



DG-FS1510HPE

8 PORT 10/100 MBPS WEB MANAGED POE SWITCH, 2
COMBO GBE PORTS

User Manual

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As our products undergo continuous development the specifications are subject to change without prior notice

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Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacturer must therefore be allowed at all times to ensure the safe use of the equipment.

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1 Precautions

- Power supply sockets with too heavy load or broken cables and plugs may cause electric shock or fire. Users should check the power supply wires and cables regularly. If there is any breakage, please replace the cable at once.
- Do not open the case of the device, especially during device power-on.
- The device should be installed at position with good ventilation and without high temperature or direct sunshine, so as to avoid faults of the device and its corresponding components due to overheat.
- Do not put this device close to a damp or watery place. Do not spill any fluid on this device.
- Keep proper space for heat dissipation, to avoid any damage to the device caused by overheating. The holes on the shell are designed for heat dissipation, to ensure that the device works normally. Do not cover the heat dissipation holes.
- Keep the power plug clean and dry, if abnormal phenomenon occurs, such as smoke, abnormal sound, abnormal smell, switch off the power.

2 Overview

The DG-FS1510HPE is an intelligent Layer 2 Ethernet switch. It provides 8 10M/100M self-adaptive Ethernet ports and 2 gigabit combo ports. The combo ports can be flexibly connected to gigabit copper cable or backbone fiber. You can select 1000BASE-LX, 1000BASE-SX or 1000BASE-T interface according to the transmission distance. The DG-FS1510HPE supports VLAN classification, DHCP, port counter, port trunking and QoS. You can configure the device easily through web interface.

2.1 Product Features

- 8 10M/100M self-adaptive FE ports and 2 10M/100M/1000M self-adaptive GE ports. 2 SFP slots are shared with GE ports. You can connect the switch to other switches through copper cable or fiber.
- Manage the switch through web page. Network administrator can monitor and configure the switch through any Ethernet port.
Supports the following standards: IEEE802.3at and IEEE802.3af standard
- VLAN: Supports up to 32 Tag VLANs and up to 26 Port Based VLANs.
- Supports 4K MAC addresses.
- Other functions: CoS, broadcast storm control, port management, bandwidth control, spanning tree protocol and simple network management.

3 Technical Specifications

3.1 Environment Requirements

The whole device can survive in a wide range of operating temperature and can work normally and stably in tough environment.

- Operating temperature: 0°C—50°C
- Storage temperature: -40°C—70°C
- Relative humidity: 10%—90% RH (non-condensing)

3.2 Power Interface

Power input: 100V AC ~240V AC, 50/60Hz

3.3 Power Consumption

Whole device consumption: < 180 W

3.4 Ethernet Interface

- Standard: IEEE802.3af and IEEE802.3af.
- Transmission rate: Port 1 ~ Port 8 are 10 M/100 M self-adaptive.
Port 9 ~ Port 10 are 10 M/100 M/1000 M self-adaptive.
- Working mode: full duplex, half duplex, self-adaptive.
- Port type: 8 x 10/100Base-TX self-adaptive Ethernet ports. 2 x SFP fiber ports. They are shared with 10/100/1000Base-TX self-adaptive Ethernet ports.
- Transmission distance: < 100m, Cat. 3/5 UTP. The transmission distance of SFP port is determined by optical module.
- Auto-MDI/MDI-X. Automatically distinguish crossover cable from straight through cable.

3.5 Physical Characteristics

- Dimensions: 330(W) x 44(H) x 230(D) mm
- Net Weight: 2.5 kgs

4 Device Installation and Description

4.1 Preparation Before Installation

4.1.1 Package Contents

- DG-FS1510HPE Fast Ethernet Switch
- Power Cord
- Bracket Mounting Kit containing two brackets and six screws for attaching the brackets to the switch
- CD containing User Manual
- Four adhesive foot pads

4.1.2 Optional Accessories and Tools

- Screwdriver
- ESD straps
- Ethernet crimping pliers, crystal heads
- Ethernet (either crossover or straight through) cable

4.1.3 Choosing the Installation Location

The DG-FS1510HPE can be installed in either of the following ways as required:

- On the work platform
- On a rack

4.1.3.1 Installing the DG-FS1510HPE on the Work Platform

The common way is to install the DG-FS1510HPE on a clean work platform. Pay attention to the following precautions:

- Ensure that the work platform is flat and stable.
- Ensure good ventilation of air ports on both sides of the device.
- Do not put heavy objects on the device.

4.1.3.2 Installing the DG-FS1510HPE on a Rack

Before installing the DG-FS1510HPE on a rack, you need to install the provided L-Clamps on both sides of the DG-FS1510HPE.

4.2 Hardware Description

4.2.1 Front Panel



The following table describes the interfaces of the DG-FS1510HPE.

Interface /Button	Description
Ports 1~8	8 x RJ-45 Ethernet interfaces, 10 M/100 M self-adaptive.
Ports 9, 10	Two groups of fiber-copper combo ports. The copper ports are 10 M/100 M/1000 M self-adaptive Ethernet ports and the fiber ports are SFP optical module ports. If the combo ports are preferred to serve as fiber ports, that is, if the ports connect to a fiber port, the copper port is disabled.
Reset	Keep the device powered on and push a paper clip into the hole. Press down the button for about 5 seconds. The system restores the factory default settings.

The following table describes the LED indicators of the DG-FS1510HPE.

Interface/Button	Status/Color	Description
PWR	Green (ON)	Power ON.
	OFF	Power OFF.
Ports (1-8) (Link/Activity LED)	Amber (OFF)	Port disconnected or link fail.
	ON	Port Connected.
	Blinking	Sending or receiving data.
Ports (1-8) (PoE LED)	Green (OFF)	PoE power OFF.
	ON	PoE power ON.
10/100/1000 Copper ports LED's	OFF	Port disconnected or link fail.
	Green (ON)	1000Mbps connected.
	Amber (ON)	10/100 Mbps connected.
	BLinking	Sending or receiving data.
SFP Ports LED's	OFF	Port disconnected or link fail.
	Green (ON)	1000FX connected.
	Blinking	Sending or receiving data.

4.2.2 Rear Panel



Interface	Description
100-240VAC 50/60Hz	The power interface. The power input is 100 V ~ 240 V AC, 50 Hz ~ 60Hz.

4.3 Electrical Setup

4.3.1 Setting Up the Power Interface

After placing the DG-FS1510HPE to a flat and stable surface, insert the supplied power cord to the power socket, and connect the other end of the cable to the power interface of DG-FS1510HPE.

4.3.2 Setting Up the Ethernet Interfaces

The DG-FS1510HPE provides 10 Ethernet service interfaces of standard RJ45 connectors. You can use either the crossover or straight through cable to connect an interface.

Note:

To ensure good quality of the data signal, the length of the network cable connected to the Ethernet interface should be shorter than 100m.

5 Device Startup

5.1 Check Before Power-On

Before powering on the device, check the following:

- Whether the voltage of the power supply is consistent with the power requirement of the device.
- Whether the power cord is correctly connected.
- Whether the device is correctly connected to the ground on the rear side.

5.2 Powering On the Device

After connecting the power cable, turn on the power switch. When the **Power** indicator turns on, the system starts to initialize. When other indicators blink three times and the **Power** indicator is always on in green, the switch works normally.

6 Device Upgrade

You can upgrade the software through any Ethernet port for DG-FS1510HPE. After software upgrade is complete, the system reboots automatically.

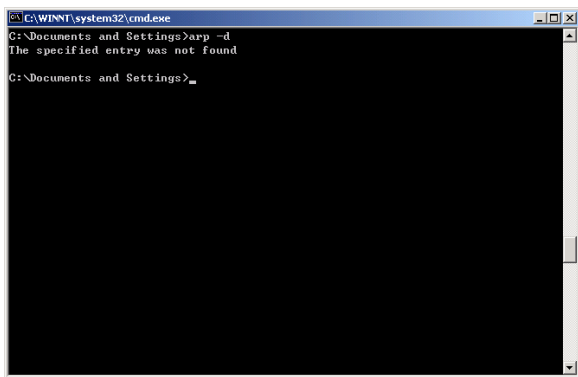
7 Web Configuration and Management

The system does not support the CLI and telnet management. It supports the web management only. This section describes the web configuration and management.

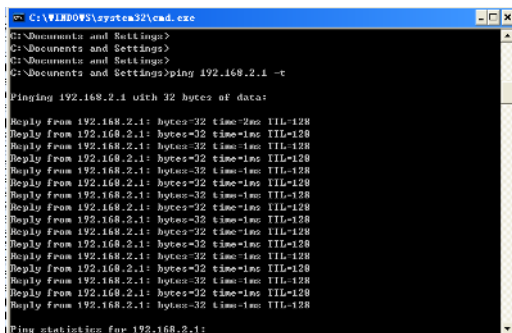
7.1 Preparation Before Login

Before accessing the switch, ensure the communication between PC and switch is normal. Check the communication as follows.

1. Set the IP address of the PC in the range 192.168.2.X (2~254)
2. The subnet mask to 255.255.255.0.
3. Enter arp -d or arp -d 192.168.2.1 in the DOS window. See the following figure.



1. Ping the maintenance IP address (192.168.2.1 by default) of the switch. See the following figure.



```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings>
C:\Documents and Settings>
C:\Documents and Settings>ping 192.168.2.1 -t

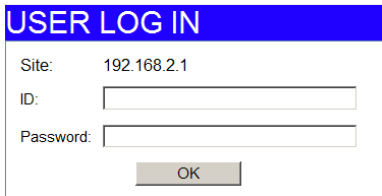
Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Ping statistics for 192.168.2.1:
```

If the PC can read the MAC address of the switch and can ping through the maintenance IP address of the switch, that means the communication of the PC and the switch is normal.

7.2 Logging In to the Switch

1. Open the web browser, and type the default IP address of switch in the address bar as 'http://192.168.2.1'.
2. Enter the ID and the password. The default ID is **admin** and password is **system**.
3. Click OK to log in.



USER LOG IN

Site: 192.168.2.1

ID:

Password:

After logging in to the switch successfully, the following page appears.



7.3 System Management

Choose **Administrator**, and the sub-menus of **Administrator** are shown as below.



7.3.1 Authentication Configuration

Choose **Administrator > Authentication Configuration**, and the following page appears. Read the **Note** in the page, and change the user name and password. After proper configuration, click **Update** to apply the settings and then **Reboot** the device for the changes to take effect.

Authentication Configuration	
Setting	Value
Username	<input type="text" value="admin"/> max:15
Password Confirm	<input type="password" value="•••••"/> max:15 <input type="password" value="•••••"/>
<input type="button" value="Update"/>	

Note:
Username & Password can only use "a-z", "A-Z", "0-9", "_", "+", "-", ".".

7.3.2 System IP Configuration

Choose **Administrator > System IP Configuration**, and the following page appears. In this page, you can set the maintenance IP address of the switch, subnet mask and gateway. After proper configuration, click **Update** to apply the settings and then **Reboot** the device for the changes to take effect.

System IP Configuration	
Setting	Value
IP Address	<input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="2"/> . <input type="text" value="1"/>
Subnet Mask	<input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/>
Gateway	<input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="2"/> . <input type="text" value="254"/>
IP Configure	<input checked="" type="radio"/> Static <input type="radio"/> DHCP
<input type="button" value="Update"/>	

7.3.3 System Status

Choose **Administrator > System Status**, and the following page appears. In this page, you can view the MAC address, Number of ports, Comment, system version and idle time security.

System Status	
MAC Address	fc:8c:d0:00:18
Number of Ports	8 x 2
Comment	<input type="text" value=""/>
System Version	IP1876D_WebGui_IP2101.3.05_PnPFD65100_v108.23
Idle Time Security	<input type="radio"/> No Idle Time Security
	<input type="radio"/> Idle Time Security
	<input type="radio"/> Reset to default
<input type="button" value="Load"/>	

7.3.4 Loading Default Settings

Choose **Administrator > Load default setting** and the following page appears. In this page, click **Load** to load the default settings that do not include IP address, user name and password.

<h3>Load Default Setting</h3> <p>recover switch default setting excluding the IP address, User name and Password</p> <p style="text-align: center;"><input type="button" value="Load"/></p>

7.3.5 Firmware Update

Choose **Administrator > Firmware Update**, and the following page appears. In this page, enter the login password and reenter the password in Reconfirm field. Then click **Update**. A pop up page will appear asking you to select new file for updating the firmware.

Firmware Update

Please input the password to continue the Firmware Update process.

Password

ReConfirm

Notice:
After clicking the "UPDATE" button, IF the firmware update webpage is not redirected correctly or is shown as "Webpage not found".
Please connect to <http://192.168.2.1>

**Caution:**

When firmware update is in progress, do not shut down the switch.

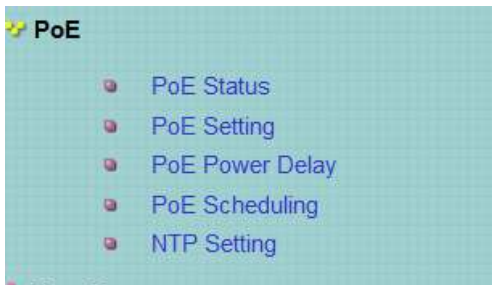
7.3.6 Reboot the Device

Choose **Administrator > Reboot Device**, and the following page appears. In this page, click **Confirm** to reboot the device.

Reboot Device:
Click "Confirm" to Reboot the Device

7.4 POE

Choose **POE**, and the submenus of **POE** are shown as below.



7.4.1 PoE Status

Choose **PoE**> **PoE Status** and the following page appears displaying: Max available Power, System operation status, Main power consumption, device temperature etc.

PoE Status	
Max available Power	<input type="text" value="130"/> Watt <input type="button" value="Update"/>
System operation status	On
Main Power consumption	0(Watt)
Device Temperature	
Device #1	51 (C)

7.4.2 PoE Setting

Choose PoE > **PoE Setting** and the following page appears.

PoE Setting

Function	Status	Priority	Power Budget
	---	<input type="checkbox"/> (Critical-1, High-2, Low-3)	<input type="checkbox"/> (Watt MAX:36W)
Port No.	01 <input type="checkbox"/> 02 <input type="checkbox"/> 03 <input type="checkbox"/> 04 <input type="checkbox"/> 05 <input type="checkbox"/> 06 <input type="checkbox"/> 07 <input type="checkbox"/> 08 <input type="checkbox"/>		
<input type="button" value="Update"/>			

Port Status <input type="button" value="Refresh"/>					
Port	Status	Class	Priority	Power Consumption(Watt)	Power Budget(Watt)
1	Disable	---	3	0.00	30
2	Enable	---	3	0.00	30
3	Enable	---	3	0.00	30
4	Enable	---	3	0.00	30
5	Enable	---	3	0.00	30
6	Enable	---	3	0.00	30
7	Enable	---	3	0.00	30
8	Enable	---	3	0.00	30

7.4.3 PoE Power Delay

Choose PoE > PoE Power Delay and the following page appears.

PoE Power Delay

Function	Delay Mode	Delay Time (0~300)
	<input type="text" value="---"/>	<input type="text" value=""/> second
Port No.	01 <input type="checkbox"/> 02 <input type="checkbox"/> 03 <input type="checkbox"/> 04 <input type="checkbox"/> 05 <input type="checkbox"/> 06 <input type="checkbox"/> 07 <input type="checkbox"/> 08 <input type="checkbox"/>	
<input type="button" value="Update"/>		

Port	Delay Mode	Delay Time (second)
1	Disable	0
2	Disable	0
3	Disable	0
4	Disable	0
5	Disable	0
6	Disable	0
7	Disable	0
8	Disable	0

7.4.4 PoE Scheduling

Choose PoE > **PoE Scheduling** and the following page appears. Here you can schedule on which day and time the PoE ports will be disabled.

PoE Scheduling

Schedule on Port	01
Schedule Mode	Disable
Schedule AM/PM	A.M.

Select all

Hour	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
06	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
07	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
08	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
09	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

7.4.5 NTP Setting

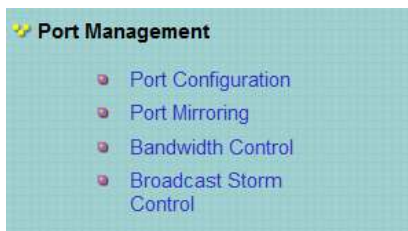
Choose PoE > **NTP Setting** and the following page appears. Set the NTP server 1 and 2. Choose the time zone from which area you are from the drop down list.

NTP Setting

System Time	17:18:44
NTP Server	#1 210.0.235.14
	#2 59.124.196.85
Time Zone	UTC 0:00

7.5 Port Management

Choose **Port Management**, and the submenus of **Port Management** are shown as below.



7.5.1 Port Configuration

Choose **Port Management > Port Configuration**, and the following page appears. In this page, you can set **Tx/Rx Ability**, **Auto-Negotiation**, **Speed**, **Duplex**, **Pause**, **Backpressure** and **Addr. Learning** of port.

Port Configuration											
Function	Tx/Rx Ability	Auto-Negotiation	Speed	Duplex	Pause	Backpressure	Addr. Learning				
Select Port No.	01 02 03 04 05 06 07 08 09 10										
<input type="button" value="Update"/>											
Port	Current Status				Setting Status						
	Link	Speed	Duplex	FlowCtrl	Tx/Rx Ability	Auto-Nego	Speed	Duplex	Pause	Backpressure	Addr. Learning
1	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
2	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
3	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
4	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
5	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
6	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
7	---	---	---	---	ON	AUTO	100M	FULL	ON	ON	ON
8	●	100M	FULL	ON	ON	AUTO	100M	FULL	ON	ON	ON
9	---	---	---	---	ON	AUTO	1G	FULL	ON	ON	ON
10	---	---	---	---	ON	AUTO	1G	FULL	ON	ON	ON

7.5.2 Port Mirroring

Choose **Port Management > Port Mirroring**, and the following page appears. In this page, you can enable port mirroring service. The packets from source port transmit to destination port.

Port Mirroring										
Dest Port	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>	10 <input type="checkbox"/>
Monitored Packets	[Disable ▼]									
Source Port	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>	10 <input type="checkbox"/>
						[Update]				
Multi to Multi Sniffer function										

7.5.3 Bandwidth Control

Choose **Port Management > Bandwidth Control** and the following page appears.

Bandwidth Control

Port No	Tx Rate	Rx Rate
01 ▾	(0~255) <input type="text"/> (0:Full Speed)	(0~255) <input type="text"/> (0:Full Speed)
Speed Base	<div style="margin-bottom: 5px;"> <input type="button" value="Low"/> ▾ Low: (1)32Kbps Tx/Rx bandwidth resolution for port 1~ port 10. Actual Tx/Rx bandwidth =Rate value x 32 kbps. The rate value is 1~255. </div> <div style="margin-bottom: 5px;"> High: (1)256Kbps Tx/Rx bandwidth resolution for port 1~ port 8. Actual Tx/Rx bandwidth=Rate value x 256Kbps. The rate value is 1~255. When link speed is 10MB. The rate value is 1~39. </div> <div> (2)the bandwidth resolution is 2048Kbps for port 9, port 10. Actual Tx/Rx bandwidth=Rate value x 2048Kbps. The rate value is 1~255. When link speed is 10MB. The rate value is 1~4. When link speed is 100MB. The rate value is 1~48. </div>	
<input type="button" value="Update"/> <input type="button" value="LoadDefault"/>		
If the link speed of selected port is lower than the rate that you setting, this system will use the value of link speed as your setting rate.		

After proper configuration, click **Update** to apply the settings. Click **Load Default** to restore the default settings.

Port No.	Tx Rate	Rx Rate	Link Speed	Port No.	Tx Rate	Rx Rate	Link Speed
1	Full Speed	Full Speed	---	6	Full Speed	Full Speed	---
2	Full Speed	Full Speed	---	7	Full Speed	Full Speed	---
3	Full Speed	Full Speed	---	8	Full Speed	Full Speed	100M
4	Full Speed	Full Speed	---	9	Full Speed	Full Speed	---
5	Full Speed	Full Speed	---	10	Full Speed	Full Speed	---

7.5.4 Broadcast Storm Control

Choose **Port Management** > **Broadcast Storm Control** and the following page appears.

Broadcast Storm Control										
Threshold	<input type="text" value="63"/> 1~63									
Enable Port	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input checked="" type="checkbox"/>	9 <input type="checkbox"/>	10 <input type="checkbox"/>
<input type="button" value="Update"/>										
This value indicates the number of broadcast packet which is allowed to enter each port in one time unit. One time unit is 50us for Gigabit speed, 500 us for 100Mbps speed and 5000us for 10Mbps speed										
Note: This effect may be not significant for long broadcast packet, since the broadcast packet count passing through the switch in a time unit is probably less than the specified number.										

7.6 VLAN Setting

In large networks, routers are used to isolate broadcast traffic for each subnet into separate domains. This switch provides a similar service at Layer 2 by using VLANs to organize any group of network nodes into separate broadcast domains. VLANs confine broadcast traffic to the originating group, and can eliminate broadcast storms in large networks. This also provides a more secure and cleaner network environment.

The system supports VLAN based on port and VLAN based on tag. You can change the VLAN mode in the **VLAN Mode** page.

Choose **VLAN Setting**, and the sub-menus of **VLAN Setting** are shown as below.



7.6.1 VLAN Mode

7.6.1.1 VLAN Based on Port

Choose **VLAN Setting > VLAN Mode**, and the following page appears. The default mode is **Port Based VLAN**. Click **Change VLAN mode** to change the VLAN mode.

VLAN Mode

VLAN Mode
Port Based VLAN
Change VLAN mode

Once "**Change VLAN mode**" is selected, a warning message will appear. Select "**Continue**" to change the mode or select "**Back**" to keep the existing vlan mode.

7.6.2 VLAN Member

7.6.2.1 VLAN Based on Port

Choose **VLAN Setting > VLAN Member**, and the following page appears.

VLAN Member Setting (Port Based)

Port		VLAN									
Port		1	2	3	4	5	6	7	8	9	10
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.6.2.2 VLAN Based on Tag

When the VLAN mode is tag based, the **VLAN Member Setting** page is shown as the following figure.

VLAN Member Setting (Tag Based)

VLAN ID:

ADD: Please enter the correct VLAN ID number in the following drop down menu to add VLAN ID to the list.
 DELETE: Please enter the correct VLAN ID number in the following drop down menu to delete the VLAN ID from the existing list.
 Refresh: Refresh the existing list of VLAN ID in the drop down menu.

VLAN Member Port	III	III	III	III	:	III	III	III
check	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VLAN Member Port	00	10						
ADD	<input type="button" value="Add"/>	<input type="button" value="Add"/>						

Please enter correct VLAN ID number, then click on the Add button to add the VLAN ID.

VLAN Member Port	III	III	III	III	:	III	III	III
check	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VLAN Member Port	00	10						
ADD	<input type="button" value="Add"/>	<input type="button" value="Add"/>						

Port VID MAP

Port	01	02	03	04	05	06	07	08
VID	---	---	---	---	---	---	---	---
Port	00	10						
VID	---	---						

VLAN MEMBER

VID : Port	1	2	3	4	5	6	7	8	9	10
...	---	---	---	---	---	---	---	---	---	---

Field	Description
VID	Select the Vlan ID to be assigned to the VLAN and click on Add to enter the VID. Once the VID is added it will appear in the drop down list.
VLAN Member Port	Select the VID from the Dropdown list and then select the desired member ports from the Table.
Port VID MAP	Port VID map shows the Port number corresponding to the VID to which the same is assigned.

When the port receives the packets without tag, the system can check the VLAN table according to the port VID. The system can add the tag according to the VID found in the VLAN table.

To add vlan, enter a VID and select vlan member for this entry from vlan member list. Now select “**Add**” button to add vlan entry to the table. Vlan entry can be modified by selecting VID from the list and then select “**Update**” button.

To delete an entry from the vlan table, select VID from the drop-down list and select “**Delete**” to remove the corresponding entry from the table.

7.6.3 Multi to 1 Setting Configuration

Choose **VLAN Setting > Multi to 1 setting**, and the following page appears. This feature can disable communication between ports in order to improve the security.

- After setting the multi to 1 setting, the VLAN original setting will be cleared. If the VLAN is configured again, the multi to 1 setting will be cleared.
- Multi to 1 Settings take effect only when “VLAN based on port” mode is selected.

In this page, select the current port from the drop-down list. Then select the port from the check box to isolate from the current port.

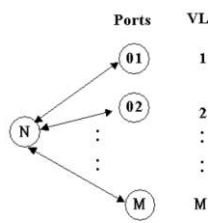
Multi to 1 Setting

Destination PortNo.	01 ▾																				
Current Setting	Port:-																				
Disable Port	<table style="width: 100%; text-align: center;"> <tr> <td>01</td><td>02</td><td>03</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>	01	02	03	04	05	06	07	08	09	10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	01	02	03	04	05	06	07	08	09	10											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
Note: "Disabled port" defines the switch physical port which is disabled. <input type="button" value="Update"/>																					

1. A example for Multi-to-1 structure

Ports

Destination Port/
Current Setting



VLAN Groups

1

2

:

:

M

2. The original setting of the VLAN Group will be cleared and replaced by this special structure if you enable this function.
 On the other hand, If you set the VLAN Group again, this special structure will be cleared and replaced by your newest setting.

3. This configuration is port base VLAN only.

7.7 Per Port Counter

Choose **Per Port Counter**, and the **Port Counter** submenu is shown as below.



Choose **Per Port Counter** > **Port Counter** and the following page appears. In this page, you can view the packet quantity.

Counter Category		
Counter Mode Selection: Transmit Packet & Receive Packet Update		
Port	Transmit Packet	Receive Packet
01	0	0
02	0	0
03	0	0
04	0	0
05	0	0
06	0	0
07	0	0
08	14096	19229
09	0	0
10	0	0

Clear Refresh

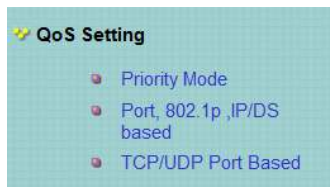
Field	Description
Counter Mode Selection	Select it from the drop-down list: <div style="border: 1px solid gray; padding: 5px; margin-top: 5px;"> Transmit Packet & Receive Packet <ul style="list-style-type: none"> <li style="background-color: #0070c0; color: white; padding: 2px;">Transmit Packet & Receive Packet <li style="padding: 2px;">Collision Count & Transmit Packet <li style="padding: 2px;">Drop packet & Receive Packet <li style="padding: 2px;">CRC error packet & Receive Packet Click Update to view the corresponding packet quantity. </div>
Refresh	Click the button to refresh the counter information.
Clear	Click the button to clear the counter information.

7.8 QoS Configuration

All switches or routers that access the Internet, rely on class information to provide the same forwarding treatment to packets in the same class. Class information can be assigned by end hosts, or switches or routers along the path. Priority can then be assigned based on a general policy, or a detailed examination of the packet. However, note that detailed examination of packets should take place close to the network edge so that core switches and routers are not overloaded.

Switches and routers along the path can use class information to prioritize the resources allocated to different traffic classes. The manner in which an individual device handles traffic is called per-hop behavior. All devices along a path should be configured in a consistent manner to construct a consistent end-to-end Quality of Service (QoS) solution.

Choose **QoS Setting**, and the sub-menus of **QoS Setting** are shown as below.



7.8.1 Priority Mode

Choose **QoS Setting > Priority Mode**, and the following page appears. In this page, you can set the priority mode.

Priority Mode	
Priority Mode	
Mode	<input checked="" type="radio"/> First-In-First-Out <input type="radio"/> All-High-before-Low <input type="radio"/> Weight-Round-Robin. Low weight: <input type="text" value="0"/> High weight: <input type="text" value="0"/>
<input type="button" value="Update"/>	
Note: When the queue weight is set to "0", it will be treated as "8". The "low weight" and "high weight" means the ratio of the packet in the transmit queue. For example, if "low weight" and "high weight" are set to "3" and "5", the ratio of the transmit packet for the low priority to high priority is 3/5.	

The system supports the following three priority modes.

- First-In-First-Out
- All-High-before-Low
- Weight-Round-Robin

Low weight: You can select 0 ~ 7 from the drop-down list.

High weight: You can select 0 ~ 7 from the drop-down list.

7.8.2 Class of Service Configuration - 1

Choose **QoS Setting > Port, 802.1p, IP/DS based**, and the following page appears.

Class of Service Configuration							
<input checked="" type="checkbox"/> =Enable High Priority							
Port No.\Mode	Port Base	VLAN Tag	IP / DS	Port No.\Mode	Port Base	VLAN Tag	IP / DS
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

As long as any of three COS schemes(802.1p,IP TOS/DS or Port Base) is mapped to "high", the data packet will be treated as the high priority.

The COS of port supports the following mode.

- Based on port
- Based on 802.1p: The priority is determined according to the value of **802.1p** (bit [15:13]) in the VLAN Tag. Packets in which values of **802.1p** (bit [15:13]) are 000-011 map to lower priority. Packets in which values of **802.1p** (bit [15:13]) are 100-111 map to higher priority.
- Based on IP / DS:
For IPv4 packets, the priority is determined according to the value of **TOS [5:0]** in the header. Packets in which values of **TOS [5:0]** are 101110, 001010, 010010, 011010 and 11x000 map to higher priority. Packets in which **TOS [5:0]** are other values map to lower priority.

7.8.3 Class of Service Configuration - 2

Choose **QoS Setting > TCP/UDP Port Based** and the following page appears. COS based on TCP/UDP port specifies the priority queues of packets or discards designated protocol packets according to the application layer protocols of packets received at the port. COS supports classifying packets into corresponding priority queues or discards packets according to the port in the range of ports 1-65535, besides certain known protocols, such as FTP, telnet and SNMP.

Class of Service Configuration					
Protocol	Option				
FTP(20,21)	F-I-F-O				
SSH(22)	F-I-F-O				
TELNET(23)	F-I-F-O				
SMTP(25)	F-I-F-O				
DNS(53)	F-I-F-O				
TFTP(69)	F-I-F-O				
HTTP(80,8080)	F-I-F-O				
POP3(110)	F-I-F-O				
NEWS(119)	F-I-F-O				
SNTP(123)	F-I-F-O				
NetBIOS(137-139)	F-I-F-O				
IMAP(143,220)	F-I-F-O				
SNMP(161,162)	F-I-F-O				
HTTPS(443)	F-I-F-O				
MSN(1863)	F-I-F-O				
XRD_RDP(3389)	F-I-F-O				
QQ(4000,8000)	F-I-F-O				
ICQ(5190)	F-I-F-O				
Yahoo(5050)	F-I-F-O				
BOOTP_DHCP(67,68)	Low				
User_Define_a	F-I-F-O				
User_Define_b	F-I-F-O				
User_Define_c	F-I-F-O				
User_Define_d	F-I-F-O				
User_Define Port number (1-65535) Mask(0-255)	User_Define_a Port: <input type="text"/> Mask: <input type="text"/>	User_Define_b Port: <input type="text"/> Mask: <input type="text"/>	User_Define_c Port: <input type="text"/> Mask: <input type="text"/>	User_Define_d Port: <input type="text"/> Mask: <input type="text"/>	

Note: The mask defines which bit is ignored within the IP address bit 0 - bit 7. For example, UDP/TCP port = 65535 and mask = 5, this means 65530, 65531, 65534 and 65535 are all taken into account.

UDP/TCP port =65535 and mask=0, this means only 65535 is taken into account.

TCP/UDP port QoS function [\[?\]](#)

Note: When the "override" item is selected, the Port_based, Tag_based, IP_TOS_based, CoS listed above will be ignored.

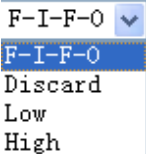
The Class of Service for TCP/UDP port number allows the network administrator to assign the specific application to a priority queue.

F-I-F-O: The incoming packet will be forwarded in first-in-first-out scheme.

Discard: The incoming packet will be discarded at the source port.

High: The incoming packet will be forwarded with the high priority.

Low: The incoming packet will be forwarded with the Low priority.

Field	Description
Option	You can select it from the drop-down list: 
User_Define	<ul style="list-style-type: none">• Port: The valid range is 1 ~ 65535.• Mask: The valid range is 0 ~ 255.
TCP/UDP port QoS function	<ul style="list-style-type: none">• Override: When the "override" item is selected, the Port_based, Tag based, IP TOS_based, CoS listed previous will be ignored.• Not Override

7.9 Security

Choose **Security**, and the sub-menus of **Security** are shown as below.



7.9.1 MAC Address Binding

Choose **Security** > **MAC Address Binding** and the following page appears. After MAC address binding is enabled at a port, only devices whose MAC addresses are consistent with the bound MAC address can communicate through the port. A port can be bound to a maximum of three MAC addresses.

If MAC address binding is enabled, address learning is automatically disabled and RSTP/STP is affected. It is recommended to disable STP on the port.

MAC Address Binding															
Port No.	MAC Address														
1	<table border="1"> <tr> <td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td> </tr> </table>			<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>										
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>										
Select Port <input type="text" value="01"/> Binding <input type="text" value="Disable"/> <input type="button" value="Update"/>															
Note: If you enable the MAC address binding function, the address learning function will be disabled automatically.															
Port No.	Binding Status	Port No.	Binding Status												
1	Disable	6	Disable												
2	Disable	7	Disable												
3	Disable	8	Disable												
4	Disable	9	Disable												
5	Disable	10	Disable												
Note: The MAC address of current management connection is 70:5a:b6:b3:df:05 at port 8.															

The configuration procedure:

- Step 1 Enter the MAC address.
- Step 2 Select the port that you want to bind MAC address.
- Step 3 Select **Enable** from the drop-down list to enable the binding service.
- Step 4 Click **Update** to apply the service of MAC address binding.

7.9.2 TCP/UDP Filter

Choose **Security > TCP/UDP Filter** and the following page appears. TCP/UDP port filter discards the set protocol packets at the secure WAN port. All ports can be set to secure WAN ports, and the available protocols include FTP, HTTP and TELNET.

TCP_UDP Filter Configuration						
Function Enable	Disable ▾					
Port Filtering Rule	negative ▾ Note: (1) The outgoing packet with selected protocol will be either forwarded or dropped at secure WAN port as (2) "negative" means the selected protocol will be dropped and other protocols will be forwarded. "positive" means the selected protocol will be forwarded and other protocol will be dropped.					
Protocol	<input type="checkbox"/> FTP(20,21)	<input type="checkbox"/> SSH(22)	<input type="checkbox"/> TELNET(23)	<input type="checkbox"/> SMTP(25)	<input type="checkbox"/> DNS(53)	<input type="checkbox"/> TFTP(69)
	<input type="checkbox"/> NEWS(119)	<input type="checkbox"/> SNMP(123)	<input type="checkbox"/> NetBIOS(137~139)	<input type="checkbox"/> IMAP(143,220)	<input type="checkbox"/> SNMP(161,162)	<input type="checkbox"/> HTTPS(443)
	<input type="checkbox"/> User_Define_a	<input type="checkbox"/> User_Define_b	<input type="checkbox"/> User_Define_c	<input type="checkbox"/> User_Define_d		
Note: These User-defined A/B/C TCP/UDP settings use the same port number settings as the Users-defined A/B/C Port number set						
Secure WAN port	<input type="checkbox"/> Port01	<input type="checkbox"/> Port02	<input type="checkbox"/> Port03	<input type="checkbox"/> Port04	<input type="checkbox"/> Port05	<input type="checkbox"/> Port06
	<input type="checkbox"/> Port09	<input type="checkbox"/> Port10				
<p>Note: The description of Secure WAN port is shown below.</p> <pre> graph LR TP[Traffic Path] --> IP[Ingress Port] IP --> C[Check TCP/UDP Port Number] C --> EP[Egress Port] EP --- Note[The packet will be either dropped or forwarded. This is the secure WAN port.] </pre>						

The configuration procedure:

1. Select **Enable** from the drop-down list to enable the TCP/UDP filter service.
2. Select port filtering rule. Negative means the selected protocol will be dropped and other protocols will be forwarded. Positive means the selected protocol will be forwarded and other protocol will be dropped.
3. Select the protocol from the check box in the right area.
4. Select the secure WAN port.
5. Click **Update** to apply the settings.

7.10 Spanning Tree

Choose **Spanning Tree**, and the sub-menus of **Spanning Tree** are shown as below.



7.10.1 STP Bridge Settings

Choose **Spanning Tree > STP Bridge Settings**, and the following page appears.

STP Bridge Settings

Spanning Tree Settings				
STP Mode	Bridge Priority	Hello Time	Max Age	Forward Delay
	(0~61440)	(1~10 Sec)	(6~40 Sec)	(4~30 Sec)
▼				
Submit				

*Note: $2 * (\text{Forward Delay} - 1) \geq \text{Max Age}$.*
 *$\text{Max Age} \geq 2 * (\text{Hello Time} + 1)$*
Bridge Priority must be multiple of 4096

Note: If you enable the MAC address binding function, the address learning function will be disabled automatically. Then both RSTP/STP and address learning w

Bridge Status				
STP Mode	Bridge ID	Hello Time	Max Age	Forward Delay
RSTP	32768:00:17:7C:0C:84:59	2	20	15

Root Status			
Root ID	Hello Time	Max Age	Forward Delay
I'm the root bridge!	2	20	15

Field	Description
STP Mode	You can select it from the drop-down list: <div style="border: 1px solid gray; padding: 5px; margin-top: 5px;"> </div>

Field	Description
Bridge Priority	The valid range is 0 ~ 61440. The lower integer value for precedence indicates the higher priority and the integer should be a multiple of 4096.
Hello Time	The valid range is 1 ~ 10. The unit is seconds. The hello time indicates the interval of transmitting BPDU.
Max Age	The valid range is 6 ~ 40. The unit is seconds. It is the longest waiting time of the blocking state turning into listening state. Max Age $\geq 2 * (\text{Hello Time} + 1)$
Forward Delay	The valid range is 4 ~ 30. The unit is seconds. It is the longest waiting time of the listening state turning into learning state or the learning state turning into forwarding state. $2 * (\text{Forward Delay} - 1) \geq \text{Max Age}$

After proper configuration, click **Submit** to apply the settings. In the mean time, you can view the STP bridge status.

7.10.2 STP Port Settings

Choose **Spanning Tree > STP Port Settings**, and the following page appears.

STP Port Settings		
STP Port Settings		
Port No.	Priority (0~240)	RPC (1~200000000) 0=AUTO
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Submit"/>		
Priority should be a multiple of 16		

STP Port Status						
Port No.	RPC	Priority	State	Status	Designated Bridge	Designated Port
1	Auto:0	0x80	--	Disable	--	--
2	Auto:0	0x80	--	Disable	--	--
3	Auto:0	0x80	--	Disable	--	--
4	Auto:0	0x80	--	Disable	--	--
5	Auto:0	0x80	--	Disable	--	--
6	Auto:0	0x80	--	Disable	--	--
7	Auto:0	0x80	--	Disable	--	--
8	Auto:0	0x80	--	Disable	--	--
9	Auto:0	0x80	--	Disable	--	--
10	Auto:0	0x80	--	Disable	--	--

Field	Description
Port No.	Select it from the drop-down list.
RPC	Root Path Cost. The valid range is 1 ~ 200000000. 0 indicates Auto.
Priority	The valid range is 0 ~ 240. It should be a multiple of 16.

RPC determines the path cost that is from per port to root bridge. It is related with speed. The following table lists the recommended value. You can modify it during actual using.

Speed	IEEE Recommended Value	Recommended Range
10Mbps	100	50~600
100Mbps	19	10~60
1000Mbps	4	3~10
10GMbps	2	1~5

After proper configuration, click **Submit** to apply the settings. In the mean time, you can view the STP port status.

7.10.3 Loopback Detection:

Choose **Spanning Tree > Loopback Detection** to configure loopback detection on an interface. When loopback detection is enabled and a port receives it's own BPDU, the detection agent drops the loopback BPDU and places the interface in discarding mode. This loopback state can be released automatically.

Loopback Detection Settings

Loopback Detect Function	Disable ▾
Auto Wake Up	Disable ▾
Wake-Up Time Interval	10 sec ▾
<input type="button" value="Submit"/>	

Port No.	Status
1	--
2	--
3	--
4	--
5	--
6	--
7	--
8	--
9	--
10	--

These parameters are displayed:

Field	Description
Loopback Detection Function	Enables/Disables (Default: disable)
Auto Wake Up	Configures the interface for automatic loopback release.
Wake-Up Time interval	Defines the time interval for the port that will be released from the discarding state.

Interface status displays a list of ports with loopback detection status. Select “Reset All Ports” option for manual release.

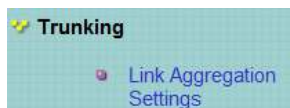
7.11 Trunking

This section describes how to configure static and dynamic trunks.

You can create multiple links between devices that work as one virtual aggregate link. A port trunk offers a dramatic increase in bandwidth for network segments where bottlenecks exist, as well as providing a fault tolerant link between two devices.

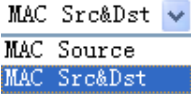
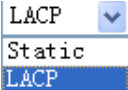
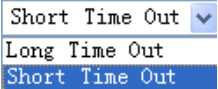
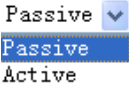
The switch supports both static trunking and dynamic Link Aggregation Control Protocol (LACP). Static trunks have to be manually configured at both ends of the link. On the other hand, LACP configured ports can automatically negotiate a trunked link with LACP-configured ports on another device.

Choose **Trunking**, and the **Link Aggregation Settings** sub-menu is shown as below.



Choose **Trunking > Link Aggregation Settings**, and the following page appears.

Trunking												
System Priority		1 (0-65535)										
Link Aggregation Algorithm		LACP Static										
<input type="button" value="Save"/>												
<input type="button" value="Cancel"/>												
Element	Link Group 1				Link Group 2				Link Group 3			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
State	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Type	LACP				LACP				LACP			
Operational Key	1-05535				1-05535				1-05535			
Trunk Cost	1-05535				1-05535				1-05535			
Admins	Admins				Admins				Admins			
<input type="button" value="Cancel"/>												

Field	Description
System Priority	The valid range is 1 ~ 65535.
Link Aggregation Algorithm	You can select it from the drop-down list: 
Member	The system supports three link groups. <ul style="list-style-type: none"> • Link Group 1: It includes the following ports: 1, 2, 3, 4. • Link Group 2: It includes the following ports: 5, 6, 7, 8. • Link Group 3: It includes the following ports: 9, 10.
State	You can select Disable or Enable .
Type	You can select it from the drop-down list: 
Operation Key	When the type is LACP, there are some protocol parameters. Such as operation key, transmitting LACP packets interactively or not.
Time Out	You can select it from the drop-down list:  <p>It is the time out of trunking, when the link port does not receive the corresponding LACPDU.</p>
Activity	You can select it from the drop-down list:  <p>One switch should be set to Active between two switches.</p>

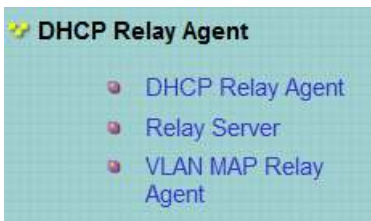
After proper configuration, click Submit to apply the settings. Click Refresh to refresh the state of link group. When the "--" in **Member configuration** turns into "A", that indicates the trunking service has established between the system and the corresponding end.



Note: When you configure trunking service, you need to disable the Pause and Backpressure of corresponding port in the Port Configuration page in the Port management navigation.

7.12 DHCP Relay Agent

Choose **DHCP Relay Agent** and the submenu shown as below appears.



7.12.1 DHCP Relay Agent

DHCP Relay Agent	
DHCP Relay State :	Enable ▾
DHCP Relay Hops Count Limit (1-16):	Enable Disable <input type="text"/>
DHCP Relay Option 82 State :	Enable ▾
<input type="button" value="Update"/>	

Field	Description
DHCP relay State	Select Enable or Disable to start or Stop the DHCP relay agent respectively.

DHCP relay Hop count limit	Sets the maximum allowed number in the hops field of the BOOTP/DHCP header.
DHCP relay option 82 State	Select Enable or Disable to start or Stop the DHCP relay option 82 respectively.

7.12.2 Relay Server

Choose **Relay Server** and the following page appears.

DHCP Relay Agent	
DHCP Server IP	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="button" value="Add"/>
DHCP Server IP List	

7.12.3 VLAN MAP Relay Agent

Choose **VLAN MAP Relay Agent**

DHCP Relay Agent		
VLAN ID	<input type="text" value="1-4094"/> <input type="button" value="Add"/>	
Map Server IP	<input type="text"/> <input type="button" value="Add"/>	
MAP List		
VLAN ID	Server IP	Action

After proper configuration, click **Submit** to apply the settings. Click **Refresh** to refresh the state of link group.

7.13 Configuration Backup and Recovery

Choose Backup/Recovery, and the following page appears. In this page, you can download the switch configuration to PC, or upload the configuration file to switch according to the page attention.

Configuration Backup/Recovery

Backup(Switch→PC)
Please check "Download" to download EEPROM contents.

Recovery(PC→Switch)
Select the image file :

Password:

7.14 Miscellaneous Configuration

Choose **Miscellaneous**, and the following page appears. In this page, you can enable Aging, VLAN striding and set VLAN uplink.

Miscellaneous Setting									
Output Queue Aging Time									
Aging time <input type="text" value="Disable"/>	The output queue aging function allows the administrator to select the aging time of a packet stored in the output queue. A long time will lower the free packet buffer, resulting in the poor utilization of the buffer and the poor switch performance.								
VLAN Striding									
VLAN Striding <input type="text" value="Disable"/>	When this function is enabled, the switch will forward a uni-cast packet to the destination port. No matter whether the destination port is in the same VLAN group.								
IGMP Snooping V1 & V2									
IGMP Snooping <input type="text" value="Disable"/>	IGMP Snooping V1 & V2 function enable								
IGMP Leave Packet <input type="text" value="Disable"/>	Leave packet will be forwarded to IGMP router ports.								
VLAN Uplink Setting									
Port 01 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 02 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 03 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 04 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 05 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 06 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 07 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 08 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 09 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2	Port 10 <input type="radio"/> Uplink1 <input type="radio"/> Uplink2
<input type="radio"/> Clear Uplink1 <input type="radio"/> Clear Uplink2									
<input type="button" value="Update"/>									

7.15 SNMP Settings

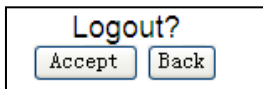
Choose **SNMP Settings**, and the following page appears. In this page, you can configure SNMP related parameters.

SNMP Settings	
Community Settings	
Community Name	Access Right
<input type="text" value="public"/>	<input type="text" value="ReadWrite"/> <input type="button" value="v"/>
<input type="text"/>	<input type="text" value="Read Only"/> <input type="button" value="v"/>
<input type="button" value="Update"/>	
SNMP Settings	
System Description	<input type="text" value="DG-FS1526"/>
System Contact	<input type="text" value="DIGISOL"/>
System Location	<input type="text" value="DIGISOL"/>
<input type="button" value="Update"/>	
SNMP Trap Settings	
Trap State	<input type="text" value="Enable"/> <input type="button" value="v"/>
<input type="button" value="Update"/>	
Enable: <input type="checkbox"/> Disable: <input type="checkbox"/>	<input type="text"/>
Trap: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="text"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Field	Description
Community Name.	The community name used by SNMP.
Access Right	The right of community name.
System Description System Contact System Location	System related information.
Trap State	Enable/disable SNMP trap.

7.16 Logout

Choose **Logout**, and the following page appears.



In this page, the system asks you whether to logout. Click **Accept** to logout. Click **Back** to return to the previous page.

8 Troubleshooting

If a fault occurs, refer to the following table for troubleshooting:

Symptom	Suggested Solution
The Power indicator is not ON after the system has started	<ul style="list-style-type: none">• Check whether the power is correctly connected.• Check whether the power switch is turned on.
The Power indicator is ON but the Ethernet indicator is off	<ul style="list-style-type: none">• Check whether the network cable is correctly connected.• Check whether the configuration is correct.

9 Glossary

Auto-negotiation: Auto-negotiation is an Ethernet procedure by which two connected devices choose common transmission parameters, such as speed, duplex mode and flow control. In this process, the connected devices first share their capabilities as for these parameters and then choose the highest performance transmission mode they both support.

Backpressure: The build-up of data behind an I/O switch if the buffers are full and incapable of receiving any more data; the transmitting device halts the sending of data packets until the buffers have been emptied and are once more capable of storing information.

Flow-control: Flow control is the process of managing the pacing of data transmission between two nodes to prevent a fast sender from outrunning a slow receiver. It provides a mechanism for the receiver to control the transmission speed, so that the receiving node is not overwhelmed with data from transmitting node.

Address Learning: Address learning is a service that characterizes a learning bridge, in which the source MAC address of each received packet is stored so that future packets destined for that address can be forwarded only to the bridge interface on which that address is located.

TCP: The Transmission Control Protocol (TCP) is one of the core protocols of the Internet Protocol Suite. TCP is one of the two original components of the suite, complementing the Internet Protocol (IP), and therefore the entire suite is commonly referred to as TCP/IP. TCP provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer.

UDP: User Datagram Protocol. UDP provides a datagram mode for packet-switched communications. It uses IP as the underlying transport mechanism to provide access to IP-like services. UDP packets are delivered just like IP packets – connection-less datagrams that may be discarded before reaching their targets. UDP is useful when TCP would be too complex, too slow, or just unnecessary.

FTP: File Transfer Protocol (FTP) is a standard network protocol used to copy a file from one host to another over a TCP-based network, such as the Internet. FTP is built on client-server architecture and utilizes separate control and data connections between the client and server.

Http: The Hypertext Transfer Protocol (HTTP) is a networking protocol for distributed, collaborative, hypermedia information systems.

TELNET: Telnet defines a remote communication facility for interfacing to a terminal device over TCP/IP.

ToS: Type of Service level, which processes the precedence part of the IP packet ToS (3 bits) as an index to the eight QoS Class values.

Link-Aggregation: Link aggregation is a term which describes using multiple network cables/ports in parallel to increase the link speed beyond the limits of any one single cable or port, and to increase the redundancy for higher availability.

COS: Class of Service is supported by prioritizing packets based on the required level of service, and then placing them in the appropriate output queue. Data is transmitted from the queues using weighted round-robin service to enforce priority service and prevent blockage of lower-level queues. Priority may be set according to the port default, the packet's priority bit (in the VLAN tag), TCP/UDP port number, IP Precedence bit, or DSCP priority bit.

SNMP: Simple Network Management Protocol. The application protocol in the Internet suite of protocols which offers network management services.

QOS: Quality of Service. QoS refers to the capability of a network to provide better service to selected traffic flows using features such as data prioritization, queuing, congestion avoidance and traffic shaping. These features effectively provide preferential treatment to specific flows either by raising the priority of one flow or limiting the priority of another flow.

DHCP: Dynamic Host Control Protocol. Provides a framework for passing configuration information to hosts on a TCP/IP network. DHCP is based on the Bootstrap Protocol (BOOTP), adding the capability of automatic allocation of reusable network addresses and additional configuration options.

DHCP OPTION 82: A relay option for sending information about the requesting client (or an intermediate relay agent) in the DHCP request packets forwarded by the switch and in reply packets sent back from the DHCP server. This information can be used by DHCP servers to assign fixed IP addresses, or set other services or policies for clients.

This product comes with Three Years warranty. For further details about warranty policy and Product Registration, please visit support section of www.smartlink.co.in