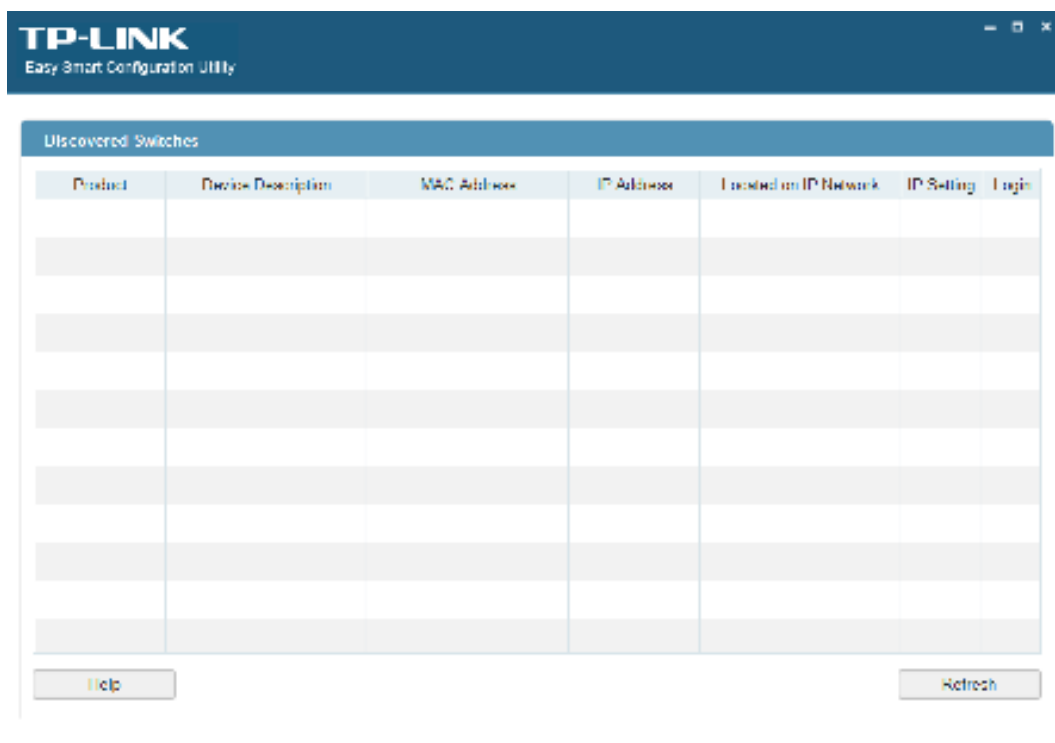


### Easy Smart Configuration Utility



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# Chapter 1 About this Guide

This User Guide contains information for setup and guidance of the Easy Smart Configuration Utility. Please read this guide carefully before operation.

## 1.1 Intended Readers



This Guide is intended for network managers familiar with IT concepts and network terminologies.

## 1.2 Conventions

In this Guide the following conventions are used:

- **Menu Name**→**Submenu Name** indicates the menu structure. **System**→**System Info**→**System Summary** means the System Summary page under the System Info menu option located under the System menu.
- **Bold font** indicates a button, a toolbar icon, menu or menu item.

Symbols in this guide:

Symbol	Description
 <b>Note:</b>	Ignoring this type of note might result in a malfunction or damage to the device.
 <b>Tips:</b>	This format indicates important information that helps you make better use of your device.

## 1.3 Overview of This Guide

Chapter	Introduction
Chapter 1 About This Guide	Introduces the guide structure and conventions.
Chapter 2 Getting Started	Introduces the installation and uninstallation of the utility, and the overview of its interface.

Chapter	Introduction
Chapter 3 System	<p>This module is used to configure system properties of the switch. Here mainly introduces:</p> <ul style="list-style-type: none"> <li>● System Info: View device information and define the device description.</li> <li>● IP Setting: Get and modify the network parameters of the switch.</li> <li>● User Account: Modify the username and password for users to login the Web management page.</li> <li>● Backup and Restore: Save the current configuration file to your computer or download a backup configuration file to your switch.</li> <li>● System Reboot: Reboot your switch.</li> <li>● System Reset: Reset the switch to the default.</li> <li>● Firmware Upgrade: Update the firmware of the switch.</li> </ul>
Chapter 4 Switching	<p>This module is used to configure the basic functions of the switch.</p> <ul style="list-style-type: none"> <li>● Port Setting: Configure and view the basic parameters of each port, including the port status, speed, duplex mode and flow control.</li> <li>● IGMP Snooping: Enable IGMP snooping feature and view the current IGMP Group information.</li> <li>● Port Trunk: Configure and view the information of the trunk group of the switch.</li> </ul>
Chapter 5 Monitoring	<p>This module is used to monitor the traffic information of the switch, and provide the convenient method to locate and solve the network problem.</p> <ul style="list-style-type: none"> <li>● Port Statistics: View the statistic information of each port.</li> <li>● Port Mirror: Monitor and mirror network traffic by forwarding copies of incoming and outgoing packets from one/multiple ports (mirrored port) to a specific port (mirroring port).</li> <li>● Cable Test: Diagnose the connection status of the cable connected to the switch and the distance to the problem location.</li> <li>● Loop Prevention: Detect loops using loopback detection packets, and then display an alert or further block the corresponding port.</li> </ul>

Chapter	Introduction
Chapter 6 VLAN	<p>This module is used to configure VLANs to control broadcast in LANs. Here mainly introduces:</p> <ul style="list-style-type: none"><li>● MTU VLAN: Set the MTU VLAN mode.</li><li>● Port Based VLAN: Set the Port-Based VLAN mode</li><li>● 802.1Q VLAN: Set the 802.1Q Tag VLAN mode.</li><li>● 802.1Q PVID Setting: Configure 802.1Q PVID value.</li></ul>
Chapter 7 QoS	<p>This module is used to configure QoS function to provide different quality of service for various network applications and requirements. Here mainly introduces:</p> <ul style="list-style-type: none"><li>● QoS Basic: Configure and view the basic parameters of QoS.</li><li>● Bandwidth Control: Configure and view the bandwidth control function information.</li><li>● Storm Control: Configure and view the storm control function information.</li></ul>
Chapter 8 Help	Lists the help and version information of the utility.

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## Chapter 2 Getting Started

### 2.1 Introduction

Easy Smart Configuration Utility is the management software for the TP-LINK Easy Smart Switches. The utility allows operators to centrally manage entire networks of the Easy Smart Switches, which include TL-SG105E/TL-SG108E/TL-SG108PE/TL-SG1016DE/TL-SG1024DE. Among of them, TL-SG105E V1.0 and TL-SG108E V1.0 can only be configured with Easy Smart Configuration Utility while TL-SG105E V2.0/TL-SG108E V2.0/TL-SG108PE/TL-SG1016DE/TL-SG1024DE can also be managed on their Web-Management page. Throughout this guide, we will take TL-SG108E V2.0 for example.

### 2.2 Install the Easy Smart Configuration Utility


If an earlier version of the utility is present on your computer, please install this version to replace the older version.

1. Insert the provided resource CD that came with your switch into your computer that you want to use to manage your switches.

The resource CD home screen displays.



You can read the Easy Smart Configuration Utility User Guide by clicking **Documentation** in the upper right corner of the above screen and view all the files on the resource CD by clicking **Browse CD**.

If the home screen does not display, browse the files on the CD and double-click **AutoRun.exe**. You can also directly read the User Guide and double-click the icon in the Utility folder to install the utility with the same steps from the following step 2 to step 3. 

2. Click the **Install Easy Smart Configuration Utility** link on the resource CD home screen.
  - a. The InstallShield Wizard prepares the setup shown as the following screen. Please wait for a moment.

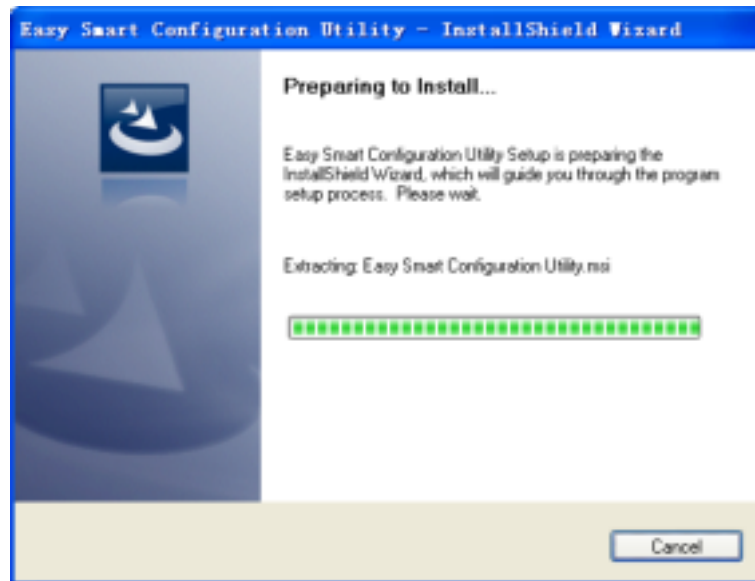


Figure 2-1 Preparing to Install

- b. Then the following screen will appear. Click **Next** to continue. If you want to stop the installation, click **Cancel**.





Figure 2-2 Welcome to the InstallShield Wizard

- c. Choose the destination location for the installation files and click **Next** to continue.

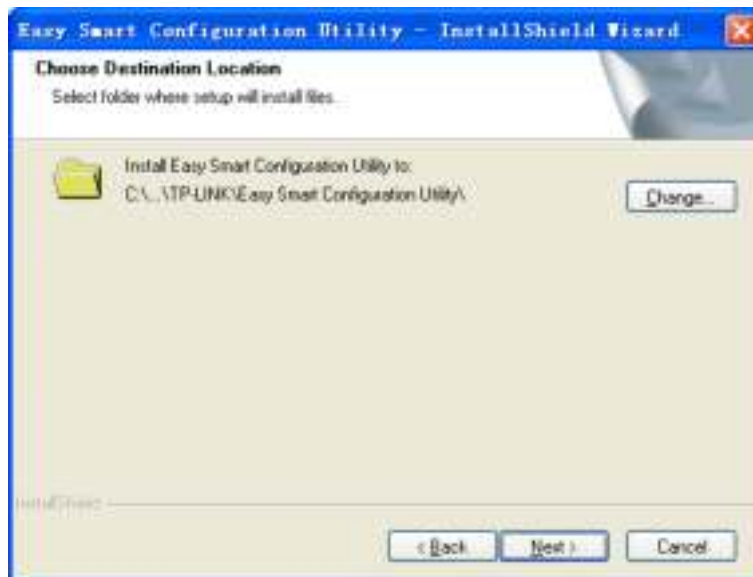


Figure 2-3 Choose Destination Location

By default, the installation files are saved in the Program Files folder of system disk. Click the **Change** button to modify the destination location properly to your need.

- d. Now the wizard is ready to begin the installation. Click **Install** to begin the installation on the following screen.

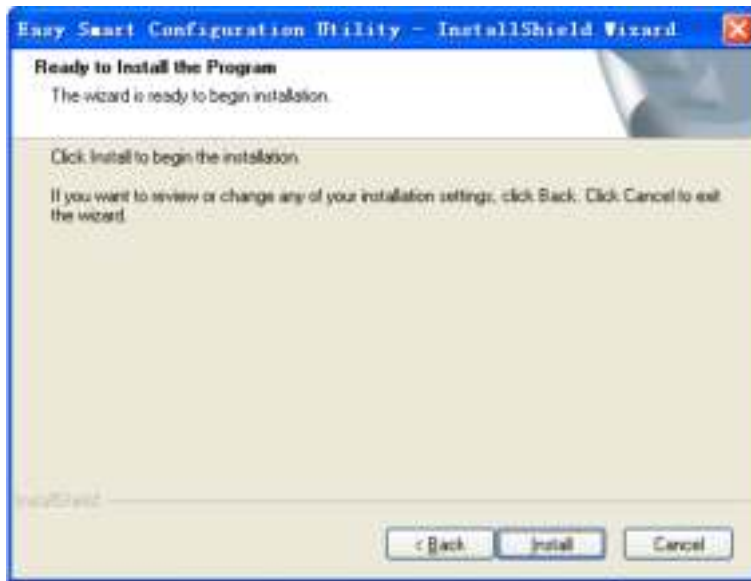


Figure 2-4 Ready to Install the Program

- e. The InstallShield Wizard is installing Easy Smart Configuration Utility shown as the following screen. Please wait for a while.



Figure 2-5 Setup Status

- f. Click **Finish** to complete the installation on the following screen.

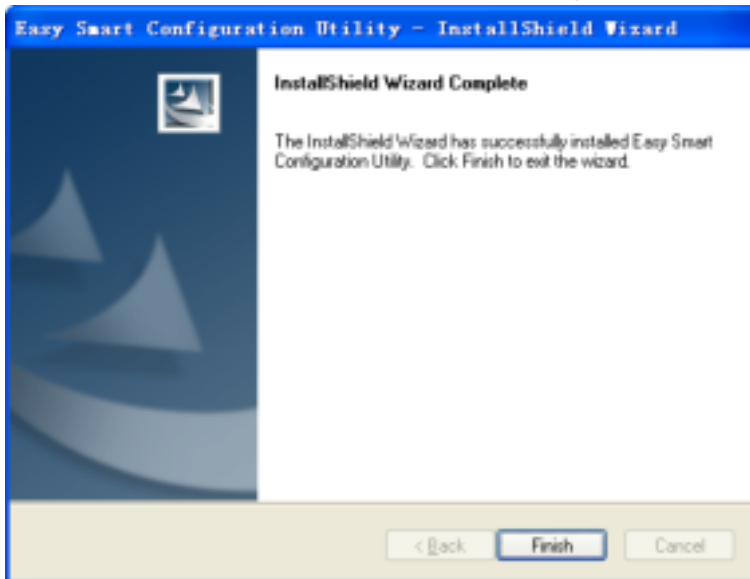



Figure 2-6 InstallShield Wizard Complete

3. The installation process creates a TP-LINK subdirectory under the \Program Files directory on your computer, copies the utility program into the \Program Files\TP-LINK\Easy Smart Configuration Utility directory, and places a utility icon  on the computer desktop.



The setting figure will be shown as below:

MAC Address:	00-0A-EB-13-23-A2
Hardware Version:	TL-SG108E 2.0
Firmware Version:	1.0.0 Build 20151112 Rel.56727
Device Description:	<input type="text" value="TL-SG108E"/>
DHCP Setting:	<input type="button" value="Disable"/> ▼
IP Address:	<input type="text" value="192.168.0.1"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="0.0.0.0"/>
User Name:	<input type="text"/>
Password:	<input type="text"/>

Figure 2-9 Switch Setting

You can configure the switch's Device Description, DHCP Setting, IP Address, Subnet Mask and Default Gateway on this page. The login User Name and Password are required to complete the configuration. By default, they are both **admin**.


When the switch IP Address is not in the same subnet with host IP Address, it can be discovered by the utility, but you cannot login the utility management page. Therefore, it needs to set the switch IP Address in the same subnet with host IP Address, which allows you to login the utility management page and configure the switch.

Clicking **Apply** can only make the new configurations effective before the switch is rebooted. If you want to keep the configurations effective even the switch is rebooted, please select the checkbox behind **Save Config**.

## 2.5 Refresh

Click **Refresh** in Figure 2-7 to restart the switch discovering process.

## 2.6 Utility Features Overview

You can select a switch and click  or double click its corresponding entry to log on to the switch for further configuration. Please ensure that host IP address and switch IP address must be in the same subnet.



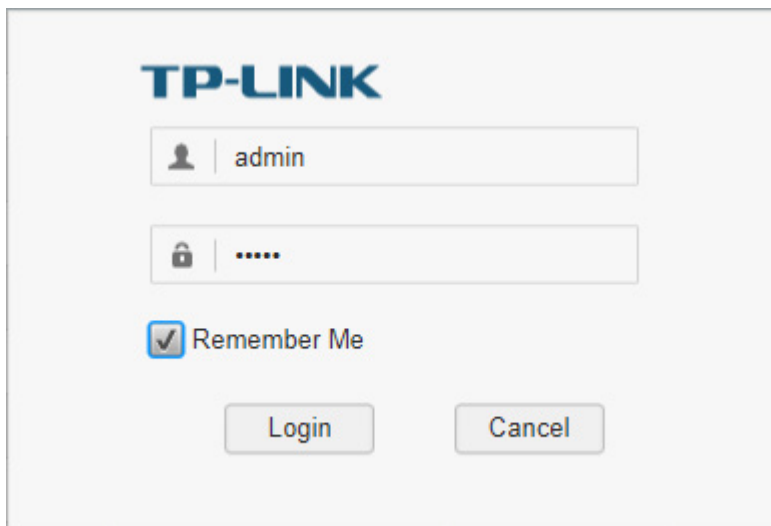
Product	Device Description	MAC Address	IP Address	Located on IP Network	IP Setting	Login
TL-SG100L	TL-SG100L	00 23 79 00 23 79	192.168.0.1	192.168.0.6		

Figure 2-10 Discovered Switch

Enter the User Name and Password to login the configuration interface. They are both **admin** by default. You can select **Remember Me** to remember the User Name and Password.



The login form features the TP-LINK logo at the top. Below it are two input fields: the first for the username, containing the text 'admin', and the second for the password, containing six dots. A 'Remember Me' checkbox is checked. At the bottom, there are two buttons: 'Login' and 'Cancel'.

Figure 2-11 Login

The configuration figure is shown as blow:

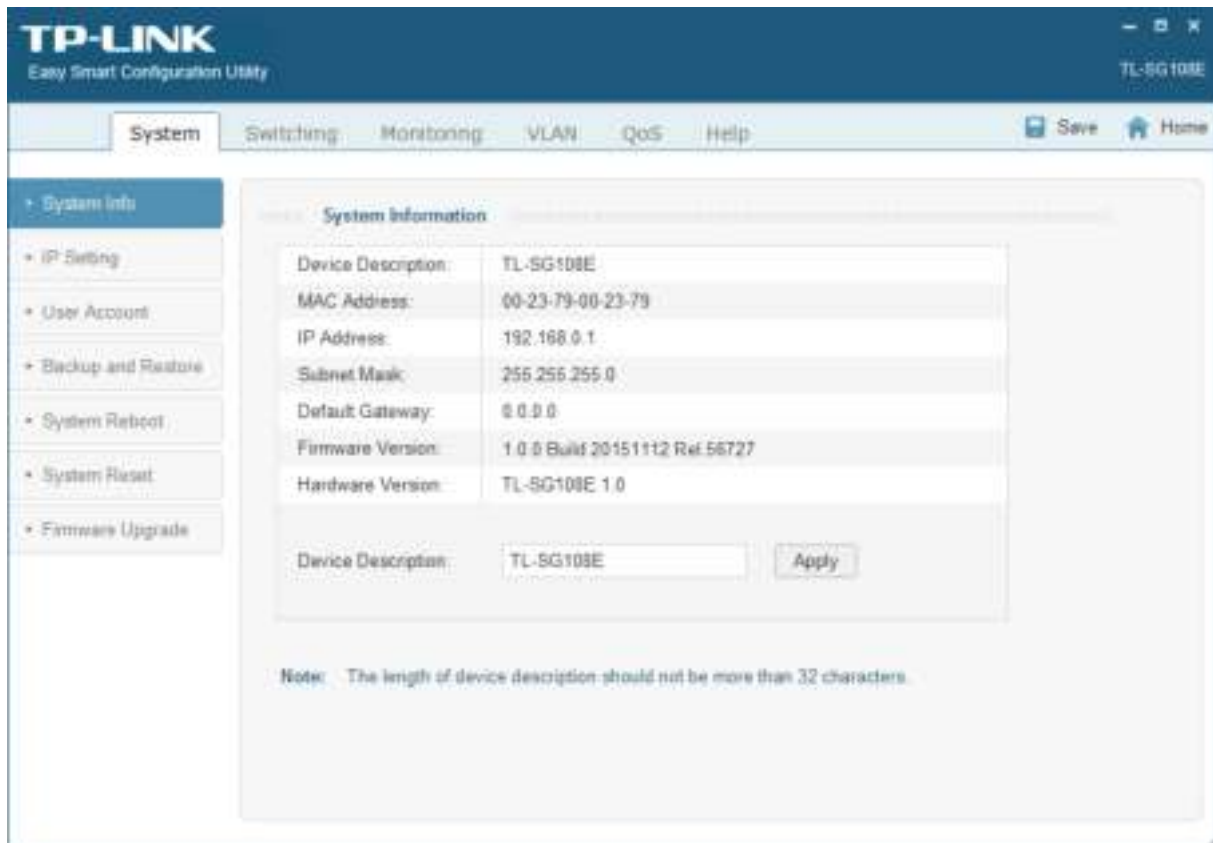



Figure 2-12 Switch Configuration

Device description field shows the device model number of the switch that you are managing.

Click the icon  to save the current configurations.

Click the icon  to return to the discovering page.

### **Note:**

The switch you log on to should be in the same subnet with your computer.

## 2.7 Uninstall the Utility

If you want to remove the Easy Smart Configuration Utility, please take the following steps:

1. On the Windows taskbar, click the **Start** button, point to **All Programs**→**TP-LINK** → **Easy Smart Configuration Utility**, and then click **Uninstall Easy Smart Configuration Utility**, shown as the following figure.



Figure 2-13 Preparing Setup

- Then the following screen will appear. If you want to stop the remove process, click **Cancel**.

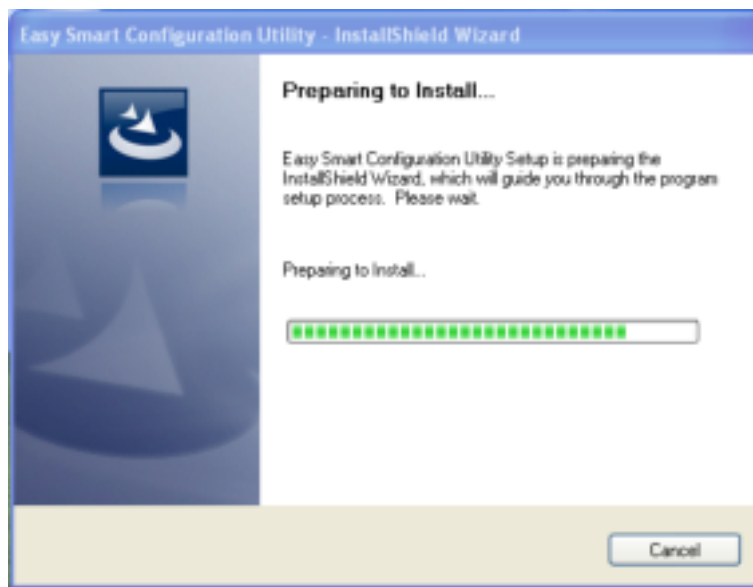


Figure 2-14 Preparing Setup

- On the continued screen, click **Yes** to remove the utility from your PC.

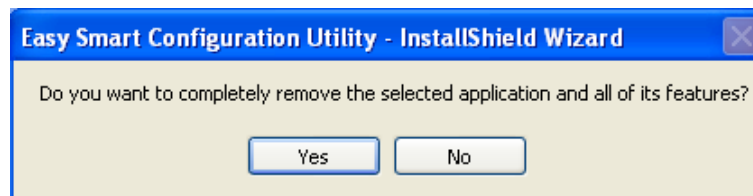


Figure 2-15 Uninstall the Utility



4. Click **Finish** to complete.



Figure 2-16 Uninstall Complete

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## Chapter 3 System

The System module is mainly for system configuration of the switch, including seven submenus: **System Info**, **IP Setting**, **User Account**, **Backup and Restore**, **System Reboot**, **System Reset** and **Firmware Upgrade**.

### 3.1 System Info

On this page you can view the system information and define the device description.

Choose the menu **System**→**System Info** to load the following page.

System Information	
Device Description:	TL-SG108E
MAC Address:	00-23-79-00-23-79
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
Firmware Version:	1.0.0 Build 20150518 Rel.56479
Hardware Version:	TL-SG108E 2.0

Device Description:	<input type="text" value="TL-SG108E"/>	<input type="button" value="Apply"/>
---------------------	--	--------------------------------------

Note: The length of device description should not be more than 32 characters.

Figure 3-1 System Information

#### ➤ System Info

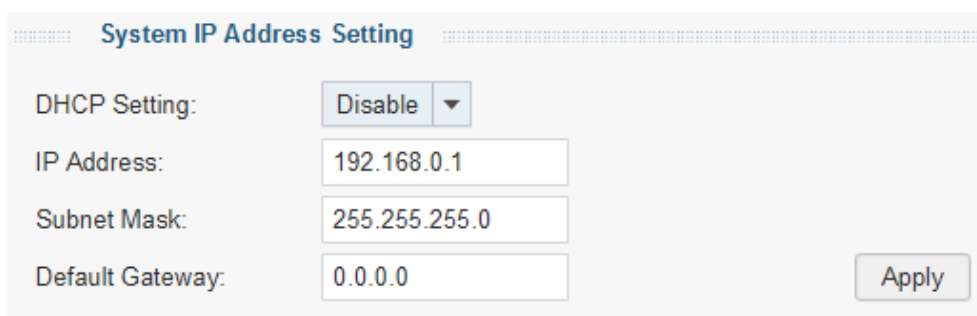
- Device Description:** Displays the device model number.
- MAC Address:** Displays the MAC address of the switch.
- IP Address:** Displays the system IP address of the switch. The default system IP is 192.168.0.1 and you can change it appropriate to your needs.
- Subnet Mask:** Displays the subnet mask of the switch.
- Default Gateway:** Displays the default gateway of the switch.
- Firmware Version:** Displays the installed software version number.
- Hardware Version:** Displays the installed device hardware version number.
- Device Description:** Give a description to the device for identification.

## 3.2 IP Setting

Each device in the network possesses a unique IP address. You can login the IP Setting page to operate the switch using this IP address. The switch supports the DHCP mode to obtain an IP address from the DHCP server.

On this page you can get and modify the network parameters of the switch.

Choose the menu **System**→**IP Setting** to load the following page.



System IP Address Setting	
DHCP Setting:	Disable ▼
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
	Apply

Figure 3-2 System IP Address Setting

The following entries are displayed on this screen:

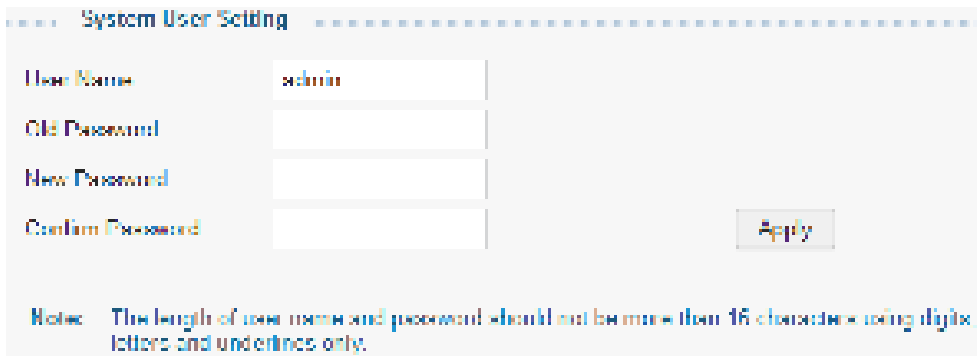
### ➤ System IP Address Setting

- DHCP Setting:** Enable or disable the DHCP function. If DHCP setting is enabled, the switch will obtain the IP address, subnet Mask and default gateway from the DHCP Server automatically; otherwise, these three items should be configured manually. By default, it is disabled.
- IP Address:** Enter the system IP of the switch. The default system IP is 192.168.0.1 and you can change it appropriate to your needs.
- Subnet Mask:** Enter the subnet mask of the switch. By default, the switch uses 255.255.255.0 as the subnet mask.
- Default Gateway:** Enter the default gateway of the switch.

## 3.3 User Account

On this page you can modify the administrator's username and password in order to refuse illegal users.

Choose the menu **System**→**User Account** to load the following page.



System User Setting

User Name: admin

Old Password:

New Password:

Confirm Password:

Apply

Note: The length of user name and password should not be more than 16 characters using digits, letters and underlines only.

Figure 3-3 System User Setting

The following entries are displayed on this screen:

➤ **System User Setting**

- User Name:** Create a name for administrator's login.
- Old Password:** Type in the old password.
- Password:** Type in a new password for administrator's login.
- Confirm Password:** Retype the new password.



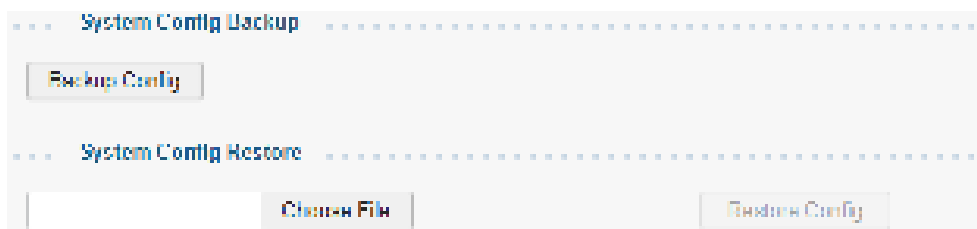
**Note:**

1. The length of user name and password should not be more than 16 characters using digits, letters and underlines only.
2. The default username/password is admin/admin.

### 3.4 Backup and Restore

On this page you can download the current configuration and save it as a file to your computer, or upload a backup configuration file to restore your switch to this previous configuration.

Choose the menu **System**→**Backup and Restore** to load the following page.



System Config Backup

Backup Config

System Config Restore

Choose File Restore Config

Figure 3-4 System Config Backup

The following entries are displayed on this screen:

➤ **System Config Backup**

**Backup Config:** Click the **Backup Config** button to save the current configuration as a file to your computer. You are suggested to take this measure before upgrading.

➤ **System Config Restore**

**Restore Config:** Click the **Choose File** button to select the backup configuration file, and then click the **Restore Config** button. It will take effect after the switch automatically reboots.

 **Note:**

1. It will take a few minutes to backup the configuration. Please wait without any operation.
2. It will take a few minutes to restore the configuration. Please wait without any operation.
3. To avoid any damage, please don't power down the switch while being restored.
4. After being restored, the current settings of the switch will be lost. Wrong uploaded configuration file may cause the switch unmanaged.

### 3.5 System Reboot

On this page you can reboot the switch and return to the login page. Please save the current configuration before rebooting to avoid losing the configuration unsaved.

Choose the menu **System**→**System Reboot** to load the following page.

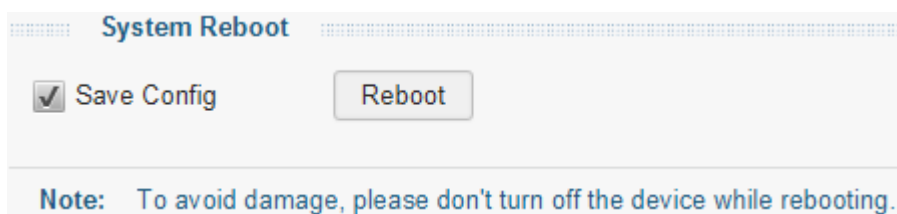


Figure 3-5 System Reboot

 **Note:**

To avoid damage, please don't turn off the device while rebooting.

### 3.6 System Reset

On this page you can reset the switch to the default. All the settings will be cleared after the switch is reset.

Choose the menu **System**→**System Reset** to load the following page.

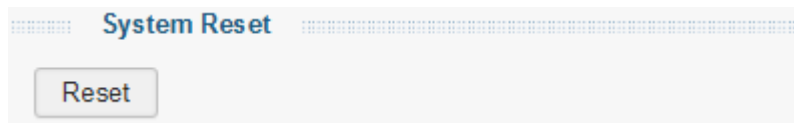


Figure 3-6 System Reset

 **Note:**

After the system is reset, the switch will be reset to the default and all the settings will be cleared.

### 3.7 Firmware Upgrade

The switch system can be upgraded via this management page. To upgrade the system is to get more functions and better performance. Go to <http://www.tp-link.com> to download the updated firmware.

Choose the menu **System**→**Firmware Upgrade** to load the following page.

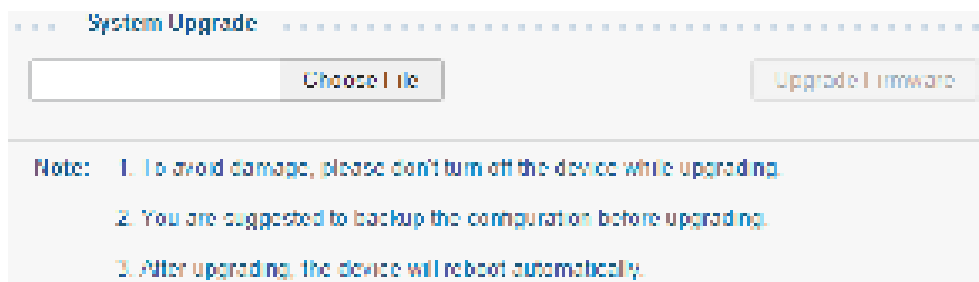


Figure 3-7 System Upgrade

 **Note:**

1. Don't interrupt the upgrade.
2. Please select the proper software version matching with your hardware to upgrade.
3. To avoid damage, please don't turn off the device while upgrading.
4. After upgrading, the device will reboot automatically.
5. You are suggested to backup the configuration before upgrading.

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## Chapter 4 Switching

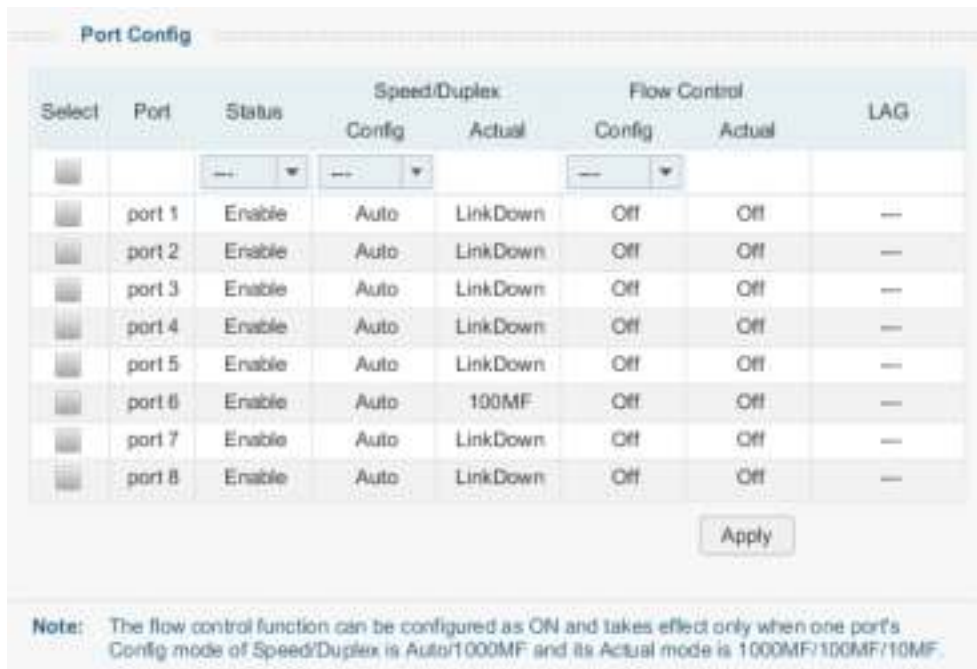
Switching module is used to configure the basic functions of the switch, including three submenus: **Port Setting**, **IGMP Snooping** and **Port Trunk**.

### 4.1 Port Setting

On this page, you can configure the basic parameters for the ports. When the port is disabled, the packets on the port will be discarded. Disabling the port which is vacant for a long time can reduce the power consumption effectively. And you can enable the port when it is in need.

The parameters will affect the working mode of the port, please set the parameters appropriate to your needs.

Choose the menu **Switching**→**Port Setting** to load the following page.



Select	Port	Status	Speed/Duplex		Flow Control		LAG
			Config	Actual	Config	Actual	
<input type="checkbox"/>		---	---		---		
<input type="checkbox"/>	port 1	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 2	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 3	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 4	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 5	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 6	Enable	Auto	100MF	Off	Off	---
<input type="checkbox"/>	port 7	Enable	Auto	LinkDown	Off	Off	---
<input type="checkbox"/>	port 8	Enable	Auto	LinkDown	Off	Off	---

**Note:** The flow control function can be configured as ON and takes effect only when one port's Config mode of Speed/Duplex is Auto/100MF and its Actual mode is 100MF/100MF/10MF.

Figure 4-1 Port Config

The following entries are displayed on this screen:

➤ **Port Config**

**Select:** Select the desired port for configuration. It is multi-optional.

**Port:** Displays the port number.

**Status:** Allows you to Enable/Disable the port. When Enable is selected, the port can forward the packets normally.

**Speed and Duplex:**

**Config:** Select the Speed and Duplex mode for the port. The device connected to the switch should be in the same Speed and Duplex mode with the switch. When “Auto” is selected, the Speed and Duplex mode will be determined by auto-negotiation.

**Actual:** Displays the actual working state of the port.

**Flow Control:**

**Config:** Select On/Off to Enable/Disable the Flow Control feature. When Flow Control is enabled, the switch can synchronize the speed with its peer to avoid the packet loss caused by congestion.

**Actual:** Displays the state of the Flow Control function of the port. It is off by default.

**LAG:**

Displays the LAG number which the port belongs to.

**Note:**

1. The switch can not be managed through the disabled port. Please enable the port which is used to manage the switch.
2. The parameters of the port members in a LAG should be set as the same.

## 4.2 IGMP Snooping

Internet Group Management Protocol (IGMP) snooping is a multicast control mechanism, which can be used on the switch for dynamic registration of the multicast group.

IGMP Snooping allows the switch to recognize the IGMP messages transmitted between network stations or devices and an IGMP host. When receiving IGMP report message from the IGMP host, the switch will add the port to the multicast address table; when listening to IGMP leave message from the IGMP host, the switch will remove the port from the multicast address table. By managing and controlling the multicast address table, the broadcasting of multicast traffic can be effectively prevented in the network.

On this page you can enable IGMP snooping feature and view the current IGMP Group information.



Choose the menu **Switching**→**IGMP Snooping** to load the following page.

Figure 4-2 IGMP Snooping

The following entries are displayed on this screen:

➤ **IGMP Snooping**

**IGMP Snooping:** Enable or disable IGMP snooping function globally on the switch.

**Report Message Suppression** Enable or disable Report Message Suppression function globally. If this function is enabled, the first Report Message from the listener will forward to the router ports while the subsequent Report Message will be suppressed to reduce the IGMP packets.

➤ **Multicast IP Table**

**IP Address:** Displays the multicast IP address.

**VLAN ID:** Displays the VLAN ID of the multicast group. If the packet does not carry VLAN ID, then here displays the PVID of the port. All port members of a multicast group should be divided to the same VLAN, and have the same PVID.

**Ports:** Displays the forwarding port list of the multicast group.

## 4.3 Port Trunk

Port trunk is used to combine a number of ports together to make a single high-bandwidth data path, which can highly extend the bandwidth. The bandwidth of the trunk is the sum of bandwidth of its member ports.

There are some rules on using trunk:

- For the member ports in a trunk group, their configuration of **Port setting (Speed and Duplex, Flow Control)**, **QoS** must be the same.
- For the newly joined member ports in a trunk group, their default setting of **Port setting (Speed and Duplex, Flow Control)**, **QoS** will be configured the same as that of the first member port in the trunk group.
- The trunk member ports cannot be set as mirroring port.
- Before setting the trunk, its member ports should be divided to the same VLAN, and have the same PVID and drop the untagged packet rule. Change of the trunk setting will not affect the VLAN setting.

If the port trunk is needed, you are suggested to configure the port trunk function here before configuring the other functions for the member ports.

On this page, you can configure and view the information of the trunk group of the switch.

Choose the menu **Switching**→**Port Trunk** to load the following page.

Trunk Config

Trunk ID: Trunk1

1 2 3 4 5 6 7 8 Apply

Trunk Table

Select	Trunk ID	Ports
<input type="checkbox"/>	Trunk1	-----
<input type="checkbox"/>	Trunk2	-----

SelectAll Delete

Note:

1. You can create up to two trunk groups.
2. Each trunk group has up to four port members and has at least two port members.
3. Mirroring and mirrored port cannot be added to a trunk group.

Figure 4-3 Trunk Config

Here you can configure and view the port parameters.

#### ➤ Trunk Config

**Trunk ID:** Select an identified number for the trunk group from the drop-down list.

**Port:** Select the port as the trunk group member. It is multi-optional. Available ports of trunk1 are port1-port4, and available ports of trunk2 are port5-port8. Clearing all the ports of the trunk group will delete this trunk group.

➤ **Trunk Table**

**Select:** Select the desired Trunk. It is multi-optional.

**Trunk ID:** Displays the Trunk number here.

**Ports:** Displays the Trunk member ports.

**SelectAll:** Select all the Trunks.

**Delete:** Delete the selected Trunk.

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## Chapter 5 Monitoring

Monitoring module monitors the traffic information of the switch, and provides the convenient method to locate and solve the network problem, includes four submenus: **Port Statistics**, **Port Mirror**, **Cable Test** and **Loop Prevention**.

### 5.1 Port Statistics

On this page you can view the statistic information of each port, which facilitates you to monitor the traffic and locate faults promptly.

Choose the menu **Monitoring**→**Port Statistics** to load the following page.

Port	Status	Link Status	TxGoodPkt	TxBadPkt	RxGoodPkt	RxBadPkt
port 1	Enable	Link Down	0	0	0	0
port 2	Enable	Link Down	0	0	0	0
port 3	Enable	100M Full	33	0	758	1
port 4	Enable	Link Down	0	0	0	0
port 5	Enable	Link Down	0	0	0	0
port 6	Enable	Link Down	0	0	0	0
port 7	Enable	Link Down	0	0	0	0
port 8	Enable	Link Down	0	0	0	0

Figure 5-1 Port Statistics

The following entries are displayed on this screen:

#### ➤ Port Statistics

- Port:** Displays the port number of the switch.
- Status:** Displays whether the port is enabled or disabled.
- Link Status:** Displays the link state of the port.
- TxGoodPkt:** Displays the number of good packets transmitted on the port. The error packets are not counted in.
- TxBadPkt:** Displays the number of error packets transmitted on the port.
- RxGoodPkt:** Displays the number of good packets received on the port. The error packets are not counted in.
- RxBadPkt:** Displays the number of error packets received on the port.

## 5.2 Port Mirror

Port mirror function is to monitor and mirror network traffic by forwarding copies of incoming and outgoing packets from one/multiple ports (mirrored port) to a specific port (mirroring port). Usually, the mirroring port is connected to a data diagnosis device, which is used to analyze the mirrored packets for monitoring and troubleshooting the network.

Choose the menu **Monitoring**→**Port Mirror** to load the following page.



Figure 5-2 Port Mirror

The following entries are displayed on this screen:

### ➤ Port Mirror

**Port Mirror Status:** Enable or disable the port mirror feature of the specified port.

**Mirroring Port:** Select a port from the drop-down list as the mirroring port.

### ➤ Mirrored Port

**Mirrored Mode:** Select a mode as the mirrored mode.

**Ingress:** the incoming packets received by the mirrored port will be copied to the mirroring port.

**Egress:** the outgoing packets sent by the mirrored port will be copied to the mirroring port.

**Both:** all the incoming and outgoing packets of the mirrored port will be copied to the mirroring port.

**Mirrored Ports:** Click the port icon to select the corresponding port as mirrored port to monitor the traffic.

For TL-SG108E V1.0, with only one port as mirrored port, it supports ingress and egress monitoring; when two or more ports is selected as mirrored ports, it only supports the ingress monitoring.



### Note:

1. The trunk member can not be selected as the mirroring port or mirrored port.
2. A port cannot be set as the mirrored port and the mirroring port simultaneously.
3. The port mirror function can span the multiple VLANs.

### 5.3 Cable Test

This switch provides cable test to diagnose the connection status of the cable connected to the switch and the distance to the problem location, which facilitates you to locate and diagnose the trouble spot of the network.

Choose the menu **Monitoring**→**Cable Test** to load the following page.

Port	Test Result	Cable Fault Distance(m)	Test
port 1	---	---	Test
port 2			Test
port 3	---	---	Test
port 4			Test
port 5	---	---	Test
port 6			Test
port 7	---	---	Test
port 8			Test

Test All

Figure 5-3 Cable Test

The following entries are displayed on this screen:

➤ **Cable Test**

**Port:** Displays the port number of the switch.

**Test Result:** Displays the connection status of the cable connected to the port. The test results of the cable include “Open”, “Short”, “Open Short”, “Normal” and “Crosstalk”.

**Cable Fault Distance(m):** Displays the error length (in meters) of the cable.

**Test:** Click **Test** to diagnose the cable connected to this port.

**Test ALL:** Click **Test All** to carry on the cable test on all ports.



**Note:**

The test result is just for your reference.

## 5.4 Loop Prevention

With loop prevention feature enabled, the switch can detect loops using loop detection packets. When a loop is detected, the switch will block the corresponding port automatically.

Choose the menu **Monitoring**→**Loop Prevention** to load the following page.

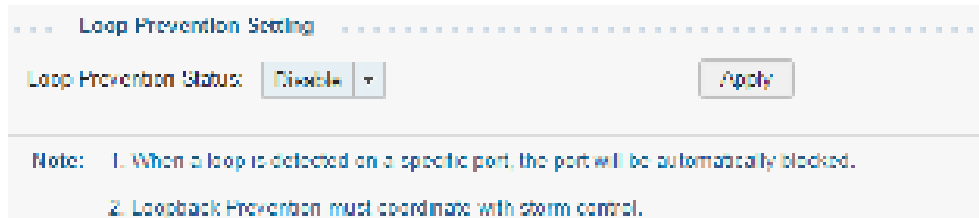


Figure 5-4 Loop Prevention Setting

The following entries are displayed on this screen:

➤ **Loop Prevention Setting**

**Loop Prevention Status:** Allows you to enable or disable loop prevention function globally.

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## Chapter 6 VLAN

The traditional Ethernet is a data network communication technology based on CSMA/CD (Carrier Sense Multiple Access/Collision Detect) via shared communication medium. Through the traditional Ethernet, the overfull hosts in LAN will result in serious collision, flooding broadcasts, poor performance or even breakdown of the Internet. Though connecting the LANs through switches can avoid the serious collision, the flooding broadcasts cannot be prevented, which will occupy plenty of bandwidth resources, causing potential serious security problems.

A Virtual Local Area Network (VLAN) is a network topology configured according to a logical scheme rather than the physical layout. The VLAN technology is developed for switches to control broadcast in LANs. By creating VLANs in a physical LAN, you can divide the LAN into multiple logical LANs, each of which has a broadcast domain of its own. Hosts in the same VLAN communicate with one another as if they are in a LAN. However, hosts in different VLANs cannot communicate with one another directly. Therefore, broadcast packets are limited in a VLAN. Hosts in the same VLAN communicate with one another via Ethernet whereas hosts in different VLANs communicate with one another through the Internet devices such as router, the Layer 3 switch, etc. The following figure illustrates a VLAN implementation.

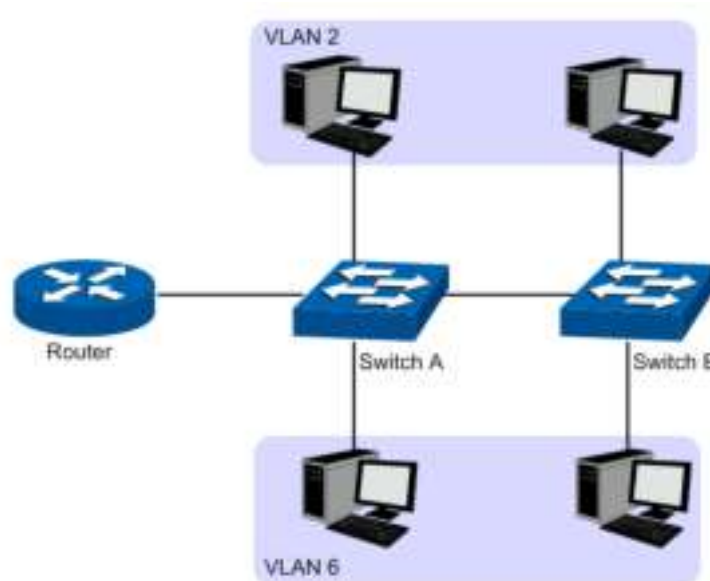


Figure 6-1 VLAN Implementation

Compared with the traditional Ethernet, VLAN enjoys the following advantages.

- (1) Broadcasts are confined to VLANs. This decreases bandwidth utilization and improves network performance.
- (2) Network security is improved. VLANs cannot communicate with one another directly. That is, a host in a VLAN cannot access resources in another VLAN directly, unless routers or Layer 3 switches are used.



- (3) Network configuration workload for the host is reduced. VLAN can be used to group specific hosts. When the physical position of a host changes within the range of the VLAN, you do not need to change its network configuration.

There are 3 types of VLAN modes supported in the switch:

1. MTU VLAN

MTU VLAN (Multi-Tenant Unit VLAN) defines an uplink port which will build up several VLANs with each of the other ports. Each VLAN contains two ports, the uplink port and one of the other ports in the switch, so the uplink port can communicate with any other port but other ports cannot communicate with each other.

2. Port Based VLAN

VLANs are divided based on ports. By default, the Port Based VLAN is enabled.

3. 802.1Q VLAN

The IEEE 802.1Q protocol defines a new format of the frame; it adds a Tag header in the original Ethernet frame, as follows:

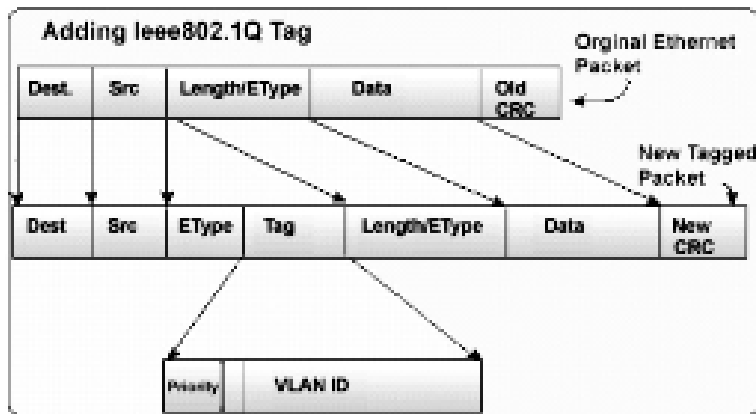


Figure 6-2 IEEE 802.1Q Frame

VLAN tags in the packets are necessary for the switch to identify packets of different VLANs. The switch works at the data link layer in OSI model and it can identify the data link layer encapsulation of the packet only, so you can add the VLAN tag field into the data link layer encapsulation for identification.

IEEE 802.1Q Tag VLAN is divided by VLAN ID (VID). On receiving a frame, the switch checks the VID in the Tag header of the frame to decide which VLAN it belongs to. If the receiving frame doesn't contain the Tag header, the switch will assign a Tag to the frame, using the PVID of the port as its VID.

In this User Guide, the tagged packet refers to the packet with VLAN tag whereas the untagged packet refers to the packet without VLAN tag.

The VLAN module is mainly for VLAN configuration, including four submenus: **MTU VLAN**, **Port Based VLAN**, **802.1Q VLAN** and **802.1Q PVID Setting**.

## 6.1 MTU VLAN

On this page you can choose to enable MTU VLAN mode and configure VLANs.

Choose the menu **VLAN**→**MTU VLAN** to load the following page.

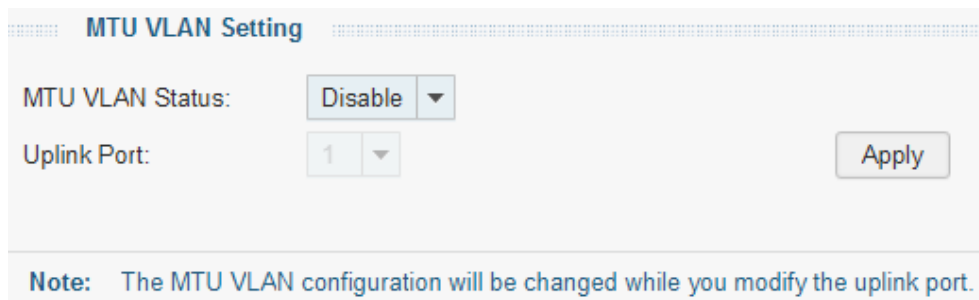


Figure 6-3 MTU VLAN Configuration

The following entries are displayed on this screen:

➤ **MTU VLAN Setting**

**MTU VLAN Status:** Enable/Disable the MTU VLAN function globally.

**Uplink Port:** Select the uplink port from the drop-down list.

## 6.2 Port Based VLAN

On this page you can configure Port Based VLAN feature and view the related settings.

Choose the menu **VLAN**→**Port Based VLAN** to load the following page.

VLAN	Port List	Delete VLAN
1	1-8	

Figure 6-4 Port Based VLAN Configuration

To ensure the normal communication of the factory switch, the default VLAN of all ports is set to VLAN1. VLAN 1 cannot be deleted.

The following entries are displayed on this screen:

➤ **Global Config**

**Port Based VLAN Configuration:** Enable or disable Port Based VLAN mode.

➤ **Port Based VLAN Setting**

**VLAN ID:** Select the ID number of VLAN from the drop-down list.

**Ports:** Click the port icon to select the port of the VLAN. It is multi-optional. If this field is selected, it indicates the port belongs to the current VLAN.

**VLAN:** Displays the ID number of VLAN.

**Port List:** Displays the port members in the VLAN.

**Delete VLAN:** Click **Delete** to delete the corresponding VLAN.



**Note:**

A VLAN cannot be the subset or superset of other VLANs.

### 6.3 802.1Q VLAN

On this page you can configure 802.1Q VLAN feature and view the related settings.

Choose the menu **VLAN**→**802.1Q VLAN** to load the following page.

VLAN	VLAN Name	Member Ports	Tagged Ports	Untagged Ports	Delete VLAN
1	Default_VLAN	1-8		1-8	

Figure 6-5 802.1Q VLAN Configuration

To ensure the normal communication of the factory switch, the default VLAN of all ports is set to be VLAN1. VLAN 1 cannot be modified or deleted.

The following entries are displayed on this screen:

➤ **Global Config**

**802.1Q VLAN Status:** Enable or disable 802.1Q VLAN mode.

➤ **802.1Q VLAN Setting**

**VLAN ID:** Enter the ID number of VLAN. It ranges from 2 to 4094.

<b>VLAN Name:</b>	Give a name to the VLAN for identification.
<b>Untagged Ports:</b>	Click the port icon to configure the egress rule of the traffic on this port as untagged. The switch drops the tag header before sending the packet.
<b>Tagged Ports:</b>	Click the port icon to configure the egress rule of the traffic on this port as tagged. The switch adds the tag header before sending the packet.
<b>VLAN ID:</b>	Displays the ID number of VLAN.
<b>VLAN Name:</b>	Displays the user-defined name of VLAN.
<b>Member Ports:</b>	Displays the port members in the VLAN.
<b>Tagged Ports:</b>	Displays the tagged port members in the VLAN.
<b>Untagged Ports:</b>	Displays the untagged port members in the VLAN.
<b>Delete VLAN:</b>	Click <b>Delete</b> to delete the corresponding VLAN.

## 6.4 802.1Q PVID Setting

PVID (Port Vlan ID) is the default VID of the port. When the switch receives an un-VLAN-tagged packet, it will add a VLAN tag to the packet according to the PVID of its received port and forward the packet.

When creating VLANs, the PVID of each port, indicating the default VLAN to which the port belongs, is an important parameter with the following two purposes:

- (1) When the switch receives an un-VLAN-tagged packet, it will add a VLAN tag to the packet according to the PVID of its received port
- (2) PVID determines the default broadcast domain of the port, i.e. when the port receives UL packets or broadcast packets, the port will broadcast the packets in its default VLAN.

On this page you can configure PVID of the specified port. By default, the PVID of all ports is 1.

Choose the menu **VLAN**→**802.1Q VLAN PVID Setting** to load the following page.



Select	Port	PVID	LAG
<input type="checkbox"/>		<input type="text"/>	
<input type="checkbox"/>	port 1	1	---
<input type="checkbox"/>	port 2	1	---
<input type="checkbox"/>	port 3	1	---
<input type="checkbox"/>	port 4	1	---
<input type="checkbox"/>	port 5	1	---
<input type="checkbox"/>	port 6	1	---
<input type="checkbox"/>	port 7	1	---
<input type="checkbox"/>	port 8	1	---

**Note:** 1. By default, the PVID of all ports is 1.  
2. 802.1Q VLAN PVID will be restored to 1 when 802.1Q VLAN is disabled.

Figure 6-6 802.1Q VLAN PVID Setting

The following entries are displayed on this screen:

➤ **802.1Q VLAN PVID Setting**

- Select:** Select the desired port for configuration. It is multi-optional.
- Port:** Displays the port number.
- PVID:** Enter a PVID number for the port. When adding the tag header to the received untagged packet, the switch will automatically use this PVID value as the VLAN ID of the added tag.
- LAG:** Displays the LAG to which the port belongs.

 **Note:**

1. 802.1Q VLAN should be enabled before setting PVID.
2. You can go to [Switching→Port Trunk](#) page to configure the LAG status of the port.

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## Chapter 7 QoS

QoS (Quality of Service) functions to provide different quality of service for various network applications and requirements and optimize the bandwidth resource distribution so as to provide a network service experience of a better quality.

### ➤ QoS

This switch classifies the ingress packets, maps the packets to four different priority queues and then forwards the packets according to WRR scheduling algorithms to implement QoS function.

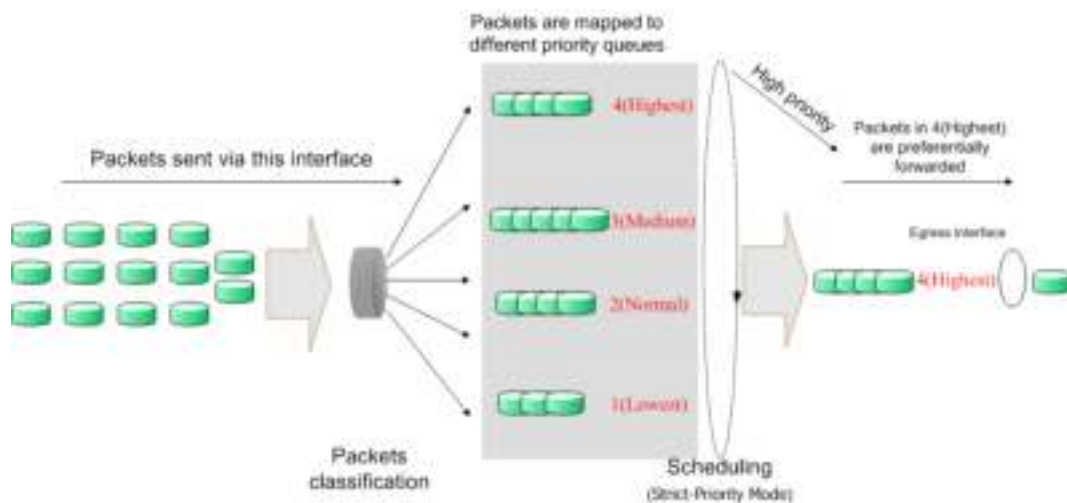


Figure 7-1 QoS Function

- Traffic classification: Identifies packets conforming to certain characters according to certain rules.
- Map: This switch supports four priority queues. The priority queues are labeled as 1(Lowest), 2(Normal), 3(Medium) and 4(Highest), among them the bigger the value, the higher the priority. The ingress packets are mapped to four different priority queues based on the QoS modes. This switch implements three priority modes based on port, on 802.1P and on DSCP.
- Queue scheduling algorithm: When the network is congested, the problem that many packets compete for resources must be solved, usually in the way of queue scheduling. In all QoS modes, this switch adopts WRR scheduling algorithm. In WRR scheduling algorithm, packets in all the queues are sent in order based on the weight value for each queue and every queue can be assured of a certain service time. The weight value indicates the occupied proportion of the resource.

### ➤ QoS Mode

This switch implements three priority modes based on port, on 802.1P and on DSCP. By default, the priority mode based on port is enabled and the other two modes are optional.

1. Port Based

When port-base QoS mode is enabled, the user can manually map the ingress packets of the port to four different priority queues. After that, the switch will preferentially send packets in the queue with higher priority, and only when the queue with higher priority is empty, packets in the queue with lower priority are sent.

2. 802.1P Based



Figure 7-2 802.1Q Frame

As shown in the figure above, each 802.1Q Tag has a Pri field, comprising 3 bits. The 3-bit priority field is 802.1p priority in the range of 0 to 7. The 802.1p priority value determines how the switch maps the ingress packets to the priority queues. The mapping relationship between eight 802.1p priority value and priority queues is shown as follows:

- Priority 1 and 2 are assigned to the 1 (Lowest) priority queue.
- Priority 0 and 3 are assigned to the 2 (Normal) priority queue.
- Priority 4 and 5 are assigned to the 3 (Medium) priority queue.
- Priority 6 and 7 are assigned to the 4 (Highest) priority queue.

When 802.1P QoS mode is enabled, the switch will automatically map the ingress packets to priority queues based on the 802.1p priority and the above mapping relationship. After that, packets in all the queues are sent in order based on the weight value for each queue. The switch implements four scheduling queues, TC1, TC2, TC3 and TC4. TC1 has the lowest priority while TC4 has the highest priority. The weight value ratio of TC1, TC2, TC3 and TC4 is 1:2:4:8. As for the untagged packets, the switch will forward it according to the default priority mode.

3. DSCP based

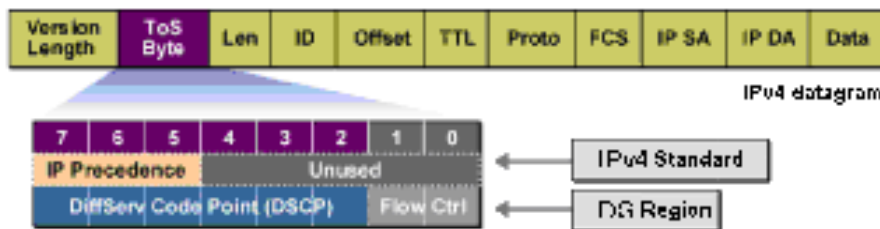


Figure 7-3 IP datagram

As shown in the figure above, the ToS (Type of Service) in an IP header contains 8 bits. The first three bits indicate IP precedence in the range of 0 to 7. RFC2474 re-defines the ToS field in the IP packet header, which is called the DS field. The first six bits (bit 0-bit 5) of the DS field indicate



DSCP priority in the range of 0 to 63. The last 2 bits (bit 6 and bit 7) are reserved. The mapping relationship between sixty-four DSCP priority value and priority queues is shown as follows:

- Priority 0 to 15 are assigned to the 1 (Lowest) priority queue.
- Priority 16 to 31 are assigned to the 2 (Normal) priority queue.
- Priority 32 to 47 are assigned to the 3 (Medium) priority queue.
- Priority 48 to 63 are assigned to the 4 (Highest) priority queue.

When DSCP QoS mode is enabled, the switch will automatically map the ingress packets to priority queues based on the DSCP precedence and the above mapping relationship. After that, packets in all the queues are sent in order based on the weight value for each queue. The switch implements four scheduling queues, TC1, TC2, TC3 and TC4. TC1 has the lowest priority while TC4 has the highest priority. The weight value ratio of TC1, TC2, TC3 and TC4 is 1:2:4:8. As for the untagged packets, the switch will forward it according to the default priority mode.

The QoS module is mainly for priority configuration and traffic control, including three submenus: **QoS Basic**, **Bandwidth Control** and **Storm Control**.

## 7.1 QoS Basic

This switch classifies the ingress packets, maps the packets to different priority queues and then forwards the packets to implement QoS function.

This switch implements three priority modes based on port, on 802.1P or on DSCP. The port-based QoS mode supports four priority queues. The port priority queues are labeled as 1, 2, 3, and 4.

On this page you can configure and view QoS mode and the port-based priority setting.

Choose the menu **QoS**→**QoS Basic** to load the following page.

Global Config

QoS Mode: Port Based Apply

Port Based Priority Setting

Select	port	Priority Queue	LAG
<input type="checkbox"/>		<span>---</span>	
<input type="checkbox"/>	port 1	1(Lowest)	---
<input type="checkbox"/>	port 2	1(Lowest)	---
<input type="checkbox"/>	port 3	1(Lowest)	---
<input type="checkbox"/>	port 4	1(Lowest)	---
<input type="checkbox"/>	port 5	1(Lowest)	---
<input type="checkbox"/>	port 6	1(Lowest)	---
<input type="checkbox"/>	port 7	1(Lowest)	---
<input type="checkbox"/>	port 8	1(Lowest)	---

Apply

Note: 1. Lowest Priority (background data)  
 2. Normal Priority (business-critical data, email, internet, etc)  
 3. Medium Priority (stream multimedia, etc)  
 4. Highest Priority (interactive voice, video, and delay sensitive data)

Figure 7-4 QoS Basic

The following entries are displayed on this screen:

➤ **Global Config**

**QoS Mode:**

Select the desired QoS mode.

- **Port Based:** The packets are mapped to 4 priority levels based on ingress port.
- **802.1P Based:** The switch classifies the ingress packets and maps the packets to different priority queues based on the 802.1p priority field in the 802.1Q tag.
- **DSCP Based:** The switch classifies the ingress packets and maps the packets to different priority queues based on the DSCP priority field in the IP ToS field.

➤ **Port Based Priority Setting**

**Select:**

Select the desired port for configuration. It is multi-optional.

**Port:**

Displays the port number.

**Priority Queue:** Specify the priority queue the packets from the port are mapped to. The priorities are labeled as 1~4 and among them the bigger the value, the higher the priority.

**LAG:** Displays the LAG number which the port belongs to.

## 7.2 Bandwidth Control

Bandwidth control functions to control the ingress/egress traffic rate on each port via configuring the available bandwidth of each port. In this way, the network bandwidth can be reasonably distributed and utilized.

On this page you can configure and view the bandwidth control function information.

Choose the menu **QoS**→**Bandwidth Control** to load the following page.

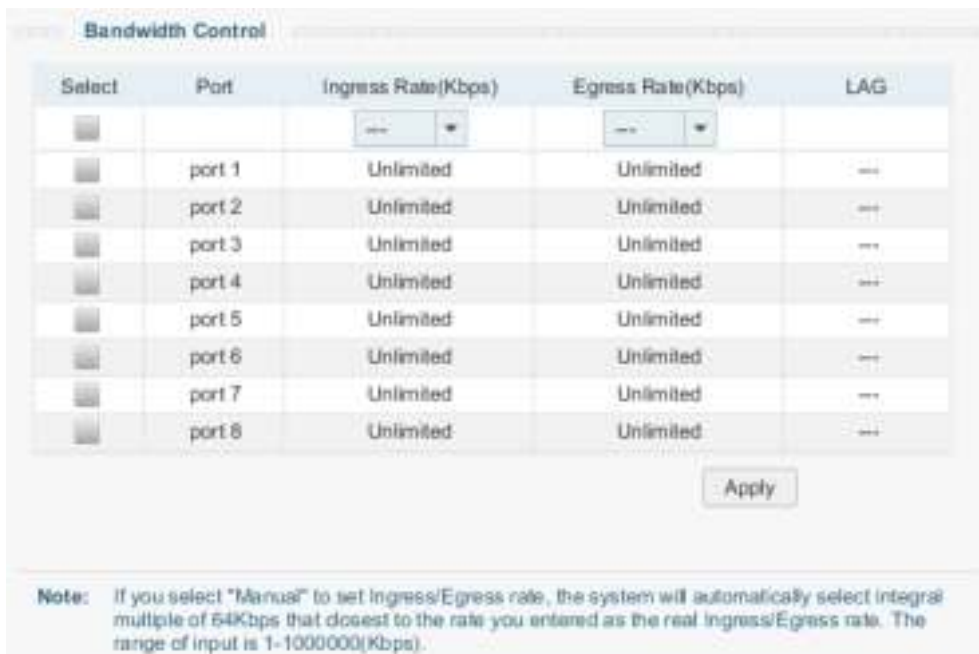


Figure 7-5 Bandwidth Control Setting

The following entries are displayed on this screen:

➤ **Bandwidth Control**

**Select:** Select the desired port for Rate configuration. It is multi-optional.

**Port:** Displays the port number of the switch.

**Ingress Rate (bps):** Configure the bandwidth for receiving packets on the port. You can select a rate from the dropdown list or select "Manual" to set Ingress rate, the system will automatically select integral multiple of 64Kbps that closest to the rate you entered as the real Ingress rate.

**Egress Rate(bps):** Configure the bandwidth for sending packets on the port. You can select a rate from the dropdown list or select "Manual" to set Egress rate, the system will automatically select integral multiple of 64Kbps that closest to the rate you entered as the real Egress rate.

**LAG:** Displays the LAG number which the port belongs to.

**Note:**

When egress bandwidth control feature is enabled for one or more ports, you are suggested to disable the flow control on each port to ensure the switch works normally.

### 7.3 Storm Control

Storm Control function allows the switch to filter broadcast, multicast and UL frame in the network. If the transmission rate of the three kind packets exceeds the set bandwidth, the packets will be automatically discarded to avoid network broadcast storm.

On this page you can configure and view the storm control function information.

Choose the menu **QoS**→**Storm Control** to load the following page.

Select	Port	Bc Limit	Mc Limit	UL Limit	Rate(Kbps)	LAG
<input type="checkbox"/>		---	---	---	---	
<input type="checkbox"/>	port 1	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 2	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 3	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 4	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 5	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 6	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 7	Disable	Disable	Disable	Unlimited	--
<input type="checkbox"/>	port 8	Disable	Disable	Disable	Unlimited	--

**Note:** If you select "Manual" to set storm control rate, the system will automatically select integral multiple of 64Kbps that closest to the rate you entered as the real storm control rate. The range of input is 1-1000000(Kbps).

Figure 7-6 Storm Control Setting

The following entries are displayed on this screen:

➤ **Storm Control Config**

- Select:** Select the desired port for Storm Control configuration. It is multi-optional.
- Port:** Displays the port number of the switch.
- Bc Limit:** Enable/Disable broadcast control feature for the port.
- Mc Limit:** Enable/Disable multicast control feature for the port.
- UL Limit:** Enable/Disable UL-Frame control feature for the port.
- Rate (Kbps):** Select the bandwidth for receiving the specified packet on the port. The packet traffic exceeding the bandwidth will be discarded.
- LAG:** Displays the LAG number which the port belongs to.

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## Chapter 8 Help

This page contains two submenus: **Help** and **About**.

### 8.1 Help

Choose the menu **Help**→**Help** to load the following page.

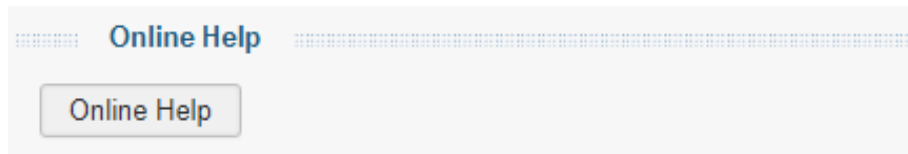


Figure 8-1 Help

Click **Online Help** to access the TP-LINK support website and the online user guide for the Easy Smart Configuration Utility (the latest copy of this manual).

### 8.2 About

To view the utility software version, choose the menu **Help**→**About**.

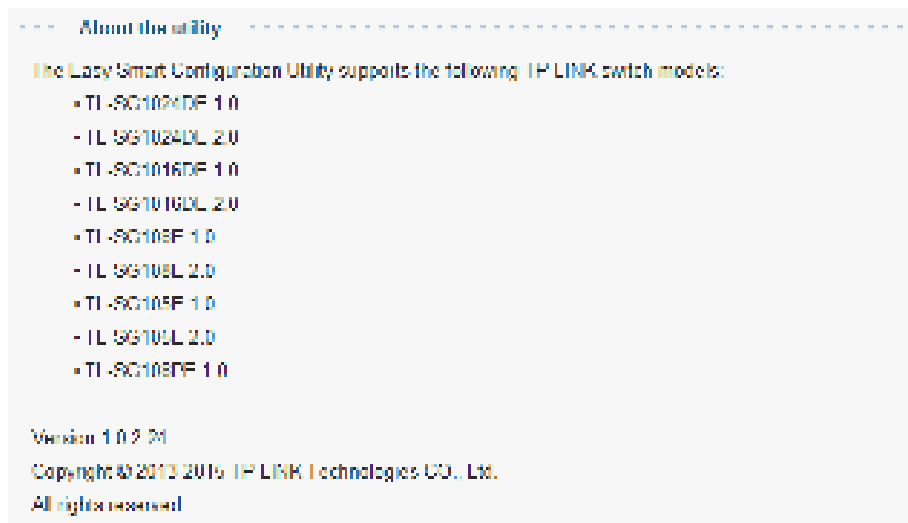


Figure 8-2 Software Version

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