Managed 10-Port GbE Switches with 2 dual-speed SFP Slots

User's Manual

DOC. 250429NGS1021

The information contained in this document is subject to change without prior notice.

FCC NOTICE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including the interference that may cause undesired operation.

CE NOTICE

Marking by the symbol indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:

EN 55032:2015 + A1:2020
EN 55035:2017 + A11:2020

Table of Contents

1. Introduction 5

1.1 Features 5

1.2 Specifications 6

1.3 LED Description 7

2. Installation 8

2.1 Unpacking 8

2.2 Safety Cautions 8

2.3 Operating Environment 8

2.4 Reset Button 9

2.5 K-Lock 9

3. Manage the Switch 10

3.1 Configuring via Web Interface 10

3.2 Web Menus 11

3.3 Configuration 11

3.3.1 System 11

3.3.1.1 IP Configuration 11

3.3.1.2 Administration 12

3.3.1.3 Time out 12

3.3.1.4 SNMP 13

3.3.1.4.1 Setting 13

3.3.1.4.2 Community Table Setting 13

3.3.1.5 IEEE 802.3az EEE Setting 14

3.3.2 Network 14

3.3.2.1 Physical Interface 14

3.3.2.2 Spanning Tree 16

3.3.2.2.1 Bridge Setting 16

3.3.2.2.2 Ports Setting 17

3.3.2.3 Link Aggregation 18

3.3.2.4 Mirror 19

3.3.2.5 Loop Prevention 20

3.3.2.6 Static Unicast 21

3.3.2.7 Static Multicast 21

3.3.2.8 IGMP Snooping 22

3.3.2.9 Bandwidth Control 22
3.3.2.9.1 Storm Control 22
3.3.2.9.2 Rate Control 22
3.3.2.9.3 Bandwidth Profile 23
3.3.2.10 Port-Based VLAN 23
3.3.2.11 802.1Q VLAN 24
3.3.2.11.1 VLAN Setting 24
3.3.2.11.2 VLAN PVID 26
3.3.2.12 Port Isolation 26
3.3.2.13 Voice VLAN 27
3.3.2.13.1 Settings 28
3.3.2.13.2 OUI 28
3.3.3 QoS 29
3.3.3.1 QoS Mode 29
3.3.3.1.1 Port-Based QoS 29
3.3.3.1.2 802.1P Base 30
3.3.3.1.3 DSCP Base 31
3.3.4 System Tools 31
3.3.4.1 Firmware Upgrade 31
3.3.4.2 Configuration 31
3.3.4.3 Cable Diagnostics 32
3.3.4.4 System Reset 32
3.3.4.5 System Reboot 32

1. Introduction

The switch is a 10-port managed Gigabit Ethernet switch with 2 SFP slots. It provides 8 10/100/1000Mbps copper ports and 2 dual-speed SFP slots. All copper ports support Auto-Negotiation and Auto-MDI/MDI-X. Each port can work as uplink port or common port. The SFP is a hot-swappable optical transceiver module that can be inserted into the SFP slot on the switch, providing connectivity to fiber optic networks. Each of two SFP slots can support either a multimode or a single-mode SFP module.

The switch provides a cost-effective, high performance, non-disruptive and smooth evolution solution up to 1000M. The Switch delivers superior performance with improving workgroup, network bandwidth, increasing network node, providing greater flexibility, and installation convenience. It is the best choice for increasing your speed.

1.1 Features

- Provides Eight 10/100/1000Mbps copper ports and two dual-speed SFP slots
- All copper ports support auto-negotiation and auto-MDI/MDI-X detection
- Supports 802.3x flow control
- Supports jumbo frame length up to 9K bytes at full wire speed forwarding
- Supports IEEE 802.3az Energy Efficient Ethernet
- Provides DHCP client & static IP configuration
- Supports port-based ,802.1Q tag-based VLAN and voice VLAN
- Support 802.1D STP and 802.1w RSTP
- Supports port link aggregation (trunking) function and LACP support

- Provides port-based, 802.1p-based and DSCP-based QoS function
- Provides port mirroring function
- Provides IGMP snooping
- Supports loop prevention
- Provides SNMP v1/v2C agent and event trap function

1.2 Specifications

10/100/1000 Copper Ports (Port 1 ~ Port 8)

Compliance	IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T
Connectors	Shielded RJ-45 jacks
Pin assignments	Auto MDI/MDI-X detection
Configuration	Auto-negotiation or software control
Transmission rate	10Mbps, 100Mbps, 1000Mbps
Duplex support	Full/Half duplex
Network cable	Cat. 5, 5e or higher up to 100m

Dual-speed SFP Slots (Port 9, Port 10)

Compliance	IEEE 802.3u 100Base-FX
	IEEE 802.3z 1000Base-SX/LX (mini-GBIC)
Connectors	SFP for optional SFP type fiber transceivers
Configuration	Auto speed detection
Transmission rate	1000Mbps, 100Mbps (Dual-speed support)
Network cables	MMF 50/125 60/125, SMF 9/125

Switch Functions

MAC Addresses Table	4K entries
Switching technology	Store and forward
Maximum packet length	9K bytes
Flow control	IEEE 802.3x pause frame base for full duplex operation
	Back pressure for half duplex operation

Mechanical

Dimension (base)	190 x 120 x 38 mm (WxDxH)
Housing	Enclosed metal with no fan
Mounting	Wall

DC Power Input

Connector	DC Jack (-Ø 6.4mm/+Ø 2.0mm) for external AC-DC power adapter
DC working voltages	+5VDC external power adapter
Power Consumption	5W max.

Environmental

Operating Temperature	0℃ ~ 40℃
Storage Temperature	-20℃ ~ 70℃
Relative Humidity	10% ~ 90% non-condensing

Electrical Approvals

FCC	Part 15 rule Class A
CE	EMC Directive of 2014/30/EU Class A

1.3 LED Description

Following is the LED description:

LED	Color	Status	Operation
Power	Green	On	The switch is powered on.
		OFF	The switch is powered off.
LAN Link/Activity	Green	On	10/100/1000 Mbps operating.
		Blinking	Transmitting / Receiving data
SFP Link/Activity	Green	On	100/1000 Mbps operating.
		Blinking	Transmitting / Receiving data.

2. Installation

2.1 Unpacking

The product package contains:

- The switch unit
- One AC power adapter
- Two wall mounting screws
- Four rubber pads

2.2 Safety Cautions

To reduce the risk of bodily injury, electrical shock, fire and damage to the product, observe the following precautions.

- Do not service any product except as explained in your system documentation.
- Opening or removing covers may expose you to electrical shock.
- Only a trained service technician should service components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
  - The power cable, extension cable, or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.
  - Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
  - Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.

2.3 Operating Environment

This switch must be installed and operated within the limits of the specified operating temperature 0 - 40℃ and humidity 10 - 90% (non-condensing).

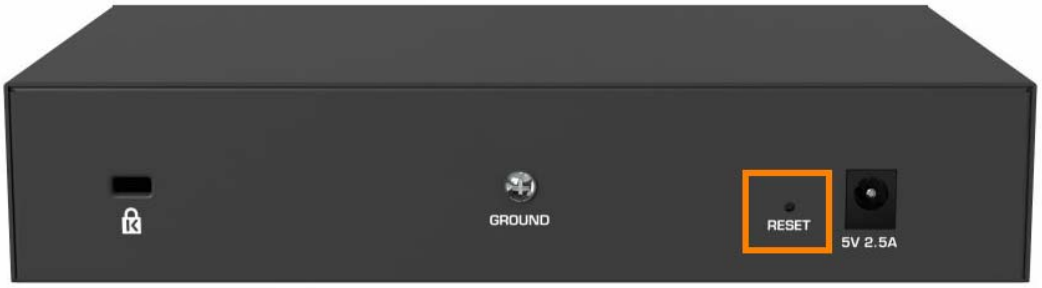
- Do not place objects on top of the unit.
- Do not obstruct any vents at the sides of the unit.
- Do not position the unit close to any heating source such as a heater, radiator or in direct exposure to

sun.

- Take care to ensure the unit does not come into contact with water. Consider using a dehumidifier to reduce humidity and prevent moisture entering the unit.

2.4 Reset Button

The reset button is used to perform a reset to the switch. It is not used in normal cases and can be used for diagnostic purpose. If any network hanging problem is suspected, it is useful to push the button to reset the switch without turning off the power. Check whether the network is recovered.



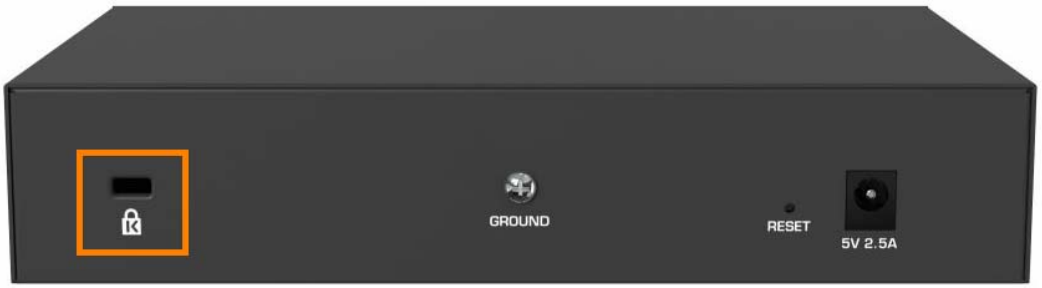
The button can also be used to restore the software configuration settings to factory default values.

The operations are:

Operation	**Function**
Press the button and release during switch operation	Reboot the switch
Press the button more than 6 seconds and release	Boot & restore all factory default settings

2.5 K-Lock

It is used with Kensington type lock.



3. Manage the Switch

The switch provides the following methods to configure and monitor the switch as follows:

- Making in-band management via web interface over TCP/IP network
- Making in-band SNMP management over TCP/IP network

3.1 Configuring via Web Interface

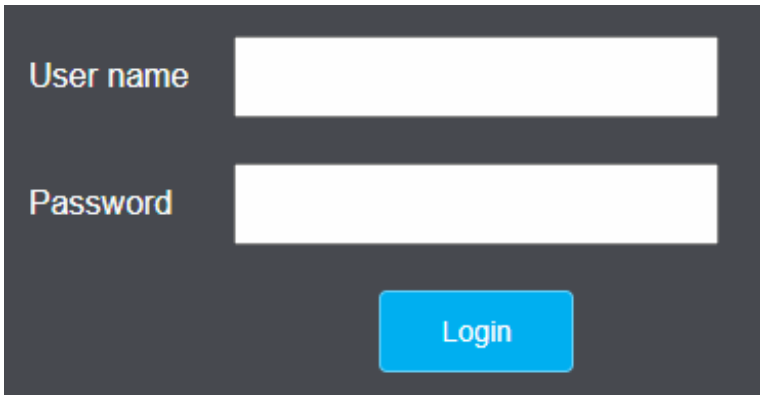
Start Web Browser

Start your browser software and enter the default IP address of the switch unit to which you want to connect. The IP address is used as URL for the browser software to search the device.

URL: http:/192.168.10.200/

Login to Switch Unit

When browser software connects to the switch unit successfully, a Login screen is provided for you to login to the device as the left display below:



Enter the following default values in the login page:

Default username: ***admin***

Default password: ***admin***

Web Page after a Successful Login

3.2 Web Menus

This section introduces how to use web browser to manage the switch. There are 3 areas of the web-based management screen. Left part of the management screen is a function list. Users can select one of them for status monitoring or switch configuration.

There are 5 operation groups in the function list.

1. System: Management features and information
2. Network: Configuration for switch L2 function
3. QoS: Configuration for Quality of Service
4. PoE: Configuration for PoE feature
5. Tool: The maintenance features including firmware upgrade, configuration backup/restore, and system reset..

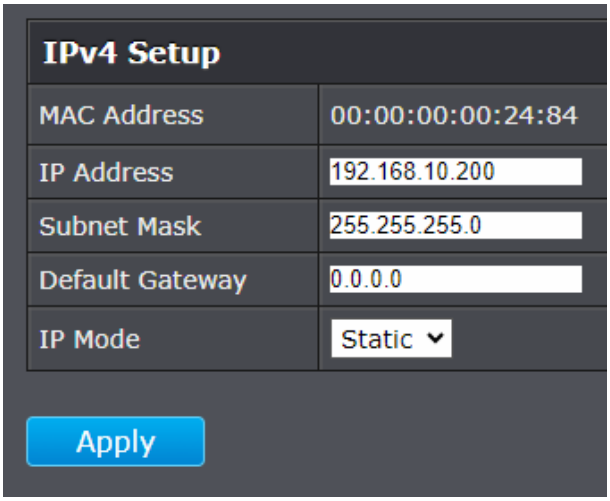
Middle part of the management screen is the main operation area for each function.

3.3 Configuration

3.3.1 System

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

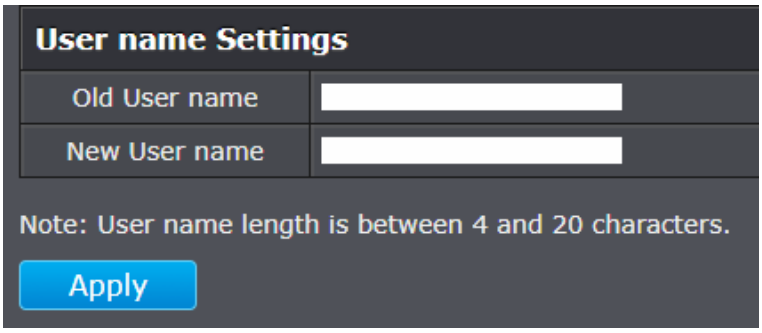
3.3.1.1 IP Configuration



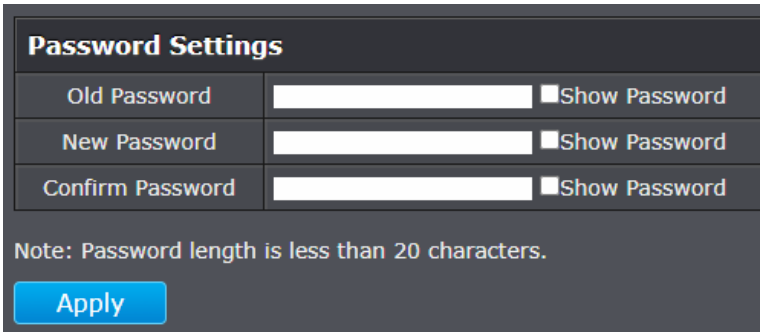
Items	Description
IP Address	The IP address of the interface in dotted decimal notation. e.g. 192.168.10.200
Subnet Mask	The IP network mask

Default Gateway	The Gateway IP address
IP Mode	Static: Set IP manually DHCP: Get IP from DHCP server

3.3.1.2 Administration

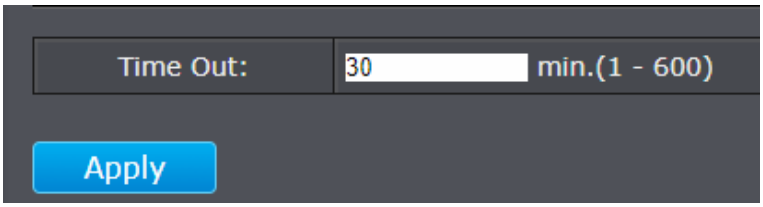


Items	Description
Old User Name	Indicates the old user name
New User Name	Indicates that the new user name replaces the old user name



Items	Description
Old Password	Indicates the old password
New Password	Indicates that the new password replaces the old password

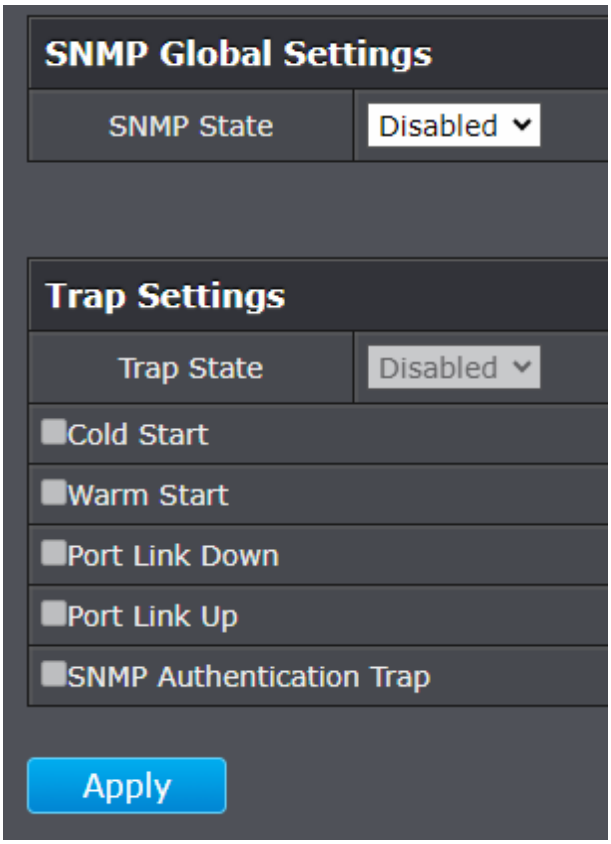
3.3.1.3 Time out



Items	Description
Time Out	If there is no web access within the timeout (minutes), the system will automatically log out.

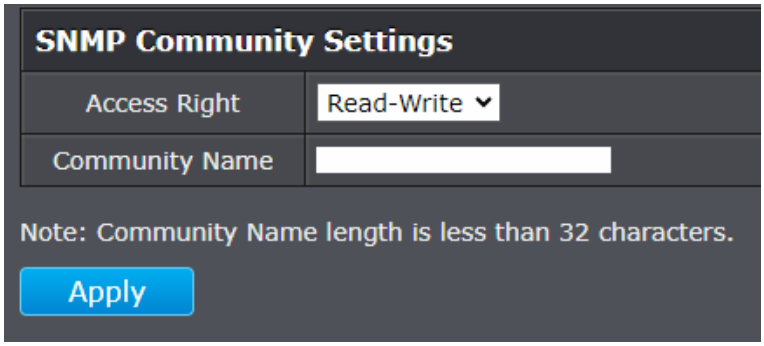
3.3.1.4 SNMP

3.3.1.4.1 Setting



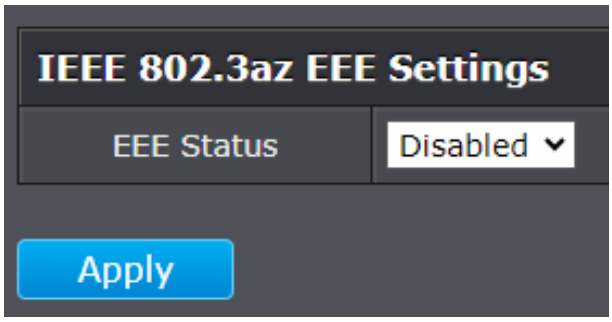
Items	Description
SNMP State	Indicates the SNMP mode operation. Possible modes are: Enabled: Enable SNMP mode operation. Disabled: Disable SNMP mode operation.
Trap State	Enable or Disable to send trap event message to NMS. Possible trap event is Cold Start, Warm Start, Port Link Down, Port Link Up and SNMP Authentication failure.

3.3.1.4.2 Community Table Setting



Items	Description
Access Right	Indicates the community access privilege, Read-Only or Read-Write.
Community Name	Indicates the community read or writes access string to permit access to SNMP agent. The allowed string length is 0 to 32, and the allowed content is the ASCII characters from 33 to 126. The field is applicable only when SNMP version is SNMPv1 or SNMPv2c.

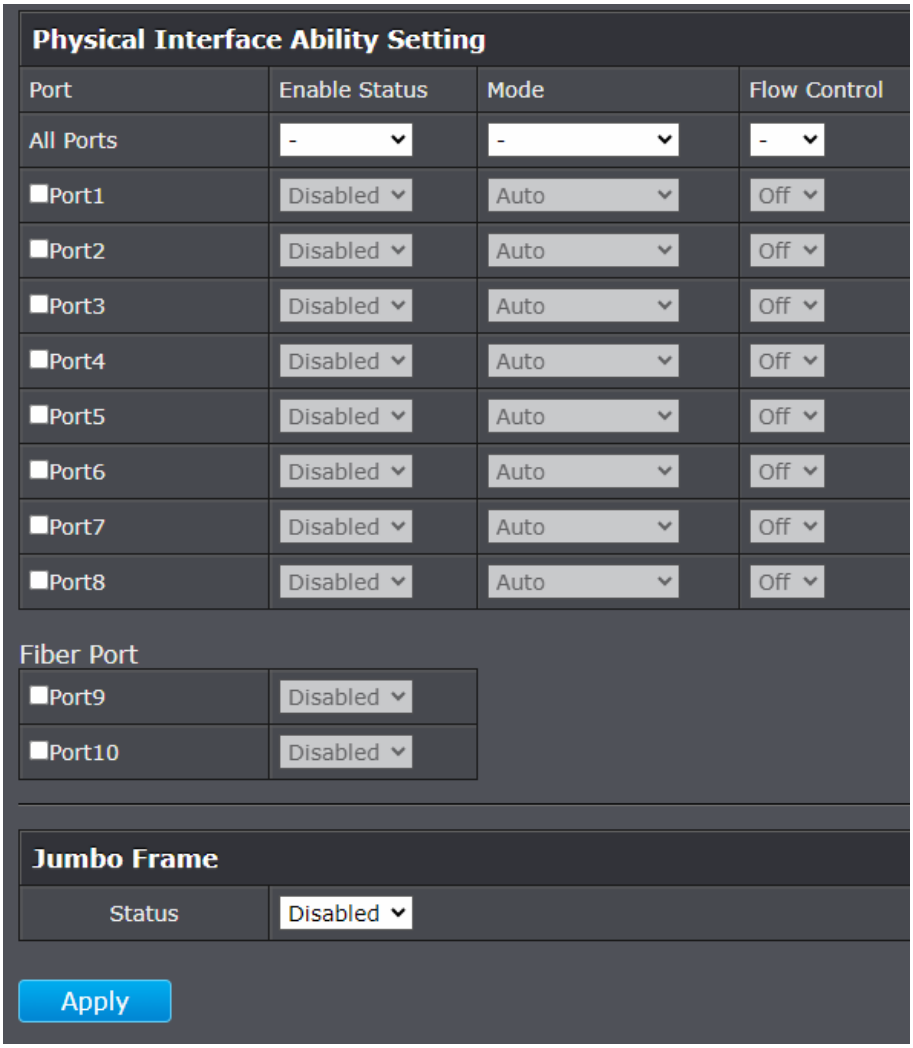
3.3.1.5 IEEE 802.3az EEE Setting



Items	Description
EEE Status	Enable or Disable 802.3az EEE is to save power when there is no traffic on the link port.

3.3.2 Network

3.3.2.1 Physical Interface



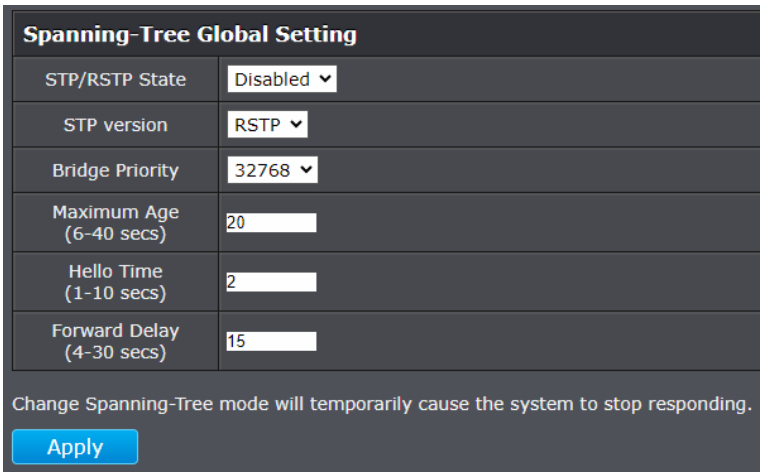
Items	Description
Port	This is the logical port number for this row.
Enable Status	Indicates the switch port operation mode. Possible setting Enabled: Enables the switch port operation Disabled: Disables the switch port operation
Mode	Selects any available link speed for the given switch port. Only speeds supported by the specific port are shown. Possible speeds are: Auto - Port auto negotiating speed with the link partner and selects the highest speed that is compatible with the link partner. 10Mbps/Half - Forces the port in 10Mbps half duplex mode. 10Mbps/Full - Forces the port in 10Mbps full duplex mode. 100Mbps/Half - Forces the port in 100Mbps half duplex mode. 100Mbps/Full - Forces the port in 100Mbps full duplex mode.

	1000Mbps /Full - Forces the port in 1Gbps full duplex
Flow Control	When Auto Speed is selected on a port, this section indicates the flow control capability that is advertised to the link partner.
Jumbo Frame Size	Indicates the maximum frame size (9k bytes) allowed for the switch port, including FCS. Possible settings are: Enabled: Allowed the max. frame size (9k bytes) pass through Disabled: Don't allow the frame length over 1522 bytes pass through

3.3.2.2 Spanning Tree

The Spanning Tree Protocol (STP) is a network protocol that ensures a loop-free topology for Ethernet networks. The basic function of STP is to prevent bridge loops and the broadcast radiation that results from them. Spanning tree also allows a network design to include spare (redundant) links to provide automatic backup paths if an active link fails, without the danger of bridge loops, or the need for manual enabling or disabling of these backup links.

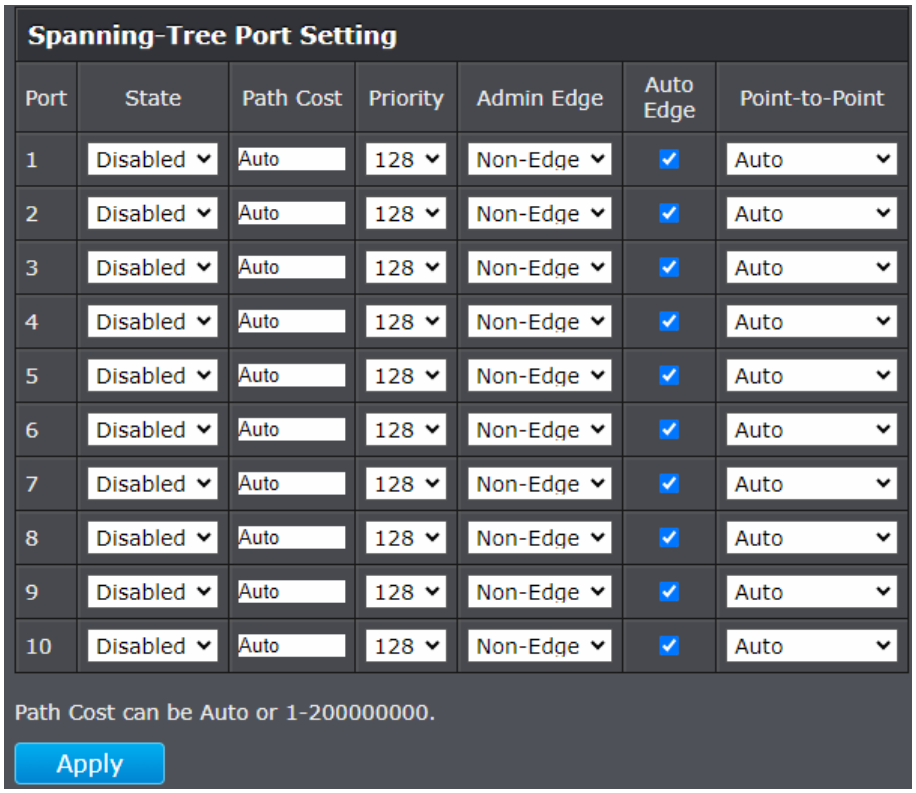
3.3.2.2.1 Bridge Setting



Items	Description
STP/RSTP State	Enable or Disable Spanning Tree function
STP version	The RSTP / STP protocol version setting. Valid values are STP and RSTP
Bridge Priority	Controls the bridge priority. Lower numeric values have better priority. The bridge priority concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier.
Maximum Age	The maximum age of the information transmitted by the Bridge when it is the Root Bridge. Valid values are in the range 6 to 40 seconds, and Max Age must be <= (FwdDelay-1)*2.

Hello Time	The Hello timer determines the interval at which an STP-capable device sends configuration BPDUs. The device sends BPDUs at an interval of the Hello timer to check whether any link has failed. Valid values are in the range 1 to 10 seconds.
Forward Delay	The delay used by STP Bridges to transit Root and Designated Ports to Forwarding (used in STP compatible mode). Valid values are in the range 4 to 30 seconds.

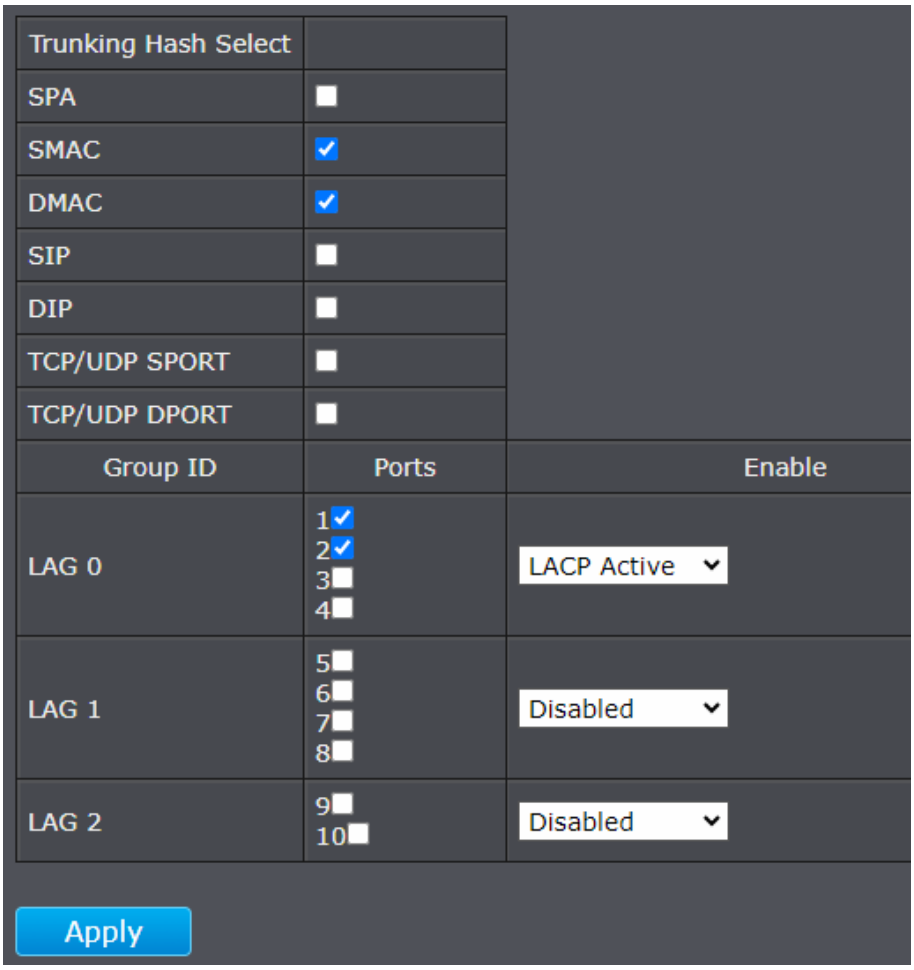
3.3.2.2.2 Ports Setting



Items	Description
Port	The switch port number of the logical STP port.
State	Controls whether STP is enabled on this switch port.
Path Cost	Controls the path cost incurred by the port. The Auto setting will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values. Using the Specific setting, a user-defined value can be entered. The path cost is used when establishing the active topology of the network. Lower path cost ports are chosen as forwarding ports in favor of higher path cost ports. Valid values are in the range 1 to 200000000
Priority	Controls the port priority. This can be used to control priority of ports having identical port cost. Lower numeric values have better priority.

Admin Edge	Controls whether the operEdge flag should start as set or cleared. (The initial operEdge state when a port is initialized).
Auto Edge	Controls whether the bridge should enable automatic edge detection on the bridge port. This allows operEdge to be derived from whether BPDU's are received on the port or not.
Point-to-Point	Controls whether the port connects to a point-to-point LAN rather than to a shared medium. This can be automatically determined, or forced either true or false. Transition to the forwarding state is faster for point-to-point LANs than for shared media.

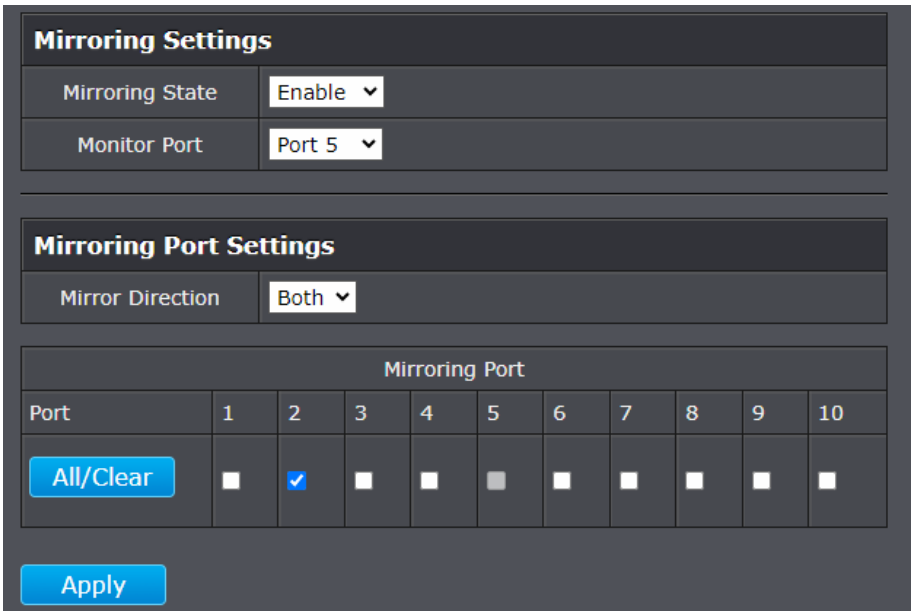
3.3.2.3 Link Aggregation



Items	Description
Trunking Hash	Indicates the key for load balance algorithms calculation. Possible options SPA: source switch port SMAC: source MAC address on the L2 header of packet

	DMAC: destination MAC address on the L2 header of packet SIP: source IP address on the L3 header of packets DIP: destination IP address on the L3 header of packets TCP/UDP SPORT: L4 source port number on the packets TCP/UDP DPORT: L4 destination port number on the packets
LAG	Indicates LA group ID ranging from 0 to 2
Enable	Indicates LA group operation mode. Possible setting Disabled: Disable the LA group Static: LA group is active by aggregating the selected port directly without through LACP protocol. LACP Active: Switch send LACP frames to link partner periodically LACP Passive: Switch only response LACP frames to link partner once it receives LACP frames from link partner.

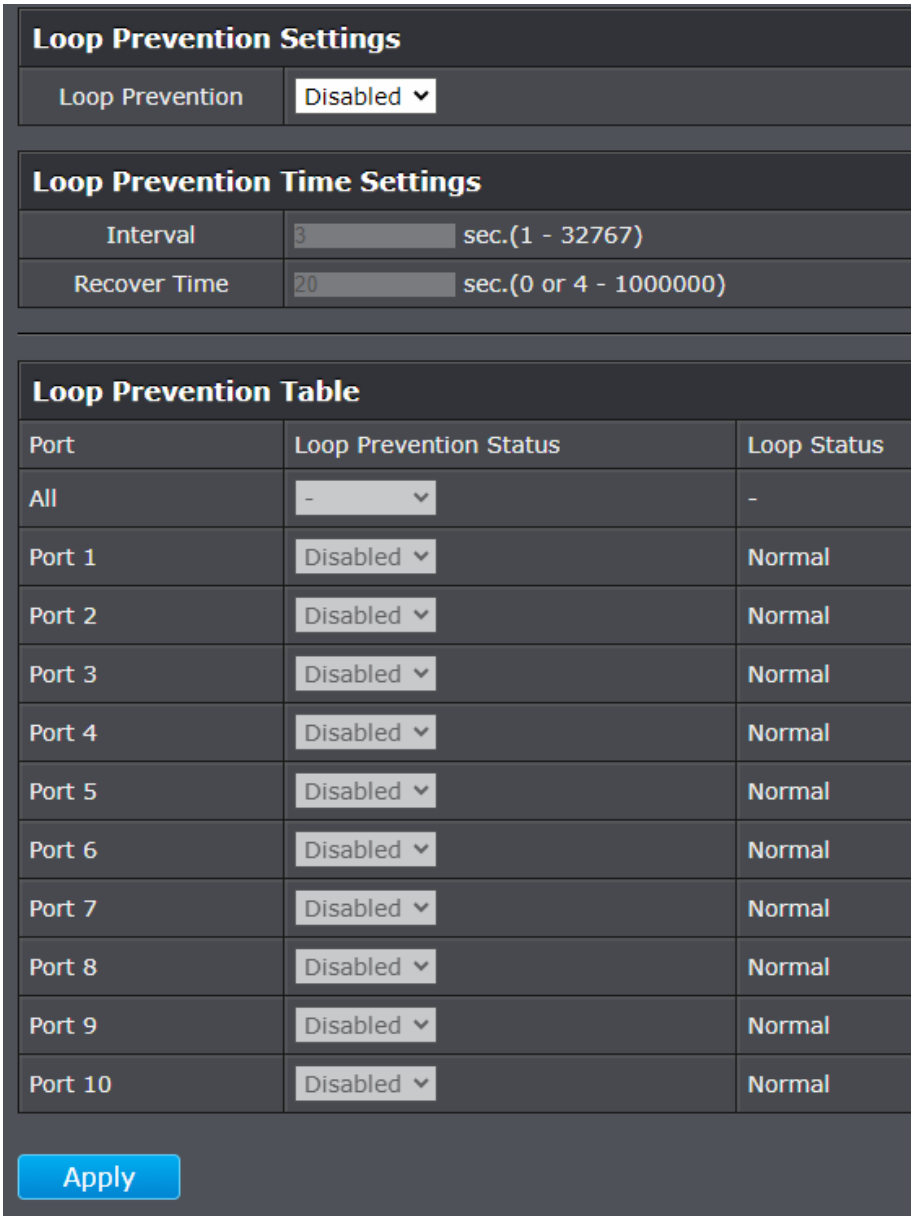
3.3.2.4 Mirror



Items	Description
Mirroring State	Indicates mirror operation mode, Possible setting Enable: Enable mirror operation Disable: Disable mirror operation
Monitor Port	The traffic is copied from Mirroring port to Monitor port.
Mirror Direction	Select mirror direction Rx: only Frames received on the mirroring port are copied to Monitor port. Frames

	transmitted are not copied. Tx: only Frames transmitted on the mirroring port are copied to Monitor port. Frames received are not copied. Both: Frames received or transmitted on the mirroring port are copied to Monitor Port.
Mirroring Port	The traffic on the mirroring port are copied to Monitor port

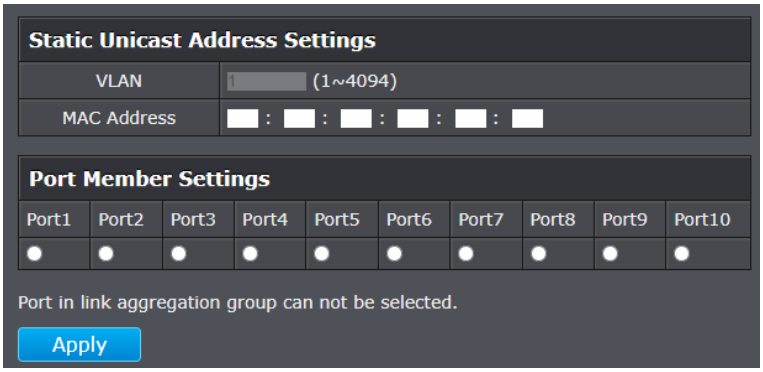
3.3.2.5 Loop Prevention



Items	Description

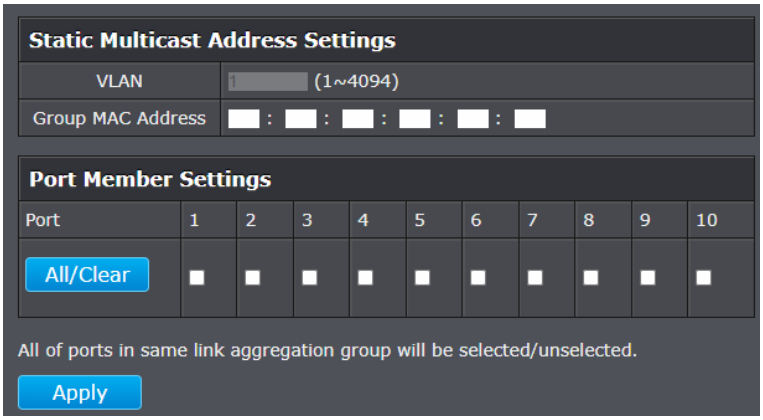
Loop Prevention	Controls whether loop prevention is enabled (as a whole).
Interval	The interval between each loop protection PDU sent on each port. Valid values are 1 to 32767 seconds.
Recover Time	The period (in seconds) for which a port will be kept disabled in the event of a loop is detected (and the port action shuts down the port). Valid values are 0 to 1000000 seconds. A value of zero will keep a port disabled (until next device restart).
Port	The switch port number of the port.
Loop Prevention Status	Controls whether loop protection is enabled on this switch port.
Loop Status	Indicates the loop detected status.

3.3.2.6 Static Unicast



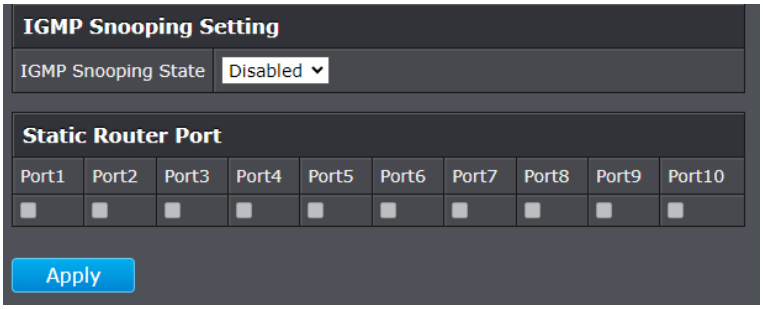
Items	Description
VLAN	The valid VLAN ID is from 1 to 4094
MAC Address	The Unicast Mac address which learned on the Forwarding Table
Port	Indicates the switch port which the MAC address allocated

3.3.2.7 Static Multicast



Items	Description
VLAN	The valid VLAN ID is from 1 to 4094
Group MAC Address	Indicates the Multicast Mac address which represented specific Multicast Group
Port	Indicates the switch ports which the Multicast group traffic would forward to

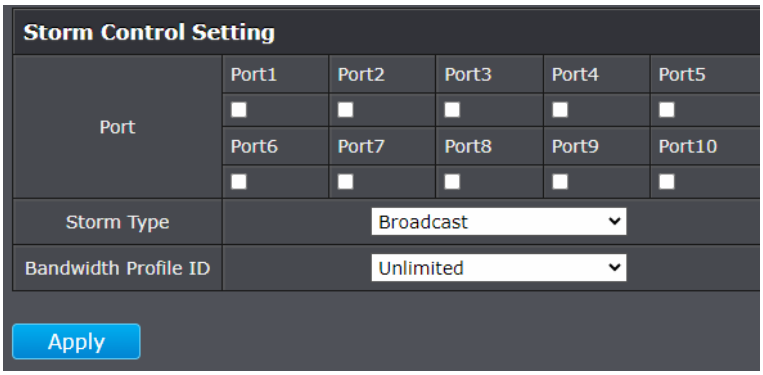
3.3.2.8 IGMP Snooping



Items	Description
IGMP Snooping State	Enable the Global IGMP Snooping
Static Router Port	Indicates the static port which multicast server allocated

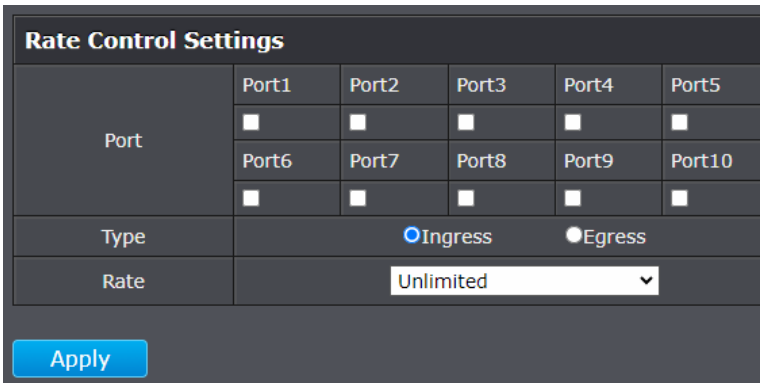
3.3.2.9 Bandwidth Control

3.3.2.9.1 Storm Control



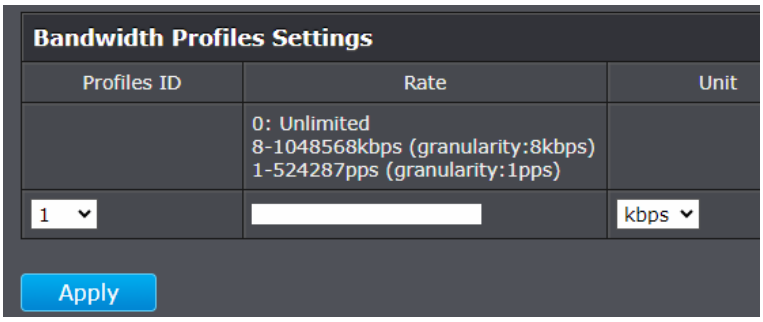
Items	Description
Port	Click the check box to enable Storm Control on the port
Storm Type	Select storm type to configure storm rate
Bandwidth Profile ID	Select the Profile ID with the storm limit rate preferred

3.3.2.9.2 Rate Control



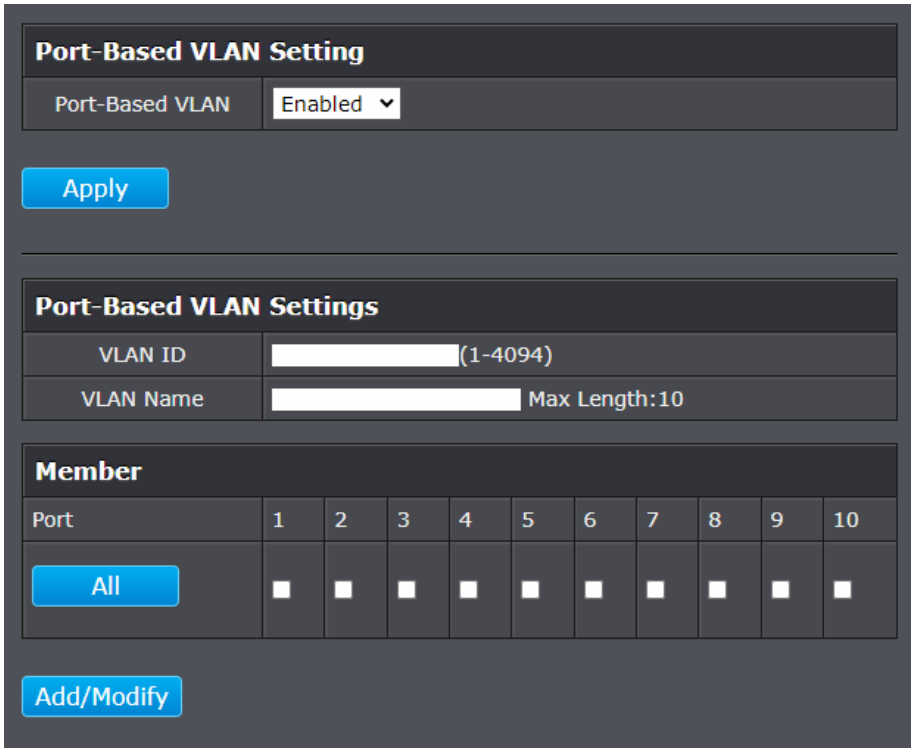
Items	Description
Port	Click the check box to enable Rate Control on the port
Type	Select the rate limit for Ingress or Egress traffic
Rate	Select the rate limit preferred.

3.3.2.9.3 Bandwidth Profile



Items	Description
Profile ID	Select the Profile to set the rate
Rate	Two rate units are supported, kbps or pps. The granularity is 8kbps or 1pps.

3.3.2.10 Port-Based VLAN



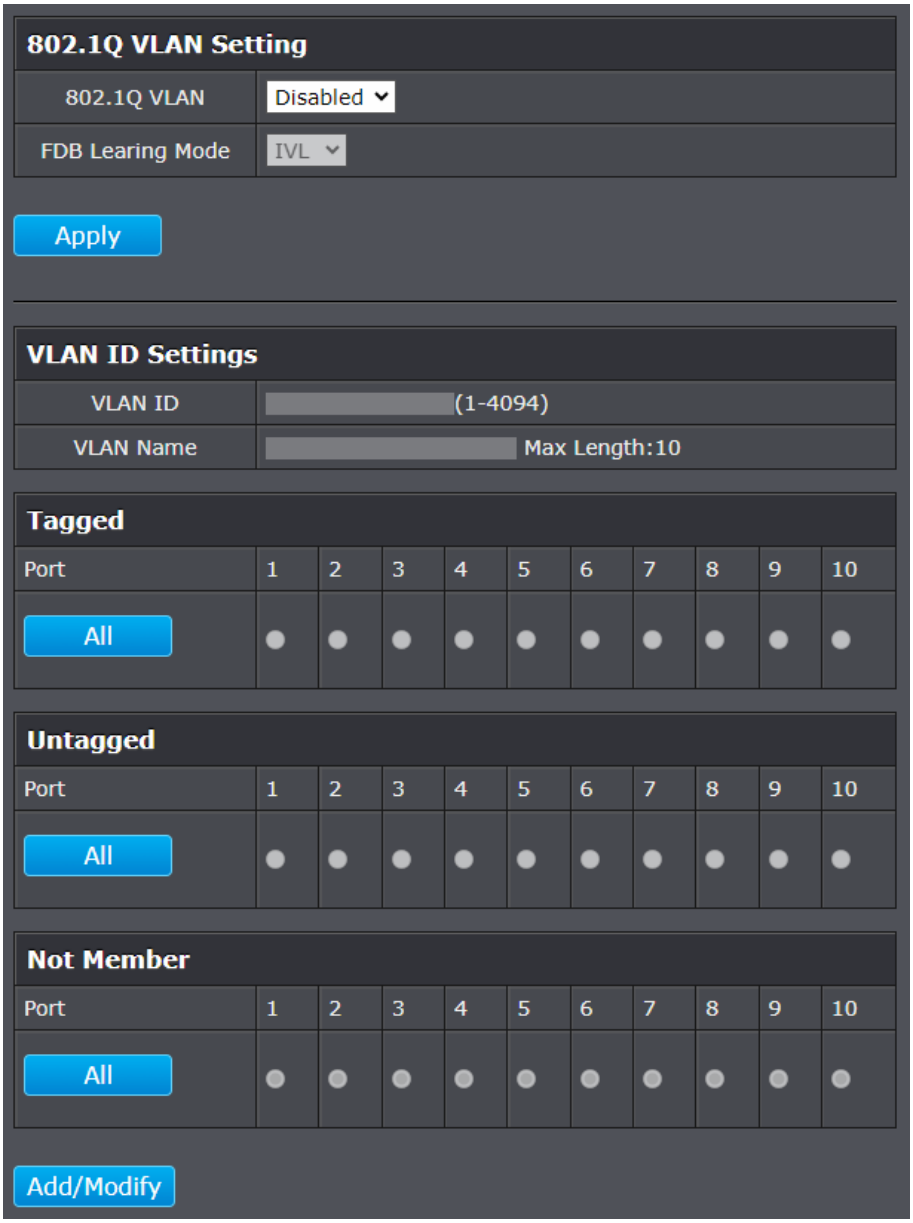
Items	Description
Port-Based VLAN	Enable or Disable Port-Based VLAN. Please note that Port-Based VLAN and 802.1Q VLAN are not able to be enabled at the same time. 802.1Q VLAN will be enabled automatically if Port-Based VLAN is disabled. 802.1Q VLAN will be disabled automatically if Port-Based VLAN is enabled.
VLAN ID	Indicates the VLAN to be created
VLAN Name	Indicates the name of the VLAN created
Member Port	Indicates the port which belong to the VLAN.

3.3.2.11 802.1Q VLAN

VLANs allow network administrators to group hosts together even if the hosts are not on the same network switch. This can greatly simplify network design and deployment, because VLAN membership can be configured through software. Without VLANs, grouping hosts according to their resource needs necessitates the labor of relocating nodes or rewiring data links.

This page allows for controlling VLAN configuration on the switch.

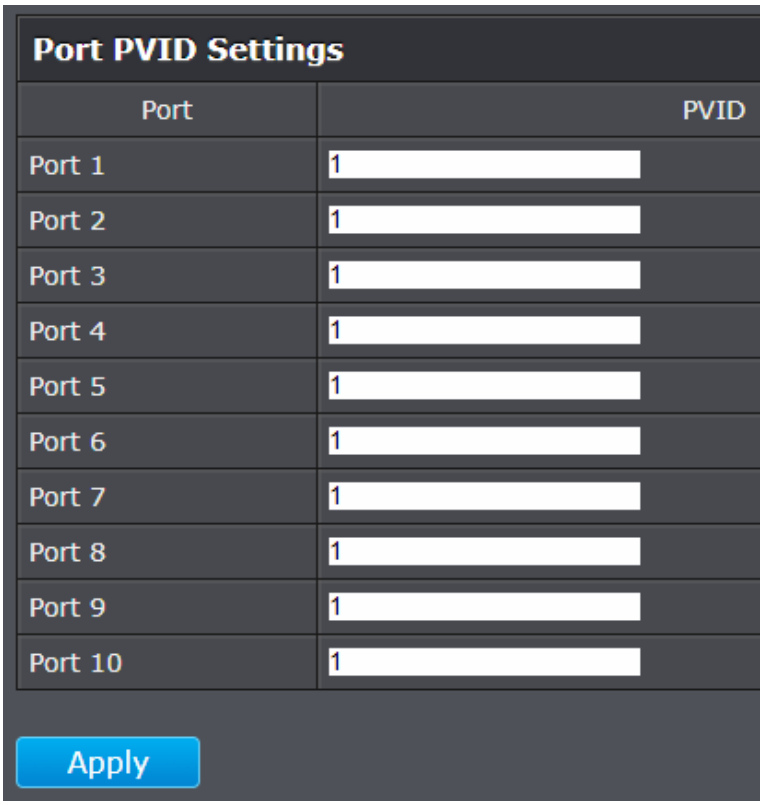
3.3.2.11.1 VLAN Setting



Items	Description
802.1Q VLAN	Enable or Disable 802.1Q VLAN. Please note that Port-Based VLAN and 802.1Q VLAN are not able to be enabled at the same time. Port-Based VLAN will be enabled automatically if 802.1Q VLAN is disabled. Port-Based VLAN will be disabled automatically if802.1Q VLAN is enabled.
FDB Learning Mode	Select FDB learning mode to IVL or SVL
VLAN ID	Indicates the VLAN to be created
VLAN Name	Indicates the name of the VLAN created

Tagged Port	The frames transmitted from the port would be tagged with VLAN information
Untagged Port	The frames transmitted from the port would be untagged without VLAN information
Not Member Port	Indicates the port which does not belong to the VLAN.

3.3.2.11.2 VLAN PVID

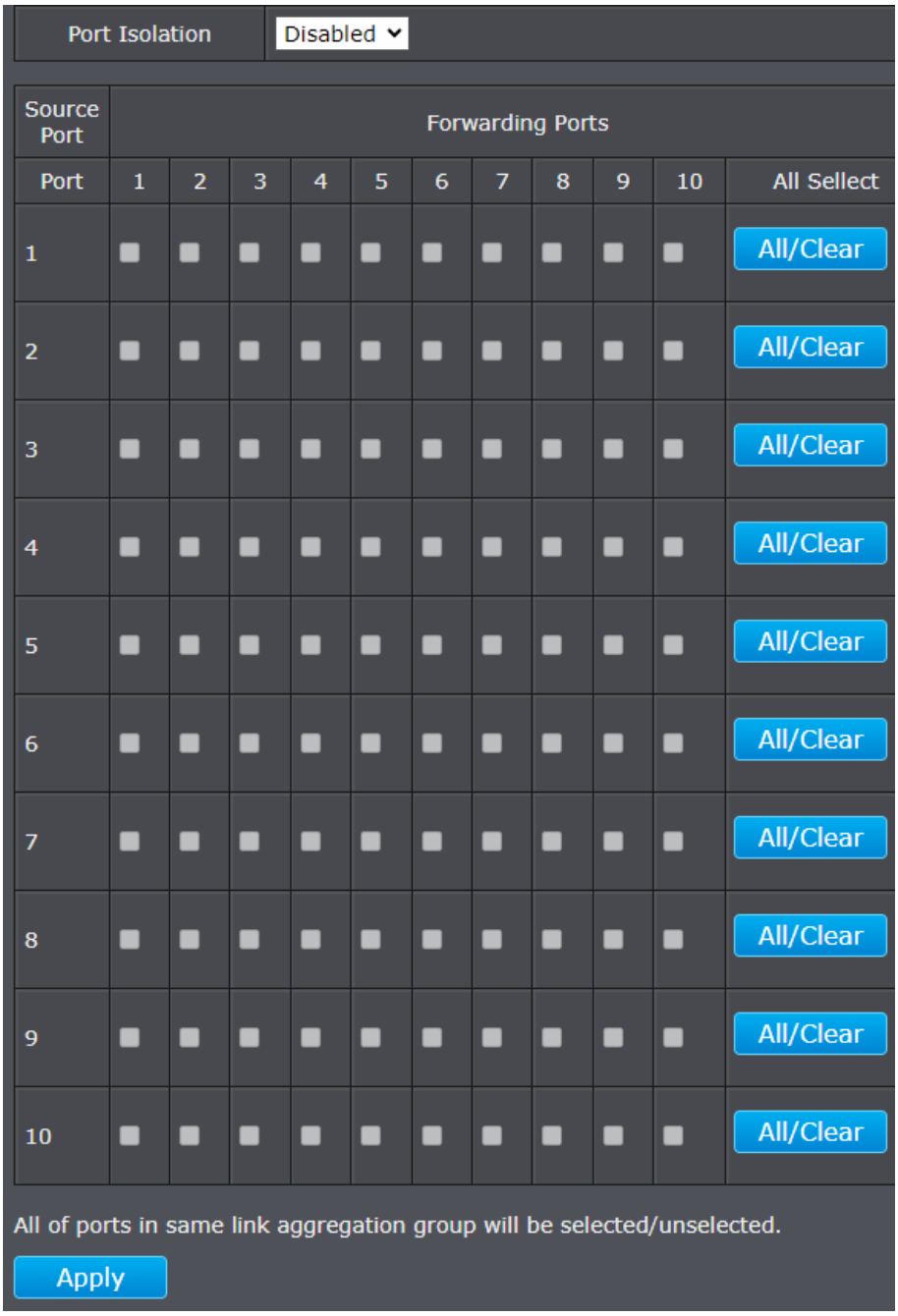


Items	Description
PVID	Indicates the default VLAN ID on the port. The tag with default VLAN ID will be added into the Rx frames if it's untagged when frame received.

3.3.2.12 Port Isolation

This page is used for enabling or disabling port isolation on ports in a VLAN.

A port member of a VLAN can be isolated to other isolated ports on the same VLAN.

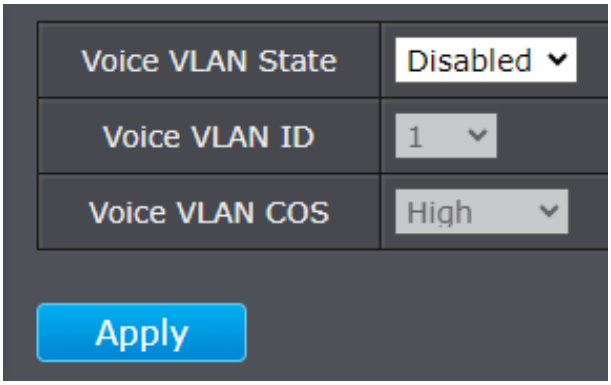


Items	Description
Port Isolation	Enable or Disable port isolation on the 802.1Q VLAN
Source Port	Indicates the port that traffic is coming from
Forwarding Port	A check box is provided for each port which allows to receive traffic coming from the Source port.

3.3.2.13 Voice VLAN

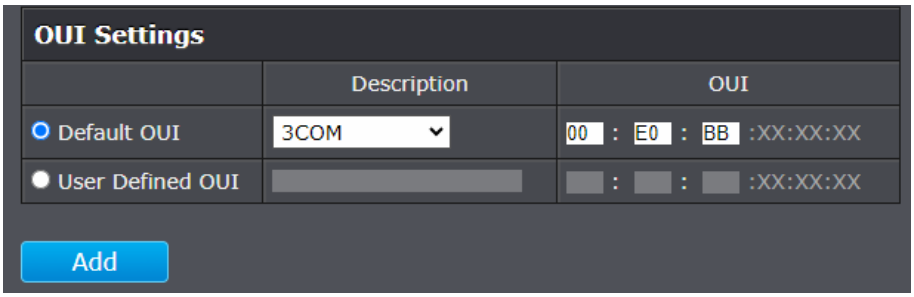
Voice VLAN is VLAN configured specially for voice traffic. By adding the ports with voice devices attached to voice VLAN, we can perform QoS-related configuration for voice data, ensuring the transmission priority of voice traffic and voice quality.

3.3.2.13.1 Settings



Items	Description
Voice VLAN State	Indicates the Voice VLAN mode operation. Possible mode are: Enabled: Enable Voice VLAN mode operation. Disabled: Disable Voice VLAN mode operation.
Voice VLAN ID	Indicates the Voice VLAN. The allowed range is 1 to 4094.
Voice VLAN COS	Indicates the Voice VLAN traffic class. All traffic on the Voice VLAN will apply this class.

3.3.2.13.2 OUI



Items	Description
Description	The description of OUI address. Normally, it describes which vendor telephony device it belongs to. The allowed string length is 0 to 20.
OUI	A telephony OUI address is a globally unique identifier assigned to a vendor by IEEE. It must be 6 characters long and the input format is "xx-xx-xx" (x is a hexadecimal digit).

3.3.3 QoS

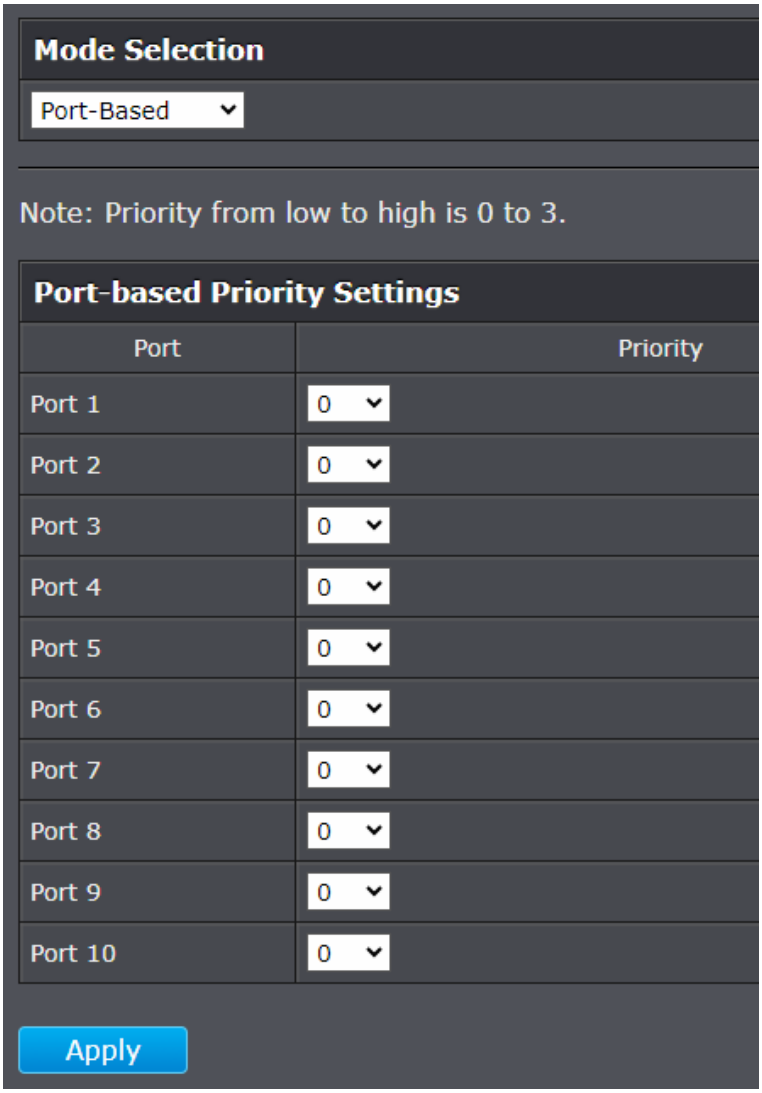
QoS is an acronym for Quality of Service. It is a method to guarantee a bandwidth relationship between individual applications or protocols.

A communications network transports a multitude of applications and data, including high-quality video and delay-sensitive data such as real-time voice. Networks must provide secure, predictable, measurable, and sometimes guaranteed services.

Achieving the required QoS becomes the secret to a successful end-to-end business solution. Therefore, QoS is the set of techniques to manage network resources.

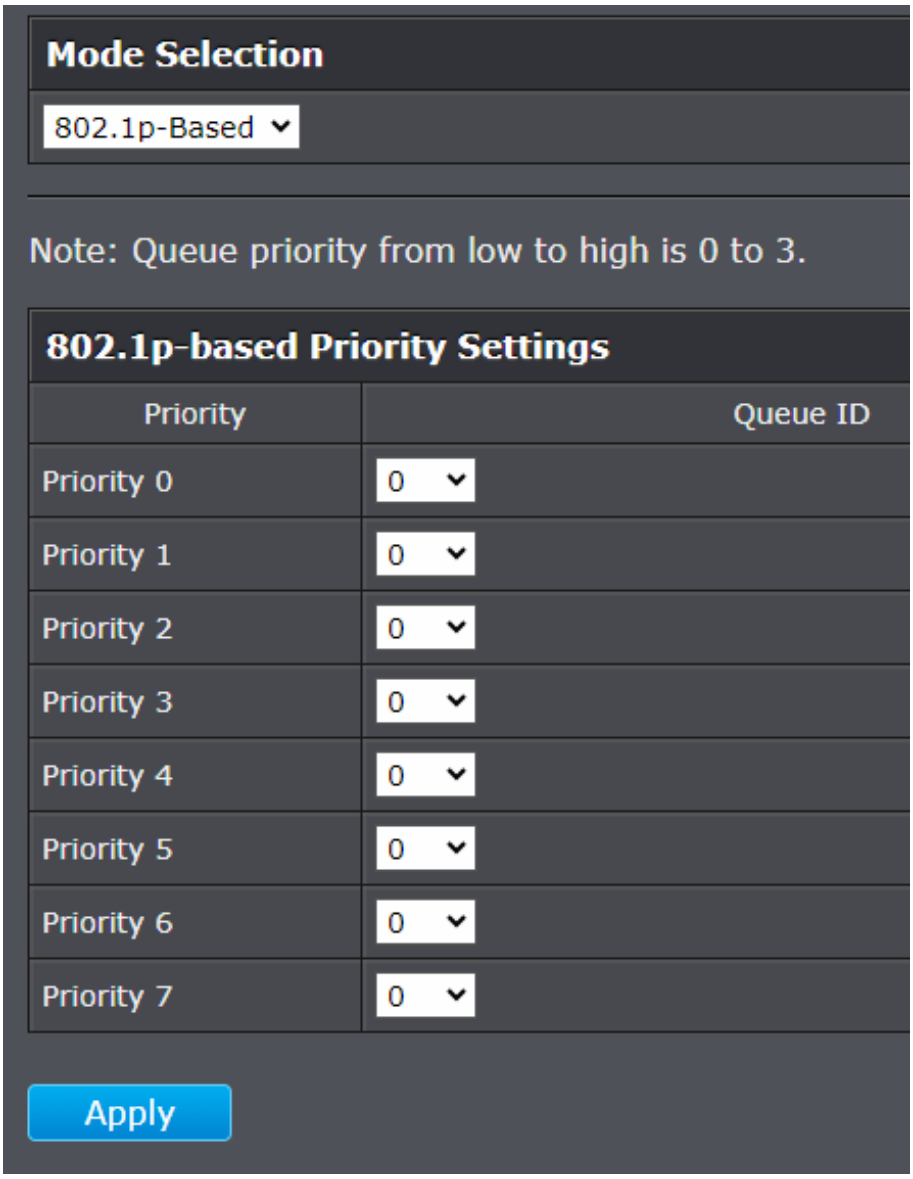
3.3.3.1 QoS Mode

3.3.3.1.1 Port-Based QoS



Items	Description
Mode Selection	Select QoS operation mode to be Port-Base, 802.1P-Based, or DSCP-based
Port X	Indicates the switch port number X
priority	Indicates the port priority mapping to Queue. There are 4 egress queue per-port supported.

3.3.3.1.2 802.1P Base



Items	Description
Mode Selection	Select QoS operation mode to be Port-Base, 802.1P-Based, or DSCP-based
Priority	Indicates the tag priority bits on the frames

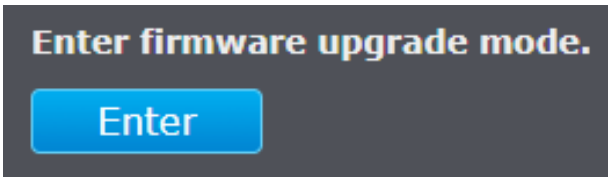
Queue ID	Indicates the tag priority in frames mapping to Queue. There are 4 egress queue per-port supported.

3.3.3.1.3 DSCP Base

Items	Description
DSCP int	Indicates the DSCP value in the ingress frames
priority	Indicates the DSCP value in frames mapping to Queue. There are 4 egress queue per-port supported.

3.3.4 System Tools

3.3.4.1 Firmware Upgrade



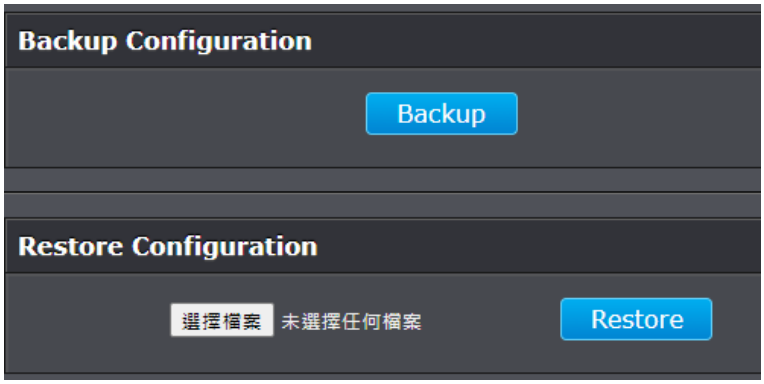
Click “Enter” to enter upgrade mode as below.

Browse to the Firmware File of a software image and click “Upgrade”.

System will reboot after image file upload and program to flash.

Warning: While the firmware is being updated, Web access appears to be defunct. Do not restart or power off the device at this time or the switch may fail to function afterwards.

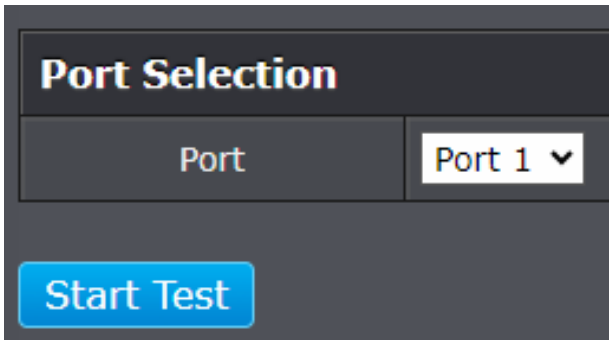
3.3.4.2 Configuration



Click “Backup” to save configuration file to web browser.

Select image file and click “Restore” to upload configuration from web browser to switch.

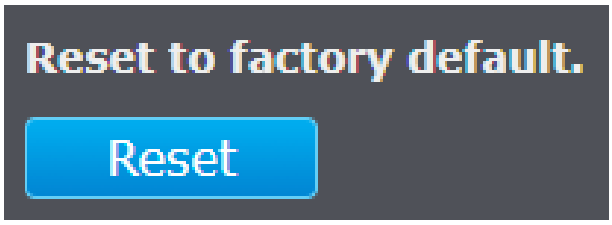
3.3.4.3 Cable Diagnostics



Click “Start test” to test the cable on the port.

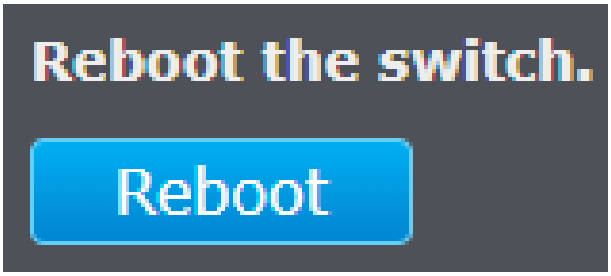
Items	Description
Port	Indicates the switch port

3.3.4.4 System Reset



Click “Reset” to reset configuration to factory default including IP and login user and password.

3.3.4.5 System Reboot



Click “Reboot” to reboot the switch.