TRENDnet®

User's Guide

TPE-224WS

1.12

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).

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INTRODUCTION

This chapter describes the features of the TPE-224WS 24-Port 10/100Mbps Web Smart PoE Switch w/ 4 Gigabit Ports and 2 Mini-GBIC Slots 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.

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 IGMP Snooping
- Supports SNMP for RFC1213 MIB II and Private MIB
- Supports IEEE 802.1D Spanning Tree

- Supports 802.1x port based access control
- 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
- Quick Installation Guide
- Power Cord
- Utility and User's Guide CD-ROM
- Rack mount Kit

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.

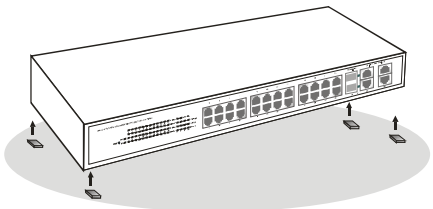


Figure 1. Attach the rubber feet to the bottom

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.

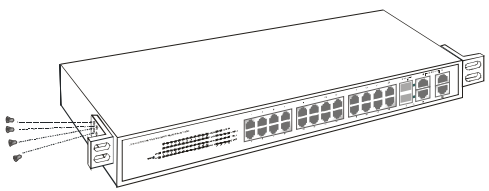


Figure 2. Attach the mounting bracket to the Switch with the provided screws.

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

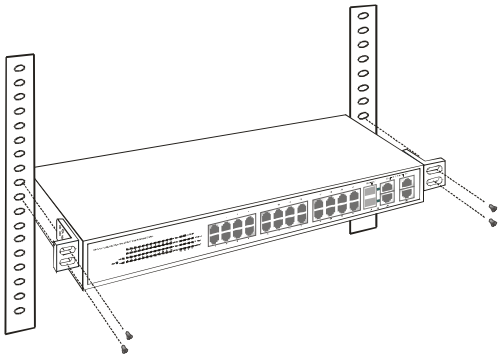


Figure 3. Mount the Switch to the rack

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.

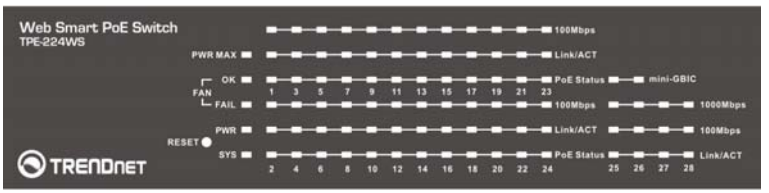


Figure 6. LED indicators

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

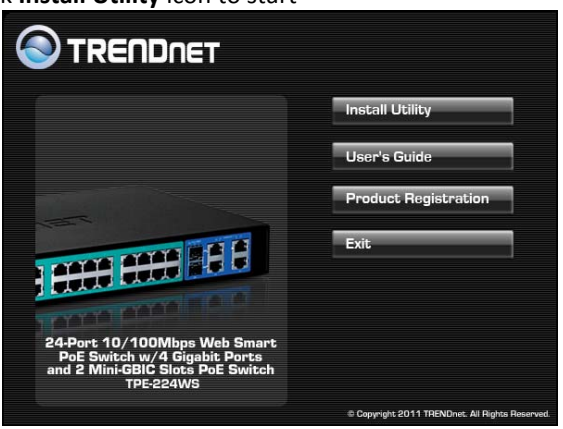
You can configure the Switch such as VLAN, Port Trunking, and Broadcast Storm … etc using the Web Browser.

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

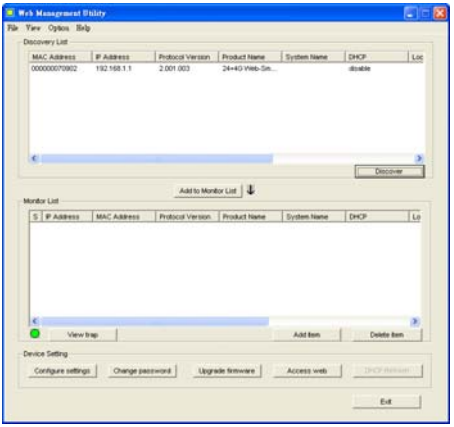
The following are step-by-step instructions for installing the Web Management utility.

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 ***"Discover"*** 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 can receive events that occur from the Web Management Switch listed in the Monitor List. *For information on Trap settings using the Web Management Utility refer to the* ***Trap Setting*** *section in the manual.*

There is a light indicator near the ***"View Trap"*** button. A Green light indicates that there has not been any new trap information transmitted. A Red light indicates new trap information being transmitted and is set as a reminder to view the trap.

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.

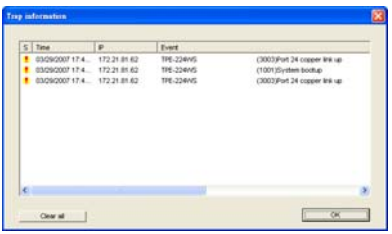


Figure 8. Trap Information

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.

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"***.

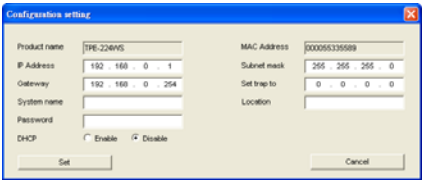


Figure 9. Configuration Setting

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

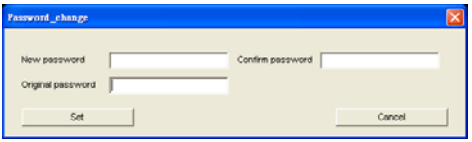


Figure 10. Password Change

Firmware Upgrade: When the device has a new function, there will be a new firmware to update the device, use this function to update. Select the path of where the firmware updated firmware is located by clicking ***"Browse"***. Once you have selected the firmware, type the password of the device

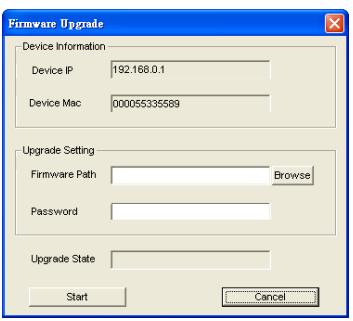


Figure 11. Firmware Upgrade

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

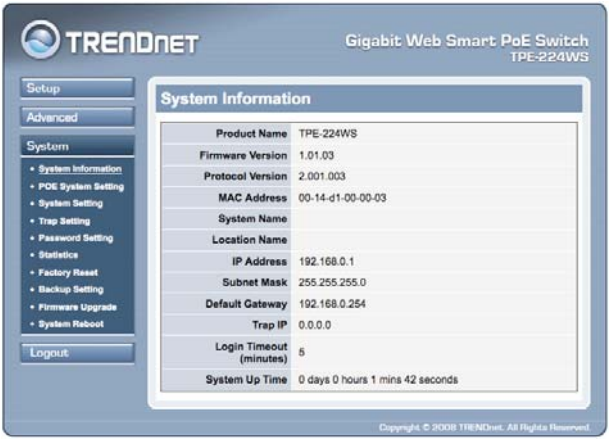
Before you configure this device, make sure your computer is on the same subnet as the Web Smart PoE Switch. For example, since the default IP address of the Web Smart PoE Switch is ***192.168.0.1***, then the computer should be set at 192.168.0.x (where x is a number between 2 and 253), and the default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

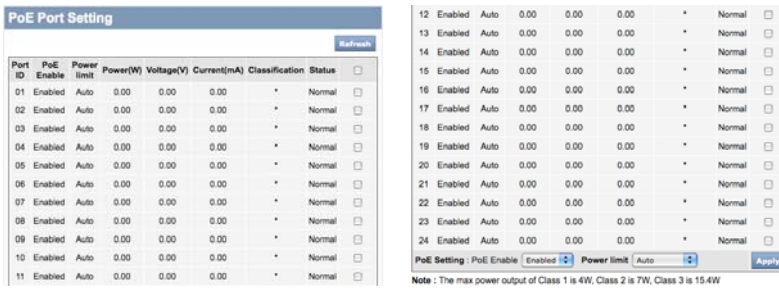


Figure 12. PoE Port Setting

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

In Port Settings menu (Figure 13), this page will show each port’s status, selected drop down menu to set each port’s *Speed, and QoS priority* then press *“Apply”* button to activate changes. To refresh the information table to view the latest port setting and Link Status, press the Refresh button.

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

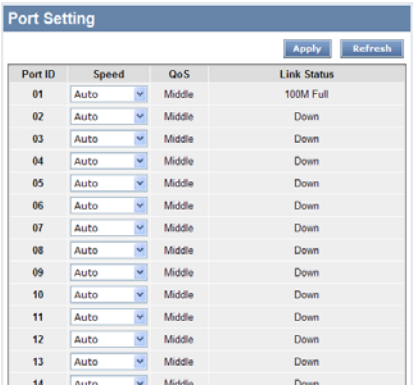


Figure 13. Port Setting

Note: The priority of 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 are 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 are Auto.

The 25~26 Mini-GBIC (Gigabit Fiber) connections can operate in Forced Mode settings (1000M Full), Auto, or 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 group of ports that can be anywhere in the network, but communicate as though they were in the same area.

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), and therefore help to simplify network management by allowing users to move devices to a new VLAN without having to change any physical connections.

IEEE802.1Q VLAN function base on VID and PVID to distributes different VLAN groups. But ***IEEE802.1Q VLAN*** doesn't support multi-need server application via Untag port (Untag Port cannot overlap in different VLAN groups). For multi-need server application via Untag Port that the device support ***IEEE802.1Q Asymmetric VLAN*** function can be covered it.

Asymmetric VLAN

IEEE 802.1Q Asymmetric VLAN default setting is “Disabled”, you can press “Enabled” radio button and ***Apply*** it to submit the Asymmetric VLAN function.

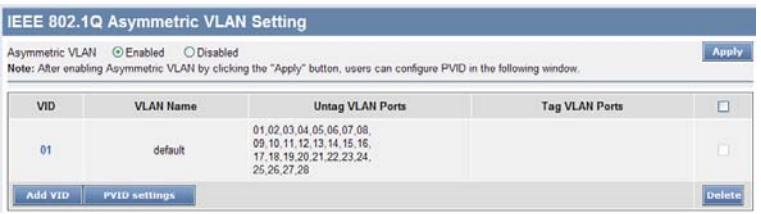


Figure 14. Enabled Asymmetric VLAN function

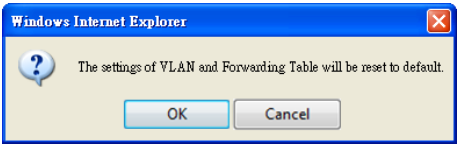


Figure 15. Change setting warning message

Note: The Settings of VLAN, IGMP Snooping and Forwarding Table will be reset to default.

Untag Asymmetric VLAN Setting:

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”.

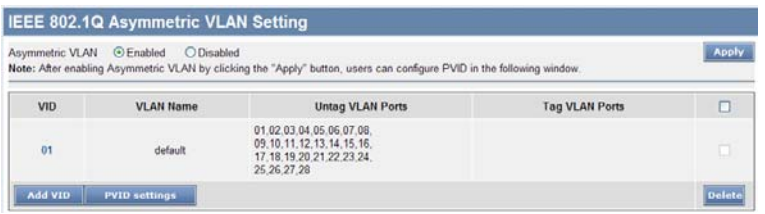


Figure 16. 802.1Q Asymmetric VLAN Setting

Add VID: Click to create a new VID group, assigning ports 1 ~ 28 as Untag, Tag, or Not Member. A port can be "Untagged" in only one VID. To save the VID group, press Apply.

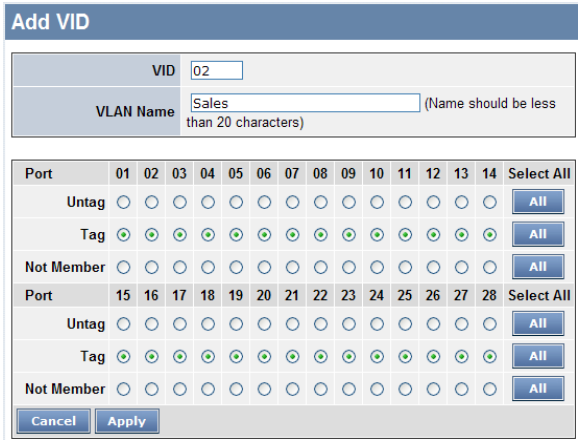


Figure 17. Add New VID

VID: A unique VLAN ID.

VLAN Name: A VLAN name is used to associate with the VLAN ID.

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.

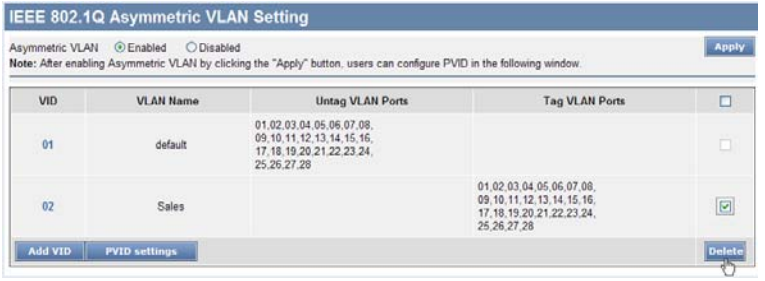


Figure 18. Delete VID

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

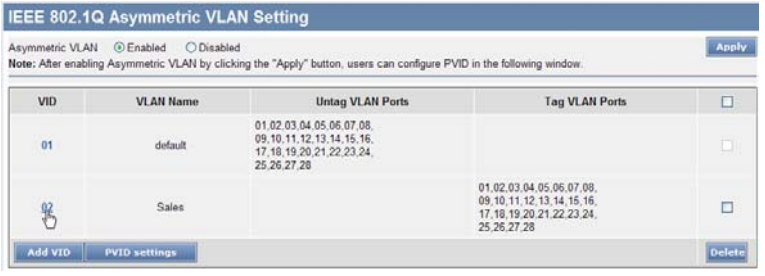


Figure 19. Modify VID

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.

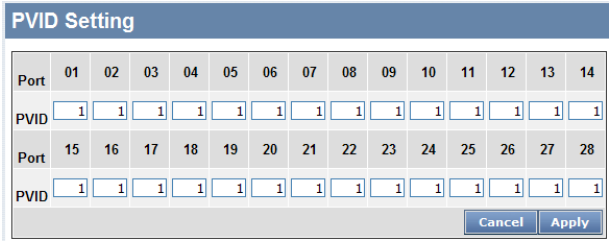


Figure 20. PVID Setting

Example 1:

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

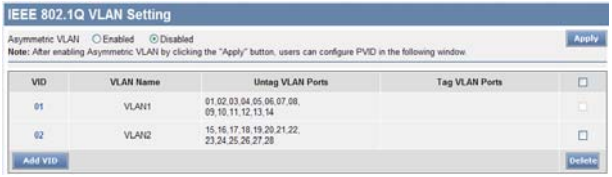


Figure 21.

Step1: Set VID 01 port 1~14 to “Untag” ports and 15~28 to “Not Member” ports then apply setting.

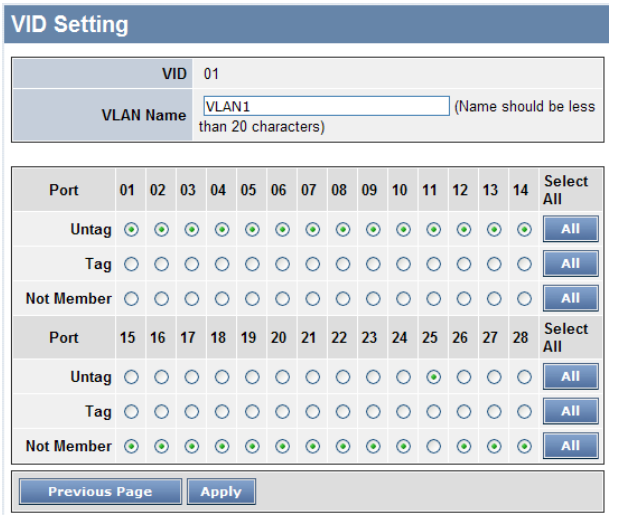

VID Setting
VID
01
VLAN Name
VLAN1
(Name should be less than 20 characters)
Port
01 02 03 04 05 06 07 08 09 10 11 12 13 14
Select All
Untag
Tag
Not Member
All
Port
15 16 17 18 19 20 21 22 23 24 25 26 27 28
Select All
Untag
Tag
Not Member
All
Previous Page
Apply

Figure 22.

Step2: Create VID 02 and set port 1~14 to “Not Member” ports and 15~28 to “Untag” ports member then apply setting.

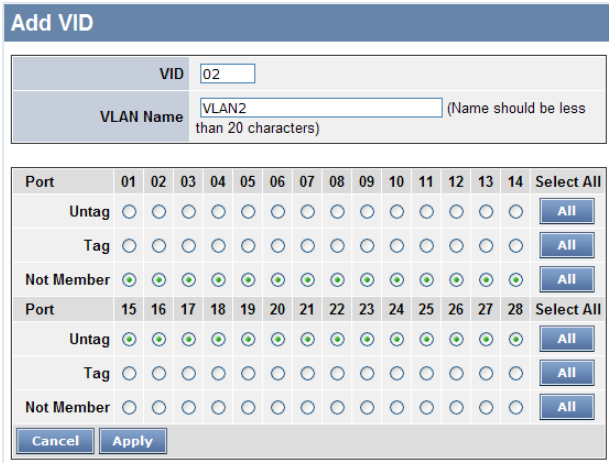
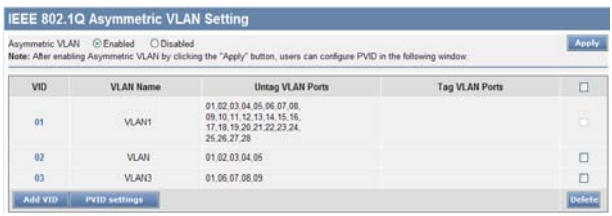


Figure 23.

Example2:

802.1Q Asymmetric VLAN settings example:

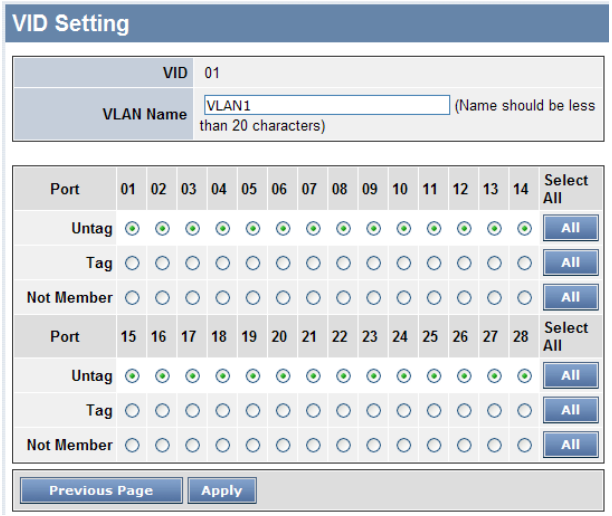
Port 1~28 in VLAN 1, port1~5 in VLAN 2, port1,6~9 in VLAN 3. All VLAN1~3 have access to Internet via port 1.



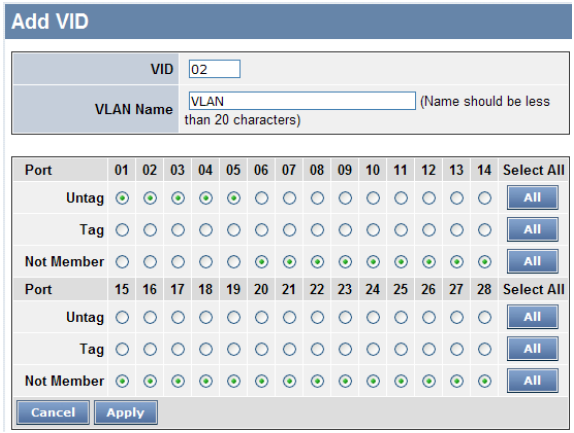
Note: The multi-need server must be support IEEE 802.1Q VLAN

Step1: Enable Asymmetric VLAN function.

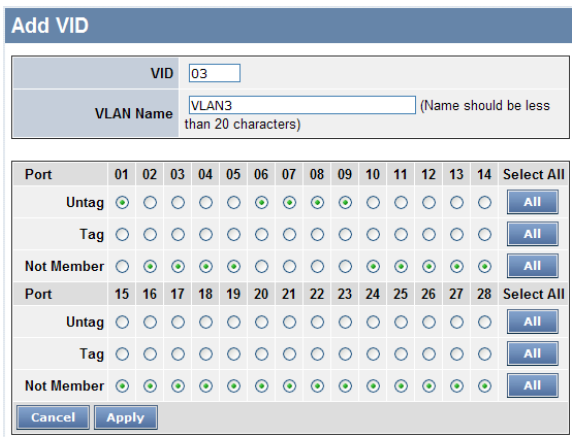
Step2: Set VLAN1 port 1~28 to "**Untag**" ports, then apply setting.



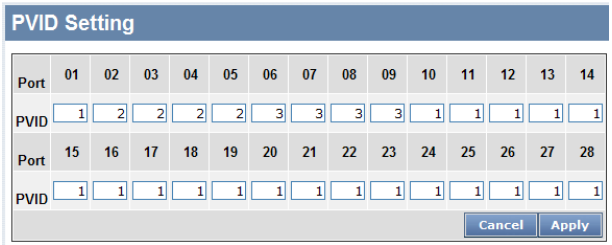
Step3: Create VID 02 and set port 1~5 to "**Untag**" ports and port 6~28 to "**Not Member**" ports, then apply setting.



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



Step 5: Set PVID port 2~9 value as below list



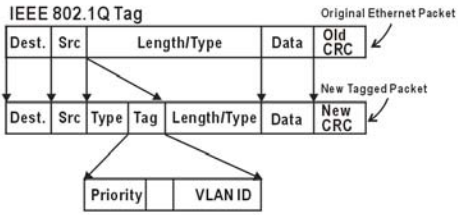
Note:

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

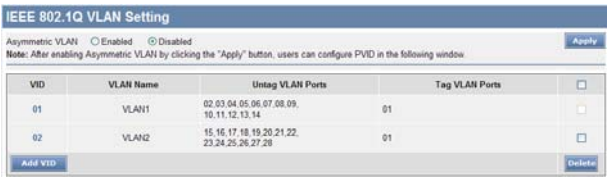
The IEEE802.1Q protocol defines a new format of the frame; it adds a tag header in the original Ethernet frame, as follows:

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.

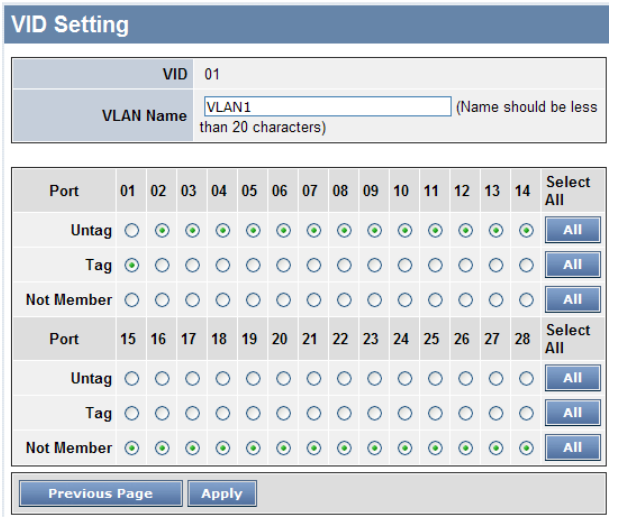


Example 3:

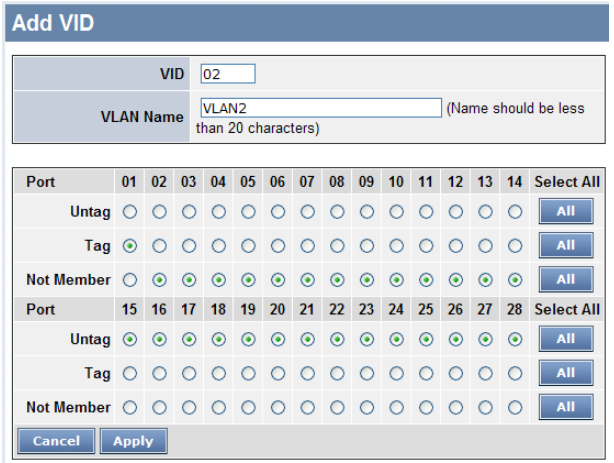
Create two VLAN groups for Tag ports multi-need server application setting and two VLAN clients cannot negotiate to each other. (Asymmetric VLAN function disabled)



Step1: Set VLAN1 port 1 to “Tag” port, port 2~14 to “Untag” ports, and port 15~28 to “Not Member” ports then apply setting.


VID Setting
VID
01
VLAN Name
VLAN1
(Name should be less than 20 characters)
Port
01 02 03 04 05 06 07 08 09 10 11 12 13 14
Select All
Untag
Tag
Not Member
All
Port
15 16 17 18 19 20 21 22 23 24 25 26 27 28
Select All
Untag
Tag
Not Member
All
Previous Page
Apply

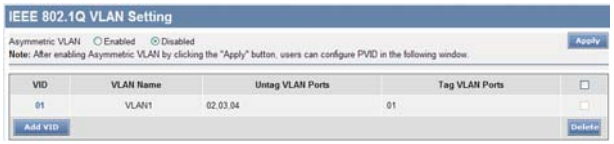
Step 2: Set VLAN2 port 1 to “Tag” port, port 15~28 to “Untag” ports, and port 2~14 to “Not Member” ports then apply setting.



Note: The multi-need server must be support IEEE 802.1Q VLAN, the sever uplink port is port 1.

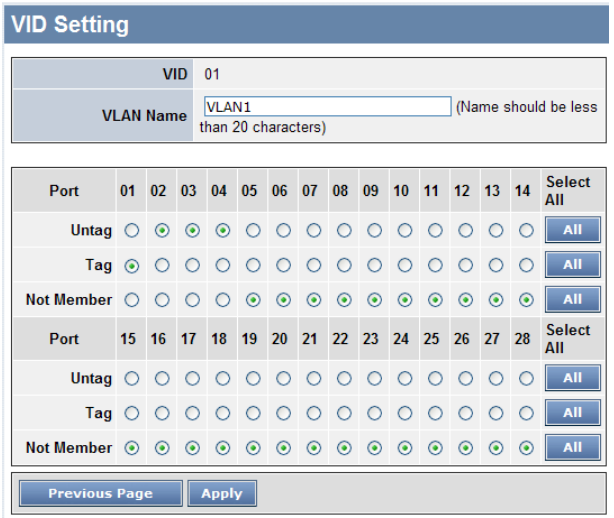
Example 4:

Setting Tag VLAN on two switches. Switch 1’s VLAN 1 (2 ~ 4 ports) have access to the Switch 2’s VLAN 1 (2 ~ 4 ports).



The settings of VLAN group for two devices are same.

Step1: Set Switch1's VLAN1 port 1 to **"Tag"** and 5~28 to "**Not Member**", then apply setting.



Step2: Set Switch2's VLAN1 member as Switch1.

Step3: Uplink two switches via Port 1.

Trunk Setting

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

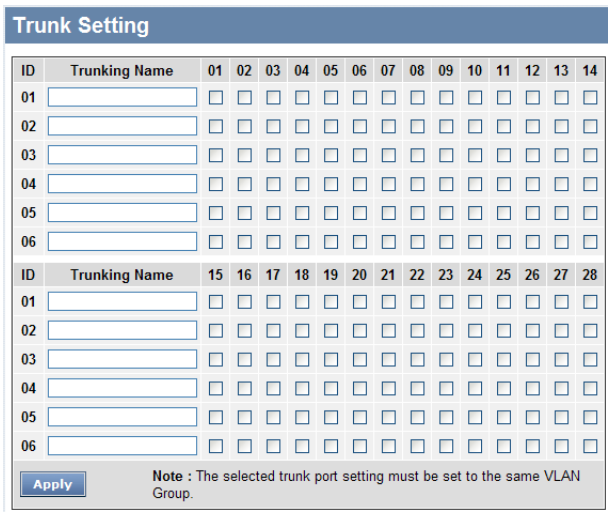


Figure 24. Trunk Configuration

Be sure that the selected trunk setting port must connect to the device with a same VLAN group.

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.

Figure 25. Mirror Setting

Selection of the Sniffer mode is as follow:

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

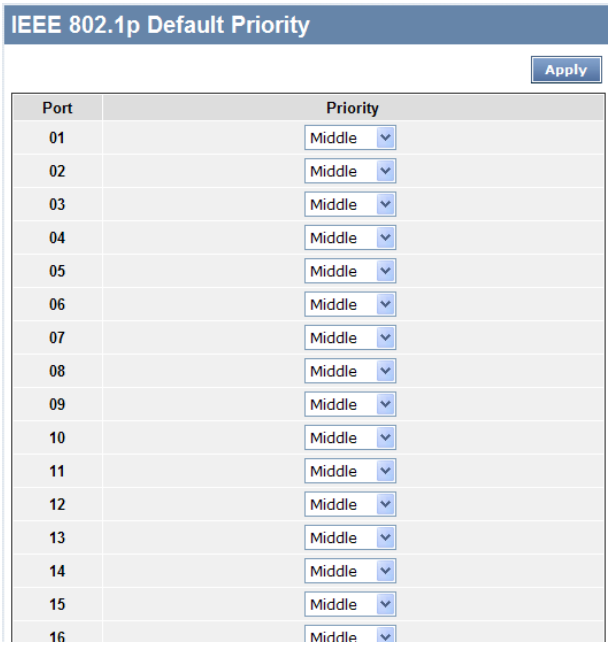
RX (receive) mode: this mode will duplicate the data that send to the source and forward to the Sniffer port.

Both (transmit and receive) mode: this mode will duplicate both the

data transmit from and data that send to the source port, then it will forward to the Sniffer port.

IEEE 802.1p Default Priority

This feature displays the status Quality of Service priority levels of each port, and 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.

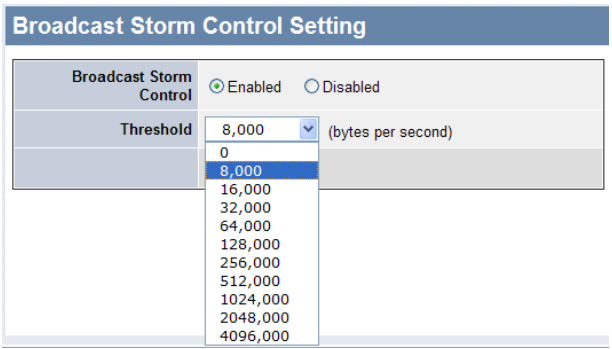


Figure 26. Broadcast Storm Control Setting

Advanced Setting

Find that there are four items, including *SNMP Setting, Spanning Tree Setting, 802.3x Setting and IGMP Snooping Setting* in Advanced menu.

SNMP Setting

The Web Smart Switch supports SNMP include software (referred to as an agent), which runs locally on the device. A defined set of variables (managed objects) is maintained by the SNMP agent and used to manage the device. These objects are defined in a Management Information Base (MIB), which provides a standard presentation of the information controlled by the on-board SNMP agent. SNMP defines both the format of the MIB specifications and the protocol used to access this information over the network.

Figure 27. SNMP Setting

SNMP Setting: Enable or Disable the SNMP function on the Web Smart Switch.

Community Setting: In support of SNMP version 1, the Web-Smart Switch accomplishes user authentication by using Community Settings that function as passwords. The remote user SNMP application and the Switch SNMP must use the same community string. SNMP packets from a station that are not authenticated are ignored (dropped).

Read_Only: The community with read-only privilege allows authorized management stations to retrieve MIB objects. (Default: public)

Read_Write: The community with read/write privilege allows authorized management stations to retrieve and modify MIB objects. (Default setting: private)

Trap Setting: Enable or Disable the Trap function on the Web Smart Switch.

Traps are messages that alert network personnel of events that occur on the Switch. Such events can be as serious as a reboot (someone accidentally turned the Switch OFF), or less serious events such as a port status change. The Switch can generate traps and send them to the trap recipient (i.e. network administrator).

Trap Name: Enter a Trap Name (i.e. Trap Name must be selected from a Community Name)

IP: Enter the IP of the device to be monitored, and choose the event(s) to trap.

Event: The available trap Events to choose from include: ***System Device Bootup***, ***Fiber Link Up / Link Down***, ***Fiber Abnormal Receive Error***, ***Fiber Abnormal Transmit Error***, ***Twisted Pair Link Up / Link Down***, ***Twisted Pair Abnormal Receive Error***, ***Twisted Pair Abnormal Transmit Error***.

Spanning Tree Setting

The Web Smart Switch supports IEEE 802.1D Spanning Tree Protocol (STP) implementation is designed to prevent network loops that could cause a broadcast storm. When the physical links forming a loop provide redundancy, only a single path will be forwarding frames. If the link fails, STP activates a redundant link automatically.

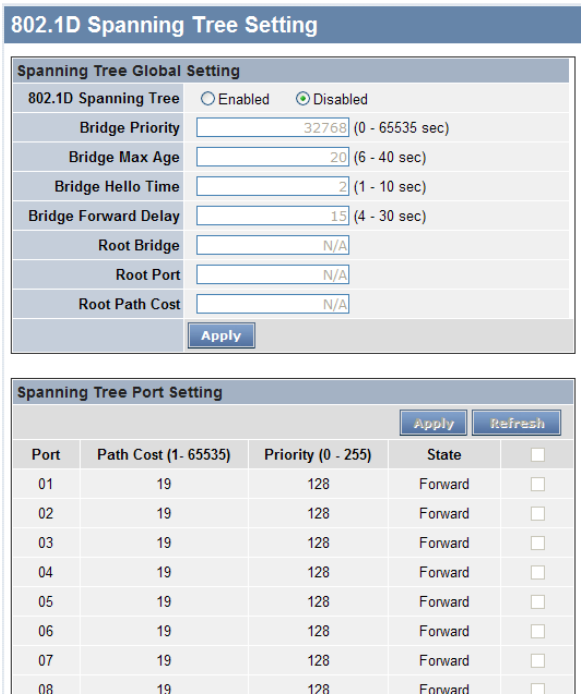


Figure 28. Spanning Tree Setting

802.11D Spanning Tree: Enable or Disable the 802.11D Spanning function on the Web Smart Switch.

Bridge Priority: This value between 0 and 65535 specifies the priority for forwarding packets: the lower the value, the higher the priority. The default is 32768.

Bridge Max Age: This value may be set to ensure that old information does not endlessly circulate through redundant paths in the network,

preventing the effective propagation of the new information. Set by the Root Bridge, this value will aid in determining that the Switch has spanning tree configuration values consistent with other devices on the bridged LAN. If the value ages out and a BPDU has still not been received from the Root Bridge, the Switch will start sending its own BPDU to all other switches for permission to become the Root Bridge. If it turns out that the Switch has the lowest Bridge Identifier, it will become the Root Bridge. A time interval may be chosen between 6 and 40 seconds. The default value is 20.

Bridge Hello Time: The user may set the time interval between transmissions of configuration messages by the root device, thus stating that the Switch is still functioning. The default is 2 seconds.

Bridge Forward Delay: This sets the maximum amount of time that the root device will wait before changing states. The default is 15 seconds.

Root Bridge: Displays the MAC address of the Root Bridge.

Root port: Displays the root port.

Root Path Cost: Shows the root path cost.

Path Cost: This defines a metric that indicates the relative cost of forwarding packets to specified port list. The lower the number, the greater the probability the port will be chosen to forward packets. The default value is 19.

Path Priority: Select a value between 0 and 255 to specify the priority for a specified port for forwarding packets: the lower the value, the higher the priority. The default is 128.

802.1x Setting

The IEEE 802.1x provides a security standard for network access control. 802.1x holds a network port disconnected until authentication is completed. Depending on the results, the port is

either made available to the user, or the user is denied access to the network. 802.1X uses the Extensible Authentication Protocol (EAP) for passing authentication messages.

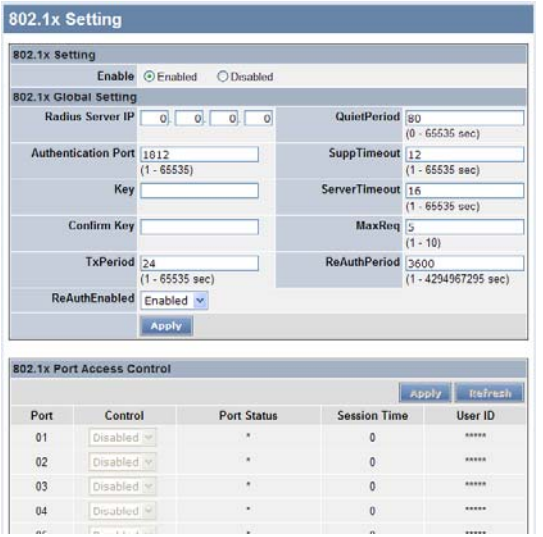


Figure 29. 802.1x Setting

Enable: Enable or Disable the 802.11x function on the Web Smart Switch.

Radius Server IP: Enter the IP address of the Radius Server.

Authentication Port: Sets primary port for security monitoring. Default is 1812.

Key/Confirm Key: Masked password matching the Radius Server Key.

TxPeriod: Sets the number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request. Default is 24 seconds.

ReAuthEnabled: This *Enable* or *Disable* the periodic ReAuthentication control. When the 802.1X function is *Enabled*, the ReAuthEnabled function is by default also *Enabled*.

QuietPeriod: Sets the number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client. Default 80 seconds.

SuppTimeout: Sets the switch-to-client retransmission time for the EAP-request frame. Default is 12 seconds.

ServerTimeout: Sets the amount of time the switch waits for a response from the client before resending the response to the authentication server. Default is 16 seconds.

MaxReq: This parameter specifies the maximum number of times that the switch retransmits an EAP Request packet to the client before it times out the authentication session. Default is 5 times.

ReAuthPeriod: This command affects the behavior of the switch only if periodic re-authentication is enabled. Default is 3600.

802.1x Port Access Control: Enable or disable the 802.1x port access on selected port.

IGMP Snooping 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.

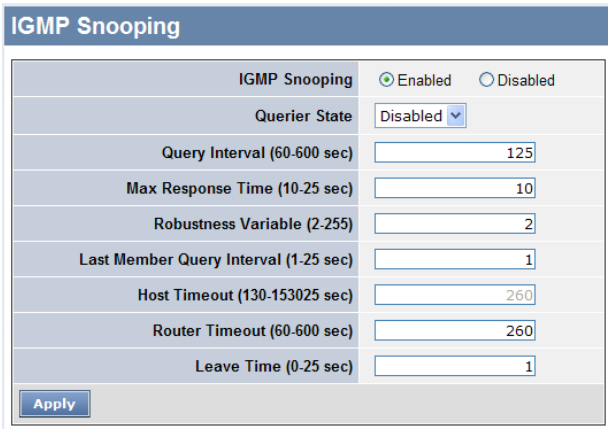


Figure 30. IGMP Global Setting

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.

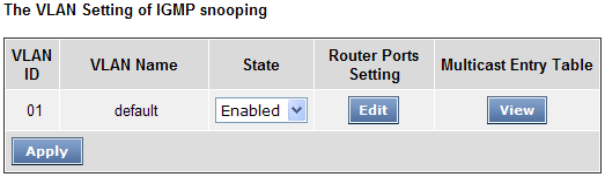


Figure 31. VLAN Setting of IGMP Snooping

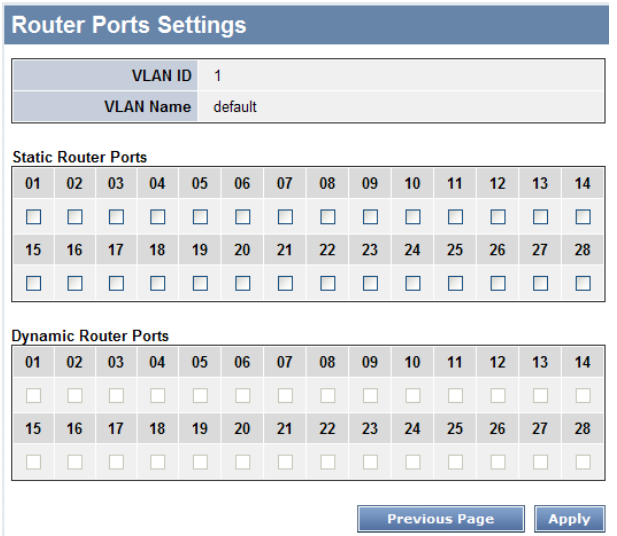


Figure 32. IGMP-Router Port Setting

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

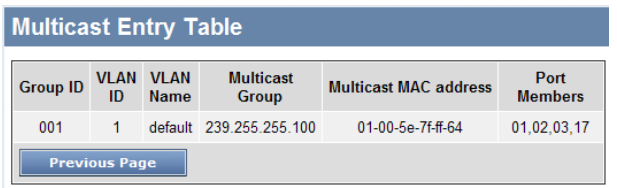


Figure 33. IGMP – Multicast Entry Table Setting

System Setting

Find that there are nine items, including *System Information, System Setting, Trap Setting, Password Setting, Statistics, Factory Reset, Backup Setting, Firmware Upload and System Reboot* in System menu.

System Information

Press on the ***"System Information"*** to present the system information status on this screen, it will show 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.

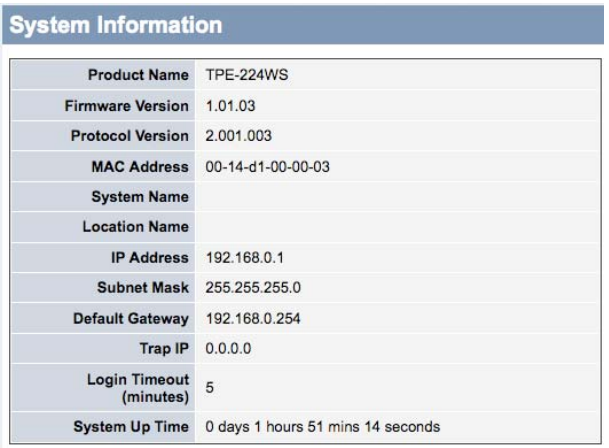


Figure 34. System Information

System Setting

The System Setting includes IP Information and System information. There are two ways for the switch to attain IP: Static and DHCP (Dynamic Host Configuration Protocol).

When using static mode, the IP Address, Subnet Mask and Gateway can 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 with 192.168.0.1 as the IP address.

By entering a System Name and System Location, the device can more easily be recognized 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 a re-login before using the Utility again.

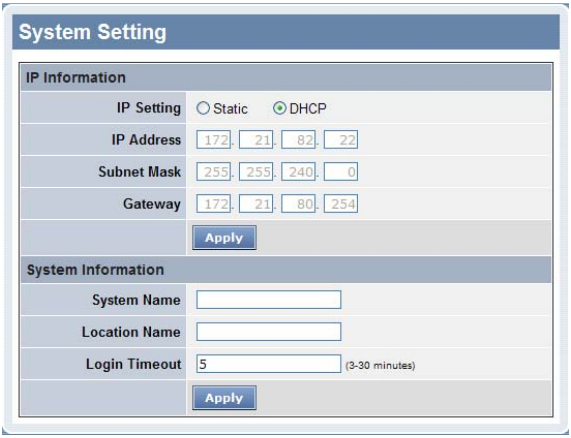


Figure 35. System Setting

Trap Setting

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

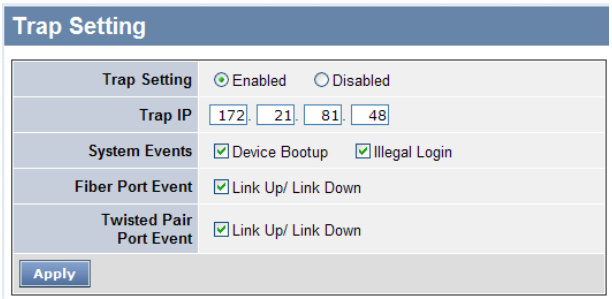


Figure 36. Trap Setting

System Events: Monitoring the system's trap.

Device Bootup: a trap when booting up the system.

Illegal Login: a trap when there is using a wrong password login, and it will record from where the IP to be login.

Fiber Port Event: Monitoring the Fiber port status.

Link Up/Link Down: a trap when there is linking status happens in mini-GBIC connection.

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

Link Up/Link Down: a trap when there is linking status happens in 1000BASE-T connection.

Password Setting

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

If you forget the password, press the ***"Reset"*** button in the front panel of the Switch.

Note: *All current settings will be erased and return to default settings when pressing the "Reset" button.*

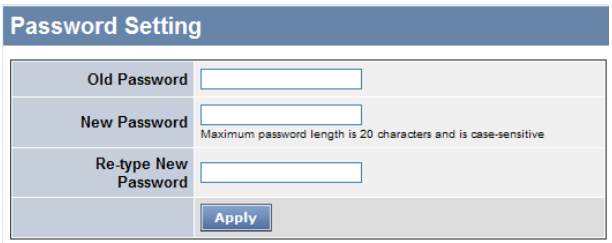


Figure 37. Password Setting

Statistic

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

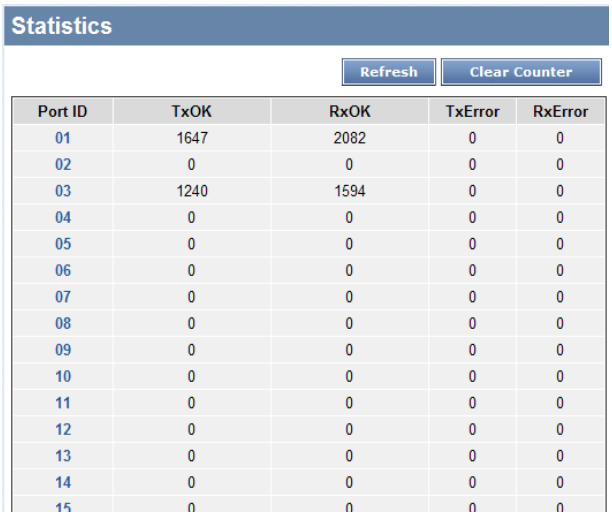


Figure 38. Statistics

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 39. Port Statistics.

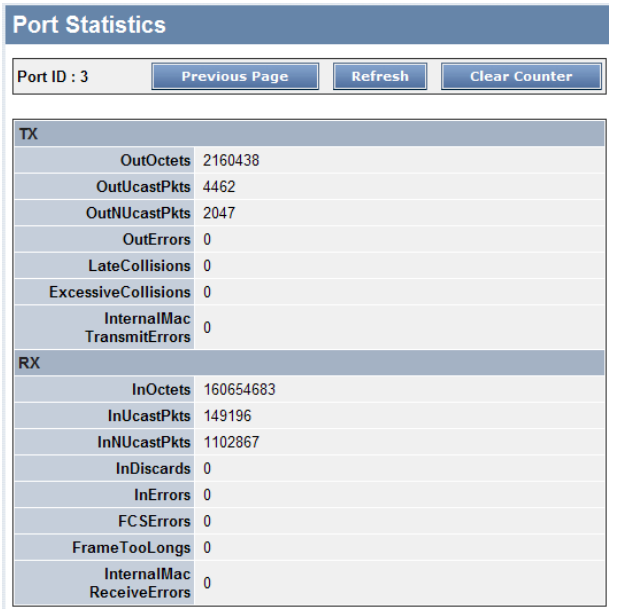


Figure 39. Port Statistics

Factory Reset

The Factory Reset helps you to reset the device back to the default setting from the factory. All of the configuration will be reset, the IP address of the device will be set to default setting 192.168.0.1.

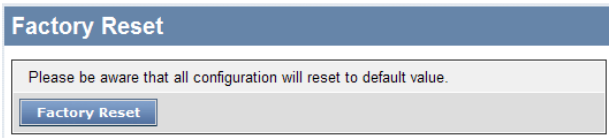


Figure 40. Factory Reset

Backup Setting

The backup setting help you to backup the current setting of the Switch. Once you need to backup the setting, press the ***"Backup"*** button to save the setting.

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

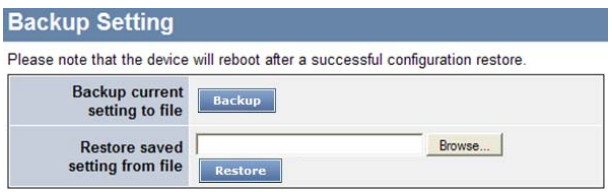


Figure 41. Backup Setting

Note: when restoring a recorded file, the current password will not be erased.

Firmware Upload

The Firmware Upload helps you to backup or upload firmware from/to the Switch. Once you need to backup the current firmware of the Switch, press 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"*** button to proceed the firmware upload.

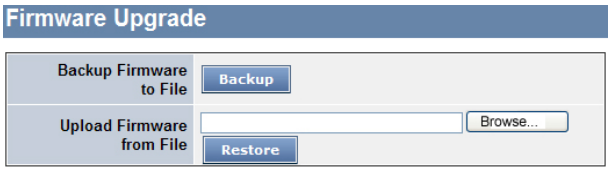


Figure 42. Firmware Upload

System Reboot

Provides to a safe way to reboot the system and ensure the configuration has been saved, or all the changes you just made may be lost after system reboot.

Figure 43. System Reboot

Logout

When pressed you will logout of the web configuration page and return back to the first Login page.

Figure 44.

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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