PLANET
Networking & Communication

User's Manual

FNSW-1608PS
FGSW-1828PS

16-Port 10/100Mbps

Web Smart PoE Switch

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Revision

PLANET 16-Port 10/100Mbps Web Smart PoE Switch User's Manual

FOR MODELS: FNSW-1608PS / FGSW-1828PS

REVISION: FNSW-1608PSv2 / FGSW-1828PS (June.2008)

Part No.: 2080-A31120-006

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Checklist

Check the contents of your package for following parts:

- FNSW-1608PS or FGSW-1828PS x1
- Quick Installation Guide x1
- User's manual CD x1
- Power cord x 1
- Rubber feet x 4
- Two rack-mounting brackets with attachment screws x1

If any of these pieces are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

In the following section, the term **"Web Smart PoE Switch"** means the two Switch devices, ie. FNSW-1608PS and FGSW-1828PS; term of **"switch"** can be any third switches.

1.2 About the Switch

The Web Smart PoE Switch provide 16 10/100Mbps Fast Ethernet ports with 8 PoE interfaces, the Web Smart PoE Switch supports MDI / MDI-X convertible on 16-10/100Mbps ports and also provide PoE inject function on port#1 to port#8 which is able to drive 8 IEEE 802.3af compliant powered devices.

The unshielded twisted-pair (UTP) cable ports providing dedicated 10/100Mbps bandwidth, the dual speed ports used standard twisted-pair cabling and are ideal for SOHO or segmenting networks into small. Each 10/100Mbps port can supports up to 200Mbps of throughput in full-duplex mode, the Web Smart PoE Switch also provides a simple, cost-effective, and highly reliable network connection for data as well as power. Furthermore, it is the ideal device for bridging among Ethernet, Fast Ethernet workgroups and networks.

The Web Smart PoE Switch equipped with non-blocking 3.2 / 7.2Gbps backplane, greatly simplifies the tasks of upgrading your LAN for catering to increase bandwidth demands.

For efficient management, the Web Smart PoE Switch is equipped with remote Web interface. The Web Smart PoE Switch can be programmed for advanced switch management functions such as SNMP Alert Trap, port configuration, port-based / IEEE 802.1Q / MTU VLAN, port mirroring, port trunk, QoS, bandwidth control, broadcast storm control, MAC address / TCP & UDP filter and IGMP Snooping v1/v2. Also the PoE Setting, such as PoE power Disable/Enable and PoE power consumption monitoring

The FGSW-1828PS also provide two Gigabit Ethernet ports, either TP or SFP per port. The two Gigabit ports either can be 1000Base-T for 10/100/1000Mbps or 1000Base-SX/LX through SFP (Small Factor Pluggable) interfaces. The distance can be extended from 100 meters (TP), 550 meters (Multi-mode fiber), up to above 10/20/30/40/50/70/120 kilometers (Single-mode fiber).

With its Auto-Negotiation capability, all the RJ-45/STP ports of Web Smart PoE Switch can be configured to speeds of 10/20Mbps / 100/200Mbps (Fast Ethernet) or1000/2000Mbps (Gigabit Ethernet) automatically. In addition, the products are equipped with the MDI/MDI-X auto detection for easily plug and play connection, regardless of cabling types-straight through or crossover.

1.3 Features

◆ Complies with the IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z Gigabit Ethernet standard

◆ 16-Port 10/100Mbps with 8-Port PoE Web Smart PoE Switch (FNSW-1608PS)

◆ 16-Port 10/100Mbps + 2 Gigabit TP / SFP Combo Web Smart PoE Switch (FGSW-1828PS)

◆ 8-Port support 48VDC power to PoE Powered Device (Port 1 to port 8)

◆ Each Switching ports support auto-negotiation-10/20, 100/200Mbps (Fast Ethernet) , 1000/2000Mbps (Gigabit Ethernet) supported

◆ Auto-MDI/MDI-X detection on each RJ-45 port

◆ Prevents packet loss with back pressure (Half-duplex) and IEEE 802.3x PAUSE frame flow control (Full-duplex)

◆ High performance Store and Forward architecture, broadcast storm control, runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth

◆ 4K MAC address table, automatic source address learning and ageing

◆ 2.75Mb embedded memory for packet buffers

◆ Remote Web interface for Switch management and setup

◆ SNMP Trap for alarm notification of events

◆ Broadcast Storm Control support

◆ Supports up to 16 / 18 port-based VLAN groups / 32 IEEE 802.1Q VLAN groups / MTU VLAN

◆ Supports up to 2 Trunk groups, each trunk for up to maximum 4 port with 800Mbps bandwidth

◆ Supports QoS , bandwidth control and MAC address filter / TCP & UDP filter on each port

◆ Supports port mirroring function and IGMP Snooping v1 / v2

◆ PoE power Disable/Enable and PoE power consumption monitoring by management interface

◆ Firmware upgrade through Web interface

◆ Password setting, IP setting and device description setting through Planet Smart discovery utility

◆ 19-inch rack mount size

◆ Internal full-range power supply suitable for worldwide use

◆ EMI standards complies with FCC, CE class A

1.4 Specification

Model	FNSW-1608PS	FGSW-1828PS
Hardware Specification		
Fast Ethernet Ports	16 10/ 100Base-TX RJ-45 Auto-MDI/MDI-X ports	
Gigabit ports	None	2 Gigabit TP / SFP combo interfaces
Power over Ethernet ports	8-Port with PoE injector function (Port 1 to port 8)	
Switch Processing Scheme	Store-and-Forward	
Throughput (packet per second)	2.38Mpps.	5.35Mpps.
Switch fabric	3.2Gbps.	7.2Gbps
Address Table	4K entries	
Share data Buffer	2.75Mb embedded memory for packet buffers	
Flow Control	Back pressure for half duplex, IEEE 802.3x Pause Frame for full duplex	

Dimensions	440 x 120 x 44 mm (1U height)	
Weight	1.75 kg	2.02 kg
Power Requirement	100-240V AC, 50-60 Hz, 1A	
System operation Power Consumption / Dissipation (Full load)	13.5 watts / 46BTU	21 watts / 71BTU
Temperature	Operating: 0~50 degree C Storage: -40~70 degree	
Humidity Operating:	5% to 90%, Storage: 5% to 90% (Non-condensing)	
Power over Ethernet		
PoE Standard	IEEE 802.3af Power over Ethernet / PSE	
PoE Power Supply Type	End-Span	
PoE Power Output	Per Port 48V DC, 350mA . Max. 15.4 watts	
Power Pin Assignment	1/2(+), 3/6(-)	
Power Budget	110 watts	
Smart function		
System Configuration	Web interface	
Alert Trap	SNMP Trap for alarm notification of events	
Port configuration	Port speed duplex mode selection. Flow control disable / enable. Port disable / enable. Port description on each port	
Bandwidth Control	Yes, 1Mbps / 2Mbps / 4Mbps / 8Mbps / 16Mbps / 32Mbps / 64Mbps	
Broadcast Storm Control	Yes, 5% / 10% / 25% / 50% / Disable	
Port Statistics	Display each port's detail Ethernet traffic counter information	
VLAN	16 / 18 port-based VLAN groups / 32 IEEE 802.1Q VLAN groups / MTU VLAN	
Port trunking	Support 2 groups of 4-Port trunk support, up to 800Mbps bandwidth per trunk	
Port Mirroring	Port mirroring allows monitoring of the traffic across any port in real time	
QoS	Allow to assign low / high priority on each port. First-In-First-Out, All-High-before-Low, Weight-Round-Robin QoS policy.	
MAC address / TCP & UDP filter	Yes	
IGMP Snooping v1 / v2	Allow to disable or enable.	
PoE power control	Allow to disable or enable power provision and assign priority on each PoE port	
Standards Conformance		
Regulation Compliance	FCC Part 15 Class A, CE	
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet IEEE 802.3z Gigabit Ethernet IEEE 802.3x Full-duplex Flow control IEEE 802.3af Power over Ethernet IEEE 802.1Q VLAN IEEE 802.1p QoS	

This product provides three different running speeds – 10Mbps, 100Mbps and 1000Mbps in the same Web Smart PoE Switch and automatically distinguishes the speed of incoming connection.

This section describes the hardware features of Web Smart PoE Switch. For easier management and control of the Web Smart PoE Switch, familiarize yourself with its display indicators, and ports. Front panel illustrations in this chapter display the unit LED indicators. Before connecting any network device to the Web Smart PoE Switch, read this chapter carefully.

2.1 Front Panel

The Front Panel of the Web Smart PoE Switch consists of 16 Auto-Sensing 10/100Mbps Ethernet RJ-45 Ports, Also the FGSW-1828PS provides 2 Gigabit TP/SFP combo ports either can be 1000Base-T for 10/100/1000Mbps or 1000Base-SX/LX through SFP (Small Factor Pluggable) interface.

The LED Indicators are also located on the front panel of the Web Smart PoE Switch.
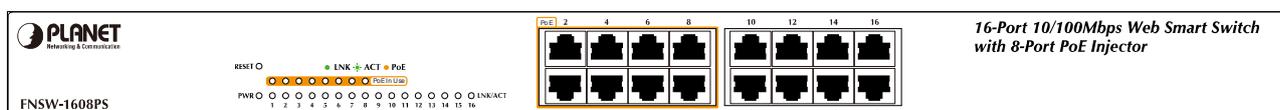

Figure 2-1: FNSW-1608PS Switch front panel

Figure 2-2: FGSW-1828PS Switch front panel

2.1.1 LED indicators

System

LED	Color	Function
PWR	Green	Lights to indicate that the Switch has power.

Per 10/100Mbps port

LED	Color	Function
PoE In-use	Orange	Lights to indicate the port is providing 48VDC in-line power. (1-8 ports)
LNK/ACT	Green	Lights to indicate the link through that port is established at 10/100Mbps full duplex mode. Blink slowly to indicate the link through that port is established at 10/100Mbps half duplex mode. Blink fast to indicate that the Switch is actively sending or receiving data over that port.

Per 10/100/1000Base-T port / SFP interfaces (FGSW-1828PS only)

LED	Color	Function
LNK/ACT	Green	Lights to indicate the link through that port is established at 10/100/1000Mbps full duplex mode. Blink slowly to indicate the link through that port is established at 10/100Mbps half duplex mode. Blink fast to indicate that the Switch is actively sending or receiving data over that port.
100/1000	Green	Steady Lights to indicate the port is run at 1000Mbps. Blink Slowly to indicate the port is run at 100Mbps Off: indicate that the port is operating at 10Mbps.

✍ **Notice:** 1.Press the RESET button once. The Web Smart PoE Switch will reboot automatically.

2. Press the RESET button for 5 seconds. The Web Smart PoE Switch will back to the factory

default mode; the entire configuration will be erased.

2.2 Rear Panel

The rear panel of the Web Smart PoE Switch indicates an AC inlet power socket, which accepts input power from 100 to 240VAC, 50-60Hz, 1A.

Figure 2-3: FNSW-1608PS / FGSW-1828PS Switch rear panel

Power Notice:

1. The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.

2. In some area, installing a surge suppression device may also help to protect your Web Smart PoE Switch from being damaged by unregulated surge or current to Web Smart PoE Switch.

2.3 Hardware Installation

This part describes how to install your Web Smart PoE Switch and make connections to the Switch. Please read the following topics and perform the procedures in the order being presented. To install your Web Smart PoE Switch on a desktop or shelf, simply completed the following steps.

2.3.1 Desktop Installation

To install Web Smart PoE Switch on a desktop or shelf, simply completed the following steps:

Step 1: Attached the rubber feet to the recessed areas on the bottom of the Web Smart PoE Switch.

Step 2: Place the Web Smart PoE Switch on a desktop or shelf near an AC power source.

Step 3: Keep enough ventilation space between the Web Smart PoE Switch and the surrounding objects.

✎ *Notice:*	When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 4, Specification.

Step 4: Connect your Switch to network devices.

A. Connect one end of a standard network cable to the 10/100 RJ-45 ports on the front of the Web Smart PoE Switch.

B. Connect the other end of the cable to the network devices such as printer servers, workstations or routers…etc.

✎ *Notice:*	Connection to the Web Smart PoE Switch requires UTP Category 5 network cabling with RJ-45 tips. For more information, please see the Cabling Specification in **Appendix A**.

Step 5: Supply power to the Web Smart PoE Switch.

A. Connect one end of the power cable to the Web Smart PoE Switch.

B. Connect the power plug of the power cable to a standard wall outlet then power on the Web Smart PoE Switch.

When the Web Smart PoE Switch receives power, the Power LED should remain solid Green.

2.3.2 Rack Mounting

To install the Web Smart PoE Switch in a **19-inch** standard rack, follow the instructions described below.

Step 1: Place your Web Smart PoE Switch on a hard flat surface, with the front panel positioned towards your front side.

Step 2: Attach a rack-mount bracket to each side of the Web Smart PoE Switch with supplied screws attached to the package. Figure 2-4 shows how to attach brackets to one side of the Web Smart PoE Switch.


Figure 2-4 Attaching the brackets to the Web Smart PoE Switch

Caution:

You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

Step 3: Secure the brackets tightly.

Step 4: Follow the same steps to attach the second bracket to the opposite side.

Step 5: After the brackets are attached to the Web Smart PoE Switch, use suitable screws to securely attach the brackets to the rack, as shown in Figure 2-5.
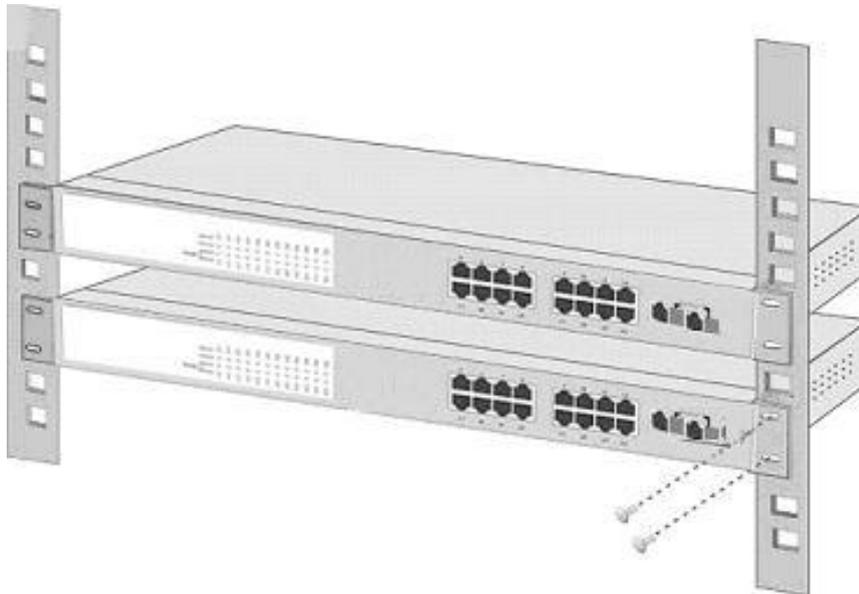
Figure 2-5 Mounting the Web Smart PoE Switch in a Rack

Step 6: Proceed with the steps 4 and steps 5 of section **2.3.1 Desktop Installation** to connect the network cabling and supply power to your Web Smart PoE Switch.

3. SWITCH MANAGEMENT

This chapter describes how to manage the Web Smart PoE Switch. Topics include:

- Overview

- Management method

- Logging on to the Web Smart PoE Switch

3.1 Overview

The Web Smart PoE Switch provides a user-friendly, Web interface. Using this interface, you can perform various switch configuration and management activities, including:

Please refer to the following Chapter 4 for the details.

3.2 Management Method

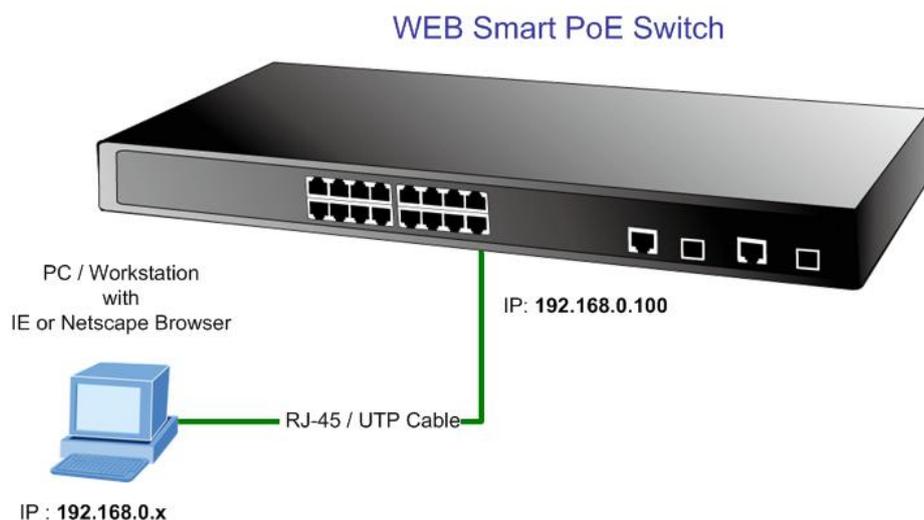User can manage the Web Smart PoE Switch by Web Management via a network connection.

3.2.1 Web Management

The PLANET Web Smart PoE Switch provide a built-in browser interface. You can manage the Switch remotely by having a remote host with Web browser, such as Microsoft Internet Explorer, Netscape Navigator or Mozilla Firefox.

The following shows how to startup the Web Management of the Switch, please note the Web Smart PoE Switch is configured through an Ethernet connection, make sure the manager PC must be set on the same IP subnet address, for example, the default IP address of the Switch is **192.168.0.100** (the factory-default IP address), then the manager PC should be set at 192.168.0.x (where x is a number between 1 and 254, except 100), and the default subnet mask is 255.255.255.0.

Use Internet Explorer 5.0 or above Web browser, enter default IP address http://192.168.0.100

After entering the username and password (default user name and password is **"admin"**) in login screen

3.2.2 PLANET Smart Discovery Utility

You can manage the Web Smart PoE Switch remotely by having a remote host with Web browser, such as Microsoft Internet Explorer or Netscape Navigator.

Using this management method:

The Web Smart PoE Switch must have an Internet Protocol (IP) address accessible for the remote host. For easily list the FNSW-1608PS / FGSW-1828PS in your Ethernet environment, the Planet Smart Discovery Utility from user's manual CD-ROM is an ideal solution.

The following install instructions guiding you for run the Planet Smart Discovery Utility.

1. Deposit the Planet Smart Discovery Utility in administrator PC.

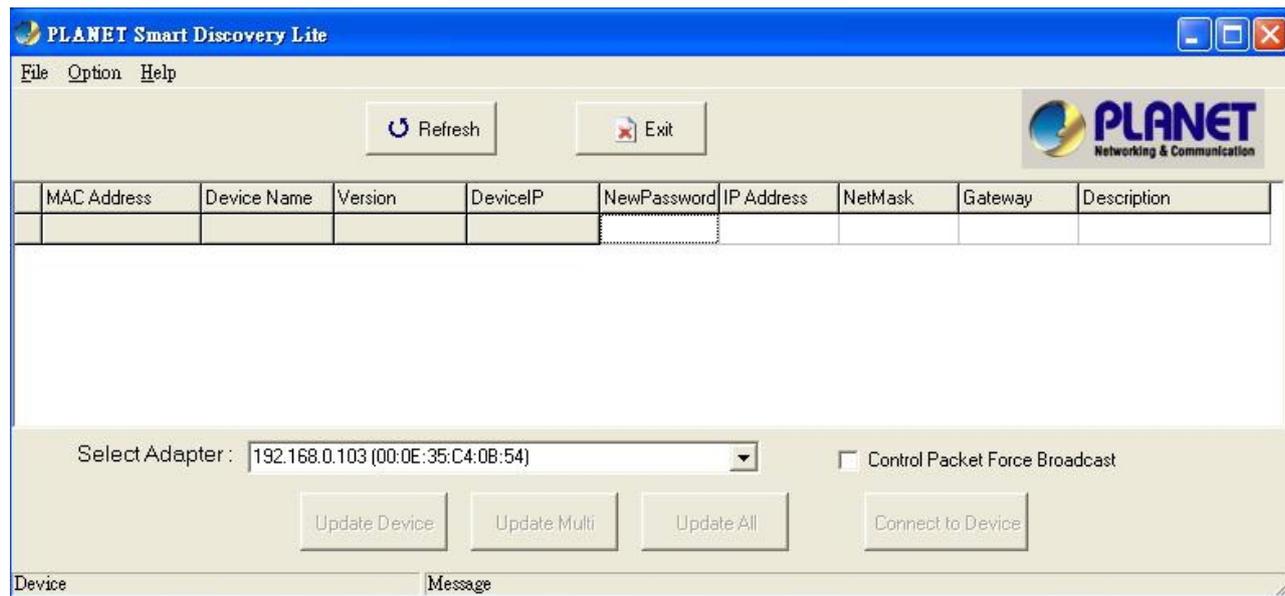2. Run this utility and the following screen appears.

Figure 3-1 Planet Smart Discovery Utility Screen

✎ *Notice:*		If there are two LAN cards or above in the same administrator PC, choose different LAN card by use the **"Select Adapter"** tool.

3. Press **"Refresh"** button for list current connected devices in the discovery list, the screen is shown as follow.
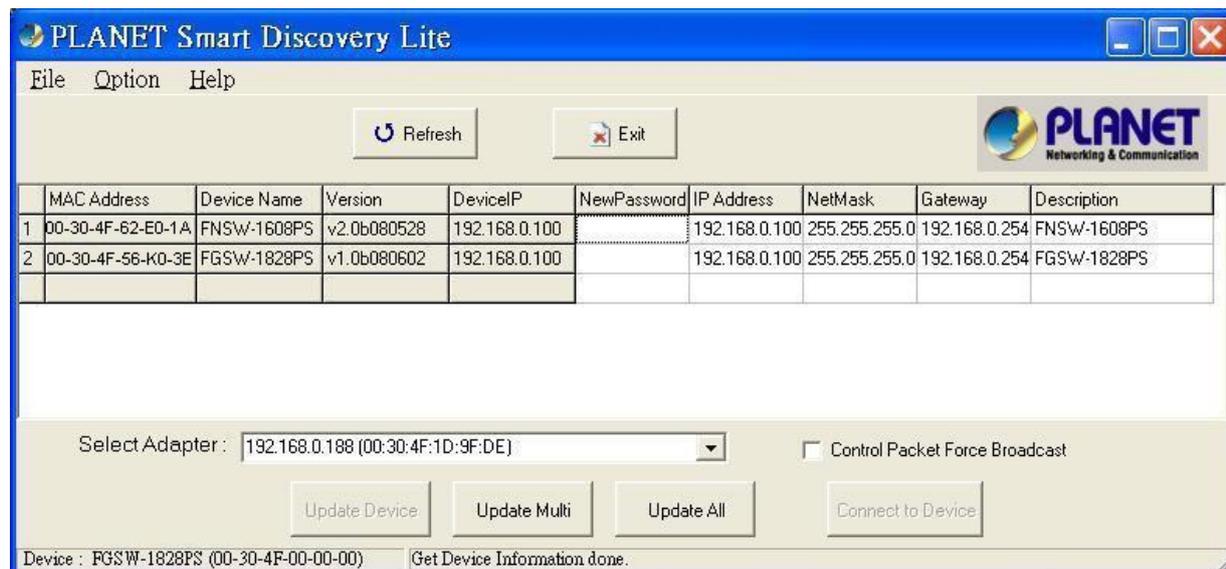

Figure 3-2 Planet Smart Discovery Utility Screen

4. This utility show all necessary information from the devices, such as MAC Address, Device Name, firmware version, Device IP Subnet address, also can assign new password, IP Subnet address and description for the devices.

5. After setup completed, press **"Update Device"**, **"Update Multi"** or **"Update All"** button to take affect. The meaning of the 3 buttons above are shown as below:

>   **Update Device**: use current setting on one single device.

>   **Update Multi:** use current setting on choose multi-devices.

>   **Update All:** use current setting on whole devices in the list.

The same functions mentioned above also can be finding in **"Option"** tools bar.

6. To click the **"Control Packet Force Broadcast"** function, it can allow assign new setting value to the Web Smart PoE Switch under different IP subnet address.

7. Press **"Connect to Device"** button then the Web login screen appears in Figure 3-3.

8. Press **"Exit"** button to shutdown the planet Smart Discovery Utility.

3.3 Logging on to the FNSW-1608PS / FGSW-1828PS

When you log on to the Web Smart PoE Switch Web interface for the first time, a sign-on string appears and you are prompted for a Web login username and password.

Figure 3-3 Web Smart PoE Switch Web Login Screen

The factory default login username and password is **admin**.

✎ *Notice:*   1. For FNSW-1608PS the display will be the same to FGSW-1828PS.

2. For security reason, please change and memorize the new password after this first setup.

To modify your PC's IP domain to the same with Web Smart PoE Switch then use the default IP address (*192.168.0.100*) to remote configure Web Smart PoE Switch through the **Web** interface.

✎ *Notice:* The following section will base on the console screens of FGSW-1828PS, for FNSW-1608PS the display will be the same to FGSW-1828PS.

4.1 Login in to the Switch

To access the Web-browser interface you must first enter the user name and password, the default user name and password is **"admin".** You will see the following screen comes out on the Web browser program:

Figure 4-1 Web Login Screen

After the User name and Password is entered, you will see the Web Main Menu screen.

The Switch Menu provide eight major management functions, the screen in Figure 4-2 appears.

Figure 4-2 Web Main Menu Screen

These items and its description shown as below:

◆ **System:** Provide System configuration of Web Smart PoE Switch. **Explained in section 4.2.**

◆ **Port Management:** Provide Port Management configuration of Web Smart PoE Switch. **Explained in section 4.3.**

◆ **VLAN Setting:** Provide VLAN Setting configuration of Web Smart PoE Switch. **Explained in section 4.4.**

◆ **Trunk Setting:** Provide Trunk Setting configuration Web Smart PoE Switch. **Explained in section 4.5.**

◆ **QoS Setting:** Provide QoS Setting configuration of Web Smart PoE Switch. **Explained in section 4.6.**

◆ **Security:** Provide Security configuration of Web Smart PoE Switch. **Explained in section 4.7.**

◆ **Misc Operation:** Provide Misc Operation configuration of Web Smart PoE Switch. **Explained in section 4.8.**

◆ **POE Setting:** Provide POE Setting configuration of Web Smart PoE Switch. **Explained in section 4.9.**

◆ **Logout:** Provide Logout function of Web Web Smart PoE Switch. **Explained in section 4.10.**

4-2 System

This section provides System Information, IP Configuration, Password Setting, Alert Trap, Factory Default, Firmware Update and Reboot functions of Web Smart PoE Switch, the screen in Figure 4-3 appears and table 4-1 describes the System object of Web Smart PoE Switch.
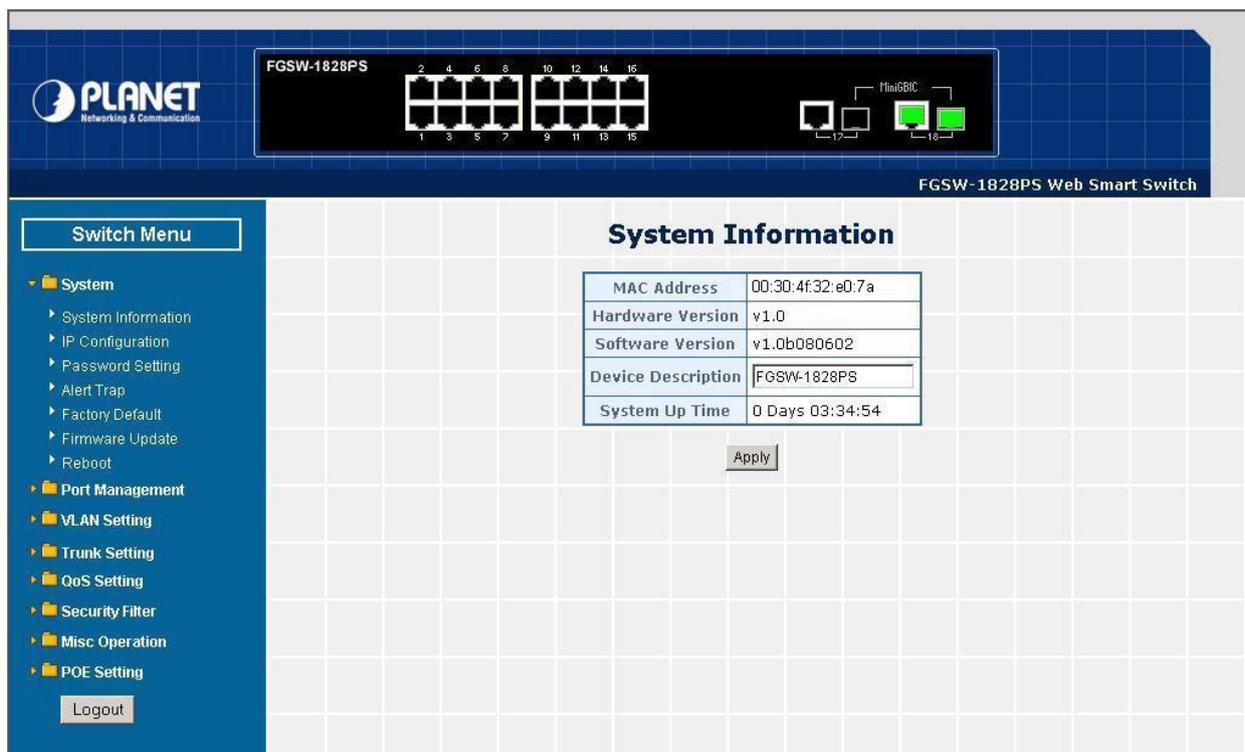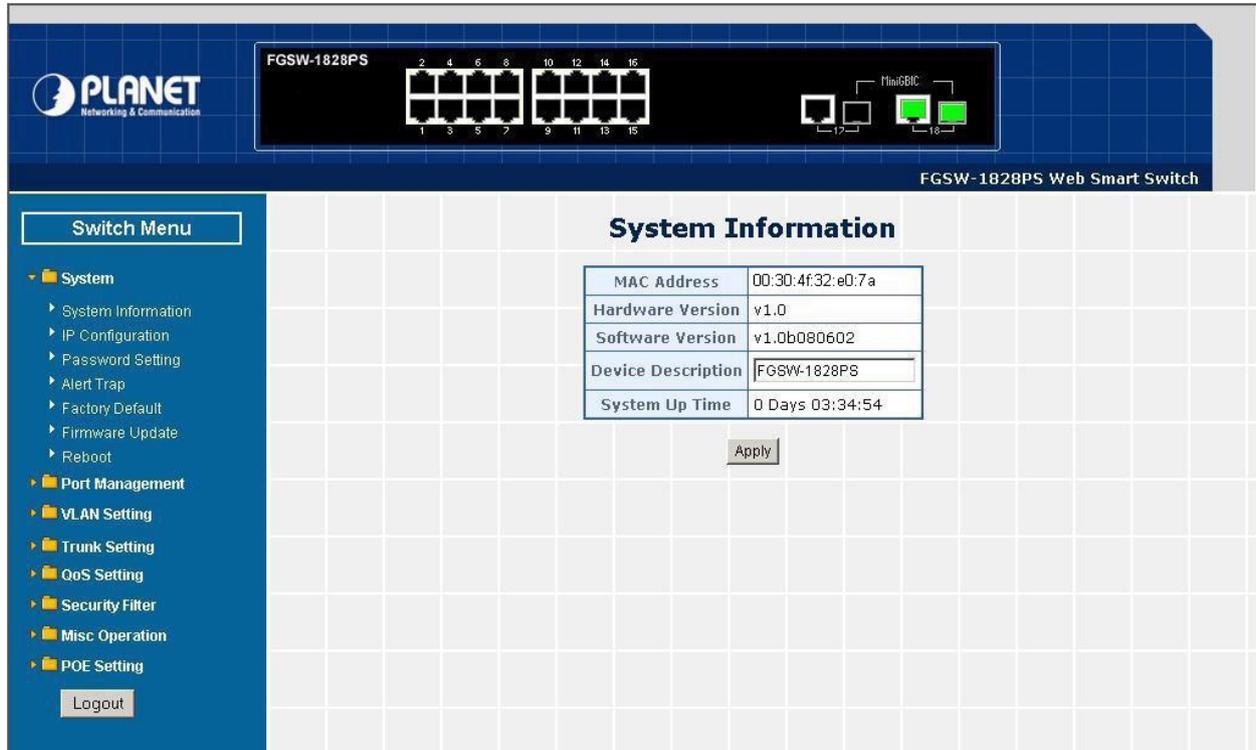

Figure 4-3 System Web Page Screen

Object	Description
System Information	Display the MAC address, Hardware Version, and Software Version, Device Description. **Explained in section 4.2.1.**
IP Configuration	Allow to change the IP subnet address of Web Smart PoE Switch. **Explained in section 4.2.2.**
Password Setting	Allow to change the username and password of Web Smart PoE Switch. **Explained in section 4.2.3.**
Alert Trap	Allow configure the Alert Trap function of Web Smart PoE Switch. **Explained in section 4.2.4.**
Factory Default	Allow reset the Web Smart PoE Switch to factory default mode. **Explained in section 4.2.5.**
Firmware Update	Allow proceed firmware upgrade process of Web Smart PoE Switch. **Explained in section 4.2.6.**
Reboot	Allow reboot the Web Smart PoE Switch. **Explained in section 4.2.7.**

Table 4-1 Descriptions of the System Web Page Screen Objects

4.2.1 System Information

This section displays the MAC address, Hardware Version, Software Version and System Up Time, also allow define the device description and press **"Apply"** button to take affect. The screen in Figure 4-4 appears.

Figure 4-4 System Information Web Page Screen

✎ **Notice:**   Up to 16 characters is allowed for the Device Description.

4.2.2 IP Configuration

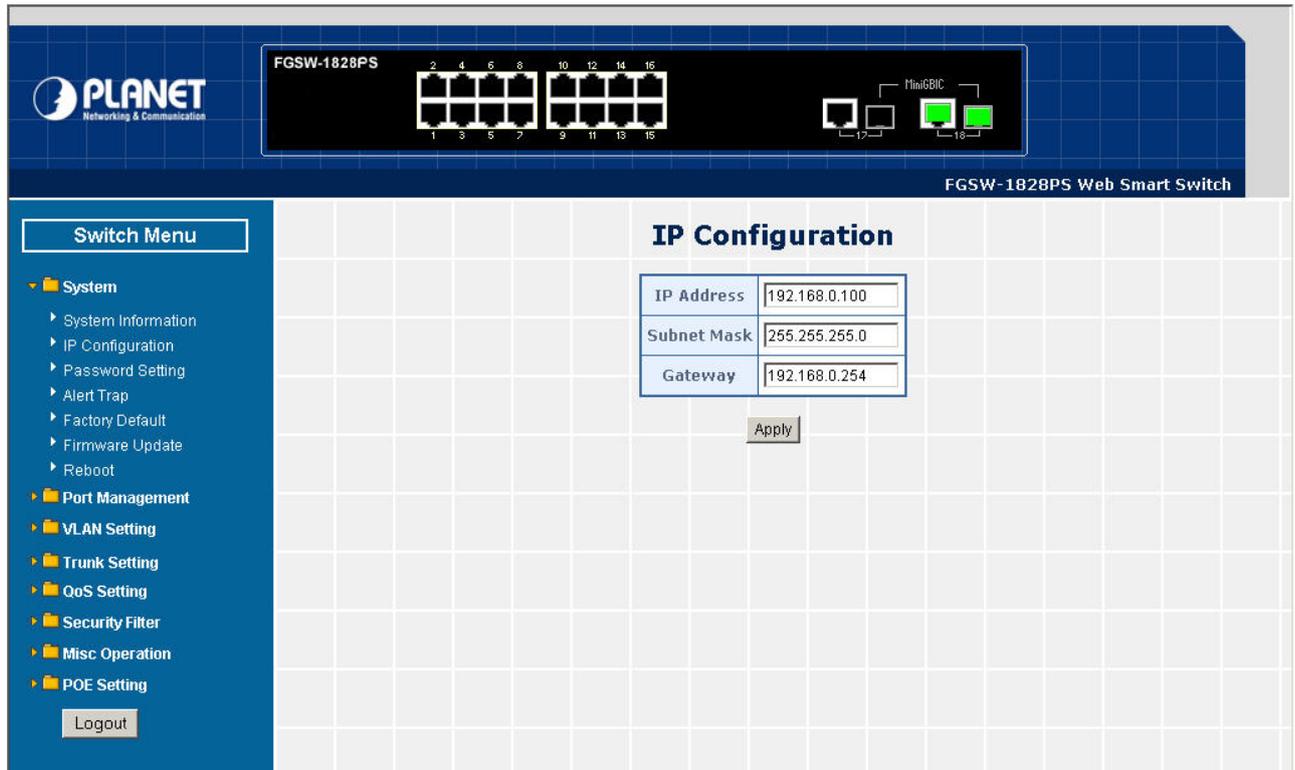This section provides change the IP Address, Subnet Mask and Gateway, the screen in Figure 4-5 appears.

Figure 4-5 IP Configuration Web Page Screen

After setup complete and press **"Apply"** button to take affect. The following screen in Figure 4-6 appears and then another Web page login screen with new IP address will show up. After input correct username and password then can continue the Web Smart PoE Switch management.
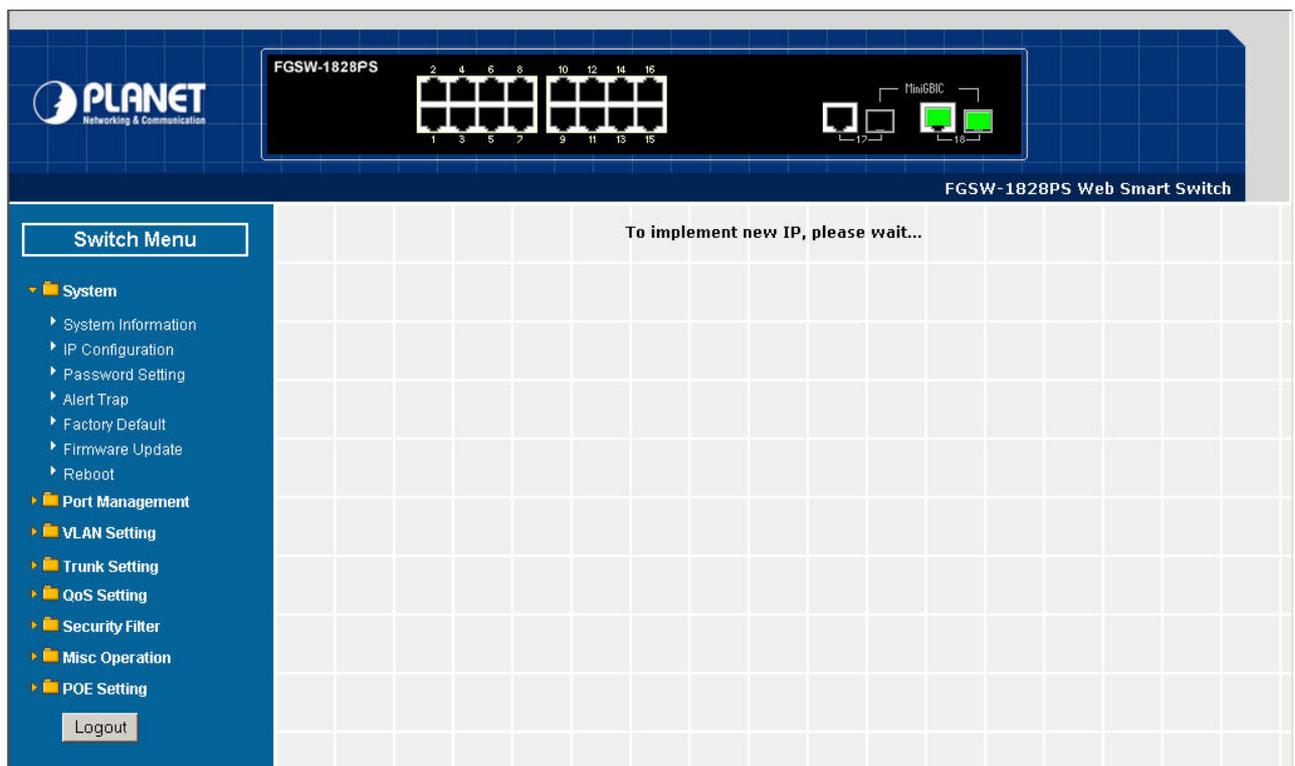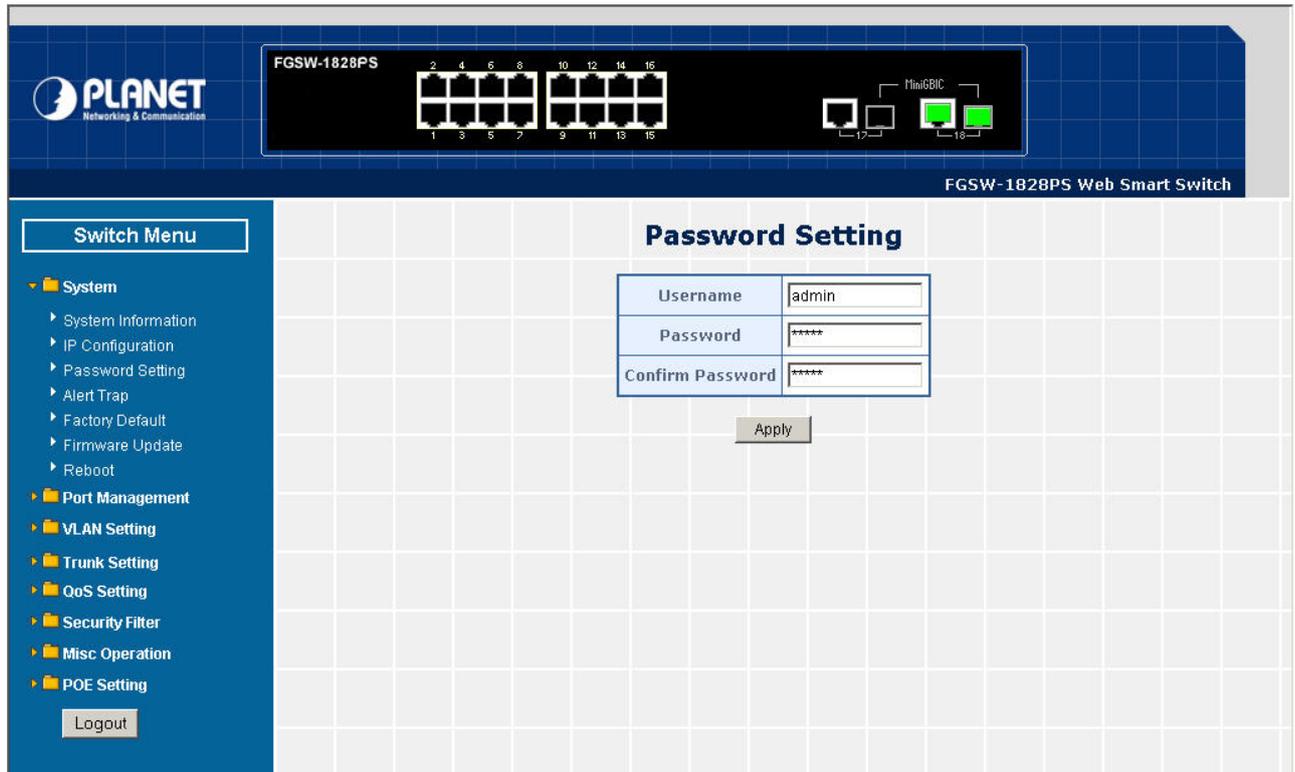

Figure 4-6 IP Configuration Web Page Screen

4.2.3 Password Setting

This section provides change the Username and Password, the screen in Figure 4-7 appears.

Figure 4-7 Password Setting Web Page Screen

⚙️*Notice:*   Up to 8 characters is allowed for the username and password assign.

4.2.4 Alert Trap

This section provides Web Smart PoE Switch Alert Trap configuration, such as Disable or enable the trap mode and alert IP address assign the screen in Figure 4-8 appears. The table 4-2 describes the Alert Trap object of Web Smart PoE Switch.
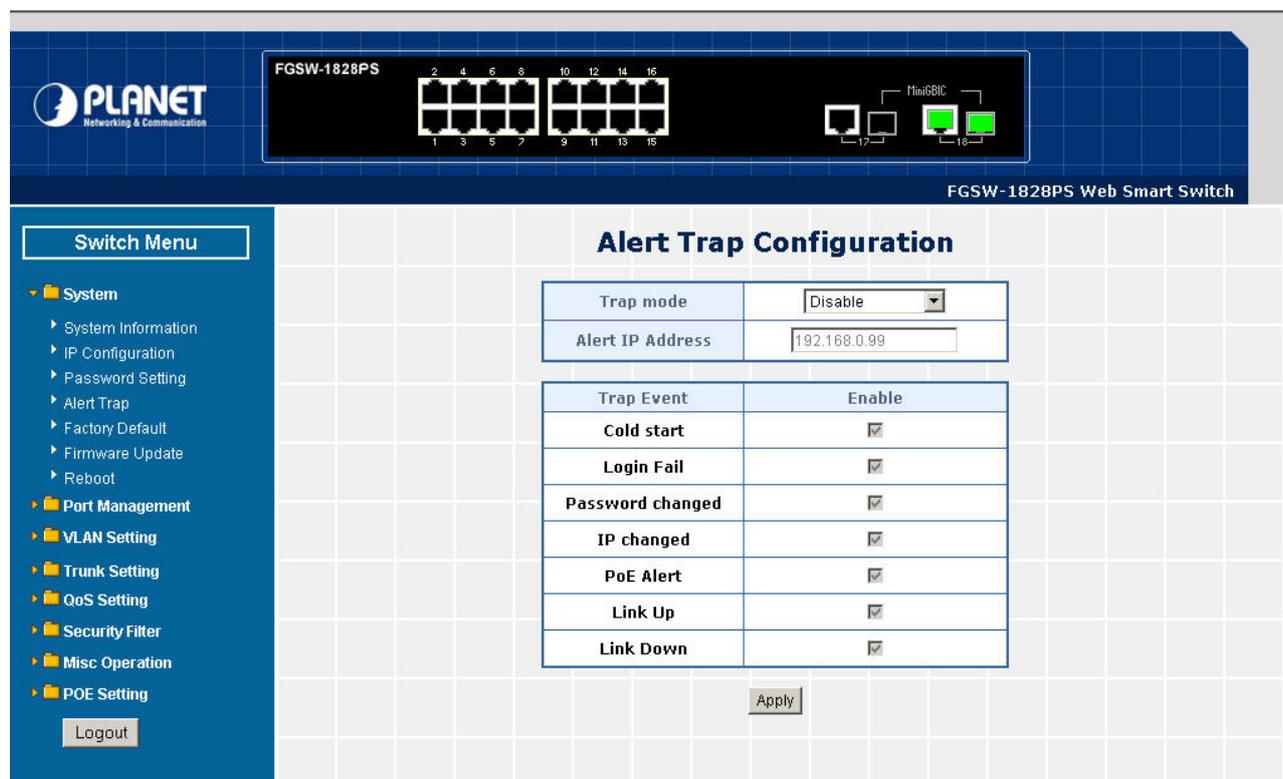

Figure 4-8 Alert Trap Web Page Screen

Object	Description
Trap mode	Allow disable or enable the Alert Trap mode.
Alert IP Address	Allow assign an Alert IP Address of one specific workstation that gets SNMP Trap.
Trap Event	
Cold start	Choose this event then can get Cold Start Trap.
Login Fail	Choose this event then can get Login Fail Trap.
Password Changed	Choose this event then can get Password Changed Trap.
IP Changed	Choose this event then can get IP address Changed Trap.
PoE Alert	Choose this event then can get link up / link down Trap from each PoE port.
Link Up	Choose this event then can get link up trap from each Ethernet port.
Link Down	Choose this event then can get link down trap from each Ethernet port.
Apply	Press this button to take affect.

Table 4-2 Descriptions of the Alert Trap Web Page Screen Objects

4.2.5 Factory Default

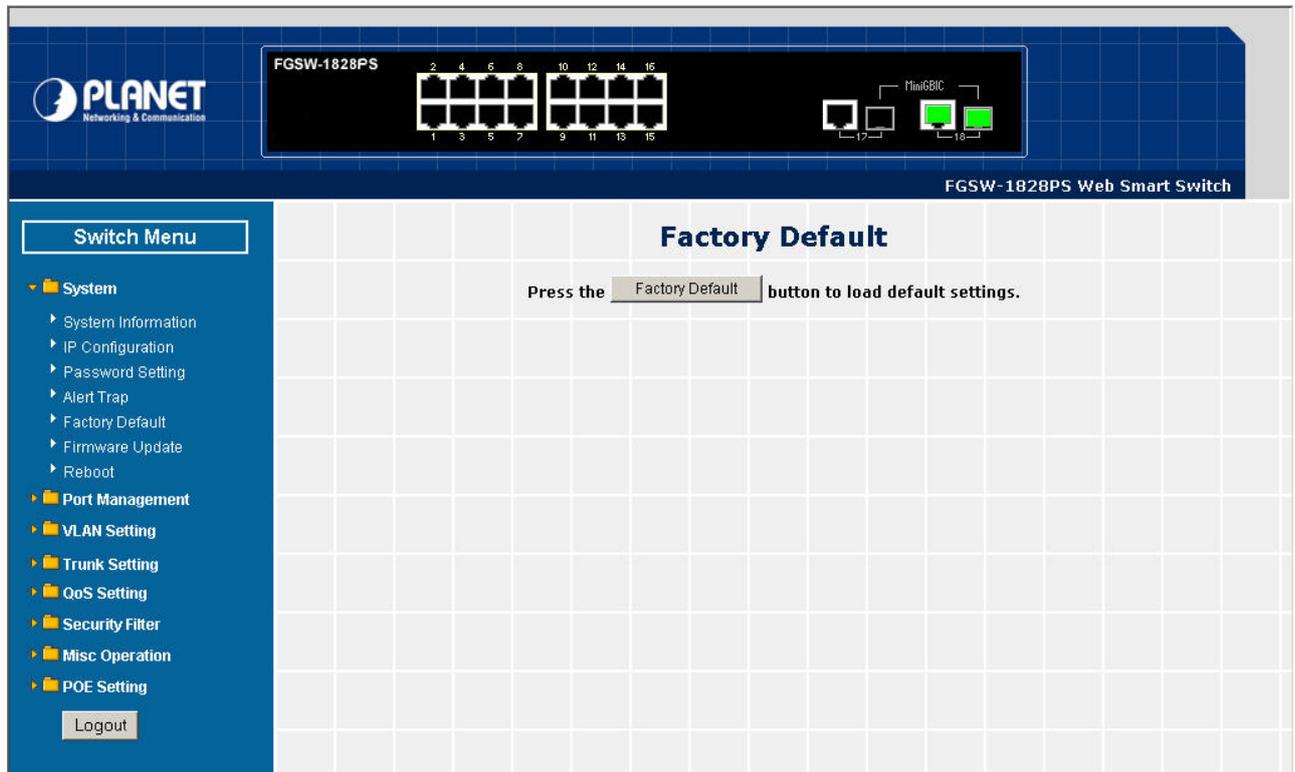This section provides reset the Web Smart PoE Switch to factory default mode, the screen in Figure 4-9 appears.

Figure 4-9 Factory Default Web Page Screen

Press **"Factory Default"** button to take affect. The following screen in Figure 4-10 appears and then another Web page login screen with default setting will show up. After input default username and password then can continue the Web Smart PoE Switch management.
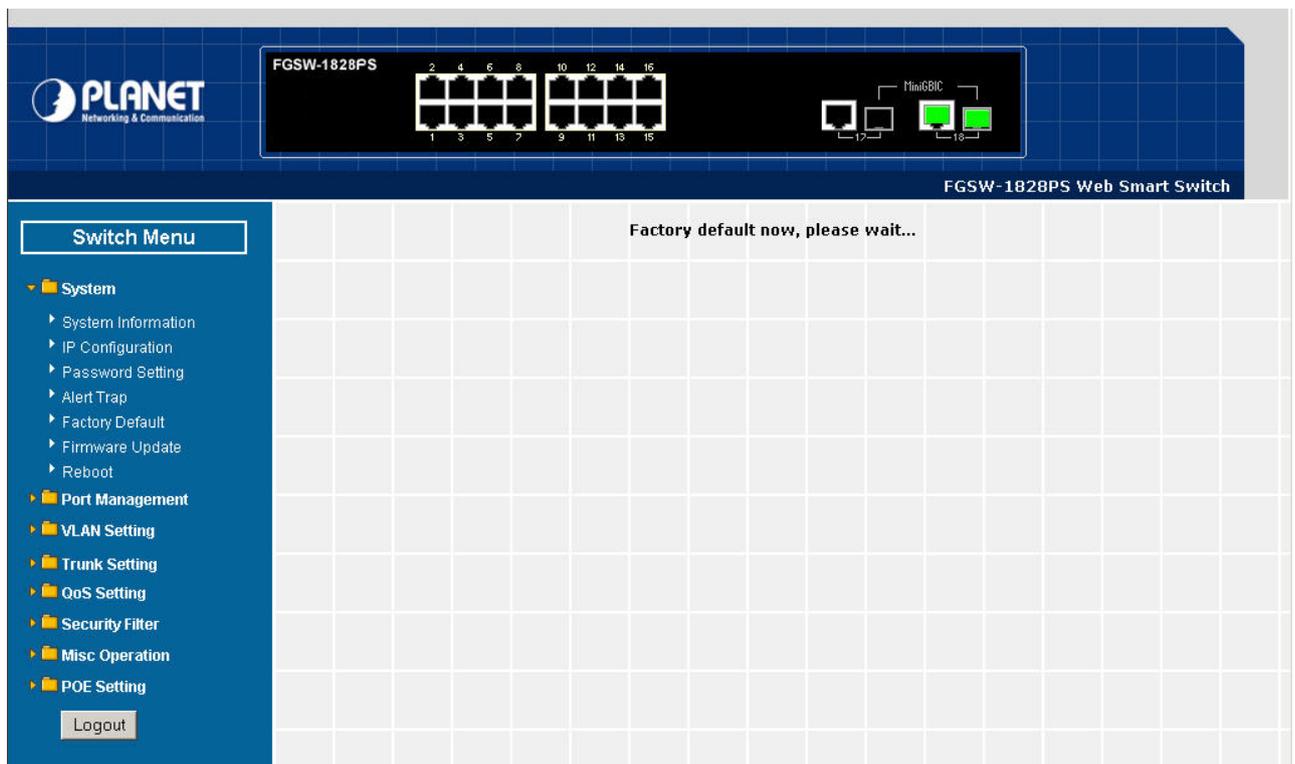

Figure 4-10 Factory Default Web Page Screen

4.2.6 Firmware Update

This section provides firmware upgrade of the Web Smart PoE Switch, the screen in Figure 4-11 appears.
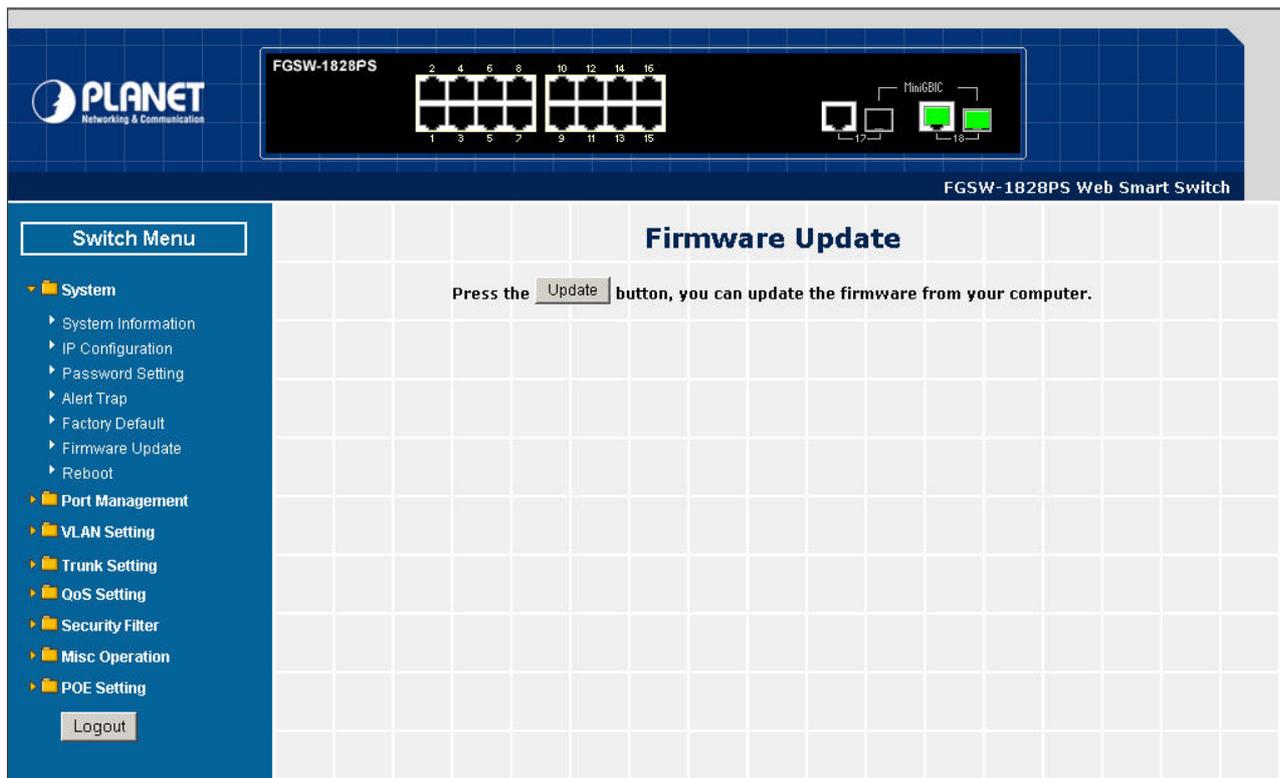

Figure 4-11 Firmware Update Web Page Screen

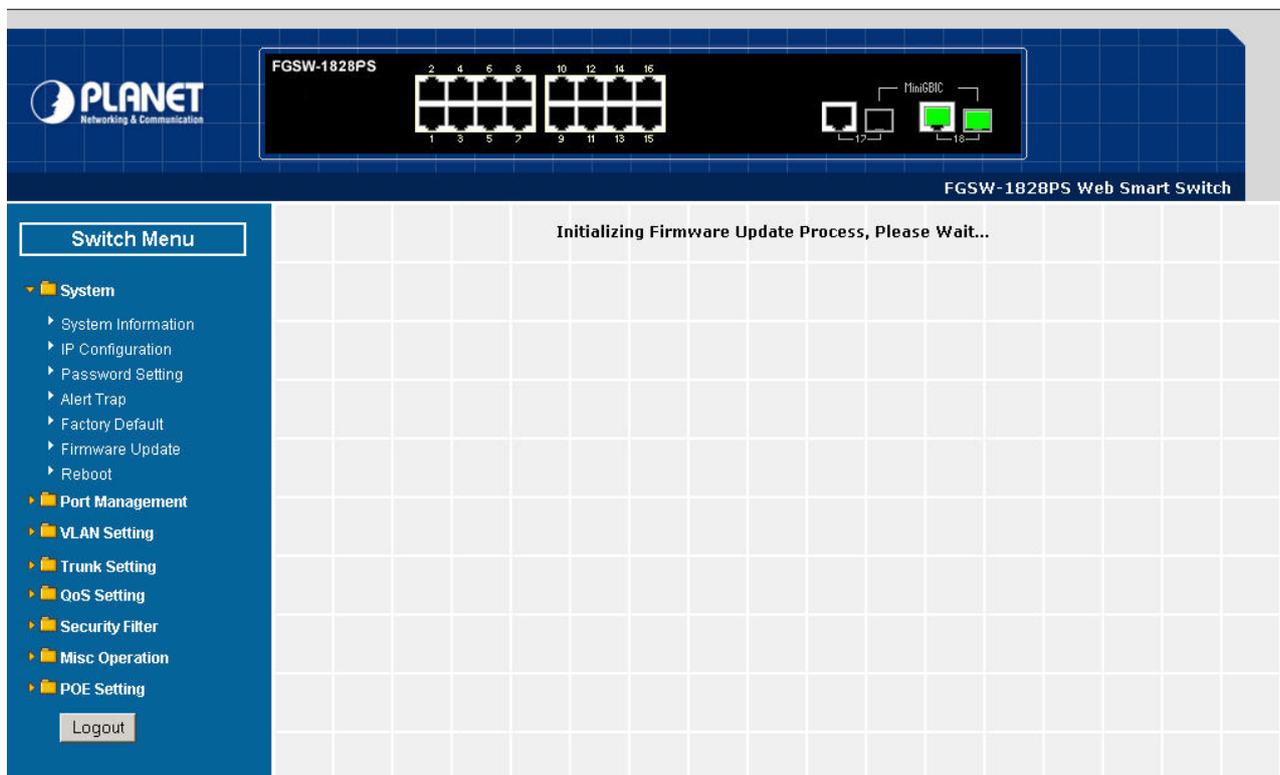Press **"Update"** button for start the firmware upgrade process, the screen in Figure 4-12 & 4-13 appears.

Figure 4-12 Firmware Update Web Page Screen

Erase Flash In Progress (65/128)
If this webpage doesn't refresh smoothly, please connect to http://192.168.0.100 to continue.

Figure 4-13 Firmware Update Web page Screen

Then the following screen appears, press **"Browser"** button to find the firmware location administrator PC, the screen in Figure 4-14 appears.
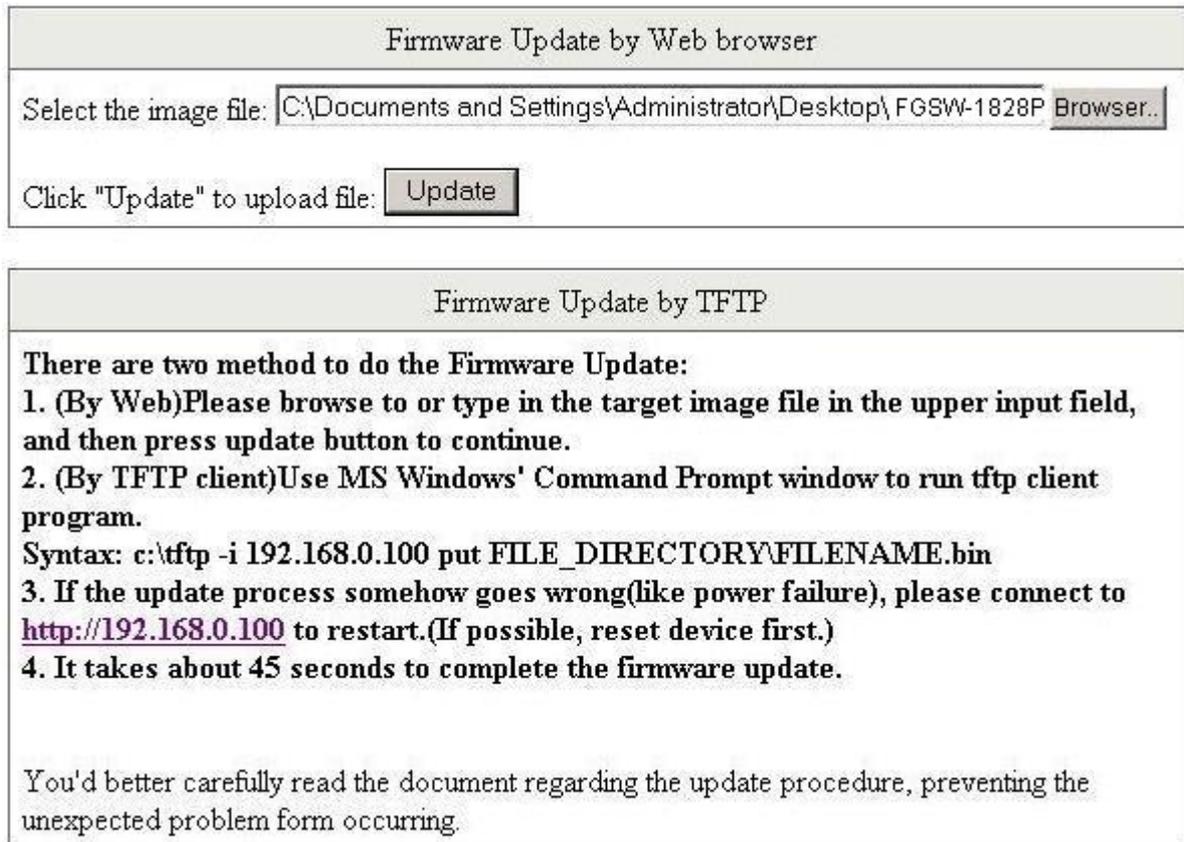
Firmware Update by Web browser

Select the image file: | Browser..

Click "Update" to upload file: Update

Firmware Update by TFTP

There are two method to do the Firmware Update:
1. (By Web)Please browse to or type in the target image file in the upper input field, and then press update button to continue.
2. (By TFTP client)Use MS Windows' Command Prompt window to run tftp client program.
Syntax: c:\tftp -i 192.168.0.100 put FILE_DIRECTORY\FILENAME.bin
3. If the update process somehow goes wrong(like power failure), please connect to http://192.168.0.100 to restart.(If possible, reset device first.)
4. It takes about 45 seconds to complete the firmware update.

You'd better carefully read the document regarding the update procedure, preventing the unexpected problem form occurring.

Figure 4-14 Firmware Update Web Page Screen

After find the firmware location from administrator PC, press **"Update"** button to start the firmware upgrade process. The screen in Figure 4-15 appears.

Firmware Update by Web browser

Select the image file: C:\Documents and Settings\Administrator\Desktop\ FGSW-1828P Browser..

Click "Update" to upload file: Update

Firmware Update by TFTP

There are two method to do the Firmware Update:
1. (By Web)Please browse to or type in the target image file in the upper input field, and then press update button to continue.
2. (By TFTP client)Use MS Windows' Command Prompt window to run tftp client program.
Syntax: c:\tftp -i 192.168.0.100 put FILE_DIRECTORY\FILENAME.bin
3. If the update process somehow goes wrong(like power failure), please connect to http://192.168.0.100 to restart.(If possible, reset device first.)
4. It takes about 45 seconds to complete the firmware update.

You'd better carefully read the document regarding the update procedure, preventing the unexpected problem form occurring.

Figure 4-15 Firmware Update Web Page Screen

When firmware upgrade process is completed then the following screen appears, please wait for a while for system reboot. After device reboot then can use the latest firmware of the Web Smart PoE Switch.

Flash Update is completed. Please Wait for its Restart.

Figure 4-16 Firmware Update Web Page Screen

4.2.7 Reboot

This section allows reboot the Web Smart PoE Switch, the screen in Figure 4-17 appears.
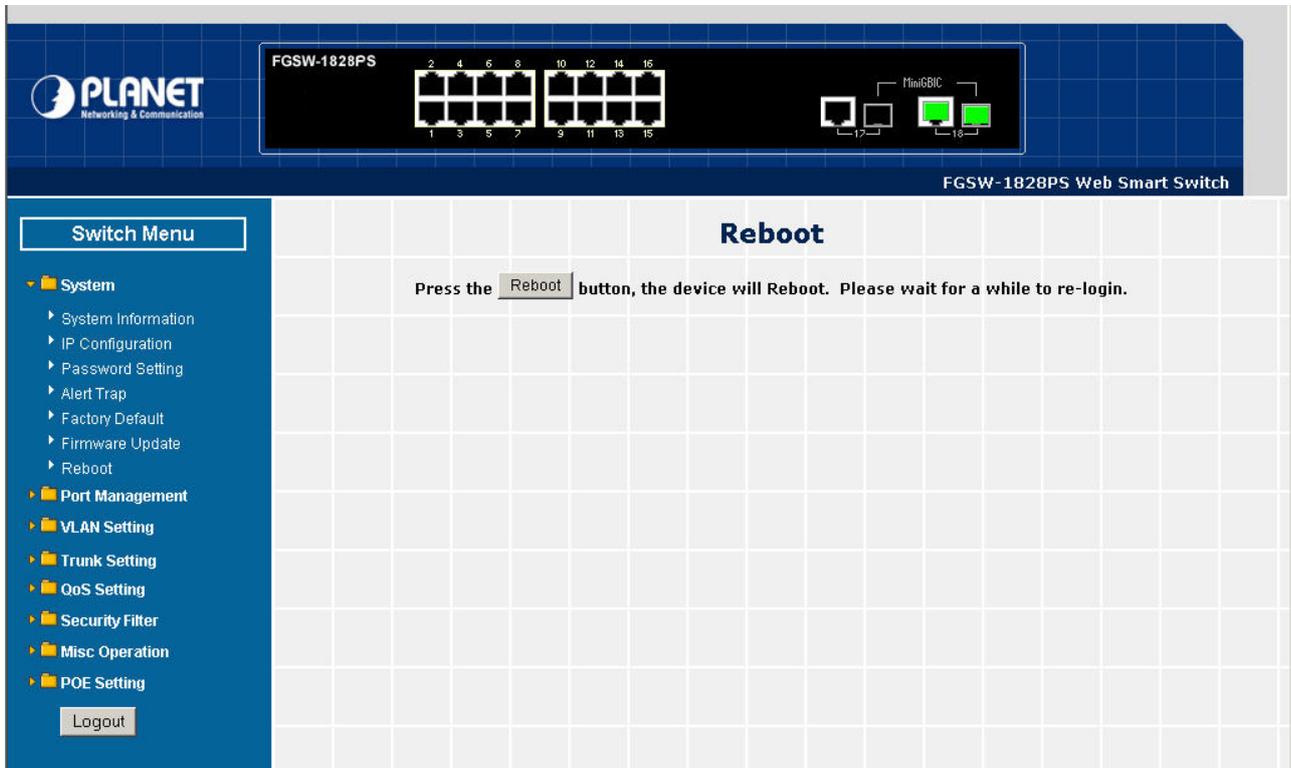

Figure 4-17 Reboot Web Page Screen

Press **"Reboot"** button to reboot the Web Smart PoE Switch, the screen in Figure 4-18 appears. After device reboot completed, the Web login screen appears and login for further management.
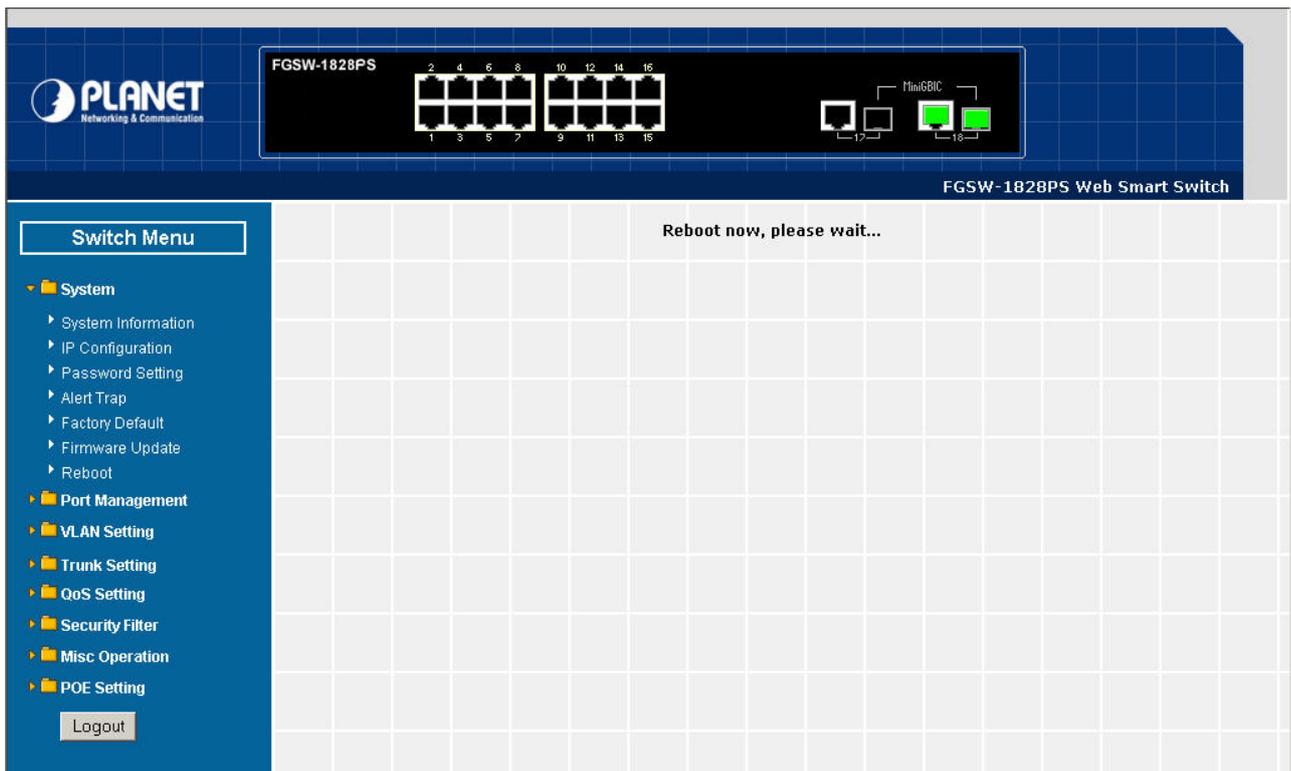
4-3 Port Management

This section provides Port Configuration, Port Mirroring, Bandwidth Control, Broadcast Storm Control and Port Statistics from Web Smart PoE Switch, the screen in Figure 4-19 appears and table 4-3 describes the Port Management object of Web Smart PoE Switch.
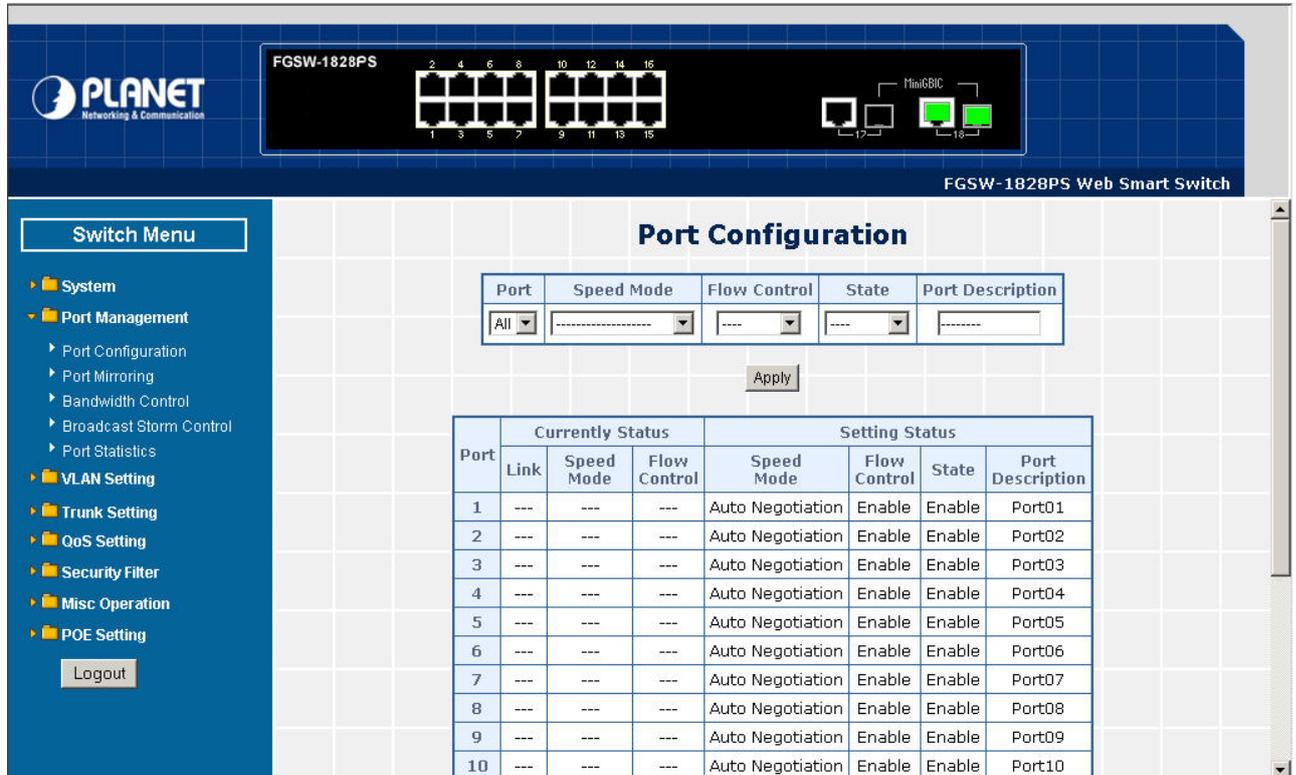
Figure 4-19 Port Management Web Page Screen

Object	Description
Port Configuration	Allow to configure each port of Web Smart PoE Switch. **Explained in section 4.3.1.**
Port Mirroring	Allow to use port mirroring function of Web Smart PoE Switch. **Explained in section 4.3.2.**
Bandwidth Control	Allow to configure bandwidth control of each port from Web Smart PoE Switch. **Explained in section 4.3.3.**
Broadcast Storm Control	Allow to configure broadcast storm control of each port from Web Smart PoE Switch. **Explained in section 4.3.4.**
Port Statistics	Display each port statistics of Web Smart PoE Switch. **Explained in section 4.3.5.**

Table 4-3 Descriptions of the Port Management Web Page Screen Objects

4.3.1 Port Configuration

This section introduces detail settings of per port on Web Smart PoE Switch; the screen in Figure 4-20 & 4-21 appears and table 4-4 & 4-5 descriptions the Port Configuration objects of Web Smart PoE Switch.
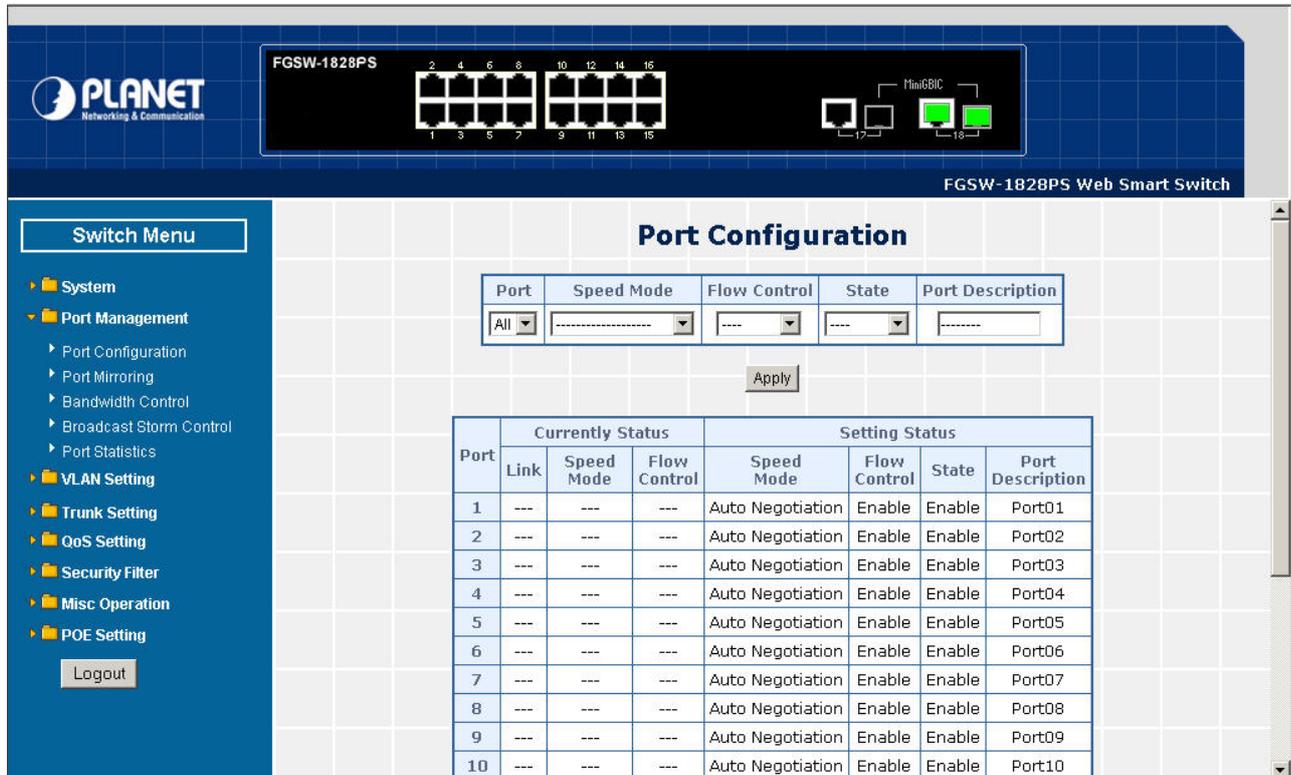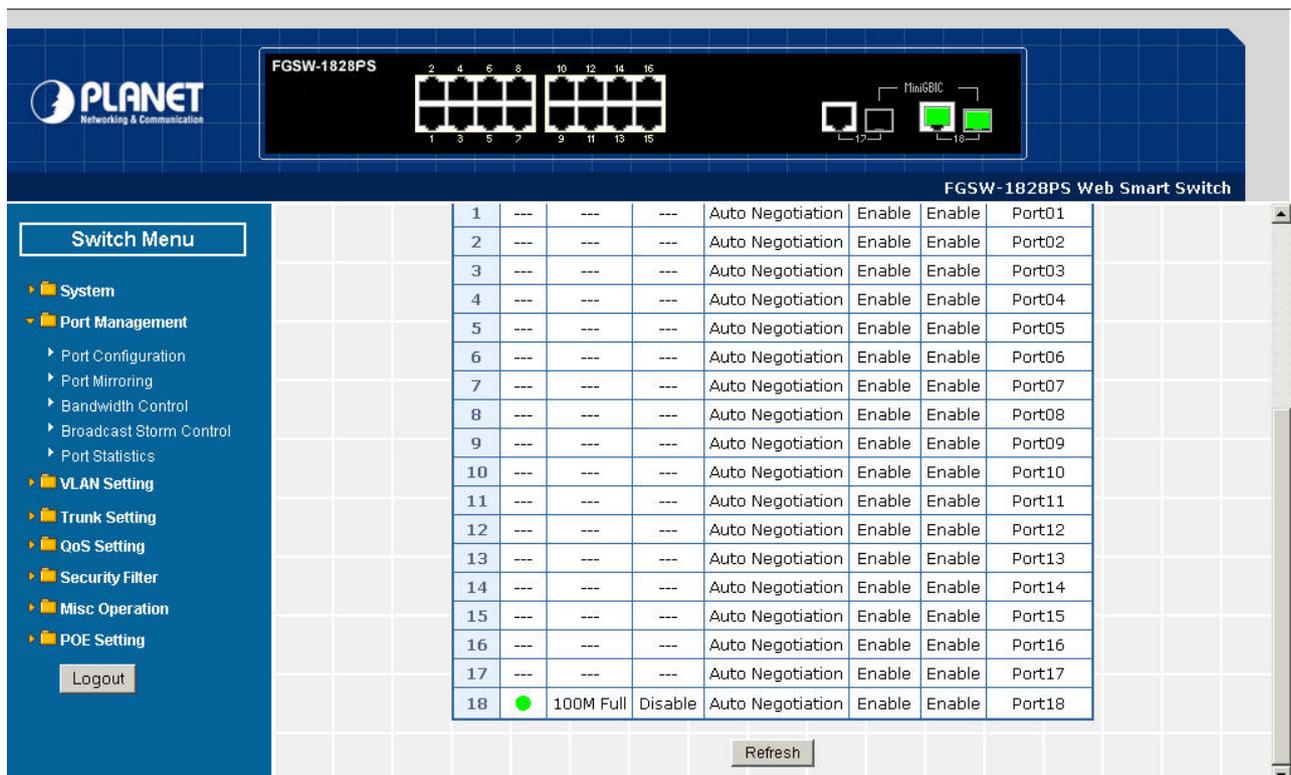

Figure 4-20 Port Configuration Web Page Screen

Object	Description
Port	Allow choosing all or one port of Web Smart PoE Switch for further management, the available options is **All** & **01 to 16** (FNSW-1608PS). Or **All & 01 to 18** (FGSW-1828PS).
Speed Mode	Allow choosing various speed duplex mode from one specific port of Web Smart PoE Switch , the available options are shown as below: **Auto Negotiation** **1000Full (FGSW-1828PS 1000Mbps Port Only)** **100Full** **100Half** **10Full** **10Half** Default mode is **Auto Negotiation**.
Flow Control	Allow to configure Flow control function of each port from Web Smart PoE Switch, the available options are **Enable** and **Disable**. Default mode is **Enable**.
State	Allow disable or enable one specific port from Web Smart PoE Switch, the available options are **Enable** and **Disable**. Default mode is **Enable**.
Port Description	Allow input per Port Description of Web Smart PoE Switch, up to maximum **8** characters allow.
Apply button	Press **"Apply"** button for save current configuration of each port on Web Smart PoE Switch.

Table 4-4 Descriptions of the Port Configuration Web Page Screen Objects

Object	Description
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Current Status	Display per port Current Status, such as Link, Speed Mode and Flow Control.
Link	Display current link status from each port of the Web Smart PoE Switch.
Speed Mode	Display current speed mode from each port of the Web Smart PoE Switch.
Flow Control	Display current flow control status from each port of the Web Smart PoE Switch.
Setting Status	Display per port Current Setting Status, such as Speed Mode, Flow Control, State and Port Description.
Speed Mode	Display per port Speed Mode setting value.
Flow Control	Display per port Flow Control setting value.
State	Display per port State setting value.
Port Description	Display per Port Description.
Refresh button	Press **"Refresh"** button to refresh current status.

Table 4-5 Descriptions of the Port Configuration Web Page Screen Objects

4.3.2 Port Mirroring

This section introduces detail settings of Port Mirroring function of Web Smart PoE Switch; the screen in Figure 4-22 appears and table 4-6 descriptions the Port Mirroring objects of Web Smart PoE Switch.
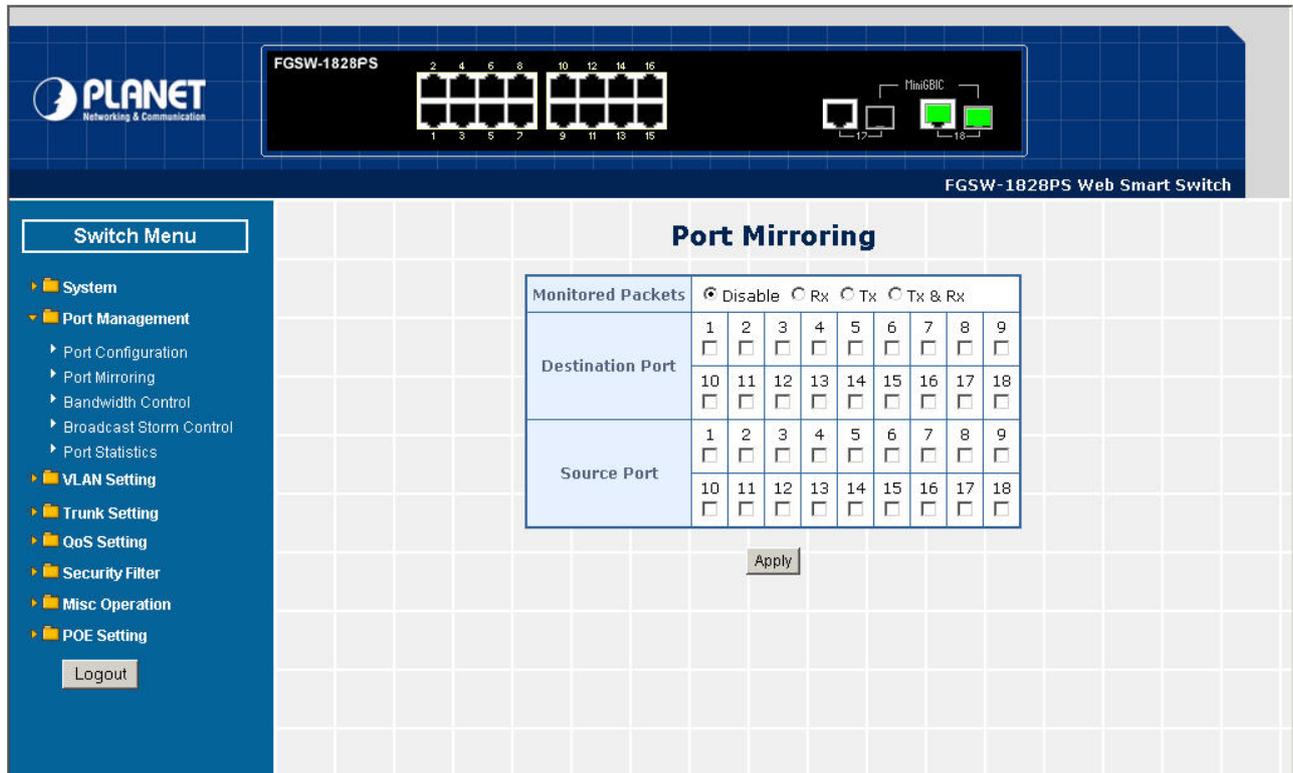
Figure 4-22 Port Mirroring Web Page Screen

Object	Description
Monitored Packets	Provide disable and enable the Port Mirroring function, the available options are **Disable**, **RX**, **TX**, **TX & RX**. Default mode is **Disable**.
Destination Port	The destination port can be used to see all monitor port traffic. It can connect destination port to LAN analyzer or Netxray.
Source Port	The source port that want to monitor. All monitor port traffic will be copied to destination port.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-6 Descriptions of the Port Mirroring Screen Objects

4.3.3 Bandwidth Control

This section introduces detail settings of Bandwidth Control function of Web Smart PoE Switch; the screen in Figure 4-23 appears and table 4-7 description the Bandwidth Control objects of Web Smart PoE Switch.
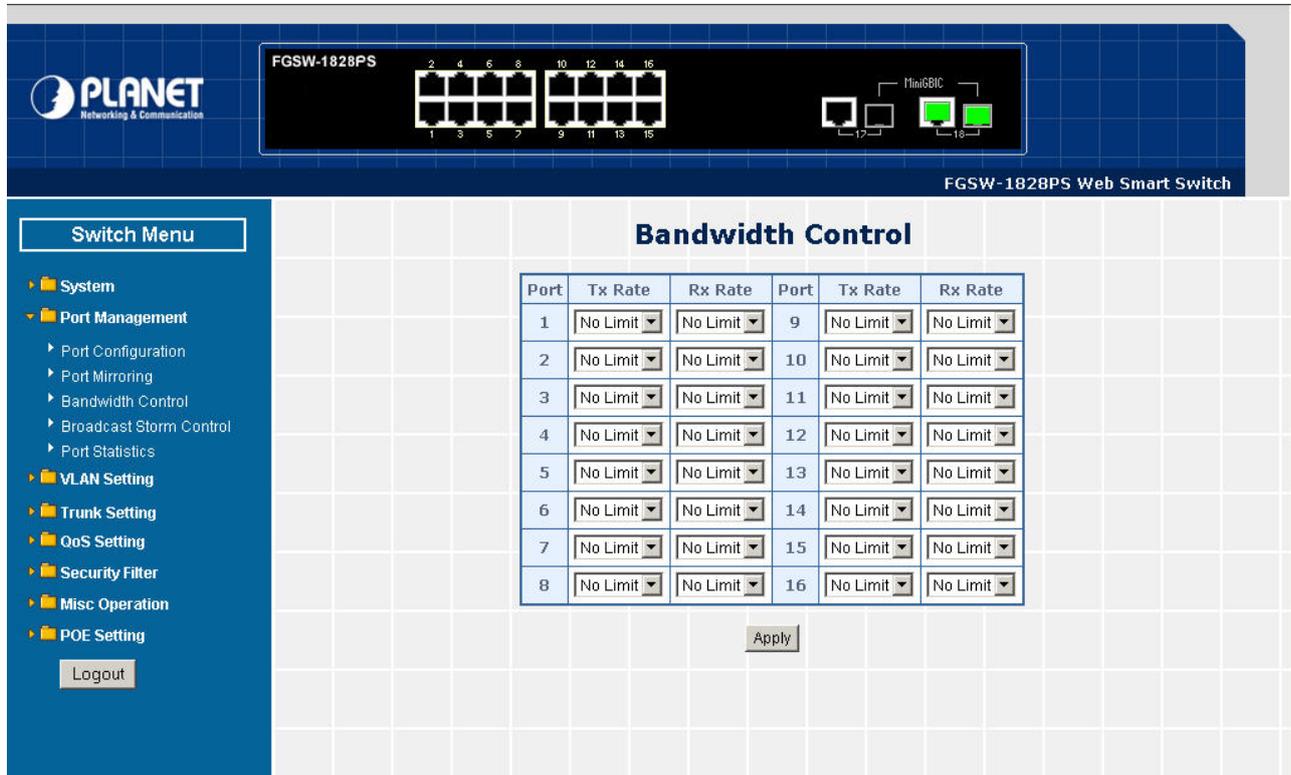
Figure 4-23 Bandwidth Control Web Page Screen

Object	Description
Port	Indicate port 1 to port 16 of Web Smart PoE Switch.
Tx Rate	Provide **No Limit, 1Mbps, 2Mbps, 4Mbps, 8Mbps, 16Mbps, 32Mbps, 64Mbps** different transmit rate for bandwidth control function of Web Smart PoE Switch. Default mode is **"No Limit"**.
Rx Rate	Provide **No Limit, 1Mbps, 2Mbps, 4Mbps, 8Mbps, 16Mbps, 32Mbps, 64Mbps** different receive rate for bandwidth control function of Web Smart PoE Switch. Default mode is **"No Limit"**.
Apply button	Press this button for save current configuration of each port on Web Smart PoE Switch.

Table 4-7 Descriptions of the Bandwidth Control Screen Objects

4.3.4 Broadcast Storm Control

This section introduces detail settings of Broadcast Storm Control function of Web Smart PoE Switch; the screen in Figure 4-24 appears and table 4-8 descriptions the Broadcast Storm Control objects of Web Smart PoE Switch.
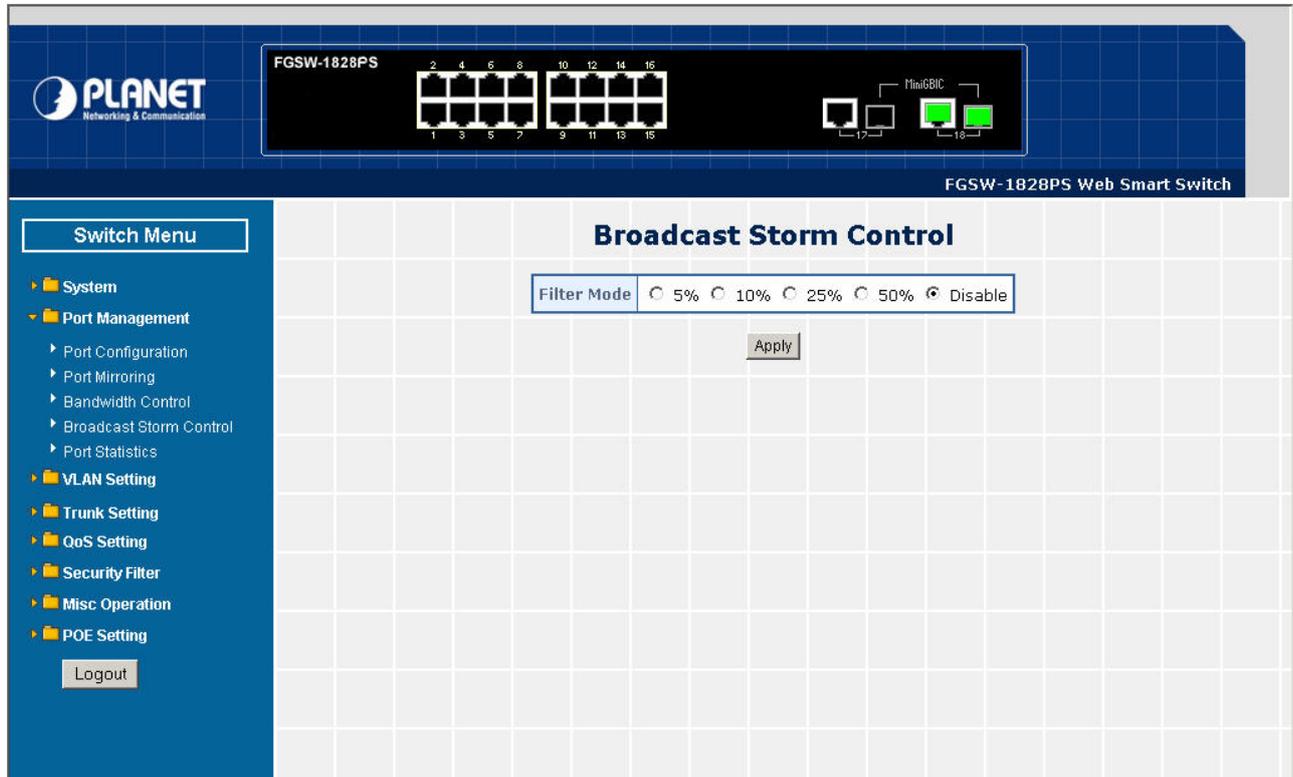

Figure 4-24 Broadcast Storm Control Web Page Screen

Object	Description
Filter Mode	Provide **5%, 10%, 25%, 50%, Disable** different filter mode. Default mode is **Disable**.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-8 Descriptions of the Broadcast Storm Control Screen Objects

4.3.5 Port Statistics

This section introduces detail information of Port Statistics function of Web Smart PoE Switch; the screen in Figure 4-25 appears and table 4-9 descriptions the Port Statistics objects of Web Smart PoE Switch.
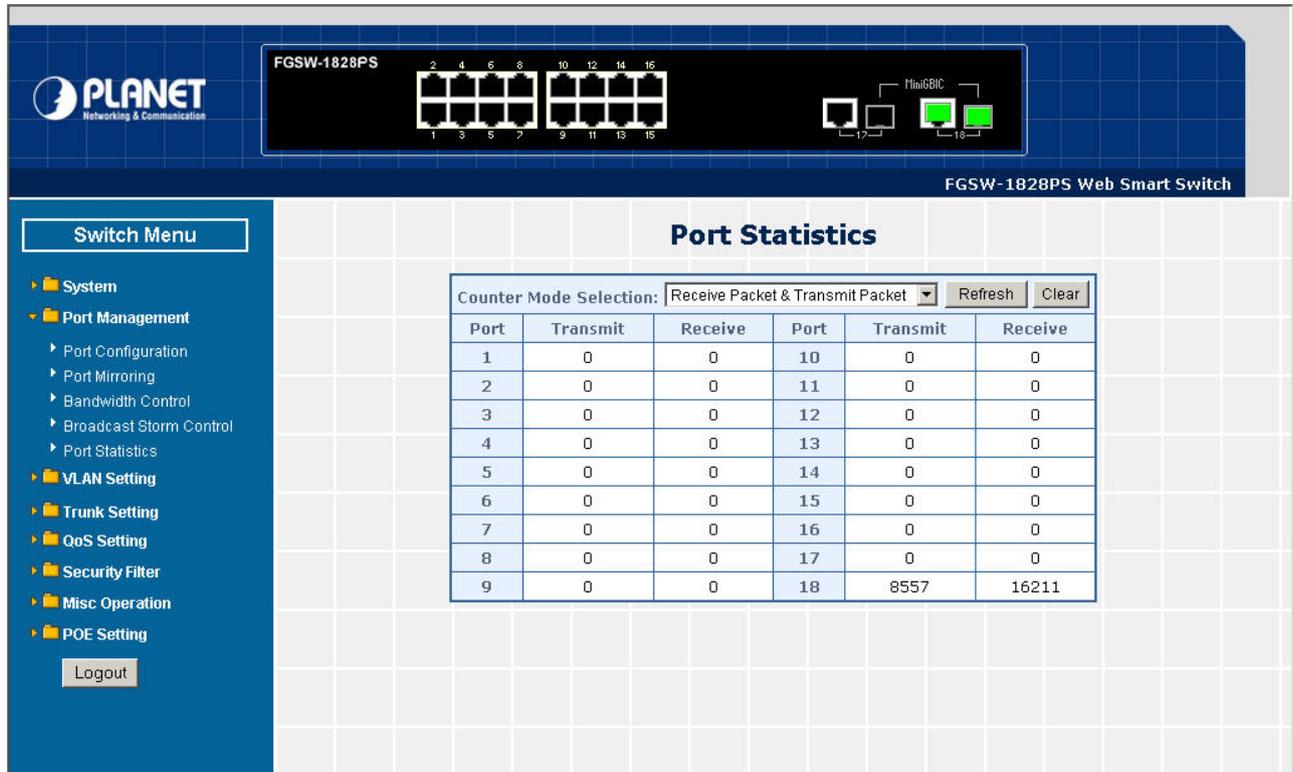
Figure 4-25 Port Statistics Web Page Screen

Object	Description
Counter Mode Selection	Provide different type of Ethernet traffic counter mode, the available options are shown as below: **Receive Packet & Transmit Packet** **collision Count & Transmit Packet** **Drop Packet & Receive Packet** **CRC error Packet & Receive Packet** Default mode is **Receive Packet & Transmit Packet**.
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Transmit	Display Transmit count value from each port.
Receive	Display Receive count value from each port.
Refresh button	Press this button for refresh the Port Statistics value of Web Smart PoE Switch.
Clear button	Press this button for clear the Port Statistics value of Web Smart PoE Switch.

Table 4-9 Descriptions of the Port Statistics Screen Objects

4-4 VLAN Setting

A Virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain. It allows you to isolate network traffic so only members of the VLAN receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is logically equivalent of reconnecting a group of network devices to another Layer 2 switch. However, all the network devices are still plug into the same switch physically.

The Switch supports IEEE 802.1Q (tagged-based) and Port-Base VLAN setting in web management page. In the default configuration, VLAN support is **"No VLAN"**.

Port-based VLAN

Port-based VLAN limit traffic that flows into and out of switch ports. Thus, all devices connected to a port are members of the VLAN(s) the port belongs to, whether there is a single computer directly connected to a switch, or an entire department.

On port-based VLAN.NIC do not need to be able to identify 802.1Q tags in packet headers. NIC send and receive normal Ethernet packets. If the packet's destination lies on the same segment, communications take place using normal Ethernet protocols. Even though this is always the case, when the destination for a packet lies on another switch port, VLAN considerations come into play to decide if the packet is dropped by the Switch or delivered.

IEEE 802.1Q VLANs

IEEE 802.1Q (tagged) VLAN are implemented on the Switch. 802.1Q VLAN require tagging, which enables them to span the entire network (assuming all switches on the network are IEEE 802.1Q-compliant).

VLAN allow a network to be segmented in order to reduce the size of broadcast domains. All packets entering a VLAN will only be forwarded to the stations (over IEEE 802.1Q enabled switches) that are members of that VLAN, and this includes broadcast, multicast and unicast packets from unknown sources.

VLAN can also provide a level of security to your network. IEEE 802.1Q VLAN will only deliver packets between stations that are members of the VLAN. Any port can be configured as either tagging or untagging. The untagging feature of IEEE 802.1Q VLAN allows VLAN to work with legacy switches that don't recognize VLAN tags in packet headers. The tagging feature allows VLAN to span multiple 802.1Q-compliant switches through a single physical connection and allows Spanning Tree to be enabled on all ports and work normally.

Any port can be configured as either tagging or untagging. The untagging feature of IEEE 802.1Q VLAN allows VLAN to work with legacy switches that don't recognize VLAN tags in packet headers. The tagging feature allows VLAN to span multiple 802.1Q-compliant switches through a single physical connection and allows Spanning Tree to be enabled on all ports and work normally.

Some relevant terms:

   Tag - The act of putting 802.1Q VLAN information into the header of a packet.
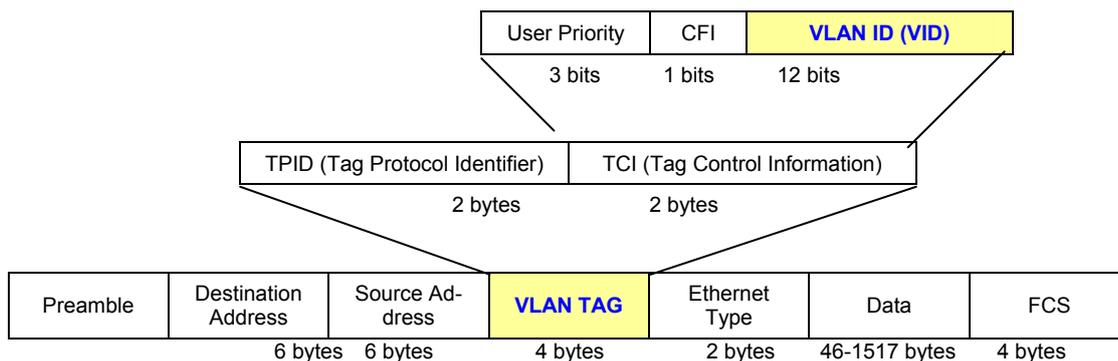
   Untag - The act of stripping 802.1Q VLAN information out of the packet header.

802.1Q VLAN Tags

The figure below shows the 802.1Q VLAN tag. There are four additional octets inserted after the source MAC address. Their presence is indicated by a value of 0x8100 in the Ether Type field. When a packet's Ether Type field is equal to 0x8100, the packet carries the IEEE 802.1Q/802.1p tag. The tag is contained in the following two octets and consists of 3 bits of user priority, 1 bit of Canonical Format Identifier (CFI - used for encapsulating Token Ring packets so they can be carried across Ethernet backbones), and 12 bits of VLAN ID (VID). The 3 bits of user priority are used by 802.1p. The VID is the VLAN identifier and is used by the 802.1Q standard. Because the VID is 12 bits long, 4094 unique VLAN can be identified.
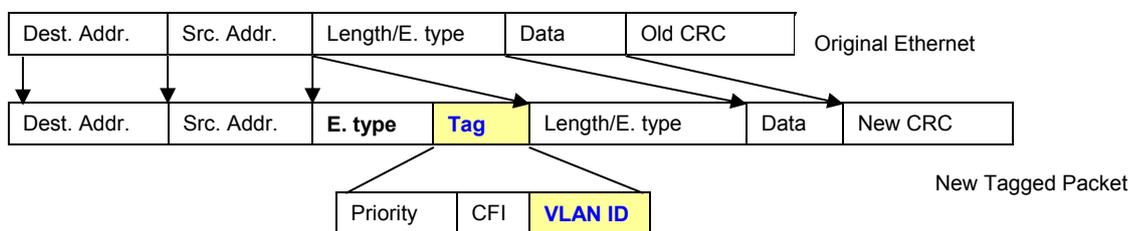
The tag is inserted into the packet header making the entire packet longer by 4 octets. All of the information originally contained in the packet is retained.

802.1Q Tag

User Priority	CFI	VLAN ID (VID)
3 bits	1 bits	12 bits

TPID (Tag Protocol Identifier)	TCI (Tag Control Information)
2 bytes	2 bytes

Preamble	Destination Address	Source Address	VLAN TAG	Ethernet Type	Data	FCS
	6 bytes	6 bytes	4 bytes	2 bytes	46-1517 bytes	4 bytes

The Ether Type and VLAN ID are inserted after the MAC source address, but before the original Ether Type/Length or Logical Link Control. Because the packet is now a bit longer than it was originally, the Cyclic Redundancy Check (CRC) must be recalculated.

Adding an IEEE802.1Q Tag

Dest. Addr.	Src. Addr.	Length/E. type	Data	Old CRC	Original Ethernet

Dest. Addr.	Src. Addr.	E. type	Tag	Length/E. type	Data	New CRC

New Tagged Packet

Priority	CFI	VLAN ID

Port VLAN ID

Packets that are tagged (are carrying the 802.1Q VID information) can be transmitted from one 802.1Q compliant network device to another with the VLAN information intact. This allows 802.1Q VLAN to span network devices (and indeed, the entire network – if all network devices are 802.1Q compliant).

Every physical port on a switch has a PVID. 802.1Q ports are also assigned a PVID, for use within the switch. If no VLAN are defined on the switch, all ports are then assigned to a default VLAN with a PVID equal to 1. Untagged packets are assigned the PVID of the port on which they were received. Forwarding decisions are based upon this PVID, in so far as VLAN are concerned. Tagged packets are forwarded according to the VID contained within the tag. Tagged packets are also assigned a PVID, but the PVID is not used to make packet forwarding decisions, the VID is.

Tag-aware switches must keep a table to relate PVID within the switch to VID on the network. The switch will compare the VID of a packet to be transmitted to the VID of the port that is to transmit the packet. If the two VID are different the switch will drop the packet. Because of the existence of the PVID for untagged packets and the VID for tagged packets, tag-aware and tag-unaware network devices can coexist on the same network.

A switch port can have only one PVID, but can have as many VID as the switch has memory in its VLAN table to store them.

Because some devices on a network may be tag-unaware, a decision must be made at each port on a tag-aware device before packets are transmitted – should the packet to be transmitted have a tag or not? If the transmitting port is connected to a tag-unaware device, the packet should be untagged. If the transmitting port is connected to a tag-aware device, the packet should be tagged.
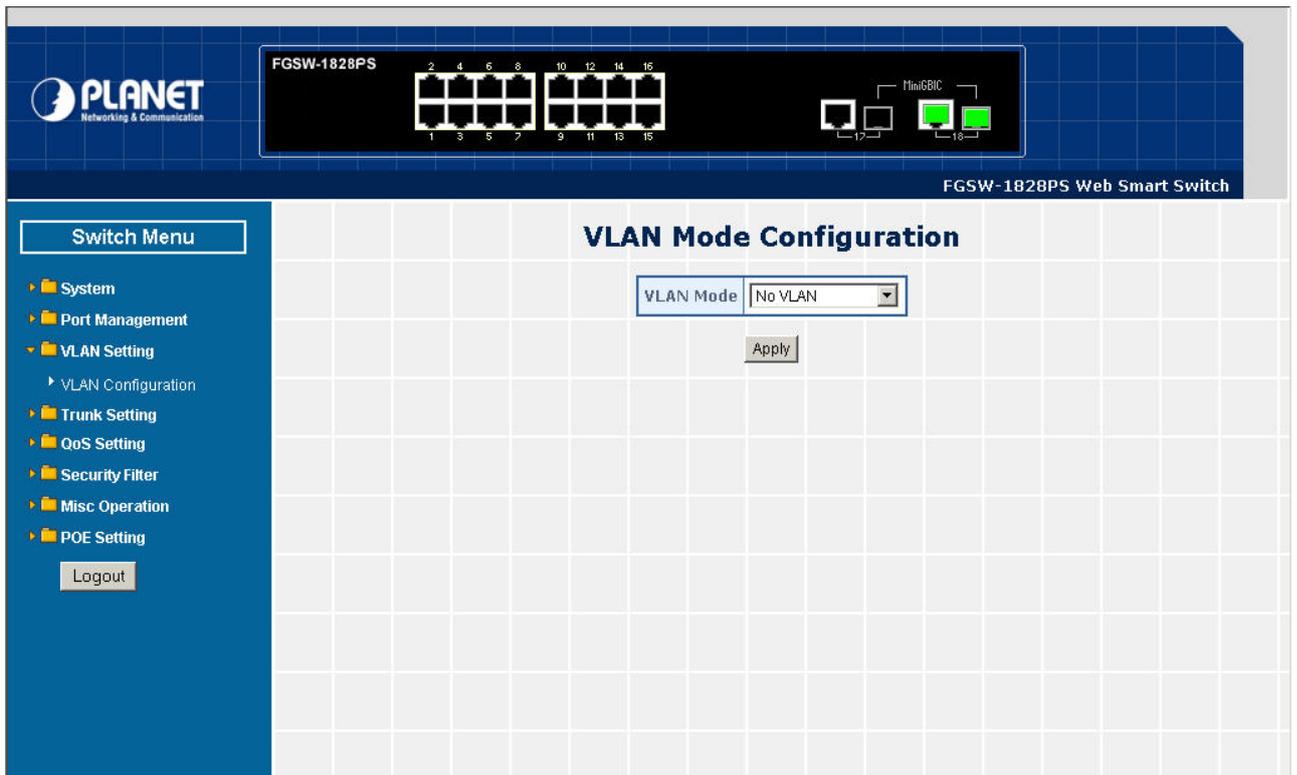
Default VLANs

The Switch initially configures one VLAN, VID = 1, called **"default."** The factory default setting assigns all ports on the Switch to the **"default"**. As new VLAN are configured in Port-based mode, their respective member ports are removed from the "default."

✎ *Notice:* Base on the Switch chipset specification, the Switch supports **SVL(Shared VLAN Learning)** , all VLAN groups share the same Layer 2 learned MAC address table.

This section provides VLAN Configuration from Web Smart PoE Switch, the screen in Figure 4-26 appears and table 4-10 describes the VLAN Setting object of Web Smart PoE Switch.

Figure 4-26 VLAN Setting Web Page Screen

Object	Description
VLAN Mode	Provide different VLAN operation mode, the available options are shown as below: **No VLAN** **802.1Q VLAN. Explained in section 4.4.1.** **Port Based VLAN. Explained in section 4.4.2.** **MTU. Explained in section 4.4.3.** Default mode is **No VLAN**.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-10 Descriptions of the VLAN Setting Screen Objects

4.4.1 802.1Q VLAN

This section introduces detail information of IEEE 802.1Q VLAN function of Web Smart PoE Switch; Choose **"802.1Q VLAN"** from VLAN from the VLAN Mode and press **"Apply"** button to enable the 802.1Q VLAN function. The screen in Figure 4-27 & 4-28 appears and table 4-11 description the 802.1Q VLAN objects of Web Smart PoE Switch.
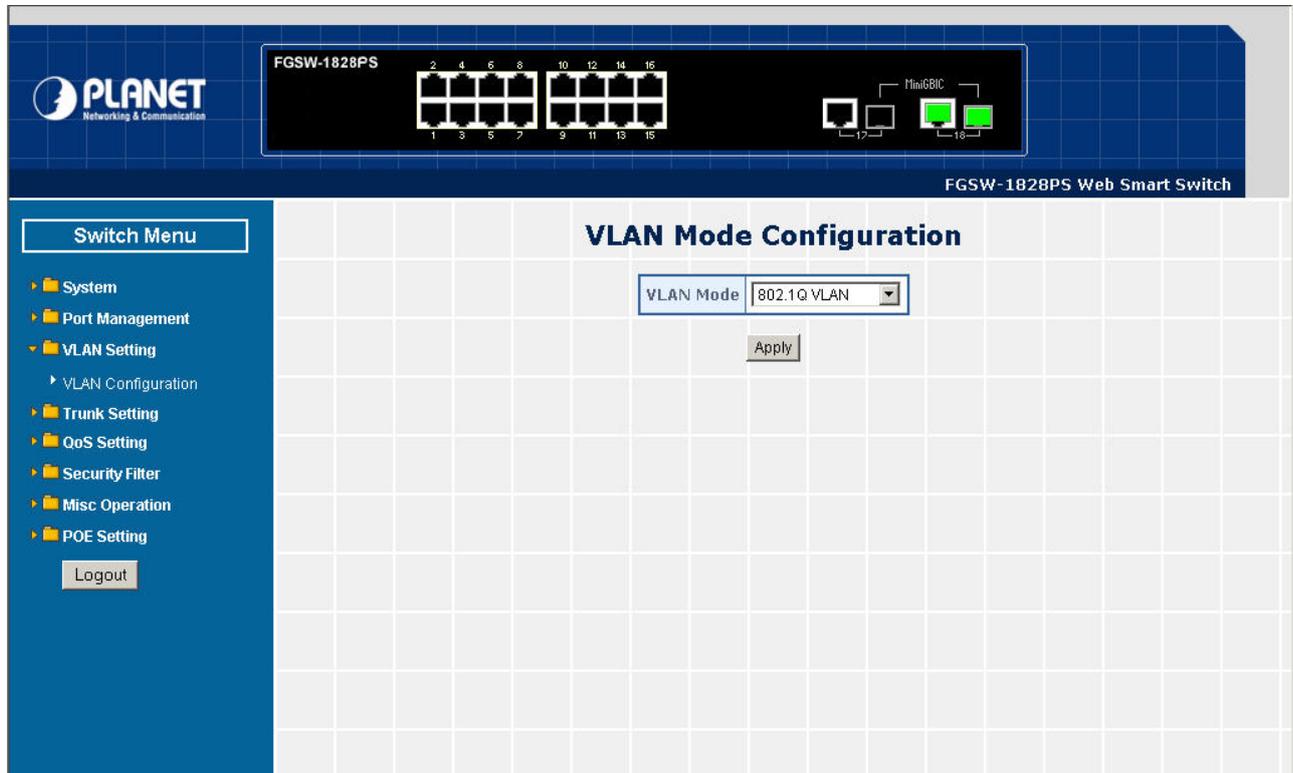

Figure 4-27 802.1Q VLAN Configuration Web Page Screen

Figure 4-28 802.1Q VLAN Configuration Web Page Screen

Object	Description
Group	Display the existence 802.1Q VLAN groups.
VID	Display different VLAN ID from multi-802.1Q VLAN groups.
VLAN Name	Assign and display different VLAN name from multi-802.1Q VLAN groups. Up to maximum **8** characters allow.
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Member	Allow to click specific port as member port from different 802.1Q VLAN groups.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.
Per Port Setting	Allow to define per port UnTag / Tag, Uplink and PVID. The screen in Figure 4-29 appears.
Delete Group	Press this button for delete existence 802.1Q VLAN groups.
Add New Group	Press this button for create a new 802.1Q VLAN groups. Up to maximum **32 802.1Q VLAN groups** support on Web Smart PoE Switch.

Table 4-11 Descriptions of the 802.1Q VLAN Setting Screen Objects
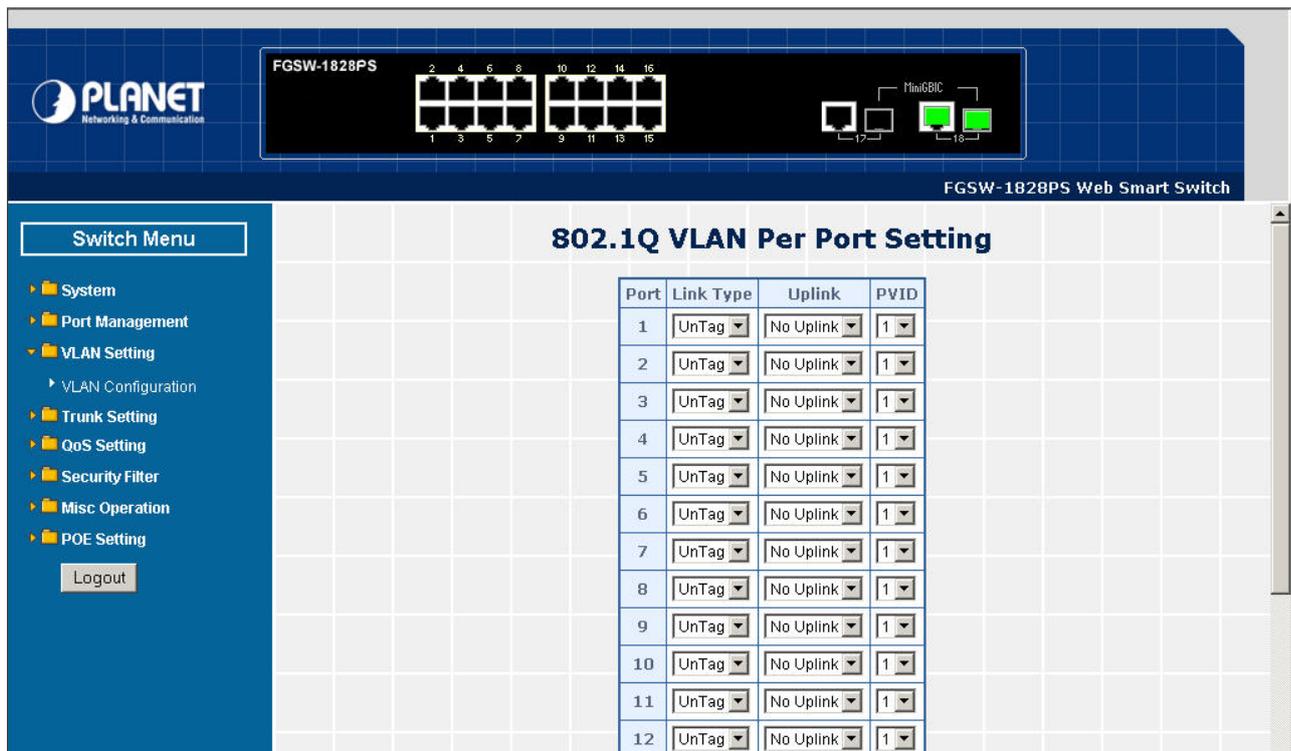
Figure 4-29 802.1Q VLAN per Port Setting Web Page Screen

This section introduces detail information of IEEE 802.1Q VLAN Per Port Setting of Web Smart PoE Switch; The table 4-12 description the 802.1Q VLAN Per Port Setting objects of Web Smart PoE Switch.

Object	Description
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Link Type	Define **UnTag** or **Tag** on each port of Web Smart PoE Switch. Default mode is **"UnTag"**.
Uplink	Define **No Uplink** or **Uplink** on each port of Web Smart PoE Switch. Default mode is **"No Uplink"**.
PVID	Assign PVID on each port of Web Smart PoE Switch. Default PVID is **"1"**.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.
VLAN Group Setting	Return to 802.1Q VLAN Group Setting screen.

Table 4-12 Descriptions of the 802.1Q VLAN per Port Setting Screen Objects

802.1Q VLAN Setting example:

Two separate 802.1Q VLAN scenario

1. Shows how the Web Smart PoE Switch. Handles Untagged and Tagged traffic from two 802.1Q VLAN groups.

2. Each VLAN isolate network traffic, only the same VLAN member port can receive traffic from each other.
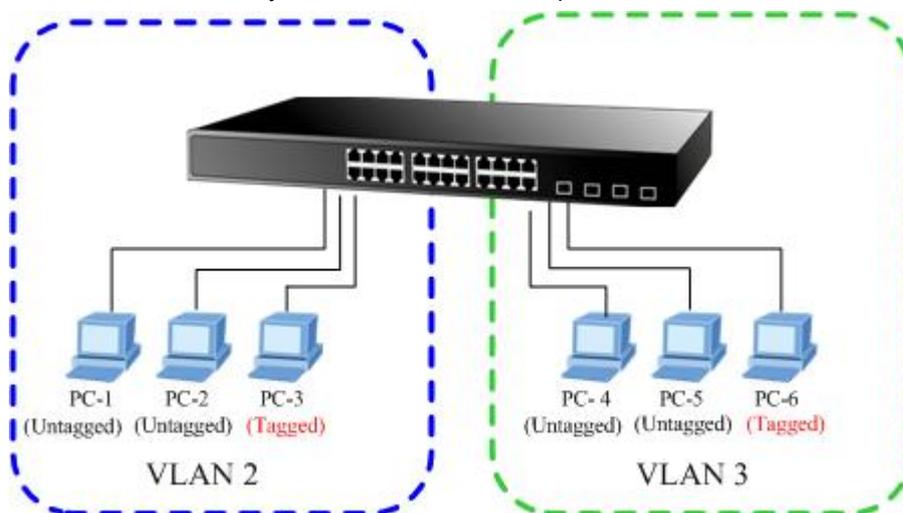

Figure 4-30 two separate 802.1Q VLAN diagram

VLAN Group	VID	Untagged Members	Tagged Members
VLAN Group 1	1	Port-7~Port-18	N/A
VLAN Group 2	2	Port-1,Port-2	Port-3
VLAN Group 3	3	Port-4,Port-5	Port-6

Table 4-13 VLAN and Port Configuration

The scenario described as follow:

■ **Untagged packet entering VLAN 2**

1. While **[PC-1]** transmit an **untagged** packet enters **Port-1**, the Web Smart PoE Switch. Will tag it with a **VLAN Tag=2**. **[PC-2]** and **[PC-3**] will received the packet through **Port-2** and **Port-3**.

2. [PC-4], [PC-5] and [PC-6] received no packet.

3. While the packet leaves **Port-2**, it will be stripped away it tag becoming an **untagged** packet.

4. While the packet leaves **Port-3**, it will keep as a **tagged** packet with **VLAN Tag=2**.

■ **Tagged packet entering VLAN 2**

5. While **[PC-3]** transmit a **tagged** packet with **VLAN Tag=2** enters **Port-3**, **[PC-1]** and **[PC-2]** will received the packet through **Port-1** and **Port-2**.

6. While the packet leaves **Port-1** and **Port-2**, it will be stripped away it tag becoming an **untagged** packet.

■ **Untagged packet entering VLAN 3**

7. While **[PC-4]** transmit an **untagged** packet enters **Port-4**, the switch will tag it with a **VLAN Tag=3**. **[PC-5]** and **[PC-6]** will received the packet through **Port-5** and **Port-6**.

8. While the packet leaves **Port-5**, it will be stripped away it tag becoming an **untagged** packet.

9. While the packet leaves **Port-6**, it will keep as a **tagged** packet with **VLAN Tag=3**.

✎ *Notice:* At this example, VLAN Group 1 just set as default VLAN, but only focus on VLAN 2, VLAN 3 traffic flow.

Setup steps

1. Create VLAN Group:

Set VLAN Group 1 = default-VLAN with VID (VLAN ID) =1.

Add two VLANs – VLAN 2 and VLAN 3, VLAN Group 2 with VID=*2*, VLAN Group 3 with VID=*3*.
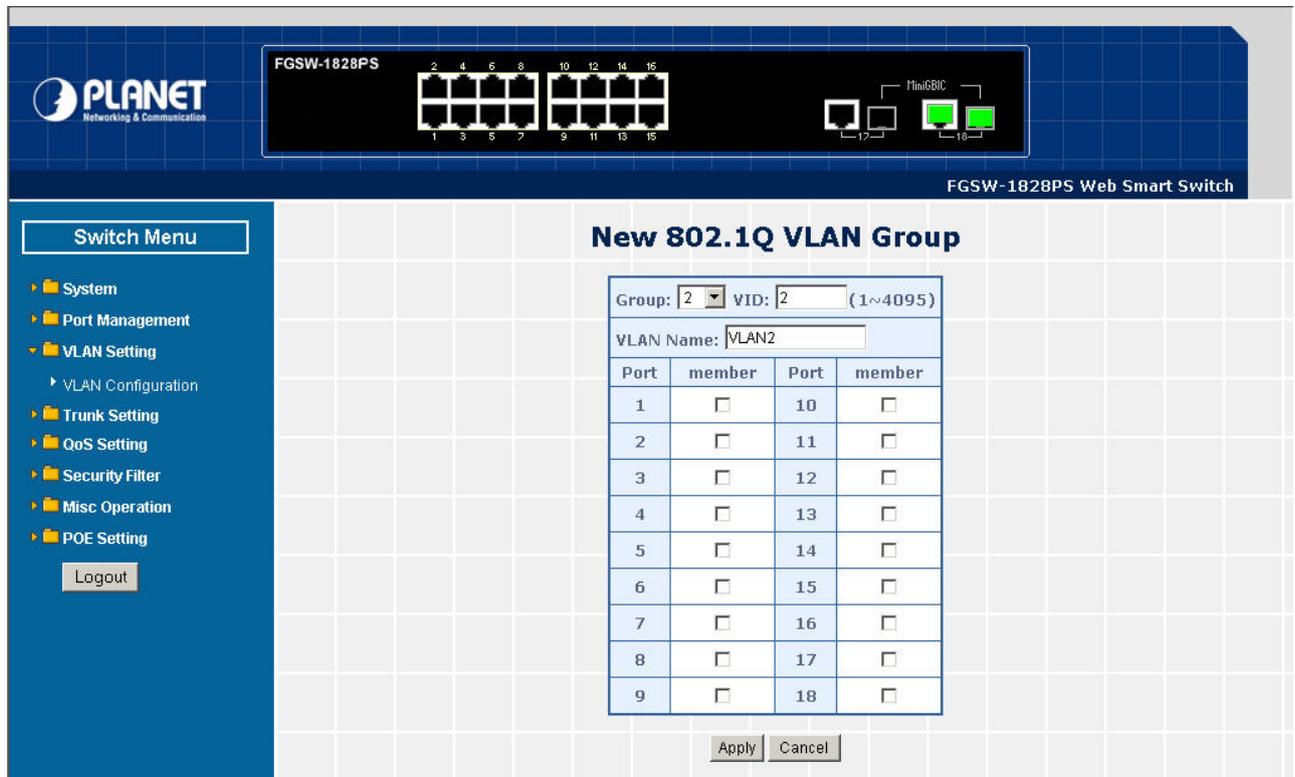

Figure 4-31 Add new VLAN Group Screen

2. Assign VLAN Member :

VLAN 2 : **Port-1,Port-2 and Port-3**. VLAN 3 : **Port-4, Port-5 and Port-6.** VLAN 1: All other ports – Port-7~Port-18.

New 802.1Q VLAN Group

Group: 2 VID: 2 (1~4095)

VLAN Name: VLAN2

Port	member	Port	member
1	☑	10	☐
2	☑	11	☐
3	☑	12	☐
4	☐	13	☐
5	☐	14	☐
6	☐	15	☐
7	☐	16	☐
8	☐	17	☐
9	☐	18	☐

Apply Cancel

New 802.1Q VLAN Group

Group: 3 VID: 3 (1~4095)

VLAN Name: VLAN3

Port	member	Port	member
1	☐	10	☐
2	☐	11	☐
3	☐	12	☐
4	☑	13	☐
5	☑	14	☐
6	☑	15	☐
7	☐	16	☐
8	☐	17	☐
9	☐	18	☐

Apply Cancel

Figure 4-32 Assign VLAN members for VLAN 2 and VLAN 3

Please remember to remove the Port 1 – Port 6 from VLAN 1 membership, since the Port 1 – Port 6 had been assigned to VLAN 2 and VLAN 3.

802.1Q VLAN Group

Group: 1 VID: 1 (1~4095)

VLAN Name: Default

Port	member	Port	member
1	☐	10	☑
2	☐	11	☑
3	☐	12	☑
4	☐	13	☑
5	☐	14	☑
6	☐	15	☑
7	☑	16	☑
8	☑	17	☑
9	☑	18	☑

Figure 4-33 Remove specify ports from VLAN 1 member

3. **Assign PVID for each port:**

   Port-1,Port-2 and Port-3 : PVID=*2.*

   Port-4,Port-5 and Port-6 : PVID=*3.*

   Port-7~Port-18: PVID=*1.*

4. **Enable VLAN Tag for specific ports**

   Link Type: Port-3 (VLAN-2) and Port-6 (VLAN-3).

The Per Port VLAN configuration in Figure 4-34 appears.

Figure 4-34 Port 1-Port 6 802.1Q VLAN Configuration

Two separate 802.1Q VLAN with overlapping area scenario

1. Based on the two separate VLAN group example above, VLAN 2 and VLAN 3 member port cannot see each other.

2. The member ports from VLAN 2 and VLAN 3 need to access one public server.
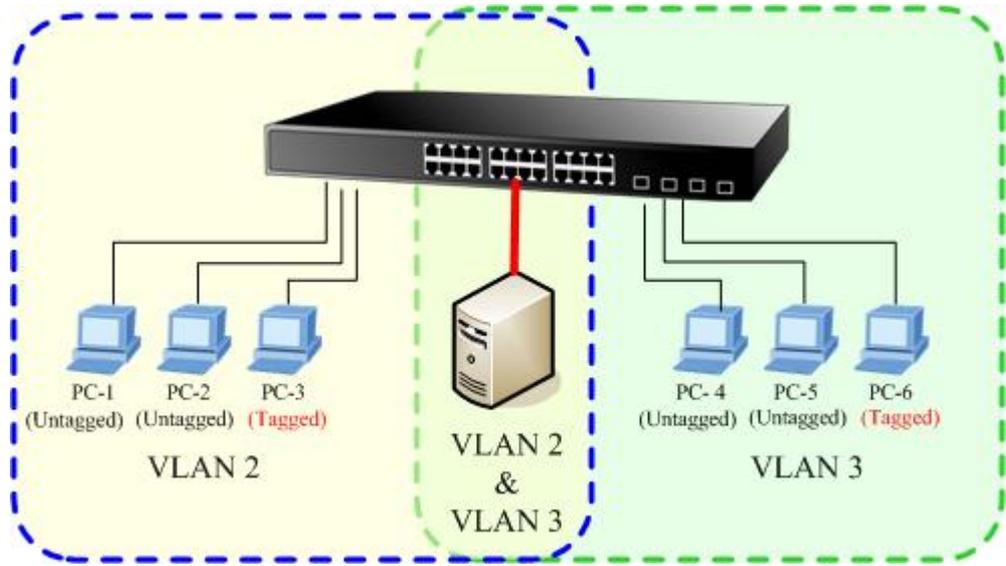
Figure 4-35 A Server connect to the VLAN overlapping area

1. Specify **Port-7** on the Web Smart PoE Switch that connects to the server.

2. Assign **Port-7** to both **VLAN 2** and **VLAN 3** at the VLAN Member configuration page. The screen in Figure 4-36 appears.

Figure 4-36 VLAN overlap port setting

3. Define a **VLAN 1** as a **"Public Area"** that overlapping with both **VLAN 2 members** and **VLAN 3 members**.

Figure 4-37 VLAN 1 – The public area member assign

4. Setup **Port-7** with "**PVID=1**" at VLAN per Port Configuration page. The screen in Figure 4-38 appears.

802.1Q VLAN Per Port Setting

Port	Link Type	Uplink	PVID
1	UnTag ▼	No Uplink ▼	2 ▼
2	UnTag ▼	No Uplink ▼	2 ▼
3	UnTag ▼	No Uplink ▼	2 ▼
4	UnTag ▼	No Uplink ▼	3 ▼
5	UnTag ▼	No Uplink ▼	3 ▼
6	UnTag ▼	No Uplink ▼	3 ▼
7	UnTag ▼	No Uplink ▼	1 ▼
8	UnTag ▼	No Uplink ▼	1 ▼
9	UnTag ▼	No Uplink ▼	1 ▼
10	UnTag ▼	No Uplink ▼	1 ▼
11	UnTag ▼	No Uplink ▼	1 ▼
12	UnTag ▼	No Uplink ▼	1 ▼

Figure 4-38 Setup Port-7 with PVID-1

Although the VLAN 2 members: Port-1 to Port-3 and VLAN 3 members: Port-4 to Port-6 also belongs to VLAN 1. But with different PVID settings, packets form VLAN 2 or VLAN 3 is not able to access to the other VLAN.

4.4.2 Port Based VLAN

This section introduces detail information of Port Based VLAN function of Web Smart PoE Switch; Choose **"Port Based VLAN"** from VLAN from the VLAN Mode and press **"Apply"** button to enable the port based VLAN function. The screen in Figure 4-39 & 4-40 appears and table 4-14 description the Port Based VLAN objects of Web Smart PoE Switch.
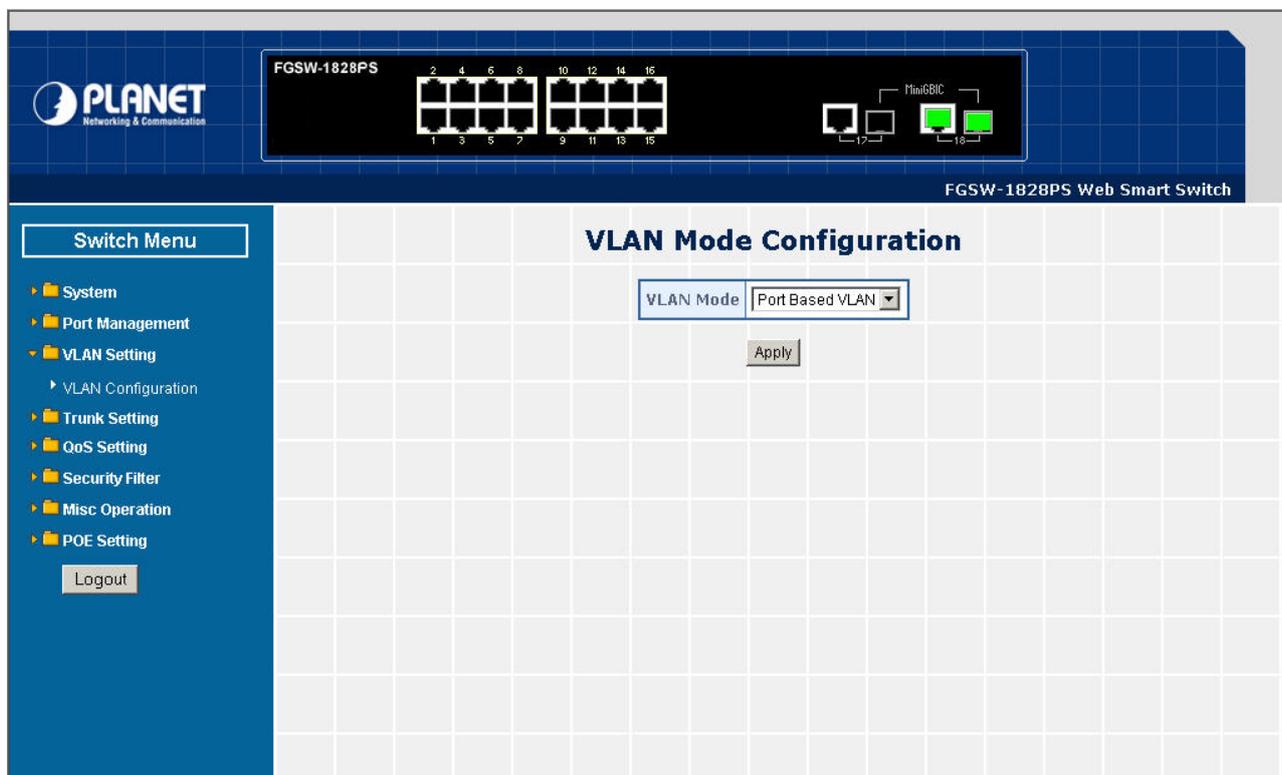
Figure 4-39 Port Based VLAN Configuration Web Page Screen
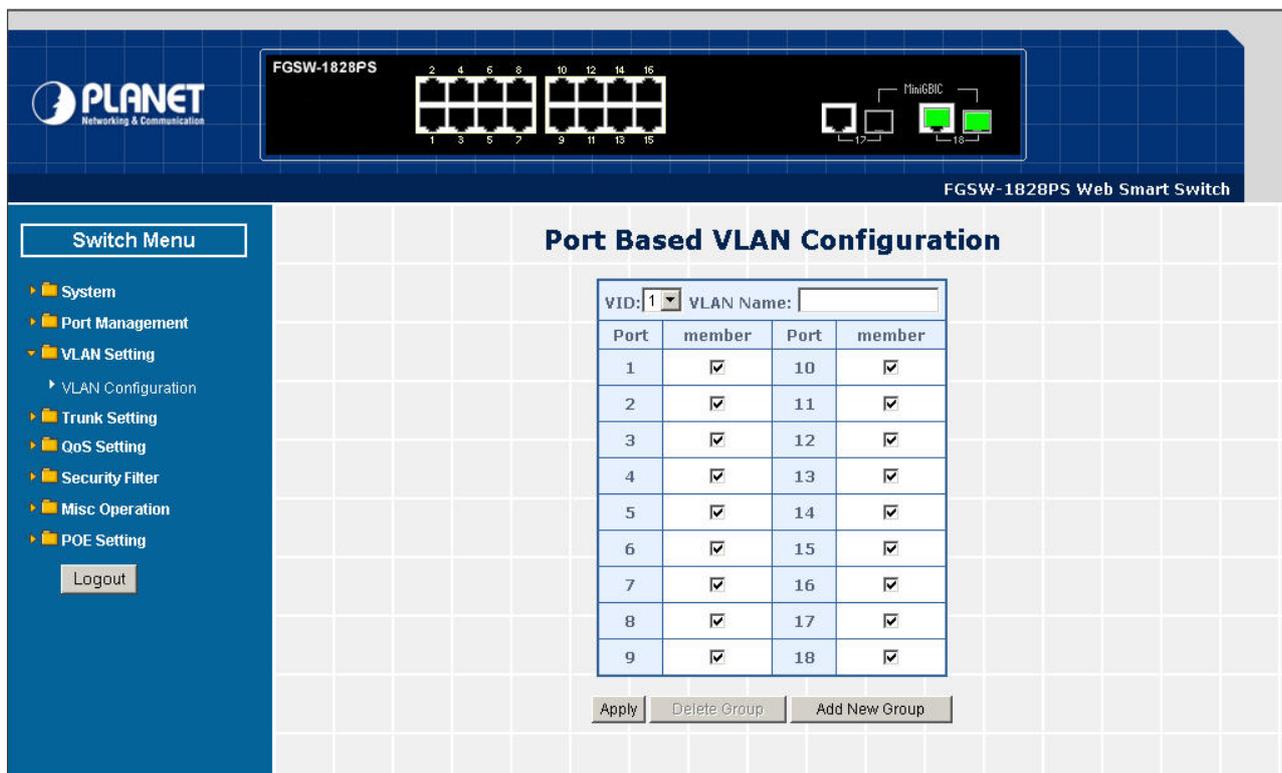
Figure 4-40 Port Based VLAN Configuration Web Page Screen

Object	Description
VID	Display different VLAN ID from multi-port based VLAN groups.
VLAN Name	Assign and display different VLAN name from multi-port based VLAN groups. Up to maximum **8** characters allow.
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Member	Allow to click specific port as member port from different port based VLAN groups.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.
Delete Group	Press this button for delete existence port based VLAN groups.
Add New Group	Press this button for create a new port based VLAN groups.

Table 4-14 Descriptions of the Port Based VLAN Configuration Screen Objects

Port Based VLAN Setting example:

VLAN scenario

1. Port 18 is the file server port for all the workstations

2. Port 1 to port 17 is different devices that do not need to see each other

Setup steps

1. Port Setting

 1.1 Assign VLAN 1 for the first VLAN group with port 1 and port 18.

 1.2 Assign VLAN 2 for the second VLAN group with port 2 and port 18

 1.3 Repeat the same steps for port 3 to port 18. i.e. 3 & 18, 4 & 18….., 17 & 18

After the above steps port 1 to port 17 is being separated physically due to it belongs to different VLAN groups (different VLAN). However, they all can access port 18 due to port 18 is using overlapping feature to communicate with port 1 to port 17.

4.4.3 MTU VLAN

This section introduces detail information of MTU VLAN function of Web Smart PoE Switch; Choose **"MTU"** from VLAN from the VLAN Mode and press **"Apply"** button to enable the MTU VLAN function. The screen in Figure 4-41 appears and table 4-15 description the MTU VLAN objects of Web Smart PoE Switch.
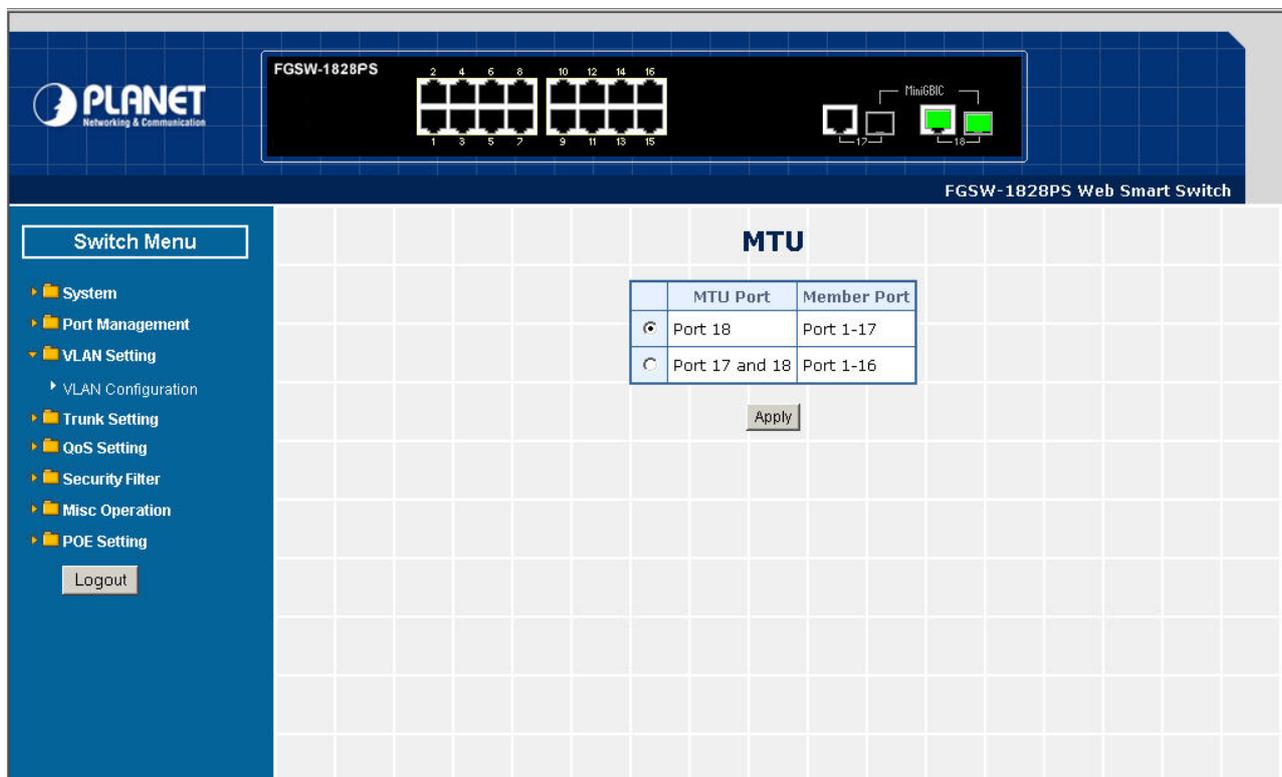
Figure 4-41 MTU VLAN Configuration Web Page Screen

Object	Description
MTU Port	Indicate the MTU Port of Web Smart PoE Switch.
Member Port	Indicate the Member Port of Web Smart PoE Switch.
Apply button	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-15 Descriptions of the MTU VLAN Setting Screen Objects

4-5 Trunk Setting

Port link aggregations can be used to increase the bandwidth of a network connection or to ensure fault recovery. Link aggregation lets you group up to 4 consecutive ports into a single dedicated connection between any two the Switch or other Layer 2 switches. However, before making any physical connections between devices, use the Link aggregation Configuration menu to specify the link aggregation on the devices at both ends. When using a port link aggregation, note that:

- ◦ The ports used in a link aggregation must all be of the same media type (RJ-45, 100 Mbps fiber).
- ◦ The ports that can be assigned to the same link aggregation have certain other restrictions (see below).
- ◦ Ports can only be assigned to one link aggregation.
- ◦ The ports at both ends of a connection must be configured as link aggregation ports.
- ◦ None of the ports in a link aggregation can be configured as a mirror source port or a mirror target port.
- ◦ Enable the link aggregation prior to connecting any cable between the switches to avoid creating a data loop.
- ◦ Disconnect all link aggregation port cables or disable the link aggregation ports before removing a port link aggregation to avoid creating a data loop.

It allows a maximum of 4 ports to be aggregated at the same time and up to 2 groups. If the group is defined as a local static link aggregation group, then the number of ports must be the same as the group member ports.

Link Aggregation
4-Port Trunk, Bandwidth up to 800Mbps
(Full-Duplex Mode)
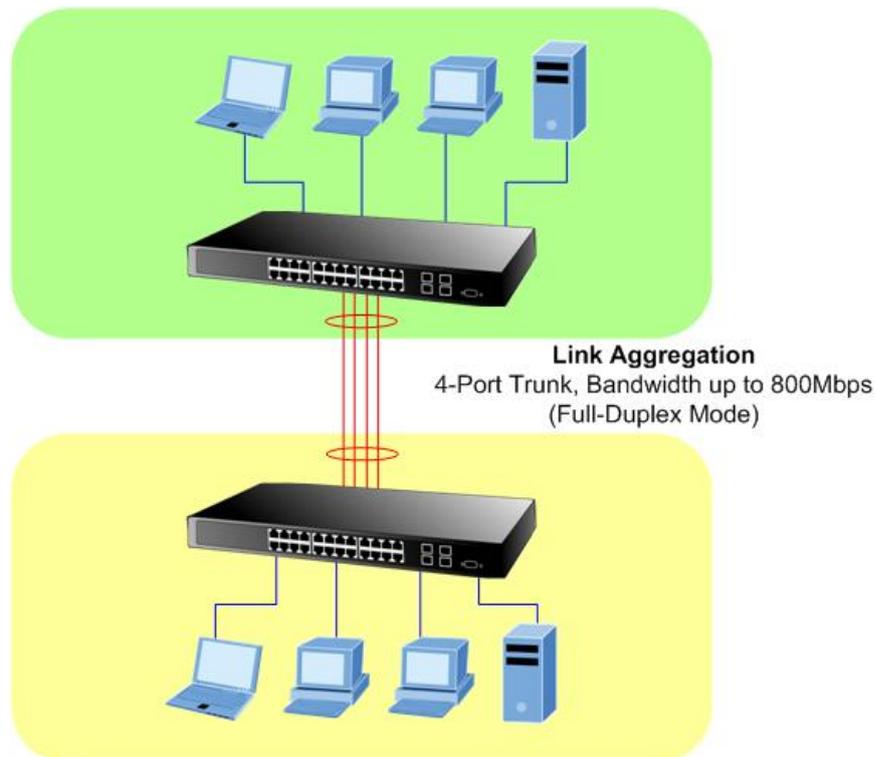
This function allows to configuring the trunk function. It provides up to two trunk groups and each trunk group provides 4 member ports. Also provide four various Trunk Hash Algorithm policies for selection. The screen in Figure 4-42 appears and table 4-16 description the Trunk Setting objects of Web Smart PoE Switch.
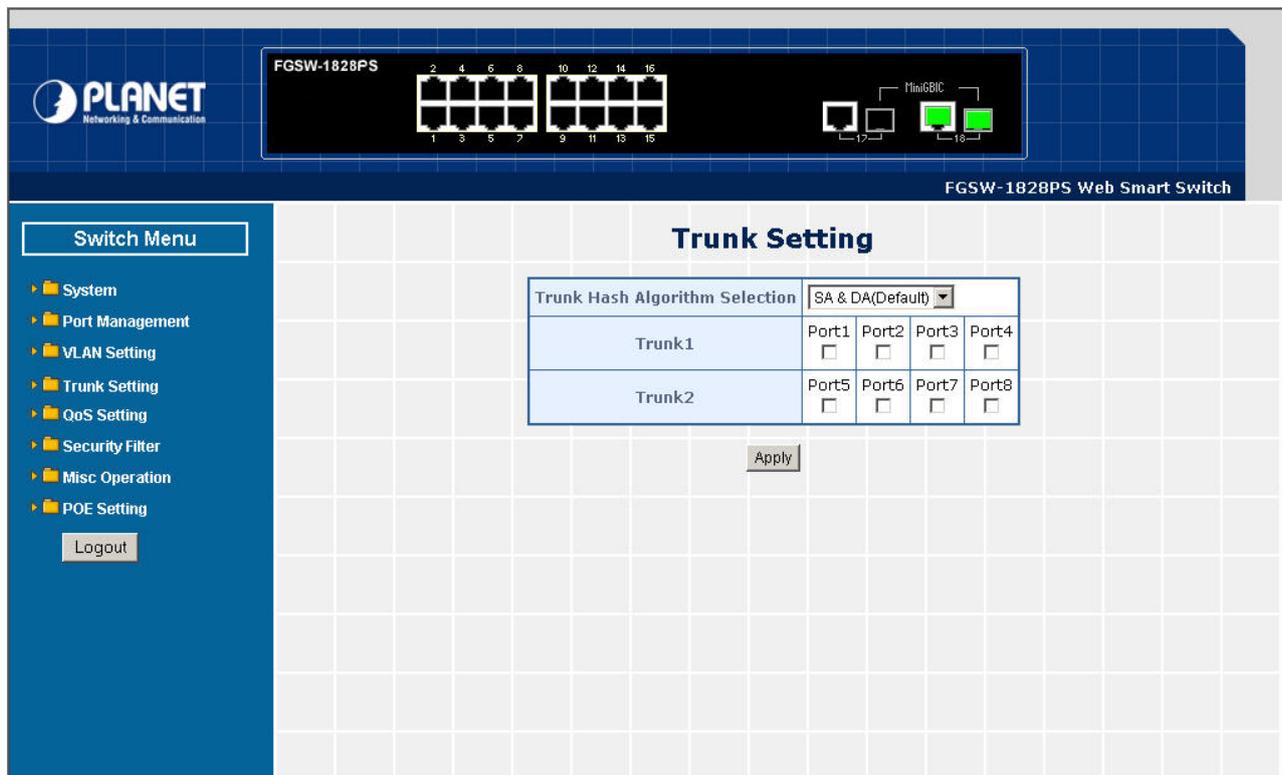
Figure 4-42 Trunk Setting Web Page Screen

Object	Description
Trunk Hash Algorithm selection	Provide four various Trunk Hash Algorithm polices, the available options are shown as below: **SA & DA(Default)** **Port ID** **SA** **DA** Default mode is **SA & DA**.
Trunk1	Indicate the Trunk Member Port 1,2,3,4 of Web Smart PoE Switch.
Trunk2	Indicate the Trunk Member Port 5,6,7,8 of Web Smart PoE Switch.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

**Table 4-16** Descriptions of the Trunk Setting Screen Objects

4-6 QoS Setting

Quality of Service (QoS) is an advanced traffic prioritization feature that allows you to establish control over network traffic. QoS enables you to assign various grades of network service to different types of traffic, such as multi-media, video, protocol-specific, time critical, and file-backup traffic.

QoS reduces bandwidth limitations, delay, loss, and jitter. It also provides increased reliability for delivery of your data and allows you to prioritize certain applications across your network. You can define exactly how you want the switch to treat selected applications and types of traffic.

You can use QoS on your system to:

◦ Control a wide variety of network traffic by:

◦ Classifying traffic based on packet attributes.

◦ Assigning priorities to traffic (for example, to set higher priorities to time-critical or business-critical applications).

◦ Applying security policy through traffic filtering.

◦ Provide predictable throughput for multimedia applications such as video conferencing or voice over IP by minimizing delay and jitter.

◦ Improve performance for specific types of traffic and preserve performance as the amount of traffic grows.

◦ Reduce the need to constantly add bandwidth to the network.

◦ Manage network congestion.

This function provides QoS Setting of Web Smart PoE Switch; the screen in Figure 4-43 appears and table 4-17 descriptions the QoS Setting of Web Smart PoE Switch.
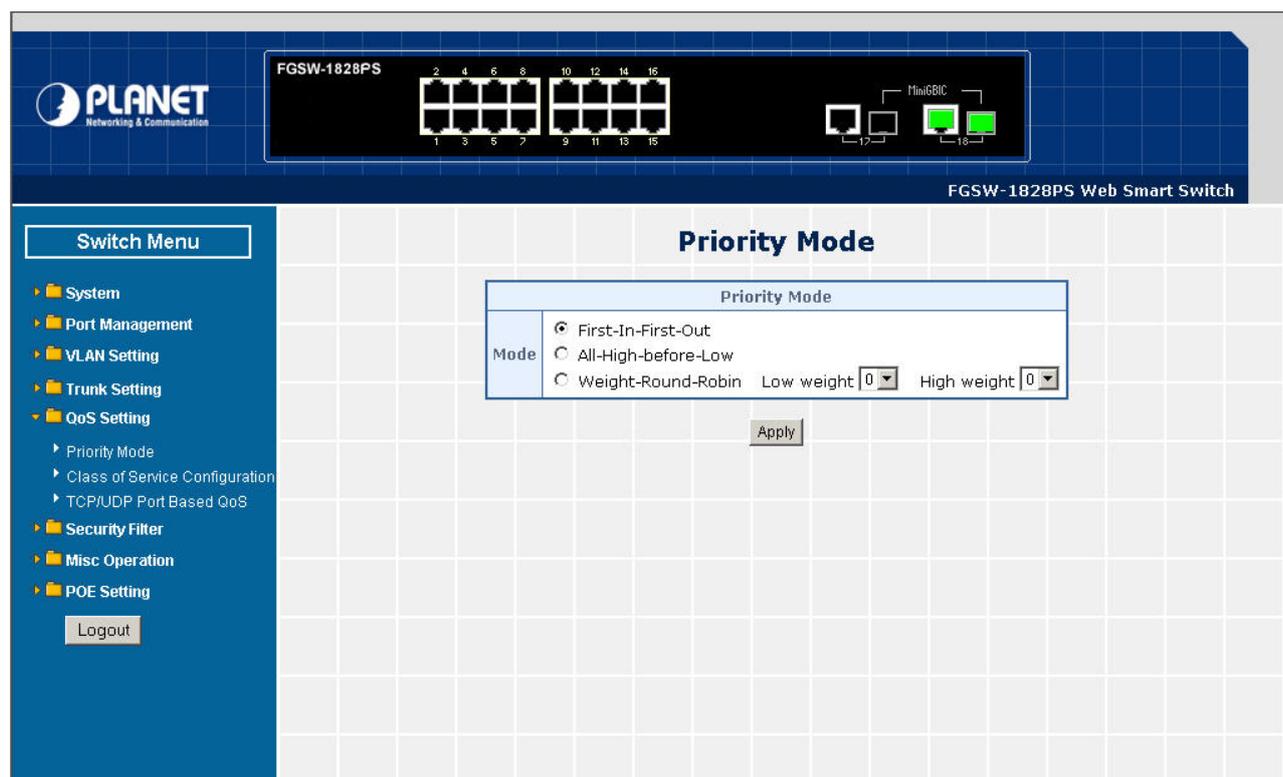
Figure 4-43 QoS Setting Web Page Screen

Object	Description
Priority Mode	Provide three different Priority polices on Web Smart PoE Switch. **Explained in section 4.6.1.**
Class of Service Configuration	Provide three different polices on each port of Web Smart PoE Switch. **Explained in section 4.6.2.**
TCP/UDP Port Based QoS	Allow to define various QoS mode on TCP / UDP port. **Explained in section 4.6.3.**

Table 4-17 Descriptions of the QoS Setting Screen Objects

4.6.1 Priority Mode

This section introduces detail information of Priority Mode of Web Smart PoE Switch; the screen in Figure 4-44 appears and table 4-18 descriptions the Priority Mode of Web Smart PoE Switch.
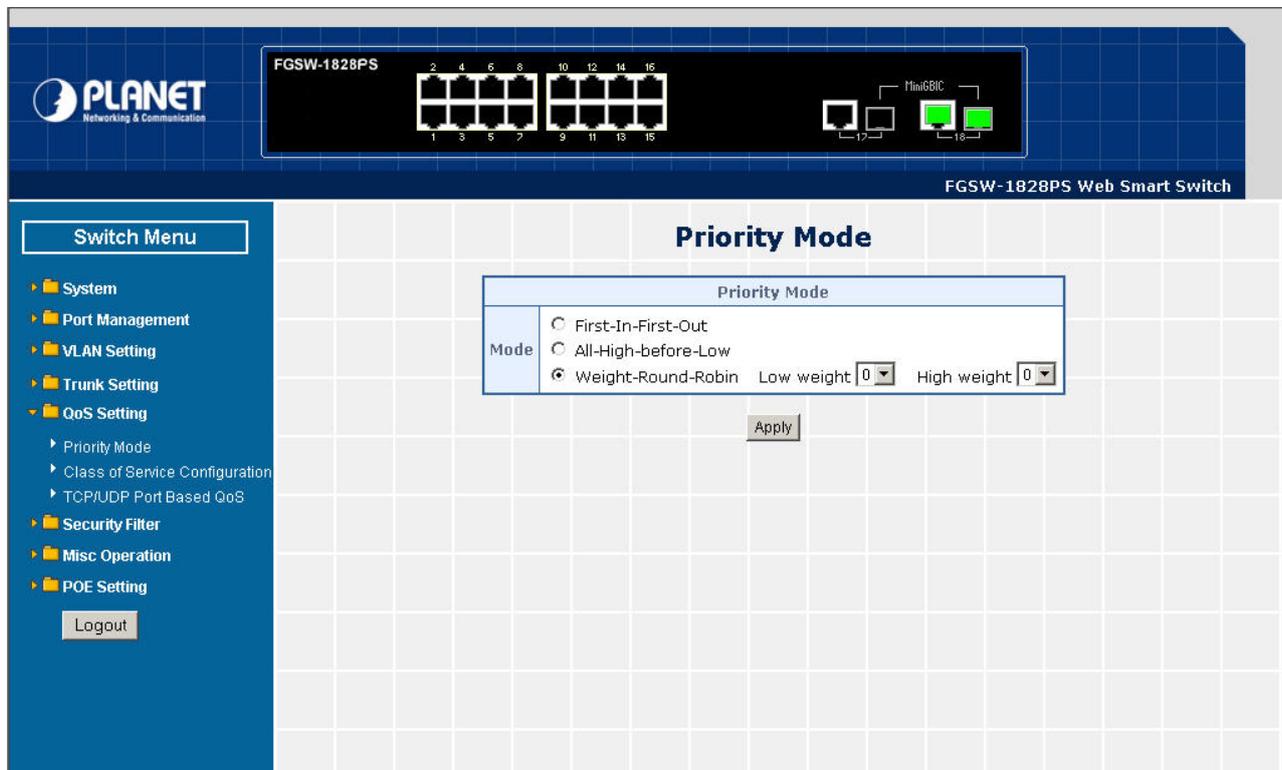
Figure 4-44 Priority Mode Web Page Screen

Object	Description
Priority Mode	Provide three different Priority polices on Web Smart PoE Switch, the available options are shown as below: **Fist-In-First-Out** **All-High-Before-Low** **Weight-Round-Robin= Low weight (0-7 range) : High weight (0-7 range)** Default mode is **First-In-First-Out**.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

**Table 4-18** Descriptions of the Priority Mode Screen Objects

4.6.2 Class of Service Configuration

This section introduces detail information of Class of Service Configuration of Web Smart PoE Switch; the screen in Figure 4-45 appears and table 4-19 descriptions the Class of Service Configuration of Web Smart PoE Switch.
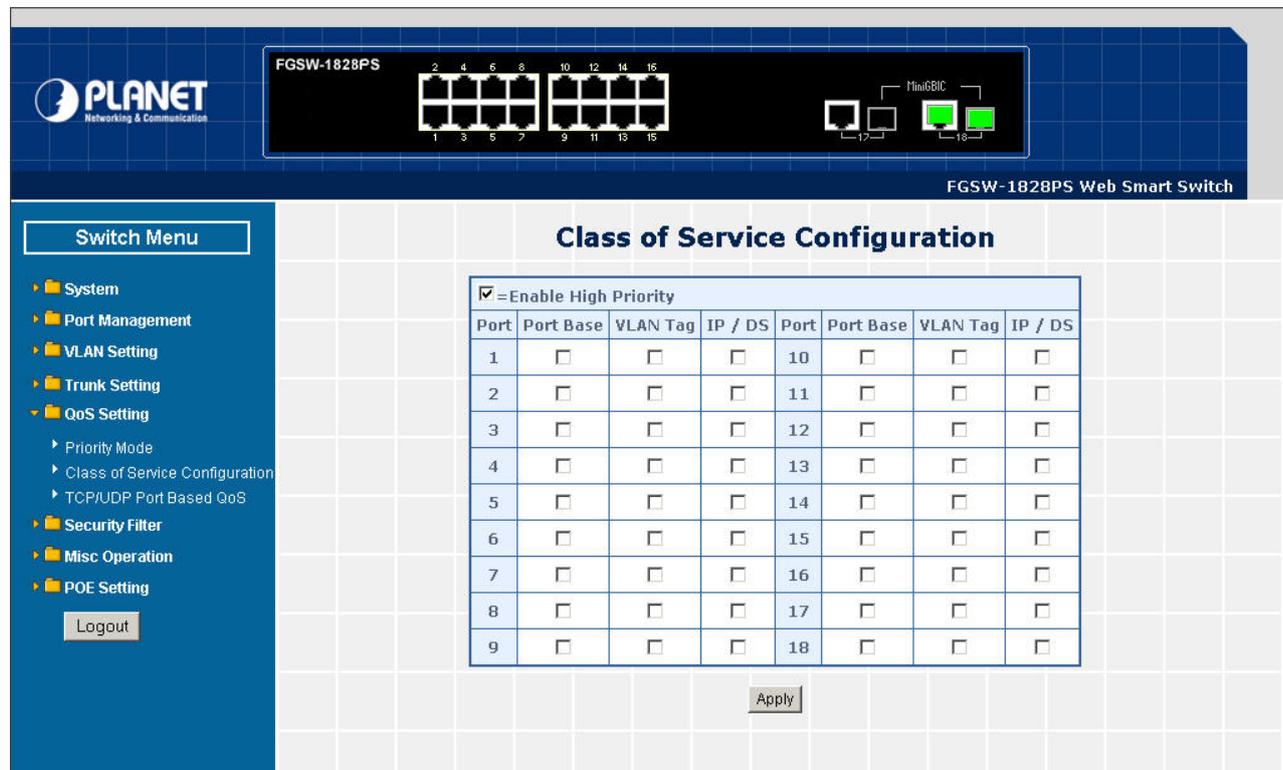
Figure 4-45 Class of Service Configuration Web Page Screen

Object	Description
Enable High Priority	Allow to disable or enable the High Priority function. Default mode is **Enable**.
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Port Base	Define per port Class of Service policy based on Port Base policy.
VLAN Tag	Define per port Class of Service policy based on VLAN Tag priority policy.
IP /DS	Define per port Class of Service policy based on IP / DS policy.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-19 Descriptions of the Class of Service Configuration Screen Objects

4.6.3 TCP / UDP Port Based QoS

This section introduces detail information of TCP / UDP Port Based QoS Configuration of Web Smart PoE Switch; the screen in Figure 4-46 & 4-47 appears and table 4-20 descriptions the TCP / UDP Port Based QoS Configuration of Web Smart PoE Switch.
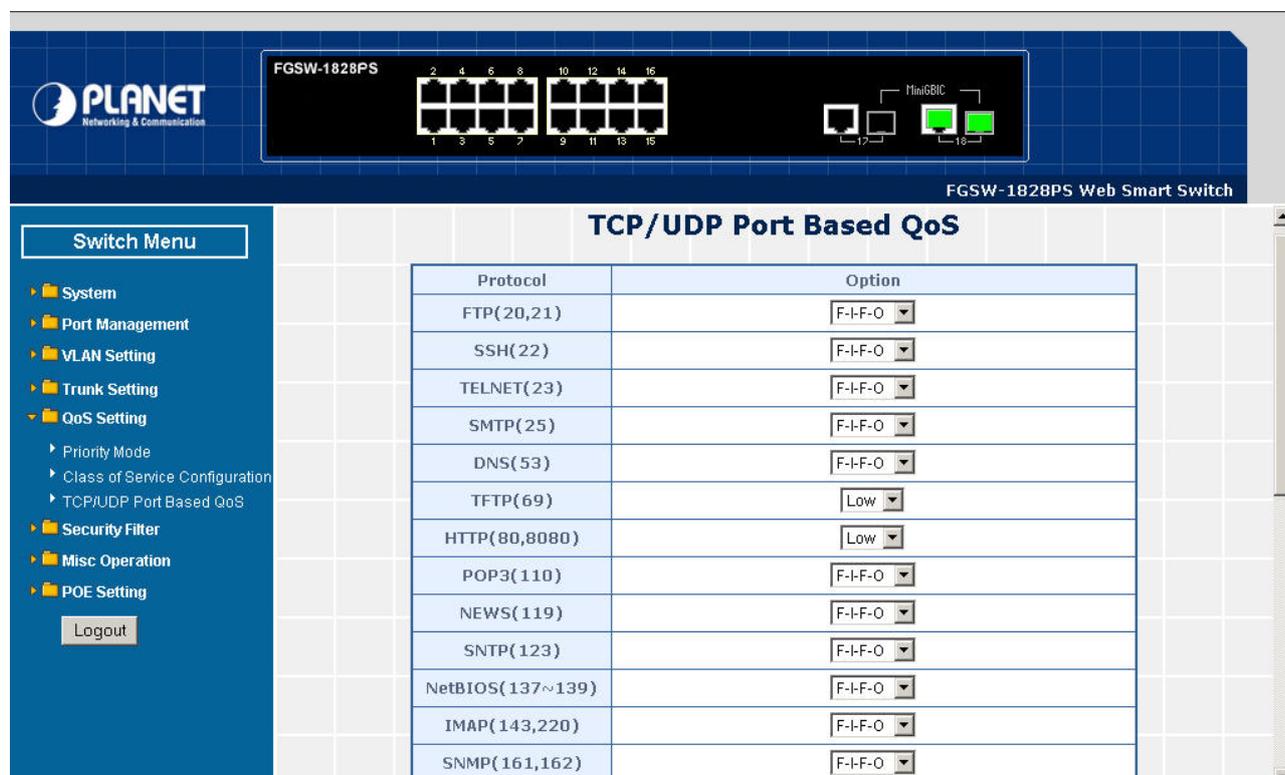
Figure 4-46 TCP / UDP Port Based QoS Configuration Web Page Screen
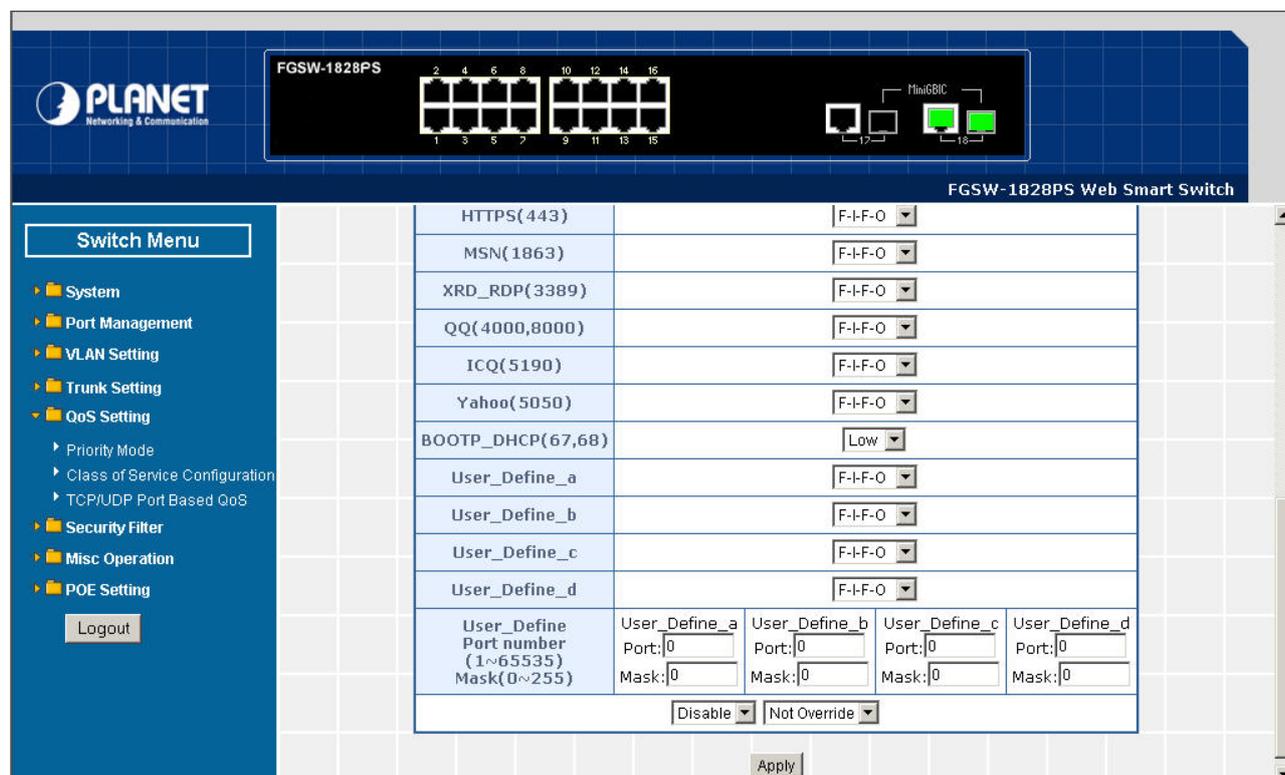
Figure 4-47 TCP / UDP Port Based QoS Configuration Web Page Screen

Object	Description
Protocol	Display different Protocol for define the QoS policy in option
FTP(20,21)	Provide **F-I-F-O, Discard, Low, High** options.
SSH(22)	Provide **F-I-F-O, Discard, Low, High** options.
TELNET(23)	Provide **F-I-F-O, Discard, Low, High** options.
SMTP(25)	Provide **F-I-F-O, Discard, Low, High** options.
DNS(53)	Provide **F-I-F-O, Discard, Low, High** options.
TFTP(69)	Provide **Low, High** options.
HTTP(80,8080)	Provide **Low, High** options.
POP3(110)	Provide **F-I-F-O, Discard, Low, High** options.
NEWS(119)	Provide **F-I-F-O, Discard, Low, High** options.
SNTP(123)	Provide **F-I-F-O, Discard, Low, High** options.
NetBIOS(137~139)	Provide **F-I-F-O, Discard, Low, High** options.
IMAP(143,220)	Provide **F-I-F-O, Discard, Low, High** options.
SNMP(161,162)	Provide **F-I-F-O, Discard, Low, High** options.
HTTPS(443)	Provide **F-I-F-O, Discard, Low, High** options.
MSN(1863)	Provide **F-I-F-O, Discard, Low, High** options.
XRD_RDP(3389)	Provide **F-I-F-O, Discard, Low, High** options.
QQ(4000,8000)	Provide **F-I-F-O, Discard, Low, High** options.
ICQ(5190)	Provide **F-I-F-O, Discard, Low, High** options.
Yahoo(5050)	Provide **F-I-F-O, Discard, Low, High** options.
BOOTP_DHCP(67,68)	Provide **Low, High** options.
User_Define_a	Provide **F-I-F-O, Discard, Low, High** options.
User_Define_b	Provide **F-I-F-O, Discard, Low, High** options.
User_Define_c	Provide **F-I-F-O, Discard, Low, High** options.
User_Define_d	Provide **F-I-F-O, Discard, Low, High** options.
User_Define Port number (1~65535) Mask(0~255)	Allow to define 4 protocol port numbers, such as Port and Mask. The available options are shown as below: **User_Define_a** **User_Define_b** **User_Define_c** **User_Define_d**
Disable	Allow to choose **"Disable"** or **"Enable"** options. Default mode is **Disable.**
Not Override	Allow to choose **"Override"** or **"Not Override"** options. Default mode is **Not Override .**
Apply	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-20 Descriptions of the TCP / UDP Port Based QoS Configuration Screen Objects

4-7 Security Filter

This function provides Security Filter of Web Smart PoE Switch; the screen in Figure 4-48 appears and table 4-21 descriptions the Security Filter of Web Smart PoE Switch.
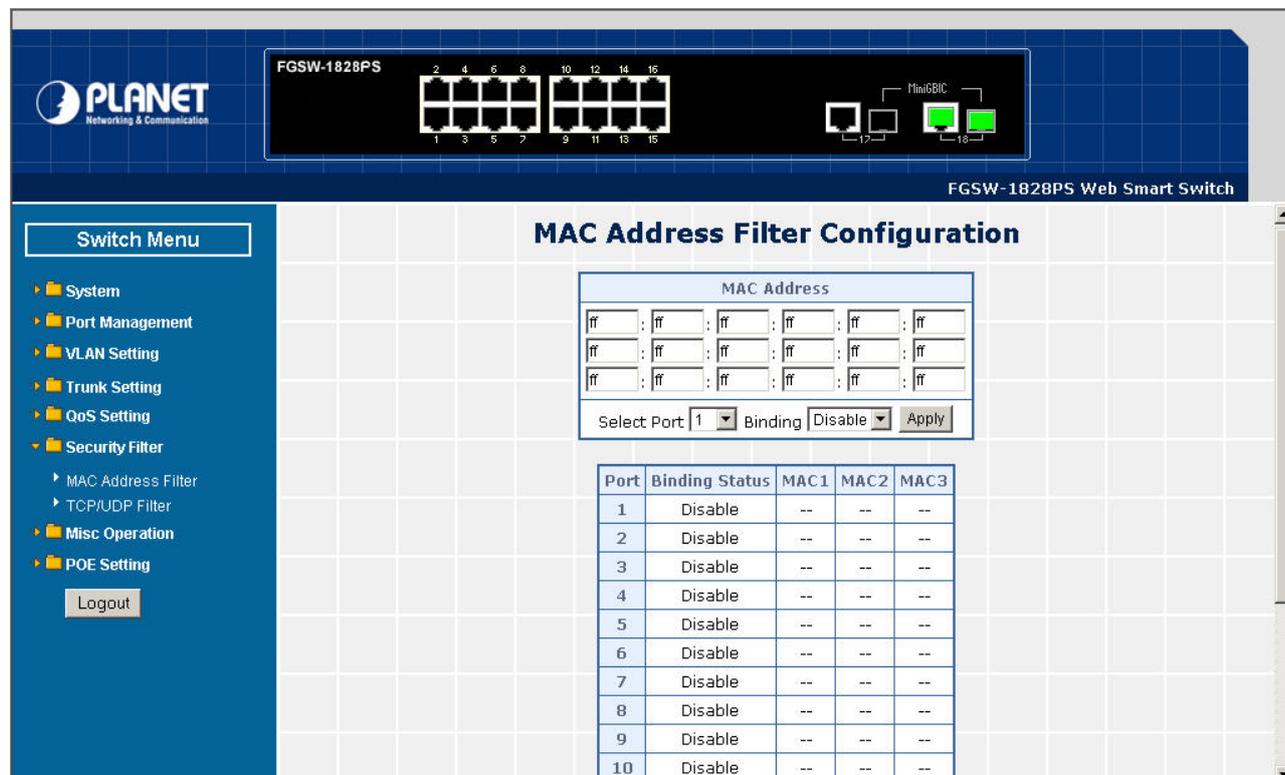
**Figure 4-48** Security Filter Web Page Screen

Object	Description
MAC Address Filter	Allow define three MAC Address on per port of Web Smart PoE Switch. **Explained in section 4.7.1**.
TCP/UDP Filter	Allow define the filter policy of TCP / UDP flow on Web Smart PoE Switch. **Explained in section 4.7.2**.

Table 4-21 Descriptions of the Security Filter Web Page Screen Objects

4.7.1 MAC Address Filter

This section introduces detail information of MAC Address Filter of Web Smart PoE Switch; the screen in Figure 4-49 appears and table 4-22 & 4-23 descriptions the MAC Address Filter of Web Smart PoE Switch.
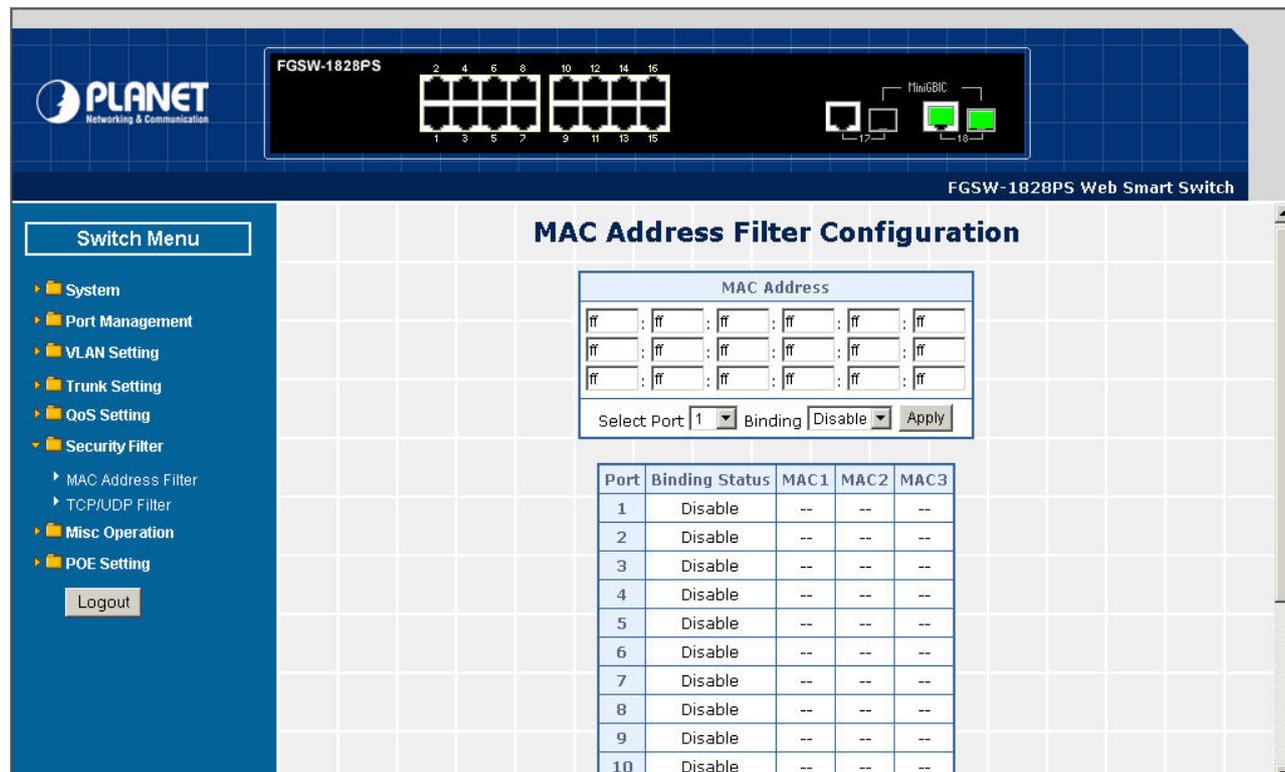
Figure 4-49 MAC Address Filter Web Page Screen

Object	Description
MAC Address	Allow to input three MAC Address on per port of Web Smart PoE Switch.
Select Port	Allow to select port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Binding	Allow to Disable or Enable the binding function on each port of Web Smart PoE Switch.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-22 Descriptions of the MAC Address Filter Screen Objects

Object	Description
Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).
Binding Status	Display Binding Status from each port of Web Smart PoE Switch.
MAC 1	Display first assigns MAC Address on each port of Web Smart PoE Switch.
MAC 2	Display second assigns MAC Address on each port of Web Smart PoE Switch.
MAC 3	Display third assigns MAC Address on each port of Web Smart PoE Switch.

Table 4-23 Descriptions of the MAC Address Filter Screen Objects

4.7.2 TCP / UDP Filter

This section introduces detail information of TCP / UDP Filter of Web Smart PoE Switch; the screen in Figure 4-50 appears and table 4-24 descriptions the TCP / UDP Filter Configuration of Web Smart PoE Switch.

Figure 4-50 TCP / UDP Filter Web Page Screen

Object	Description
Function Enable	Allow to **Disable** or **Enable** the TCP / UDP Filter function. Default mode is **Disable**.
Port Filtering Rule	Allow to **Forward** or **Block** the Port Filtering Rule. Default mode is **Block**.
Protocol	Display different Protocol for define the TCP / UDP Filter policy.
FTP(20,21)	
SSH(22)	
TELNET(23)	
SMTP(25)	
DNS(53)	
TFTP(69)	
HTTP(80,8080)	
POP3(110)	
NEWS(119)	
SNTP(123)	
NetBIOS(137~139)	Allow to choose list protocol for filtering
IMAP(143,220)	
SNMP(161,162)	
HTTPS(443)	
MSN(1863)	
XRD_RDP(3389)	
QQ(4000,8000)	
ICQ(5190)	
Yahoo(5050)	
BOOTP_DHCP(67,68)	
User_Define_a	
User_Define_b	
User_Define_c	
User_Define_d	
Secure Egress Port	Indicate port 1 to port 16 (FNSW-1608PS), port 1 to port 18 (FGSW-1828PS).Click specific port for filtering.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-24 Descriptions of the TCP / UDP Filter Configuration Screen Objects

4-8 Misc Operation

This function provides Misc Operation of Web Smart PoE Switch; the screen in Figure 4-51 appears and table 4-25 descriptions the Misc Operation of Web Smart PoE Switch.
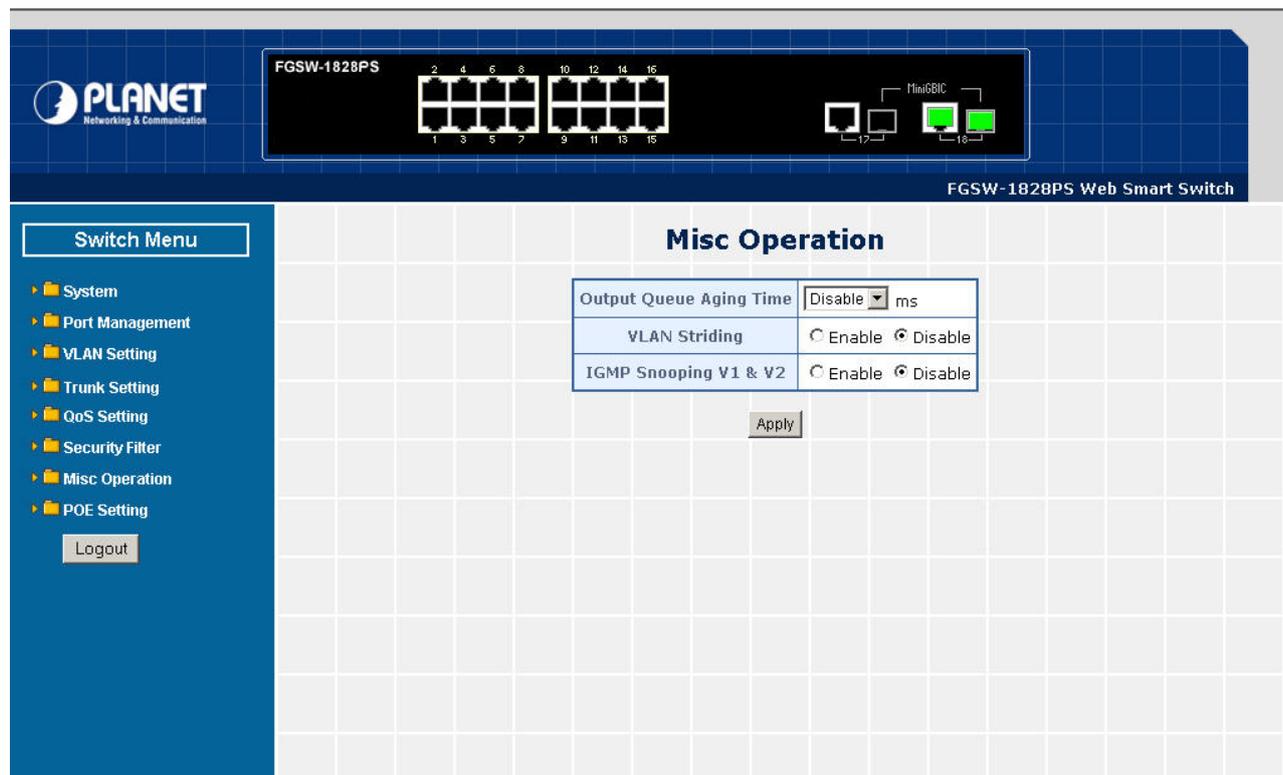
Figure 4-51 Misc Operation Web Page Screen

Object	Description
Output Queue Aging Time	Allow define the Output Queue Aging Time of Web Smart PoE Switch, the available options are **Disable, 200ms, 400ms, 600ms and 800ms**. Default mode is **Disable**.
VLAN Striding	Allow **Disable** or **Enable** the VLAN Striding function of Web Smart PoE Switch. Default mode is **Disable**.
IGMP Snooping V1 & V2	Allow **Disable** or **Enable** the IGMP Snooping V1 & V2 function of Web Smart PoE Switch. Default mode is **Disable**.
Apply	Press this button for save current configuration of Web Smart PoE Switch.

Table 4-25 Descriptions of the Misc Operation Web Page Screen Objects

4-9 POE Setting

Power Management:

In a power over Ethernet system, operating power is applied from a power source (PSU-power supply unit) over the LAN infrastructure to powered devices (PDs), which are connected to ports. Under some conditions, the total output power required by PDs can exceed the maximum available power provided by the PSU. The system may a prior be planed with a PSU capable of supplying less power than the total potential power consumption of all the PoE ports in the system. In order to maintain the majority of ports active, power management is implemented.

The PSU input power consumption is monitored by measuring voltage and current .The input power consumption is equal to the system's aggregated power consumption .The power management concept allows all ports to be active and activates additional ports, as long as the aggregated power of the system is lower than the power level at which additional PDs cannot be connected .When this value is exceeded, ports will be deactivated, according to user-defined priorities. The power budget is managed according to the following user-definable parameters: maximum available power, ports priority, maximum allowable power per port.

This function provides PoE setting of Web Smart PoE Switch; the screen in Figure 4-52 appears and table 4-26 descriptions the Misc Operation of Web Smart PoE Switch.

**Figure 4-52** POE Setting Web Page Screen

Object	Description
Power limit mode	Allow to configure power limit mode of Web Smart PoE Switch. It can choose : ■ **Port Priority** Deliver PoE power by port priority setting ■ **Total Limit**. Set limit value of the total POE port provided power to the PDs. For Web Smart PoE Switch, the total PoE power reservation from Port-1~8 is up to 110 watts
Power reservation	Show the total watts usage of Web Smart PoE Switch.
Port	Indicate the PoE port from 1 to 8.
PoE Function	Allow disable or enable the PoE function.
Priority	Allow assign port priority for the POE power management It can choose the **"port priority"**, value range from **"1~4"** and the High priority is **"1"**.
Device class	Class 0 is the default for PDs. However, to improve power management at the PSE, the PD may opt to provide a signature for Class 1 to 3. The PD is classified based on power. The classification of the PD is the maximum power that the PD will draw across all input voltages and operational modes. A PD shall return Class 0 to 3 in accordance with the maximum power draw as specified by **Table 4.1**.
Current(mA)	It shows the PoE device current Amp.
Consumption [W]	It shows the PoE device current watt.
Power Limit	It can limit the port PoE supply watts. Per port maximum value must less **15.4,** total ports values must less than the Power Reservation value. Once power overload detected, the port will auto shut down and keep on detection mode until PD's power consumption lower than the power limit value.

Table 4-26 Descriptions of the POE Setting Web Page Screen Objects

4-10 Logout

This section provide Web logout function on Web Smart PoE Switch, after choose this function and the following screen appears in Figure 4-53 & 4-54. Please press **"Logout"** button to take effect and Login Web Screen appears. Please re-login the Web Smart PoE Switch for further management.
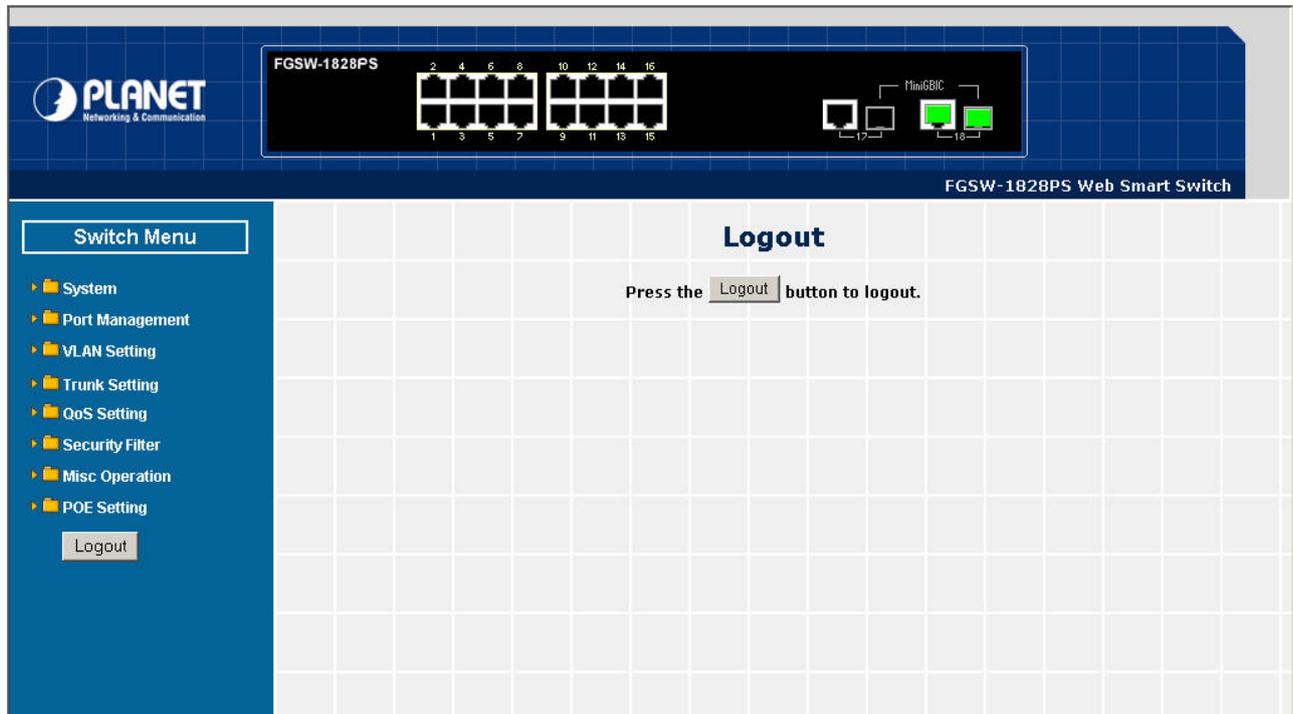

Figure 4-53 Logout Web Page Screen

Figure 4-54 Login Web Page Screen

5.1 Address Table

The Switch is implemented with an address table. This address table composed of many entries. Each entry is used to store the address information of some node in network, including MAC address, port no, etc. This information comes from the learning process of Ethernet Switch.

5.2 Learning

When one packet comes in from any port. The Switch will record the source address, port no. And the other related information in address table. This information will be used to decide either forwarding or filtering for future packets.

5.3 Forwarding & Filtering

When one packet comes from some port of the Ethernet Switching, it will also check the destination address besides the source address learning. The Ethernet Switching will lookup the address-table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. And these ports will transmit this packet to the network it connected. If found, and the destination address is located at different port from this packet comes in, the Ethernet Switching will forward this packet to the port where this destination address is located according to the information from address table. But, if the destination address is located at the same port with this packet comes in, then this packet will be filtered. Thereby increasing the network throughput and availability.

5.4 Store-and-Forward

Store-and-Forward is one type of packet-forwarding techniques. A Store-and Forward Ethernet Switching stores the incoming frame in an internal buffer, do the complete error checking before transmission. Therefore, no error packets occurrence, it is the best choice when a network needs efficiency and stability.

The Ethernet Switch scans the destination address from the packet-header, searches the routing table provided for the incoming port and forwards the packet, only if required. The fast forwarding makes the switch attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the switch is most commonly used to segment existing hubs, which nearly always improves overall performance. An Ethernet Switching can be easily configured in any Ethernet network environment to significantly boost bandwidth using conventional cabling and adapters.

Due to the learning function of the Ethernet switching, the source address and corresponding port number of each incoming and outgoing packet are stored in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. This confines network traffic to its respective domain, reducing the overall load on the network.

The Switch performs "Store and forward" therefore, no error packets occur. More reliably, it reduces the re-transmission rate. No packet loss will occur.

5.5 Auto-Negotiation

The STP ports on the Switch have built-in "Auto-negotiation". This technology automatically sets the best possible bandwidth when a connection is established with another network device (usually at Power On or Reset). This is done by detect the modes and speeds at the second of both device is connected and capable of, both 10Base-T and 100Base-TX devices can connect with the port in either Half- or Full-Duplex mode. 1000Base-T can be only connected in Full-duplex mode.

6. POWER OVER ETHERNET OVERVIEW

What is PoE?

Based on the global standard IEEE 802.3af, PoE is a technology for wired Ethernet, the most widely installed local area network technology adopted today. PoE allows the electrical power necessary for the operation of each end-device to be carried by data cables rather than by separate power cords. New network applications, such as IP Cameras, VoIP Phones, and Wireless Networking, can help enterprises improve productivity. It minimizes wires that must be used to install the network for offering lower cost, and less power failures.

IEEE802.3af also called Data Terminal equipment (DTE) power via Media dependent interface (MDI) is an international standard to define the transmission for power over Ethernet. The 802.3af is delivering 48V power over RJ-45 wiring. Besides 802.3af also define two types of source equipment: Mid-Span and End-Span.

■   **Mid-Span**

Mid-Span device is placed between legacy switch and the powered device. Mid-Span is tap the unused wire pairs 4/5 and 7/8 to carry power, the other four is for data transmit.

■   **End-Span**

End-Span device is direct connecting with power device. End-Span could also tap the wire 1/2 and 3/6.

PoE System Architecture

The specification of PoE typically requires two devices: the **Powered Source Equipment (PSE)** and the **Powered Device (PD)**. The PSE is either an End-Span or a Mid-Span, while the PD is a PoE-enabled terminal, such as IP Phones, Wireless LAN, etc. Power can be delivered over data pairs or spare pairs of standard CAT-5 cabling.

How Power is Transferred Through the Cable

A standard CAT5 Ethernet cable has four twisted pairs, but only two of these are used for 10BASE-T and 100BASE-T. The specification allows two options for using these cables for power, shown in Figure 2 and Figure 3:

The spare pairs are used. Figure 2 shows the pair on pins 4 and 5 connected together and forming the positive supply, and the pair on pins 7 and 8 connected and forming the negative supply. (In fact, a late change to the spec allows either polarity to be used).
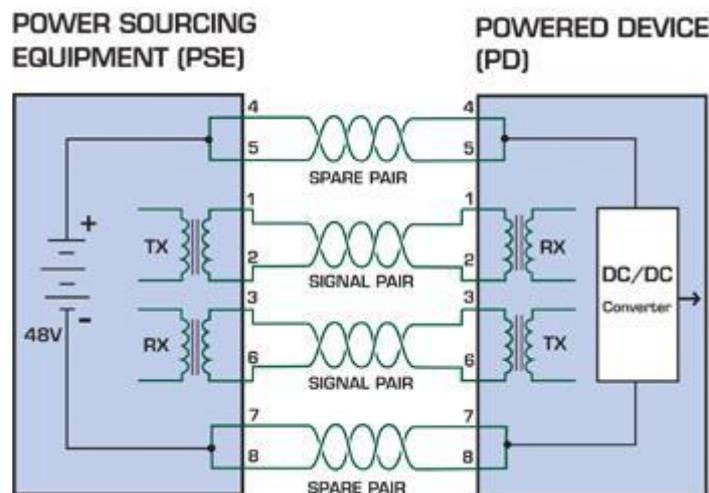
Figure 1 - Power Supplied over the Spare Pins

The data pairs are used. Since Ethernet pairs are transformer coupled at each end, it is possible to apply DC power to the center tap of the isolation transformer without upsetting the data transfer. In this mode of operation the pair on pins 3 and 6 and the pair on pins 1 and 2 can be of either polarity.
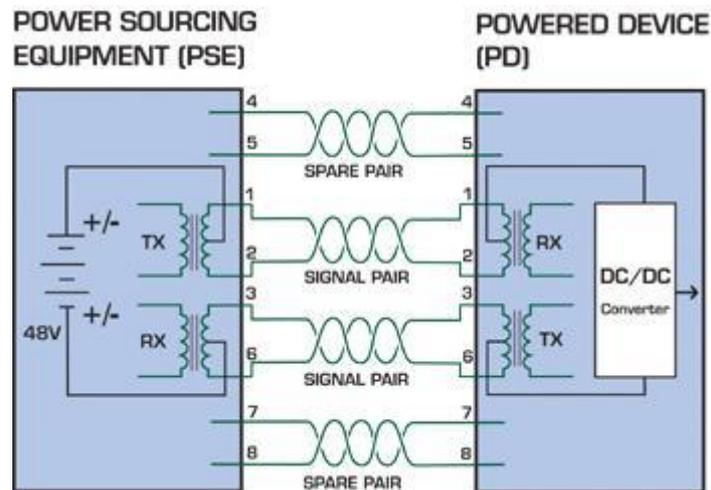
Figure 2 - Power Supplied over the Data Pins

When to install PoE?

Consider the following scenarios:

 • You're planning to install the latest VoIP Phone system to minimize cabling building costs when your company moves into new offices next month.

• The company staff has been clamoring for a wireless access point in the picnic area behind the building so they can work on their laptops through lunch, but the cost of electrical power to the outside is not affordable.

• Management asks for IP Surveillance Cameras and business access systems throughout the facility, but they would rather avoid another electrician's payment.

References:

IEEE Std 802.3af-2003 (Amendment to IEEE Std 802.3-2002, including IEEE Std 802.3ae-2002), 2003 Page(s):0_1-121

White Paper on Power over Ethernet (IEEE802.3af)

http://www.poweroverethernet.com/articles.php?article_id=52

Microsemi /PowerDsine

http://www.microsemi.com/PowerDsine/

Linear Tech

http://www.linear.com/

7. THE POE PROVISION PROCESS

While adding PoE support to networked devices is relatively painless, it should be realized that power cannot simply be transferred over existing CAT-5 cables. Without proper preparation, doing so may result in damage to devices that are not designed to support provision of power over their network interfaces.

The PSE is the manager of the PoE process. In the beginning, only small voltage level is induced on the port's output, till a valid PD is detected during the Detection period. The PSE may choose to perform classification, to estimate the amount of power to be consumed by this PD. After a time-controlled start-up, the PSE begins supplying the 48 VDC level to the PD, till it is physically or electrically disconnected. Upon disconnection, voltage and power shut down.

Since the PSE is responsible for the PoE process timing, it is the one generating the probing signals prior to operating the PD and monitoring the various scenarios that may occur during operation.

All probing is done using voltage induction and current measurement in return.

Stages of powering up a PoE link

Stage	Action	Volts specified per 802.3af	Volts managed by chipset
Detection	Measure whether powered device has the correct signature resistance of 15–33 kΩ	2.7-10.0	1.8–10.0
Classification	Measure which power level class the resistor indicates	14.5-20.5	12.5–25.0
Startup	Where the powered device will startup	>42	>38
Normal operation	Supply power to device	36-57	25.0–60.0

7.1 Line Detection

Before power is applied, safety dictates that it must first be ensured that a valid PD is connected to the PSE's output. This process is referred to as "line detection", and involves the PSE seeking a specific, 25 KΩ signature resistor. Detection of this signature indicates that a valid PD is connected, and that provision of power to the device may commence.

The signature resistor lies in the PD's PoE front-end, isolated from the rest of the the PD's circuitries till detection is certified.

7.2 Classification

Once a PD is detected, the PSE may optionally perform classification, to determine the maximal power a PD is to consume. The PSE induces 15.5-20.5 VDC, limited to 100 mA, for a period of 10 to 75 ms responded by a certain current consumption by the PD, indicating its power class.

The PD is assigned to one of 5 classes: 0 (default class) indicates that full 15.4 watts should be provided, 1-3 indicate various required power levels and 4 is reserved for future use. PDs that do not support classification are assigned to class 0. Special care must be employed in the definition of class thresholds, as classification may be affected by cable losses.

Classifying a PD according to its power consumption may assist a PoE system in optimizing its power distribution. Such a system typically suffers from lack of power resources, so that efficient power management based on classification results may reduce total system costs.

7.3 Start-up

Once line detection and optional classification stages are completed, the PSE must switch from low voltage to its full voltage capacity (44-57 Volts) over a minimal amount of time (above 15 microseconds).

A gradual startup is required, as a sudden rise in voltage (reaching high frequencies) would introduce noise on the data lines.

Once provision of power is initiated, it is common for inrush current to be experienced at the PSE port, due to the PD's input capacitance. A PD must be designed to cease inrush current consumption (of over 350 mA) within 50 ms of power provision startup.

7.4 Operation

During normal operation, the PSE provides 44-57 VDC, able to support a minimum of 15.4 watts power.

***Power Overload*s**

The IEEE 802.3af standard defines handling of overload conditions. In the event of an overload (a PD drawing a higher power level than the allowed 12.95 Watts), or an outright short circuit caused by a failure in cabling or in the PD, the PSE must shut down power within 50 to 75 milliseconds, while limiting current drain during this period to protect the cabling infrastructure. Immediate voltage drop is avoided to prevent shutdown due to random fluctuations.

7.5 Power Disconnection Scenarios

The IEEE 802.3af standard requires that devices powered over Ethernet be disconnected safely (i.e. power needs be shut down within a short period of time following disconnection of a PD from an active port).

When a PD is disconnected, there is a danger that it will be replaced by a non-PoE-ready device while power is still on. Imagine disconnecting a powered IP phone utilizing 48 VDC, then inadvertently plugging the powered Ethernet cable into a non-PoE notebook computer. What's sure to follow is not a pretty picture.

The standard defines two means of disconnection, DC Disconnect and AC Disconnect, both of which provide the same functionality - the PSE shutdowns power to a disconnected port within 300 to 400ms. The upper boundary is a physical human limit for disconnecting one PD and reconnecting another.

DC Disconnect

DC Disconnect detection involves measurement of current. Naturally, a disconnected PD stops consuming current, which can be inspected by the PSE. The PSE must therefore disconnect power within 300 to 400 ms from the current flow stop. The lower time boundary is important to prevent shutdown due to random fluctuations.

AC Disconnect

This method is based on the fact that when a valid PD is connected to a port, the AC impedance measured on its terminals is significantly lower than in the case of an open port (disconnected PD).

AC Disconnect detection involves the induction of low AC signal in addition to the 48 VDC operating voltage. The returned AC signal amplitude is monitored by the PSE at the port terminals. During normal operation, the PD's relatively low impedance lowers the returned AC signal while a sudden disconnection of this PD will cause a surge to the full AC signal level and will indicate PD disconnection.

8. TROUBLESHOOTING

This chapter contains information to help you solve issues. If the Switch is not functioning properly, make sure the Ethernet Switch was set up according to instructions in this manual.

The Link LED is not lit
> Solution:
>> Check the cable connection and remove duplex mode of the Switch.

Some stations cannot talk to other stations located on the other port
> Solution:
>> Please check the VLAN, port trunking function that may introduce this kind of problem.

Performance is bad
> Solution:
>> Check the full duplex status of the Ethernet Switch. If the Ethernet Switch is set to full duplex and the partner is set to half duplex, then the performance will be poor.

100Base-TX port link LED is lit, but the traffic is irregular
> Solution:
>> Check that the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

Why the Switch doesn't connect to the network
> Solution:
>> Check the LNK/ACT LED on the switch Try another port on the Switch Make sure the cable is installed properly Make sure the cable is the right type Turn off the power. After a while, turn on power again.

Why I connect my PoE device to FNSW-1608PS / FGSW-1828PS and it cannot power on?
> Solution:
>> 1. Please check the cable type of the connection from FNSW-1608PS / FGSW-1828PS (port 1 to port 8) to the other end. The cable should be an 8-wire UTP, Category 5 or above, EIA568 cable within 100 meters. A cable with only 4-wire, short loop or over 100 meters, all will affect the power supply.
>>
>> 2. Please check and assure the device that fully complied with IEEE 802.3af standard.

How to deal forgotten password situation of FNSW-1608PS / FGSW-1828PSS?
> Solution:
>> Please press Reset button at front panel for 5 seconds then the Web Smart PoE Switch will reset to factory default mode(username and password: admin)

A.1 Switch's RJ-45 Pin Assignments

1000Mbps, 1000Base T

Contact	MDI	MDI-X
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-

10/100Mbps, 10/100Base-TX

RJ-45 Connector pin assignment		
Contact	MDI Media Dependant Interface	MDI-X Media Dependant Interface -Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

A.2 RJ-45 cable pin assignment
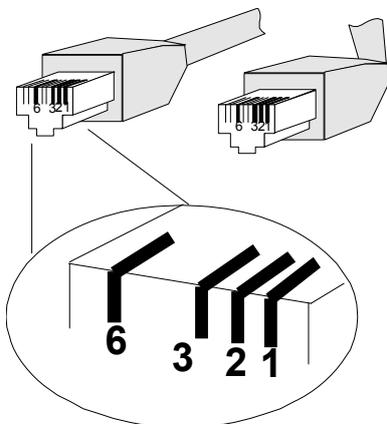
The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

Straight Cable		SIDE 1	SIDE2
1 2 3 4 5 6 7 8 (parallel lines) SIDE 1 / SIDE 2 1 2 3 4 5 6 7 8		1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown	1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown
Straight Cable		**SIDE 1**	**SIDE2**
1 2 3 4 5 6 7 8 (crossover lines) SIDE 1 / SIDE 2 1 2 3 4 5 6 7 8		1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown	1 = White / Orange 2 = Green 3 = White / Orange 4 = Blue 5 = White / Blue 6 = Orange 7 = White / Brown 8 = Brown

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as above picture before deploying the cables into your network.

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Networking & Communication

EC Declaration of Conformity

For the following equipment:

*Type of Product: 16-Port 10/100Base-TX + 2G TP/SFP Combo Web Smart PoE Switch
*Model Number: FGSW-1828PS

* Produced by:
Manufacturer's Name   :   **Planet Technology Corp.**
Manufacturer's Address: 11F, No 96, Min Chuan Road
                           Hsin Tien, Taipei, Taiwan , R. O.C.

is herewith confirmed to comply with the requirements set out   in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (89/336/EEC,92/31/EEC,93/68/EEC).
For the evaluation regarding the EMC, the following standards were applied:

Emission	EN 50081-1	(1992)
Conducted / Radiated	EN 55022	(1998)
Harmonic	EN 61000-3-2	(1995)
Flicker	EN 61000-3-3	(1995)
Immunity	EN 55024	(1998)
ESD	EN 61000-4-2	(1995)
RS	EN 61000-4-3	(1996)
EFT/ Burst	EN 61000-4-4	(1995)
Surge	EN 61000-4-5	(1995)
CS	EN 61000-4-6	(1996)
Voltage Disp	EN 61000-4-11	(1994)

Responsible for marking this declaration if the:

☒ **Manufacturer**   ☐ **Authorized representative established within the EU**

Authorized representative established within the EU (if applicable):

Company Name: **Planet Technology Corp.**

Company Address: **11F, No.96, Min Chuan Road, Hsin Tien, Taipei, Taiwan, R.O.C**

Person responsible for making this declaration

Name, Surname   **Kent Kang**

Position / Title :   **Product Manager**

Taiwan	**10th, JUNE, 2008**	
Place	*Date*	*Legal Signature*

PLANET TECHNOLOGY CORPORATION

EC Declaration of Conformity

For the following equipment:

*Type of Product : 16-Port 10/100Mbps / 8-Port PoE Web Smart Ethernet Switch
*Model Number : FNSW-1608PS

* Produced by:
Manufacturer's Name : **Planet Technology Corp.**
Manufacturer's Address: 11F, No 96, Min Chuan Road
                           Hsin Tien, Taipei, Taiwan , R. O.C.

is herewith confirmed to comply with the requirements set out   in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (89/336/EEC,92/31/EEC,93/68/EEC).
For the evaluation regarding the EMC, the following standards were applied:

Emission	EN 55022	(1998 Class B)
Harmonic	EN 61000-3-2	(2000)
Flicker	EN 61000-3-3	(1995)
Immunity	EN 55024	(1998)
ESD	EN 61000-4-2	(1995)
RS	EN 61000-4-3	(1995)
EFT/ Burst	EN 61000-4-4	(1995)
Surge	EN 61000-4-5	(1995)
CS	EN 61000-4-6	(1996)
Magnetic Field	EN 61000-4-8	(1993)
Voltage Disp	EN 61000-4-11	(1994)

Responsible for marking this declaration if the:

☒ **Manufacturer**   ☐ **Authorized representative established within the EU**

Authorized representative established within the EU (if applicable):

Company Name: **Planet Technology Corp.**

Company Address: **11F, No.96, Min Chuan Road, Hsin Tien, Taipei, Taiwan, R.O.C**

Person responsible for making this declaration

Name, Surname   **Kent Kang**

Position / Title :   **Product Manager**

Taiwan   **10th, JUNE, 2008**   _____
Place   *Date*   *Legal Signature e*

PLANET TECHNOLOGY CORPORATION