TRENDnet

User's Guide

TEG-448WS

H/W: B2

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 the instructions, 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 the 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.

VCCI Warning

This is a product of VCCI Class A Compliance.

注意
この装置は、情報処理装置等電波障害自主規制協議会(VCCI)の基準に基づく第一種情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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 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 mounted 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. 1.00

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ABOUT THIS GUIDE

Congratulations on your purchase of the TEG-448WS 48-Port Gigabit Ethernet Web Smart Switch. This device integrates 1000Mbps Gigabit Ethernet, 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

Purpose

This guide describes how to install your TEG-448WS 48-Port Gigabit Ethernet Web Smart Switch.

Terms/Usage

In this guide, the term “Switch” (first letter upper case) refers to the device of TEG-448WS 48-Port Gigabit Ethernet Web Smart Switch and “switch” (first letter lower case) refers to other Ethernet switches.

INTRODUCTION

This chapter describes the features of the TEG-448WS 48-Port Gigabit Ethernet Web Smart 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 transfers occur 10 times faster than Fast Ethernet, servers outfitted with Gigabit Ethernet Adapters 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 802.3 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.

Features

- 48×10/100/1000Mbps 1000BASE-T Auto-negotiation Gigabit Ethernet ports
- 4 x 1000Mbps mini-GBIC slots for optional mini-GBIC transceiver to extend distance, shared with 4 1000BASE-T ports
- All RJ-45 ports support auto MDI/MDIX
- 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 architecture to support rate adaptation and ensure data integrity
- Integrated address Look-Up Engine, supports 8K absolute MAC addresses
- 1024KB RAM for data buffering

- Supports IEEE 802.3x flow control for full-duplex mode ports
- Supports IEEE 802.1Q VLAN
- Supports IEEE 802.1p Priority Queues
- Supports IGMP Snooping
- Supports Static Port Trunk
- Supports Jumbo Frame
- Supports Broadcast Storm Control
- Supports six Trunk groups.
- Supports Port-mirroring
- Supports Port-setting for Speed, Duplex and Flow control
- Easy configuration via WEB Browser
- Easy setup via Web Management Utility
- Standard 19” Rack-mount size

PACKAGE CONTENTS AND INSTALLATION

This chapter provides Packaging Contents and installation information for the Switch.

Package Contents

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

- TEG-448WS 48-Port Gigabit Web-Based Smart Switch
- Quick Installation Guide
- CD-ROM (Utility & User's Guide)
- Power Cord
- Rackmount Kit (Rubber Feet, Screws and Mounting Brackets)

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 hub 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 rackmount 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 hub and protect the hub case from scratching.

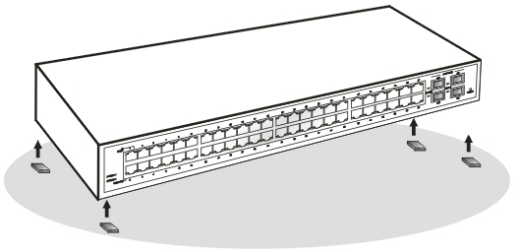


Figure 1. Attach the adhesive rubber pads to the bottom

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 at the switch's front panel (one on each side), and secure them with the provided screws.

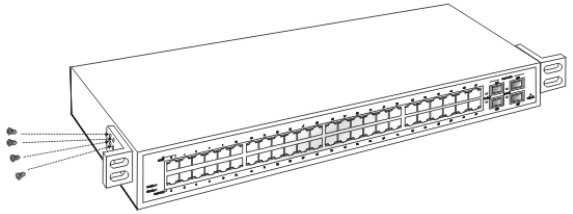


Figure 2. Combine the Switch with the provided screws

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

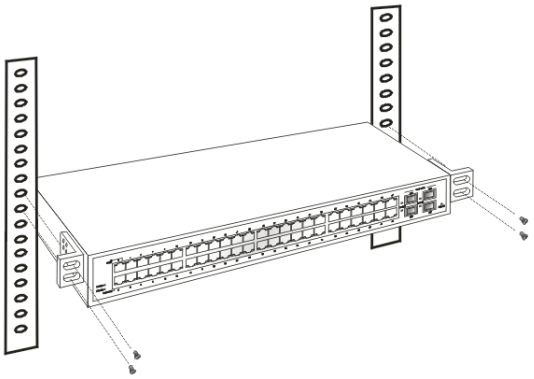


Figure 3. Mount the Switch in the rack

Connecting Network Cable

The Switch supports 10/100/1000Mbps Ethernet that runs in Auto-negotiation mode, 10/100Mbps Ethernet that runs in half and full duplex mode and 1000Mbps Gigabit Ethernet that runs in full duplex mode using four pair of Category 5 Cable.

These RJ-45 ports are Auto-MDIX, allowing you to use either a standard or crossover RJ-45 cable.

There are 4 additional mini-GBIC slots for optional mini-GBIC modules.

AC Power

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

IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front panel, rear panel, and LED indicators of the Switch.

Front Panel

The figure below shows the front panel of the Switch.

Figure 4. Front panel of 48-port Gigabit Ethernet Switch

LED Indicator:

Comprehensive LED indicators display the status of the switch and the network (see the LED Indicators chapter below).

1000BASE-T Gigabit Ethernet Ports (Port 1~48):

The Switch has 48 auto-negotiation, auto-MDIX Gigabit ports. These ports can 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 Ports (Port 45F~48F)

The Switch is equipped with four mini-GBIC ports. The ports support optional 1000BASE-SX/LX mini-GBIC module.

Port 45, 46, 47 and 48 are shared with the mini-GBIC 45F, 46F, 47F and 48F ports. When you plug in a mini-GBIC module, the device the RJ-45 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 connector. The following shows the rear panel of the Switch

Figure 5. Rear panel of the Switch

AC Power Connector:

Plug in the female connector of the provided power cord into this connector. Connect the male 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.

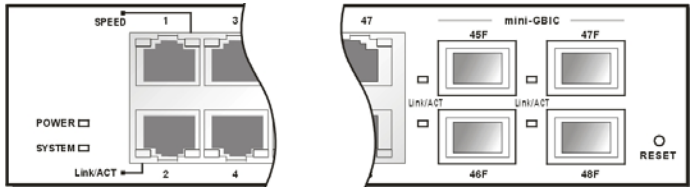


Figure 6. LED indicators of the Switch

Power and System LEDs

POWER: Power Indicator

On	:	When the Power LED is lit, the Switch is receiving power.
Off	:	When the Power LED is off, the switch is off.

System: Management Indicator

Blinking	:	When the Switch is working, the System LED blinks.
On/Off	:	The Switch is not working.

Ports 1~48 Status LEDs

Link/ACT: Link/Activity(left side of each RJ-45 port)

On	Amber:	When the Link/ACT LED lights green, the respective port is successfully connected to a 10 Mbps Ethernet or 100Mbps Fast Ethernet network.
	Green:	When the Link/ACT LED lights amber, the respective port is successfully connected to a 1000Mbps Gigabit Ethernet network.
Blinking	Amber:	When the Link/ACT LED is blinking amber, the port is transmitting or receiving data on the 10Mbps Ethernet or 100Mbps Fast Ethernet network.
	Green:	When the Link/ACT LED is blinking amber, the port is transmitting or receiving data on the 1000Mbps Gigabit Ethernet network.
Off	:	No link.

mini-GBIC 45F~48F Status LEDs

Link/ACT

On	:	When the Link/ACT LED is lit, the port is successfully connected.
Blinking	:	When the Link/ACT LED is blinking, the port is transmitting or receiving data on the Ethernet network.
Off	:	LC fiber cable is not connected or the mini-GBIC module is not installed.

CONFIGURATION

You can configure the Switch settings such as VLAN, Trunking, QoS… 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 Management utility.

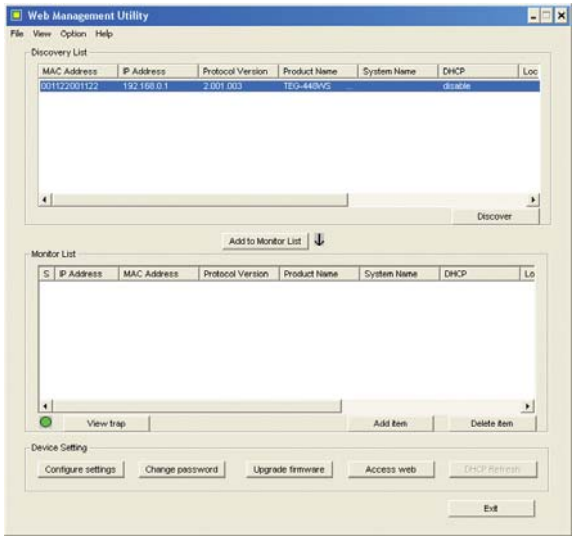


Figure 7. Web Management Utility

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:

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

Monitor List

All the switches in the Monitor List can be monitored; you can also monitor traps 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 version of the Utility protocol.
- ***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 device
- ***Location:*** Shows where the device is located.

- ***Trap IP:*** Shows the IP 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 8)

Figure 8.

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 9)

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

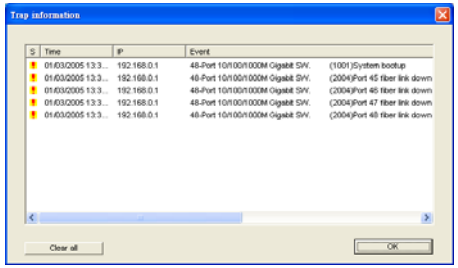


Figure 9.

Note: In order to receive Trap information, the Switch has to be configured with Trap IP and Trap Events in the Web browser. See Page 31 for more details.

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

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

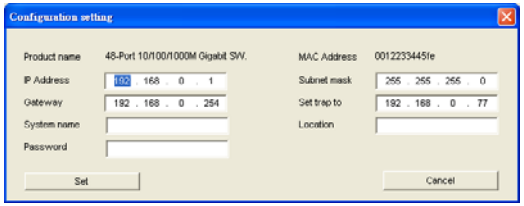


Figure 10. Configuration Setting

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

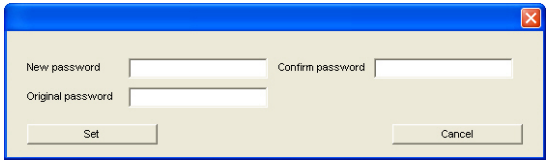


Figure 11. Password Change

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

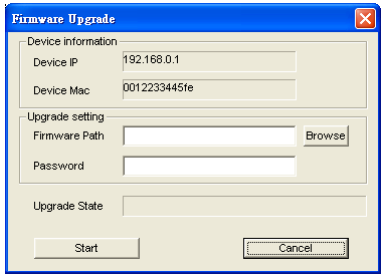


Figure 12.

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

Toolbar

The toolbar in the Web Management Utility has four options; File, View, Options and Help.

Under ***"File"***, there are four options; Monitor Save, Monitor Save As, Monitor Load and Exit.

- ***Monitor Save:*** To record the settings of the Monitor List to the default. The next time you open the Web Management Utility, it will 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 Web Management Utility.

In the ***"View TAB"***, there are view log and clear log function, this function will help you to show trap setting.

- ***View Log:*** To show the event of the Web Management Utility and the device.
- ***Clear Log:*** to clear the log.

In the ***"Option TAB"***, there are Refresh Time function, this function helps you to refresh the time of monitoring the device. Choose ***15 secs, 30 secs, 1 min, 2 min and 5 min*** to select the time of monitoring.

In the ***"Help TAB"***, there is About function, it will show out the version of the Web Management Utility.

Configuring the Switch

The 48-Port 10/100/1000Mbps Gigabit Ethernet Web Smart 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 the PC is configured to be in the same the **subnet** as the switch. For example, since the default the default IP address of the Web Smart Switch is ***192.168.0.1***, then the PC should be set to 192.168.0.x (where x is a number between 2 and 254), with a default subnet mask of 255.255.255.0.

Open Internet Explorer 5.0 or above.

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

Figure 13.

You can also access the browser configuration through the Web Management Utility. Select the desired Switch in the Monitor and click **"Access Web"**.

When the following dialog page appears, enter the default password ***"admin"*** and click Login.

Figure 14.

After entering the password, the system information screen will appear.

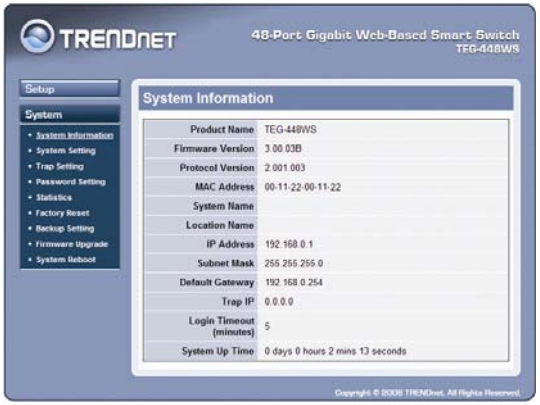


Figure 15. System Information

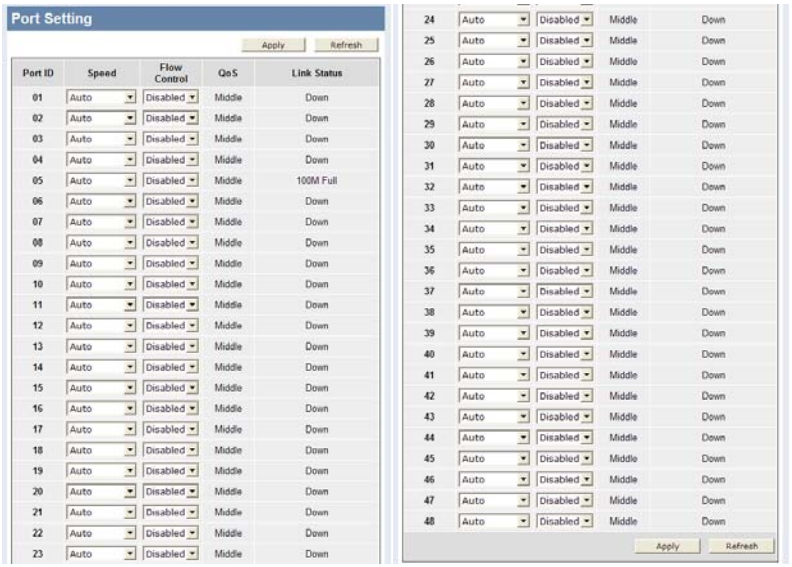
Setup Settings

There are seven options; *Port Settings, IEEE 802.1Q VLAN Setting, Trunk Setting, Mirror Setting, IEEE 802.1p Default Priority, Broadcast Storm Control Setting and Jumbo Frame Setting*

Port Settings

In Port Settings menu, this screen shows each port's status. You can change the speed and flow control parameters by clicking on the dropdown menu. If you want to update the link status, press the "Refresh" button.

The *Link Status* in the screen will show the connection speed and duplex mode. If there is no connection to the port, ***down*** will be displayed.



Note 1: Be sure to click refresh after switching between media type (Fiber to Copper or Copper to Fiber).

Note 2: The priority of Gigabit Fiber port is higher than Copper.

Speed:

The 1000Base-T connection 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 set to Auto. The 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 Flow Control to ***Disable*** if flow control is not needed.

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

VLAN Settings (IEEE 802.1Q VLAN)

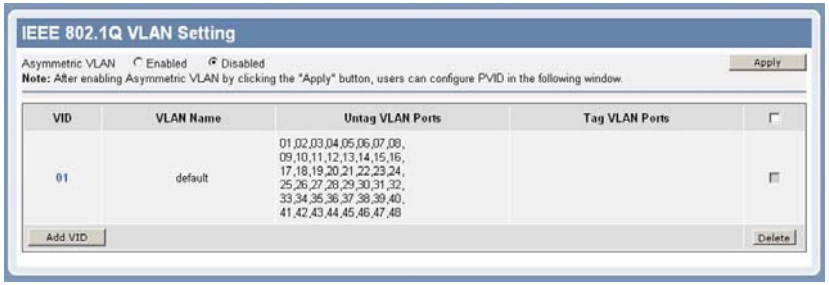
A VLAN is a group of ports that can be anywhere in the network, but communicate as though they were in the same area.

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

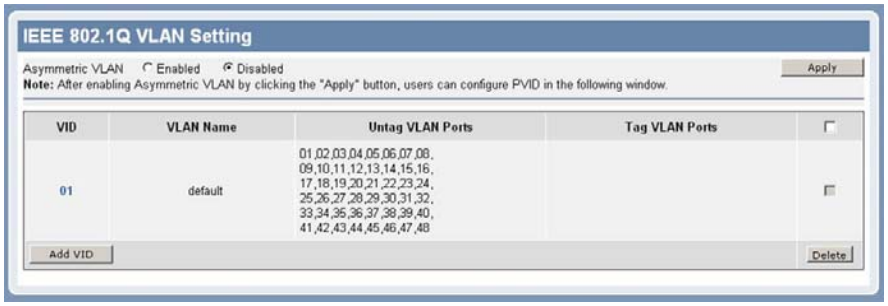
IEEE 802.1Q Asymmetric VLAN default setting is “Disabled”, you can press “Enabled” ratio button and Apply it to submit the Asymmetric VLAN function.



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

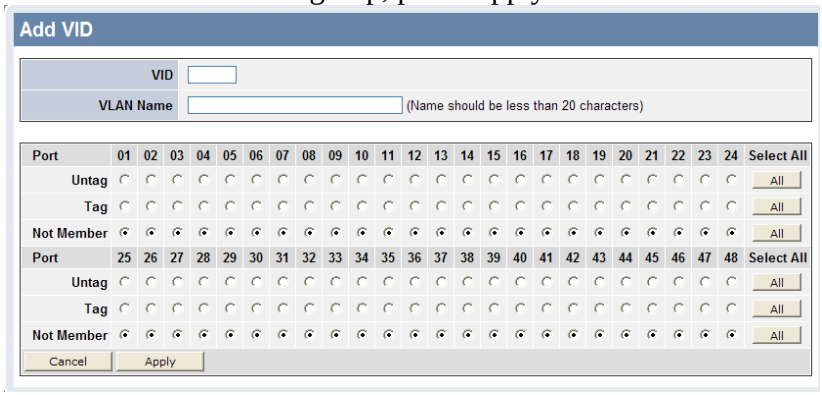
Untag Asymmetric VLAN Setting:

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”.



802.1Q VLAN Setting

Add VID: Click to create a new VID group, assigning ports from 01 to 48 as Untag, Tag, or Not Member. A port can be “Untagged” in only one VID. To save the VID group, press Apply.



VLAN Settings

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.

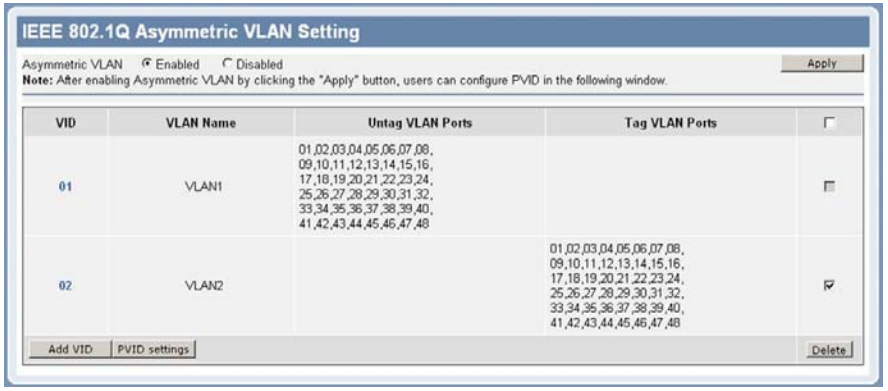
Not Member: The port number which not to be grouped.

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

Cancel: To call the modifications off.

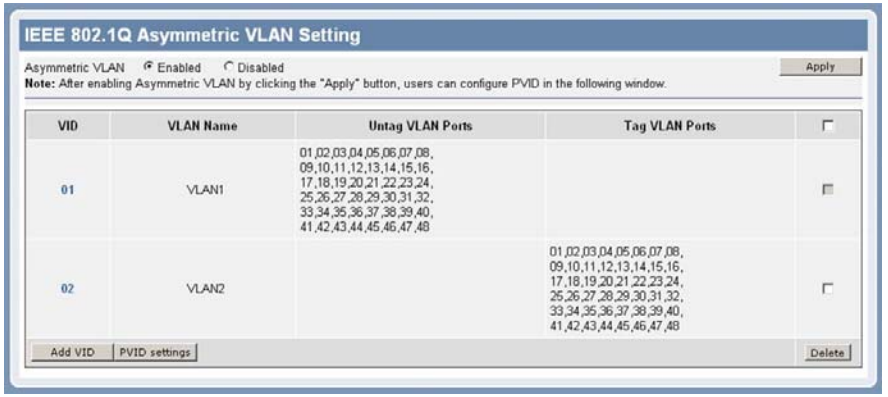
Apply: To activate and save the modifications.

Delete: Click to delete selected VID

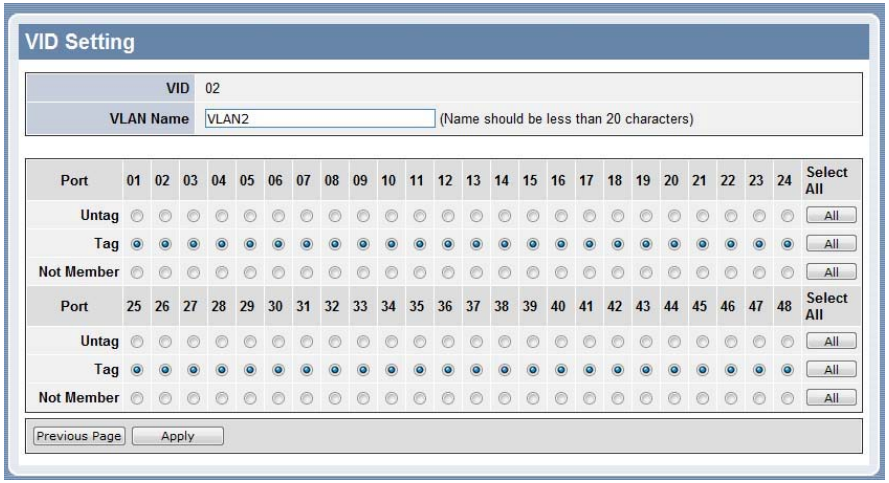


Delete VID

To change exist VLAN setting, press the VID to modify it.

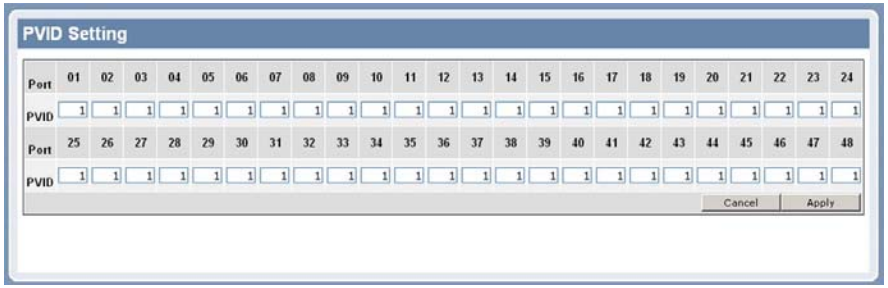


Modify VID



PVID settings:

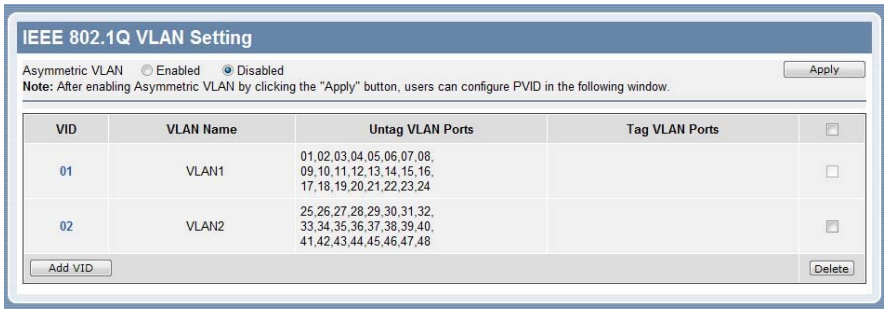
While receiving an untagged frame from the port, the switch will assign a tag to the frame, using the PVID of the port as its VID.



PVID settings

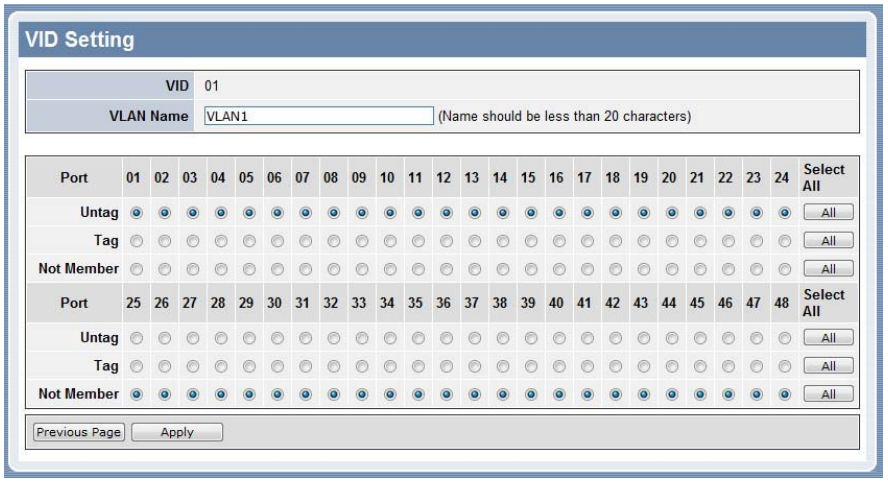
Example 1:

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).

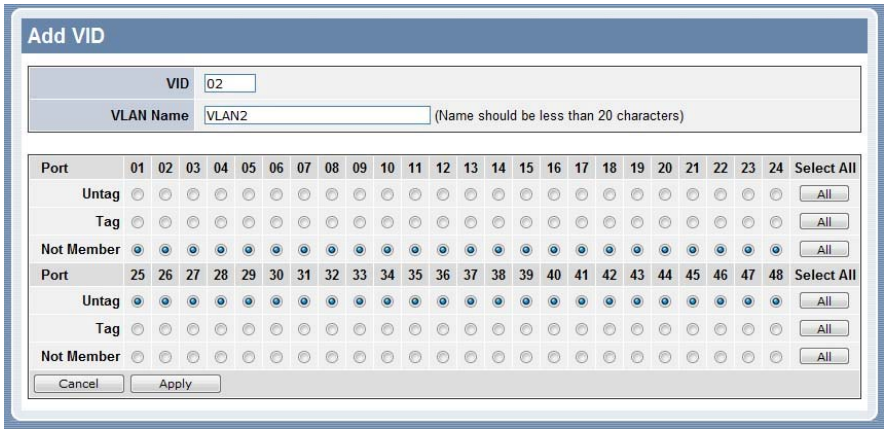


Untag VLAN setting example

Step1: Set VID 01 port 1~24 to “Untag” ports and 25~48 to “Not Member” ports then apply settings.



Step 2: Create VID 02 and set port 1~24 to “Not Member” ports and 25~48 to “Untag” ports member then apply settings

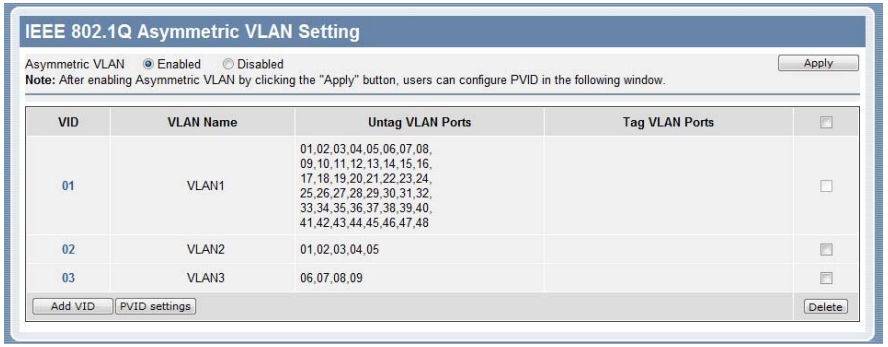


Example 2:

802.1Q Asymmetric VLAN example:

Port 1~48 in VLAN1, port1~5 in VLAN2, port1,6~9 in VLAN3. All VLAN1~3 have access to Internet via port 1.

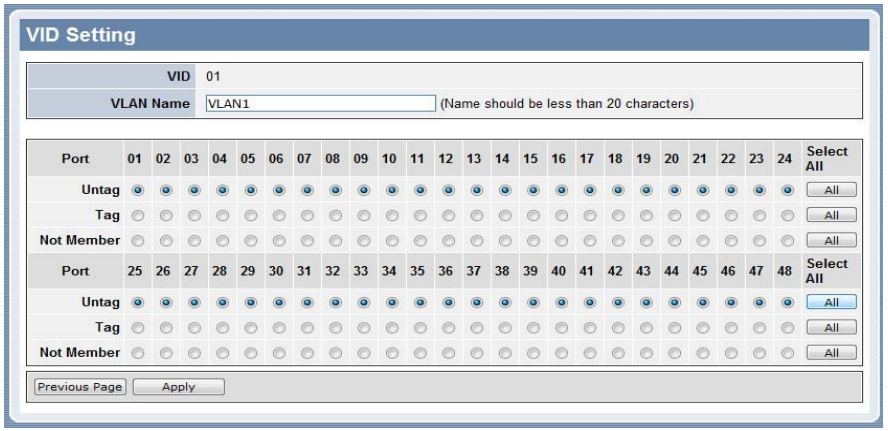
Note: The multi-need server must be support IEEE 802.1Q VLAN



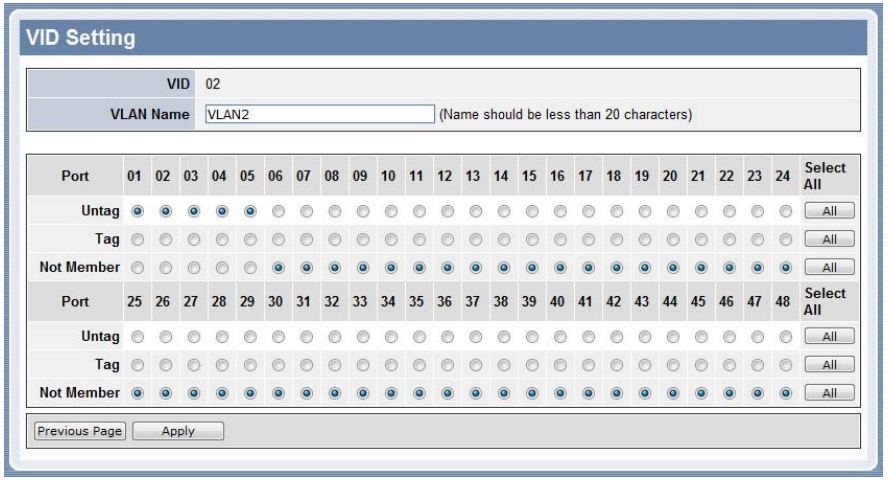
Asymmetric VLAN setting example

Step 1: Enable Asymmetric VLAN function

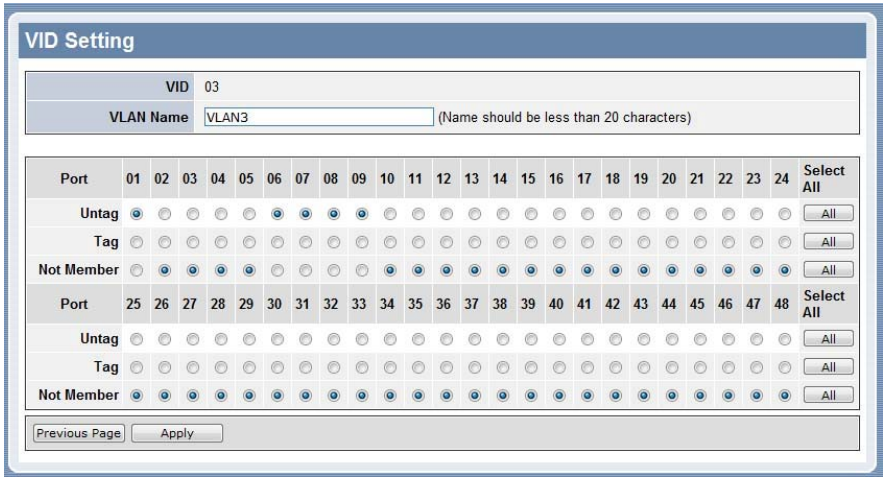
Step 2: Set VLAN1 1~48 port to “Untag” ports then apply settings.



Step 3: Create VID 02 and set port 1~5 to “Untag” and port 6~48 to “Not Member” then apply settings.



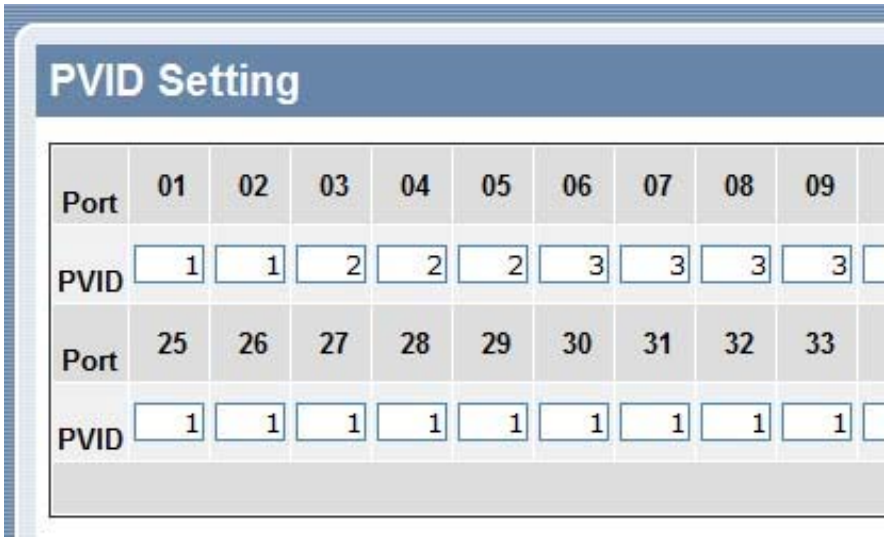
Step 4: Create VID 03 and set port 1~ port 6~9 to “Untag” port then apply settings.



Step 5: Click on PVID settings, change port 1~5 to PVID 2 and port 6~9 to PVID 3

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.

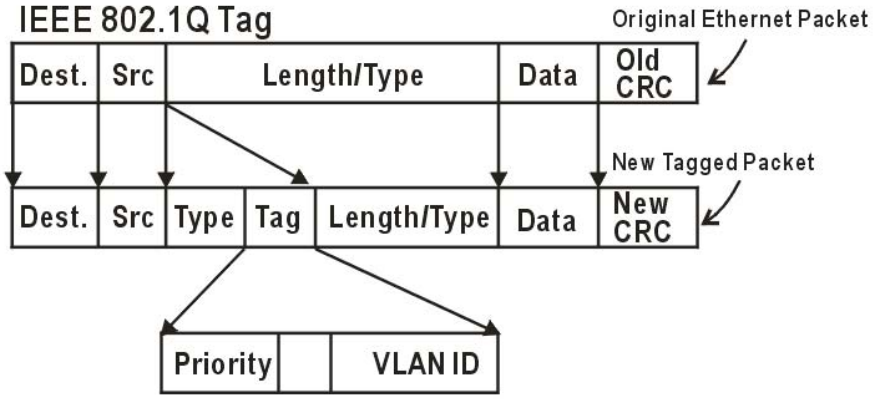


Asymmetric VLAN's PVID setting example

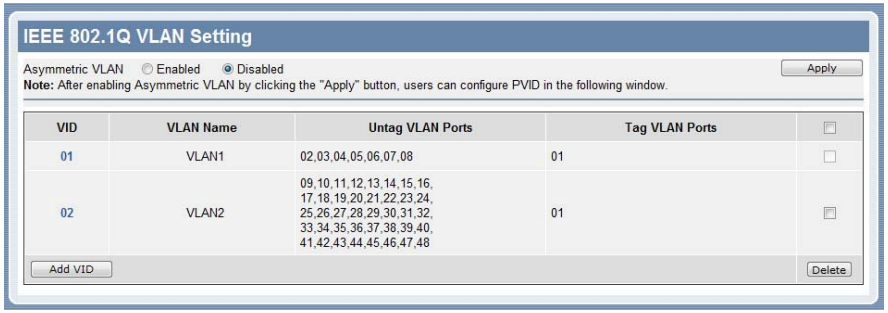
Tag VLAN Setting

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

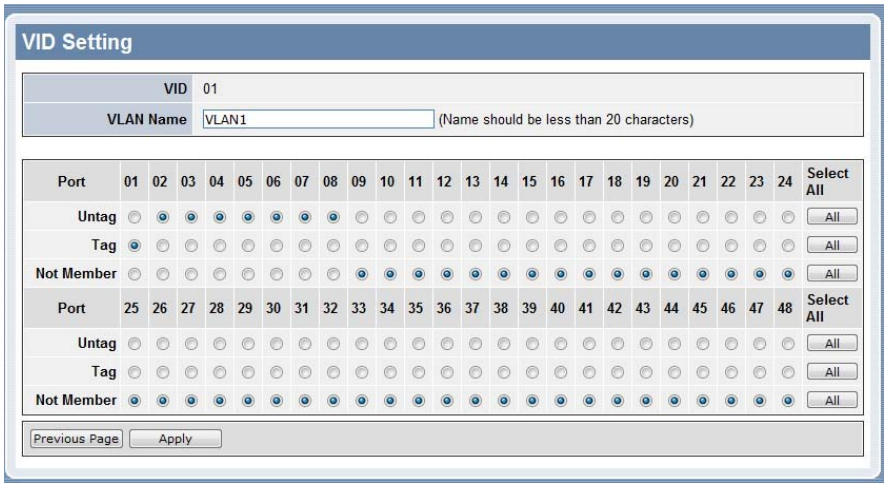
IEEE802.1Q Tag VLAN is divided by VLAN ID (VID). On receiving a frame, the switch checks the VID in the tag header of the frame to decide which VLAN it belongs to. If the receiving frame doesn't contain the tag header, the switch will assign a tag to the frame, using the PVID of the port as its VID.



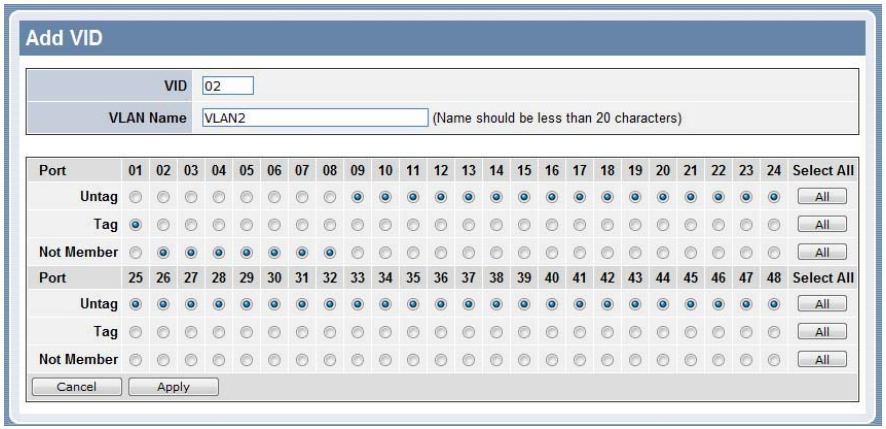
Example 3:



Step 1: Set VLAN1 port 1 to “Tag” port, port 2~8 to “Untag” ports, and port 9~48 to “Not Member” ports then apply settings.



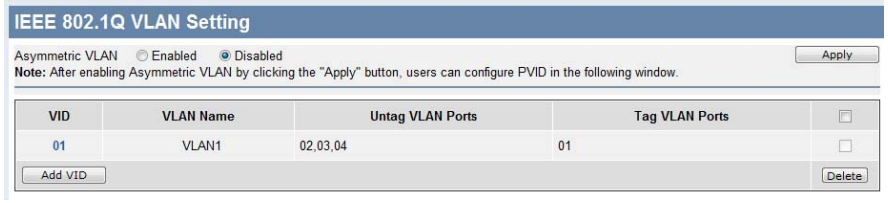
Step 2: Create VID 02 and set port 1 to “Tag” port and port 9~48 to “Untag” ports then apply settings.



Note: The multi-need server must be support IEEE 802.1Q VLAN, the sever uplink port is port1.

Example 4:

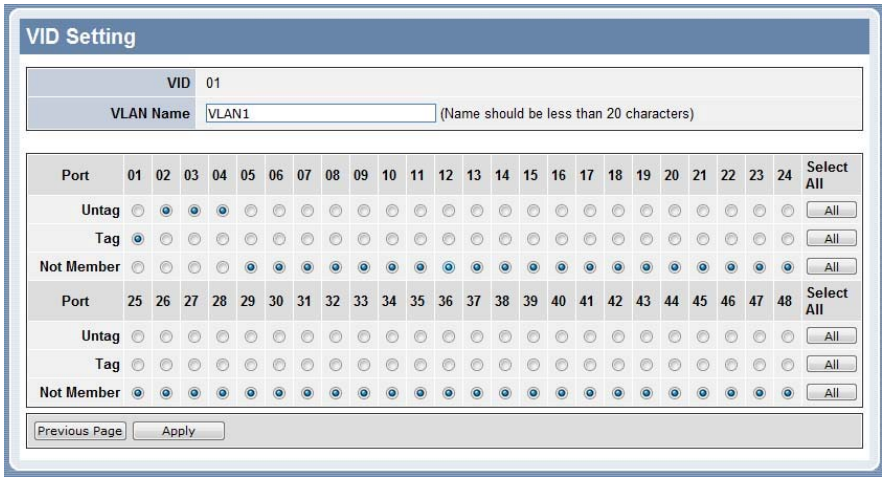
Setting Tag VLAN on two switches. Switch 1’s VLAN 1 (2 ~ 3 ports) have access to the Switch 2’s VLAN 1 (2 ~ 3 ports).



Tag VLAN setting example

The settings of VLAN group for two devices are same.

Step1: Set Switch1’s VLAN1 port 1and 4~48 to “Not Member”, then apply setting.



Step2: Set Switch2’s VLAN1 member as Switch1.

Step3: Uplink two switches via Port 4.

Trunk Setting

The Trunk function enables the user to cascade two or more devices t0 increase bandwidth.

The user can set up to six Trunk groups. Enter a Trunking Name, select the ports to be a member of the trunk, and click “Apply”.

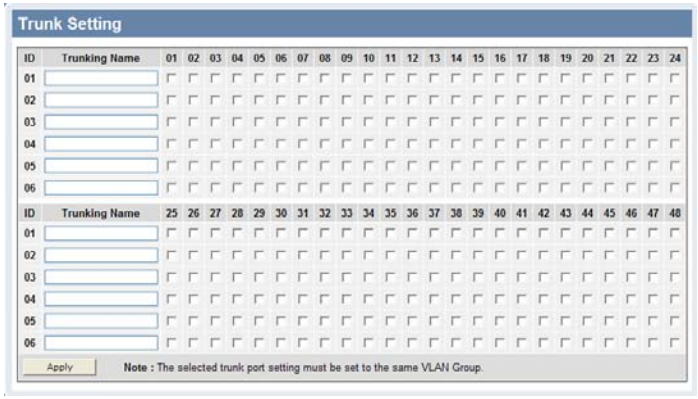
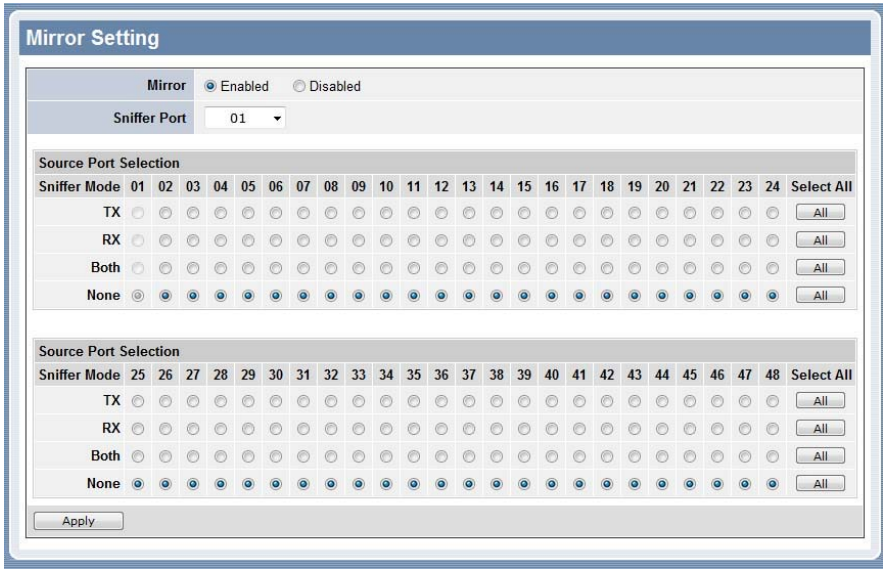


Figure 19. Trunk Settings

Note: The selected trunk port setting must set to the same VLAN group.

Mirror Setting

Port Mirroring is a method of monitoring network traffic. The Switch forwards a copy of each incoming and/or outgoing packet from one port of to another port on the Switch where the packet can be studied. It enables the manager to keep close track of switch performances.



The following options are available:

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’s sent to the source and forward it 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.

None mode: this mode will not duplicate data 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.

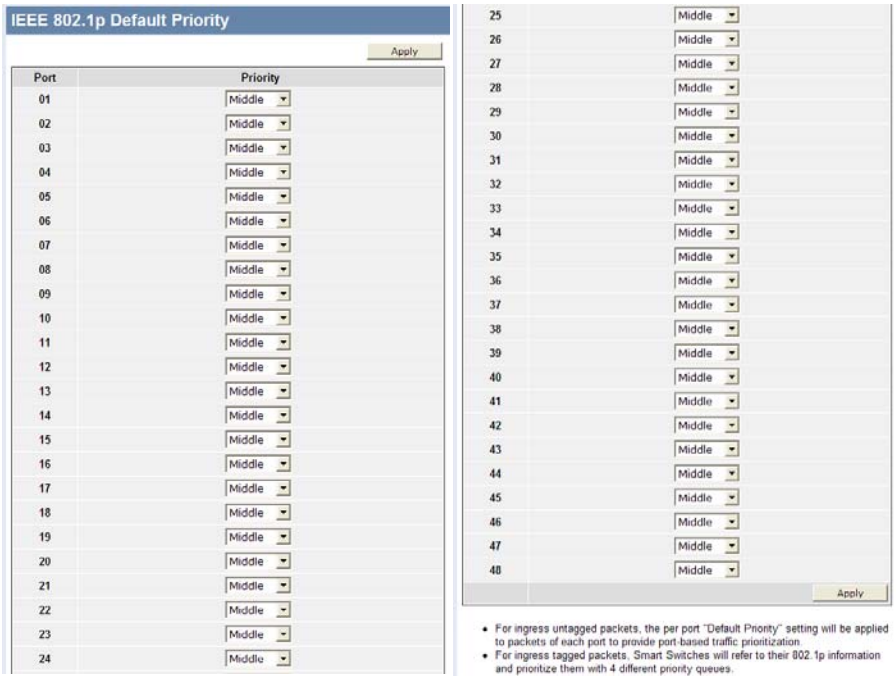
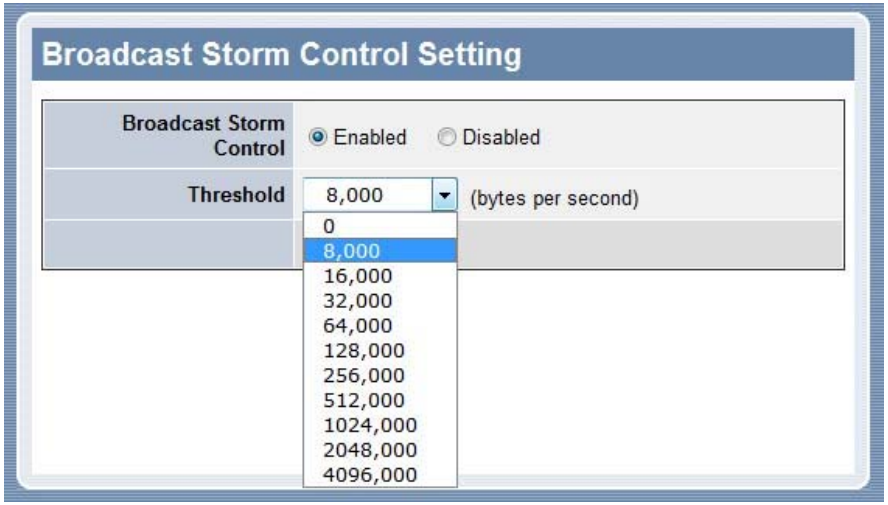


Figure 21

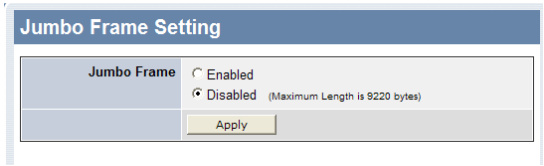
Broadcast Storm Control Setting

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.



Jumbo Frame Setting

Jumbo Frames enable the transportation of identical data in fewer frames. This ensures less overhead, lower processing time, and fewer interruptions. Maximum packet length supported is 9220 bytes.



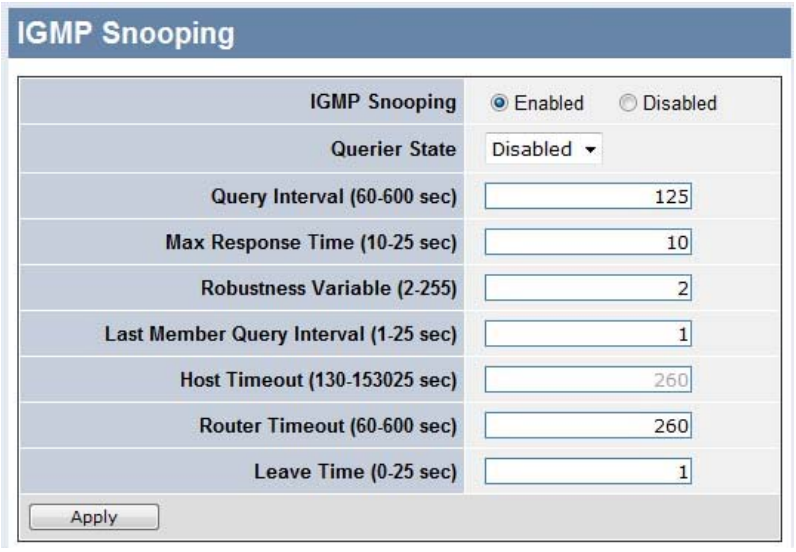
IGMP Snooping Setting

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 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

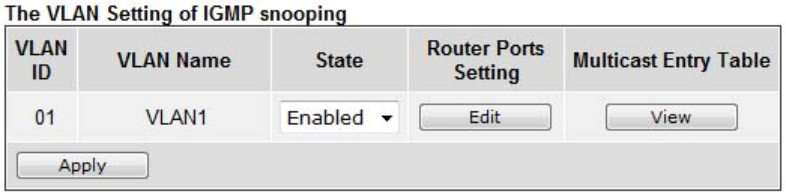
restarted whenever a report message from host is received over that port. If no report messages are received for 'HostPortPurgeInterval' time, the learnt host entry will be purged from the multicast group. Default is 260 seconds.

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.

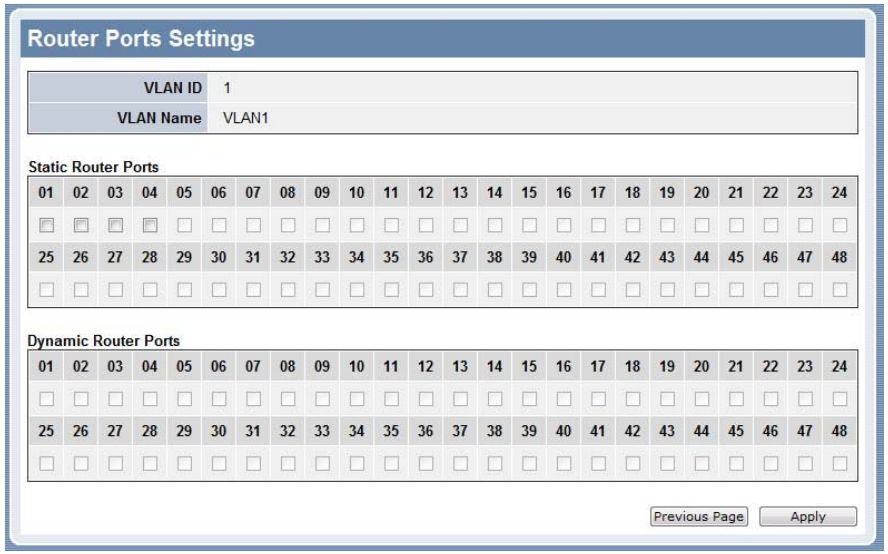
Leave Timer (0-25 sec): This is the interval after which a Leave message is forwarded on a port. When a leave message from a host for a group is received, a group-specific query is sent to the port on which the leave message is received. A timer is started with a time interval equal to IgsLeaveProcessInterval. 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.

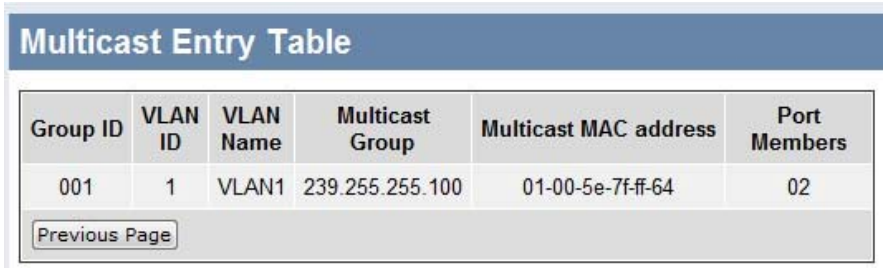


IGMP VLAN Setting



IGMP Router Ports Setting

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



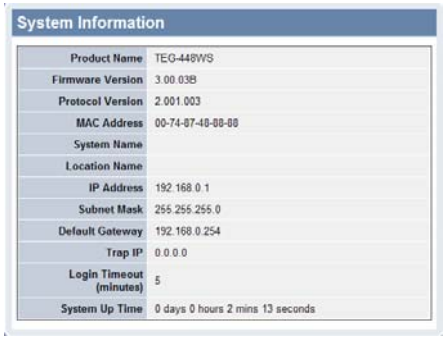
View the IGMP Multicast Entry Table

System Settings

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.



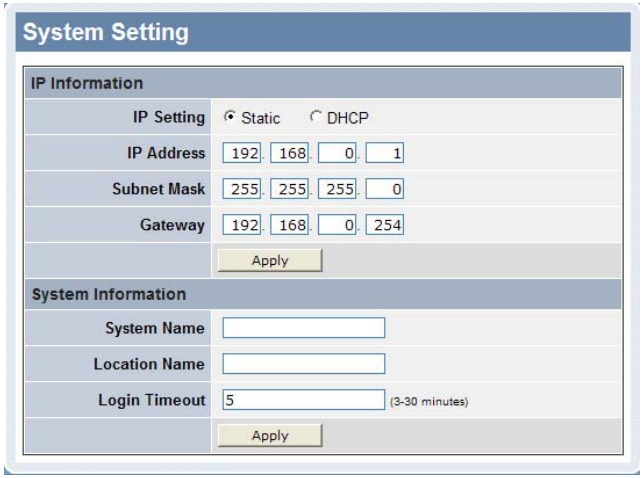
System Setting

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.

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.



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.

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 Events: Monitoring the Fiber port status.

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

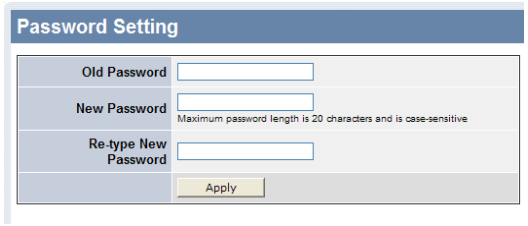
Twisted Pair Port Events: Monitoring the twisted pair port status.

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

Password Setting

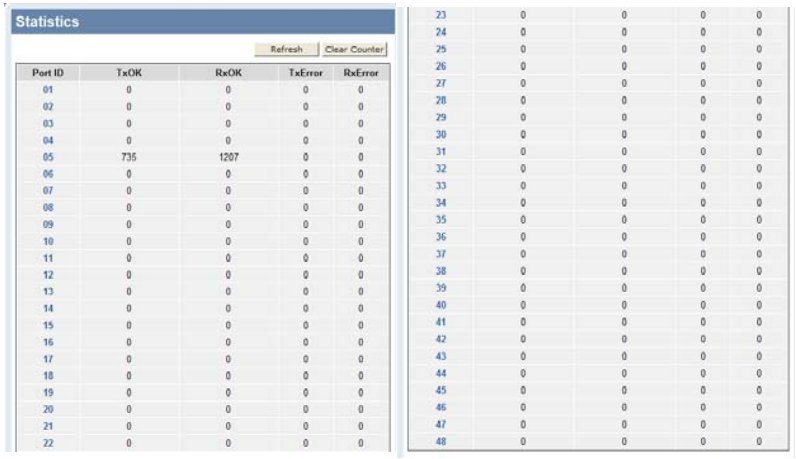
Password is an invaluable tool for the manager to secure access to the Web Management Switch. Use this option to change the password. The default password is **"admin"**.

If you forget the password, press the "Reset" button on the front of the Switch.



Statistics

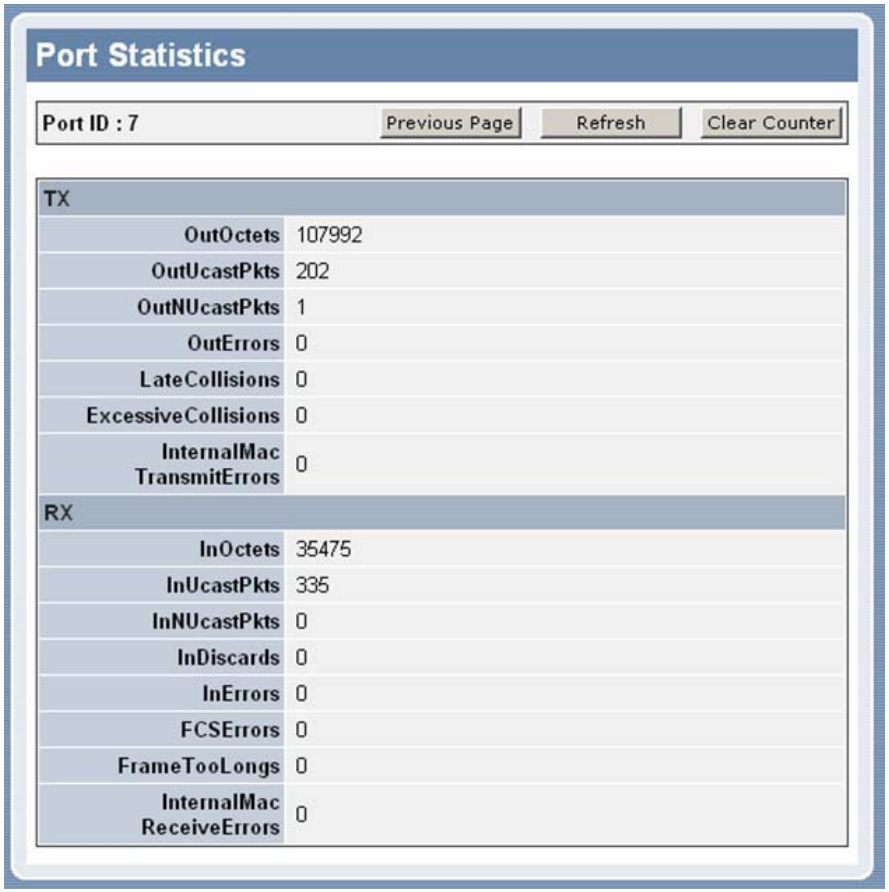
The Statistics screen will show the status of each port packet count.



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 below.



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.

Backup Setting

The backup tool allows you to backup the current setting of the Switch. Press the ***"Backup"*** button to save the setting.

To restore saved settings from a file, you must specify the backup file and press ***"Restore"*** button.

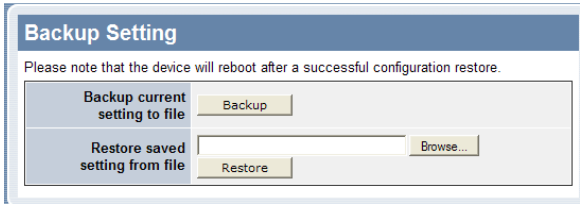
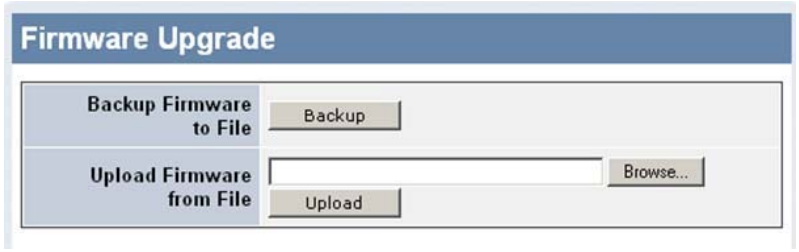


Figure 29. Backup Setting

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.



System Reboot

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

Logout

When you click on Logout, the web configuration will return to the Login screen.

Figure 31. Logout

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 802.3x Full Duplex Flow Control IEEE 802.3z 1000BASE-SX/LX Gigabit 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: 2-pair UTP Cat. 3, 4, 5; up to 100m 100BASE-TX: 2-pair UTP Cat. 5; up to 100m 1000BASE-T: 4-pair UTP Cat. 5; up to 100m Fiber module: mini-GBIC Fiber module
Number of Ports	48 × 10/100/1000Mbps Auto-MDIX RJ-45 ports 4 × mini-GBIC fiber slot (Shared)
Physical and Environmental	
AC input	100-240V AC, 50-60 Hz internal universal power supply
Power Consumption	79 Watts (Max)
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	440 x 310 x 44 mm (W x H x D)
Certifications	FCC Class A, CE Mark Class A, VCCI Class A

Performance	
Transmits Method:	Store-and-forward
Filtering Address Table:	8K entries per device
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps 1000Mbps Gigabit Ethernet: 1,488,000/pps
MAC Address Learning:	Automatic update
Transmits Method:	Store-and-forward
RAM Buffer:	1024KBytes per device

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TEG-448WS – 5 Years Limited Warranty

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