# DG-FS1526HP

## Layer 2 Fast Ethernet Web Managed PoE Switch

### User Manual

**V2.0**

**2017-01-04**

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

# Contents

# 1 Introduction

Power-over-Ethernet (PoE) eliminates the need to run DC power to other devices on a wired LAN. Using a Power-over-Ethernet system, installers need to run only a single Category 5 Ethernet cable that carries both power and data to each device. This allows greater flexibility in the locating of network devices and, in many cases, significantly decreases installation costs.

There are two system components in PoE - the PSE (Power Sourcing Equipment) and the PD (Powered Device). The IEEE 802.3af/at specification defines PSE as a device that inserts power onto an Ethernet cable. The PSE may be located at the switch (End-span configuration). or it may be a separate device located between the switch and the PD (Mid-span configuration). The PD is the natural termination of this link, receiving the power, and could be an IP phone, a WLAN access point, or any other IP device that requires power. The current is transmitted over two of the four twisted pairs of wires in a Category-5 cable.

Power-over-Ethernet follows the IEEE 802.3af/at specification and is completely compatible with existing Ethernet switches and networked devices. Because the Power Sourcing Equipment (PSE) tests whether a networked device is PoE-capable, power is never transmitted unless a Powered Device is at the other end of the cable. It also continues to monitor the channel. If the Powered Device does not draw a minimum current, because it has been unplugged or physically turned off, the PSE shuts down the power to that port. Optionally, the standard permits Powered Devices to signal t0 the PSEs exactly how much power they need.

The PoE switch is a multi-port fast Ethernet switch that can be used to build high-performance switched workgroup networks. This switch is a store-and-forward device that offers low latency for high-speed networking. It also features a ‘store-and-forward switching’ scheme that allows the switch to auto-learn and store source addresses in a 8K-entry MAC address table. The switch is targeted at workgroup, department or backbone computing environments.

# 2 Hardware Description

## 2.1 Front Panel

The front panel consists of LED indications, reset button and 24x10/100 PoE ports + 2x10/100/1000 Uplink pots.


## 2.2 LED Indicators

**Power LED:** The Power LED lights up when the switch is connected to a power source.

**Link/Act LED:**

Green (for megabit ports): Indicates that the port is running at 100M.

Green (for gigabit ports): Indicates that the port is running at 100M.

Blinking: Indicates that the switch is either sending or receiving data to the port.

Light off: No link.

**PoE LED:**

Green: Indicates the PoE powered device (PD) is connected and the port supplies power successfully.

Light off: Indicates no powered device (PD) connected.

**Reset:** By pressing the Reset button for 5 seconds the switch will change back to the default configuration and all changes will be lost.

## 2.3 Rear Panel

The rear panel view of the switch consists of a AC power connector, Power Switch and Fuse.

# 3 Hardware Installation

## 3.1 Package contents

Package contents include the following:

- PoE Switch:24x10/100 PoE ports with 2x10/100/1000 combo ports Ethernet Switch
- AC power cord
- Two (2) rack-mount pallet and Six (6) screws
- Four (4) adhesive-backed rubber feet
- User's manual

**IMPORTANT:** If any piece is missing or damaged, please contact your local dealer or reseller for service.

## 3.2 Switch Installation

**Desktop or Shelf Installation**

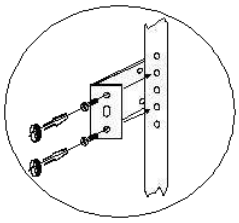
When installing the switch on a desktop or shelf, the rubber feet included with the device must be attached on the bottom at each corner of the device's base. Allow enough ventilation space between the device and the objects around it.

**Note:** Do not press on the switch. Any pressure more than 4.5kg may cause damage to switch.

**Rack Installation**

The switch can be mounted in an EIA standard size 19-inch rack, witch can be placed in a wiring closet with other equipment. To install, attach the mounting brackets to the switch's side panels (one on each side) and secure them with the screws provided.

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



Please be aware of following safety instructions when installing:

- Elevated Operating Ambient - 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 maximum ambient temperature (Tma) specified by the manufacturer.
- 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.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable Earthing 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)."

## 3.3 Grounding the Switch

The section describes how to connect the switch to ground. You must complete this procedure before powering your switch.

**Required Tools and Equipment**

- Ground screws: One M4 x 6mm (metric) pan-head screw
- Ground cable: The grounding cable should be sized according to local and national installation requirements. Depending on the power supply and system, a 12 to 6 AWG copper conductor is required for U.S installation. Commercially available 6 AWG wire is recommended. The length of the cable depends on the proximity of the switch to proper grounding facilities.
- A screwdriver

**The following steps let you connect the switch to a protective ground:**

Step 1: Verify if the system power is off.

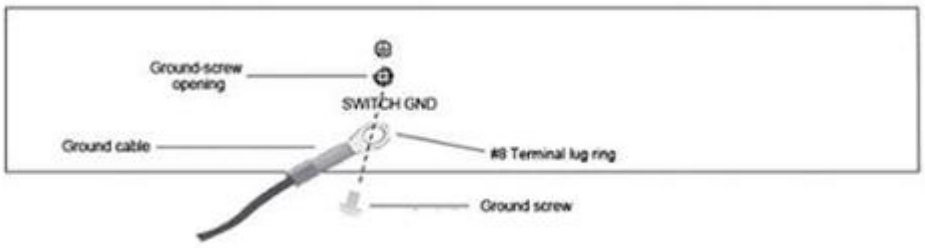
Step 2: Use the ground cable to place the #8 terminal lug ring on top of the ground-screw opening, as seen in the figure below.

Step 3: Insert the ground screw into the ground-screw opening.

Step 4: Using a screwdriver, tighten the ground screw to secure the ground cable to the switch.

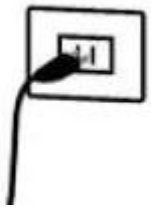
Step 5: Attach the terminal lug ring at the other end of the grounding cable to an appropriate grounding stud or bolt on rack where the switch is installed.

Step 6: Verify if the connections at the ground connector on the switch and the rack are securely attached.




## 3.4 Plugging in the AC Power Cord

Users may now connect the AC power cord into the rear of the switch and to an electrical outlet (preferably one that is grounded and surge protected).

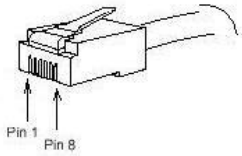


**Power Failure**

As a precaution, the switch should be unplugged in case of power failure. When power is resumed, plug the switch back in.

## 3.5 Connecting Ethernet Interface

Use switch's UTP to connect to other Ethernet terminals. Refer to the following chart:



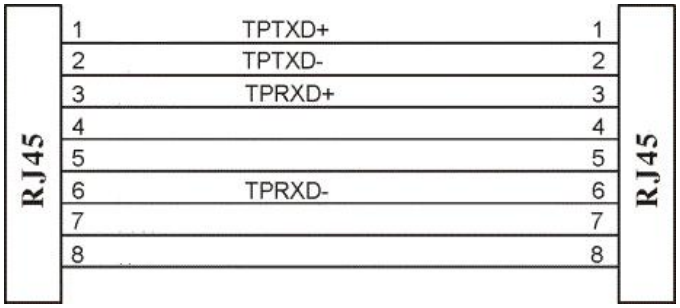

UTP port explanation for Fast Ethernet is shown as follows:

| Pin NO. | Description | Name | Note |
|---|---|---|---|
| 1 | Data transmission positive | TPTXD+ | Output |
| 2 | Data transmission negative | TPTXD- | Output |
| 3 | Data receive positive | TPRXD+ | Input |
| 6 | Data receive negative | TPRXD- | Input |

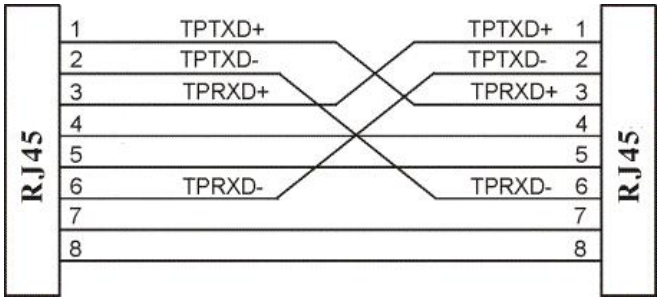
UTP port explanation for Gigabit Ethernet is shown as follows:

| Pin NO. | Description | Name | Note |
|---|---|---|---|
| 1 | Data transmission positive | TPTXD1+ | Output |
| 2 | Data transmission negative | TPTXD1- | Output |
| 3 | Data receive positive | TPRXD2+ | Input |
| 6 | Data receive negative | TPRXD2- | Input |
| 4 | Data Bi-directional positive | BI_D3+ | Bidirectional |
| 5 | Data Bi-directional negative | BI_D3- | Bidirectional |
| 7 | Data Bi-directional positive | BI_D4+ | Bidirectional |
| 8 | Data Bi-directional negative | BI_D4- | Bidirectional |

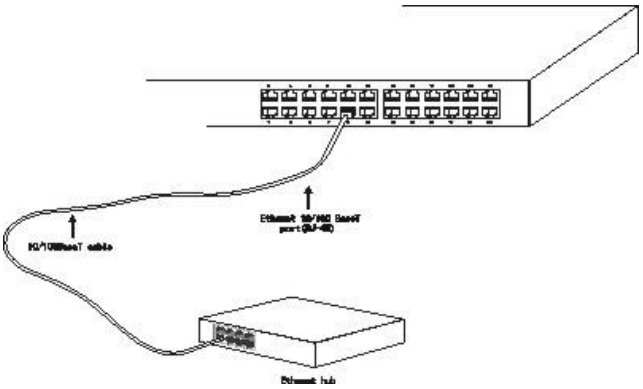
Cable connection and colors follow the regulations in EIA/TIA 568A as follows:




Cable connection and colors follow the regulation in EIA/TIA 568B as follows:




Choose the connection which best fits the connection between switch and other Ethernet terminal. 10/100Base-TX port and other Ethernet terminal connection is shown as follows:



# 4 Troubleshooting

This section is intended to help solve the most common issues with the PoE Switch

**Incorrect connections**

Every port on this switch can automatically detect either straight or crossover cables when you link it with other Ethernet devices but other devices may demand a specific cable type (depending on the device). Choose the appropriate cable to connect between the units. The RJ-45 connector should use correct UTP or STP cable, 10/100Mbps port use 2-pairs twisted cable. If th RJ-45 connector is not correctly pinned then the link will fail.

**Faulty or loose cables**

Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.

**Non-standard cables**

Non-standard and miswired cables may cause numerous network collisions and other network problems, and can seriously impair network performance. A cable tester is the recommended tool for network installation.

**RJ-45 ports:** Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mpbs connections, or 100Ω Category 5e/above cable for 1000Mbps connections. Also be sure that length of any twisted-pair connection does not exceed 100 meters (328 feet). We suggest using Category 5e cable when connection to power a device.

**Improper Network Topologies**

It is important to make sure that you have a valid network topology. Common topology faults include excessive cable length and too many repeaters (hubs) between end nodes. In addition, you should make sure that your network topology contains no data path loops. Between any two ends

nodes, there should be only one active cabling path at any time. Data path loops will cause broadcast storms that will severely impact your network performance.

**Diagnosing LED Indicators**

To assist in identifying problems, the switch can be easily monitored through panel indicators, which describe common problems the user may encounter and where the user can find possible solutions. If the LED display detection isn't correct, please unplug then plug in the cable again.

If the power indicator does not light when the power cord in plugged in, you may have a problem with the power outlet or power connections, power losses, or surges at power outlet. If the problem still cannot be resolved, please contact the local dealer for assistance.

# 5 Getting Started

This chapter introduces the management interface of the switch.

## 5.1 Management Options

The Switch can be managed through any port on the device by using the Web-based Management

Each switch must be assigned its own IP Address, which is used for communication with Web-Based Management. The PC's IP address should be in the same range as the switch. Each switch can allow only one user to access the Web-Based Management at a time.

Please refer to the following installation instructions for the Web-based Management.

## 5.2 Using Web-based Management

After a successful physical installation, you can configure the switch, monitor the network status, and display statistics using a web browser.

**Connecting to the Switch**

You will need the following equipment to begin the web configuration of your device:

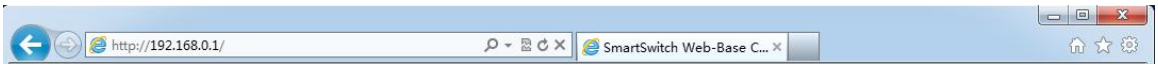
- A PC with a RJ-45 Ethernet connection
- A standard Ethernet cable

Connect the Ethernet cable to any of the ports on the front panel of the switch and to the Ethernet

port on the PC.

**Login Web-based Management**

In order to login and configure the switch via an Ethernet connection, the PC must have an IP address in the same subnet as the switch. For example, if the switch has an IP address of **192.168.0.1** the PC should have an IP address of **192.168.0.1x** (where x is a number between 2 ~ 254), and a subnet mask of 255.255.255.0. Open the web browser and enter **192.168.0.1** (the factory-default IP address) in the address bar. Then press <Enter>.



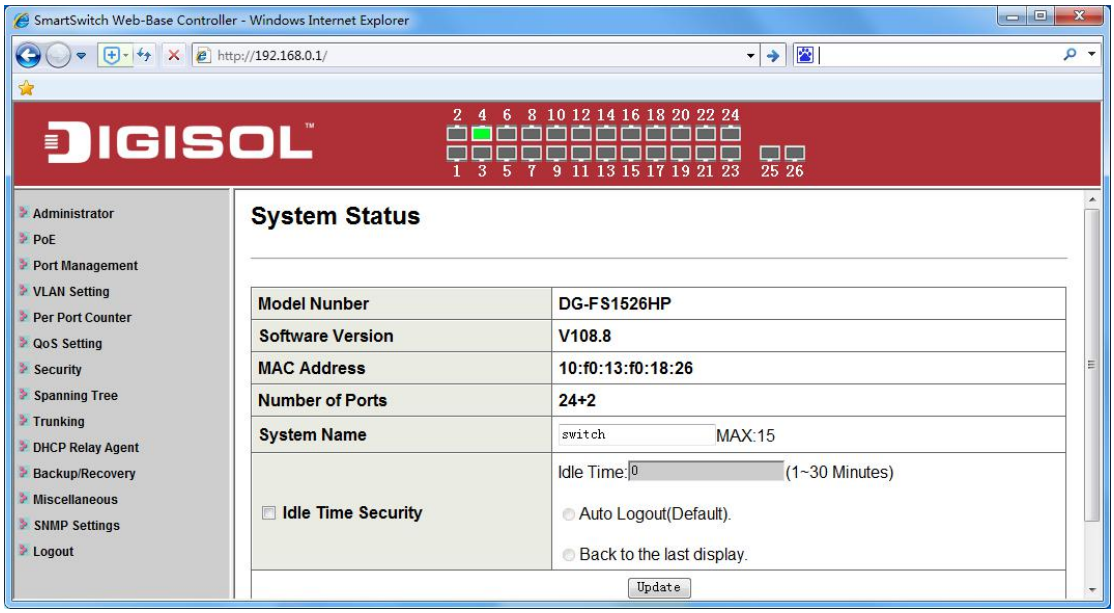

When the following logon dialog box appears, enter the username and password then click **OK**. The default username is **admin** and password is **admin**.

# 6 Configuration

The features and functions of the switch can be configured for optimum use through the Web-based Management.

## 6.1 Welcome

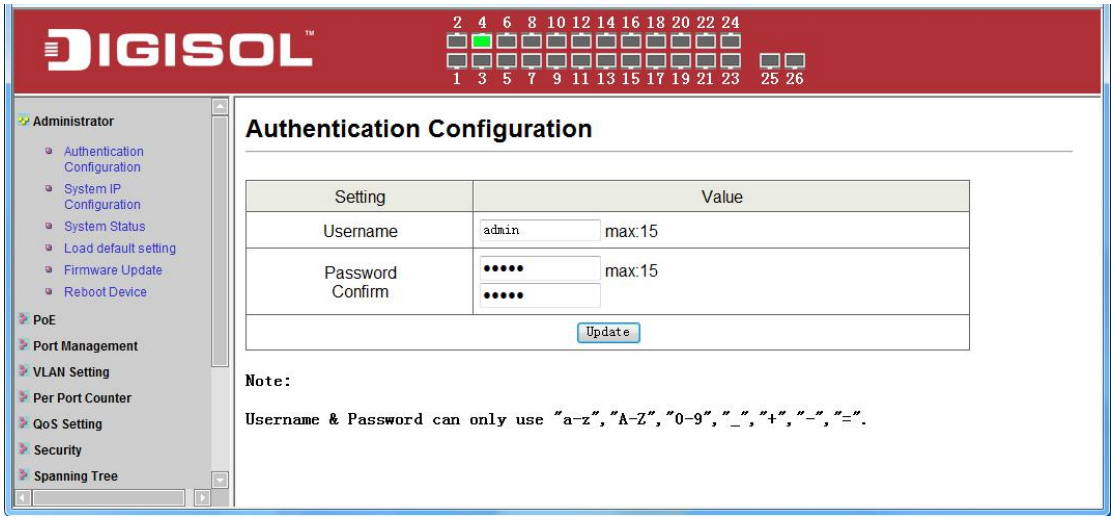
After a successful login you will see the screen bellows:



# 6.2 Administrator

**Administrator -> Authentication Configuration**

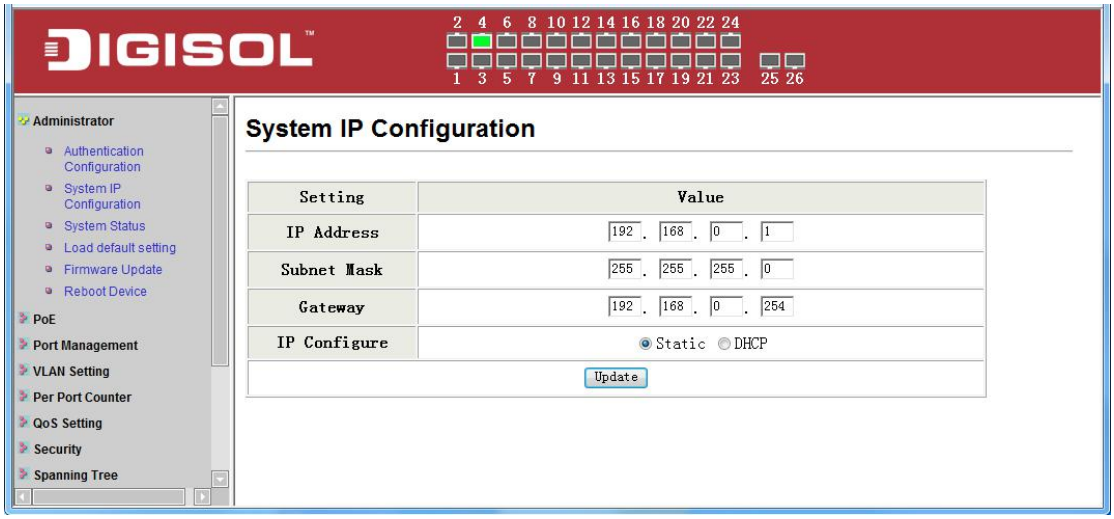
Here you can enter a new **Username/Password** and confirm it.




**Administrator -> System IP Configuration**

There are two ways for the switch to obtain an IP address: 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 (including network mask and default gateway) before using the default or previously entered settings. By default the IP setting is static mode with IP address is **192.168.0.1** and subnet mask is **255.255.255.0**

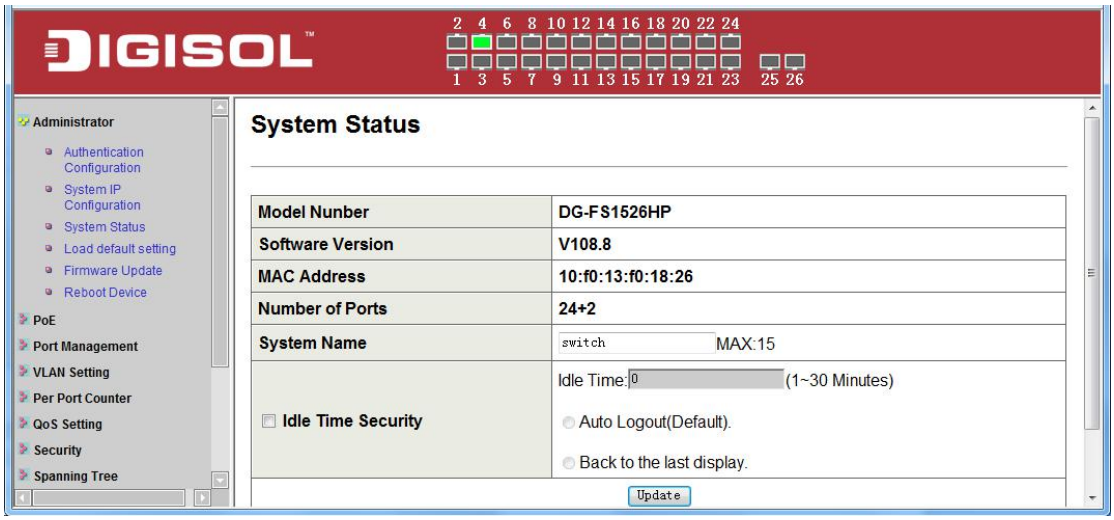



**Administrator -> System Status**

**Comment:** By entering a Comment, the device can more easily be recognized on the LAN.

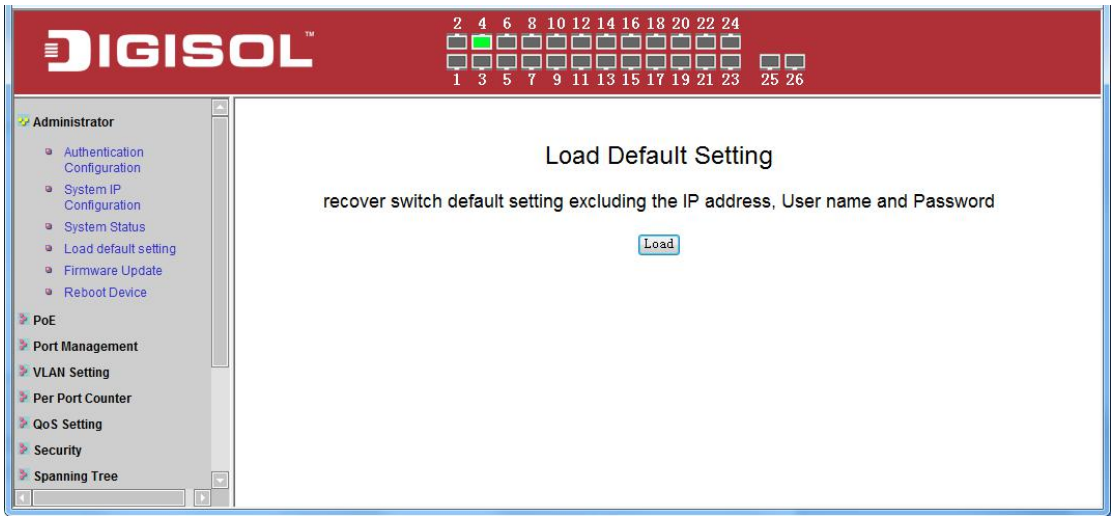
**Idle Time Security:** It controls the idle time-out period for security purposes, when there is no

action for a specific time span in the Web-based Management. If the current session times out (expires), the user is required a re-login before using the Web-based Management again. Selective range is from 3 to 30 minute, and the default setting is 5 minutes.



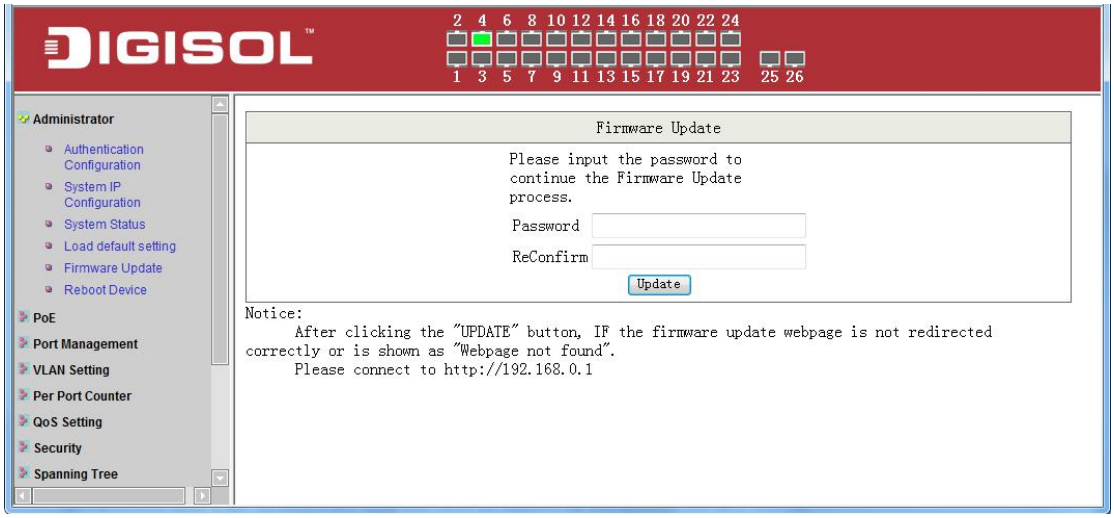

**Administrator -> Load default setting**

Provide a safe reset option for the switch. All configuration settings in non-volatile RAM will be reset to factory default and then the switch will reboot.




**Administrator -> Firmware Update**

You must enter the password of device in order to determine the firmware needs to be updated.

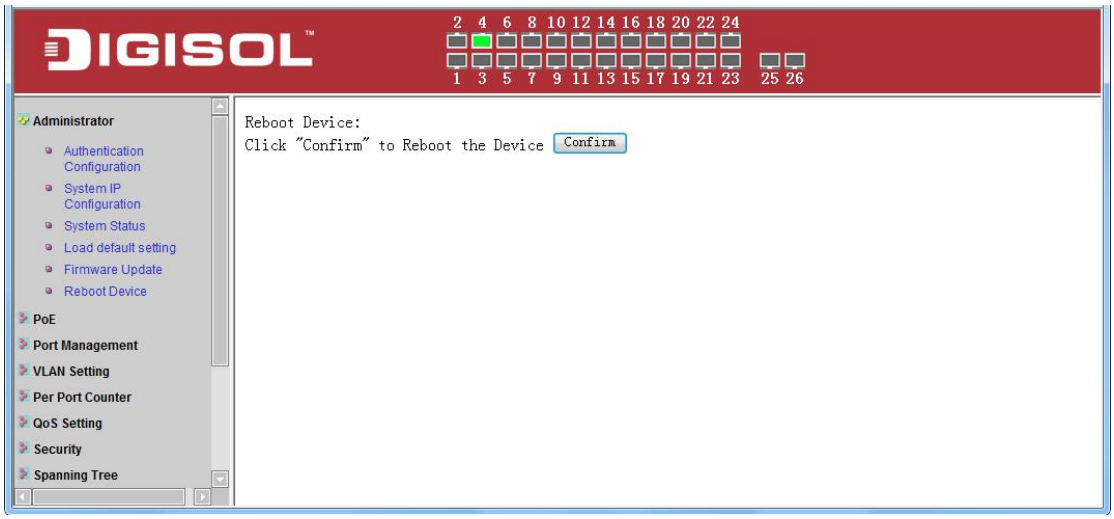



After a correct password the switch will erase the old firmware first.

After completing the erase you will see the screen bellows. Specify the Firmware Path (or Browse for one) that you are going to use, and then click **Update**. The state will show 'OK' after completion, and 'Fail' is firmware upgrade fails or cannot be completed for any reason.

**Administrator -> Reboot Device**

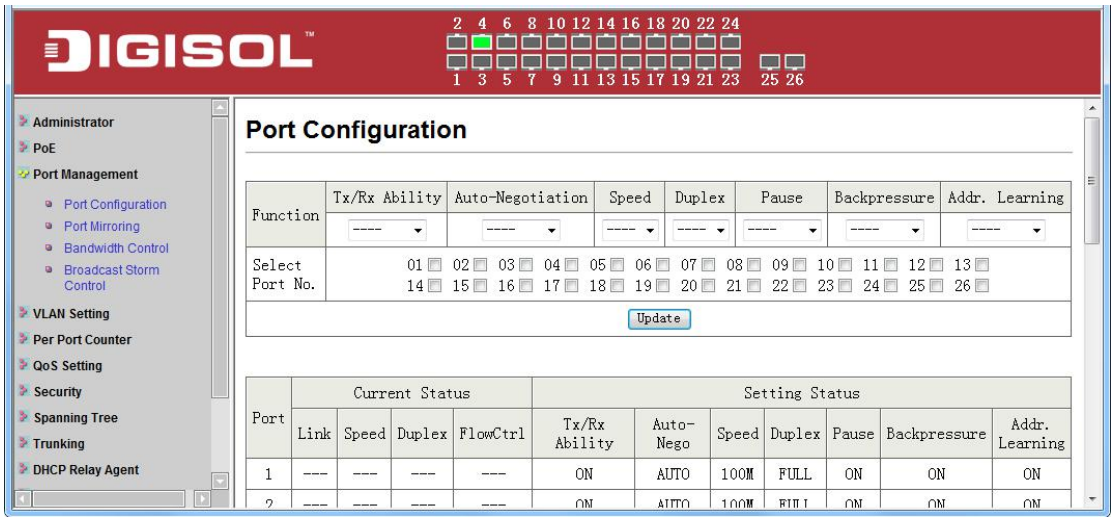
Provide a safe way to reboot the system. Click **Reboot** to restart the switch.




# 6.3 Port Management

**Port Management -> Port Configuration**

In this page, the status of all ports can be monitored and adjusted for optimum configuration.




**Enable:** Enable or disable the port's connection

**Auto-Nege:** Enable or disable port auto-NDI/MDIX

**Speed:** Copper connections can operate in Forced Mode settings (1000M Full, 100M Full, 100M Halt, 10M Full, 10M Half), Auto, or Disabled. The default setting for all ports is **Auto.**

**Duplex:** Copper connections can operate in Full-Duplex or Half-Duplex Mode

**Symmetric Pause:**

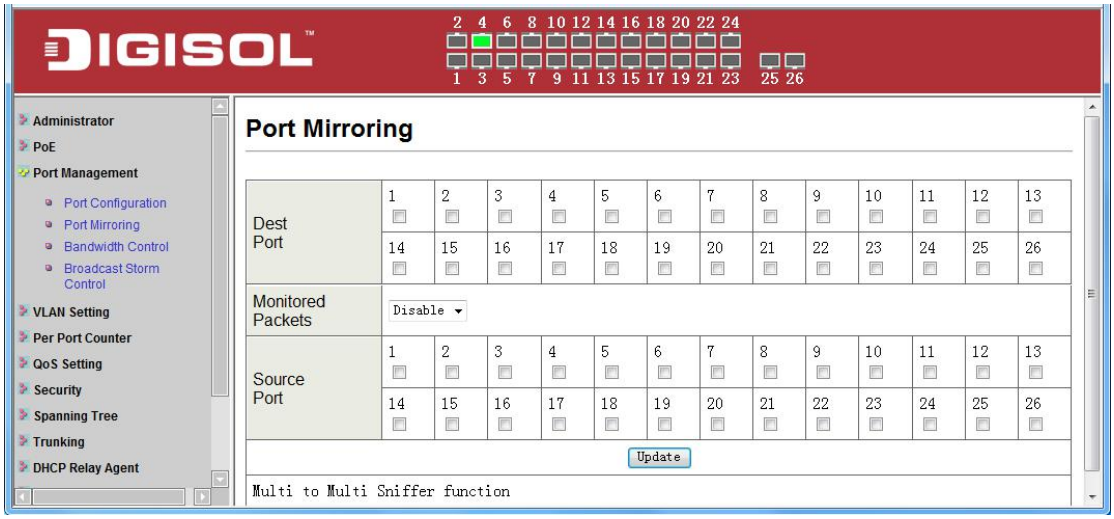
**Asymmetric Pause:**

**Backpressure:**

**Addr. Learning:** Enable or disable port learning MAC address.

## Port Management -> Port Mirroring

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.




**TX (transmit) mode:** Duplicates the data transmitted from the source port and forwards it to the Target Port. Click "all" to include all ports into port mirroring.

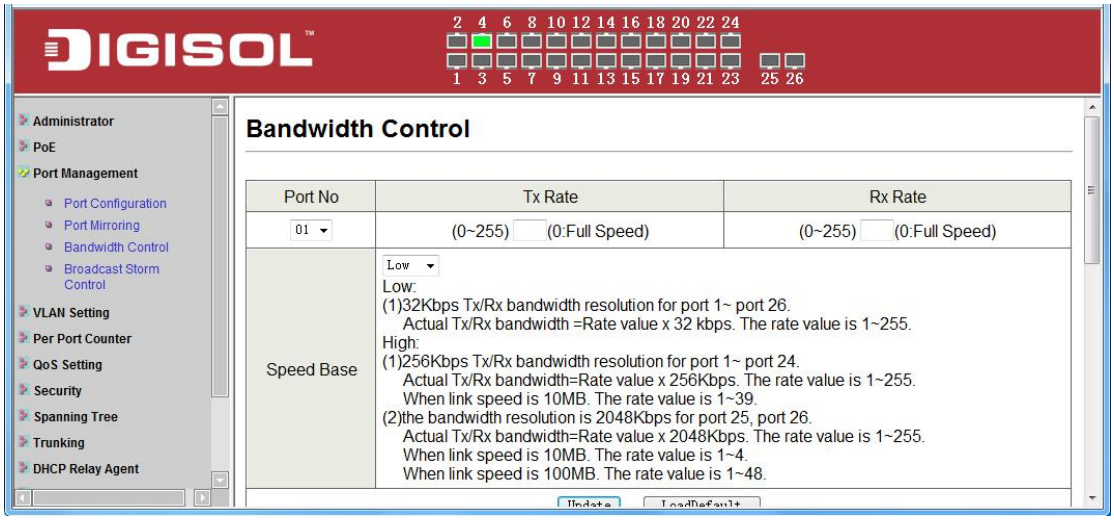
**RX (receive) mode:** Duplicates the data that received from the source port and forwards it to the Target Port. Click "all" to include all ports into port mirroring.

**Both (transmit and receive) mode:** Duplicate both the data transmitted from and data sent to the source port, and forwards all the data to the assigned Target Port. Click “all” to include all ports into port mirroring.

Note. The target ports will stop mirroring packets if there are unknown tags or destination packets sent out by source ports.

## Port Management -> Bandwidth Control

The Bandwidth Control page allows network managers to define the bandwidth settings for a specified port’s transmitting and receiving data rates.



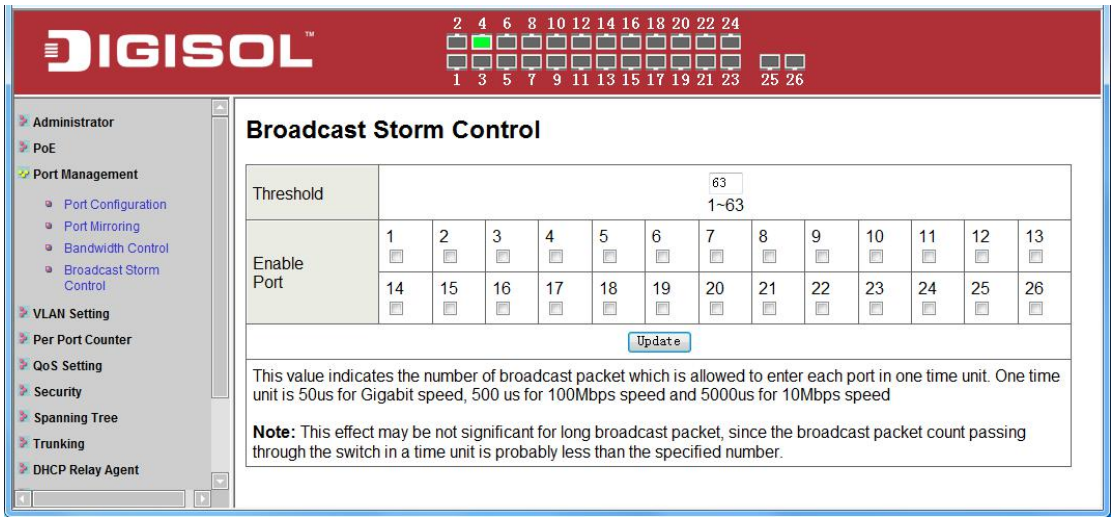

**TX Rate:** This allows you to enter data receive rate from 0 to 255 (base on speed base), 0 for full speed.

**RX Rate:** This allows you to enter data transmit rate from 0 to 255 (base on speed base), 0 for full speed.

**Speed Base:**

## Port Management -> Broadcast Storm Control

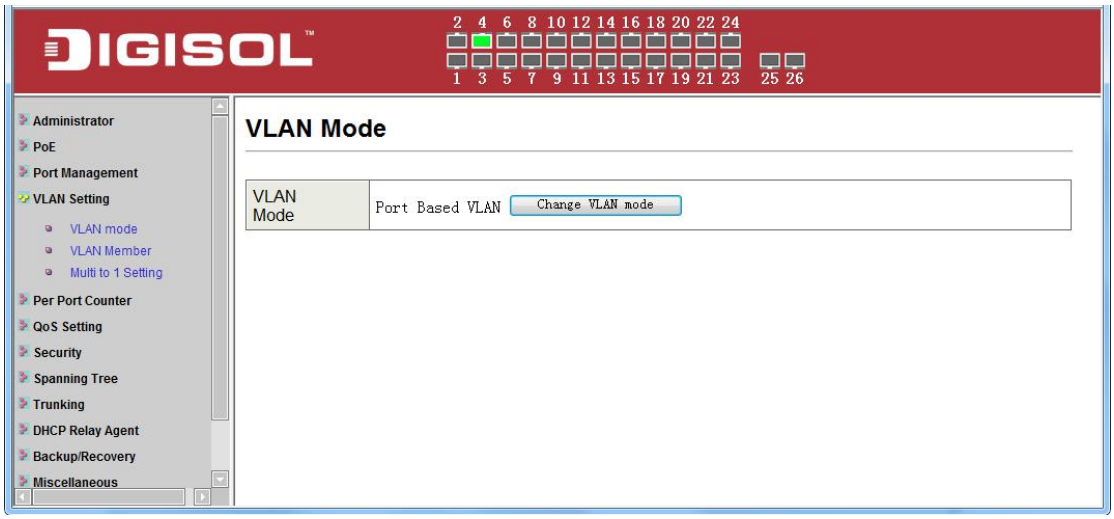
The Broadcast Storm Control feature provides the ability to control the receive rate of broadcast packets. Once a packet storm has been detected, the Switch will drop packets coming into the Switch until the storm has subsided.




# 6.4 VLAN Setting

**VLAN Setting -> VLAN Mode**

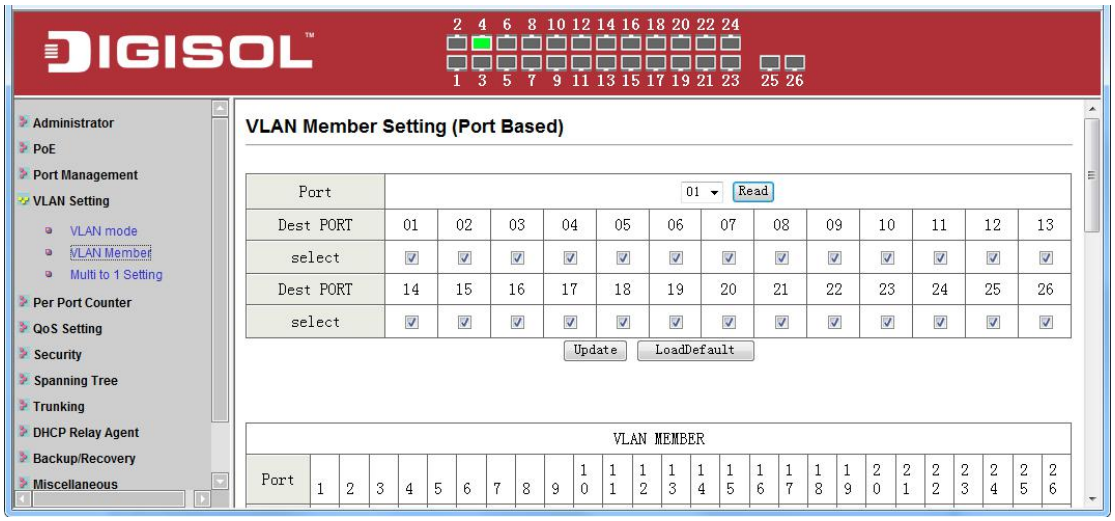
A VLAN is a group of ports that can be anywhere in the network, but communicate as though they were in the same area. VLANs can be easily organized to reflect department groups (such as R&D, Marketing), usage groups (such as e-mail), or multicast groups (multimedia applications such as video conferencing), and therefore help to simplify network management by allowing users to move devices to a new VLAN without having to change any physical connections.




**Prot Based VLAN:** Port-Based VLANs are the simplest and most common form of VLAN. It assigns the appliance LAN ports to VLANs, effectively transforming the appliances. You can assign multiple ports to the same VLAN, or each port to a separate VLAN.

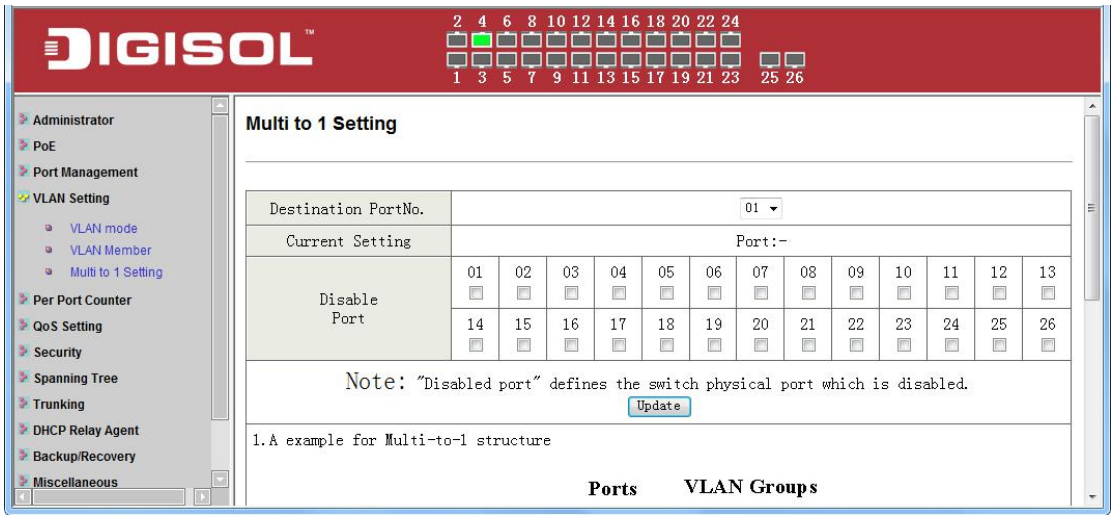
**802.1Q VLAN:** By default, 802.1Q VLAN is disabled. With 802.1Q VLAN enabled, the VLAN VID 1 is created by default with an empty VLAN name field and all ports are configured as “Untagged” members.

**VLAN Setting ->**




**Add VLAN:** Click to create a new VLAN name and to select VLAN ports. The VLAN name should be less than 10 characters. To save the members in a group, click **Add.**

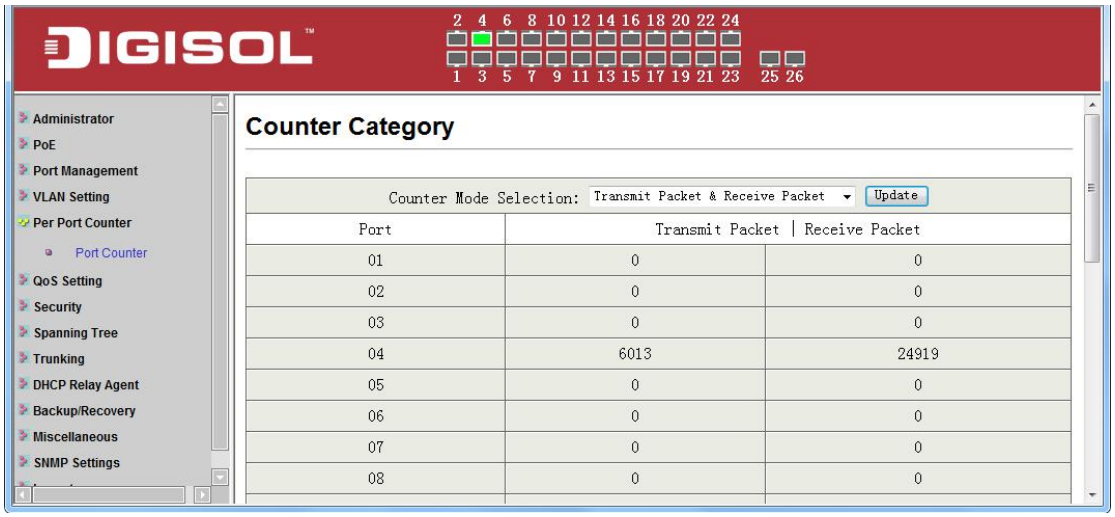
**VLAN Setting ->**




# 6.5 Per Port Counter

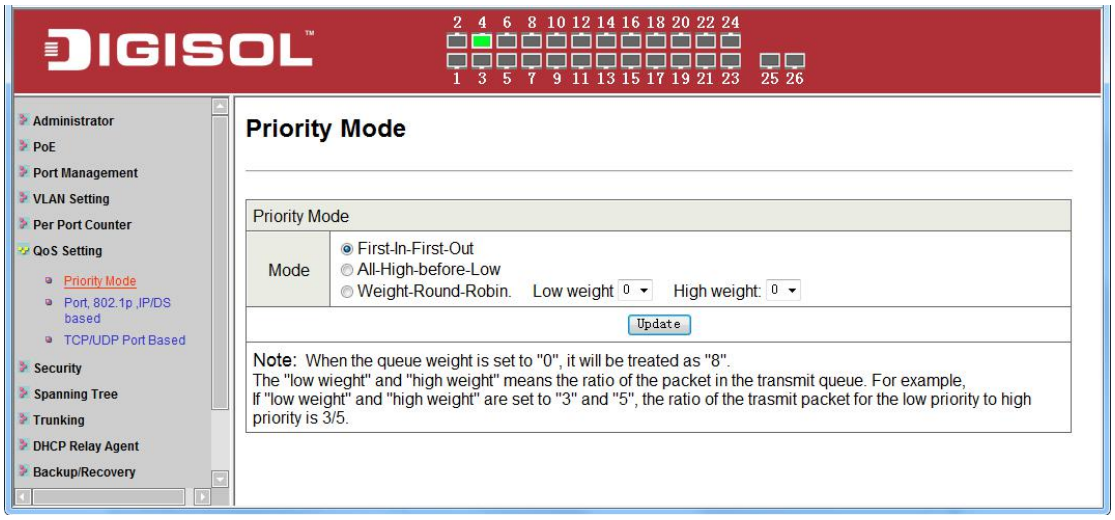
**Per Port Counter -> Port Counter**

The Statistics screen displays the status of each port packet count.

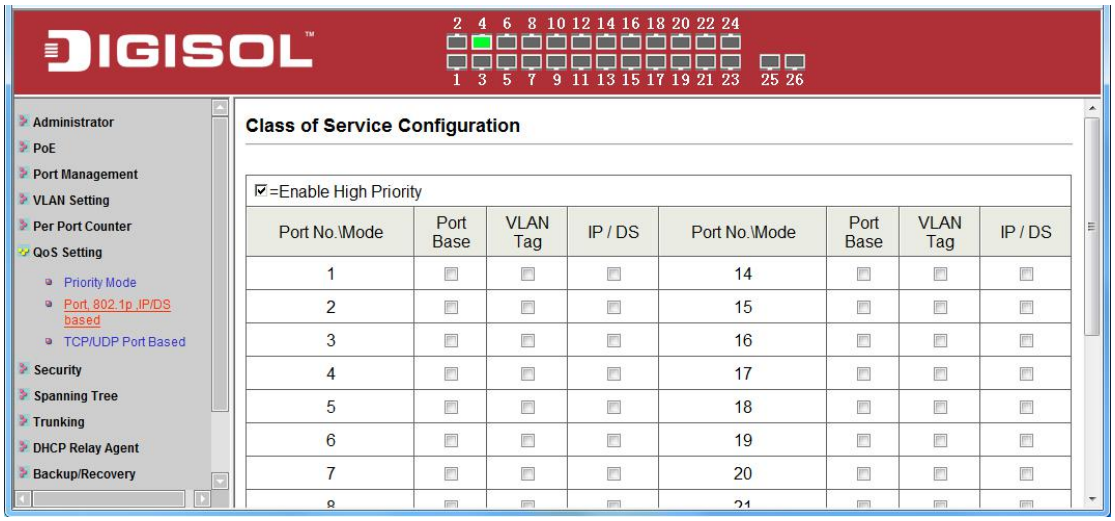



# 6.6 QoS Setting

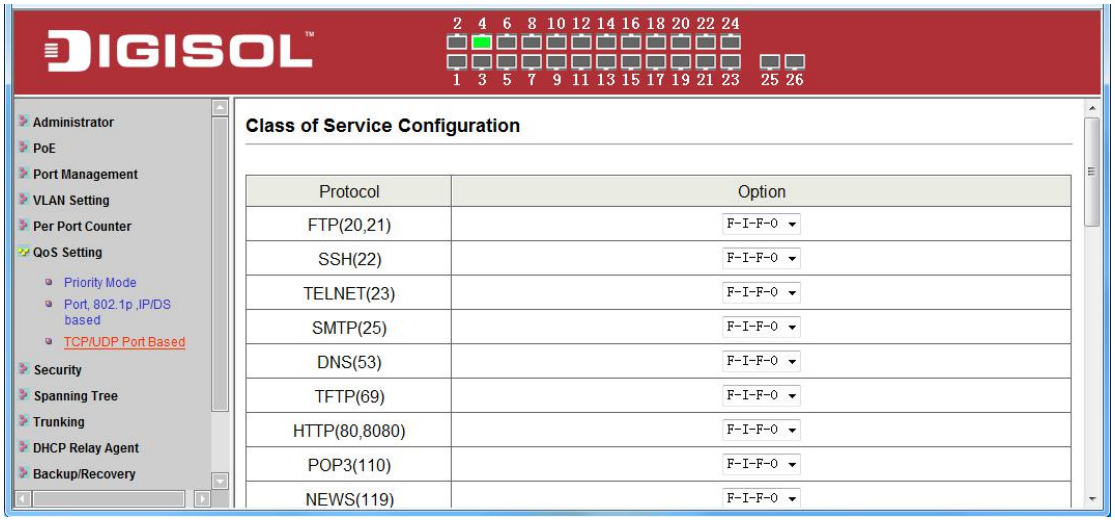
**QoS Setting -> Priority Mode**




**QoS Setting -> Port, 802.1p ,IP/DS based**

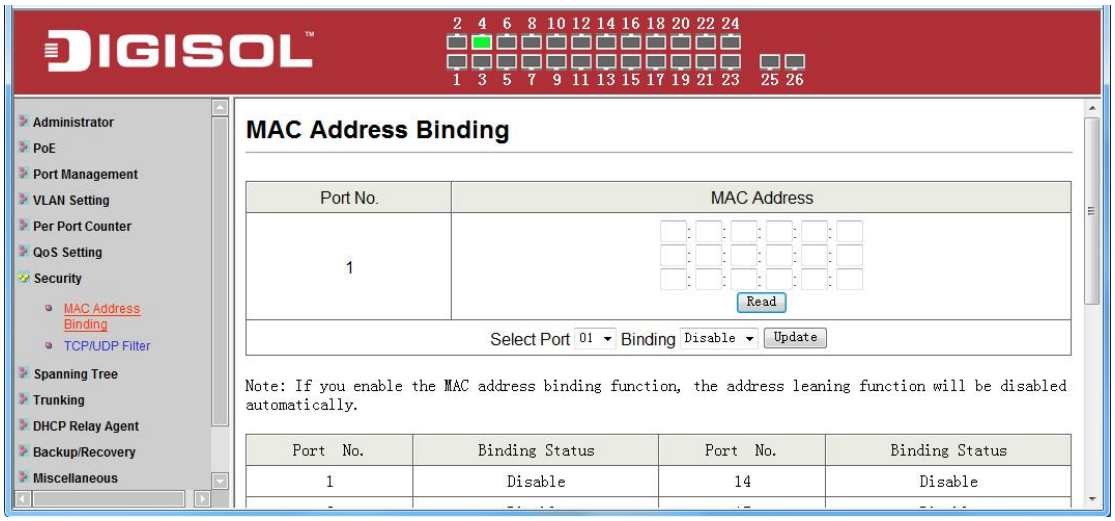



**QoS Setting -> TCP/UDP Port Based**

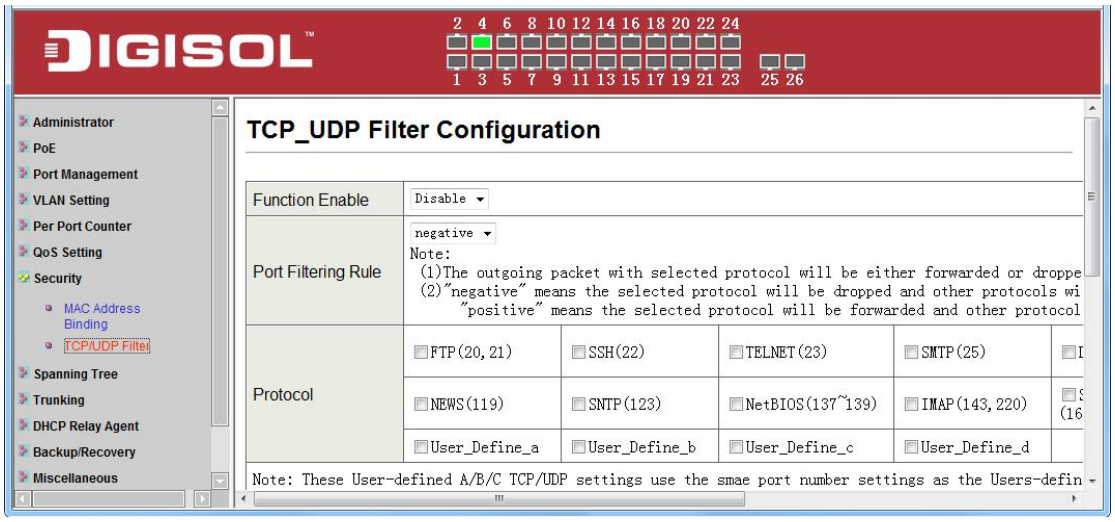



# 6.7 Security

**Security -> MAC Address Binding**

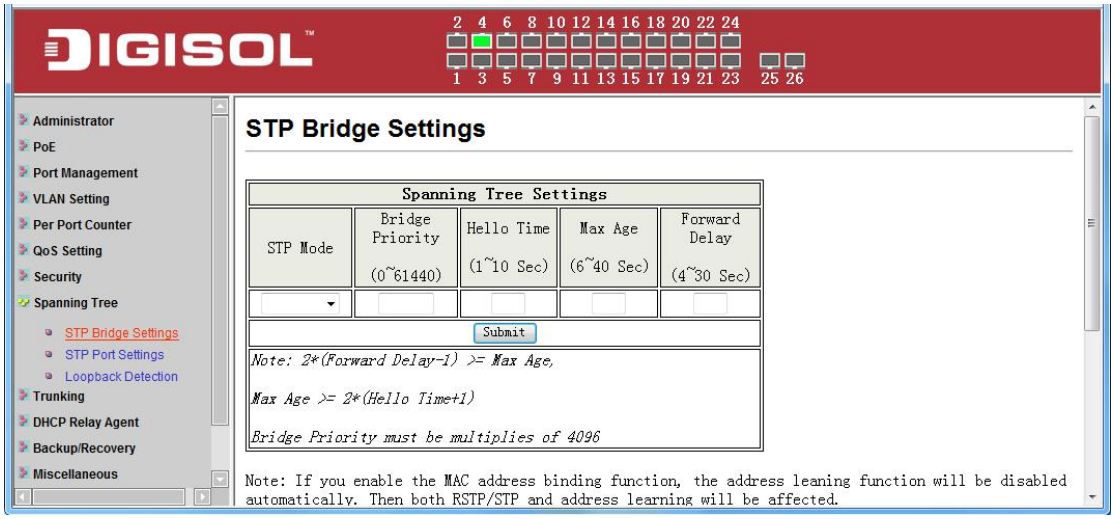



**Security -> TCP/UDP Filter**

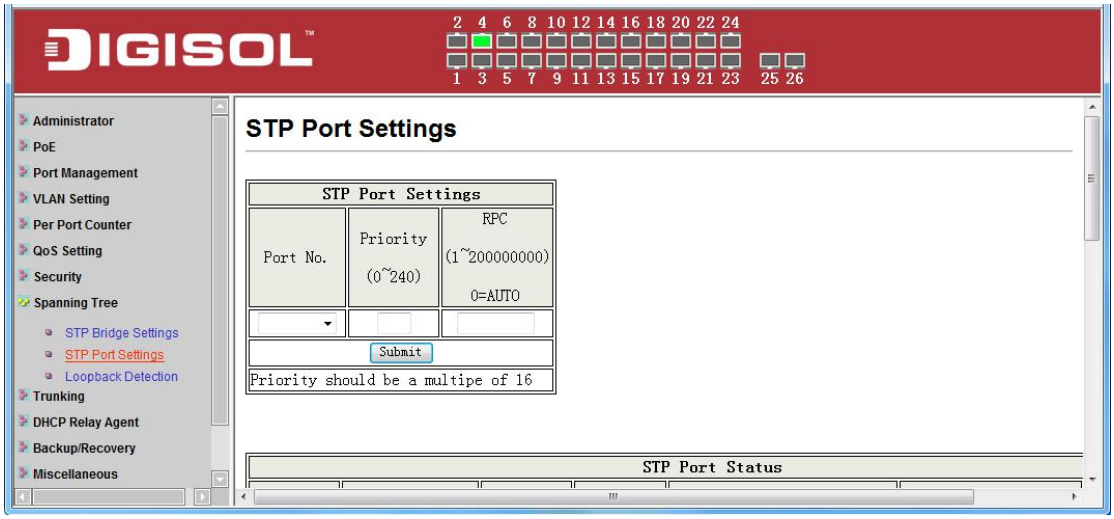



# 6.8 Spanning Tree

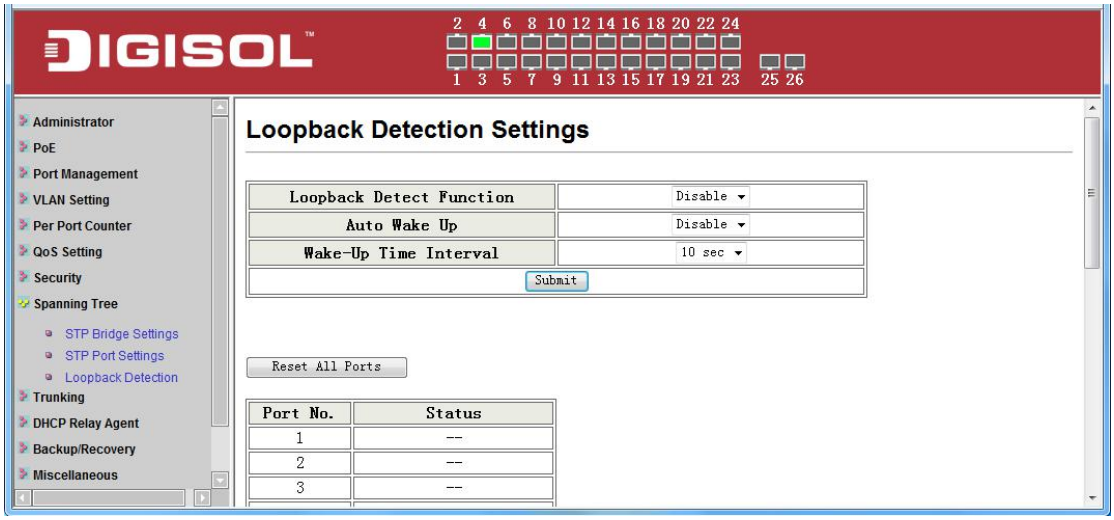
**Spanning Tree -> STP Bridge Settings**




## Spanning Tree -> STP Port Settings



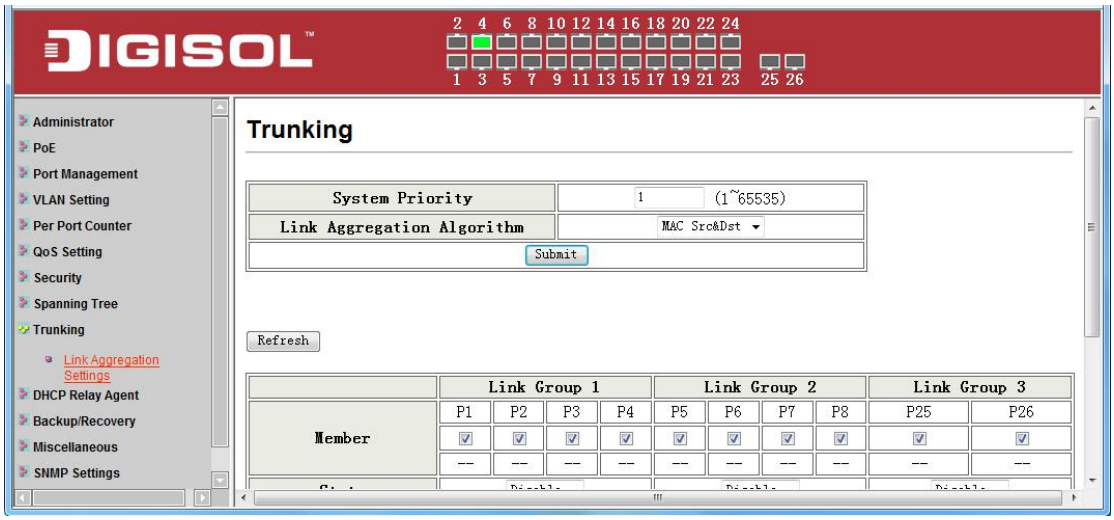

## Spanning Tree -> Loopback Detection



# 6.9 Trunking

**Trunking -> Link Aggregation Settings**

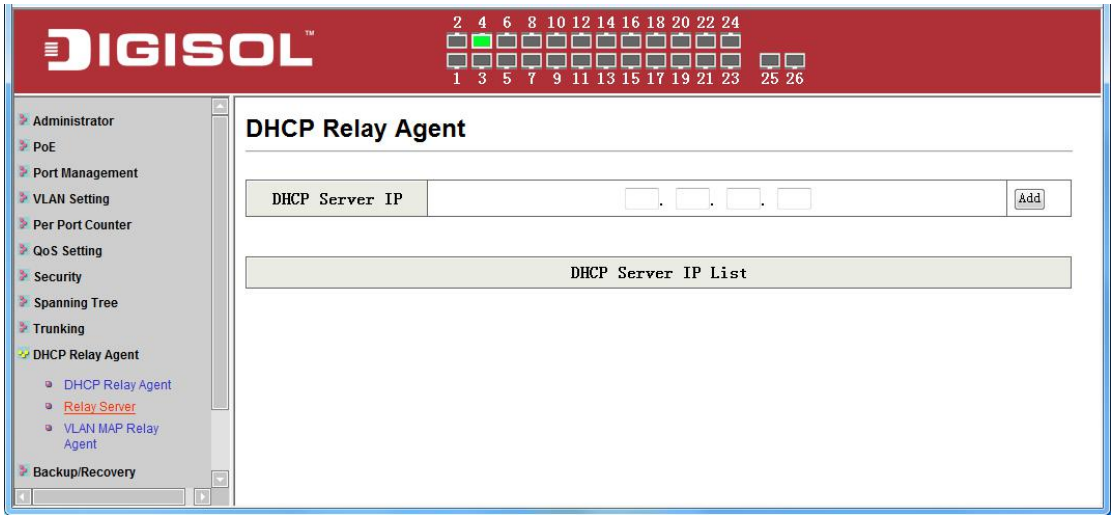
The Trunking function allows the switch to combine two or four ports together to increase bandwidth. Select the Trunking Groups, choose the Members to be grouped together, and then click **Submit** to activate the selected Trunking Groups.




# 6.10 DHCP Relay Agent

**DHCP Relay Agent -> DHCP Relay Agent**

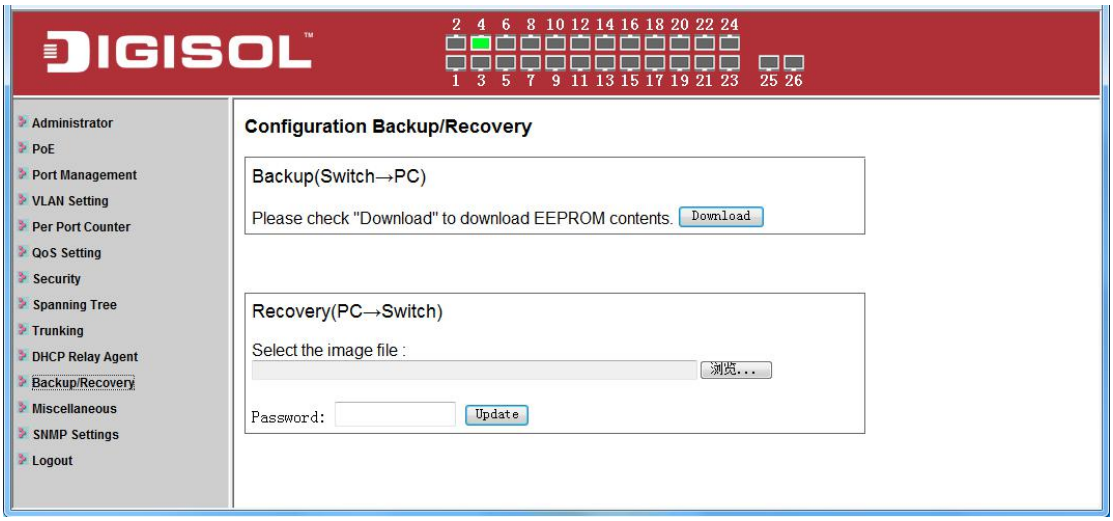

**DHCP Relay Agent -> Relay Server**




**DHCP Relay Agent -> VLAN MAP Relay Agent**


# 6.11 Backup/Recovery

Allow the current configuration settings to be saved to a file (not including the password), and if necessary, you can restore configuration settings from the file.




Backup or restore the configuration file to or from your local drive.

Click **Download** to save the current settings to your disk.

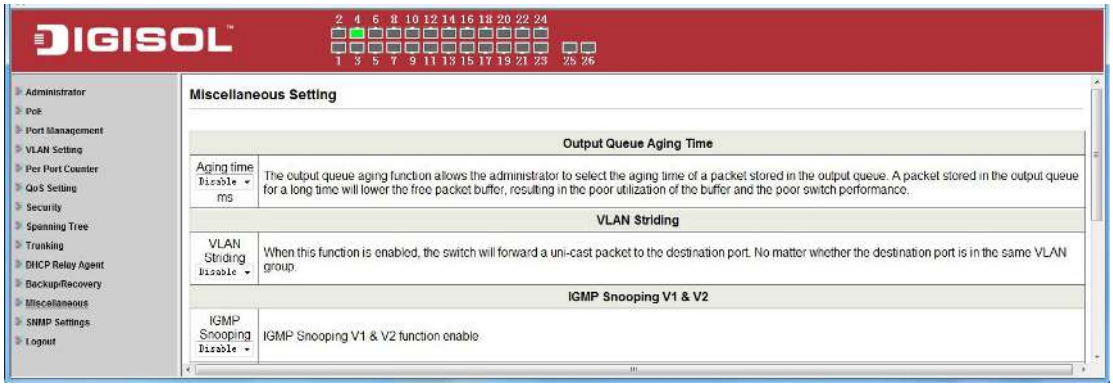
Click **Browse** to browse your inventories for a saved backup settings file.

Click **Update** after selecting the backup settings file you want to restore.

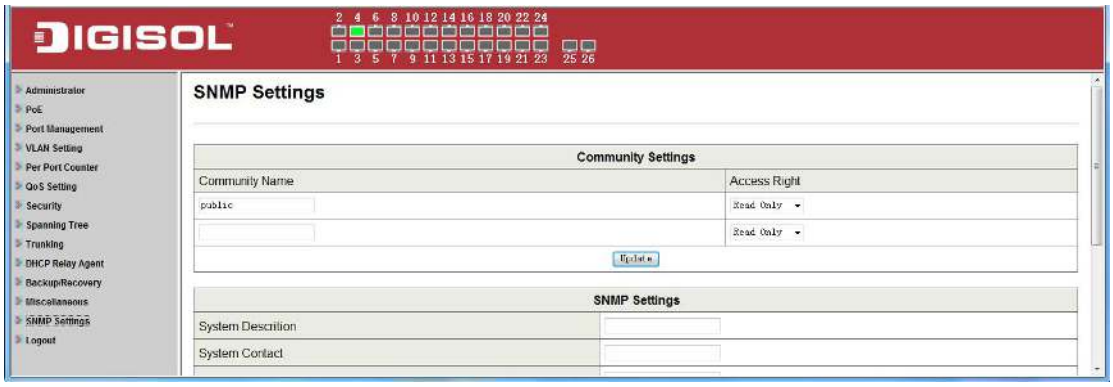
**Note:** Switch will reboot after restore and all current configurations will be lost

# 6.12 Miscellaneous

**Miscellaneous -> Miscellaneous Settings**



# 6.13 SNMP Settings




# 6.15 Logout

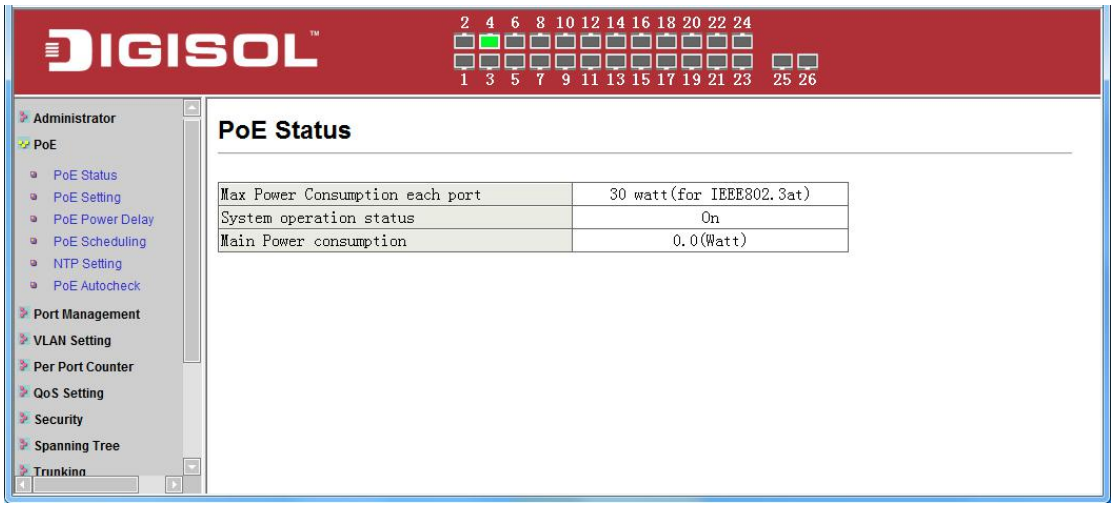
Click this to end this session

**Note:** If you close the web browser without clicking the **Logout** button, it will be seen as an abnormal exit and the login session will still be occupied.

# 6.16 PoE

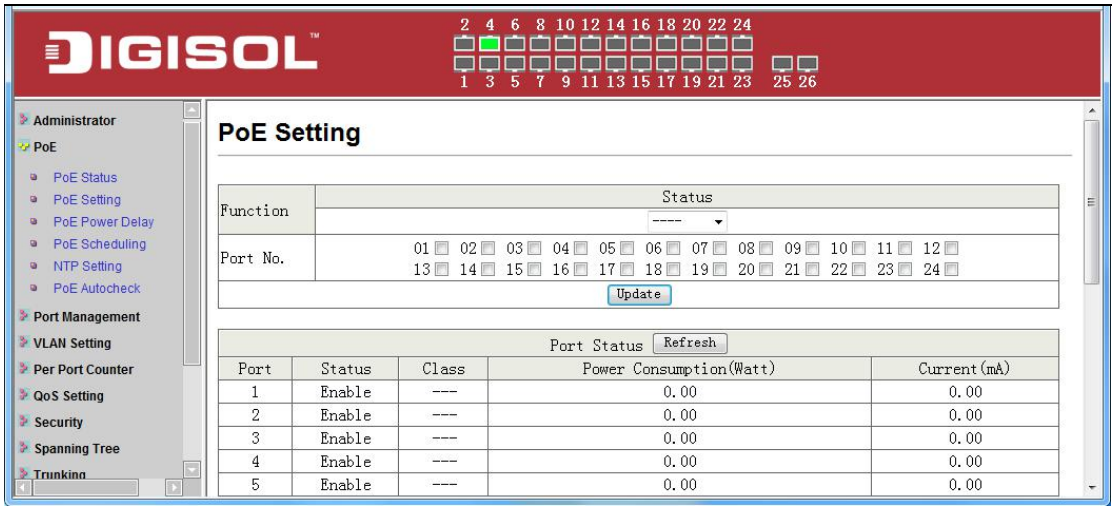
**PoE -> PoE Status**

The Statistics screen displays the total Watts usage of PoE Switch.




**PoE -> PoE Setting**

This section provides PoE (Power over Ethernet) Configuration and PoE output status of PoE Switch.




**Status:** Can enable or disable the PoE function.

**Class:** Class 0 is the default for PDs. However, to improve power management at the PSE, the PD may opt to provide a signature for Class 1 to 4.

The PD is classified based on power. The classification of the PD is the maximum power that the PD will draw across all input voltages and operational modes. A PD shall return Class 0 to 4 in accordance with the maximum power draw as specified by following Table.

| Class | Usage | Range of maximum power used by the PD |
|---|---|---|
| 0 | Default | 0.44 to 12.95 Watts |
| 1 | Optional | 0.44 to 3.84 Watts |
| 2 | Optional | 3.84 to 6.49 Watts |
| 3 | Optional | 6.49 to 12.95 Watts |
| 4 | Optional | 12.95 to 25.5 Watts |

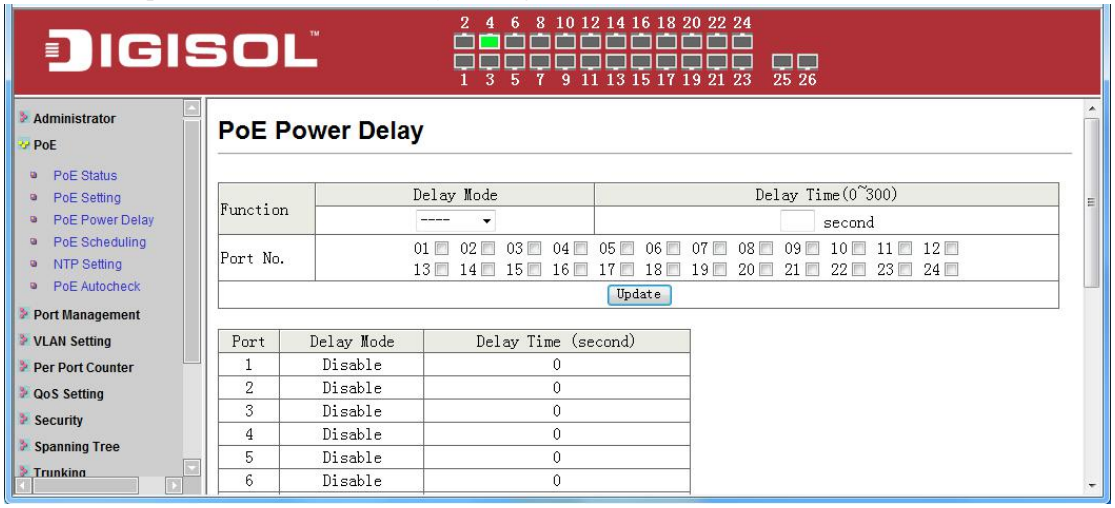
**Power Consumption (Watt):** It shows the PoE supply Watts.

**Current (mA):** It shows the PoE device current Amp.

**Current-Limit (mA):** It can limit the port PoE supply Amp. Per port maximum value must less **600**. Once power overload detected, the port will auto shut down and we should manually enable the PoE port.

## PoE -> PoE Power Delay

This section provides PoE Power Delay Configuration.



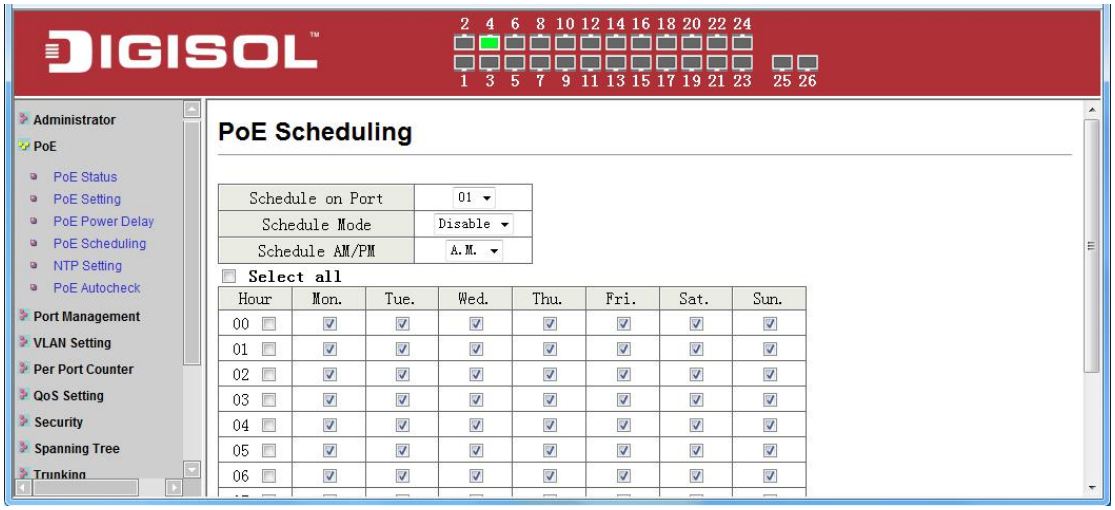
**Delay Mode:** Enable or disable the port's PoE Power Delay function.

**Delay Time:** Set PoE power delay time (0~300).

## PoE -> PoE Scheduling

PoE Schedule user can configure a duration time for PoE port as default value does not provide power.

**Note** Please enable NTP and correct the System Time first.

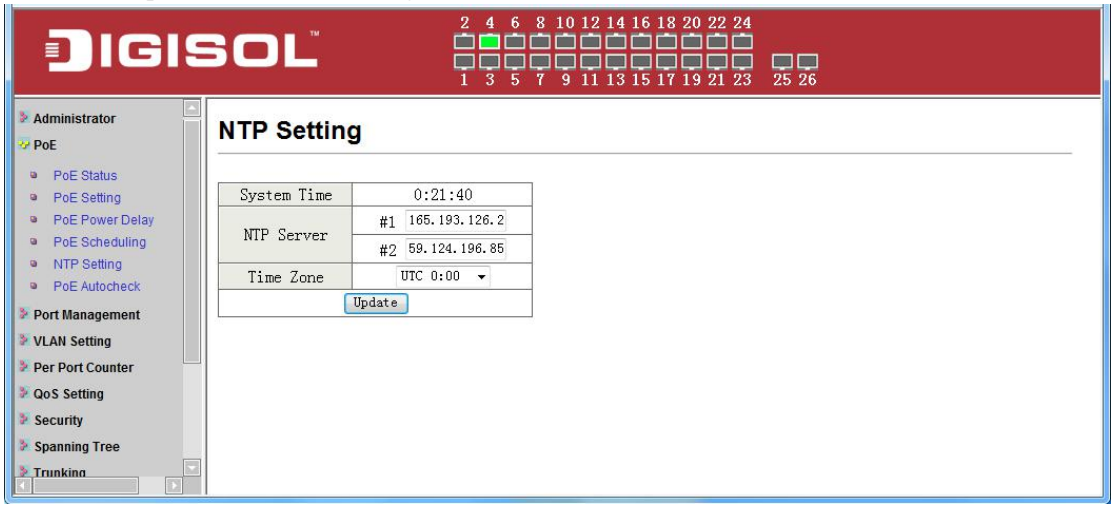



As default value, all PoE Schedule Profile functions are disabled

Please use mouse to click on the block about what time you want to supply power for PoE port.

## PoE -> NTP Setting

This section provide the NTP Configuration of PoE Switch




**System Time:** Display current time information

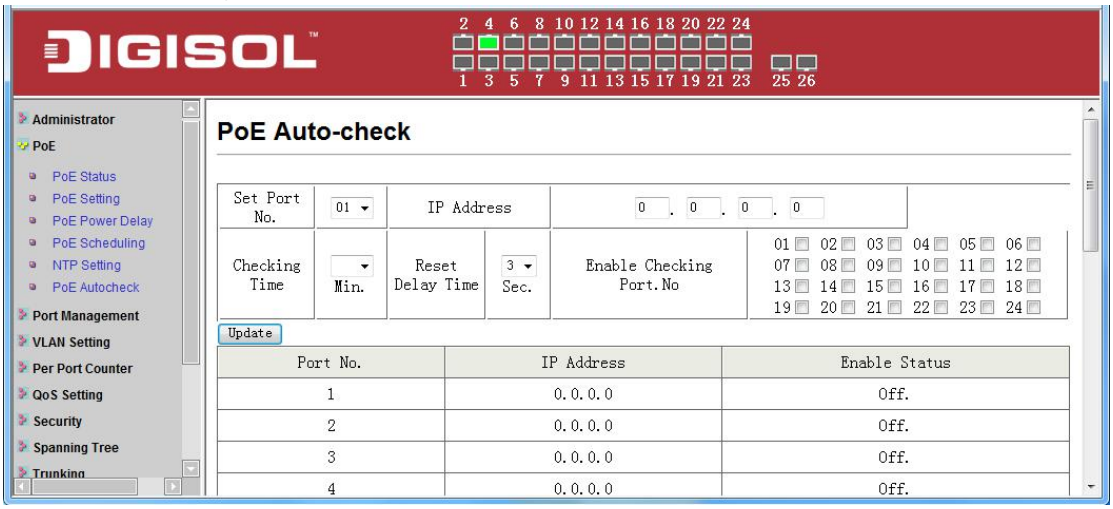
**NTP Server:** Allow assign #1 or #2 NTP server IP address manually

**Time Zone:** Allow select the time zone according to current location

## PoE -> PoE Auto-check

The PoE Switch can be configured to monitor connected PD's status in real-time via ping action.

Once the PD stops working and without response, the PoE Switch is going to restart PoE port power, and bring the PD back to work. It will greatly enhance the reliability and reduces administrator management burden.




**Set Port No.:** Select the port witch you want to set IP Address

**IP Address:** Allow assign IP address witch you want to monitor

**Checking Time:** Select time interval of ping action (1-10Min)

**Enable Checking Port. No:** Select the port witch you want to enable PoE Auto-check

DIGICARE™

# Limited Lifetime Warranty

This Product is covered under DIGICARE Limited Lifetime Warranty program backed by DIGICARE Service Center. To avail this Limited Lifetime Warranty offer, customer needs to contact DIGICARE's Technical Assistance Center for the same. You may be asked to provide proof of purchase of product for warranty claim of defective product. Please refer website www.digisol.com for the detailed support terms & conditions and support process.

## Warranty Policy

**1.** Hardware Warranty : Hardware warranty period shall be limited up to Three years. External Power Adapter shall carry One year warranty only against manufacturing defects. Any repair or replacement will be rendered by DIGICARE at its Service Center only.

**2.** Software Warranty : DIGISOL issues this Limited Software Warranty that the software portion of the product ("Software") will substantially confirm to DIGISOL's then current functional specifications for the software, as set forth in the applicable documentation, from the date of original retail purchase of the Software for a period of one year ("Software Warranty period"), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation.

**3.** Governing Law: This warranty shall be governed by Indian Laws.

**4.** Limited Lifetime Warranty shall subject to the terms & conditions specified in the DIGISOL PRODUCT WARRANTY policy displayed on www.digisol.com

DIGICARE helpdesk@digisol.com 1800 209 3444

For Warranty Details Please Visit LIMITED LIFETIME WARRANTY www.digisol.com