this table.

Figure 4-75. System event log interface.

Table 4-56.

Field	Description
Page	Select LOG page
Reload	To get the newest event logs and refresh this page
Clear	Clear log
Help	Show help file.

4.1.14.2 MAC Address Table

Refer to IEEE 802.1 D Sections 7.9. The MAC Address Table, (the Filtering Database), determines whether a frame received by a given port with a given destination MAC address will be forwarded through a given potential transmission port.

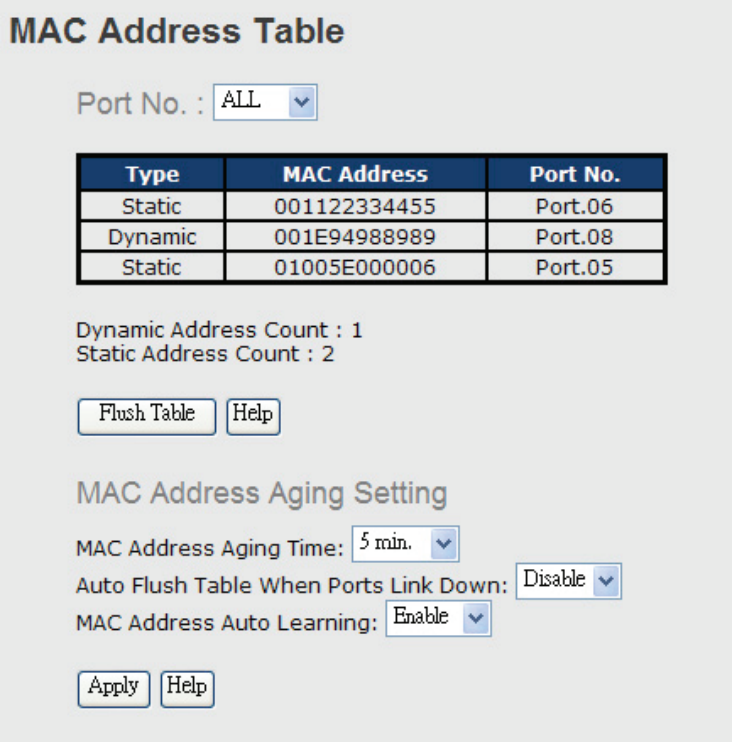


Figure 4-76. MAC Address Table interface screen.

Table 4-57. MAC Address Table interface screen components.

Field	Description
Port Number	Show all MAC addresses mapping to a selected port in the table.
Flush MAC Table	Clear all MAC addresses in the table.
MAC Address Aging	Assigned aging time MUST be a multiple of 15.
Auto Flush Table When Ports Link Down	When this is enabled and the port link is down, the switch will Flush the MAC table.
MAC Address Auto Learning	Enable or Disable the MAC Learning function.
Apply	Click "Apply" to set the configuration.

4.1.14.3 Port Overview

Port statistics show several statistics counters for all ports.

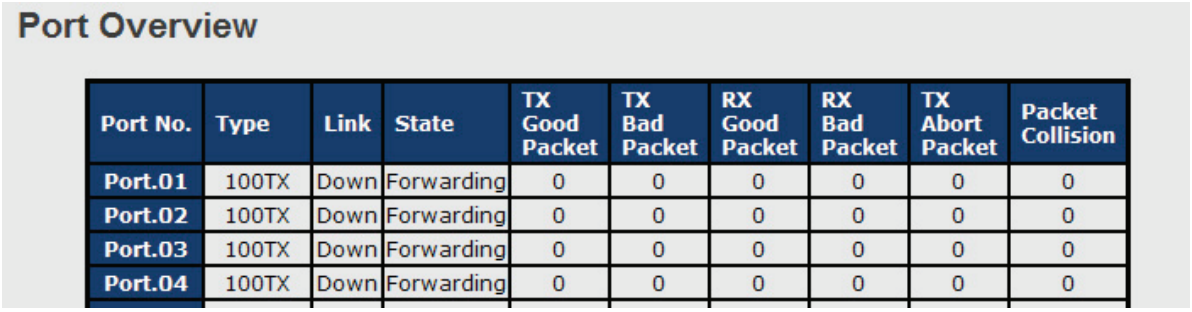


Figure 4-77. Port Overview screen.

Table 4-58. Port Overview screen options.

Field	Description
Type	Show port speed and media type.
Link	Show port link status.
State	Show ports enabled or disabled.
TX GOOD Packet	The number of good packets sent by this port.
TX Bad Packet	The number of bad packets sent by this port.
RX GOOD Packet	The number of good packets received by this port.
RX Bad Packet	The number of bad packets received by this port.
TX Abort Packet	The number of packets aborted by this port.
Packet Collision	The number of times a collision detected by this port.
Clear	Clear all counters.
Help	Show help file.

4.1.14.4 Port Counters

This page shows statistic counters for the port. The "Clear" button is to reset all counters to zero for all ports.

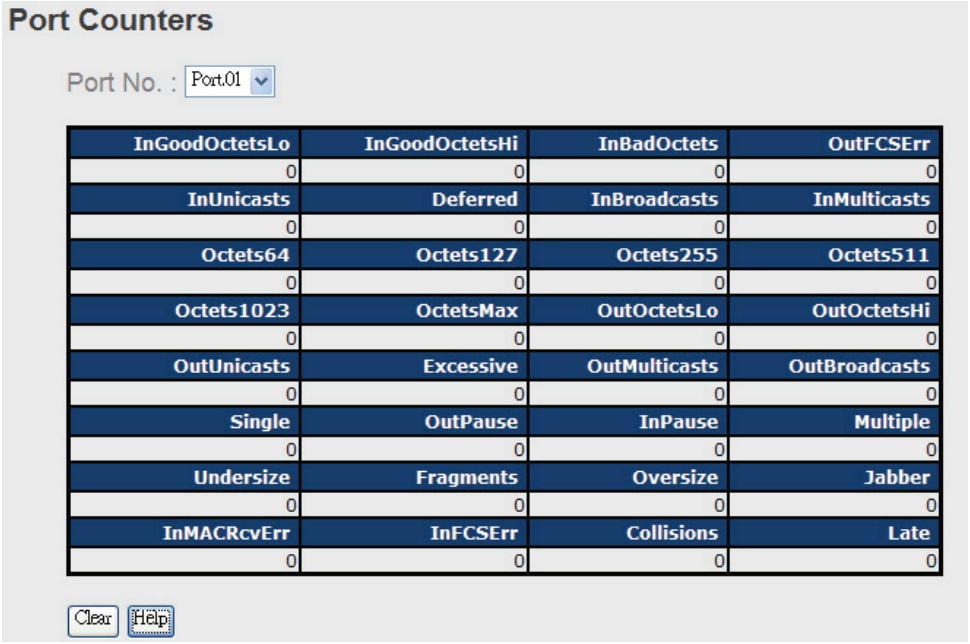


Figure 4-78. Port Counters interface screen.

Table 4-59. Port Counters interface screen options.

Field	Description
InGoodOctetsLo	The lower 32-bits of the 64-bit InGoodOctets counter. The sum of lengths of all good Ethernet frames received, that is, frames that are not bad frames.
InGoodOctetsHi	The upper 32-bits of the 64-bit InGoodOctets counter. The sum of lengths of all good Ethernet frames received, that is frames that are not bad frames.
InBadOctets	The sum of lengths of all bad Ethernet frames received.
OutFCSErr	The number of frames transmitted with a invalid FCS. Whenever a frame is modified during transmission (e.g., to add or remove a tag) the frames's original FCS is inspected before a new FCS is added to a modified frame. If the original FCS is invalid, the newFCS is made invalid too and this counter is incremented.
InUnicasts	The number of good frames received that have a Unicast destination MAC address.
Deferred	The total number of successfully transmitted frames that experienced no collisions but are delayed because the medium was busy during the first attempt. This counter is applicable in half-duplex mode only.
InBroadcasts	The number of good frames received that have a Broadcast destination MAC address.
InMulticasts	The number of good frames received that have a Multicast destination MAC address.
Octets64	Total frames received (and/or transmitted) with a length of exactly 64 octets, including those with errors.
Octets127	Total frames received (and/or transmitted) with a length of between 65 and 127 octets inclusive, including those with errors.
Octets255	Total frames received (and/or transmitted) with a length of between 128 and 255 octets inclusive, including those with error.
Octets511	Total frames received (and/or transmitted) with a length of between 256 and 511 octets inclusive, including those with error.
Octets1023	Total frames received (and/or transmitted) with a length of between 512 and 1023 octets inclusive, including those with error.

Table 4-59 (continued). Port Counters interface screen options.

Field	Description
OctetsMax	Total frames received (and/or transmitted) with a length of between 1024 and MaxSize octets inclusive, including those with error.
OutOctetsLo	The lower 32-bit of the 64-bit OutOctets counter. The sum of lengths of all Ethernet frames sent from this MAC.
OutOctetsHi	The upper 32-bit of the 64-bit OutOctets counter. The sum of lengths of all Ethernet frames sent from this MAC.
OutUnicasts	The number of frames sent that have an Unicast destination MAC address.
Excessive	The number frames dropped in the transmit MAC because the frame experienced 16 consecutive collisions. This counter is applicable in half-duplex only and only if DiscardExcessive is one.
OutBroadcasts	The number of good frames sent that have a Broadcast destination MAC address.
Single	The total number of successfully transmitted frames that experienced exactly one collision. This counter is applicable in half-duplex only.
OutPause	The number of good Flow Control frames sent.
InPause	The number of good Flow Control frames received.
Multiple	The total number of successfully transmitted frames that experienced more than one collision. This counter is applicable in half-duplex only.
Undersize	Total frames received with a length of less than 64 octets, but with a valid FCS.
Fragments	Total frames received with a length of more than 64 octets and with an invalid FCS.
Oversize	Total frames received with a length of more than MaxSize octets, but with a valid FCS.
Jabber	Total frames received with a length of more than MaxSize octets, but with an invalid FCS.
InMACRcvErr	Total frames received with an RxErr signal from the PHY.
InFCSErr	Total frames received with a CRC error not counted in Fragments, Jabber, or RxErr.
Collisions	The number of collision events seen by MAC not including those counted in Single, Multiple, Excessive or Late. This counter is applicable in half-duplex only.
Late	The number of times a collision is detected later than 512 bits-times into the transmission of a frame. This counter is applicable in half-duplex mode only.

4.1.14.5 Port Monitoring

Port monitoring supports TX (egress) only, RX (ingress) only, and TX/RX monitoring. TX monitoring sends any data that egress out checked TX source ports to a selected TX destination port as well. RX monitoring sends any data that ingress in checked RX source ports out to a selected RX destination port as well as sending the frame where it normally would have gone. Note that keep all source ports unchecked in order to disable port monitoring.

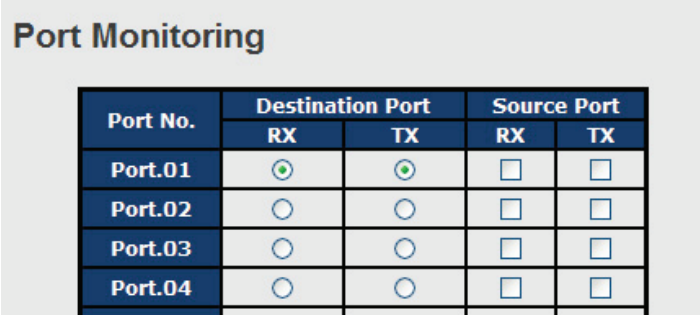


Figure 4-79. Port monitoring interface screen.

Table 4-60. Port monitoring interface screen options.

Field	Description
Destination Port	The port will receive a copied frame from the source port for monitoring.
Source Port	The port will be monitored. Mark TX or RX to monitor.
TX	The frames transmitted from the switch port.
RX	The frames receive by the switch port.
Apply	Click "Apply" to set the configurations.
Clear	Clear all blanks (disable the function).
Help	Show the help file.

4.1.14.6 Traffic Monitor

The function can monitor switch traffic. If traffic is too large, the switch will send SYSLOG Event or SMTP Mail.

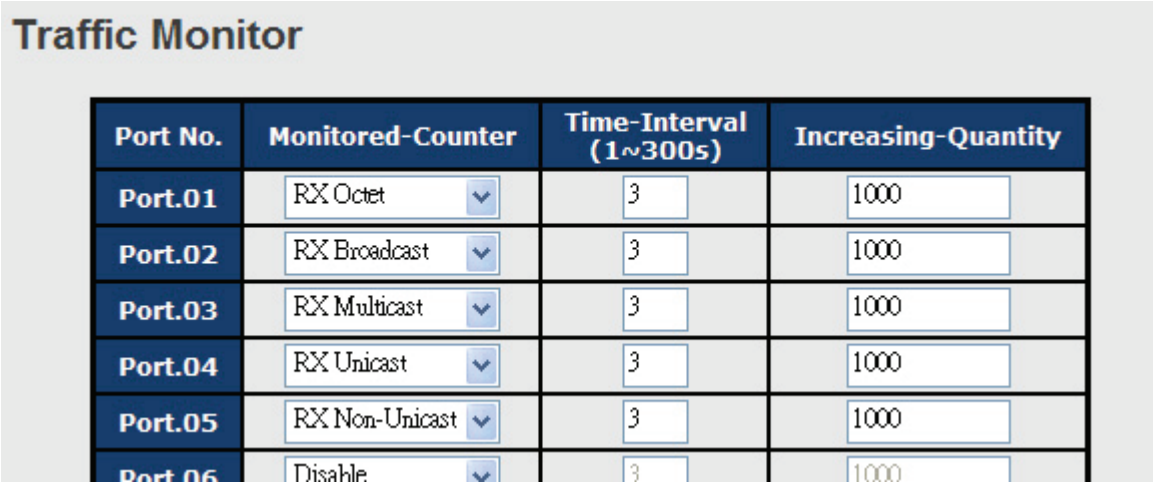


Figure 4-80. System event log interface screen.

Table 4-61. System event log interface screen components.

Field	Description
Monitored –Counter	Select monitor type
Time-Interval	Setting Interval time
Increasing – Quantity	Setting alarm Quantity
Event Alarm	Select alarm function (SYSLOG or SMTP)

4.1.14.7 Ping

Ping function allows the switch to send ICMP packets to detect the remote notes.

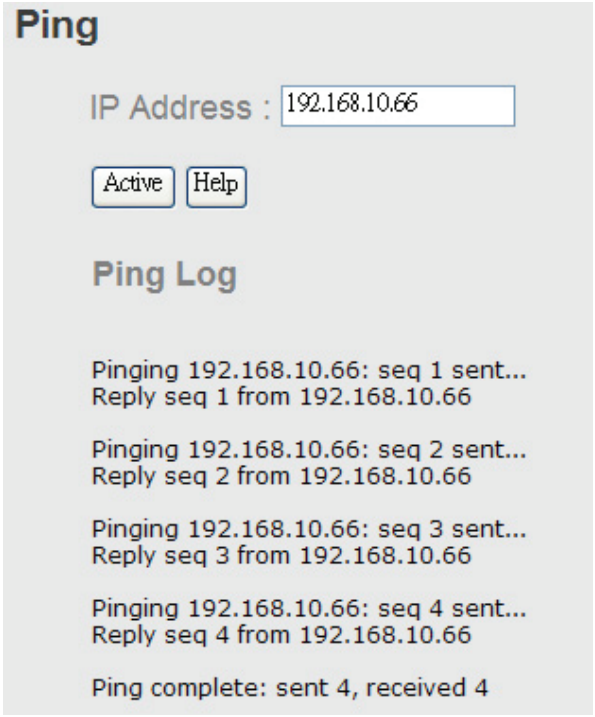


Figure 4-81. Ping interface screen.

Table 4-62. Ping interface screen fields.

Field	Description
IP address	Enter the IP address that you want to detect.
Active	Click "Active" to send ICMP packets.

4.1.15 Save Configuration

If any configuration changed, click "Save Configuration" to save current configuration data to the permanent flash memory. Otherwise, the current configuration will be lost when the power is off or the system is reset.

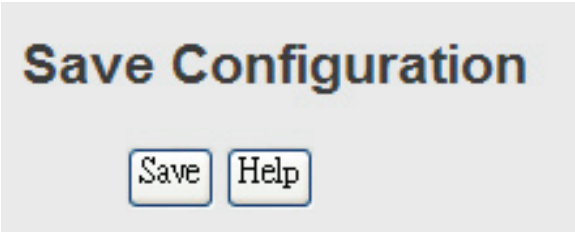


Figure 4-82. System Configuration interface screen.

Table 4-63. Save Configuration interface screen fields.

Field	Description
Save	Save all configurations.
Help	Show the help file.

4.1.16 Factory Default

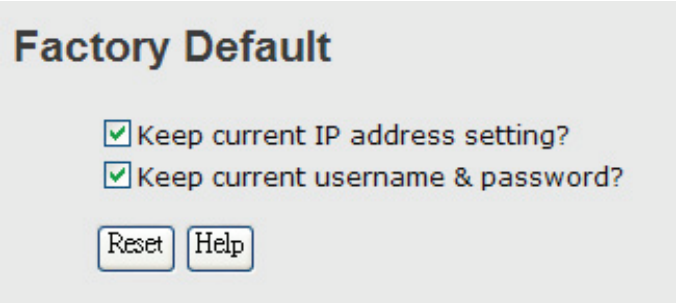


Figure 4-83. Factory Default interface screen.

Reset the switch to its default configuration. Click "Reset" to reset all configurations to the default value. You can select "Keep current IP address setting" and "Keep current username and password" to prevent IP and username and password from resetting to the default values.

4.1.2.17 System Reboot

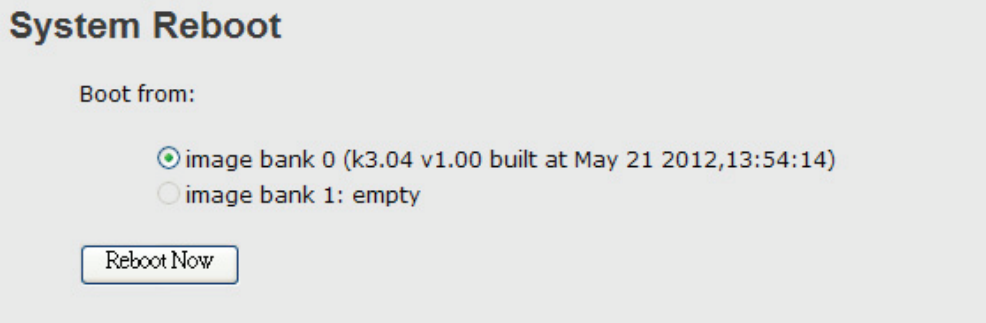


Figure 4-84. System Reboot interface screen.

5. Command-Line Interface Management

5.1 About CLI Management

The Industrial Managed Gigabit Ethernet Switch supports Web-based and CLI management. You can use a console or telnet to manage the switch via CLI.

CLI Management Using a RS-232 Serial Console (9600, 8, none, 1, none)

Before Configuring by RS-232 serial console, use an RJ-45 to DB9F cable to connect the switch's RS-232 Console port to your PC's COM port.

Follow the steps below to access the console via an RS-232 serial cable.

1. From the Windows desktop, click on Start -> Programs -> Accessories -> Communications -> Hyper Terminal

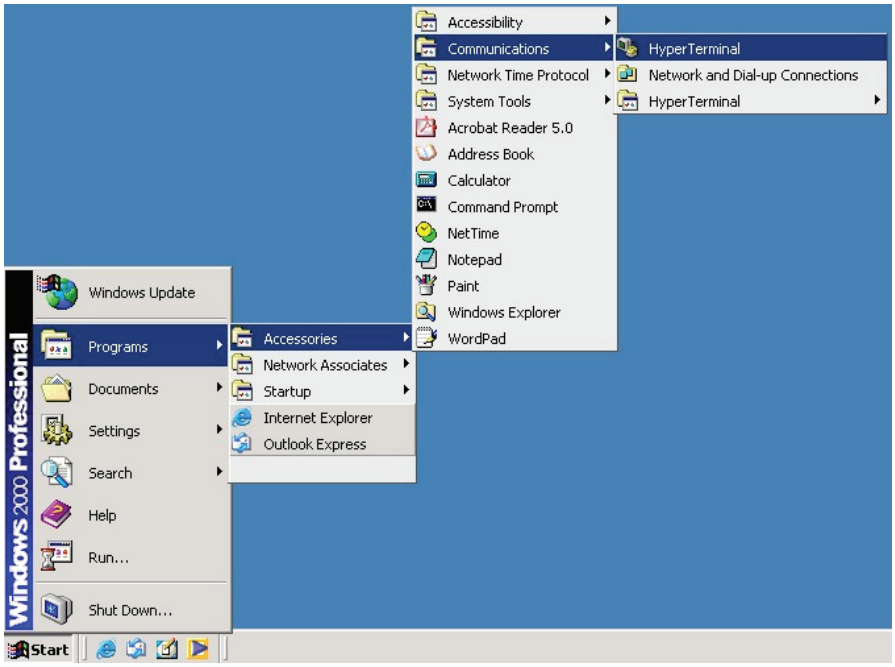


Figure 5-1. HyperTerminal screen.

2. Input a name for new connection.

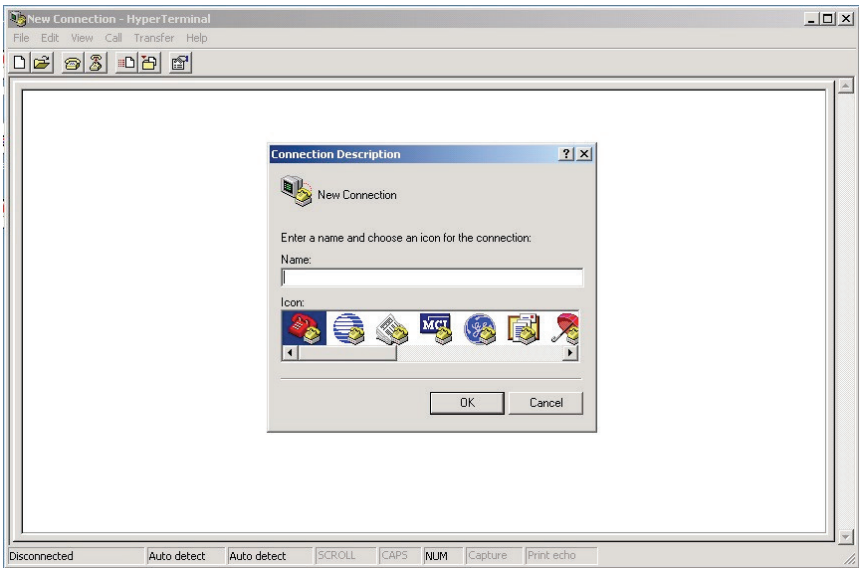


Figure 5-2. New Connection screen.

3. Select the COM port number to use.

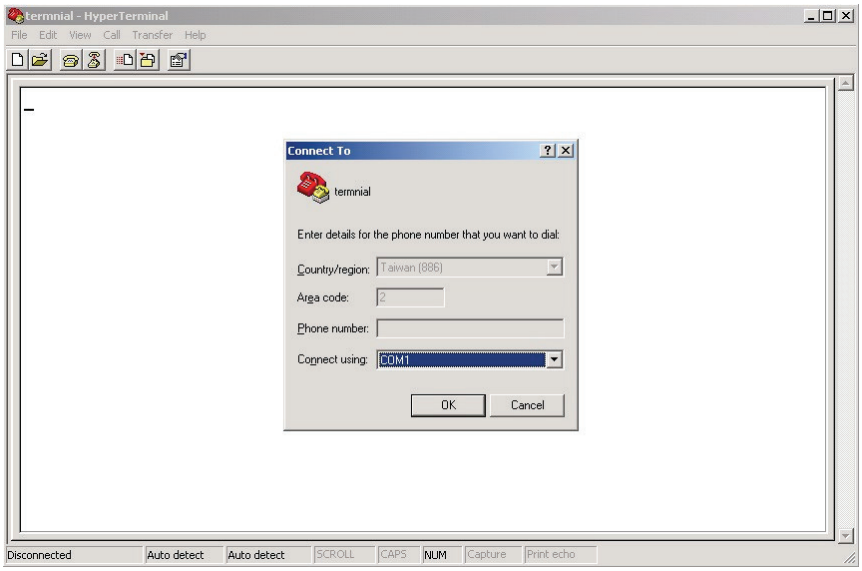


Figure 5-3. Select the COM port number.

4. Enter 9600 for Bits per second, 8 for Data bits, None for Parity, 1 for Stop bits and none for Flow control.

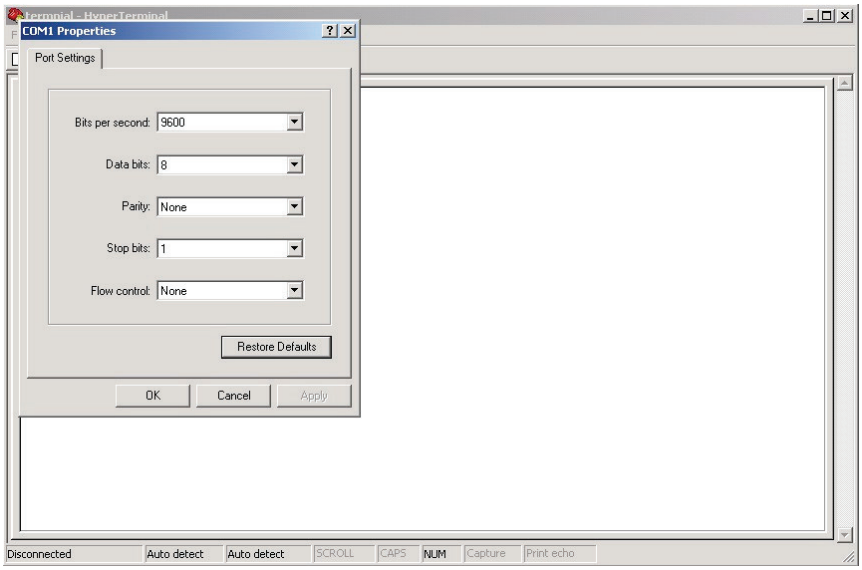


Figure 5-4. Enter COM port parameters.

5. The Console login screen will appear. Use the keyboard to enter the Console Username and Password that is the same as the Web Browser password, and then press "Enter."

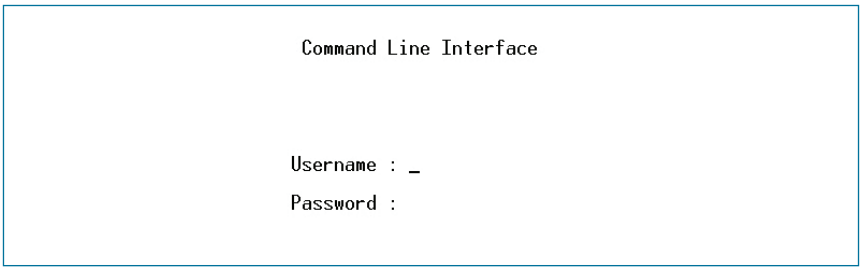


Figure 5-5. Enter console username and password.

CLI Management Using Telnet

You can use telnet to configure the switches.

The default values are:

IP Address: 192.168.10.1

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.254

User Name: admin

Password: admin

Follow the steps below to access the console via Telnet.

1. Telnet to the IP address of the switch from the Windows "Run" command (or from the MS-DOS prompt).

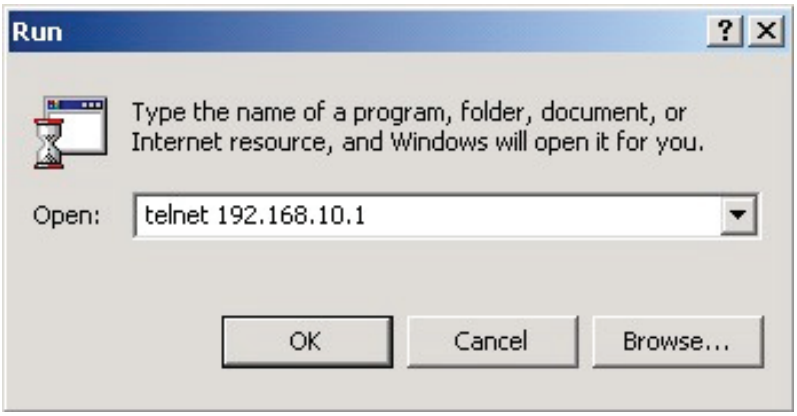


Figure 5-6. Windows Run screen.

2. The console login screen will appear. Type in the console username and password that is the same as the Web browser password, and then press "Enter."

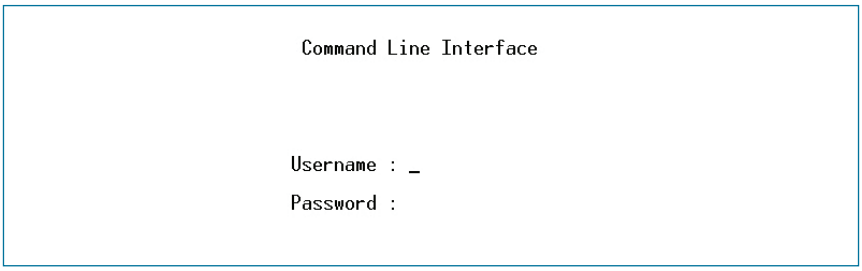


Figure 5-7. Telnet login screen.

Table 5-1. Commands level.

Modes	Access Method	Prompt	Exit Method	About this Model
User EXEC	Begin a session with your switch.	switch>	Enter logout or quit.	The user command available at the level of user is the subset of those available at the privileged level. Use this mode to: • Enter menu mode. • Display system information.
Privileged EXEC	Enter the enable command while in user EXEC mode.	switch#	Enter disable to exit.	The privileged command is advanced mode. Set this mode to: • Display advanced function status. • Save configuration.
Global configuration	Enter the configure command while in privileged EXEC mode.	switch(config)#	To exit to privileged EXEC mode, enter exit or end.	Use this mode to configure parameters that apply to your Switch as a whole.

Table 5-1 (continued). Commands level.

Modes	Access Method	Prompt	Exit Method	About this Model
VLAN database	Enter the vlan database command while in privileged EXEC mode.	switch(vlan)#	To exit to user EXEC mode, enter exit.	Use this mode to configure VLAN-specific parameters.
Interface configuration	Enter the interface command (with a specific interface) while in global configuration mode.	switch(config-if)#	To exit to global configuration mode, enter exit. To exit privileged EXEC mode or end.	Use this mode to configure parameters for the switch and Ethernet ports.

Table 5-2. Command level symbol.

Modes	Command Level Symbol
User EXEC	E
Privileged EXEC	P
Global configuration	G
VLAN database	V
Interface configuration	I

5.2 Commands Set List—System Commands Set

Table 5-3. System Commands Set.

Industrial Switch Commands	Level	Description	Example
show config	E	Show switch configuration.	switch>show config
show terminal	P	Show console information.	switch#show terminal
write memory	P	Save your configuration into permanent memory (flash rom).	switch#write memory
system name [System Name]	G	Configure system name.	switch(config)#system name xxx
system location [System Location]	G	Set switch system location string.	switch(config)#system location xxx
system description [System Description]	G	Set switch system description string.	switch(config)#system description xxx
system contact [System Contact]	G	Set switch system contact window string.	switch(config)#system contact xxx
show system-info	E	Show system information.	switch>show system-info
ip address [Ip-address] [Subnet-mask] [Gateway]	G	Configure the IP address of switch.	switch(config)#ip address 192.168.1.1 255.255.255.0 192.168.1.254
ip dhcp	G	Enable DHCP client function of switch	switch(config)#ip dhcp

Table 5-3 (continued). System Commands Set.

Industrial Switch Commands	Level	Description	Example
show ip	P	Show IP information of switch.	switch#show ip
no ip dhcp	G	Disable DHCP client function of switch.	switch(config)#no ip dhcp
reload	G	Halt and perform a cold restart.	switch(config)#reload
default	G	Restore to default.	Switch(config)#default
admin username [Username]	G	Changes a login username (maximum 10 words).	switch(config)#admin username xxxxxx
admin password [Password]	G	Specifies a password (maximum 10 words).	switch(config)#admin password xxxxxx
show admin	P	Show administrator information.	switch#show admin
dhcpserver enable	G	Enable DHCP Server.	switch(config)#dhcpserver enable
dhcpserver lowip [Low IP]	G	Configure low IP address for IP pool.	switch(config)#dhcpserver lowip 192.168.1.1
dhcpserver highip [High IP]	G	Configure high IP address for IP pool.	switch(config)# dhcpserver highip 192.168.1.50
dhcpserver subnetmask [Subnet mask]	G	Configure subnet mask for DHCP clients.	switch(config)#dhcpserver subnetmask 255.255.255.0
dhcpserver gateway [Gateway]	G	Configure gateway for DHCP clients.	switch(config)#dhcpserver gateway 192.168.1.254
dhcpserver dnsip [DNS IP]	G	Configure DNS IP for DHCP clients.	switch(config)# dhcpserver dnsip 192.168.1.1
dhcpserver leasetime [Hours]	G	Configure lease time (in hour).	switch(config)# dhcpserver leasetime 1
dhcpserver ipbinding [IP address]	I	Set static IP for DHCP clients by port.	switch(config)#interface fastEthernet 2 switch(config-if)#dhcpserver ipbinding 192.168.1.1
show dhcpserver configuration	P	Show configuration of DHCP server.	switch#show dhcpserver configuration
show dhcpserver clients	P	Show client entries of DHCP server.	switch#show dhcpserver clients
show dhcpserver ip-binding	P	Show IP-Binding information of DHCP server.	switch#show dhcpserver ip-binding
no dhcpserver	G	Disable DHCP server function.	switch(config)#no dhcpserver
security enable	G	Enable IP security function.	switch(config)#security enable
security http	G	Enable IP security of HTTP server.	switch(config)#security http
security telnet	G	Enable IP security of telnet server.	switch(config)#security telnet
security ip [Index(1..10)] [IP Address]	G	Set the IP security list.	switch(config)#security ip 1 192.168.1.55
show security	P	Show the IP security information.	switch#show security

Table 5-3 (continued). System Commands Set.

Industrial Switch Commands	Level	Description	Example
no security	G	Disable IP security function.	switch(config)#no security
no security http	G	Disable IP security of HTTP server.	switch(config)#no security http
no security telnet	G	Disable IP security of telnet server.	switch(config)#no security telnet

5.3 Commands Set List—Port Commands Set

Table 5-4. Port Commands Set.

Industrial Switch Commands	Level	Description	Example
interface fastEthernet [Portid]	G	Choose the port for modification.	switch(config)#interface fastEthernet 2
duplex [full | half]	I	Use the duplex configuration command to specify the duplex mode of operation for Fast Ethernet.	switch(config)#interface fastEthernet 2 switch(config-if)#duplex full
speed [10|100|1000|auto]	I	Use the speed configuration command to specify the speed mode of operation for Fast Ethernet. The speed can't be set to 1000 if the port isn't a Gigabit port.	switch(config)#interface fastEthernet 2 switch(config-if)#speed 100
Iflowcontrol mode [Symmetric|Asymmetric]	I	Use the flowcontrol configuration command on Ethernet ports to control traffic rates during congestion.	switch(config)#interface fastEthernet 2 switch(config-if)#flowcontrol mode Asymmetric
no flowcontrol	I	Disable flow control of interface.	switch(config-if)#no flowcontrol
security enable	I	Enable security of interface.	switch(config)#interface fastEthernet 2 switch(config-if)#security enable
no security	I	Disable security of interface.	switch(config)#interface fastEthernet 2 switch(config-if)#no security
bandwidth type all	I	Set interface ingress limit frame type to "accept all frames."	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth type all
bandwidth type broadcast-multicast-flooded-unicast	I	Set interface ingress limit frame type to "accept broadcast, multicast, and flooded unicast frames."	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth type broadcast-multicast-flooded-unicast
bandwidth type broadcast-multicast	I	Set interface ingress limit frame type to "accept broadcast and multicast frames."	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth type broadcast-multicast
bandwidth type broadcast-only	I	Set interface ingress limit frame type to "only accept broadcast frames."	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth type broadcast-only

Table 5-4 (continued). Port Commands Set.

Industrial Switch Commands	Level	Description	Example
bandwidth in [Value]	I	Set interface input bandwidth. Rate Range is from 100 kbps to 102400 kbps or to 256000 kbps for giga ports, and zero means no limit.	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth in 100
bandwidth out [Value]	I	Set interface output bandwidth. Rate Range is from 100 kbps to 102400 kbps or to 256000 kbps for giga ports, and zero means no limit.	switch(config)#interface fastEthernet 2 switch(config-if)#bandwidth out 100
show bandwidth	I	Show interfaces bandwidth control.	switch(config)#interface fastEthernet 2 switch(config-if)#show bandwidth
state [Enable | Disable]	I	Use the state interface configuration command to specify the state mode of operation for Ethernet ports. Use the disable form of this command to disable the port.	switch(config)#interface fastEthernet 2 switch(config-if)#state Disable
show interface configuration	I	Show interface configuration status.	switch(config)#interface fastEthernet 2 switch(config-if)#show interface configuration
show interface status	I	Show interface actual status.	switch(config)#interface fastEthernet 2 switch(config-if)#show interface status
show interface accounting	I	Show interface statistic counter.	switch(config)#interface fastEthernet 2 switch(config-if)#show interface accounting
no accounting	I	Clear interface accounting information.	switch(config)#interface fastEthernet 2 switch(config-if)#no accounting

5.4 Commands Set List—Trunk command set

Table 5-5. Trunk Commands Set.

Industrial Switch Commands	Level	Description	Example
aggregator priority [1to65535]	G	Set port group system priority.	switch(config)#aggregator priority 22
aggregator activityport [Port Numbers]	G	Set activity port.	switch(config)#aggregator activityport 2
aggregator group [GroupID] [Port-list] lacp workp [Workport]	G	Assign a trunk group with LACP active. [GroupID] :1to3 [Port-list]:Member port list, This parameter could be a port range(ex.1-4) or a port list separate by a comma(ex.2, 3, 6) [Workport]: The amount of work ports, this value could not be less than zero or be large than the amount of member ports.	switch(config)#aggregator group 1 1-4 lacp workp 2 or switch(config)#aggregator group 2 1,4,3 lacp workp 3
aggregator group [GroupID] [Port-list] nolacp	G	Assign a static trunk group. [GroupID] :1to3 [Port-list]:Member port list, This parameter could be a port range(ex.1-4) or a port list separate by a comma(ex.2, 3, 6)	switch(config)#aggregator group 1 2-4 nolacp or switch(config)#aggreator group 1 3,1,2 nolacp
show aggregator	P	Show the information of trunk group.	switch#show aggregator
no aggregator lacp [GroupID]	G	Disable the LACP function of trunk group.	switch(config)#no aggreator lacp 1
no aggregator group [GroupID]	G	Remove a trunk group.	switch(config)#no aggreator group 2

5.5 Commands Set List—VLAN command set

Table 5-6. VLAN Commands Set.

Industrial Switch Commands	Level	Description	Example
vlan database	P	Enter VLAN configure mode.	switch#vlan database
vlan [8021q | gvrp]	V	To set switch VLAN mode.	switch(vlan)# vlanmode 8021q or switch(vlan)# vlanmode gvrp
no vlan [VID]	V	Disable vlan group(by VID).	switch(vlan)#no vlan 2
no gvrp	V	Disable GVRP	switch(vlan)#no gvrp
IEEE 802.1Q VLAN			
vlan 8021q port [PortNumber] access-link untag [UntaggedVID]	V	Assign a access link for VLAN by port, if the port belong to a trunk group, this command can't be applied.	switch(vlan)#vlan 8021q port 3 access-link untag 33
vlan 8021q port [PortNumber] trunk-link tag [TaggedVID List]	V	Assign a trunk link for VLAN by port, if the port belongs to a trunk group, this command can't be applied.	switch(vlan)#vlan 8021q port 3 trunk-link tag 2,3,6,99 or switch(vlan)#vlan 8021q port 3 trunk-link tag 3-20
vlan 8021q port [PortNumber] hybrid-link untag [UntaggedVID] tag [TaggedVID List]	V	Assign a hybrid link for VLAN by port, if the port belong to a trunk group, this command can't be applied.	switch(vlan)# vlan 8021q port 3 hybrid-link untag 4 tag 3,6,8 or switch(vlan)# vlan 8021q port 3 hybrid-link untag 5 tag 6-8
vlan 8021q aggregator [TrunkID] access-link untag [UntaggedVID]	V	Assign an access link for VLAN by trunk group.	switch(vlan)#vlan 8021q aggregator 3 access-link untag 33
vlan 8021q aggregator [TrunkID] trunk-link tag [TaggedVID List]	V	Assign a trunk link for VLAN by trunk group.	switch(vlan)#vlan 8021q aggregator 3 trunk-link tag 2,3,6,99 or switch(vlan)#vlan 8021q aggregator 3 trunk-link tag 3-20
vlan 8021q aggregator [PortNumber] hybrid-link untag [UntaggedVID] tag [TaggedVID List]	V	Assign a hybrid link for VLAN by trunk group.	switch(vlan)# vlan 8021q aggreator 3 hybrid-link untag 4 tag 3,6,8 or switch(vlan)# vlan 8021q aggreator 3 hybrid-link untag 5 tag 6-8
show vlan [VID] or show vlan	V	Show VLAN information	switch(vlan)#show vlan 23

5.6 Commands Set List—Spanning Tree command set

Table 5-7. Spanning Tree Commands Set.

Industrial Switch Commands	Level	Description	Example
spanning-tree enable	G	Enable spanning tree	switch(config)#spanning-tree enable
spanning-tree priority [0to61440]	G	Configure spanning tree priority parameter	switch(config)#spanning-tree priority 32767
spanning-tree max-age [seconds]	G	Use the spanning-tree max-age global configuration command to change the interval between messages the spanning tree receives from the root switch. If a switch does not receive a bridge protocol data unit (BPDU) message from the root switch within this interval, it recomputed the Spanning Tree Protocol (STP) topology.	switch(config)# spanning-tree max-age 15
spanning-tree hello-time [seconds]	G	Use the spanning-tree hello-time global configuration command to specify the interval between hello bridge protocol data units (BPDUs).	switch(config)#spanning-tree hello-time 3
spanning-tree forward-time [seconds]	G	Use the spanning-tree forward-time global configuration command to set the forwarding-time for the specified spanning-tree instances. The forwarding time determines how long each of the listening and learning states last before the port begins forwarding.	switch(config)# spanning-tree forward-time 20
stp-path-cost [1to200000000]	I	Use the spanning-tree cost interface configuration command to set the path cost for Spanning Tree Protocol (STP) calculations. In the event of a loop, spanning tree considers the path cost when selecting an interface to place into the forwarding state.	switch(config)#interface fastEthernet 2 switch(config-if)#stp-path-cost 20
stp-path-priority [Port Priority]	I	Use the spanning-tree port-priority interface configuration command to configure a port priority that is used when two switches tie for position as the root switch.	switch(config)#interface fastEthernet 2 switch(config-if)# stp-path-priority 127
stp-admin-p2p [Auto|True|False]	I	Admin P2P of STP priority on this interface.	switch(config)#interface fastEthernet 2 switch(config-if)# stp-admin-p2p Auto
stp-admin-edge [True|False]	I	Admin Edge of STP priority on this interface.	switch(config)#interface fastEthernet 2 switch(config-if)# stp-admin-edge True
stp-admin-non-stp [True|False]	I	Admin NonSTP of STP priority on this interface.	switch(config)#interface fastEthernet 2 switch(config-if)# stp-admin-non-stp False
Show spanning-tree	E	Display a summary of the spanning-tree states.	switch>show spanning-tree
no spanning-tree	G	Disable spanning-tree.	switch(config)#no spanning-tree

5.7 Commands Set List—QoS commands set

Table 5-8. QoS Commands Set.

Industrial Switch Commands	Level	Description	Example
qos policy [weighted-fair|strict]	G	Select QOS policy scheduling.	switch(config)#qos policy weighted-fair
qos prioritytype [port-based|cos-only|tos-only|cos-first|tos-first]	G	Setting of QOS priority type.	switch(config)#qos prioritytype
qos priority portbased [Port] [lowest|low|middle|high]	G	Configure Port-based Priority	switch(config)#qos priority portbased 1 low
qos priority cos [Priority] [lowest|low|middle|high]	G	Configure COS Priority	switch(config)#qos priority cos 22 middle
qos priority tos [Priority] [lowest|low|middle|high]	G	Configure TOS Priority	switch(config)#qos priority tos 3 high
show qos	P	Display the information of QoS configuration	switch>show qos
no qos	G	Disable QoS function	switch(config)#no qos

5.8 Commands Set List—IGMP commands set

Table 5-9. IGMP Commands Set.

Industrial Switch Commands	Level	Description	Example
igmp enable	G	Enable IGMP snooping function	switch(config)#igmp enable
lgmp-query auto	G	Set IGMP query to auto mode	switch(config)#lgmp-query auto
lgmp-query force	G	Set IGMP query to force mode	switch(config)#lgmp-query force
show igmp configuration	P	Displays the details of an IGMP configuration.	switch#show igmp configuration
show igmp multi	P	Displays the details of an IGMP snooping entries.	switch#show igmp multi
no igmp	G	Disable IGMP snooping function	switch(config)#no igmp
no igmp-query	G	Disable IGMP query	switch#no igmp-query

5.9 Commands Set List—MAC/Filter Table command set

Table 5-10. MAC/FIlter Table Commands Set.

Industrial Switch Commands	Level	Description	Example
mac-address-table static hwaddr [MAC]	I	Configure MAC address table of interface (static).	switch(config)#interface fastEthernet 2 switch(config-if)#mac-address-table static hwaddr 000012345678
mac-address-table filter hwaddr [MAC]	G	Configure MAC address table(filter)	switch(config)#mac-address-table filter hwaddr 000012348678
show mac-address-table	P	Show all MAC address table	switch#show mac-address-table
show mac-address-table static	P	Show static MAC address table	switch#show mac-address-table static
show mac-address-table filter	P	Show filter MAC address table.	switch#show mac-address-table filter
no mac-address-table static hwaddr [MAC]	I	Remove an entry of MAC address table of interface (static)	switch(config)#interface fastEthernet 2 switch(config-if)#no mac-address-table static hwaddr 000012345678
no mac-address-table filter hwaddr [MAC]	G	Remove an entry of MAC address table (filter)	switch(config)#no mac-address-table filter hwaddr 000012348678
no mac-address-table	G	Remove dynamic entry of MAC address table	switch(config)#no mac-address-table

5.10 Commands Set List—SNMP command set

Table 5-11. SNMP Commands Set.

Industrial Switch Commands	Level	Description	Example
snmp agent-mode [v1v2c | v3]	G	Select the agent mode of SNMP	switch(config)#snmp agent-mode v1v2c
snmp-server host [IP address] community [Community-string] trap-version [v1|v2c]	G	Configure SNMP server host information and community string	switch(config)#snmp-server host 192.168.10.50 community public trap-version v1 (remove) Switch(config)# no snmp-server host 192.168.10.50
snmp community-strings [Community-string] right [RO|RW]	G	Configure the community string right	switch(config)#snmp community-strings public right RO or switch(config)#snmp community-strings public right RW
snmp snmpv3-user [User Name] password [Authentication Password] [Privacy Password]	G	Configure the userprofile for SNMPV3 agent. Privacy password could be empty.	switch(config)#snmp snmpv3-user test01 password AuthPW PrivPW
show snmp	P	Show SNMP configuration	switch#show snmp
show snmp-server	P	Show specified trap server information	switch#show snmp-server

Table 5-11 (continued). SNMP Commands Set.

Industrial Switch Commands	Level	Description	Example
no snmp community-strings [Community]	G	Remove the specified community.	switch(config)#no snmp community-strings public
no snmp snmpv3-user [User Name] password [Authentication Password] [Privacy Password]	G	Remove specified user of SNMPv3 agent. Privacy password could be empty.	switch(config)# no snmp snmpv3-user test01 password AuthPW PrivPW
no snmp-server host [Host-address]	G	Remove the SNMP server host.	switch(config)#no snmp-server 192.168.10.50

5.11 Commands Set List—Port Mirroring command set

Table 5-12. Port Mirroring Commands Set.

Industrial Switch Commands	Level	Description	Example
monitor rx	G	Set RX destination port of monitor function.	switch(config)#monitor rx
monitor tx	G	Set TX destination port of monitor function.	switch(config)#monitor tx
show monitor	P	Show port monitor information	switch#show monitor
monitor [RX|TX|Both]	I	Configure source port of monitor function	switch(config)#interface fastEthernet 2 switch(config-if)#monitor RX
show monitor	I	Show port monitor information	switch(config)#interface fastEthernet 2 switch(config-if)#show monitor
no monitor	I	Disable source port of monitor function	switch(config)#interface fastEthernet 2 switch(config-if)#no monitor

5.12 Commands Set List—802.1x command set

Table 5-13. 802.1x Commands Set.

Industrial Switch Commands	Level	Description	Example
8021x enable	G	Use the 802.1x global configuration command to enable 802.1x protocols.	switch(config)# 8021x enable
8021x system radiousip [IP address]	G	Use the 802.1x system radious IP global configuration command to change the radious server IP.	switch(config)# 8021x system radiousip 192.168.1.1
8021x system serverport [port ID]	G	Use the 802.1x system server port global configuration command to change the radious server port.	switch(config)# 8021x system serverport 1815
8021x system accountport [port ID]	G	Use the 802.1x system account port global configuration command to change the accounting port.	switch(config)# 8021x system accountport 1816
8021x system sharekey [ID]	G	Use the 802.1x system share key global configuration command to change the shared key value.	switch(config)# 8021x system sharekey 123456
8021x system nasid [words]	G	Use the 802.1x system nasid global configuration command to change the NAS ID.	switch(config)# 8021x system nasid test1

Table 5-13 (continued). 802.1x Commands Set.

Industrial Switch Commands	Level	Description	Example
8021x misc quietperiod [sec.]	G	Use the 802.1x misc quiet period global configuration command to specify the quiet period value of the switch.	switch(config)# 8021x misc quietperiod 10
8021x misc txperiod [sec.]	G	Use the 802.1x misc TX period global configuration command to set the TX period.	switch(config)# 8021x misc txperiod 5
8021x misc supportimeout [sec.]	G	Use the 802.1x misc supp timeout global configuration command to set the supplicant timeout.	switch(config)# 8021x misc supportimeout 20
8021x misc servertimeout [sec.]	G	Use the 802.1x misc server timeout global configuration command to set the server timeout.	switch(config)#8021x misc servertimeout 20
8021x misc maxrequest [number]	G	Use the 802.1x misc max request global configuration command to set the MAX requests.	switch(config)# 8021x misc maxrequest 3
8021x misc reauthperiod [sec.]	G	Use the 802.1x misc reauth period global configuration command to set the reauth period.	switch(config)# 8021x misc sreauthperiod 3000
8021x portstate [disable | reject | accept | authorize]	I	Use the 802.1x port state interface configuration command to set the state of the selected port.	switch(config)#interface fastethernet 3 switch(config-if)#8021x portstate accept
show 8021x	E	Display a summary of the 802.1x properties and also the port sates.	switch>show 8021x
no 8021x	G	Disable 802.1x function	switch(config)#no 8021x

5.13 Commands Set List—TFTP command set

Table 5-14. TFTP Commands Set.

Industrial Switch Commands	Level	Description	Example
backup flash:backup_cfg	G	Save configuration to TFTP and need to specify the IP of TFTP server and the file name of image.	switch(config)#backup flash:backup_cfg
restore flash:restore_cfg	G	Get configuration from TFTP server and need to specify the IP of TFTP server and the file name of image.	switch(config)#restore flash:restore_cfg
upgrade flash:upgrade_fw	G	Upgrade firmware by TFTP and need to specify the IP of TFTP server and the file name of image.	switch(config)#upgrade flash:upgrade_fw

5.14 Commands Set List—SYSLOG, SMTP, EVENT command set

Table 5-15. SYSLOG, SMTP, EVENT Commands Set.

Industrial Switch Commands	Level	Description	Example
systemlog ip [IP address]	G	Set System log server IP address.	switch(config)# systemlog ip 192.168.1.100
systemlog mode [client|server|both]	G	Specified the log mode.	switch(config)# systemlog mode both
show systemlog	E	Display system log.	Switch>show systemlog
show systemlog	P	Show system log client & server information.	switch#show systemlog
no systemlog	G	Disable systemlog function	switch(config)#no systemlog
smtp enable	G	Enable SMTP function	switch(config)#smtp enable
smtp serverip [IP address]	G	Configure SMTP server IP	switch(config)#smtp serverip 192.168.1.5
smtp authentication	G	Enable SMTP authentication	switch(config)#smtp authentication
smtp account [account]	G	Configure authentication account	switch(config)#smtp account User
smtp password [password]	G	Configure authentication password	switch(config)#smtp password
smtp rcptemail [Index] [Email address]	G	Configure Rcpt e-mail Address	switch(config)#smtp rcptemail 1 Alert@ test.com
show smtp	P	Show the information of SMTP	switch#show smtp
no smtp	G	Disable SMTP function	switch(config)#no smtp
event device-cold-start [Systemlog|SMTP|Both]	G	Set cold start event type	switch(config)#event device-cold-start both
event authentication-failure [Systemlog|SMTP|Both]	G	Set Authentication failure event type	switch(config)#event authentication-failure both
event Ring-topology-change [Systemlog|SMTP|Both]	G	Set s ring topology changed event type	config)#event ring-topology-change both
event systemlog [Link-UP|Link-Down|Both]	I	Set port event for system log	switch(config)#interface fastethernet 3 switch(config-if)#event systemlog both
event smtp [Link-UP|Link-Down|Both]	I	Set port event for SMTP	switch(config)#interface fastethernet 3 switch(config-if)#event smtp both
show event	P	Show event selection	switch#show event
no event device-cold-start	G	Disable cold start event type	switch(config)#no event device-cold-start
no event authentication-failure	G	Disable Authentication failure event typ	switch(config)#no event authentication-failure
no event B-ring-topology-change	G	Disable B-ring topology changed event type	switch(config)#no event ring-topology-change
no event systemlog	i	Disable port event for system log	switch(config)#interface fastethernet 3 switch(config-if)#no event systemlog
no event smpt	I	Disable port event for SMTP	switch(config)#interface fastethernet 3 switch(config-if)#no event smtp
show systemlog	P	Show system log client & server information	switch#show systemlog

5.15 Commands Set List—SNTP command set

Table 5-16. SNTP Commands Set.

Industrial Switch Commands	Level	Description	Example
sntp enable	G	Enable SNTP function	switch(config)#sntp enable
sntp daylight	G	Enable daylight saving time, if SNTP function is inactive, this command can't be applied.	switch(config)#sntp daylight
sntp daylight-period [Start time] [End time]	G	Set period of daylight saving time, if SNTP function is inactive, this command can't be applied. Parameter format: [yyyymmdd-hh:mm]	switch(config)# sntp daylight-period 20060101-01:01 20060202-01-01
sntp daylight-offset [Minute]	G	Set offset of daylight saving time, if SNTP function is inactive, this command can't be applied.	switch(config)#sntp daylight-offset 3
sntp ip [IP]	G	Set SNTP server IP, if SNTP function is inactive, this command can't be applied.	switch(config)#sntp ip 192.169.1.1
sntp timezone [Timezone]	G	Set timezone index, use "show sntp timze-zone" command to get more information of index number.	switch(config)#sntp timezone 22
show sntp	P	Show SNTP information	switch#show sntp
show sntp timezone	P	Show index number of time zone list	switch#show sntp timezone
no sntp	G	Disable SNTP function	switch(config)#no sntp
no sntp daylight	G	Disable daylight saving time	switch(config)#no sntp daylight

5.16 Commands Set List— Ring command set

Table 5-17. Ring Commands Set.

Industrial Switch Commands	Level	Description	Example
Ring enable	G	Enable B-Ring	switch(config)# Ring enable
Ring master	G	Enable ring master	switch(config)# Ring master
Ring couplering	G	Enable couple ring	switch(config)# Ring couplering
Ring dualhoming	G	Enable dual homing	switch(config)# Ring dualhoming
Ring ringport [1st Ring Port] [2nd Ring Port]	G	Configure 1st/2nd Ring Port	switch(config)# Ring ringport 7 8
Ring couplingport [Coupling Port]	G	Configure Coupling Port	switch(config)# Ring couplingport 1
Ring controlport [Control Port]	G	Configure Control Port	switch(config)# Ring controlport 2
Ring homingport [Dual Homing Port]	G	Configure Dual Homing Port	switch(config)# Ring homingport 3
show Ring	P	Show the information of B-Ring	switch#show Ring
no Ring	G	Disable B-Ring	switch(config)#no Ring
no Ring master	G	Disable ring master	switch(config)# no Ring master
no Ring couplering	G	Disable couple ring	switch(config)# no Ring couplering
no Ring dualhoming	G	Disable dual homing	switch(config)# no Ring dualhoming

Appendix A. Time Zones

Time Zone	Country and City Lists
Europe	
MEZ-1MESZ	Europe/Vienna, Europe/Berlin, Europe/Zurich
MET-1METDST	Africa/Tunis, CET, MET, Europe/Tirane, Europe/Andorra, Europe/Brussels, Europe/Prague, Europe/Copenhagen, Europe/Paris, Europe/Gibraltar, Europe/Budapest, Europe/Rome, Europe/Vaduz, Europe/Luxembourg, Europe/Malta, Europe/Monaco, Europe/Amsterdam, Europe/Oslo, Europe/Warsaw, Europe/Belgrade, Europe/Madrid, Africa/Ceuta, Europe/Stockholm, Europe/Vatican, Europe/San_Marino, Arctic/Longyearbyen, Atlantic/Jan_Mayen, Europe/Ljubljana, Europe/Sarajevo, Europe/Skopje, Europe/Zagreb, Europe/Bratislava, Poland
EET-2EETDST	Asia/Nicosia, EET, Europe/Minsk, Europe/Sofia, Europe/Athens, Europe/Vilnius, Europe/Chisinau, Europe/Istanbul, Europe/Kiev, Europe/Uzhgorod, Europe/Zaporozhye, Europe/Nicosia, Asia/Istanbul, Europe/Tiraspol, Turkey
GMT0BST	Europe/London, Europe/Dublin, Eire, Europe/Belfast, GB, GB-Eire
WET0WETDST	WET, Atlantic/Faeroe, Atlantic/Madeira, Atlantic/Canary
PWT0PST	Europe/Lisbon, Portugal
MST-3MDT	Europe/Moscow, W-SU
EUT-1EUTDST	America/Scoresbysund, Atlantic/Azores
EUT-2EUTDST	Asia/Beirut, Europe/Simferopol
EUT-3EUTDST	Asia/Tbilisi
EUT-4EUTDST	Europe/Samara
EUT-6EUTDST	Asia/Almaty, Asia/Qyzylorda
EUT-8EUTDST	Asia/Ulaanbaatar
Russian Federation	
RFT-2RFTDST	Europe/Kaliningrad
RFT-3RFTDST	Europe/Moscow
RFT-4RFTDST	Asia/Yerevan, Asia/Baku, Asia/Oral, Asia/Ashkhabad
RFT-5RFTDST	Asia/Aqtobe, Asia/Aqtau, Asia/Bishkek, Asia/Yekaterinburg
RFT-6RFTDST	Asia/Omsk, Asia/Novosibirsk
RFT-7RFTDST	Asia/Hovd, Asia/Krasnoyarsk
RFT-8RFTDST	Asia/Irkutsk, Asia/Chungking, Asia/Ulan_Bator
RFT-9RFTDST	Asia/Choibalsan, Asia/Yakutsk
RFT-10RFTDST	Asia/Vladivostok
RFT-11RFTDST	Asia/Sakhalin, Asia/Magadan
RFT-12RFTDST	Asia/Kamchatka, Asia/Anadyr

Time Zone	Country and City Lists
North America	
PST8PDT	America/Los_Angeles, US/Pacific-New, PST8PDT, US/Pacific, SystemV/PST8PDT
MST7MDT	America/Denver, America/Boise, America/Cambridge_Bay, America/Shiprock, MST7MDT, Navajo, US/Mountain, SystemV/MST7MDT
MST7	America/Phoenix, MST, US/Arizona, SystemV/MST7
CST6CDT	America/Chicago, America/North_Dakota/Center, America/Menominee, America/Costa_Rica, America/Managua, CST6CDT, US/Central, SystemV/CST6CDT
EST5EDT	America/New_York, America/Kentucky/Louisville, America/Kentucky/Monticello, America/Detroit, America/Pangnirtung, America/Louisville, EST5EDT, US/Eastern, US/Michigan, SystemV/EST5EDT
AST4ADT	America/Thule, Atlantic/Bermuda, SystemV/AST4ADT
EST5	America/Coral_Harbour, America/Cayman, America/Jamaica, America/Panama, EST, Jamaica, SystemV/EST5
AST10ADT	America/Adak, America/Atka, US/Aleutian
YST9YDT	Canada/Yukon
NST3:30NDT	America/St_Johns, Canada/Newfoundland
NAST3NADT	America/Godthab, America/Miquelon
NAST9NADT	Pacific/Pitcairn, America/Juneau, America/Yakutat, America/Anchorage, America/Nome, US/Alaska, SystemV/YST9YDT, SystemV/PST8
South America and Central America	
TTST4	America/Port_of_Spain
SAT3	America/Argentina/Buenos_Aires, America/Argentina/Cordoba, America/Argentina/Tucuman, America/Argentina/La_Rioja, America/Argentina/San_Juan, America/Argentina/Jujuy, America/Argentina/Catamarca, America/Argentina/Mendoza, America/Argentina/Rio_Gallegos, America/Argentina/Ushuaia, America/Argentina/ComodRivadavia, America/Buenos_Aires, America/Cordoba, America/Jujuy, America/Mendoza
EBST3EBDT	America/Fortaleza, America/Recife, America/Araguaina, America/Maceio, America/Bahia, America/Sao_Paulo, America/Cuiaba, America/Montevideo, America/Catamarca, America/Rosario, Brazil/East
WBST4WBDT	America/Campo_Grande, America/Boa_Vista, America/Manaus, Atlantic/Stanley, America/Asuncion, Brazil/West
ACRE5	America/Rio_Branco, America/Porto_Acre, Brazil/Acre
NORO2	America/Noronha, Brazil/DeNoronha
CST4CDT	Antarctica/Palmer, America/Santiago, Chile/Continental
EIST6EIDT	Pacific/Easter, Chile/EasterIsland
Asia	
MST-8	Asia/Kuala_Lumpur, Asia/Kuching
CST-8	Asia/Harbin, Asia/Shanghai, Asia/Chongqing, Asia/Urumqi, Asia/Kashgar, Asia/Hong_Kong, Asia/Macau, Asia/Macao, Hongkong, PRC, ROC

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Time Zone	Country and City Lists
Oceania	
CST-9:30CDT	Australia/Adelaide, Australia/Broken_Hill, Australia/South, Australia/Yancowinna
EST-10EDT	Australia/Brisbane, Australia/Lindeman, Australia/Currie, Australia/Melbourne, Australia/Sydney, Australia/ACT, Australia/Canberra, Australia/NSW, Australia/Queensland, Australia/Tasmania, Australia/Victoria
LHT-10:30LHDT	Australia/Lord_Howe, Australia/LHI
TST-10TDT	Australia/Hobart
NZST-12NZDT	Antarctica/McMurdo, Pacific/Auckland, Antarctica/South_Pole, NZ
CIST-12:45CIDT	Pacific/Chatham, NZ-CHAT
Africa	
SAST-2	Africa/Maseru, Africa/Johannesburg, Africa/Mbabane
EST-2EDT	Africa/Cairo, Egypt
UAEST-4	Asia/Dubai
IST-3IDT	Asia/Baghdad
JST-2JDT	Asia/Amman
SST-2SDT	Asia/Damascus
Universal	
UCT	Africa/Ouagadougou, Africa/Abidjan, Africa/Banjul, Africa/Accra, Africa/Conakry, Africa/Bissau, Africa/Monrovia, Africa/Bamako, Africa/Nouakchott, Africa/Casablanca, Africa/El_Aaiun, Atlantic/St_Helena, Africa/Sao_Tome, Africa/Dakar, Africa/Freetown, Africa/Lome, America/Danmarkshavn, Atlantic/Reykjavik, Etc/GMT, Etc/UTC, Etc/UCT, GMT, Etc/Universal, Etc/Zulu, Etc/Greenwich, Etc/GMT-0, Etc/GMT+0, Etc/GMT0, Africa/Timbuktu, GMT+0, GMT-0, GMT0, Greenwich, Iceland, UCT, UTC, Universal, Zulu
UCT1	Atlantic/Cape_Verde, Etc/GMT+1
UCT2	Atlantic/South_Georgia, Etc/GMT+2
UCT3	Antarctica/Rothera, America/Belem, America/Cayenne, America/Paramaribo, Etc/GMT+3
UCT4	America/Anguilla, America/Antigua, America/Barbados, America/Dominica, America/Grenada, America/Guadeloupe, America/Martinique, America/Montserrat, America/Puerto_Rico, America/St_Kitts, America/St_Lucia, America/St_Vincent, America/Tortola, America/St_Thomas, America/Aruba, America/La_Paz, America/Porto_Velho, America/Curacao, America/Caracas, America/Guyana, Etc/GMT+4, America/Virgin, SystemV/AST4
UCT5	America/Guayaquil, America/Eirunepe, America/Lima, Etc/GMT+5
UCT6	America/Belize, America/El_Salvador, America/Tegucigalpa, Pacific/Galapagos, Etc/GMT+6
UCT7	Etc/GMT+7
UCT8	Etc/GMT+8
UCT9	Pacific/Gambier, Etc/GMT+9, SystemV/YST9
UCT10	Pacific/Rarotonga, Pacific/Tahiti, Pacific/Fakaofo, Pacific/Johnston, Pacific/Honolulu, Etc/GMT+10, HST, US/Hawaii, SystemV/HST10

Time Zone	Country and City Lists
Universal (continued from previous page)	
UCT11	Pacific/Niue, Pacific/Pago_Pago, Pacific/Apia, Pacific/Midway, Etc/GMT+11, Pacific/Samoa, US/Samoa
UCT-1	Africa/Algiers, Africa/Luanda, Africa/Porto-Novo, Africa/Douala, Africa/Bangui, Africa/Ndjamena, Africa/Kinshasa, Africa/Brazzaville, Africa/Malabo, Africa/Libreville, Africa/Windhoek, Africa/Niamey, Africa/Lagos, Etc/GMT-1
UCT-2	Africa/Gaborone, Africa/Bujumbura, Africa/Lubumbashi, Africa/Tripoli, Africa/Blantyre, Africa/Maputo, Africa/Kigali, Africa/Lusaka, Africa/Harare, Etc/GMT-2, Libya
UCT-3	Indian/Comoro, Africa/Djibouti, Africa/Asmera, Africa/Addis_Ababa, Africa/Nairobi, Indian/Antananarivo, Indian/Mayotte, Africa/Mogadishu, Africa/Khartoum, Africa/Dar_es_Salaam, Africa/Kampala, Antarctica/Syowa, Asia/Bahrain, Asia/Kuwait, Asia/Qatar, Asia/Riyadh, Asia/Aden, Etc/GMT-3
UCT-4	Indian/Mauritius, Indian/Reunion, Indian/Mahe, Asia/Muscat, Etc/GMT-4
UCT-5	Indian/Kerguelen, Indian/Maldives, Asia/Karachi, Asia/Dushanbe, Asia/Ashgabat, Asia/Samarkand, Asia/Tashkent, Etc/GMT-5
UCT-5:45	Asia/Katmandu
UCT-6	Antarctica/Mawson, Antarctica/Vostok, Asia/Dhaka, Asia/Thimphu, Indian/Chagos, Asia/Colombo, Etc/GMT-6, Asia/Dacca, Asia/Thimbu
UCT-6:30	Asia/Rangoon, Indian/Cocos
UCT-7	Antarctica/Davis, Asia/Phnom_Penh, Asia/Jakarta, Asia/Pontianak, Asia/Vientiane, Asia/Bangkok, Asia/Saigon, Indian/Christmas, Etc/GMT-7
UCT-8	Antarctica/Casey, Asia/Brunei, Asia/Taipei, Asia/Makassar, Asia/Manila, Asia/Singapore, Etc/GMT-8, Asia/Ujung_Pandang, Singapore
UCT-9	Asia/Dili, Asia/Jayapura, Pacific/Palau, Etc/GMT-9
UCT-9:30	Australia/Darwin, Australia/North
UCT-10	Antarctica/DumontDUrville, Pacific/Guam, Pacific/Saipan, Pacific/Truk, Pacific/Noumea, Pacific/Port_Moresby, Etc/GMT-10, Pacific/Yap
UCT-11	Pacific/Ponape, Pacific/Kosrae, Pacific/Guadalcanal, Etc/GMT-11
UCT-11:30	Pacific/Norfolk
UCT-12	Pacific/Fiji, Pacific/Tarawa, Pacific/Enderbury, Pacific/Majuro, Pacific/Kwajalein, Pacific/Nauru, Pacific/Tongatapu, Pacific/Funafuti, Pacific/Wake, Pacific/Efate, Pacific/Wallis, Etc/GMT-12, Kwajalein
UCT-13	Etc/GMT-13
JST	Asia/Tokyo, Japan
KST	Asia/Seoul, Asia/Pyongyang, ROK
UCT-3:30	Asia/Tehran, Iran
UCT-4:30	Asia/Kabul
IST-2IDT	Asia/Jerusalem, Asia/Gaza, Asia/Tel_Aviv, Israel
CST6MEX	America/Cancun, America/Merida, America/Monterrey, America/Mexico_City, America/Lima, Mexico/General

Time Zone	Country and City Lists
Universal (continued from previous page)	
CST6	America/Regina, America/Swift_Current, Canada/East-Saskatchewan, Canada/Saskatchewan, SystemV/CST6
EET-2EETDST2	Europe/Bucharest
EET-2EETDST3	Europe/Tallinn, Europe/Helsinki, Europe/Riga, Europe/Mariehamn
EET-2EETDST2W2K	Europe/Istanbul
UCT-14	Pacific/Kiritimati, Etc/GMT-14
UCT9:30	Pacific/Marquesas
UCT12	Etc/GMT+12
North America (Canada)	
PST8PDT_CA	America/Vancouver, America/Dawson_Creek, America/Whitehorse, America/Dawson, Canada/Pacific
MST7MDT_CA	America/Edmonton, America/Yellowknife, America/Inuvik, Canada/Mountain
CST6CDT_CA	America/Rainy_River, America/Winnipeg, America/Rankin_Inlet, Canada/Central
EST5EDT_CA	America/Montreal, America/Toronto, America/Thunder_Bay, America/Nipigon, America/Iqaluit, Canada/Eastern
AST4ADT_CA	America/Goose_Bay, America/Halifax, America/Glace_Bay, Canada/Atlantic
North America (Cuba)	
EST5EDT_CU	America/Havana, Cuba
North America (Haiti)	
EST5EDT_HT	America/Nassau, America/Santo_Domingo, America/Port-au-Prince, America/Bogota
North America (Mexico)	
PST8PDT_MX	America/Tijuana, America/Ensenada, Mexico/BajaNorte
MST7MDT_MX	America/Chihuahua, America/Hermosillo, America/Mazatlan, Mexico/BajaSur
CST6CDT_MX	America/Guatemala
North America (Turks and Caicos)	
EST5EDT_TC	America/Grand_Turk
Additions Since 10g RTM	
EST5EDT_INDIANA	America/Indiana/Indianapolis, America/Indiana/Marengo, America/Indiana/Vevay, America/Fort_Wayne, America/Indianapolis, America/Indiana/Knox, America/Knox_IN, US/Indiana-Starke, US/East-Indiana
UCT-8_WA	Australia/Perth, Australia/West

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LEH2004A-4GSFP User Manual, version 1