TRENDnet®

User's Guide

TPE-224WS

FCC Warning

This equipment has been tested and found to comply with the regulations for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy. If not installed and used in accordance with instructions in this User's Guide, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at user's expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

UL Warning

a) Elevated Operating Ambient Temperature- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

b) Reduced Air Flow- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

c) Mechanical Loading- mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

d) Circuit Overloading- Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

e) Reliable Grounding - Reliable grounding of rack-mount equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

Ver. C1-1.00

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ABOUT THIS GUIDE

Congratulations on your purchase of the TPE-224WS 28-Port 10/100/1000Mbps Gigabit Ethernet Web Smart PoE Switch. This device integrates 1000Mbps Gigabit Ethernet, 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

Purpose

This guide discusses how to install your TPE-224WS 28-Port 10/100/1000Mbps Gigabit Ethernet Web Smart PoE Switch.

Terms/Usage

In this guide, the term "Switch" (first letter upper case) refers to your TPE-224WS 28-Port 10/100/1000Mbps Gigabit Ethernet Web Smart PoE Switch and "switch" (first letter lower case) refers to other Ethernet switches.

INTRODUCTION

This chapter describes the features of the TPE-224WS 28-Port 10/100/1000Mbps Gigabit Ethernet Web Smart PoE Switch and some background information about Ethernet/Fast Ethernet/Gigabit Ethernet switching technology.

Gigabit Ethernet Technology

Gigabit Ethernet is an extension of IEEE 802.3 Ethernet utilizing the same packet structure, format, and support for CSMA/CD protocol, full duplex, flow control, and management objects, but with a tenfold increase in theoretical throughput over 100-Mbps Fast Ethernet and a hundredfold increase over 10-Mbps Ethernet. Since it is compatible with all 10-Mbps and 100-Mbps Ethernet environments, Gigabit Ethernet provides a straightforward upgrade without wasting a company's existing investment in hardware, software, and trained personnel.

The increased speed and extra bandwidth offered by Gigabit Ethernet is essential to coping with the network bottlenecks that frequently develop as computers and their busses get faster and more users use applications that generate more traffic. Upgrading key components, such as your backbone and servers to Gigabit Ethernet can greatly improve network response times as well as significantly speed up the traffic between your subnets.

Gigabit Ethernet enables fast optical fiber connections to support video conferencing, complex imaging, and similar data-intensive applications. Likewise, since data transfer occurs 10 times faster than Fast Ethernet, servers outfitted with Gigabit Ethernet NIC's are able to perform 10 times the number of operations in the same amount of time.

In addition, the phenomenal bandwidth delivered by Gigabit Ethernet is the most cost-effective method to take advantage of today and tomorrow's rapidly improving switching and routing internetworking technologies. And with expected advances in the coming years in silicon technology and digital signal processing that will enable Gigabit Ethernet to eventually operate over unshielded twisted-pair (UTP) cabling, outfitting your network with a powerful 1000-Mbps-capable backbone/server connection creates a flexible foundation for the next generation of network technology products.

Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, 100BASE-T (Fast Ethernet) provides a non-disruptive, smooth evolution from the current 10BASE-T technology. The non-disruptive and smooth evolution nature, and the dominating potential market base, virtually guarantees cost-effective and high performance Fast Ethernet solutions.

100Mbps Fast Ethernet is a standard specified by the IEEE 802.3u LAN committee. It is an extension of the 10Mbps Ethernet standard with the ability to transmit and receive data at 100Mbps, while maintaining the CSMA/CD Ethernet protocol. Since the 100Mbps Fast Ethernet is compatible with all other 10Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of the existing investment in hardware, software, and personnel training.

Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridges Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different segments, which don't compete with each other for network transmission capacity.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segments, automatically forwards traffic that needs to go from one segment to another. By doing this the total network capacity is multiplied, while still maintaining the same network cabling and adapter cards.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterized by higher latencies. Routers have also been used to segment local area networks, but the cost of a router, the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

VLAN (Virtual Local Area Network)

A VLAN is a group of end-stations that are not constrained by their physical location and can communicate as if a common broadcast domain, a LAN. The primary utility of using VLAN is to reduce latency and need for routers, using faster switching instead. Other VLAN utility includes:

Security, Security is increased with the reduction of opportunity in eavesdropping on a broadcast network because data will be switched to only those confidential users within the VLAN.

Cost Reduction, VLANs can be used to create multiple broadcast domains, thus eliminating the need of expensive routers.

Power over Ethernet (PoE)

Power over Ethernet (PoE) integrates power and data onto one single cabling infrastructure, eliminating the need to have AC power available at all locations.

Power and Data are integrated onto the same cable. Supporting category 5/5e up to 100 Meters, PoE will provide power to PoE compatible device, such as IP telephones, wireless LAN access points, and IP security cameras.

PoE is already widely adopted in the market, saving up to 50% of overall installation costs by eliminating the need to install separate electrical wiring and power outlets.

Features

- 24 x 100BASE-TX Auto-MDIX & Auto-negotiation Fast Ethernet PoE ports (Port 1 ~24)
- 4 x 1000BASE-T Auto-MDIX & Auto-negotiation Gigabit Ethernet ports
  (Port 25-28)
- 2 x 1000BASE-T SX/LX Auto-Sensing Mini GBIC Ports.
  (Shared with Port 25-26)
- Supports PoE power up to 15.4W for each PoE port
- Supports PoE power up to 170W for the device
- Supports PoE Powered Device (PD) classification identify
- Half duplex transfer mode for connection speed 10Mbps and 100Mbps
- Full duplex transfer mode for connection speed of 10Mbps, 100Mbps and 1000Mbps
- Store-and-Forward switching scheme capability to support rate adaptation and ensure data integrity
- Up to 8K unicast addresses entities per device, self-learning, and table aging
- 1Mbits packet buffer
- Supports IEEE 802.1Q VLAN
- Supports IEEE 802.1p Quality of Service
- Supports IGMP Snooping
- Supports Static Port Trunking
- Supports Broadcast Storm Control
- Supports Port Mirroring
- Supports Port Setting for Speed, Duplex mode and Flow control
- Web Browser Configuration
- Windows-Based Utility
- Standard 19” Rack-mount size

PACKAGE CONTENTS AND INSTALLATION

This chapter provides packaging information for the Switch.

Unpacking

Open the box for the Switch and carefully unpacks its contents. The packaging should contain the following items:

- One TPE-224WS 28-Port 10/100/1000Mbps Gigabit Web Smart PoE Switch
- Quick Installation Guide
- Power Cord
- Utility and User's Guide CD-ROM
- Rack mount Kit (rubber feet, screws and mounting bracket)

If any item is found missing or damaged, please contact your local reseller for replacement

Installation

Install the Switch in a fairly cool and dry place. See *Technical Specifications* for the acceptable temperature and humidity operating ranges.

Install the Switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.

Leave at least 10cm of space at the front and rear of the Switch for ventilation.

Install the Switch on a sturdy, level surface that can support its weight, or in an EIA standard-size equipment rack. For information on rack installation, see the next section, Rack Mounting.

When installing the Switch on a level surface, attach the rubber feet to the bottom of each device. The rubber feet cushion the Switch and protect the Switch case from scratching.

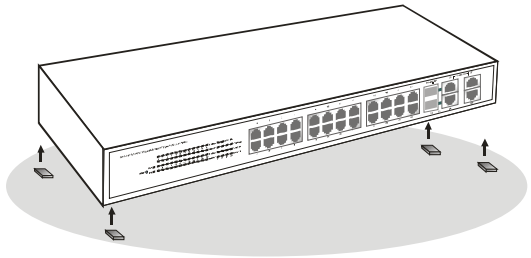


Figure 1. Attach the rubber feet to the bottom

Rack Mounting

The Switch can be mounted in an EIA standard-size, 19-inch rack, which can be placed in a wiring closet with other equipment. Attach the mounting brackets to the Switch's front panel (one on each side), and secure them with the provided screws.

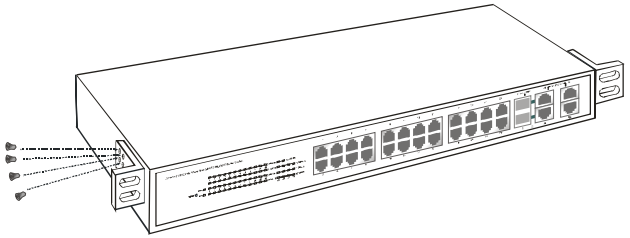


Figure 2. Attach the mounting bracket to the Switch with the provided screws.

Then, use screws provided with the equipment rack to mount each Switch in the rack.

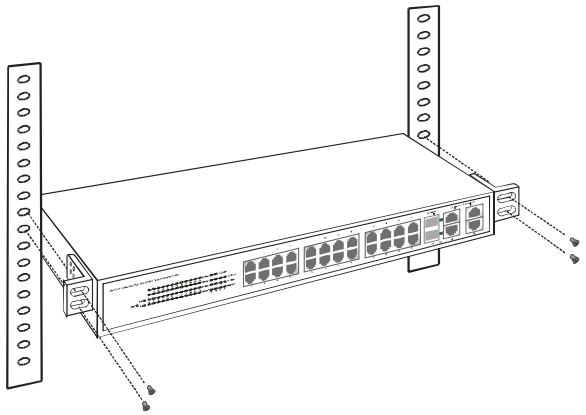


Figure 3. Mount the Switch to the rack

Connecting Network Cable

The Switch has 24 10/100Mbps Power over Ethernet ports. These ports runs both in half and full duplex mode using Cat. 5 cables. These Power over Ethernet will be automatically activated when a compatible terminal is identified. The Switch will supply power through the PoE port to the connected Powered Device.

For Non-PoE devices, the PoE port will not offer the power to these devices. This feature allows users to connect both non-PoE and PoE devices on their network.

The Switch also supports 4 10/100/1000Mbps 1000BASE-T Gigabit Ethernet ports. These ports support Auto. These ports operate in half-duplex mode for 10/100Mbps and full- duplex mode for 10/100/1000Mbps using Cat. 5e or Cat 6. Ethernet Cables.

All Ethernet ports support Auto-MDIX. Users can use either standard or crossover Ethernet cables.

There are 2 mini-GBIC slot for optional mini-GBIC module.

AC Power

The Switch uses 100-240V AC, 50-60 Hz. The Switch's power supply will adjust to the local power source automatically and may be turned on without having any or all LAN segment cables connected.

IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front panel and rear panel of the Switch.

Front Panel

The figure below shows the front panels of the Switch.

Figure 4. Front panel

LED Indicators:

Comprehensive LEDs display the status of the switch and the network (see *UNDERSTANDING LED INDICATORS* chapter below).

100BASE-TX Fast Ethernet PoE Ports (Port 1~24):

These ports are PoE enable ports. These PoE ports will be automatically activated when a compatible Powered Device is identified. The PoE port will supply power to the connected PoE device.

The Switch's PoE function supports PoE port priority management. When the system power is overloaded, the Switch will enforce PoE port priority management. Port 1 has the highest priority. Port 24 has the lowest priority.

For non-PoE devices, the PoE port will not offer the power to these devices. This feature allows users to safely use both non-PoE and Power over Ethernet devices on their network.

These ports support network speeds of either 10Mbps or 100Mbps, and can operate in half- and full- duplex transfer modes. These ports also support auto-MDIX. Users can use either standard or crossover Ethernet cables.

1000BASE-T Gigabit Ethernet Ports (Port 25~28):

The Switch's four Gigabit twisted pair ports support auto negotiation and auto MDIX. These ports operate in half-duplex mode for 10/100Mbps and full-duplex mode for 10/100/1000Mbps.

Note: When the port is set to "Forced Mode", the Auto MDIX will be disabled.

Mini-GBIC slots (Port 25~26)

The Switch is equipped with two mini-GBIC slots, supporting optional 1000BASE-SX/LX mini-GBIC modules.

The 1000BASE-T port 25 and 26 are shared with the mini-GBIC port 25 and 26. When a module is plugged into the mini-GBIC module, the device will activate the mini-GBIC, and the RJ45 port will be disabled.

Reset:

The Reset button reset settings back to factory default.

Note: Please make sure you copy down or save settings before pressing "Reset" button.

Rear Panel

The rear panel of the Switch consists of an AC power. The following shows the rear panel of the Switch.

Figure 5. Rear panel

AC Power Connector:

Plug in the female connector of the provided power cord into this connector. Connect the male of the power cord into a power outlet. Supported input voltages range from 100-240V AC at 50-60Hz.

Understanding LED Indicators

The front panel LEDs provides instant status feedback for easy monitoring and troubleshooting.

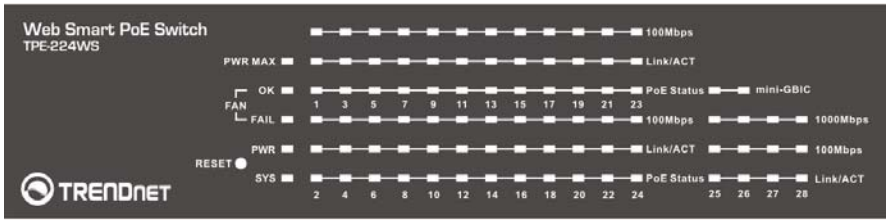


Figure 6. LED indicators

Power and System LEDs

PWR: Power Indicator

On	:	When the Power LED is lit, the Switch is receiving power.
Off	:	When the Power LED is off, the power cord is not connected or is improperly connected.

SYS: Management Indicator

Blinking	:	When the CPU is working, the System LED is blinking.
On/Off	:	The CPU is not working.

FAN: System FAN Status Indicator

OK	:	When the OK LED is lit, the system fan is working normally.
Fail	:	When the Fail LED is lit, the system fan has failed. Please shutdown the Switch immediately and contact your local dealer for repair.

PWR MAX: PoE System Power Status

On	:	When the system power resource remain <=15.4W (the system power consumption >= 155W), the LED will be lit. The system will not provide power to the additional POE PD inserted.
Off	:	When the system has enough power (the system power consumption <155W).

100BASE-TX Port 1~24 Status LEDs

Link/ACT: Link/Activity

On	:	When the Link/ACT LED is lit, the port is successfully connected to an Ethernet network.
Blinking	:	When the Link/ACT LED is blinking, the port is transmitting or receiving data on the Ethernet network.
Off	:	No link.

100Mbps

On	:	When the 100Mbps LED is lit, the port is connected to a 100Mbps Fast Ethernet network.
Off	:	When the 100Mbps LED is off, the port is connected to a 10Mbps

	Ethernet network

PoE Status

Green :	When the PoE Status light is green, the PoE powered device (PD) is connected and the port supplies power normally.
Red :	When the PoE Status light is red, the PoE port has failed due to one of the following scenarios: ◆ PoE power circuit shortage. ◆ Power over current: over the power current of PD's classification. ◆ Out of PoE voltage of 44 ~ 57 VDC output. ◆ Cause fail.
Off	No PoE powered device (PD) is connected .

1000BASE-T/mini-GBIC Port 25~26 Status LEDs

Link/ACT: Link/Activity

On :	When the Link/ACT LED is lit, the port is successfully connected to an Ethernet network.
Blinking :	When the Link/ACT LED is blinking, the port is transmitting or receiving data on the Ethernet network.
Off :	No link.

1000Mbps

On :	When the 1000Mbps LED is lit, the port is connected to a 1000Mbps Gigabit Ethernet network.
Off :	When the 1000Mbps LED is off, the port is connected to a 10Mbps Ethernet or 100Mbps Fast Ethernet network

100Mbps

On :	When the 100Mbps LED is lit, the port is connected to a 100Mbps Fast Ethernet network.
Off :	When 100Mbps LED is off, the port is connected to a 10Mbps Ethernet or 1000Mbps Gigabit Ethernet network.

mini-GBIC

On :	When the mini-GBIC LED is lit, mini-GBIC module is plugged into the mini-GBIC slot.
Off :	No mini-GBIC module inserted.

1000BASE-T Port 27~28 Status LEDs

Link/ACT: Link/Activity

On :	When the Link/ACT LED is lit, the port is successfully connected to an Ethernet network.
Blinking :	When the Link/ACT LED is blinking, the port is transmitting or receiving data on the Ethernet network.
Off :	No link.

1000Mbps

On :	When the 1000Mbps LED is lit, the port is connected to a 1000Mbps Gigabit Ethernet network.
Off :	When 1000Mbps LED is off, the port is connected to a 10Mbps Ethernet or 100Mbps Fast Ethernet network

100Mbps

On :	When the 100Mbps LED is lit, the port is connected to a 100Mbps Fast Ethernet network.
Off :	When the 100Mbps LED is off, the port is connected to a 10Mbps Ethernet or 1000Mbps Gigabit Ethernet network.

CONFIGURATION

You can configure the Switch such as VLAN, Port Trunking, and Broadcast Storm … etc using the Web Browser.

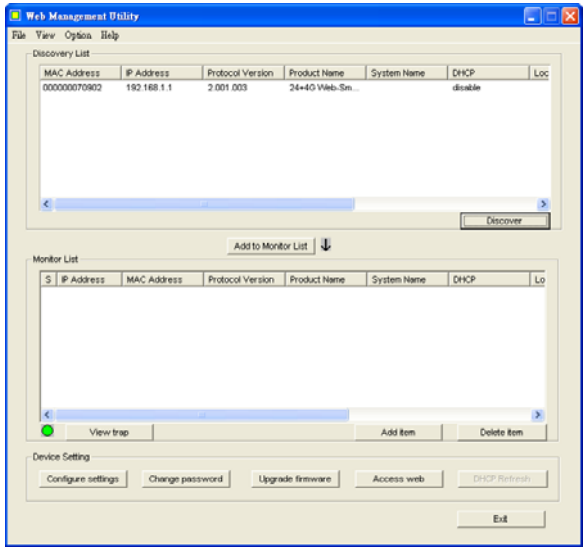
The Web Management Utility allows the user to easily discover the Web Management Switch, assign the IP Address, change the password and upgrade firmware.

Installing the Web Management Utility

The following are step-by-step instructions for installing the Web Management utility.

1. Insert the Utility CD in the CD-ROM Drive.
2. Click **Install Utility** icon to start

3. Follow the on-screen instructions to install the utility.
4. Upon completion, go to **Program Files → TRENDnet → Web Smart Switch Management Utility** and open the Web Smart Management utility.



The Web Management Utility is divided into four sections, ***Discovery List, Monitor List, Device Setting*** and ***Toolbar function***. For details instruction, follow the below section.

Discovery List

This list shows all the Web management devices in the network.

Click ***"Discovery"*** button to list all the Web Management devices in the discovery list.

Double click or press ***"Add to monitor list"*** to select add a device to the Monitor List.

System word definitions in the Discovery List:

- ***IP Address:*** Shows the current IP address of the device.
- ***MAC Address:*** Shows the MAC Address of the Switch.
- ***Protocol version:*** Shows the protocol version of the Utility.
- ***Product Name:*** Shows the product name of the Switch.
- ***System Name:*** Shows the system name of the Switch.
- ***DHCP:*** Shows the DHCP status of the Switch.
- ***Location:*** Shows where the Switch is located.
- ***Trap IP:*** Shows the IP address where the Trap is to be sent.
- ***Subnet Mask:*** Shows the Subnet Mask.
- ***Gateway:*** Shows the Gateway.

Monitor List

All the Web Smart Device in the Monitor List can be monitored; you can also receive the trap and show the status of the device.

System word definitions in the Monitor List:

- ***S:*** Shows the system symbol of the Switch. means the Switch is not connected..
- ***IP Address:*** Shows the current IP address of the device.
- ***MAC Address:*** Shows the MAC Address of the Switch.
- ***Protocol version:*** Shows the protocol version of the Utility.
- ***Product Name:*** Shows the product name of the Switch.
- ***System Name:*** Shows the system name of the Switch.
- ***DHCP:*** Shows the DHCP status of the Switch.
- ***Location:*** Shows where the Switch is located.
- ***Trap IP:*** Shows the IP address where the Trap is to be sent.
- ***Subnet Mask:*** Shows the Subnet Mask.
- ***Gateway:*** Shows the Gateway.

View Trap: The Trap function allows you to monitor events that occur with the Switches in the Monitor List.

There is an LED indicator next to the ***"View Trap"*** button. When the LED is green, it means that there is no trap transmitted. When the LED is red, it means a new trap has been transmitted. (Figure 7)

Figure 7. View Trap button

When ***"View Trap"*** is clicked, a Trap Information window will appear. This window will show the trap information including the Symbol, Time, Device IP and the Event. (Figure 8)

The symbol "" indicates a new Event has occurred. This symbol will disappear after you review and click on the event record.

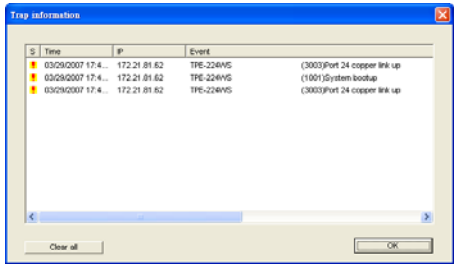


Figure 8. Trap Information

Note: In order to receive Trap information, the Switch has to be configured with Trap IP and Trap Events in Web browser, which are available in the Trap Setting Menu (see Page 52 for detail).

Add Item: To add a device to the Monitor List manually, enter the IP Address of the device that you want to monitor.

Delete Item: To delete the device in the Monitor List.

Device Setting

Configuration Setting: Under Configuration Setting, you can set the IP Address, Subnet Mask, Gateway, Set Trap to (Trap IP Address), System name, Location and DHCP function.

Select the device in the Discovery list or Monitor List and click Configure Settings. The Configuration Setting window will appear (Figure 10). After making the desired changes, enter the password and click "Set". The default password is ***"admin"***.

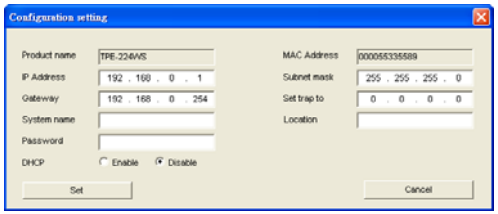


Figure 9. Configuration Setting

Password Change: This option allows you to change the password, Enter the original password, the new password, confirm the new password and click "***Set"*.**

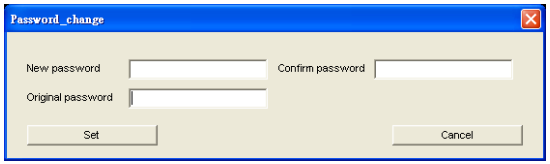


Figure 10. Password Change

Firmware Upgrade: Use this option to upgrade the firmware of the Switch.

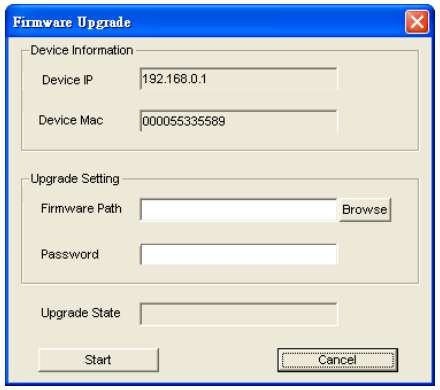


Figure 11. Firmware Upgrade

Web Configuration: Double click the device in the Monitor List or select a device in the Monitor List and click ***"Access Web"*** to access the Switch's browser configuration.

DHCP Refresh: Click ***"DHCP Refresh"*** to refresh the IP address of selected device form DHCP server.

Toolbar

The toolbar in the utility has menu options; File, View, Options and Help.

There are four options under ***"File"***; Monitor Save, Monitor Save As, Monitor Load and Exit.

- ***Monitor Save:*** To record the setting of the Monitor List to the default. The next time you open the utility, it will auto load the default recorded setting.
- ***Monitor Save As:*** To record the setting of the Monitor List with a specific filename and file path.

- ***Monitor Load:*** To manually load the setting file of the Monitor List.
- ***Exit:*** To exit the utility.

There are four options under ***"View"***; view log and clear log function.

- ***View Log:*** Displays switch and utility activities.
- ***Clear Log:*** Clears the log.

There is one option under ***"Option"***; Refresh Time. This option allows the user to set the time for monitoring the device. Choose ***15 secs, 30 secs, 1 min, 2 min and 5 min***.

There is one option under ***"Help"***; About, About displays the version of the utility.

Configuring the Switch

The TPE-224WS 28-Port 10/100/1000Mbps Gigabit Ethernet Web Smart PoE Switch has a Web GUI interface for smart switch configuration. The Switch can be configured through the Web Browser. A network administrator can manage, control and monitor the switch from the local LAN. This section indicates how to configure the Switch to enable its smart functions

Login

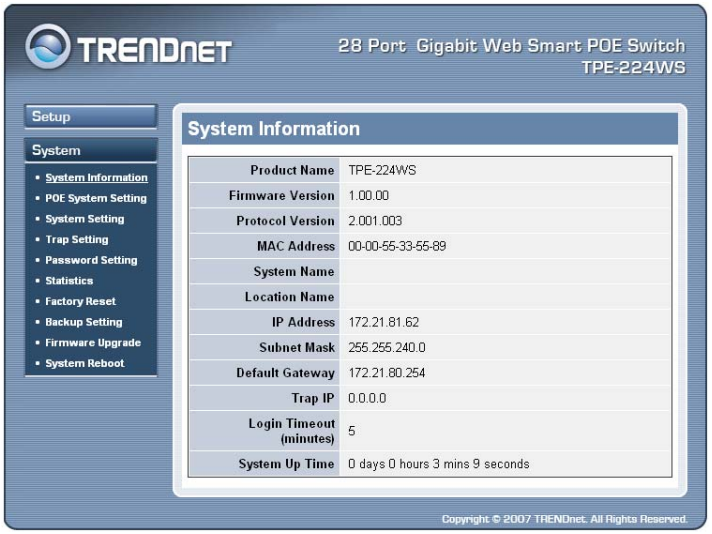
Before you configure this device, make sure your computer is on the same subnet as the Web Smart PoE Switch. For example, since the default IP address of the Web Smart PoE Switch is ***192.168.0.1***, then the computer should be set at 192.168.0.x (where x is a number between 2 and 253), and the default subnet mask is set to 255.255.255.0.

Open Internet Explorer 5.0 or above Web browser.

Enter IP address http://192.168.0.1 (the factory default IP address setting) into the address bar.

You can also access the browser configuration through the utility program. Select the device shown in the Monitor List and then click "*Web Configuration*". When the login screen appears, enter the default password ***"admin"*** and click Login.

After entering the password, the page below appears; this screen displays the device status.



Setup Setting

The following seven links appear under Configuration Setting: *Port Setting, IEEE 802.1Q VLAN Settings, Trunk Setting, Mirror Setting, IEEE 802.1p Default Priority, PoE Port Setting, PoE System Setting and Broadcast Strom Control Setting* in Setup menu.

PoE Port Setting

When you click on PoE Port Setting, the PoE Status will appear on the screen. It will display the PoE status including, Port Enable, Power limit, Power (W), Voltage(V), Current (mA), Classification and Port status.

Note: The PoE Status information of Power current, Power Voltage and Current is existing power usage information for connected Powered Devices. Click "Refresh" to refresh status information.

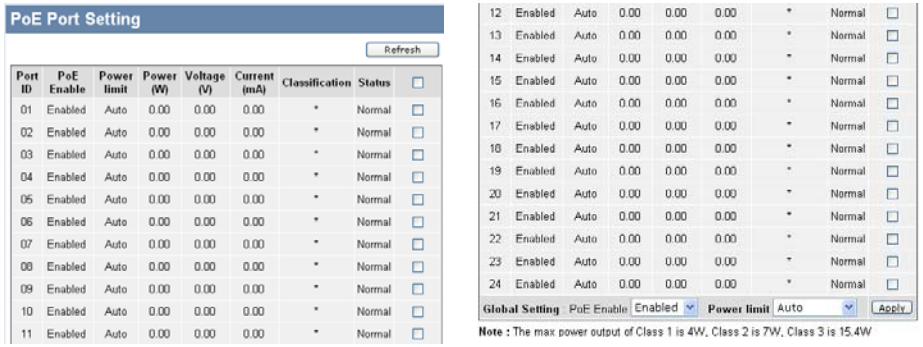


Figure 12. PoE Port Setting

PoE Enable:

Enables or disables the PoE function for the selected port.

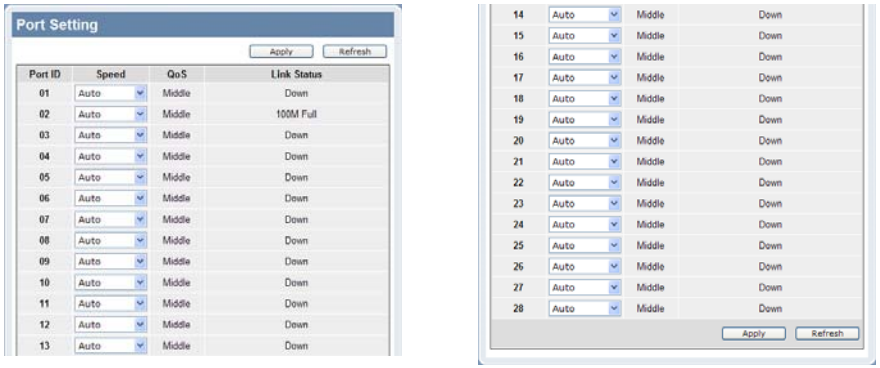
Power Limit:

This function allows you to manually setting the port power current limitation assigned to the Powered Device. To protect the Switch and the connected device, the power limit function will disable the PoE function of the port when the power overloads. Select "Class 1 (4W)", "Class 2 (7W)", "Class 3 (15.4W)" or "Auto" for the power limit. "Auto" will follow the classification from the PD power current based on the 802.3af standard.

Port Settings

Port Settings, will show each port's status. Click the drop down menu to set each port's *Speed, and QoS priority* then press *"Apply"*. To refresh the information table to view the latest port setting and Link Status, click Refresh.

Link Status will show the connection speed and duplex mode. The dialog box will show ***Down*** when the port is disconnected.



Note: The priority for Gigabit Fiber port is higher than Copper.

Speed:

The 1~24 100BASE-TX port connections can operate in Forced Mode settings (100M Full, 100M Half, 10M Full, 10M Half), Auto, or Disable. The default setting for all ports is Auto.

The 25~28 1000BASE-T port connections can operate in Forced Mode settings (1000M Full, 100M Full, 100M Half, 10M Full, 10M Half), Auto, or Disable. The default setting for all ports is Auto.

The 25~26 mini-GBIC (Gigabit Fiber) connections can operate in Forced Mode settings (1000M Full), Auto, or Disable

Flow Control:

This setting determines whether or not the Switch will be handling flow control. Set Flow Control to ***Enable*** to avoid data transfer overflow. Set it to ***Disable***; is flow control is not needed

When the port is set to ***forced mode***, then the flow control will automatically set to ***Disable.***

QoS:

Displays each port's 802.1p QoS priority level for received data packet handling. Default setting for all ports is Middle. You can change the priority settings in ***802.1p Default Priority***.

IEEE 802.1Q VLAN

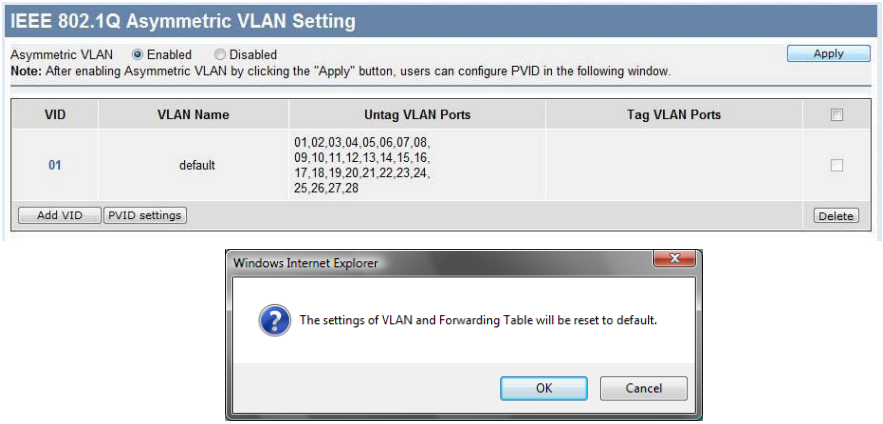
A VLAN is a collection of ports that make up a single broadcast domain.

VLANs can be easily organized to reflect department groups (such as R&D, Marketing), usage groups (such as e-mail), or multicast groups (multimedia applications such as video conferencing). VLANs help to simplify network management by allowing users to move devices to a new VLAN without having to change any physical connections.

The IEEE 802.1Q VLAN Configuration page provides powerful VID management functions. By default, the VID is 01, named “default”, and all 16 ports are configured as “Untagged”.

Asymmetric VLAN

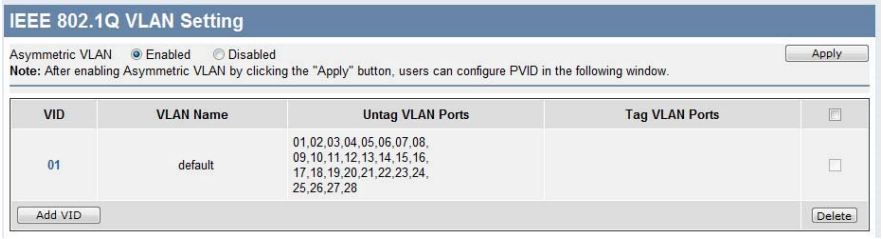
If asymmetric VLAN is enabled, and for example when port 1 received an untagged packet, the switch will apply the PVID of port 1 to tag this packet; the packet then will be forwarded.



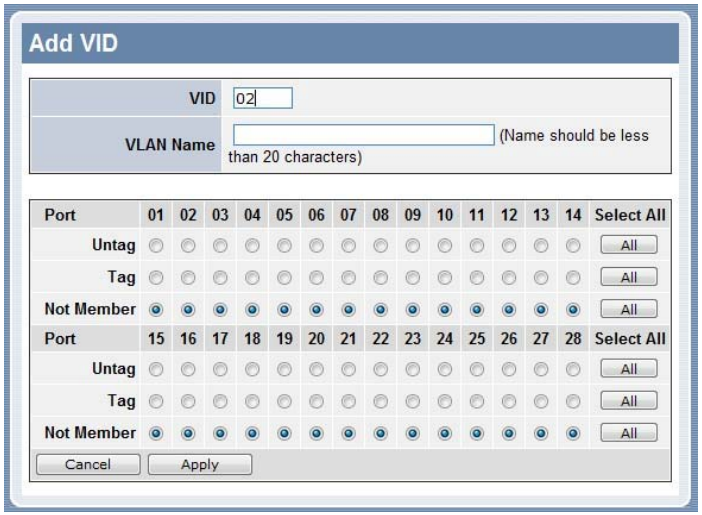
Note: The settings of VLAN, IGMP Snooping and Forwarding Table will be reset to default once Asymmetric VLAN is changed.

Untag Asymmetrick VLAN Settings:

The IEEE 802.1Q VLAN configuration page provides powerful VID management functions. The original default VLAN setting has the VID as 01, named “default”, and contains all ports as “Untagged”.



Add VID: Click to create a new VID group, assigning ports from 01 to 28 as Untag, Tag, or Not Member. A port can be “Untagged” in only one VID. To save the VID group, press Apply.



Add New VID

VID: A unique VLAN ID.

VLAN Name: A VLAN name can be setting as user wish.

Port: The switch port number.

Untag: Outgoing frames without VLAN tag.

Tag: Outgoing frames with VLAN tag.

Not Member: The port number which not to be grouped.

Select All: Select all ports to be VLAN members or not VLAN members.

Cancel: To call the modifications off.

Apply: To activate and save the modifications.

Delete: Click to delete selected VID.

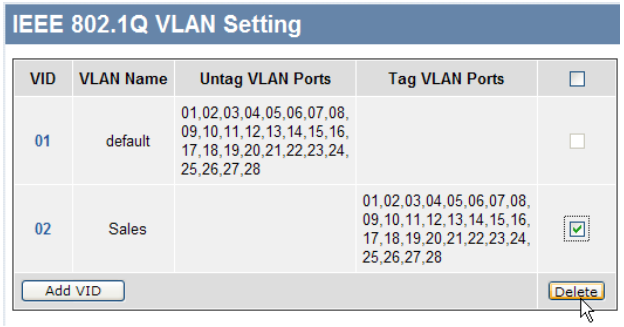
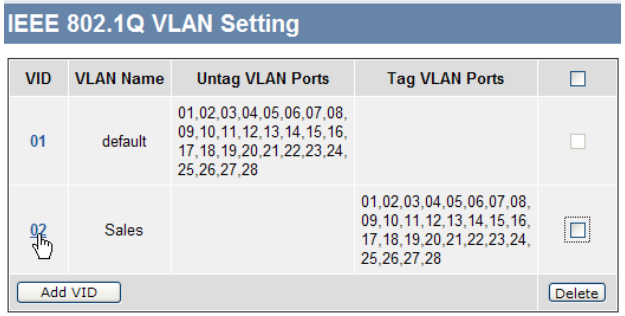
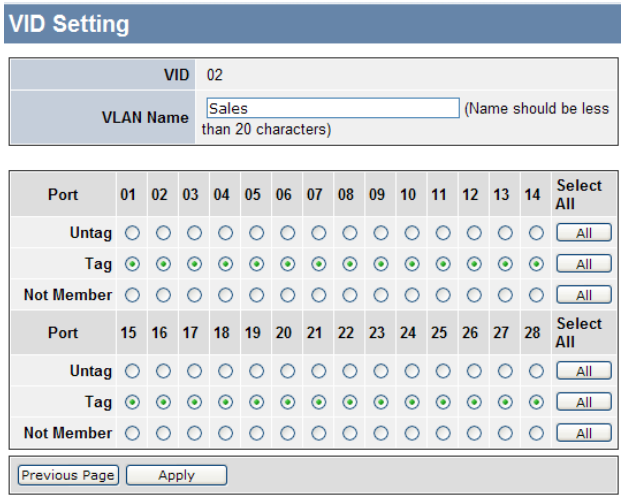


Figure 13. Delete VID

To change existing IEEE 802.1Q VLAN settings, press the VID to modify that IEEE 802.1Q VLAN setting.



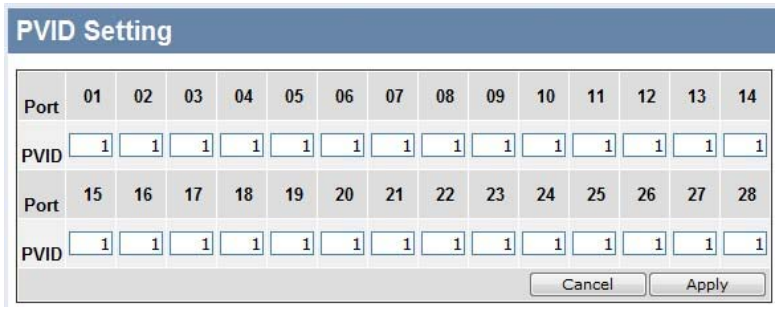
Modify VID



Modify VID

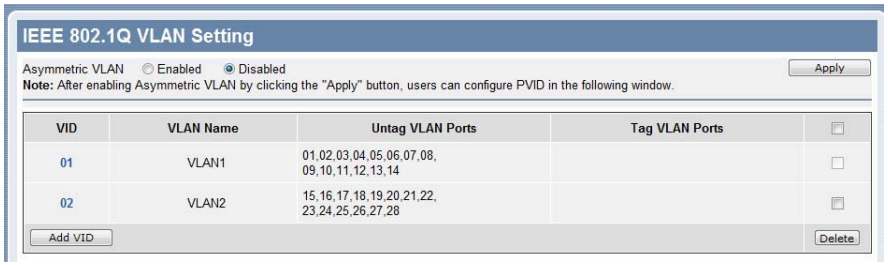
PVID settings:

While receiving an untagged frame from the port, the switch will assign a tag to the frame, using the PVID of the port as its VID.

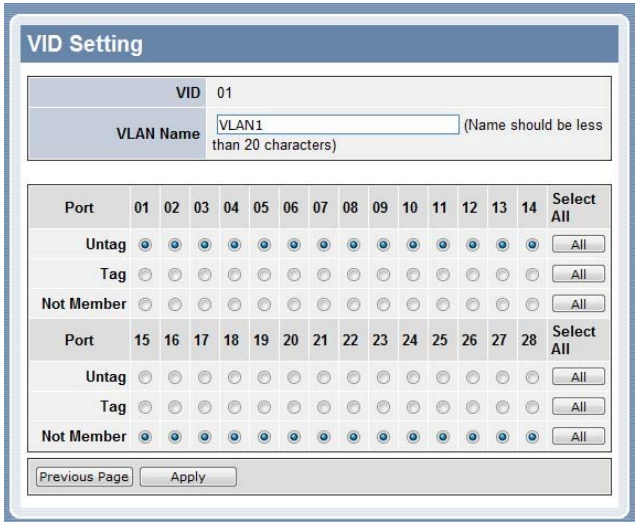


Here is an example of two VLAN groups with several ports on each group and VLAN 1 (VID 01) does not have communication with VLAN 2 (VID 02).

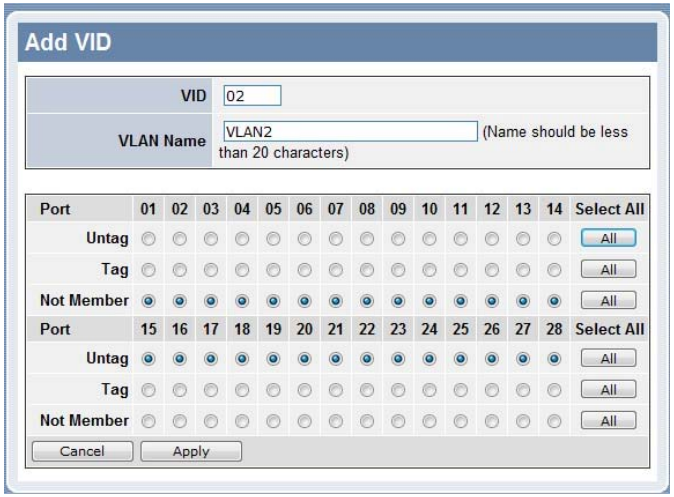
Example 1:



Step 1: Set VLAN 1 member port 15~28 to "**Net Member**" ports then apply settings



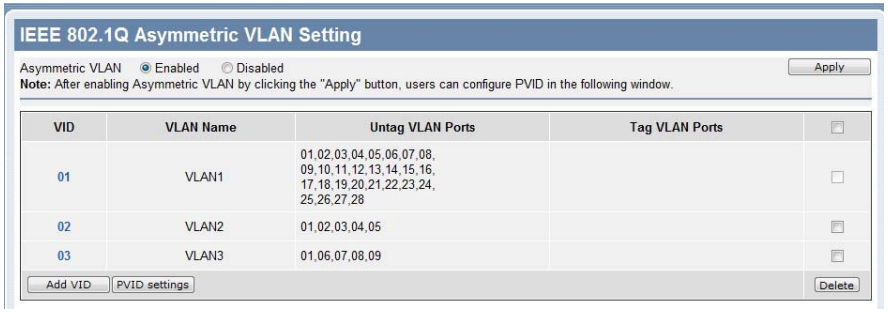
Step 2: Create VID 2 and set port 15~28 to "**Untag**" ports then apply settings



Example 2:

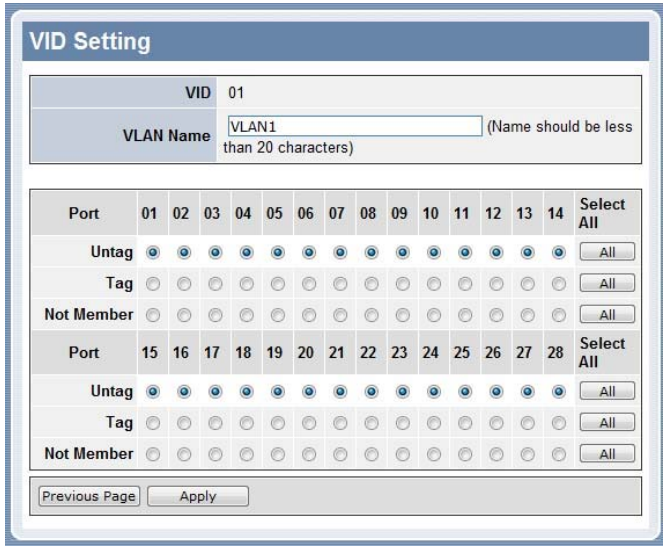
802.1Q Asymmetric VLAN settings example: port 1~24 in VLAN1, port 1~5 in VLAN 2, port 1/6~9 in VLAN 3. All VLAN1~3 have access to internet via port 1.

Note: The multi-need server must be support IEEE 802.1Q VLAN

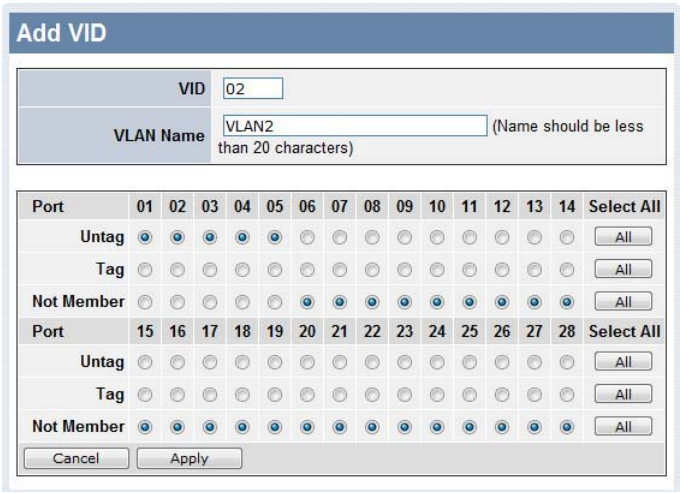


Step 1: Enable Asymmetric VLAN function

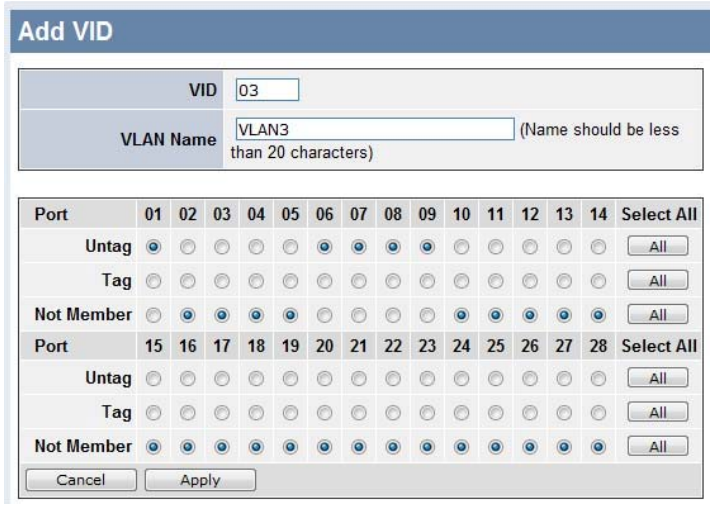
Step 2: Set VLAN1 port 1~28 to "**Untag**" ports then apply settings.



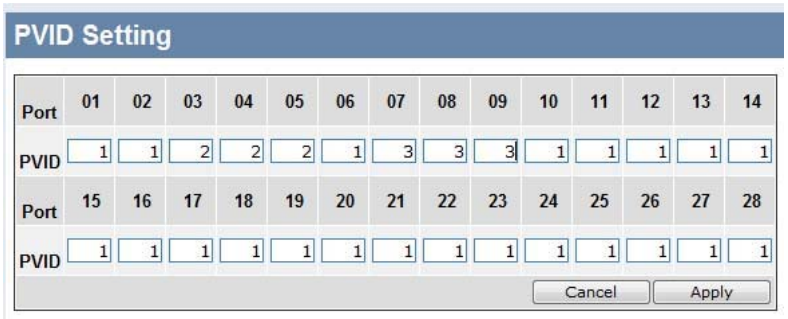
Step 3: Create VID 02 and set port 1~5 to "**Untag**" ports and port 6~28 to "**Not Member**" ports then apply settings.



Step 4: Create VID 03 and set port 1,6~9 to "**Untag**" ports and apply settings.



Step 5: Set PVID port 3~9 as shown in the below list then complete.



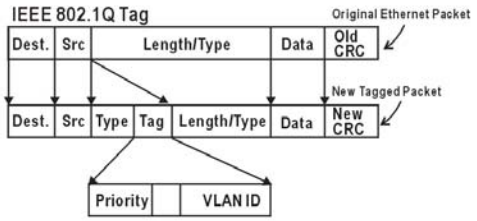
Note:

1. Untag port VLAN member can exist in different VLAN groups simultaneously when Asymmetric VLAN function enabled.
2. You must create VLAN and add VLAN member first that just can set PVID setting.
3. You must change Untag Port PVID to another existent VLAN ID that just can remove Untag port member from VLAN group

Tag VLAN Setting

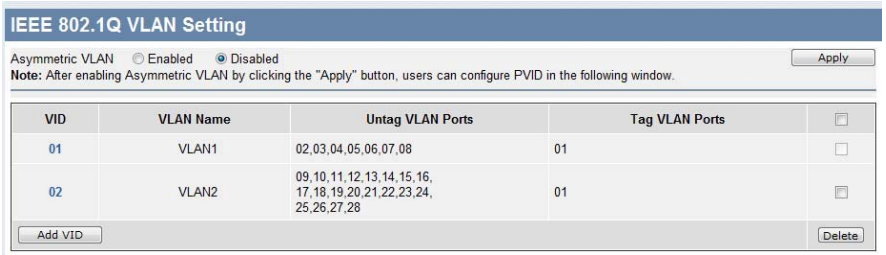
The IEEE802.1Q protocol defines a new format of the frame; it adds a tag header in the original Ethernet frame, as follows:

IEEE802.1Q Tag VLAN is divided by VLAN ID (VID). On receiving a frame, the switch checks the VID in the tag header of the frame to decide which VLAN it belongs to. If the receiving frame doesn't contain the tag header, the switch will assign a tag to the frame, using the PVID of the port as its VID.

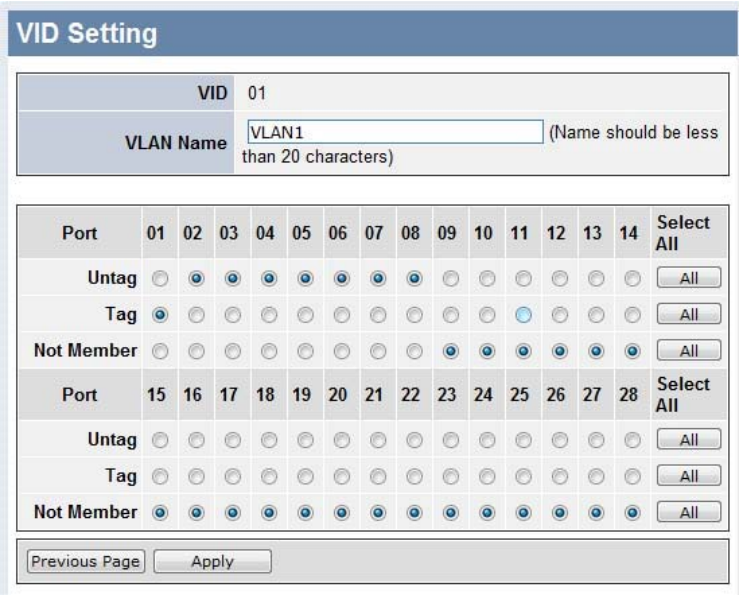


Example 3:

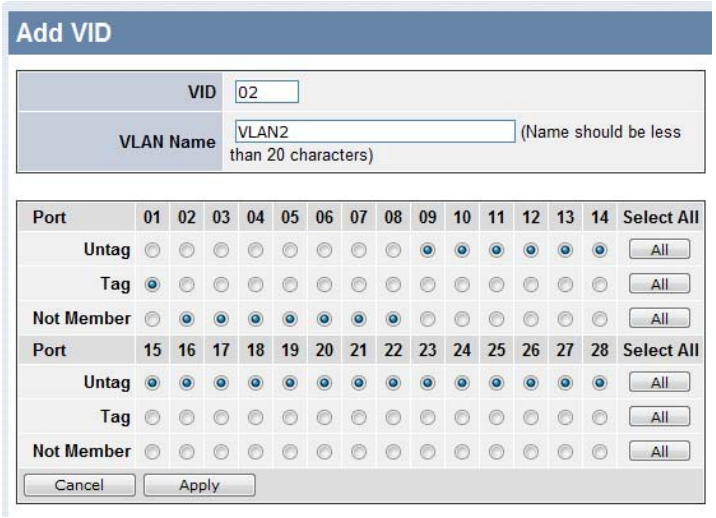
Create two VLAN groups for Tag ports multi-need server application setting and two VLAN clients cannot negotiate to each other. (Asymmetric VLAN function disabled)



Step 1: Set VLAN1 port 1 to "Tag" port and port 9~28 to "Not Member" ports then apply settings.



Step 2: Create VID 02 and set port 1 to “Tag” port and port 9~28 to “Untag” ports then apply settings.



Note: The multi-need server must be support IEEE 802.1Q VLAN, the sever uplink port is port1. The Tag port can exist in the different VLAN group simultaneously even Asymmetric VLAN function is disabled.

Example 4:

Setting tag VLAN with two switches. Switch 1’s VLAN 1 (2 ~ 3 ports) have access to the Switch 2’s VLAN**.** The settings of VLAN group for two devices are same.

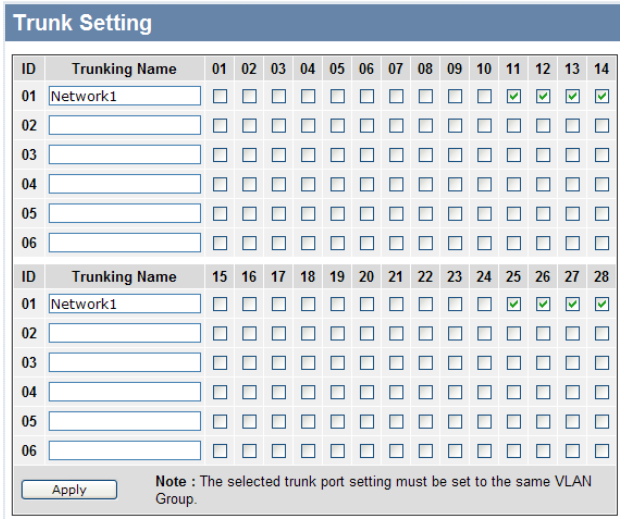
Step 1: Set Switch1’s VLAN1 port 1and 4~27 to “**Not Member**”, then apply setting.

Step 2: Set Switch2’s VLAN1 member as Switch1.

Step 3: Uplink two switches via Port 28

Trunk Setting

The Trunking function enables the cascading of two or more ports to increase bandwidth. Up to six Trunk groups may be created, each supporting up to 8 ports. Add a Trunking Name, select the ports to be trunked together, and click Apply.

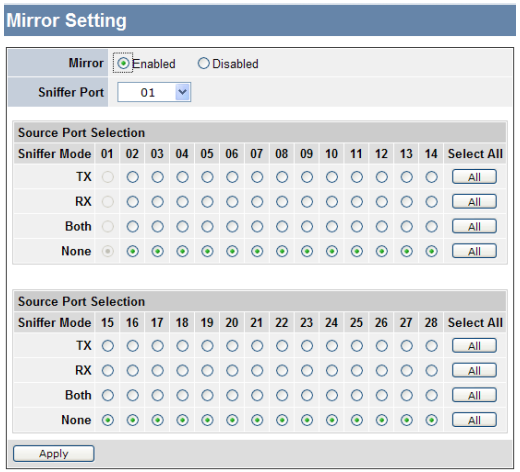


Trunk Configuration

Be sure that the trunked ports are not part of separate VLAN groups.

Mirror Setting

Port Mirroring is a method of monitoring network traffic that forwards a copy of each incoming and/or outgoing packet from one port of the Switch to another port where the packet can be studied. This enables network managers to better monitor network performances.



Selection of the Sniffer mode is as follows:

TX (transmit) mode: this mode will duplicate the data transmit from the source port and forward to the Sniffer port.

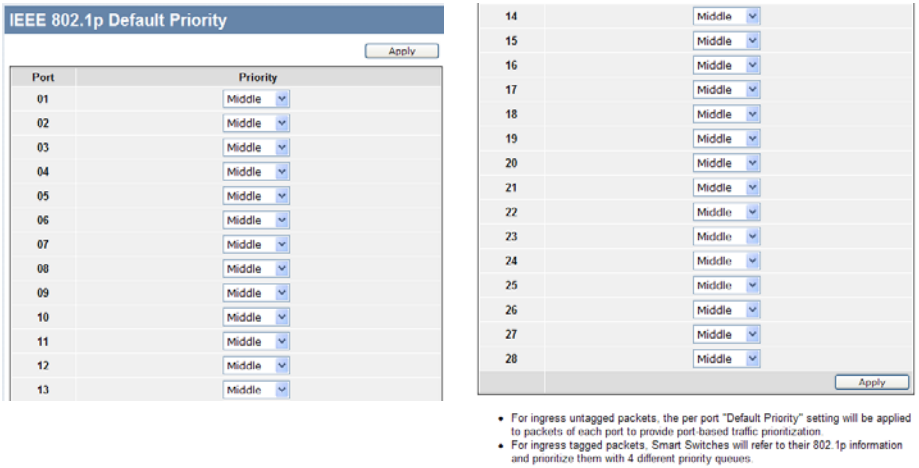
RX (receive) mode: this mode will duplicate the data that send to the source and forward to the Sniffer port.

Both (transmit and receive) mode: this mode will duplicate both TX and RX data transmissions. These data transmission will then be forward to the Sniffer port.

None mode: this mode will not duplicate data to the Sniffer port.

IEEE 802.1p Default Priority

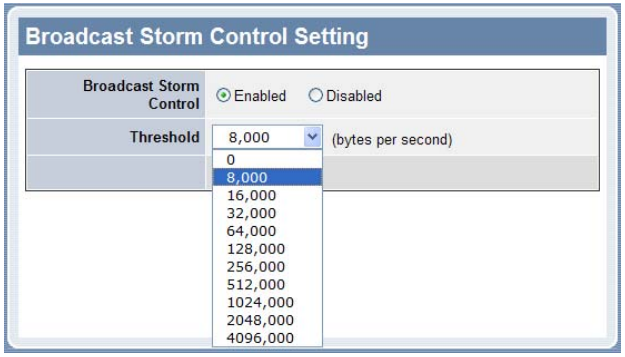
This feature displays the Quality of Service priority levels of each port. For packets that are untagged, the Switch will assign the priority in the tag depending on your configuration.



IEEE 802.1p Default Priority Setting

Broadcast Storm Control Setting

The Broadcast Storm Control feature provides the ability to control the receive rate of broadcasted packets. If Enabled (default is Disabled), threshold settings of 8,000 ~ 4,096,000 bytes per second can be assigned. Press Apply for the settings to take effect.



Broadcast Storm Control Setting

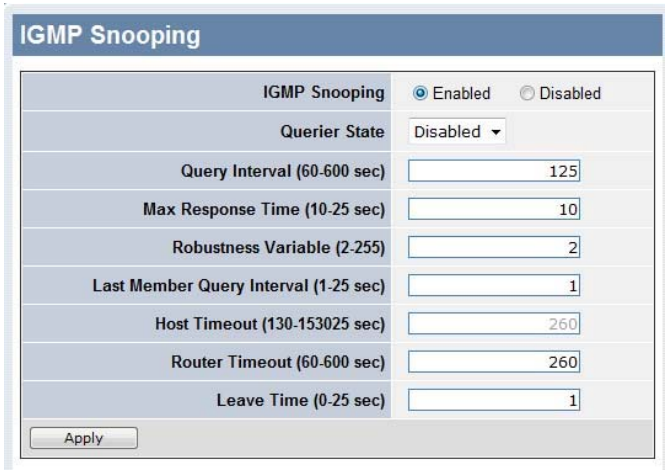
IGMP Snooping Setting

Find that there are two items, including *IGMP Global Setting and IGMP VLAN Setting* in Advanced menu.

IGMP Global Setting

With Internet Group Management Protocol (IGMP) snooping, the Web-Smart Switch can make intelligent multicast forwarding decisions by examining the contents of each frame's Layer 2 MAC header. IGMP snooping can help reduce cluttered traffic on the LAN.

With IGMP snooping enabled globally, the Web-Smart Switch will forward IP multicast traffic only to connections that have group members attached.



IGMP Snooping: Enable or Disable the IGMP Snooping function on the Web Smart Switch.

Querier State: Enable or Disable the Querier State of IGMP Snooping.

Query Interval (60-600 sec): The Query Interval is the interval between General Queries sent. By adjusting the Query Interval, the number of IGMP messages can increase or decrease; larger values cause IGMP Queries to be sent less often. Default is 125 seconds.

Max Response Time (10-25 sec): The Max Response Time specifies the maximum allowed time before sending a responding report. Adjusting this setting effects the "leave latency", or the time between the moment the last host leaves a group and when the routing protocol is notified that there are no more members. It also allows adjustments for controlling the frequency of IGMP traffic on a subnet. Default is 10 seconds.

Robustness Variable (1-255): The Robustness Variable allows adjustment for the expected packet loss on a subnet. If a subnet is expected to be lousy, the Robustness Variable may be increased. The Robustness Variable cannot be set zero, and SHOULD NOT be one. Default is 2 times.

Last Member Query Interval (1-25 sec): The Last Member Query Interval is the Max Response Time inserted into Group-Specific Queries sent in response to Leave Group messages, and is also the amount of time between Group-Specific Query messages. This value may be adjusted to modify the "leave latency" of the network. A reduced value results in reduced time to detect the loss of the last member of a group. Default is 1 second.

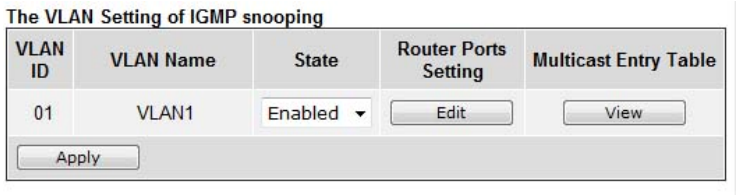
Host Timeout (130-1225 sec): This is the interval after which a learnt host port entry will be purged. For each host port learnt, a 'PortPurgeTimer' runs for 'HostPortPurgeInterval'. This timer will be restarted whenever a report message from host is received over that port. If no report messages are received for 'HostPortPurgeInterval' time, the learnt host entry will be purged from the multicast group. Default is 260 seconds.

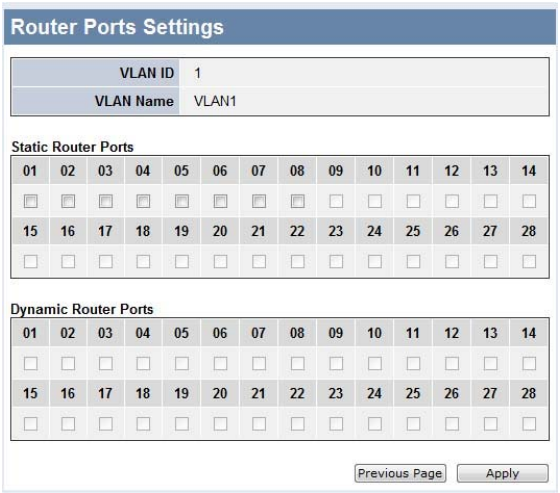
Router Timeout (60-600 sec): This is the interval after which a learnt router port entry will be purged. For each router port learnt, a 'RouterPortPurgeTimer' runs for 'RouterPortPurgeInterval'. This timer will be restarted whenever a router control message is received over that port. If no router control messages are received for 'RouterPortPurgeInterval' time, the learnt router port entry will be purged. Default is 125 seconds.

Leave Timer (0-25 sec): This is the interval after which a Leave message is forwarded on a port. When a leave message from a host for a group is received, a group-specific query is sent to the port on which the leave message is received. A timer is started with a time interval equal to IgsLeaveProcessInterval. If a report message is received before above timer expires, the Leave message is dropped. Otherwise the Leave message is either forwarded to the port. Default is 1 second.

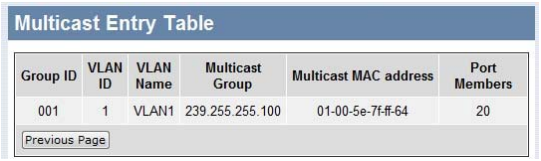
IGMP VLAN Setting

To enable IGMP snooping for a given VLAN, select Enable under State then press the Edit button under Static Router Port Setting, then select the ports to be assigned for IGMP snooping for the VLAN, and press Apply for changes to take effect.





To view the Multicast Entry Table for a given VLAN, press the View button.

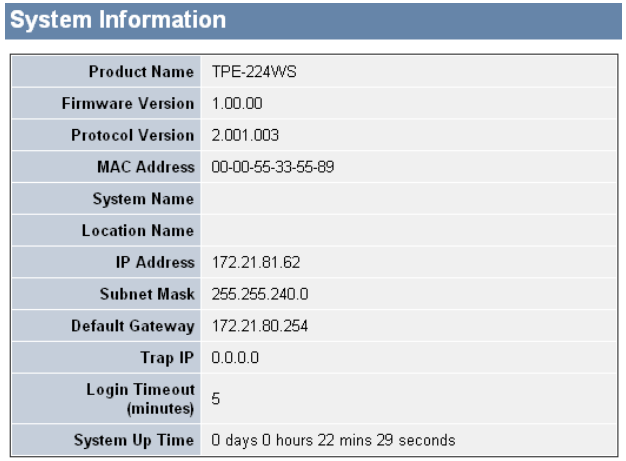


System Setting

The following links appear under System Settings: *System Information, System Setting, Trap Setting, Password Setting, Statistics, Factory Reset, Backup Setting, Firmware Upload and System Reboot*.

System Information

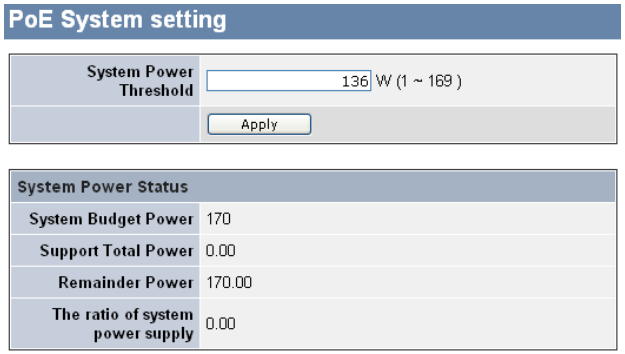
Click on ***"System Information"*** to display the system information status on this screen. This page displays the Product Name, Firmware Version, Protocol Version, MAC Address, System Name, Location Name, IP Address, Subnet Mask, Default Gateway, Trap IP, Login Timeout and System Up Time.



System Information

PoE System Setting

This PoE System Setting page will display the PoE status including System Budget Power, Support Total Power, Remainder Power, and the ratio of system power supply.



PoE System Setting

System Power Threshold:

When the ratio of the system power supply is larger than or smaller than the ***System Power Threshold*** Setting, the Switch will send trap events to the management computer.

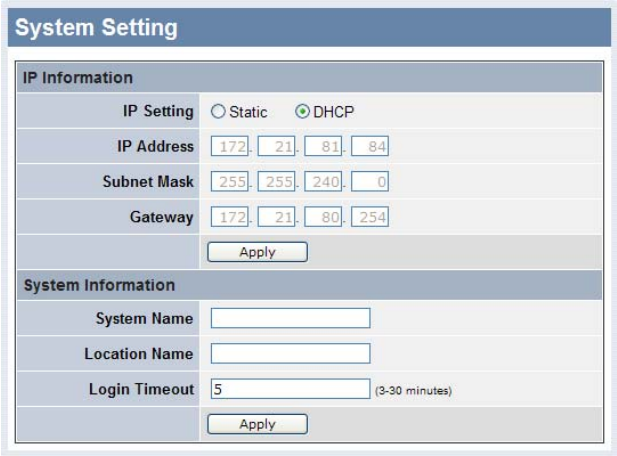
Note: When the system power overload occurs, the Switch will enforce the PoE port priority management; Port 1 has the highest priority. Port 24 has the lowest priority.

System Setting

System Setting includes IP Information and System information. There are two ways to configure an IP Address on the Switch: Static and DHCP (Dynamic Host Configuration Protocol).

When using static mode, the IP Address, Subnet Mask and Gateway must be manually configured. When using DHCP mode, the Switch will first look for a DHCP server to provide it with an IP address, network mask, and default gateway before using the default or previously entered settings. By default the IP setting is static mode.

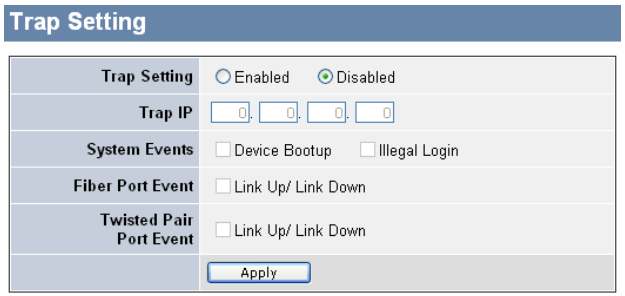
By entering a System Name and System Location, the device can be identified easier through the Web Management Utility and in other Web-Smart devices on the LAN. The Login Timeout controls the idle time-out for security purposes, when there is no action in the Web-based Utility. When the Login Timeout expires, the Web based Utility requires the user to login to the browser configuration.



System Setting

Trap Setting

By configuring the Trap Setting, it allows you to monitor specified events on this Web-Smart Switch through the Web Management Utility. By default, Trap Setting is Disabled. When the Trap Setting is Enabled, enter the Destination IP address of the managing PC that will receive the trap information.



Trap Setting

System Events: Monitoring the system's trap.

Device Bootup: a trap when booting up the system.

Illegal Login: a trap when an incorrect password is entered. The Switch will record the IP address of the computer.

Fiber Port Event: Monitoring the Fiber port status.

Link Up/Link Down: a trap for link status on the mini-GBIC connection.

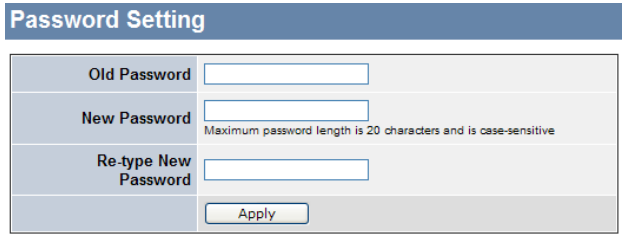
Twisted Pair Port Event: Monitoring the twisted pair port status.

Link Up/Link Down: a trap for link status happens in 1000BASE-T connection.

Password Setting

Setting a password is an invaluable tool for managers to secure the Web Smart PoE Switch. After entering the old password and the new password two times, press Apply to save settings..

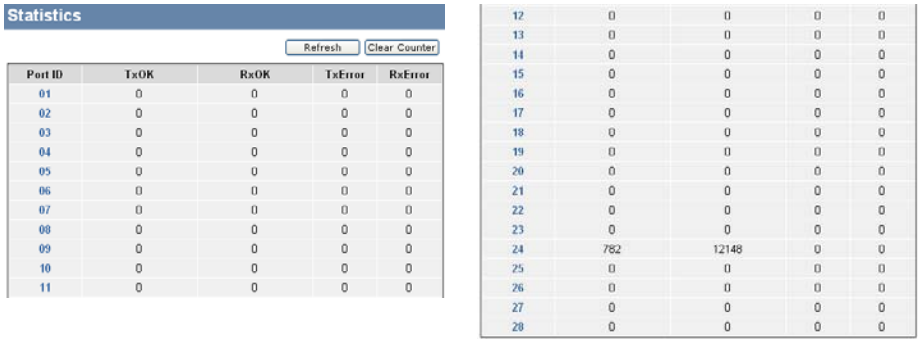
If you forgot the password, press the ***"Reset"*** button in the front panel of the Switch. Settings include VLAN, Port Setting… etc. will be lost and the Switch will restore to the default settings.



Password Setting

Statistic

The Statistic Menu screen will show the status of each port packet count.



Statistics

Refresh: To renew the details collected and displayed.

Clear Counter: To reset the details displayed.

To view the statistics of individual ports, click one of the Port ID as Figure 14.

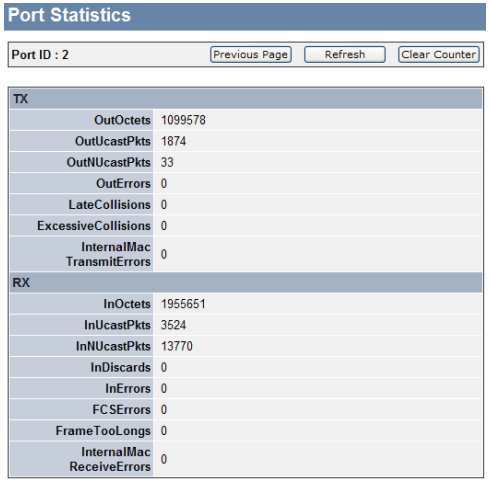
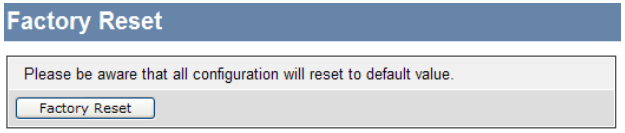


Figure 14. Port Statistics

Factory Reset

The Factory Reset option allows you to reset the device back to the default setting from the factory. The configuration will reset to factory defaults. The IP address of the device will reset to the default IP address.



Factory Reset

Backup Setting

The backup setting option allows you to save the current settings of the Switch. Click the ***"Backup"*** button to save settings.

To restore a current setting file to the device, you must specify the backup file and press ***"Restore"***.

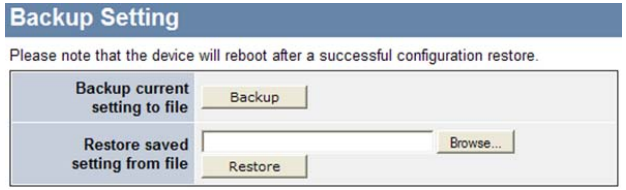
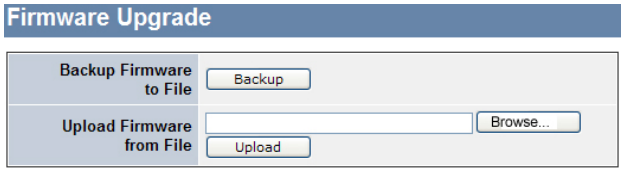


Figure 15. Backup Setting

Note: when restoring saved configuration, the current password will not be erased.

Firmware Upload

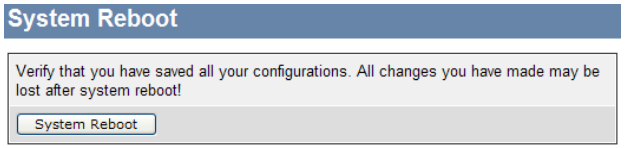
The Firmware Upload option allows you to backup or upload firmware from/to the Switch. Click the ***"Backup"*** button to save the current firmware of the Switch; To restore or upgrade firmware to the Switch, you must specify the firmware file and press ***"Upload"***.



Firmware Upload

System Reboot

Provides a safe way to reboot the system. Ensure the configuration has been saved before performing a system reboot. Changes you have made may be lost after system reboot.



System Reboot

Logout

When press this function, the web configuration will go back to first Login page.

TECHNICAL SPECIFICATIONS

General	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet IEEE 802.3ab 1000BASE-T Gigabit Ethernet IEEE 802.3z 1000BASE-SX/LX Gigabit Ethernet IEEE 802.3af Power over Ethernet
Protocol	CSMA/CD
Data Transfer Rate	Ethernet: 10Mbps (half-duplex), 20Mbps (full-duplex) Fast Ethernet: 100Mbps (half-duplex), 200Mbps (full-duplex) Gigabit Ethernet: 2000Mbps (full-duplex)
Topology	Star
Network Cables	10BASET: UTP Cat. 3, 4, 5; up to 100m 100BASE-TX: UTP Cat. 5, 5e; 6 up to 100m 1000BASE-T: UTP Cat. 5e, 6; up to 100m Fiber module: mini-GBIC Fiber module
Number of Ports	24 × 10/100M 100BASE-TX PoE Fast Ethernet Ports 4 x 10/100/1000M 1000BASE-T Gigabit Ethernet Ports 2 x mini-GBIC Slots (shared with port 25 and 26 1000BASE-T ports)
Physical and Environmental	
AC inputs	100-240V AC, 50-60 Hz internal universal power supply
Power Consumption	26.5 watts. max. (no PD device connected) 196.5 watts. max. (up to 11 PoE Device connected)
Temperature	Operating: 0~ 40 °C, Storage: -10 ~ 70 °C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	440 x 210 x 44 mm (L x W x H)
Certifications	CE, FCC

Power over Ethernet	
Standard	IEEE 802.3af
Power current	Up to 15.4W per PoE port
PD Classification	Maximum 170W for all PoE ports
PoE pin assignment	Auto PD classification identify
Safety protection	Power(+): pin 3 & pin 6 in RJ-45 Power(-): pin 1 & pin 2 in RJ-45
Performance	
Transmits Method:	Store-and-forward
RAM Buffer:	1Mbits per device
Filtering Address Table:	8K entries per device
MAC Address Learning:	Automatic update
Packet Filtering / Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps 1000Mbps Gigabit Ethernet: 1,488,000/pps

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TPE-224WS – 5 Years Warranty

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Governing Law: This Limited Warranty shall be governed by the laws of the state of California.

Note: AC/DC Power Adapter, Cooling Fan, and Power Supply carry 1-Year Warranty

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Product Warranty Registration

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