D-Link®
Building Networks for People

DGS-1216T/1224T/1224TP/1248T

MANUAL
WEB SMART SWITCH

Version 3.20

WIRED

Table of Contents

About This Guide

This guide provides instructions to install D-Link Gigabit Ethernet Web Smart Switches DGS-1216T/24T/24TP/48T, how to use the SmartConsole Utility, and to configure Web-based Management Utility step-by-step.

Note: The model you have purchased may appear slightly different from the illustrations shown in the document. Refer Product Instruction and Technical Specification section for detailed information about your switch, its components, network connections, and technical specifications.

This guide is mainly divided into four parts:

1. Hardware Installation: Step-by-step hardware installation procedures
2. Getting Started: A startup guide for basic switch installation and settings
3. Smart Console Utility: An introduction to the central management system
4. Configuration: Information about the function descriptions and configuration settings

Online Resources

The website addresses are not prefixed with **http://** because most of the current web browsers do not need it. If you are using an older web browser, you may have to append **http://** in the web address.

For the latest information about the Web Smart Switches, e-mail:

Resource	Website
D-Link	***www.dlink.com.tw***
Technical Support	***tsd.dlink.com.tw***

Terms/Usage

In this guide, the term “Switch” (first letter is capitalized) refers to the Smart Switch, and “switch” (first letter in lower case) refers to other Ethernet switches. Some technologies refer to terms “switch”, “bridge” and “switching hubs” interchangeably, and both are commonly accepted for Ethernet switches.

A **NOTE** Alerts you to supplementary information.

A **CAUTION** indicates potential property damage or personal injury.

Copy Right and Trademarks

1 Hardware Installation

This chapter provides unpacking and installation information for the D-Link Web-Smart Switch.

Step1: Unpacking

Open the shipping carton and carefully unpack its contents. Please consult the packing list located in the User Manual to make sure all items are present and undamaged. If any item is missing or damaged, please contact your local D-Link reseller for replacement.

- One D-Link Web-Smart Switch
- One AC power cord
- Four rubber feet
- Screws and two mounting brackets
- One Multi-lingual Getting Started Guide
- User's Guide CD with SmartConsole Utility program

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

Step2: Switch Installation

For safe switch installation and operation, it is recommended that you:

- Visually inspect the power cord to see that it is secured fully to the AC power connector.
- Make sure that there is proper heat dissipation and adequate ventilation around the switch.
- Do not place heavy objects on the switch.

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.

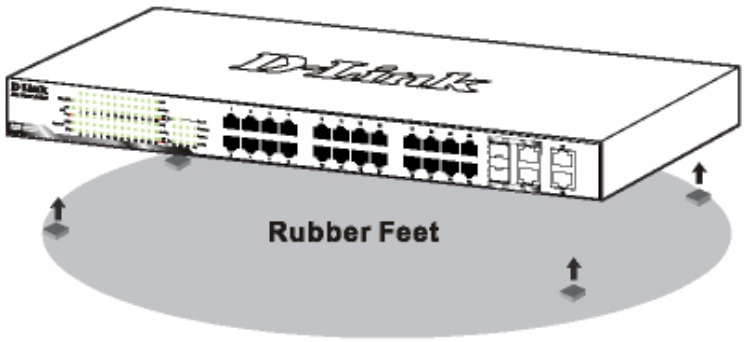


Figure 1 – Attach the adhesive rubber pads to the bottom

Rack Installation

The switch can be mounted in an EIA standard size 19-inch rack, which 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 (please note that these brackets are not designed for palm size switches).

Figure 2 – Attach the mounting brackets to the Switch

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

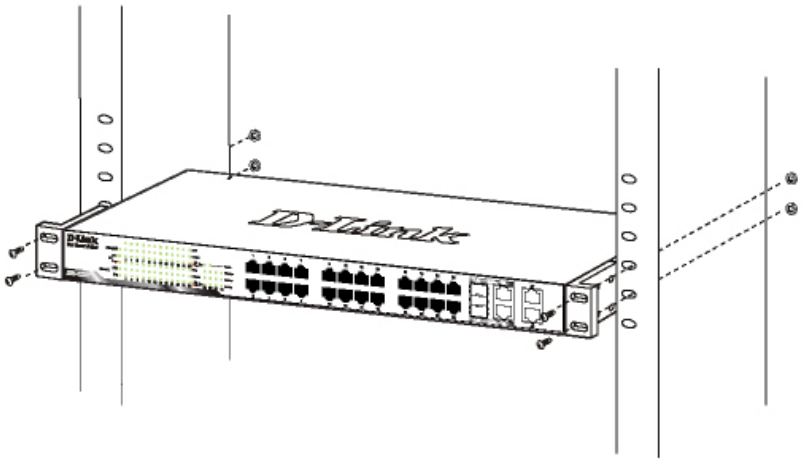


Figure 3 – Mount the Switch in the rack or chassis

Step 3 – 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).

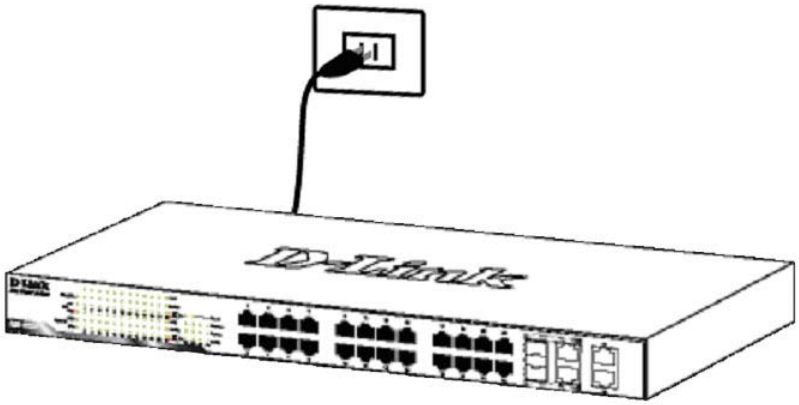


Figure 4 –Plugging the switch into an outlet

Power Failure

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

2 Getting Started

This chapter guides you how to get into and introduces the management interface of D-Link Web-Smart Switch.

Management Options

The D-Link Web Smart Switch can be managed through any port on the device by using the Web-based Management Utility or through any PC using the SmartConsole Utility.

If you want to manage only one D-Link Web Smart Switch, the Web-Based Management Utility is the better option. Each switch must be assigned its own IP Address, which is used for communication with Web-Based Management Utility or an SNMP network manager and the PC should have an IP address in the same range as the switch.

However, if you want to manage multiple D-Link Web Smart Switches, the SmartConsole Utility is the better option. Using the SmartConsole Utility, you don't need to change the IP address of your PC and it is easy to start the initial setting of multiple Smart Switches.

Please refer to the following detailed installation instructions for the Web-Based Management Utility and the SmartConsole Utility.

Using Web-based Management Utility

After a successful physical installation, you can configure the Switch, monitor the LED panel, and display statistics graphically using a web browser.

Supported Web Browsers

The embedded Web-based Management Utility currently supports the following web browsers:

- Microsoft Internet Explorer ver. 6.0, 5.5
- Mozilla ver. 1.7.12, 1.6
- Firefox ver. 1.5, 1.0.7
- Netscape ver. 8.0.4, 7.2
- Opera ver. 8.5, 7.6
- Safari ver. 2.0.2

Connecting to the Switch

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

1. A PC with a RJ-45 Ethernet connection
2. 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.

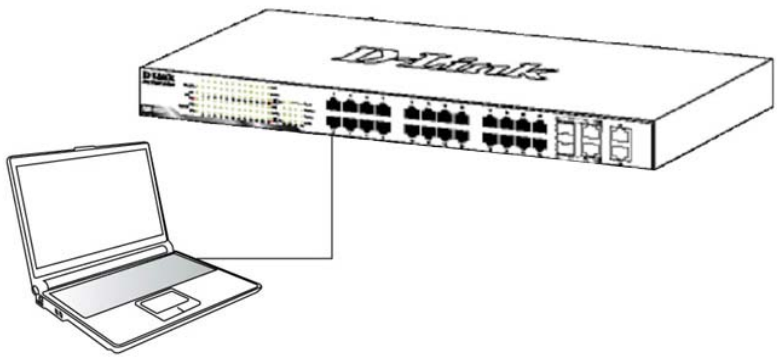


Figure 5 –Connected Ethernet cable

Login Web-based Management Utility

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.x** (where x is a number between 2 and 254), and a subnet mask of **255.255.255.0**. There are two ways to login the Web-based Management Utility, you may click the Web Access button at the top of the SmartConsole Utility or open your web browser and enter **192.168.0.1** (the factory-default IP address) in the address box. Then press <Enter>

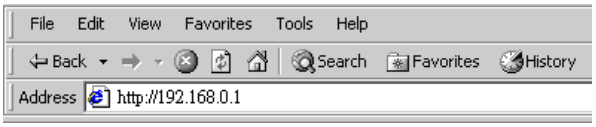


Figure 6 –Enter the IP address 192.168.0.1 in the web browser

NOTE: The switch's factory default IP address is 192.168.0.1 with a subnet mask of 255.255.255.0 and a default gateway of 192.168.0.254.

The web configuration can also be accessed through the SmartConsole Utility. Open the SmartConsole Utility and double-click the switch as it appears in the Monitor List. This will automatically load the web configuration in your web browser.

When the following login box appears, enter the password then press **OK** to entering the Web-based Management Utility. The default password is **Admin**.

Figure 7 – Log in screen

Smart Wizard

Before entering the Web-based Management Utility, When The Smart Wizard will guide you to quick configure the D-Link Web Smart Switch. Please refer to ***Samrt Wizard Configuration*** section for detail configurations.

Web-based Management Utility

After clicking the **Exit** button in Smart Wizard, you will enter the Web-based Management Utility. Please refer to Chapter 5 ***Configuration*** for detail configurations.

SmartConsole Utility

The SmartConsole Utility included on the installation CD is a program for discovering Smart Switches with the same L2 network segment connected to your PC. This tool is only for computers running Windows 2000, Windows XP, and Windows Vista x64/86 operating systems. There are two options for the installation of SmartConsole Utility, one is through the autorun program on the installation CD and the other is manual installation.

NOTE: Please be sure to remove any existing SmartConsole Utility from your PC before installing the latest SmartConsole Utility.

Option 1: Follow these steps to install the SmartConsole Utility via the autorun program on the installation CD.

1. Insert the Utility CD into your CD-Rom Drive.
2. The autorun program will pop up automatically
3. Simply click on the ”Install SmartConsole Utility” button and an installation wizard will guide you through the process.
4. After successfully installing the SmartConsole Utility, you can open the utility by clicking Start > Programs > D-Link SmartConsole Utility.
5. Just connect the Smart Switch to the same L2 network segment of your PC and use the SmartConsole Utility to discover the Smart Switches.

Option 2: Follow these steps to install the SmartConsole Utility manually.

1. Insert the Utility CD into your CD-Rom Drive.
2. From the Start menu on the Windows desktop, choose Run.
3. In the Run dialog box, type D:\D-Link SmartConsole Utility\setup.exe (where D:\ represents the drive letter of your CD-Rom) and click OK.
4. Follow the on-screen instructions to install the utility.
5. Upon completion, go to Start > Programs > D-Link SmartConsole Utility and open the SmartConsole Utility.
6. Just connect the Smart Switch to the same L2 network segment of your PC and use the SmartConsole Utility to discover the Smart Switches.

For a detailed look at SmartConsole’s functions, please refer to Chapter 4 ***SmartConsole Utility***

3 Product Introduction

Thank you and congratulations on your purchase of D-Link Web Smart Switch Products.

D-Link's next generation Web Smart Gigabit switch series blends plug-and-play simplicity with exceptional performance and reliability for small and medium-sized business (SMB) networking. All models are housed in a new style rack-mount metal case with easy-to-view front panel diagnostic LEDs, and provide advance features including up to two or four combo SFP fiber connections, network security, traffic segmentation, QoS and versatile management. Some of the advanced features include:

A Switch for Each Business Size: With three models (16, 24 and 48) Gigabit ports to choose from, this series provides flexible choices for different network size requirements. Since Gigabit copper ports capable of connecting to your existing Cat.5 twisted-pair cable, these switches eliminate the need of a complex reconfiguration process. In addition supports auto-detection of MDI/MDIX, bringing inexpensive and easy Gigabit connection to the desktops. Each switch provides two or four combo SFP slots for flexible connection to a fiber backbone or servers. All the SFP slots support 100M and 1000M dual speed fiber connections.

Extensive Layer 2 Features: Implemented as complete L2 devices, these switches include functions such as Jumbo frame support, IGMP snooping, port mirroring, Spanning Tree, port trunks. The IEEE 802.3x flow control function allows your servers to directly connect to the switch for fast, reliable data transfer.

Traffic Segmentation and QoS: The switches support 802.1Q VLAN standard tagging by prioritizing traffic to enhance network security and performance. Also support 802.1p priority queues, enabling users to run bandwidth-sensitive applications such as streaming multimedia and VoIP in network. These functions allow switches to work seamlessly with VLAN and 802.1p traffic in network. Asymmetric VLAN is implemented in these switches for a more efficient use of shared resources such as server or gateway devices.

Network Security: D-Link's innovative Safeguard Engine function protects the switches against traffic flooding caused by virus attacks. Additional features like MAC address filters screen access to the network.

They support 802.1X port-based authentication, allowing network to be configured with external RADIUS servers.

Versatile Management: The new generation of Gigabit web smart switches provides growing businesses simple and easy management of their network using an intuitive SmartConsole utility or a Web-Based management interface that allows administrators to remotely control their network down to the port level. The SmartConsole easily allows customers to discover multiple D-Link web smart switches with the same L2 network segment connected to user's local PC. With this utility, users do not need to change the IP address of PC and also provides easy initial setting of smart switches. The switches with the same L2 network segment connected to user's local PC are displayed on the screen for instant access. It allows extensive switch configuration setting, and basic configuration of discovered devices such as password change, firmware upgrade.

In addition, users can also use the built-in MIB browser to poll the switches for information about their status and send traps of abnormal events. MIB support allows users to integrate the switches with third-party devices for management in an SNMP environment.

DGS-1216T

16 Port 10/100/1000BaseT with 2 Combo SFP Smart Switch

Front Panel

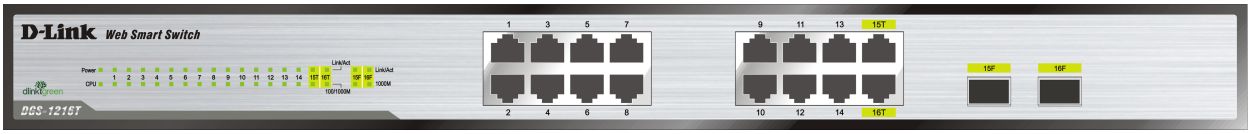


Figure 8 – DGS-1216T Front Panel

Power LED: The Power LED flashes when the Switch is connected to a power source.

CPU LED: When the CPU LED is blinking, then the switch is in the normal condition. If the CPU LED is off or stays in solid light state that means the system might have crashed or firmware upgrade has failed.

Port Link/Act LED (1-14, 15T/F, 16T/F): The Link/Act LED flashes which indicates a network link through the corresponding port. Blinking state indicates that the Switch is either sending or receiving data to the port.

NOTE: On DGS-1216T, the MiniGBIC ports 15F and 16F are shared with normal RJ-45 ports 15T and 16T. When MiniGBIC port is used, the RJ-45 port cannot be used.

100/1000M LED (1-14, 15T, 16T): A steady green light denotes a valid 1000Mbps link on the corresponding port, a steady orange light denotes a valid 10 or 100Mbps link on the port. These LEDs will remain dark if there is no link/activity on the port.

1000M LED (15F, 16F): The 1000M LED sign lights up when the corresponding port is running on 1000Mbps. These LEDs will remain dark if there is no link/activity on the port.

Rear Panel

Figure 9 – DGS-1216T Rear Panel

Reset: By pressing the Reset button the Switch will change back to the default configuration and all changes will be lost.

Power: The power port is where to connect the AC power cord.

DGS-1224T

24 Port 10/100/1000BaseT with 2 Combo SFP Smart Switch

Front Panel

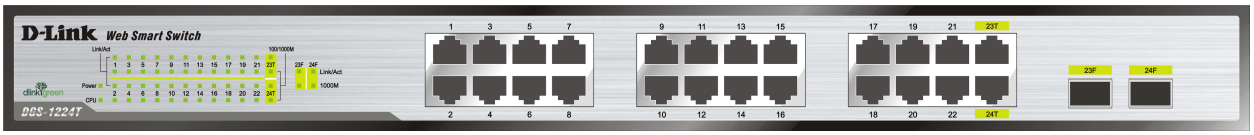


Figure 10 – DGS-1224T Front Panel

Power LED: The Power LED flashes when the Switch is connected to a power source.

CPU LED: When the CPU LED is blinking, then the switch is in the normal condition. If the CPU LED is off or stays in solid light state that means the system might have crashed or firmware upgrade has failed.

Port Link/Act LED (1-22, 23T/F, 24T/F): The Link/Act LED flashes which indicates a network link through the corresponding port. Blinking state indicates that the Switch is either sending or receiving data to the port.

NOTE: On DGS-1224T, the MiniGBIC ports 23F and 24F are shared with normal RJ-45 ports 23T and 24T. When MiniGBIC port is used, the RJ-45 port cannot be used.

100/1000M LED (1-22, 23T, 24T): The 100/1000M LED lights up in steady green denotes a valid 1000Mbps link on the corresponding port, a steady orange light denotes a valid 10 or 100Mbps link on the port. These LEDs will remain dark if there is no link/activity on the port.

1000M LED (23F, 24F): The 1000M LED sign lights up when the corresponding port is running on 1000Mbps. These LEDs will remain dark if there is no link/activity on the port.

Rear Panel

Figure 11 – DGS-1224T Rear Panel

Reset: By pressing the Reset button the Switch will change back to the default configuration and all changes will be lost.

Power: The power port is where to connect the AC power cord.

DGS-1224TP

24 Port 10/100/1000BaseT PoE with 4 Combo SFP Smart Switch

Front Panel

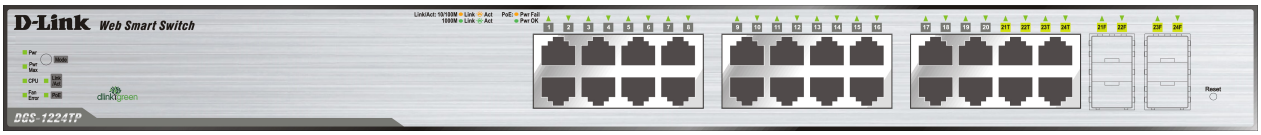


Figure 12 – DGS-1224TP Front Panel

Power LED: The Power LED flashes when the Switch is connected to a power source.

Power Max LED: The Power Max lights up when the system power resource remain ≦15.4W, in the meantime, system will not provide power to the additional PoE PD inserted.

CPU LED: When the CPU LED is blinking, then the switch is in the normal condition. If the CPU LED is off or stays in solid light state that means the system might have crashed or firmware upgrade has failed.

Fan Error LED: The FAN LED shows the status of the fans, light off indicates all fans work fine and the red light indicates that one or multiple fans are working abnormally.

Mode Button: To select the mode of port LED, the Link/Act and PoE LED under the mode button will solid green to indicate which mode is selected.

Port LED (1-20, 21T~24T): The port LED will indicate Link/Act or PoE status of this port depending on the LED mode you selected:

Mode	Color	Status
Link/Act	Off	The corresponding port is link down
	Solid Green	The corresponding port is link up at 1000Mbps
	Blinking Green	Data is sending or receiving on corresponding port at 1000Mbps
	Solid Orange	The corresponding port is link up at 10Mbps or 100Mbps
	Blinking Orange	Data is sending or receiving on corresponding port at 10Mbps or 100Mbps
PoE	Off	No power feeding or no PD found on corresponding port
	Solid Green	The corresponding port is providing standard 48V power to the PD
	Solid Orange	PoE error has occurred at this port. You may check the detailed information for the errors on the ***PoE Port Setting*** page in Web-based Management Utility.

Port LED (21F~24F): The port LED will indicate Link/Act of this port:

Mode	Color	Status
Link/Act	Off	The corresponding port is link down
	Solid Green	The corresponding port is link up at 1000Mbps

	Blinking Green	Data is sending or receiving on corresponding port at 1000Mbps
	Solid Orange	The corresponding port is link up at 100Mbps
	Blinking Orange	Data is sending or receiving on corresponding port at 100Mbps

NOTE: On DGS-1224TP, the MiniGBIC ports 21F to 24F are shared with normal RJ-45 ports 21T to 24T. When MiniGBIC port is used, the RJ-45 port cannot be used.

Reset: By pressing the Reset button the Switch will change back to the default configuration and all changes will be lost.

Rear Panel

Figure 13 – DGS-1224TP Rear Panel

Power: The power port is where to connect the AC power cord.

DGS-1248T

48 Port 10/100/1000BaseT with 4 Combo SFP Smart Switch

Front Panel

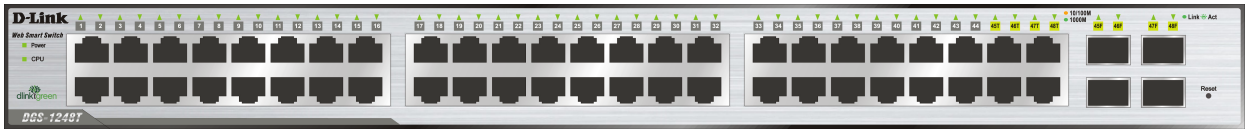


Figure 14 – DGS-1248T Front Panel

Power LED: The Power LED flashes when the Switch is connected to a power source.

CPU LED: When the CPU LED is blinking, then the switch is in the normal condition. If the CPU LED is off or stays in solid light state that means the system might have crashed or firmware upgrade has failed.

Port LED (1-44, 45-48T/F): The port LED lights up in steady green denotes a valid 1000Mbps link on the port, and blinking green light indicates activity on the port (at 1000Mbps). A steady orange light denotes a valid 10 or 100Mbps link on the port while a blinking orange light indicates activity on the port (at 100Mbps). These LEDs will remain dark if there is no link/activity on the port.

NOTE: On DGS-1248T, the MiniGBIC ports 45F to 48F are shared with normal RJ-45 ports 45T to 48T. When MiniGBIC port is used, the RJ-45 port cannot be used.

Reset: By pressing the Reset button the Switch will change back to the default configuration and all changes will be lost.

Rear Panel

Figure 15 – DGS-1248T Rear Panel

Power: The power port is where to connect the AC power cord.

4 SmartConsole Utility

D-Link SmartConsole Utility allows the administrator to quickly discover all D-Link smart switches which are in the same domain the PC, collect traps and log messages, and quick access to some basic configurations of the switch.

The SmartConsole Utility is divided into three parts, **Device Configurations** at the top, **Device List**, and **SmartConsole Settings** at the left.

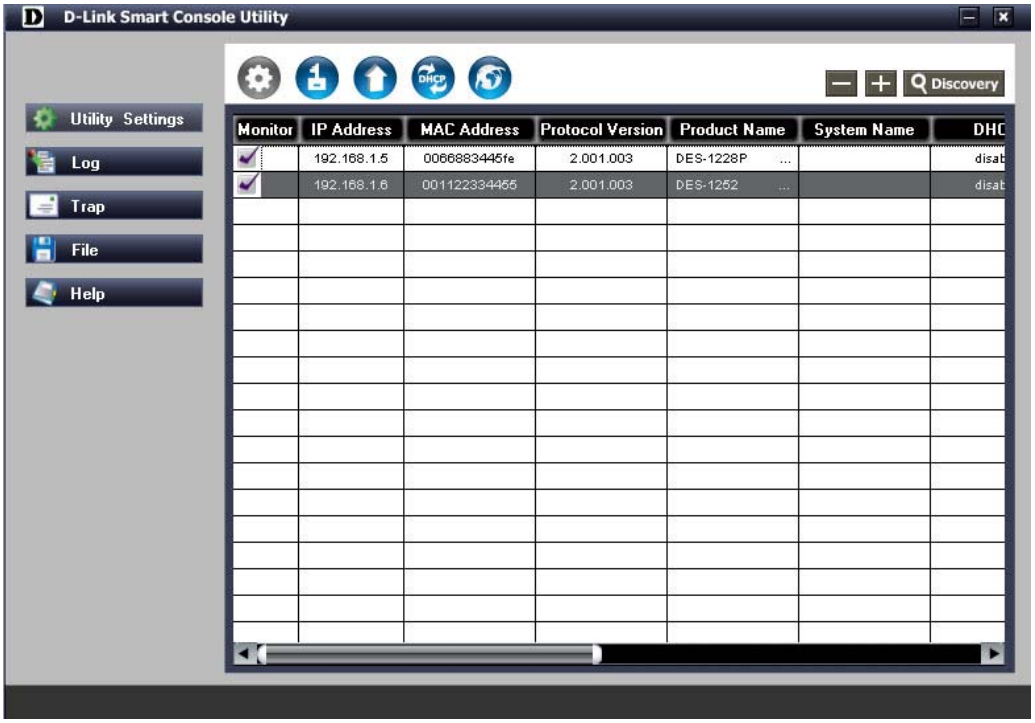


Figure 16 – SmartConsole Utility

SmartConsole Settings

The SmartConsole Settings at the left has five icons, **Utility Settings**, **Log**, **Trap**, **File**, and **Help**.

Utility Settings

By clicking on this icon the Utility Settings window will pop up. **Refresh time** refreshes the devices which were selected as monitored device in the Device List. Choices include **15 secs, 30 secs, 1mins, 2mins and 5 mins** for selecting the monitoring time intervals. **Utility Group Interval** establishes the intervals (in seconds) that the Switch will be discovered in the SmartConsole Device List.

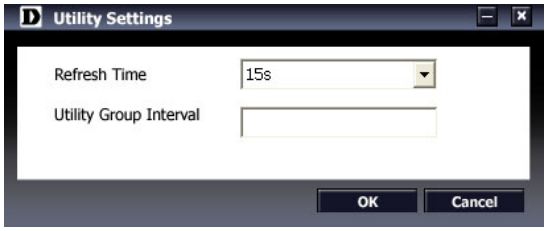


Figure 17 – SmartConsole Utility Settings

NOTE: If the Group Interval is set to 0, IGMP snooping must be disabled or the Web-Smart Switch will not be discovered.

Log

By clicking on this icon the Log window will pop up. Click **View Log** to show the events of the SmartConsole Utility and the device. **Date/Time** indicates when the log was received, **IP** indicates where it comes from and **Status** shows the content of this log message. Click **Clear** Log to clear all log entries. Click **OK** to exit.

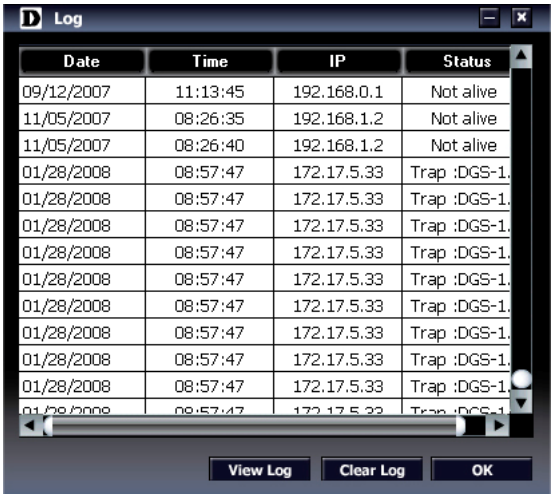


Figure 18 – SmartConsole Log

Trap

By clicking on this icon the Trap window will pop up. Click **View Trap** to show the events of the SmartConsole Utility and the device. **Date/Time** indicates when the trap was received, **IP** indicates where it comes from and **Status** shows the content of this trap message. Click **Clear Trap** to clear all entries. Click **OK** to exit.

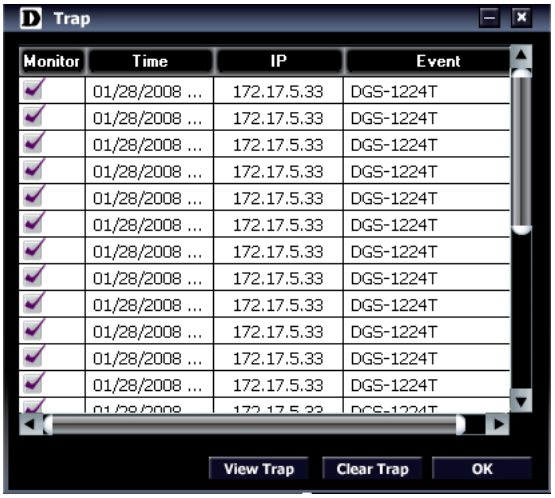


Figure 19 – SmartConsole Trap

The trap icon in the SmartConsole Settings will change while receiving new trap messages please see below for detail description

Icon	Description
	No new traps
	New traps was received

File

By clicking on this icon you will see below options:

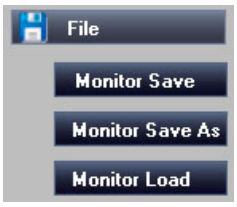


Figure 20 – SmartConsole File

Monitor Save: To record the setting of the Device List as default for the next time the SmartConsole Utility is used.

Monitor Save As: To record the setting of the Device List in an appointed filename and file path.

Monitor Load: To manually load a Device List setting file.

Help

By clicking on this icon a window with information about the SmartConsole will pop up.

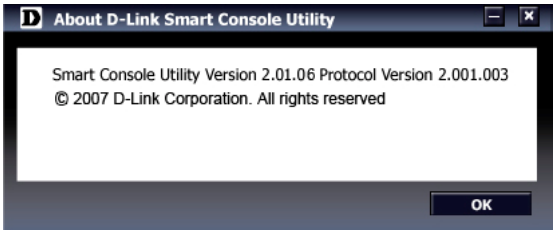


Figure 21 – SmartConsole Help

Device Configurations

The Device Configurations in the SmartConsole Utility has five icons:

Device Settings

Device Password Manager

Firmware Upgrade

DHCP Refresh

Web Access

and the +, −, Discovery device buttons for the Device List.

Device Settings

Select a switch from the Device List, then clicking on this icon the Device Settings window will pop up. Here you can configure the Product Name, IP Address, Gateway, Subnet Mask, System Name, Location, Trap IP, Switch Group Interval, and DHCP Setting of the Switch.

To apply the configuration, insert the correct device password in Confirm Password then click **OK**

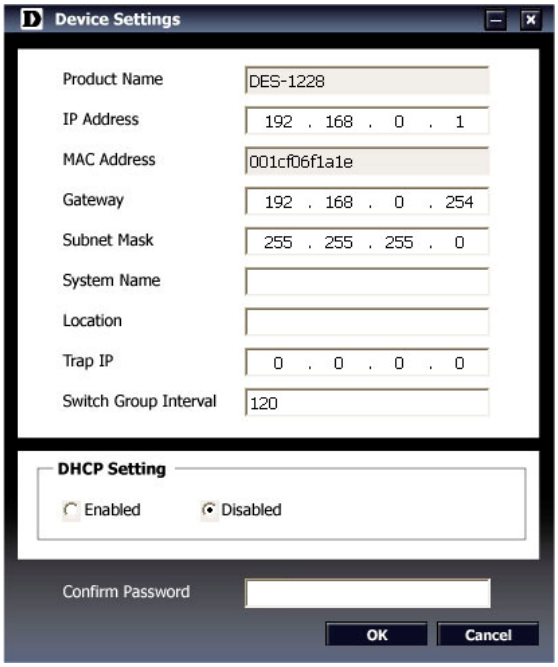


Figure 22 – SmartConsole Device Settings

Device Password Manager

Select a switch from the Device List, then clicking on this icon the Device Password Manager window will pop up. Here you can enter a new password and confirm.

Figure 23 – SmartConsole Device Password Manager

Firmware Upgrade

Select a switch from the Device List, then clicking on this icon the Firmware Upgrade window will pop up. Choose a Firmware Path (or you can Browse for one) that you're going to use then input the correct password of device and click **Upgrade** and wait the upgrade successfully message pop up to complete the firmware upgrade

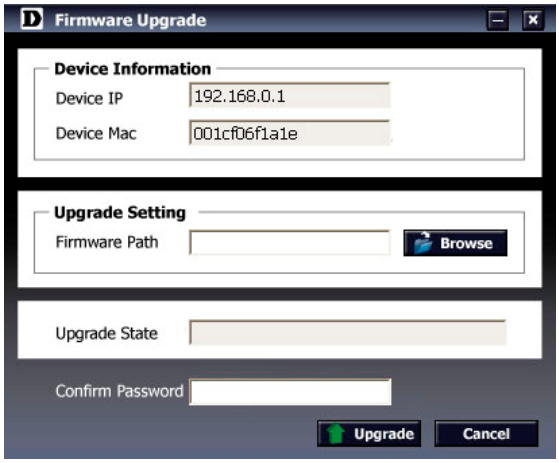


Figure 24 – Firmware Upgrade

CAUTION: Do not disconnect the PC or remove the power cord from device until upgrade complete. Switch may crash if firmware upgrade incompletely.

DHCP Refresh:

If the DHCP enabled switch in Device List shows the default IP, which means the device doesn't get IP from DHCP server successfully. Select this switch and click the DHCP refresh icon, the DHCP refresh will popup. Entering the correct Device Password then press **OK**, the device will renew the IP address from DHCP server.

Figure 25 – SmartConsole Firmware Upgrade

Web Access

Select a switch from the Device List, then clicking this icon an internet browser will pop up (default is Internet Explorer). Here you can configure the Switch through the Web-based Management Utility. You may also get into the Web-based Management Utility by double clicking the device in the device list.

Add(+), Delete(-) and Discover the device

By pressing the **Discovery** button, all the Web-Smart devices locate in the same domain with the management PC are listed in the Device List.

Click the **+** and insert the device IP address to add a device into Discover List, or select a device and click the **–** button to remove it.

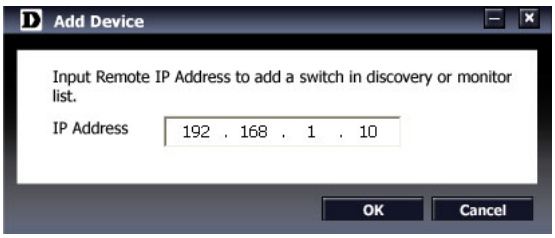


Figure 26 – SmartConsole Add device

Figure 27 – SmartConsole Delete device

Device List

This is the list where all Web-Smart devices on the network are discovered.

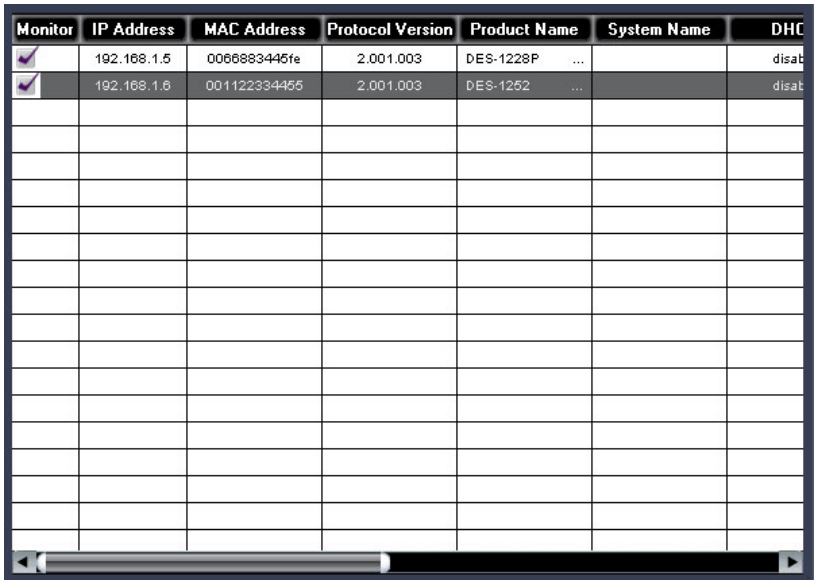


Figure 28 – SmartConsole Device List

Definitions of the Device List features:

Monitor: Check the Monitor box, and the SmartConsole will collect the trap and log data from the device. The in the monitor means the device was discovered by SmartConsole, by single click the icon it will become , which means this device will keep updating the information such as system log or trap to the SmartConsole Utility. When the device was detected not reachable, the icon will change to . Please check if the power or the cable of this device is disconnected.

IP Address: Shows the current IP addresses of devices.

MAC Address: Shows the device MAC Address.

Protocol version: Shows the version of the Utility protocol.

Product Name: Shows the device product name.

System Name: Shows the appointed device system name.

DHCP: Specify if the IP address of this device is from DHCP server or manual configured

Location: Shows where the appointed device location.

Trap IP: Shows the IP where the Trap information will be sent.

Subnet Mask: Shows the Subnet Mask setting of the device.

Gateway: Shows the Gateway setting of the device.

Device Group Interval: Shows the intervals (in seconds) that the Switch will be discovered in the SmartConsole Device List

Firmware version: Show the current Firmware version of this device.

5 Configuration

Through a Web-based Management Utility, the features and functions of the D-Link Web Smarty Switch can be configured for optimum use.

Smart Wizard Configuration

Before entering the Web-based Management Utility, When The Smart Wizard will guide you to quick configure some functions. If you don't plan to change anything, click **Exit** to exit the Wizard and enter the Web Interface.

Password Settings

Password setting allows you to change the login password of the device. Type the desired new password in the **Switch Password** box and again in the **Confirm Switch Password** then click the Apply button to change the password.

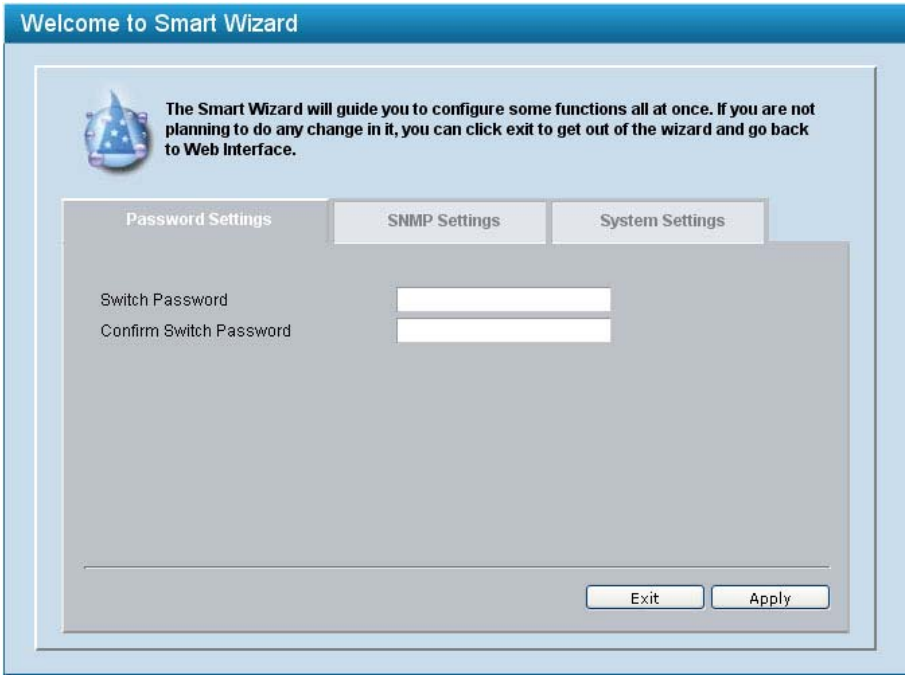


Figure 29 – Configure Password in Smart Wizard

SNMP Settings

The SNMP Setting allows you to quick enable/ disable the SNMP function and configure the SNMP community name. For detail SNMP function description please see “Setup Menu > System > SNMP Settings”. The default SNMP Setting is Disabled. Click Enabled the Apply to configure Community Settings.

Public: Read-only privilege allows authorized management stations to retrieve MIB objects.

Private: Read/write privilege allows authorized management stations to retrieve and modify MIB objects.

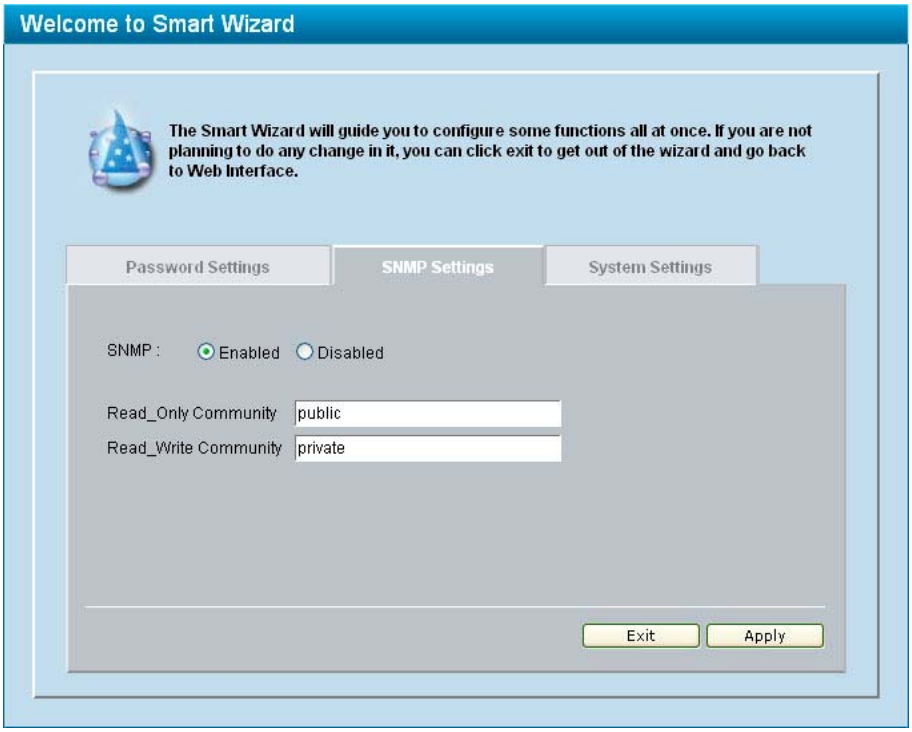


Figure 30 – Configure SNMP in Smart Wizard

System Settings

By selecting Static and clicking Apply you can manually change the system IP Address, Subnet Mask, and Gateway address. You can further configure and read more about the above settings in the “Setup Menu > System > System Settings”. The default setting of System IP address is DHCP.

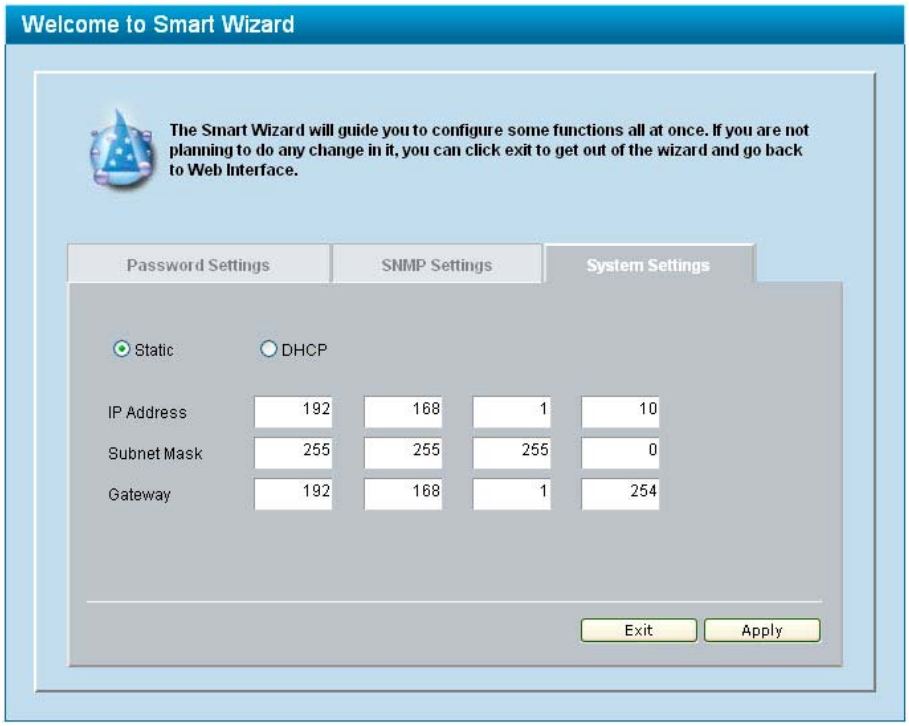


Figure 31 – Configure System IP address in Smart Wizard

NOTE: Changing the system IP address will disconnect you from your internet connection, please enter the correct IP address in the Web browser and make sure your PC is in the same subnet with the switch. See ***Login Web-based Management Utility*** for detail description.

If you want to change the IP settings, click **YES** and start a new web browser.

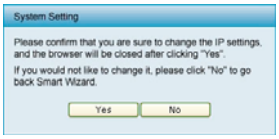


Figure 32 – Confirm the changes of IP address in Smart Wizard

Identifying the Web-based Management Utility

After clicking the **Exit** button in Smart Wizard you will see the screen below:

Figure 33 – Web-based Management Utility

This is the Web-based Management Utility. Here you will see a **Tools** menu bar on top, a **Function Tree**, and the **Main Configuration Screen**.

In the **Tools** menu, you can **Reset**, **Config Backup** and **Restore**, **Firmware Backup** and **Upload**, and **System Reboot**.

Next to the **Tools** menu is the **Smart Wizard** button. By clicking this you can return to the **Smart Wizard** if you wish to make any changes there.

By choosing different functions in the function tree, you can change all the configurations in the **Main Configuration Screen**. The main configuration screen will show the current status of your Switch by clicking the model name on top of the function tree.

At the upper right of the screen you can see your username and current IP address.

Under your username is the **Logout** button. Click this to end this session.

Finally, by clicking on the D-Link logo at the upper left of the screen you will be linked to the official D-Link website.

For learn the further information to configuring the D-Link Web Smart Switch via Web-based Management Utility, please check the “Configuration” section.

Tool Menu

The Tool Menu offers global function controls such as Reset, Configuring Backup and Restoration, Firmware Backup and Upload, and System Reboot.

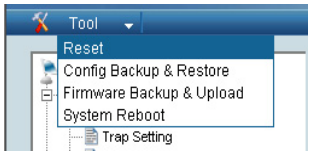


Figure 34 – Tool Menu

Reset

Provide a safe reset option for the Switch. All configurations will be reset to default. Click **Factory Reset** to restore the settings to default values.

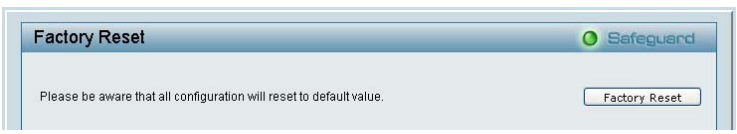


Figure 35 – Tool Menu > Reset

Configure Backup & Restore

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

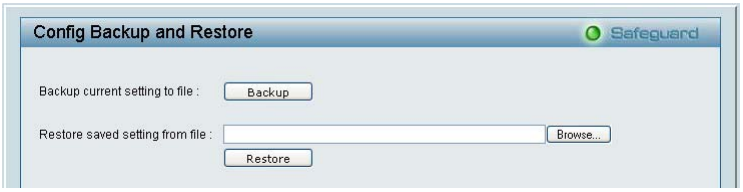


Figure 36 – Tool Menu > Configure Backup and Restore

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

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

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

Note: To restore the configuration the switch will restart and all current configurations will be lost

Firmware Backup and Upload

Allow for the firmware to be saved, or for an existing firmware file to be uploaded to the Switch.

Figure 37 – Tool Menu > Firmware Backup and Upload

Click **Backup** to save the firmware to your disk.

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

Click **Restore** after selecting the firmware file you want to restore.

CAUTION: Do not disconnect the PC or remove the power cord from device until upgrade complete. Switch may crash if firmware upgrade incompletely.

System Reboot

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

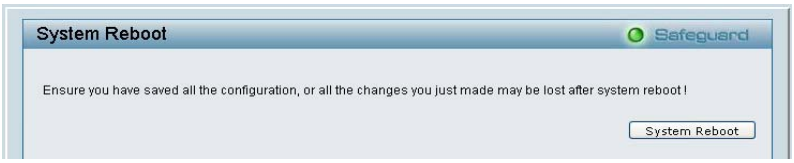


Figure 38 – Tool Menu > System Reboot

Setup Menu

All configuration options on the switch are accessed through the Setup menu on the left side of the screen. Click on the setup item that you want to configure. The following sections describe in more detail each of the features and functions.

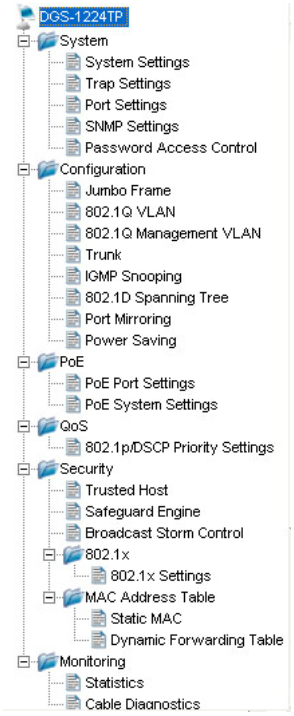


Figure 39 –Setup Menu

System > System Settings

The System Setting allows the user to configure the IP address and the basic system information of the Switch.

IP 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.

System Information: By entering a **System Name** and **System Location**, the device can more easily be recognized through the SmartConsole Utility and in other Web-Smart devices on the LAN.

Login Timeout: The Login Timeout controls the idle time-out for security purposes, when there is no action in the Web-based Management Utility. When the Login Timeout expires, the Web-based Management Utility requires a re-login before using the Utility again.

Group Interval: The D-Link Web Smart Switch will routinely send report packets to the SmartConsole Utility in order to maintain the correct data shown. The user can configure the **Group Interval** to control the time routine. Zero means disabling Group Interval, and 120~1225 means sending the message according to the value chosen, the unit is in seconds.

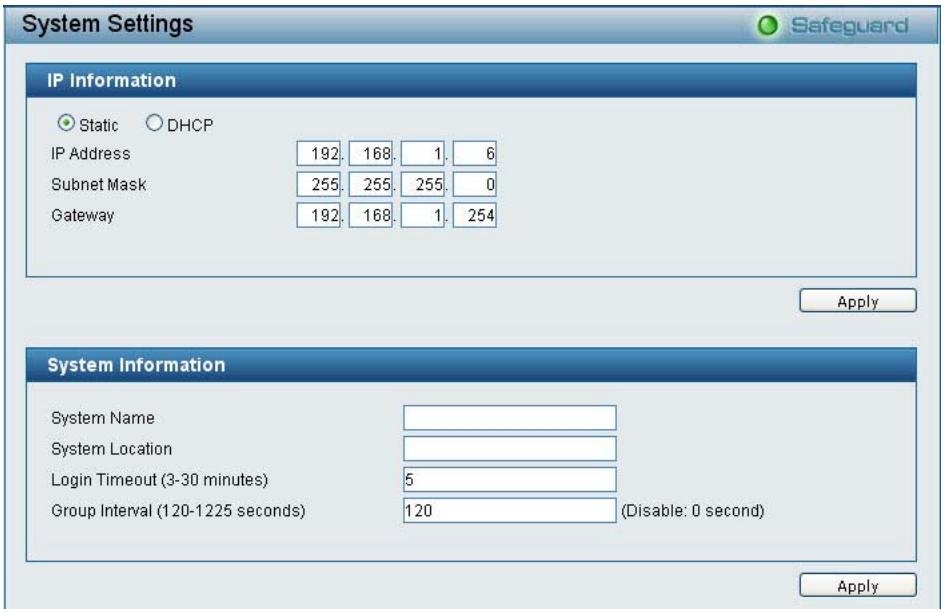


Figure 40 – System > System Setting

System > Trap Settings

By configuring the Trap Setting, it allows SmartConsole 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 station that will receive trap information.

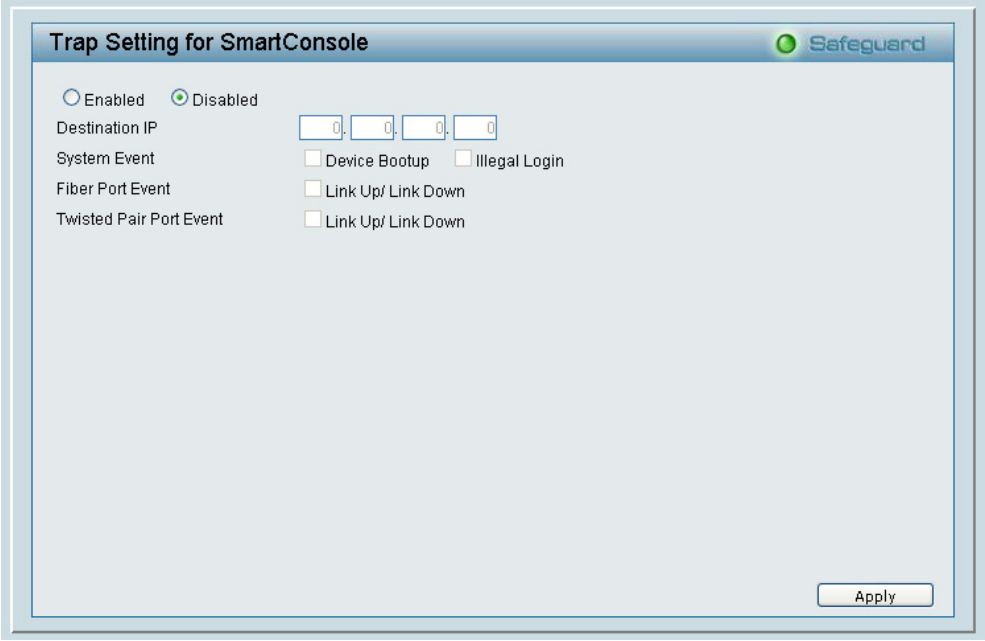


Figure 41 – System > Trap Setting

You can choose which event to send to the managing station

System Event: Monitors the system's trapping information.

Device Bootup: Traps system boot-up information.

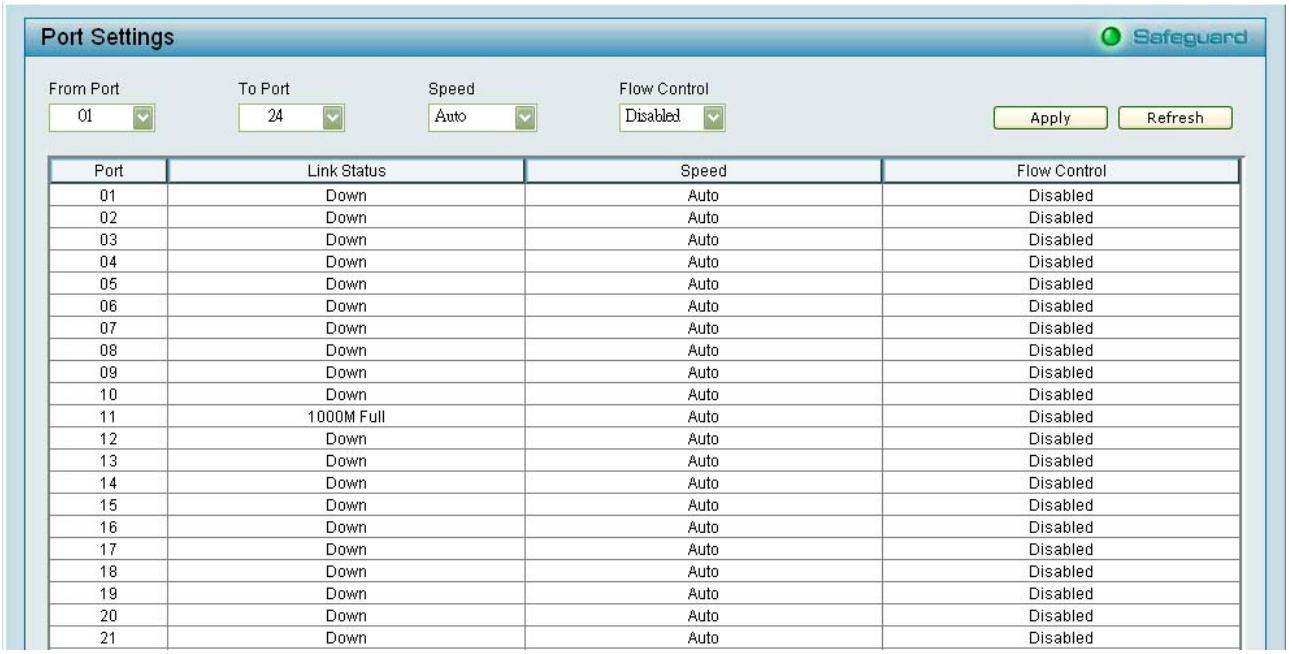
Illegal Login: Traps events of incorrect password logins, recording the IP of the originating PC.

Fiber Port Link Up/Link Down: Traps fiber connection information.

Twisted pair Port Link Up/Link Down: Traps copper connection information.

System > Port Settings

In the Port Setting page, the status of all ports can be monitored and adjusted for optimum configuration. By selecting a range of ports (**From Port** and **To Port**), the **Speed** can be set for all such ports, by clicking **Apply**. To refresh the information table to view the latest Link Status and Priority, press the **Refresh** button.



Port	Link Status	Speed	Flow Control
01	Down	Auto	Disabled
02	Down	Auto	Disabled
03	Down	Auto	Disabled
04	Down	Auto	Disabled
05	Down	Auto	Disabled
06	Down	Auto	Disabled
07	Down	Auto	Disabled
08	Down	Auto	Disabled
09	Down	Auto	Disabled
10	Down	Auto	Disabled
11	1000M Full	Auto	Disabled
12	Down	Auto	Disabled
13	Down	Auto	Disabled
14	Down	Auto	Disabled
15	Down	Auto	Disabled
16	Down	Auto	Disabled
17	Down	Auto	Disabled
18	Down	Auto	Disabled
19	Down	Auto	Disabled
20	Down	Auto	Disabled
21	Down	Auto	Disabled

Figure 42 – System > Port Setting

Speed: Gigabit Fiber connections can operate in Auto Mode or Disable. Copper connections can operate in Forced Mode settings (100M Full, 100M Half, 10M Full, 10M Half), Auto, or Disable. 100M Fiber connections support 100M Full Force Mode, Auto or Disable. The default setting for all ports is **Auto**.

NOTE: Be sure to adjust port speed settings appropriately after changing connected cable media types.

Link Status: Reporting **Down** indicates the port is disconnected.

Priority: 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 ***Qos > 802.1p Default Priority***

NOTE: When the Combo Fiber port and the Copper ports are both connected, the Fiber port will take precedence over the Copper ports, meaning the Fiber port will be the only connection.

System > SNMP Settings

Simple Network Management Protocol (SNMP) is an OSI Layer 7 (Application Layer) designed specifically for managing and monitoring network devices. SNMP enables network management stations to read and modify the settings of gateways, routers, switches, and other network devices. Use SNMP to configure system features for proper operation, monitor performance and detect potential problems in the Switch or LAN.

Managed devices that support 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.

The default SNMP setting is disabled. Click enable, then **Apply**, to set Community Settings.

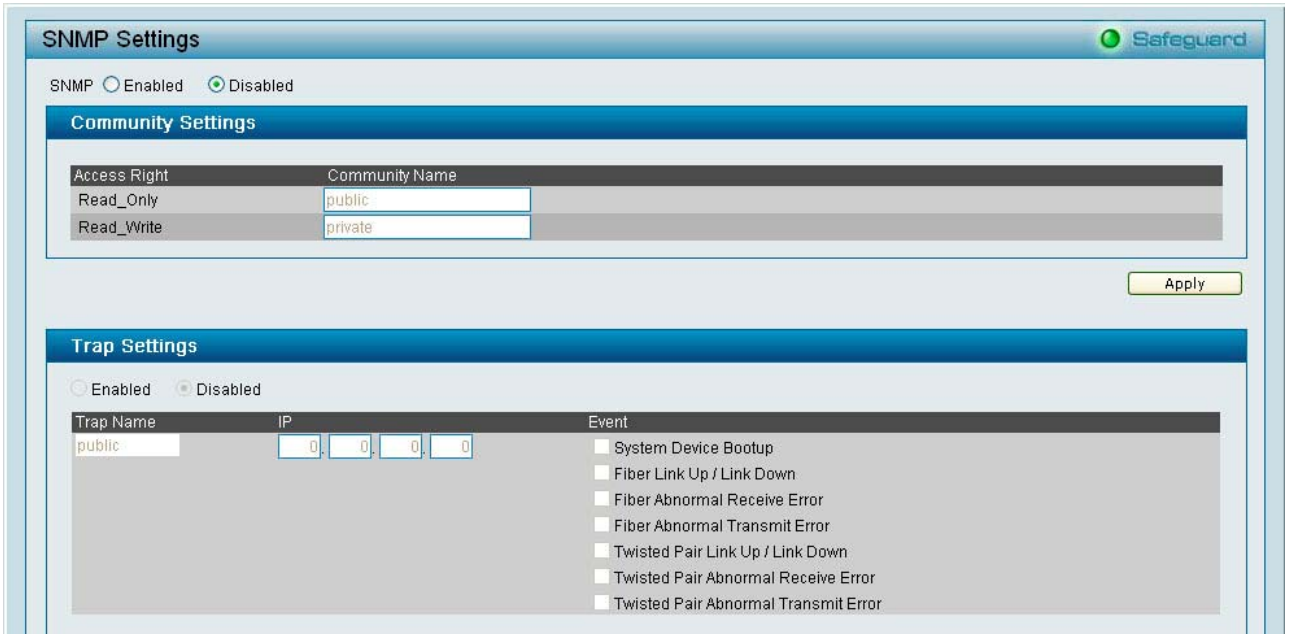


Figure 43 – System > SNMP Setting

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).

The default community strings for the Switch used for SNMP v.1 management access are:

Public: The community with read-only privilege allows authorized management stations to retrieve MIB objects.

Private: The community with read/write privilege allows authorized management stations to retrieve and modify MIB objects.

Trap Setting: 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).

Setting up a Trap: Select **Enable**, enter a Trap Name, add the IP of the device to be monitored, and choose the event(s) to trap. The available trap Events to choose from including:

- 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

Note: Trap Name must be selected from a Community Name

System > Password Access Control

Setting a password is a critical 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.

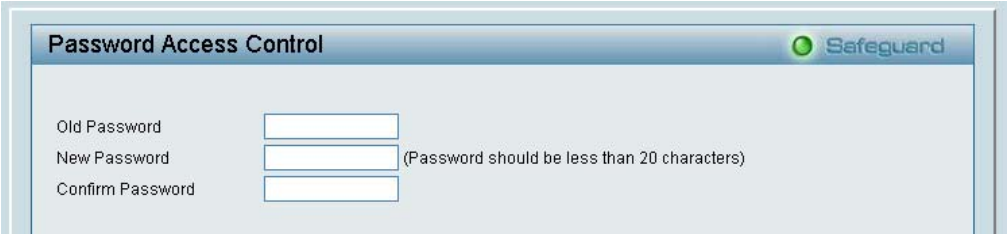


Figure 44 – System > Password Access Control

Configuration > Jumbo Frame

D-Link Gigabit Web Smart Switches support jumbo frames (frames larger than the Ethernet frame size of 1536 bytes) of up to 10240 bytes (tagged) can be transmitted by the Switch. Default is disabled, Select **Enabled** then click **Apply** to turn on the jumbo frame support.

Figure 45 – Configuration > Jumbo Frame

Configuration > 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.

The IEEE 802.1Q VLAN Configuration page provides powerful VID management functions. The original settings have the VID as 01, named “default”, and all ports as “Untagged”

Rename: Click to rename the VLAN group.

Delete VID: Click to delete the VLAN group.

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

You may change the name accordingly to the desired groups, such as the aforementioned R&D, Marketing, email, etc.

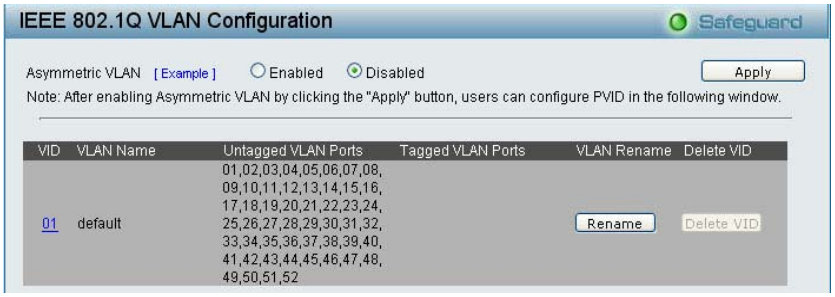


Figure 46 – Configuration > 802.1Q VLAN > Default Setting

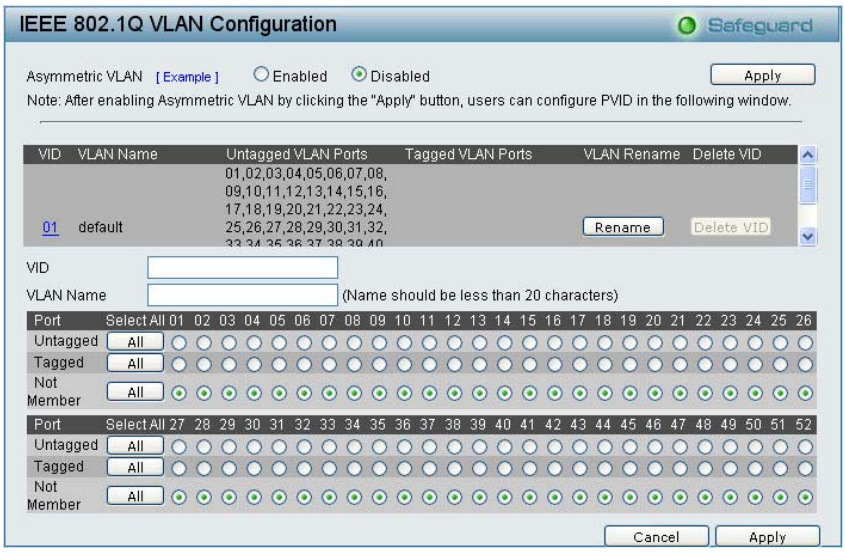


Figure 47 – Configuration > 802.1Q VLAN > Add VID

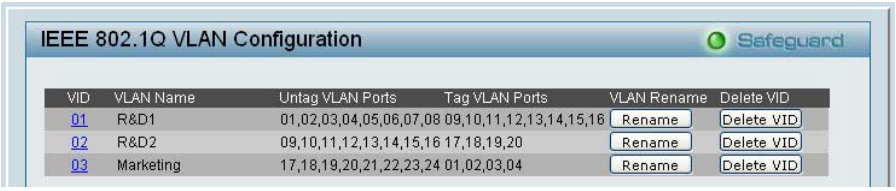


Figure 48 – Configuration > 802.1Q VLAN > Example VIDs

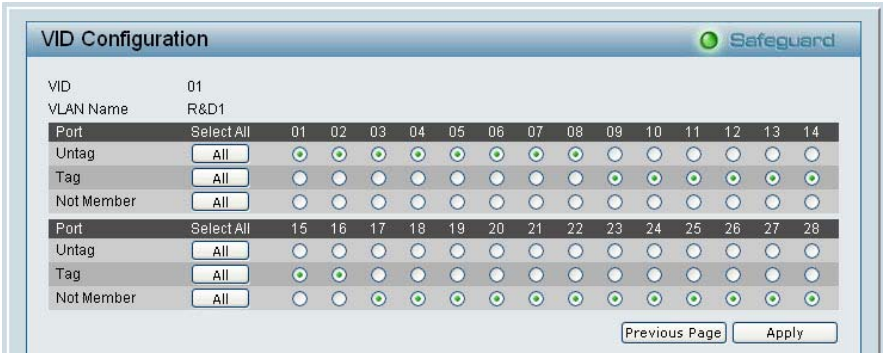


Figure 49 – Configuration > 802.1Q VLAN > VID Assignments

Configuration >Asymmetric VLAN

This function is located in the 802.1Q Configuration page; it allows devices in different VLANs to communicate with the servers, firewalls or other shared resources in the shared VLAN. This configuration is accomplished in three steps:

- Enabling Asymmetric VLAN function
- Creating shared VLAN and access VLAN
- Configuring the PVID of access VLAN

The example below is a typical application of Asymmetric VLAN. Servers and firewall are located in shared VLAN (default VLAN), and the PC 1, 2 and 3 are located in different VLAN because of security issue but both of them have to access the servers.

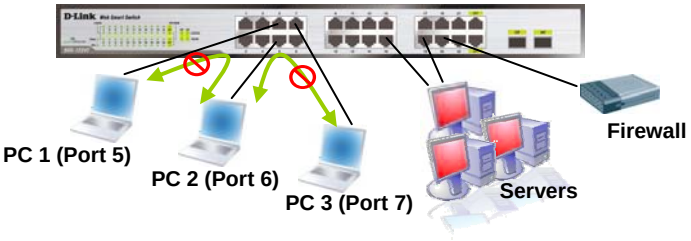


Figure 50 – Configuration > 802.1Q VLAN > Asymmetric VLAN Example

1. Enable Asymmetric VLAN

Enable Asymmetric VLAN and click **Apply** button. The overlapping VLAN cannot be configured unless this function is enabled..

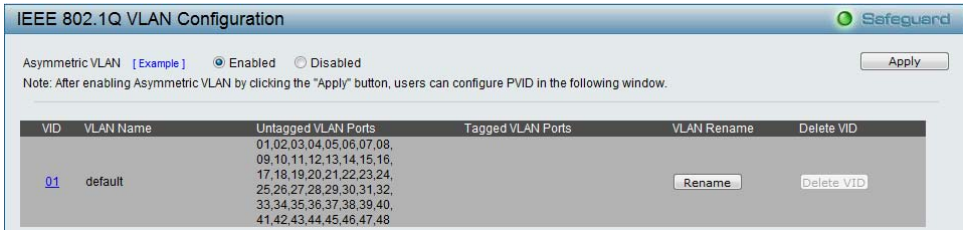


Figure 51 – Configuration > 802.1Q VLAN > Asymmetric VLAN - Enabling Asymmetric VLAN

2. Configure the shared VLAN (VLAN 1) and access VLANs (VLAN 2, 3, 4)

In this case, default VLAN is used as shared VLAN, and ports that shared in the network are:

- Ports 15-18 are connected to the server
- Port 20 is connected to the firewall

The group of shared ports needs to be included for all the VLANs. In this case, port 15-18 are already belong to VLAN 1, therefore no changes is needed.

VLAN 2 is then configured to include ports 15-18, 20 (shared VLAN ports) and the set of ports to be separated from the other subset VLANs (For example, port 5). VLAN 3 and 4 are then configured to include shared ports and the set of ports to be separated from the other subset VLANs (For example, port 6 and 7). Therefore we have three VLANs that share ports and are separated from each other so cannot communicate with each other.

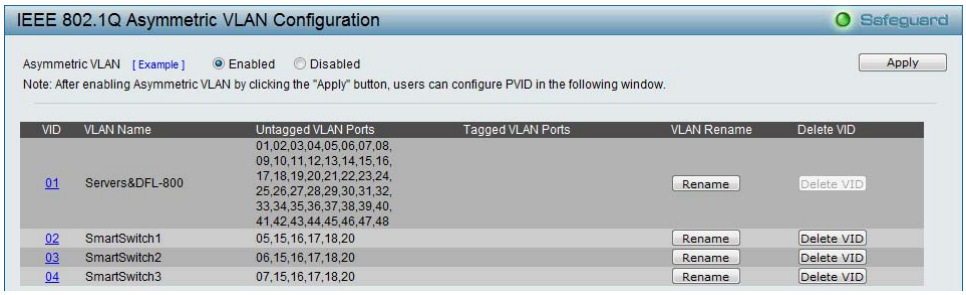


Figure 52 – Configuration > 802.1Q VLAN > Asymmetric VLAN – Create VLANs

3. Configuring the PVID of access VLAN

Configure the PVID setting located in the bottom of VLAN configuration page. The user needs to set the shared set of ports as PVID 1, the other separated groups of ports as PVID 2, 3 and 4.

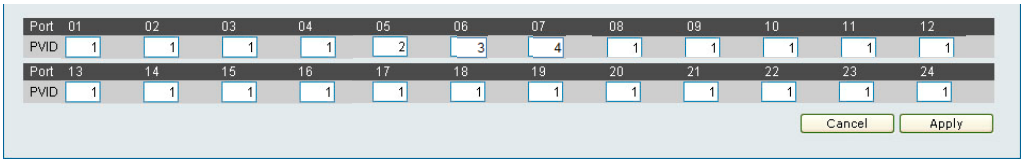


Figure 53 – Configuration > 802.1Q VLAN > Asymmetric VLAN – Assign PVID

After configuration, the user is able to share the network resources set on the shared group of ports (nominated as PVID 1), with both smaller subsets of VLANs (nominated PVID 2, 3 and 4). However, VLAN 2,

3 and 4 groups are incapable of sharing information with each other. Click **Example** to see the example to configure asymmetric VLAN in larger networks.

Configuration > 802.1Q Management VLAN

802.1Q Management VLAN setting allows you to transfer the authority of the switch from the default VLAN to others created by users. Doing so makes managing the whole network more flexible.

By default, the Management VLAN is disabled. You can select any existing VLAN as the management VLAN when this function is enabled.

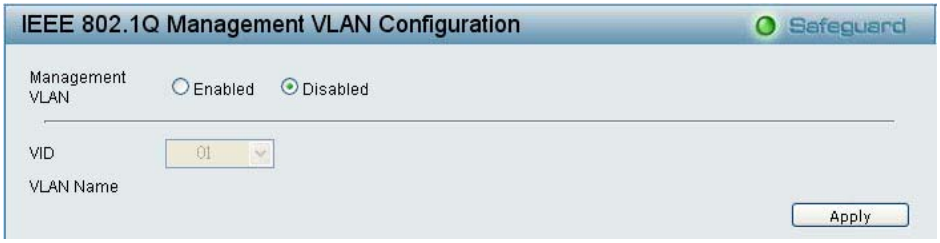


Figure 54 – Configuration > 802.1Q Management VLAN

Configuration > Trunking

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.

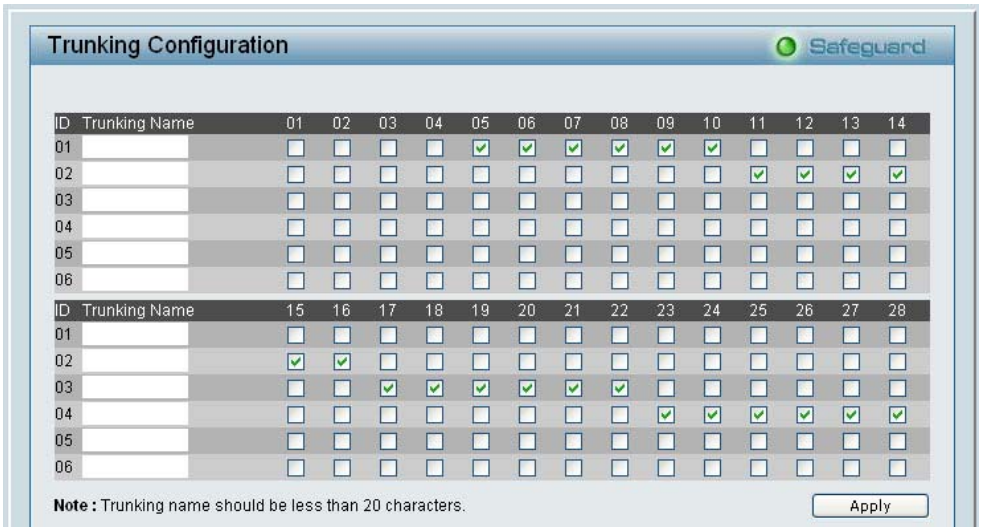


Figure 55 – Configuration > Trunking

NOTE: Each combined trunk port must be connected to devices within the same VLAN group.

Configuration > IGMP Snooping

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 multicast traffic only to connections that have group members attached.

Please note that IGMP will not alter or route IP multicast packets. To send IP multicast packets across subnetworks a multicast routing protocol will be necessary.

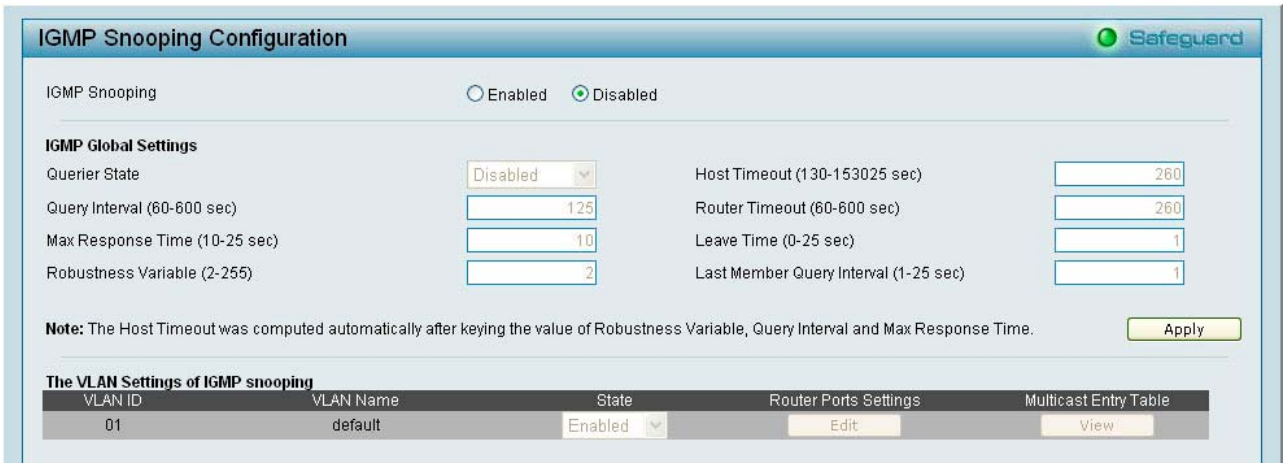


Figure 56 – Configuration > IGMP Snooping Configuration

By default, IGMP is disabled. If enabled, the IGMP Global Settings will need to be entered:

Querier State: D-Link Smart Switch is able to send out the IGMP Queries to check the status of multicast clients. Default is disabled.

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 IGMP 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 (2-255 sec): The Robustness Variable allows adjustment for the expected packet loss on a subnet. If a subnet is expected to be lossy, the Robustness Variable may be increased. The Robustness Variable can not be set zero, and SHOULD NOT be one. Default is 2 seconds.

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 (System assigned): This is the interval after which a learnt host port entry will be purged. For each host port learnt, a 'Port Purge Timer' runs for 'Host Port Purge Interval'. This timer will be restarted whenever a report message from host is received over that port. If no report messages are received for 'Host Port Purge Interval' time, the learnt host entry will be purged from the multicast group. After entering Max Response Time, Robustness Variable and Last Member Query Interval, system will auto assign the value of Host Timeout.

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 'Router Port Purge Timer' runs for 'Router Port Purge Interval'. This timer will be restarted whenever a router control message is received over that port. If no router control messages are received for 'Router Port Purge Interval' time, the learnt router port entry will be purged. Default is 260 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 Igs Leave Process Interval. 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.

To enable IGMP snooping for a given VLAN, select enable and click on the **Apply** button. Then press the **Edit** button under **Router Port Setting**, and select the ports to be assigned for IGMP snooping for the VLAN, and press **Apply** for changes to take effect.

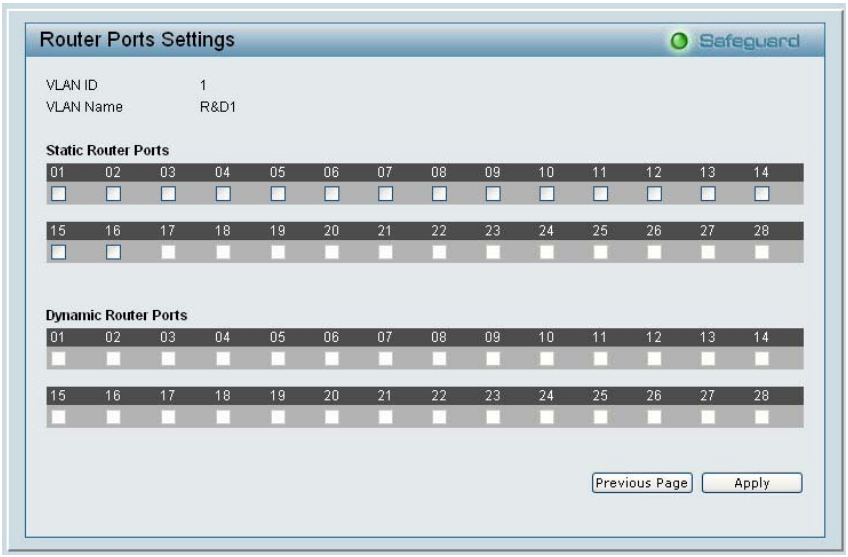


Figure 57 – Configuration > IGMP Router port Settings

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

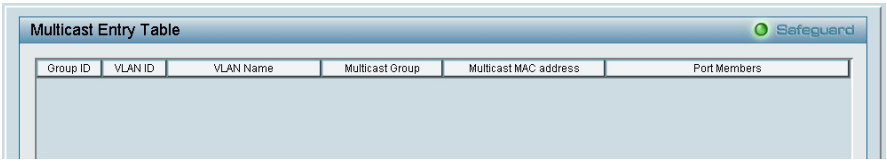


Figure 58 – Configuration > IGMP Multicast Entry Table

Configuration > 802.1D Spanning Tree

802.1D Spanning Tree Protocol (STP) implementation is a backup link(s) between switches, bridges or routers designed to prevent network loops that could cause a broadcast storm. When 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.

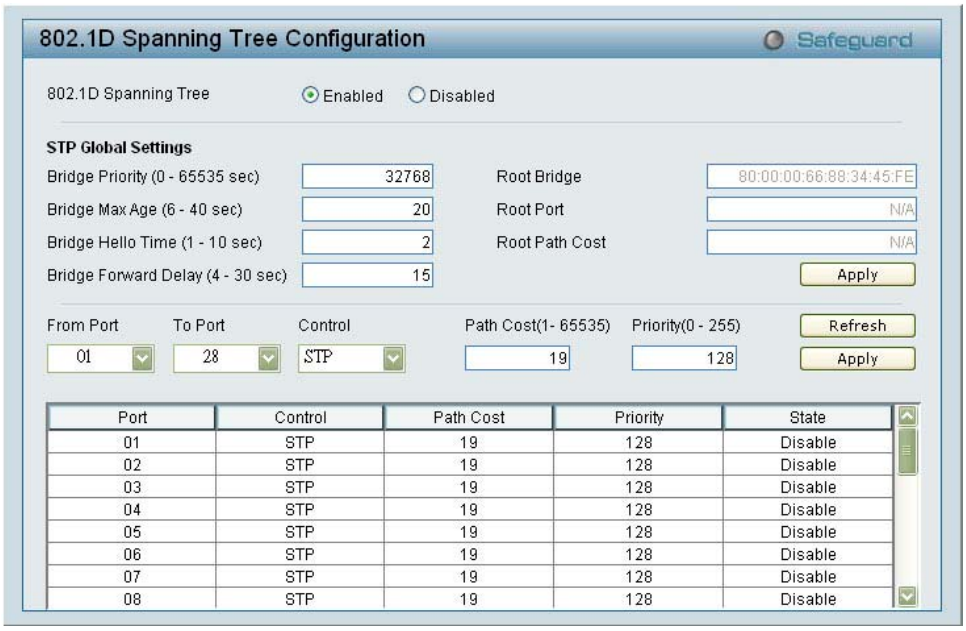


Figure 59 – Configuration > Spanning Tree

By default, Spanning Tree is disabled. If enabled, the Switch will listen for BPDU packets and its accompanying Hello packet. BPDU packets are sent even if a BPDU packet was not received. Therefore, each link between bridges is sensitive to the status of the link. Ultimately this difference results in faster

detection of failed links, and thus faster topology adjustment. A draw-back of 802.1D is this absence of immediate feedback from adjacent bridges.

After enabling STP, setting the STP Global Setting includes the following options:

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. (Max Age has to have a value bigger than Hello Time)

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.

In addition to 802.1D global settings, the D-Link Web smart switch allows the user to configure 802.1D STP by ports. Select **From Port** / To Port to specify the ports you want to configure.

Control: select STP to let a port partake in the STP calculations and send/receive BPDU (Bridge Protocol Data Unit) packets. When selecting **STP**, the corresponding port will be treat as a normal STP port which will process the procedure Listening>Learning>Forwarding to prevent the loop happen. By selecting **Disable**, all the STP activities will be shut down by ports. You may also appoint this port to be the STP **Edge** port to forward STP packet only, in order to speed up the overall STP calculations.

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.

Configuration > 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.

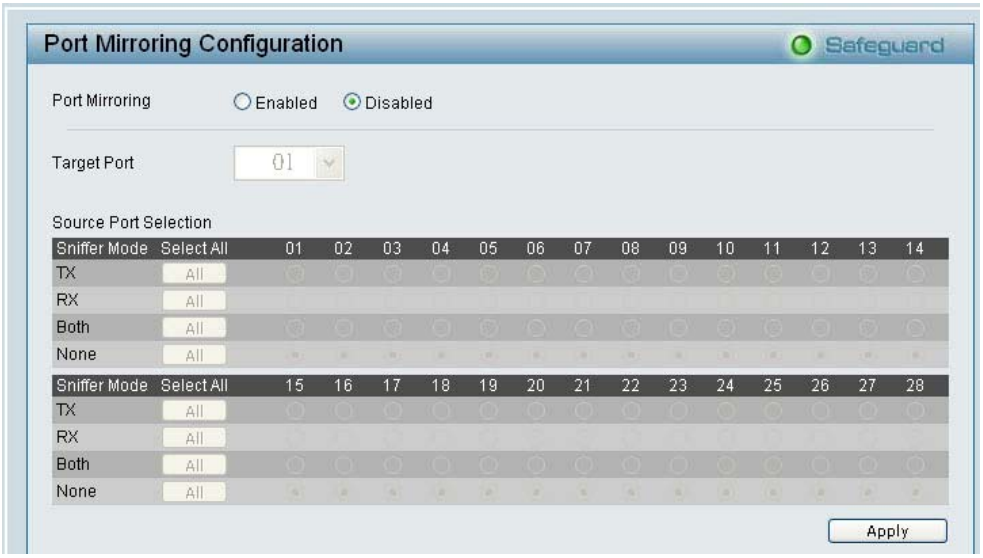


Figure 60 – Configuration > Port Mirroring

Selection options for the Source Ports are as follows:

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 gets sent to the source 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.

None: Turns off the mirroring of the port. Click “all” to remove all ports from mirroring.

Configuration > Power Saving

The Power Saving mode feature reduces power consumption automatically when the RJ-45 port is link down or the connected devices are turned off. By reducing power consumption, less heat is produced, resulting in extended product life and lower operating costs.

By default, the Power Saving mode is enabled.

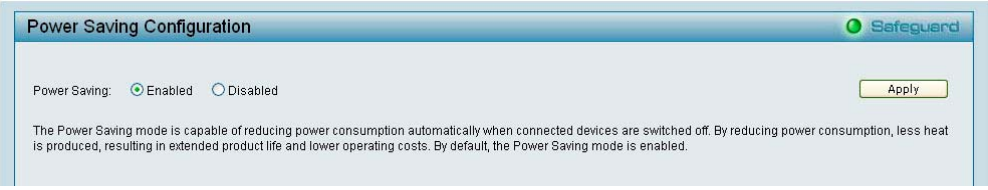


Figure 61 – Configuration > Power Saving

Power over Ethernet (PoE) > PoE Port Settings (Only for DGS-1224TP)

DGS-1224TP supports Power over Ethernet (PoE) as defined by the IEEE 802.3af specification. Ports 1-24 can supply 50VDC power to PDs (Powered Device) over Category 5 or Category 3 UTP Ethernet cables. DGS-1224TP follows the standard PSE (Power Supply Equipment) pinout Alternative A, whereby power is sent out over pins 1, 2, 3 and 6.

DGS-1224TP works with all D-Link 802.3af capable devices. The Switch also works in PoE mode with all non-802.3af capable D-Link AP, IP Cam and IP phone equipment via the PoE splitter DWL-P50.

IEEE 802.3af defined that the PSE provides power according to the following classification:

Class	Usage	Max power used by PD
0	Default	15.4W
1	Optional	4.0W
2	Optional	7.0W
3	Optional	15.4W
4	Reserved	15.4W

The PoE port table will display the PoE status including, Port Enable, Power Limit, Power (W), Voltage (V), Current (mA), Classification, Port Status. You can select **From Port** / **To Port** to control the PoE functions of a port. DGS-1224TP will auto disable the ports if a port current is over 350mA while other ports remain active

Note: The PoE Status information of Power current, Power Voltage, and Current is the power usage information of the connected PD; please "Refresh" to renew the information.

Figure 62 – PoE > PoE Port Setting

PoE Enable: Select to enable or disable the PoE function by ports.

Power Limit: This function allows you to manually set the port power current limitation to be given to the PD. To protect the DGS-1224TP and the connected devices, the power limit function will disable the PoE function of the port when the power is overloaded. Select from "**Class 1**", "**Class 2**", "**Class 3**" and "**Auto**" for the power limit. "**Auto**" will negotiate and follow the classification from the PD power current based on the 802.3af standard.

PoE Port Status: The PoE port status in the right of the window shows the current status of corresponding PoE port; see below for the detail description of diagnostic messages

- **Normal:** There is no PD is detected on corresponding port. The end point device may not support the PD function or the PD function is turned off on this device.
- **Power management cause fail:** The power feeding is temporary shut down because of PD suddenly require more power which over the maximum power limitation defined on corresponding port. Please disconnect the PD and check if there is damage or short happen on the PD.
- **Over current:** The power feeding is temporary shut down because PD requires more than 350mA power. Please disconnect the PD and check if there is damage or short happen on the PD.
- **Short circuit:** The power feeding is temporary shut down because the circuit of the ethernet cable might short somewhere between switch and PD, you may use the cable diagnostic function to check the status of the cable and define the distance of short.
- **Power ON:** The PoE function work normally on corresponding port.

Power over Ethernet (PoE) > PoE System Settings (Only for DGS-1224TP)

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

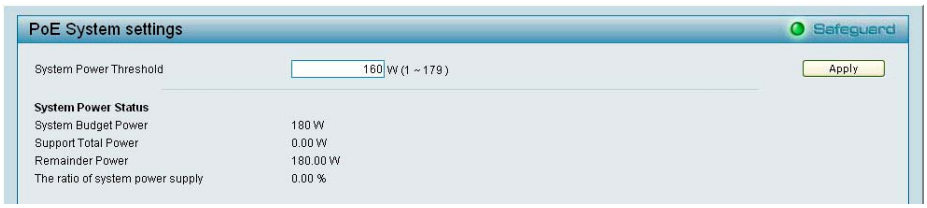


Figure 63 – PoE > PoE System Setting

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

Note: When there is a system power shortage with the PD, the Switch will enforce the PoE port priority management. The lower port numbers will have priority over the higher port numbers. For example, Port 1 > Port 2 > ... > Port 24.

QoS > 802.1p/DSCP Priority Settings

QoS is an implementation of the IEEE 802.1p standard that allows network administrators to reserve bandwidth for important functions that require a larger bandwidth or that might have a higher priority, such as VoIP (voice-over Internet Protocol), web browsing applications, file server applications or video conferencing. Thus with larger bandwidth, less critical traffic is limited, and therefore excessive bandwidth can be saved.

The following figure displays the status of Quality of Service priority levels of each port, higher priority means the traffic from this port will be first handled by the switch. And for packets that are untagged, the switch will assign the priority depending on your configuration.

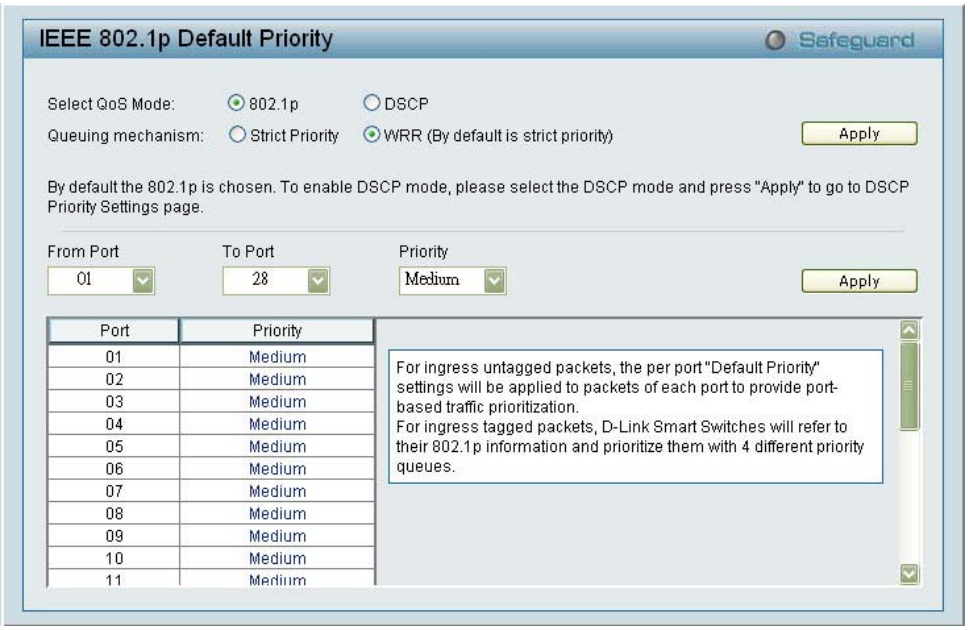


Figure 64 – QoS > 802.1p Default Priority

By selecting the DSCP priority, the web pages will changes as seen below:

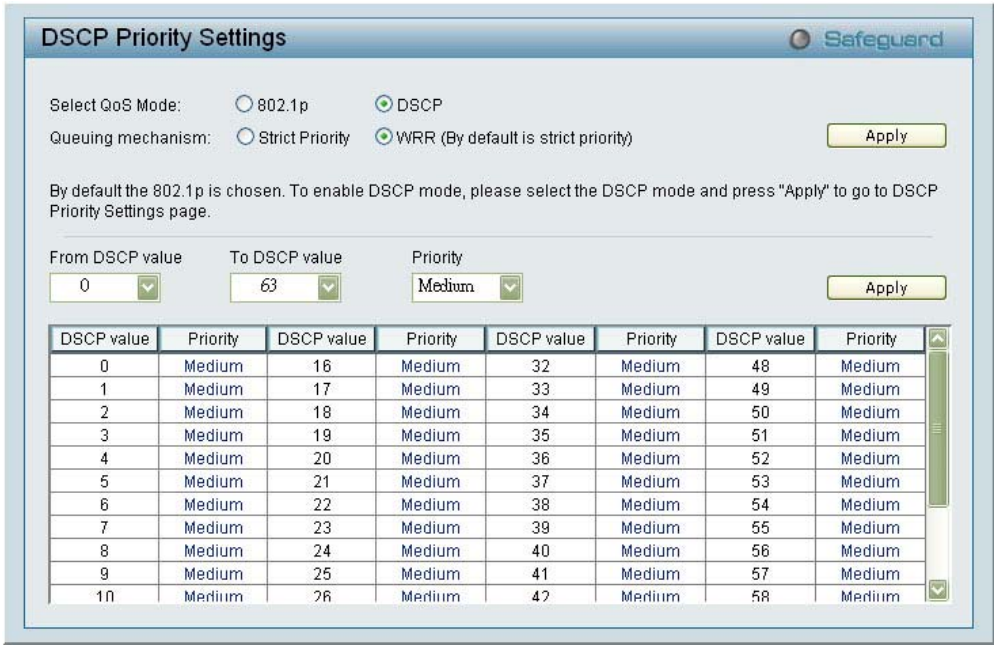


Figure 65 – QoS > DSCP Priority Settings

Select QoS Mode: D-Link Smart Switch allows the user to prioritize the traffic based on the 802.1p priority in the VLAN tag or the DSCP (Differentiated Services Code Point) priority in the IP header. Choose one to prioritize the packets.

Queue Mechanism: Select **Strict** Priority, to process the packets with the highest priority. Select **WRR** (Weighted Round-Robin), to process packets according to the weight of each priority. When a priority level has reached its egress weight, the system will process the packets in the next level even if there are remaining packets. D-Link Smart Switch system's weight of priority levels are: 8 (Highest), 4 (High), 2 (Middle) and 1 (Low) packet. By default, the queuing mechanism is **Strict**.

You may select **From Port** / **To Port** to configure the priority of each port.

Security > Trusted Host

Use Trusted Host function to manage the switch from a remote station. You can enter upto three designated management stations, by defining the IP address/Mask as seen in the figure below..

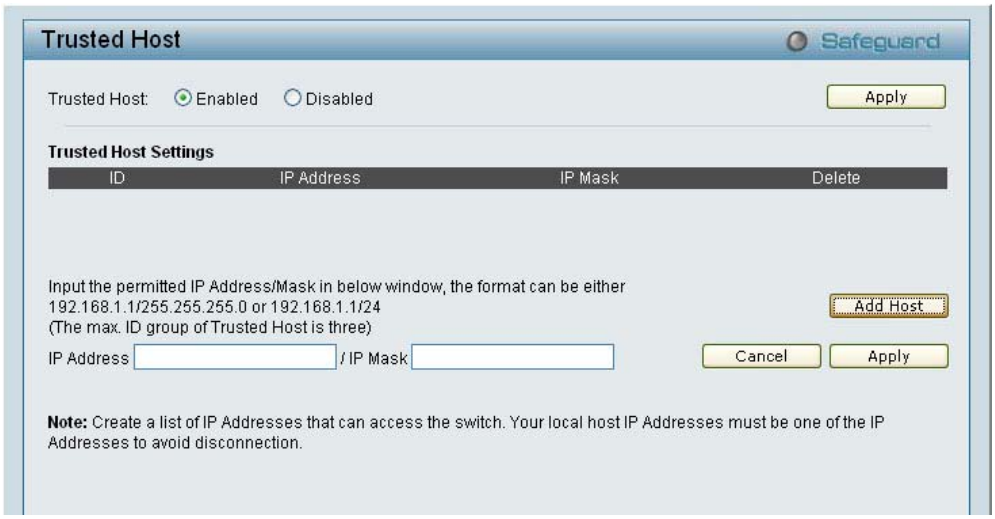


Figure 66 Security > Trusted Host

To define a management station IP setting, click the **Add Host** button and type in the IP address and IP mask then click the **Apply** button. You may permit only single or a range of IP addresses by different IP

mask setting, the format can be either 192.168.1.1/255.255.255.0 or 192.168.0.1/24. Please see below for the example for permitting the IP range

IP Address	IP Mask	Permitted IP
192.168.0.1	255.255.255.0	192.168.0.1~192.168.0.255
172.17.5.215	8	172.0.0.1~172.255.255.255

To delete the IP address simply click the **Delete Host** button, check the unwanted address then click Apply.

Security > Safeguard Engine

D-Link's **Safeguard Engine** is a robust and innovative technology that automatically throttles the impact of packet flooding into the switch's CPU. This function helps protect the Web-Smart Switch from being interrupted by malicious viruses or worm attacks. By default this is enabled.

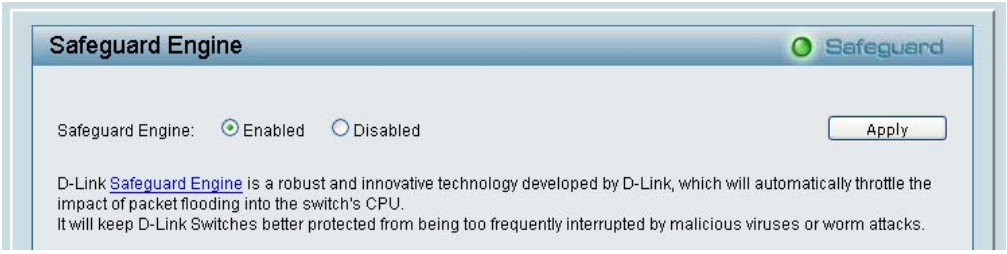


Figure 67 – Security > Safeguard Engine

Security > Broadcast Storm Control

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 68 – Security > Broadcast Storm Control

Security > 802.1X Settings

Network switches provide easy and open access to resources by simply attaching a client PC. Unfortunately this automatic configuration also allows unauthorized personnel to easily intrude and possibly gain access to sensitive data.

IEEE-802.1X provides a security standard for network access control, especially in Wi-Fi wireless networks. 802.1X holds a network port disconnected until authentication is completed. The switch uses Extensible Authentication Protocol over LANs (EAPOL) to exchange authentication protocol client identity (such as a user name) with the client, and forward it to another remote RADIUS authentication server to verify access rights. The EAP packet from the RADIUS server also contains the authentication method to be used. The client can reject the authentication method and request another, depending on the configuration of the client software and the RADIUS server. Depending on the authenticated results, the port is either made available to the user, or the user is denied access to the network.

The RADIUS servers make the network a lot easier to manage for the administrator by gathering and storing the user lists.

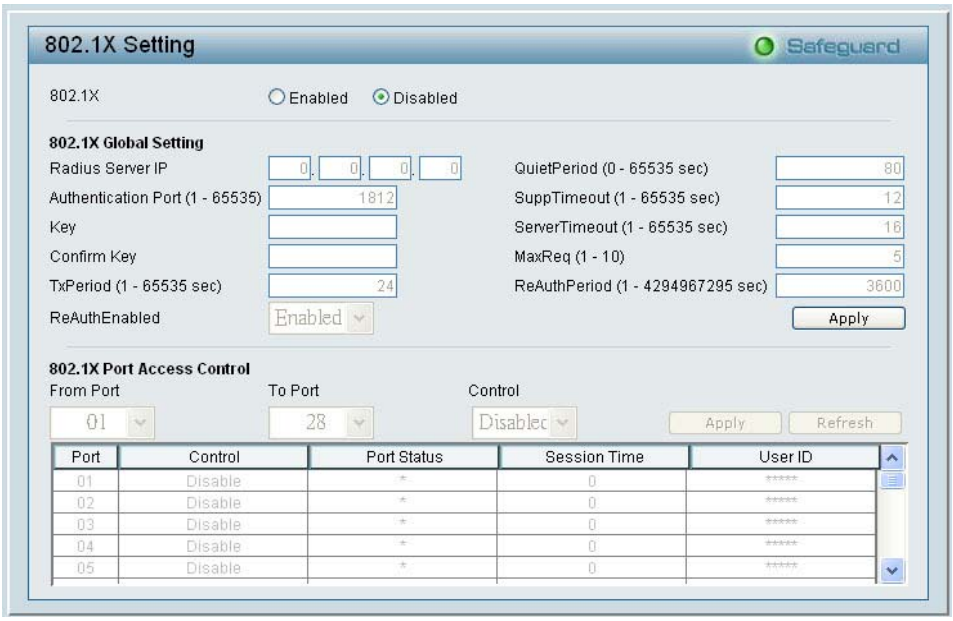


Figure 69 – Security > 802.1X Setting

By default, 802.1X is disabled. To use EAP for security, select enabled and set the 802.1X **Global Settings** for the Radius Server and applicable authentication information.

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

Key: Masked password matching the Radius Server Key.

Confirm Key: Enter the Key a second time for confirmation.

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 enables or disables 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 is 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.

To establish 802.1X port-specific assignments, select the **From Ports** / **To Ports** and select enable.

Security > Mac Address Table > Static Mac

This page provides two distinct features. The top table provides the ability to turn off auto learning Mac address if a port isn't connected to an uplink Switch (i.e. DHCP Server). By default, this feature is Off (disabled). The Macs listed on this table may only connect from corresponding ports and VIDs, in order to protect the network from illegal Macs.

Figure 70 – Security > Static Mac Address

To initiate the removal of auto-learning for any of the uplink ports, press On to enable this feature, and select the port(s) for auto learning to be disabled.

The **Static Mac Address Setting** table displays the static Mac addresses connected, as well as the VID. Press **Delete** to remove a device. To add a new Mac address assignment, press **Add Mac**, then select the assigned Port number, enter both the Mac Address and VID and press **Apply**.

Security > Mac Address Table > Dynamic Forwarding Table

For each port, this table displays the Mac address of each packet passing through the Switch. To add a Mac address to the Static Mac Address List, click the **Add** checkbox then press **Apply** associated with the identified packet.

Figure 71 – Security > Dynamic Forwarding Table

Monitoring > Statistics

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

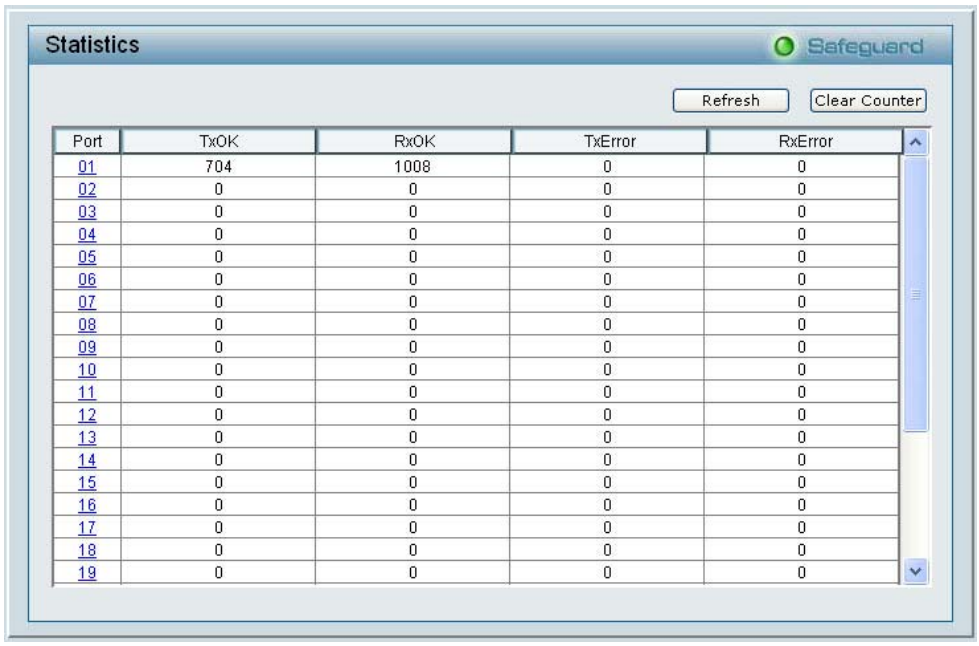


Figure 72 – Monitoring > Statistics

Refresh: To renew the details collected and displayed.
Clear Counter: To reset the details displayed.
TxOK: Number of packets transmitted successfully.
RxOK: Number of packets received successfully.
TxError: Number of transmitted packets resulting in error.
RxError: Number of received packets resulting in error.

To view the statistics of individual ports, click one of the linked Port numbers for details.

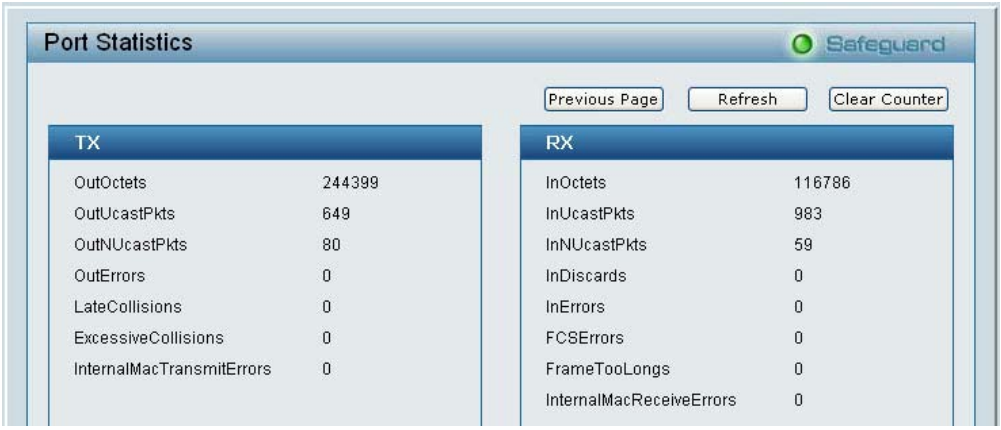


Figure 73 – Monitoring > Port Statistics

Monitoring > Cable Diagnostics

The Cable Diagnostics is designed primarily for administrators and customer service representatives to view tests of the copper cables. It rapidly determines the type of cable errors occurred in the cable.

Select a port and then click the **Test Now** button to view the diagnosis.

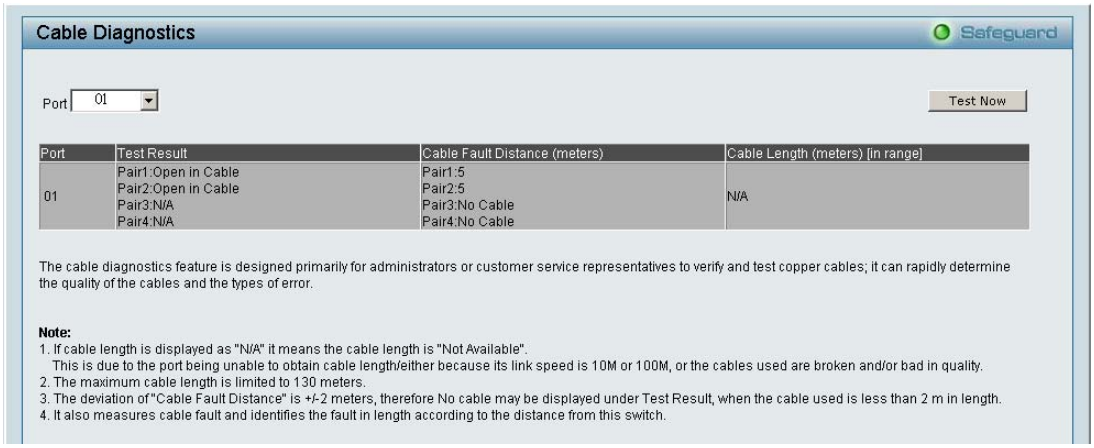


Figure 74 – Monitoring > Cable Diagnostic

Test Result: The description of the cable diagnostic results.

- **OK** means the cable is fine
- **Short in Cable** means the lines of the RJ45 cable maybe in contact somewhere
- **Open in Cable** means the lines of RJ45 cable maybe broken or the other end of the cable is simply disconnected.
- **Test Failed** means some other errors occured during cable diagnostics. Please select the same port and test again.

Cable Fault Distance (meters): Indicates the distance of the cable fault from the Switch port, if the cable is less than 2 meters, it will show “No Cable”.

Cable Length (meter): If the test result shows the cable is OK, cable length indicates the total length of the cable. The cable lengths are categorized into four types: <50 meters, 50~80 meters, 80~100 meters and >100 meters.

NOTE: Cable length detection is supported on Gigabit ports only.

NOTE: Please make sure the power saving function is disabled before using the cable diagnostics function.

Appendix A - Ethernet Technology

This chapter provides 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, and management objects, but with a tenfold increase in theoretical throughput of 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 existing investments in hardware, software, or trained personnel.

The increased speed and extra bandwidth offered by Gigabit Ethernet is essential to help solving network bottlenecks that frequently develop as more advanced computer users and newer applications continue to demand greater network resources. Upgrading key components, such as backbone connections and servers to Gigabit Ethernet technology can greatly improve network response times as well as significantly speed up the traffic between 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 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 which will create 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 utilizes existing investments in hardware, software, and personnel training.

Switching Technology

Another approach to push 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 won'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.

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 devices, 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.

Appendix B - Technical Specifications

Hardware Specifications

Key Components / Performance

- Switching Capacity:
  - DGS-1216T: 32Gbps
  - DGS-1224T: 48Gbps
  - DGS-1224TP: 48Gbps
  - DGS-1248T: 96Gbps
- Max. Forwarding Rate
  - DGS-1216T: 23.8Mpps
  - DGS-1224T: 35.7Mpps
  - DGS-1224TP: 35.7Mpps
  - DGS-1248T: 71.4Mpps
- Forwarding Mode: Store and Forward
- Packet Buffer memory:
  - DGS-1216T: 512KB
  - DGS-1224T: 512KB
  - DGS-1224TP: 512KB
  - DGS-1248T: 1MB
- SDRAM for CPU: 8M Bytes
- Flash Memory: 2M Bytes

Port Functions

- 16, 24 or 48 10/100/1000BaseT ports compliant with the following standards:
  - IEEE 802.3
  - IEEE 802.3u
  - IEEE 802.3ab
  - IEEE 802.3af (DGS-1224TP)
  - Supports Full-Duplex operations
- 2 or 4 combo SFP ports compliant with the following standards:
  - IEEE 802.3z
  - Supports Full-Duplex operations
- SFP transceivers supported
  - DEM-310GT (1000BASE-LX)
  - DEM-311GT (1000BASE-SX)
  - DEM-314GT (1000BASE-LH)
  - DEM-315GT (1000BASE-ZX)
  - DEM-312GT2 (1000BASE-SX)
  - DEM-210 (100BASE-FX)
  - DEM-211 (100BASE-FX)
- WDM Transceivers Supported:
  - DEM-330T (TX-1550/RX-1310nm)
  - DEM-330R (TX-1310/RX-1550nm)
  - DEM-331T (TX-1550/RX-1310nm)
  - DEM-331R (TX-1310/RX-1550nm)

Physical & Environment

- AC input, 100~240 VAC, 50/60Hz, internal universal power supply
- Operation Temperature 0~40°C
- Storage Temperature -10~70°C
- Operation Humidity: 10%~90% RH
- Storage Humidity: 5%~90% RH

Emission (EMI) Certifications

- FCC class A
- CE Class A
- VCCI Class A

Safety Certifications

- cUL, UL

Features

L2 Features

- Supports up to 8K MAC address
- IGMP snooping: supports 64 multicast group
- 802.1D Spanning Tree
- Port trunk (Link Aggregation): up to 6 groups per device, up to 8 ports per group
- Port mirroring
- Jumbo Frame:
  - DGS-1216T: 10,240KB
  - DGS-1224T: 10,240KB
  - DGS-1224TP: 10,240KB
  - DGS-1248T: 9,216KB

VLAN

- 802.1Q VLAN standard (VLAN Tagging)
- Up to 256 static VLAN groups

QoS (Quality of Service)

- 802.1p Priority Queues standard
- Up to 4 queues per port
- Supports WRR mode in queue handling

Security

- 802.1x port-based access control
- Broadcast Storm Control
- D-Link Safeguard Engine

Management

- Web-based GUI or SmartConsole Utility
- SNMP support
- DHCP client
- Trap setting for destination IP, system events, fiber port events, twisted-pair port events

- Port access control
- Web-based configuration backup / restoration
- Web-based firmware backup/upload
- Firmware upgrade using SmartConsole Utility
- Reboot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