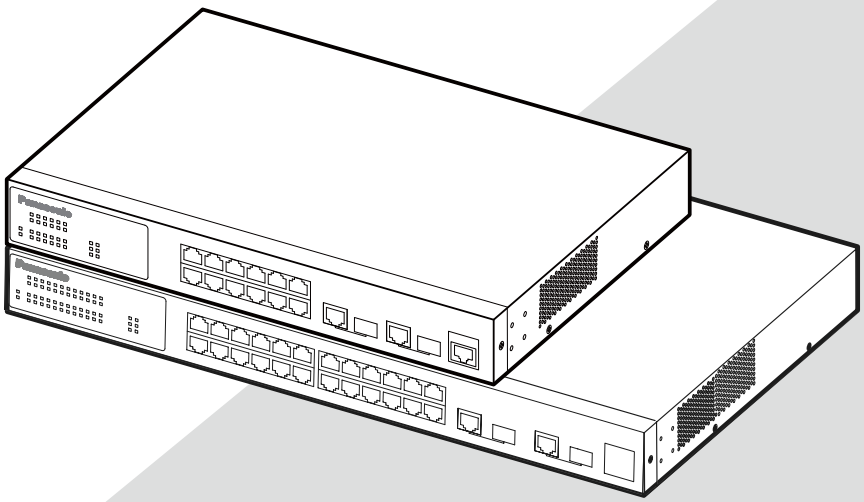
Panasonic®

Operation Manual For CLI Screens

Layer 2 Switching Hub

Model Number: PN23129A
PN23169A
PN23249A

- Thank you for purchasing our product.
- This manual provides important information about safe and proper operations of this Switching Hub.
- Please read the **"Important Safety Instructions"** on pages 3 to 5.
- Any problems or damage resulting from disassembly of this Switching Hub by customers are not covered by the warranty.



This operation manual is applicable to the following Switching Hubs:

Product name	Model No.
Switch-M12PWR	PN23129A
Switch-M16PWR	PN23169A
Switch-M24PWR	PN23249A

Important Safety Instructions

This chapter contains important safety instructions for preventing bodily injury and/or property damage. You are required to follow them.

- Severity of bodily injury and/or property damage, which could result from incorrect use of the Switching Hub, are explained below.

⚠WARNING	This symbol indicates a potential hazard that could result in serious injury or death.
⚠ CAUTION	This symbol indicates safety instructions. Deviation from these instructions could lead to bodily injury and/or property damage.

- **The following symbols are used to classify and describe the type of instructions to be observed.**

This symbol is used to alert users to what they must not .	This symbol is used to alert users to what they must do.

⚠WARNING

- **Do not use power other than AC 100 - 240V.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not handle the power cord with wet hand.**
  Deviation could lead to electric shock and/or equipment failure.
- **Do not handle this Switching Hub and connection cables during a thunderstorm.**
  Deviation could lead to electric shock.
- **Do not disassemble and/or modify this Switching Hub.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not damage the power cord. Do not bend too tightly, stretch, twist, bundle with other cord, pinch, put under a heavy object, and/or heat it.**
  Damaged the cord could lead to fire, short, and/or electric shock.
- **Do not put foreign objects (such as metal and combustible) into the opening (such as twisted pair port, console port, SFP extension slot), and/or do not drop them into the inside of the Switching Hub.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not connect equipment other than 10BASE-T/100BASE-TX/1000BASE-T to twisted pair port.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not place this Switching Hub in harsh environment (such as near water, high humid, and/or high dust).**
  Deviation could lead to fire, electric shock, and/or equipment failure.

⚠WARNING

- **Do not place this Switching Hub under direct sun light and/or high temperature.**
  Deviation could lead to high internal temperature and fire.
- **Do not install this Switching Hub at the location with continuous vibration or strong shock, or at the unstable location**
  Deviation could lead to injury and/or equipment failure.
- **Do not install any module other than our optional SFP module to SFP extension slot.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not connect any cable other than our optional console cable.**
  Deviation could lead to fire, electric shock, and/or equipment failure.
- **Do not put this Switching Hub into fire.**
  Deviation could lead to explosion and/or fire.
- **Do not use the supplied power cord for anything other than this product**.
  Deviation could lead to fire, electric shock, and/or equipment failure.

⚠WARNING

- **Use the bundled power cord (AC 100 – 240V specifications).**
  Deviation could lead to electric shock, malfunction, and/or equipment failure.
  The warranty does not cover any problems resulting from the use of any power cord other than the one supplied.
- **Unplug the power cord in case of equipment failure.**
  Deviation, such as keeping connected for a long time, could lead to fire.
- **Connect this Switching Hub to ground.**
  Deviation could lead to electric shock, malfunction, and/or equipment failure.
- **Connect the power cord firmly to the power port.**
  Deviation could lead to electric fire, shock, and/or malfunction.
- **Unplug the power cord if the STATUS LED (Self-diagnosis), TEMP LED (temperature sensor), or FAN LED (fan sensor) blinks in orange (system fault).**
  Deviation, such as keeping connected for a long time, could lead to fire.
- **When this Switching Hub is installed on wall surface, mount it firmly so as not to drop down because of weight of the main body and connection cable. Deviation could lead to injury and/or equipment failure (excluding Switch-M24PWR).**

⚠CAUTION

- **Handle the Switching Hub carefully so that fingers or hands may not be damaged by twisted pair port, SFP extension slot, console port, or power cord hook block.**

Important Requests on Protection from Lightning Strike

- If you connect a network camera, a wireless access point, or other devices that can be affected by a lightning strike (in particular, devices installed outdoors) to the twisted pair port of this Switching Hub, a lightning surge current/voltage may be conducted to this Switching Hub through the twisted pair cable, leading to malfunction. If you connect such a device, it is strongly recommended that you install a surge protective device (SPD) on the twisted pair port side of this Switching Hub.
- A lightning surge current/voltage may be conducted to this Switching Hub through the power supply or ground wire connected to the power port, leading to malfunction. If a lightning surge current/voltage may flow in through the power supply or ground wire, it is recommended that you install a surge protective device (SPD) on the power port side of this Switching Hub.

Basic Instructions for the Use of This Product

- For inspection and/or repair, consult the retailer.
- Use commercial power supply from a wall socket, which is close and easily accessible to this Switching Hub.
- Unplug the power cord when installing or moving this Switching Hub.
- Unplug the power cord when cleaning this Switching Hub.
- Use this Switching Hub within the specifications. Deviation could lead to malfunction.
- Do not touch the metal terminal of the RJ45 connector, the modular plug of connected twisted pair cable, or the metal terminal of the SFP extension slot. Do not place charged objects in the proximity of them. Static electricity could lead to equipment failure.
- Do not put the modular plug of the connected twisted pair cable on objects that can carry static charge, such as carpet. Do not place it in the proximity. Static electricity could lead to equipment failure.
- Do not put a strong shock, including dropping, to this Switching Hub. Deviation could lead to equipment failure.
- Before connecting a console cable to the console port, discharge static electricity, for example by touching metal appliance (do not discharge by touching this Switching Hub).
- Do not store and/or use this Switching Hub in the environment with the characteristics listed below.
  (Store and/or use this Switching Hub in the environment in accordance with the specification.)
  - High humidity. Possible spilled liquid (water).
  - Dusty. Possible static charge (such as carpet).
  - Under direct sunlight.
  - Possible condensation. High/low temperature exceeding the specifications environment.
  - Strong vibration and/or strong shock.
- Please use this Switching Hub in place where ambient temperature is from 0 to 40 degrees C.
  For Switch-M12PWR:
  When the total power supply is 140W or less, please use the Switching Hub in place where ambient temperature is from 0 to 45 degrees C.
  When the total power supply is 110W or less, please use the Switching Hub in place where ambient temperature is from 0 to 50 degrees C.

  For Switch-M16PWR:
  When you set the fan speed to High, please use the Switching Hub in place where ambient temperature is from 0 to 50 degrees C.
  You can also use it in the ambient temperature range from 0 to 50 degrees C if you set the fan speed to Mid (factory default) and control the total power supply to 110 W or below.

For Switch-M24PWR:
When the total power supply is 145W or less, please use the Switching Hub in place where ambient temperature is from 0 to 45 degrees C.
When the total power supply is 130W or less, please use the Switching Hub in place where ambient temperature is from 0 to 50 degrees C.

Failure to meet the above conditions may result in fire, electric shock, breakdown, and/or malfunction. Please take notice because such cases are out of guarantee.
Additionally, do not cover the bent hole of this Switching Hub.
Deviation could lead to high internal temperature, equipment failure and/or malfunction.

- When using two Switching Hubs, do not stack them. When you place them side by side, allow for a space of 20 mm or more between them. This space is not necessary if you use PN71052 connection brackets (excluding Switch-M24PWR).
- When stacking Switching Hubs, leave a minimum of 20 mm space between them.

1. Panasonic will not be liable for any damage resulting from the operation not in accordance with this operation manual or the loss of communications, which may or may not be caused by failure and/or malfunction of this device.
2. The contents described in this document may be changed without prior notice.
3. For any question, please contact the retailer where you purchased the product.

* Brands and product names in this document are trademarks or registered trademarks of their respective holders.

Table of Contents

1. Outline

Thank you for purchasing our Switching Hub. This operation manual provides information required to use the Web-browser-based administration function of the Switching Hub.

2. Features

2.1. Web-browser-based Administration Function

The web-browser-based administration function allows you to easily perform administration task, such as configuration and monitoring, from a web browser, such as Microsoft Internet Explorer.

3. Web-browser-based Administration

The web-browser-based administration function (hereafter, WEB Administrative Function) allows the administrator to perform tasks, such as configuring the Switching Hub and monitoring the network, by using a web browser as a user interface. Further, this function shows virtual LEDs, reflecting the current state of the LEDs on the Switching Hub, so that the administrator can administrate the Switching Hub remotely as if the Switching Hub is nearby.

3.1. Operating Environment

To use the WEB Administration Function, you must set the network settings.

1. Setting the IP Address
   Set the IP address for the Switching Hub via the console.
   Select as follows: Basic Switch Configuration... → System IP Configuration → Set IP Address. Set the IP address setting. Then, set a subnet mask in "Set Subnet Mask." Set a default gateway address, if needed, in "Set Default Gateway."
2. Enabling the WEB Administration Function
   You need to enable the WEB Administration Function of the Switching Hub.
   Select as follows: Main Menu → Basic Switch Configuration... → System Security Configuration → Web Server Status. The command prompt changes to "Enable or Disable web server (E/D)." Enter "e" to enable the WEB Administration Function. The factory default setting is "Disabled."

The terminal to access the Switching Hub must have a web browser (Microsoft Internet Explorer 6.0) and Java RE (Ver. 1.4 or above) installed. Further, the terminal must be connected to the Switching Hub directly or via network.

Note: If a proxy server is used, active windows may not be displayed properly on the terminal. We recommend connecting the terminal and the Switching Hub directly without using a proxy.

3.2. Accessing WEB Administration Function

To use the WEB Administration function, open the browser on the terminal, enter the IP address of the Switching Hub in the URL field and then press the "Enter" key. Then, a login screen, as shown in **Fig. 2-1**, appears. Enter your username and password.
The default login name is "manager" and the password is "manager."

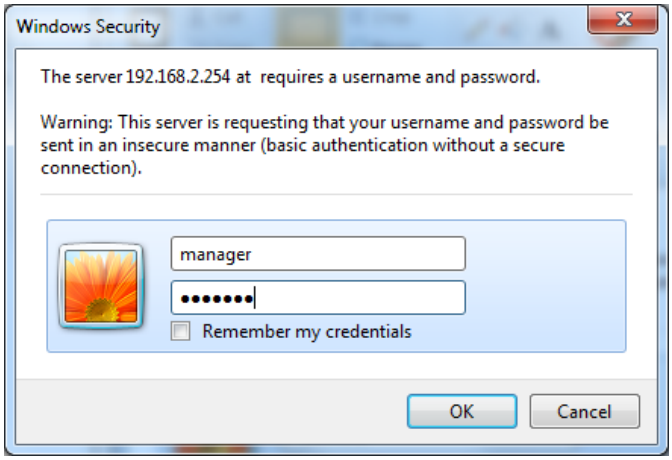


Fig. 2-1 Login Screen

Note: If a login screen does not appear, check the following items:

(1) The IP address, subnet mask and default gateway of this switch have been set properly.

(2) The IP address you entered in the web browser's URL field is the same as the IP address of this switch.

(3) The WEB Administration function has been enabled.

If the authentication succeeds, a language selection screen, as shown in **Fig. 2-2**, appears.
Select a desired interface language and then press "OK."

Fig. 2-2 Language Selection Screen

After selecting the interface language, a main screen, as shown in **Fig. 2-3**, appears.

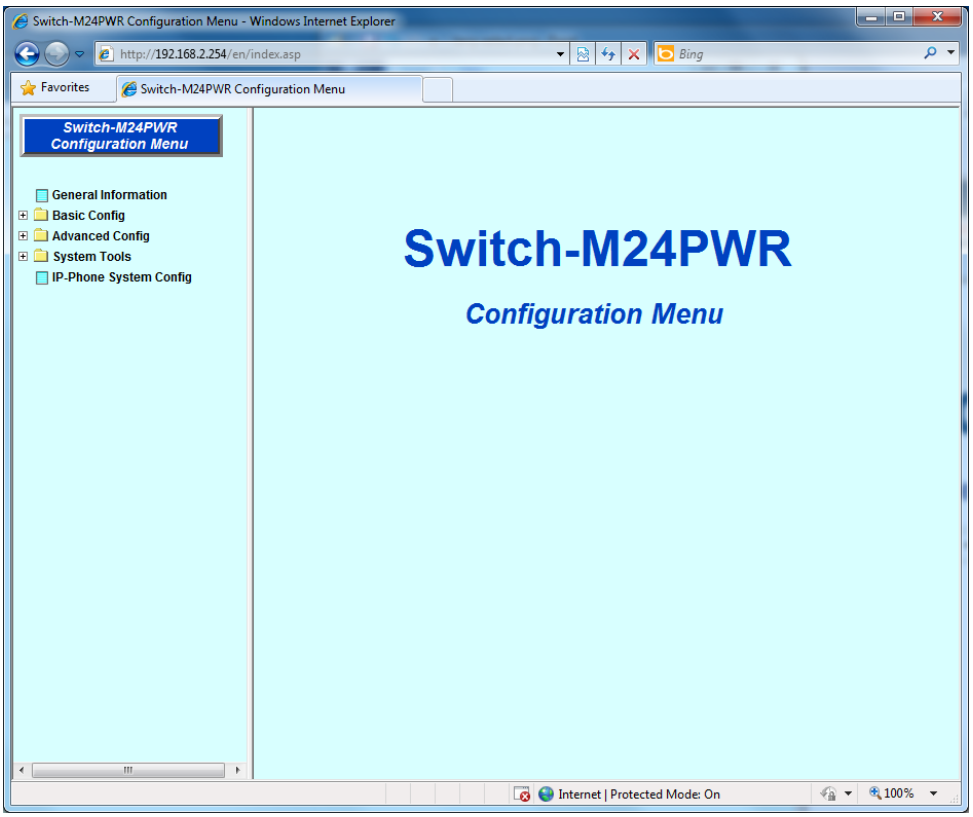


Fig. 2-3 Main Screen

The left side of the screen shows functions you can select on the screen.

1. General Information
   Shows a list view of the basic information about the Switching Hub.

2. Basic Switch Configuration
   Sets the basic settings, such as IP address and ports, of the Switching Hub.

3. Advanced Config
   Sets the advances settings, such as VLAN, QoS, IGMP snooping, of the Switching Hub.

4. System Administration Tool
   Accesses administration tools, such as firmware update, system log viewer.

To mange and operate the Switching Hub, we recommend you to set the “Basic Switch Configuration” first and then to set advanced configurations.

3.3. General Information

Selecting "General Information" opens a screen, as shown in **Fig. 3-1**. This screen shows a list view of the basic information about the Switching Hub.

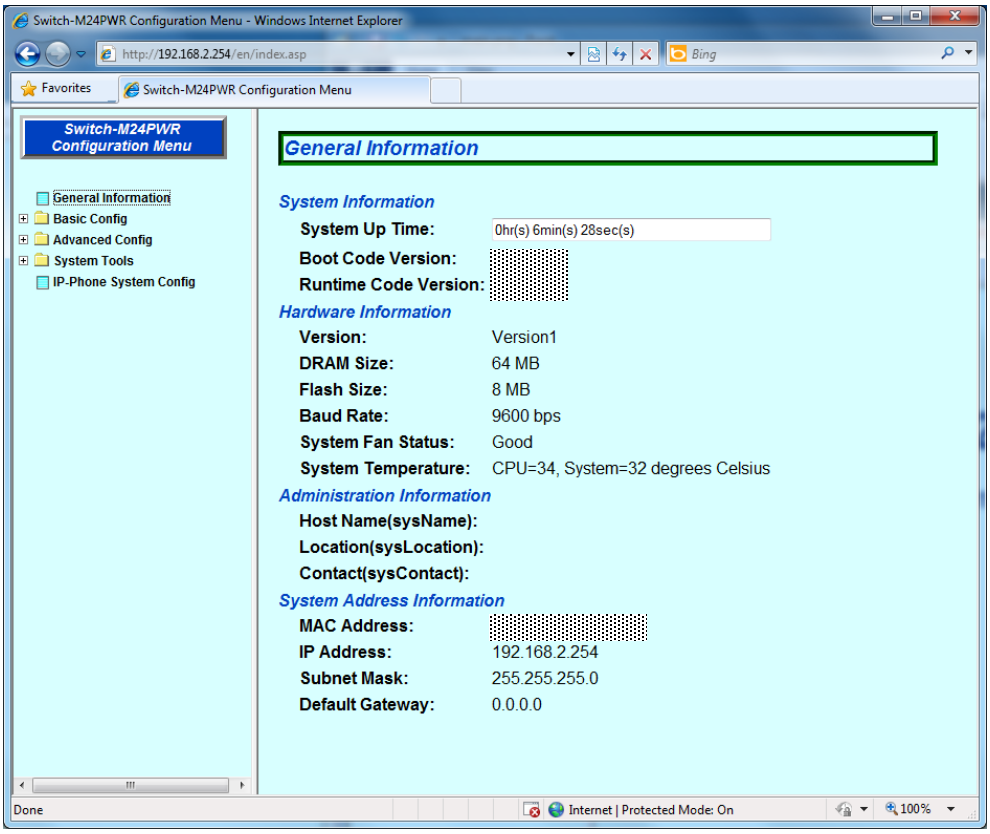


Fig. 3-1 General Information

Screen Description

System Up Time	Shows the cumulative time since the power on of this Switching Hub.	
Boot Code Version Runtime Code Version	Shows this Switching Hub's firmware version. * The firmware update, as described in 4.3.1, is applicable to the runtime code only.	
Hardware Information	Shows the hardware information.	
	Version	Shows the hardware version information.
	DRAM Size	Shows the sizes of installed DRAM.
	Flash Size	Shows the sizes of installed flash memory.
	Console Baud Rate	Shows the baud rate of the console.
	System Fan Status	Shows the operation status of the installed fan. "Normal" indicates a normal operation. "Error" indicates an error or a stop.
	System Temperature	Shows the internal temperatures of the Switching Hub. The sensors measure the temperature of CPU and system.
Administration Information	This item is configured in accordance with "4.1.1 System Administration Configuration."	
	Host Name	Shows the Switching Hub name. The default value is empty. For configuration details, refer to 4.1.1.
	Location	Shows the Switching Hub's location. The default value is empty. For configuration details, refer to 4.1.1.
	Contact	Shows the contact information. The default value is empty. For configuration details, refer to 4.1.1.
System Address Information	This item is configured in accordance with "4.1.2 System IP Configuration."	
	MAC Address	Shows the MAC address of this Switching Hub. This value is uniquely assigned to each device and cannot be changed.
	IP Address	Shows the Switching Hub's current IP address. 0.0.0.0 is displayed because no address is set on default setting. For configuration details, refer to 4.1.2.
	Subnet Mask	Shows the Switching Hub's current subnet mask. 0.0.0.0 is displayed because no address is set on default setting. For configuration details, refer to 4.1.2.
	Default Gateway	Shows the IP address of the router for the default gateway. 0.0.0.0 is displayed because no address is set on default setting. For configuration details, refer to 4.1.2.

4. Switch Configuration

After changing the configuration, you must follow the procedure in section 4.3.3 to save the changes. Otherwise, the change will not be applied upon rebooting the Switching Hub.

4.1. Basic Switch Configuration

4.1.1. System Administration Configuration

Select "Basic Config" and then select "Administration Config." A screen, as shown in **Fig. 4-1-1**, appears. This screen shows this Switching Hub's basic information. On this screen, you can set administrative information, such as device name.

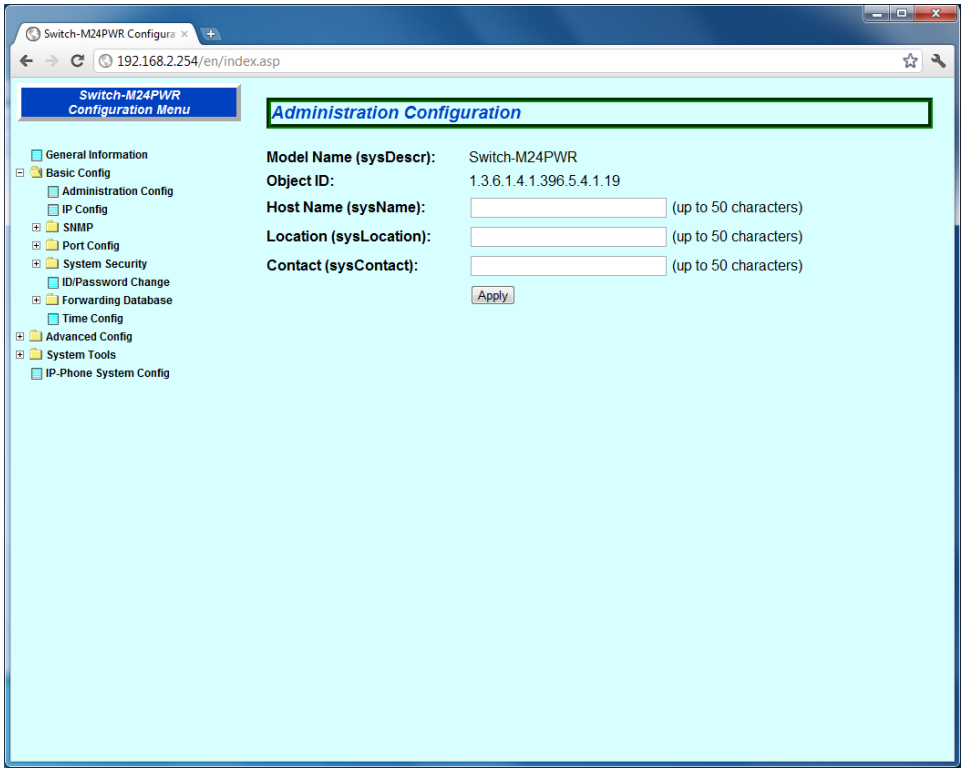


Fig. 4-1-1 System Administration Configuration

Screen Description

Product Name	Shows the system information. This item is not editable.
Object ID	Shows the corresponding OID in the MIB. This item is not editable.
Hostname	Shows the system name. The default setting is empty.
Location	Shows the device installation location. The default setting is empty.
Contact information	Shows the contact information. The default setting is empty.

4.1.2. IP Configuration

Select "Basic Config" and then select "IP Config." A screen, as shown in **Fig. 4-1-2**, appears. On this screen, you can configure IP-address-related settings of this Switching Hub.

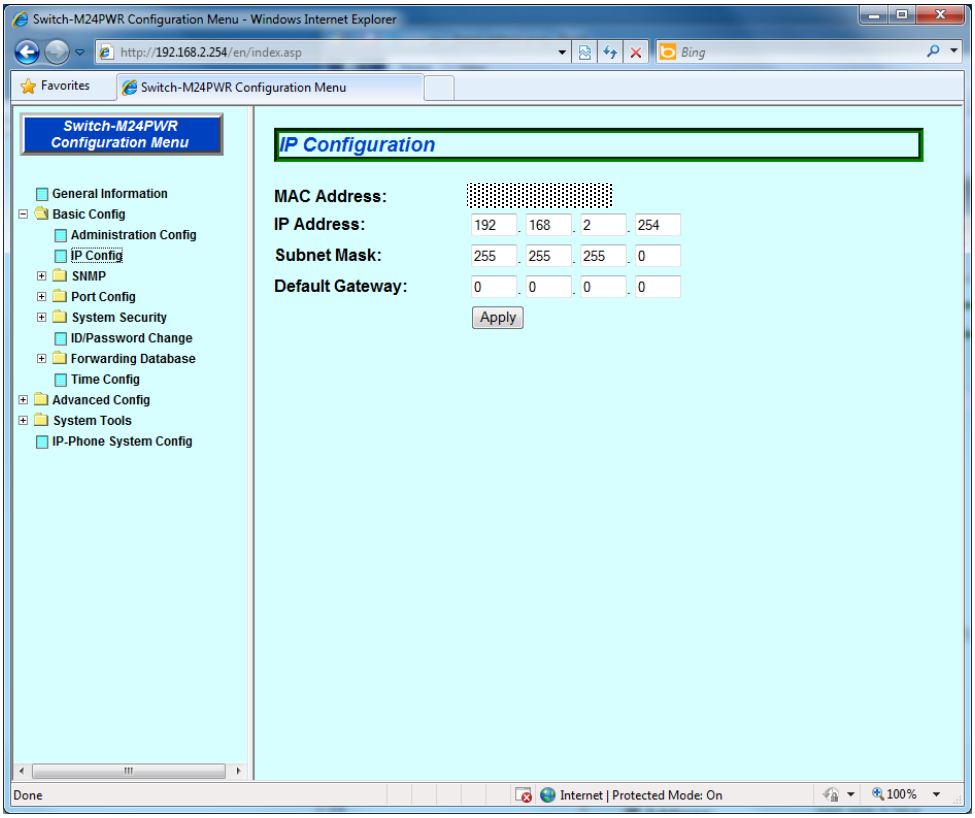


Fig. 4-1-2 IP Configuration

Screen Description

MAC Address	Shows the MAC address of this Switching Hub. This value is a unique identifier assigned to the device and unchangeable.
IP Address	Shows the current IP address. 0.0.0.0 is default setting.
Subnet Mask	Shows the current subnet mask. 0.0.0.0 is default setting.
Default Gateway	Shows the IP address of the router, set as a current default gateway. 0.0.0.0 is default setting.

Note: The above item needs to be set in order to use the SNMP control function and to enable a remote connection by Telnet. You must set them. If you are unsure, consult the network administrator. Any IP addresses on the local network must be unique and no duplication is allowed. In addition, you need to set the subnet mask and the default gateway, which are the same for other devices on the same subnet using this Switching Hub. These values, in addition to IP addresses, uniquely identify devices on the network.

4.1.3. SNMP Configuration

Select "Basic Config," select "SNMP" and then select "SNMP Config." A screen, as shown in **Fig. 4-1-3**, appears. On this screen, you can configure the SNMP manager settings.

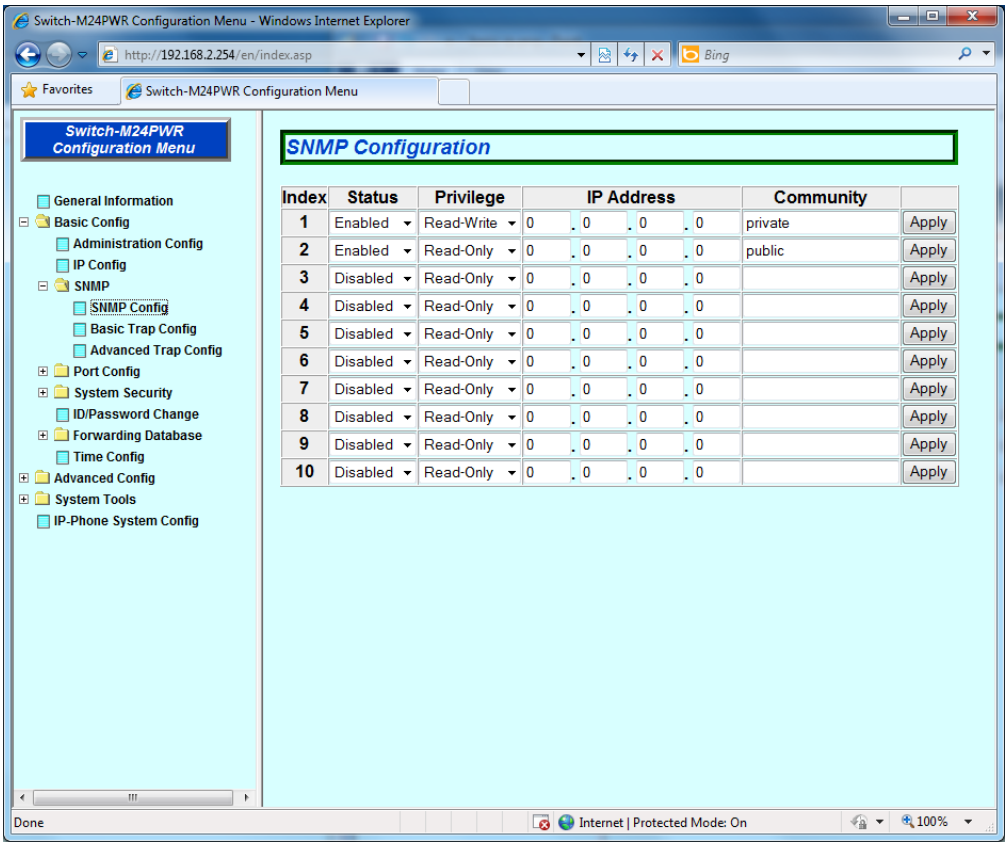


Fig. 4-1-3 SNMP Configuration

Screen Description

No.	Shows the entry number on the SNMP Manager List.	
Status	Shows the SNMP manager status.	
	Enabled	The SNMP manager is enabled.
	Disabled	The SNMP manager is disabled.
Access privilege	Shows the access privilege of the SNMP manager.	
	Read-Write	Both the read and write operations are allowed.
	Read-Only	Only the read operation is allowed.
IP address	Shows the IP address of an SNMP manager.	
Community	Shows the community name for SNMP access.	

4.1.4. Basic Trap Configuration

Select "Basic Config," select "SNMP" and then select "Basic Trap Config." A screen as shown in **Fig. 4-1-4**, appears. On this screen, you can set the SNMP Trap settings.

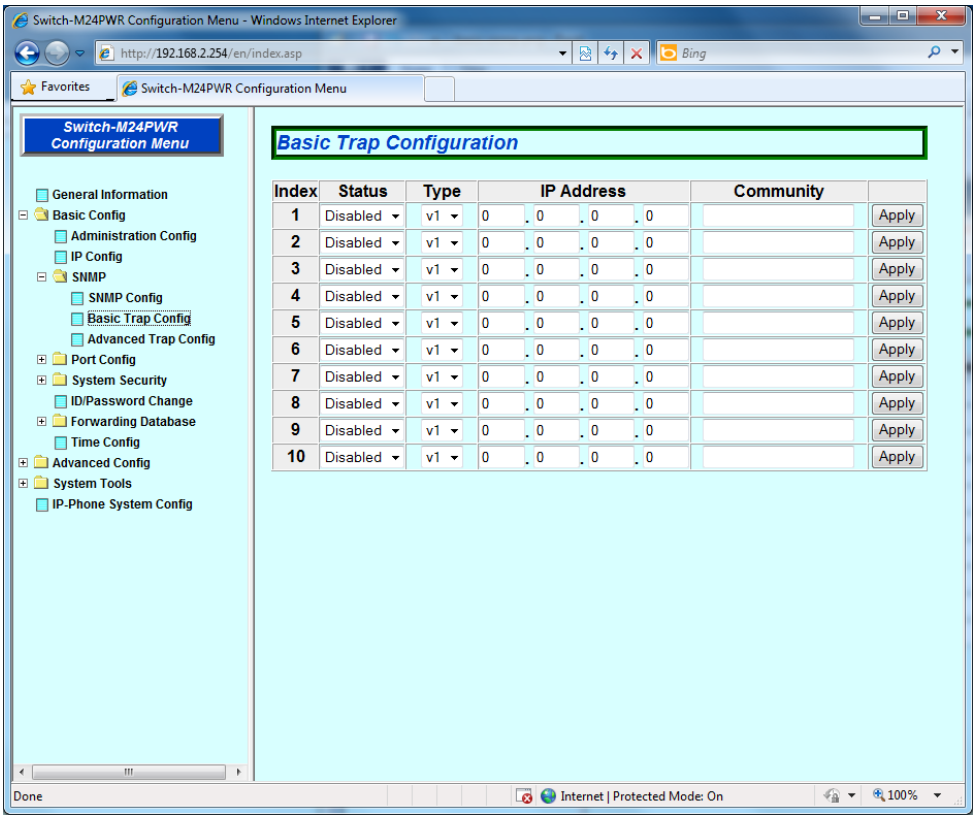


Fig. 4-1-4 Basic Trap Configuration

Screen Description

No.	Shows the entry number for the trap receiver.	
Status	Shows the trap sending setting.	
	Enabled	Sends traps.
	Disabled	Does not send traps. (Factory default settings)
Type	Shows the trap type.	
	v1	Sends SNMPv1 traps. (Factory default settings)
	v2	Sends SNMPv2 traps.
IP address	Shows the IP address of a trap receiver.	
Community	Shows the community name for a trap receiver.	

Note: The SNMP agent must be enabled (refer to 4.1.8 System Security Configuration).

4.1.5. Advanced Trap Configuration

Select "Basic Config," select "SNMP" and then select "Adranced Trap Config." A screen, as shown in **Fig. 4-1-5**, appears. On this screen, you can set the trap sending behaviors.

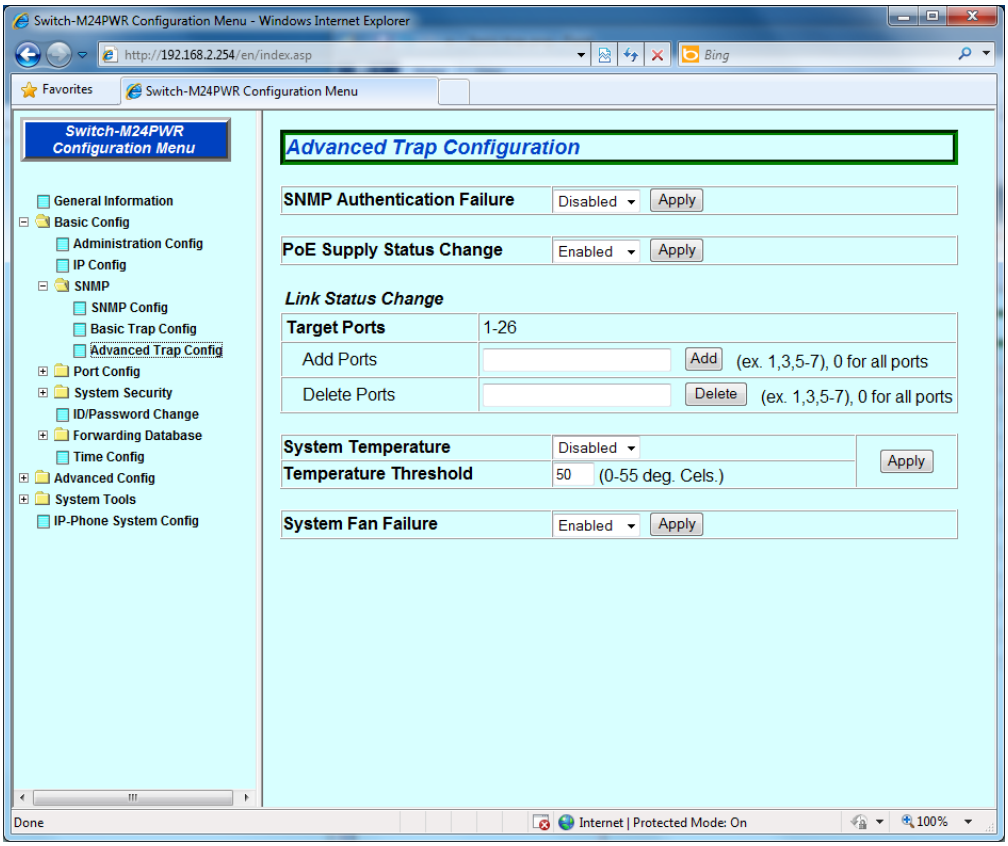


Fig. 4-1-5 Advanced Trap Configuration

Screen Description

SNMP Authentication Failure	Shows the trap sending settings for an SNMP authentication failure.	
	Enabled	Enables the trap sending.
	Disabled	Disables the trap sending. (Factory default settings)
PoE Supply Status Change	Shows the PoE trap control settings.	
	Enabled	Enables the trap sending.
	Disabled	Disables the trap sending. (Factory default settings)
Link Status Change	Configure the port to which the trap is sent when its link status changes.	
	Target Ports	Shows the current target ports.
	Add Ports	Enter port numbers to be added.
	Delete Ports	Enter port numbers to be deleted.
System Temperature	Shows the temperature trap control settings.	
	Enabled	Enables the trap sending.
	Disabled	Disables the trap sending. (Factory default settings)
Temperature Threshold	Shows the threshold temperature value to send the trap.	
System Fan Failure	Shows the fan trap control settings.	
	Enabled	Enables the trap sending. (Factory default settings)
	Disable	Disables the trap sending.

4.1.6. Basic Port Configuration

Select "Basic Config," select "Port Config" and then select "Basic Port Config." A screen, as shown in **Fig. 4-1-6**, appears. On this screen, you can configure port status display settings, mode settings and others.

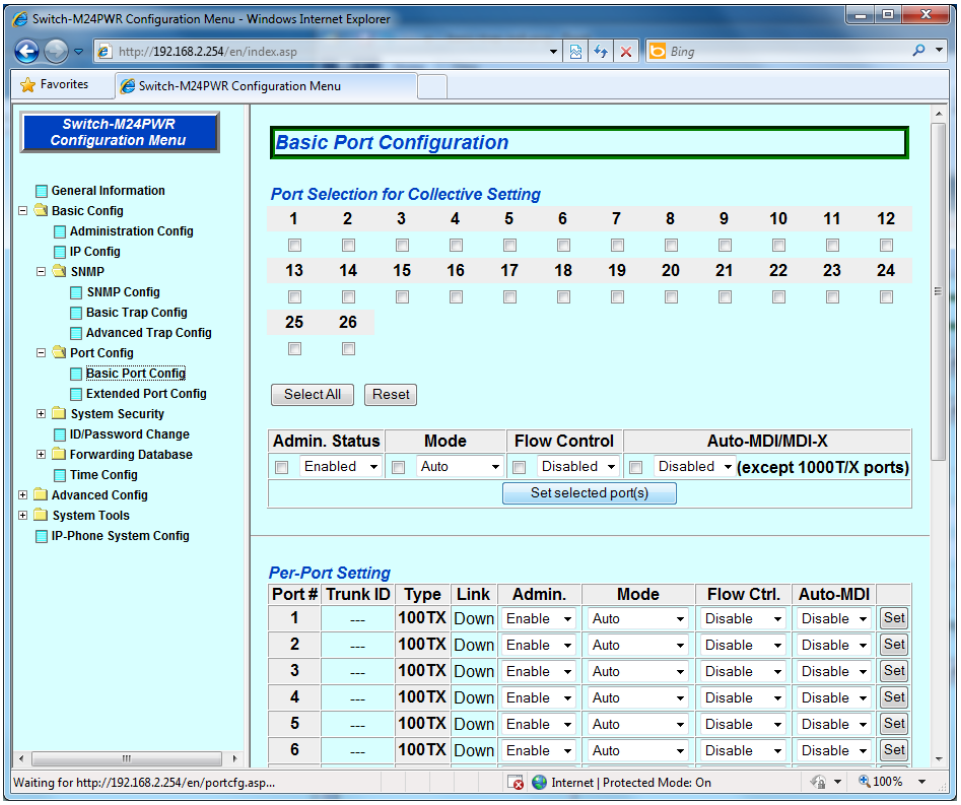


Fig. 4-1-6 Basic Port Configuration

Screen Description

Port #	Shows the port number.	
Trunk	Shows the group number for a trunked port.	
Type	Shows the port type.	
	100TX	The port type is 10/100BASE-TX.
	1000T	The port type is 1000BASE-T.
	1000X	The port type is SFP port.
Admin	Shows the current port status. The factory default setting is "Enabled" for all ports.	
	Enable	The port is available for use.
	Disable	The port is not available for use.
Link	Shows the current link status.	
	Up	Link is established successfully.
	Down	Link is not established.
Mode	Shows the communication speed and full-duplex/half-duplex settings. The factory default setting is "Auto" for all ports.	
	Auto	Auto negotiation mode
	100M/Full	100 Mbps full-duplex
	100M/Half	100 Mbps half-duplex
	10M/Full	10 Mbps full-duplex
	10M/Half	10 Mbps half-duplex
Flow Ctrl.	Shows the flow control settings. The factory default setting is "Disable" for all ports.	
	Enable	The flow control is enabled.
	Disable	The flow control is disabled.
Auto-MDI	Shows the Auto MDI function settings. The factory default setting is "Disable." (The settings for 10/100/1000BASE-T ports are fixed at "Enable.")	
	Enable	The Auto-MDI function is enabled.
	Disable	The Auto-MDI function is disabled.

4.1.7. Extended Port Configuration

Select "Basic Config," select "Port Config" and then select "Extended Port Config." A screen, as shown in **Fig. 4-1-7**, appears. On this screen, you can configure port status display settings, mode settings and others.

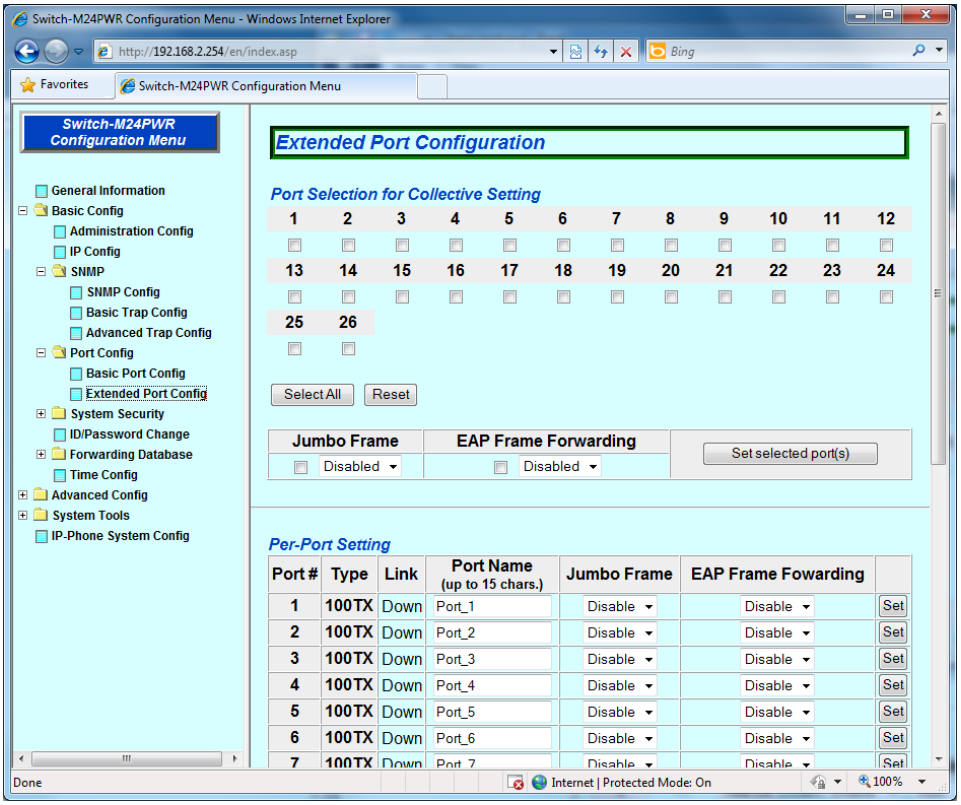


Fig. 4-1-7 Advanced Port Configuration

Screen Description

Port #	Shows the port number.	
Type	Shows the port type.	
	100TX	The port type is 10/100BASE-TX.
	1000T	The port type is 1000BASE-T.
	1000X	The port type is SFP expansion port.
Link	Shows the current link status.	
	Up	Link is established successfully.
	Down	Link is not established.
Port Name	Shows the port name.	
Jumbo Frame	Shows the jumbo frame settings. The factory default setting is "Disable" for all ports.	
	Enable	Jumbo frame is enabled.
	Disable	Jumbo frame is disabled.
EAP Frame Forwarding	Shows the EAP frame forwarding function settings. The factory default setting is "Disable" for all ports. Setting this item to "Enable" forwards EAP frames, used in IEEE802.1X authentication. Setting this item to "Disable" destroys the packets.	
	Enable	The EAP Packet Forwarding function is enabled.
	Disable	The EAP Packet Forwarding function is disabled.

4.1.8. System Security Configuration

Select "Basic Config," select "System Security" and then select "General Config." A screen, as shown in **Fig. 4-1-8**, appears. On this screen, you can configure the access control settings for accessing this Switching Hub for configuration and management.

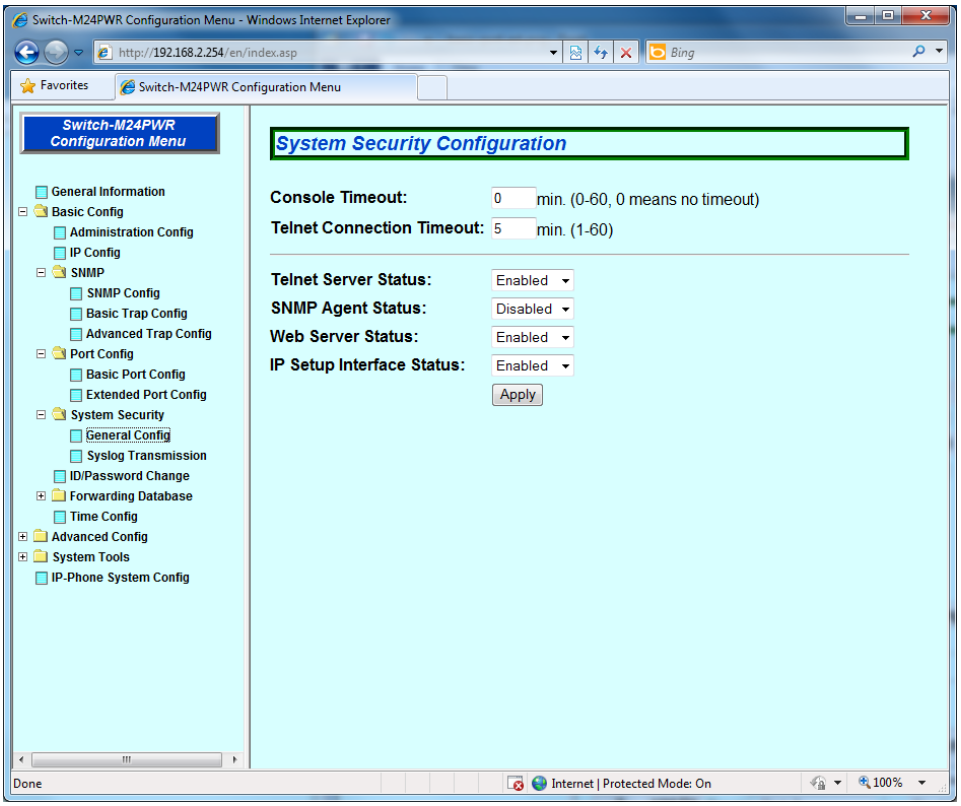


Fig. 4-1-8 System Security Configuration

Screen Description

Console Timeout	Shows the idle timeout settings (in minutes) for terminating a console-connected session if no input is made. The factory default setting is 5 minutes.	
Telnet Connection Timeout	Shows the idle timeout settings (in minutes) for terminating a Telnet-connected session if no input is made. The factory default setting is 5 minutes.	
Telnet Server Status	Shows the Telnet access settings. The factory default setting is "Enabled."	
	Enabled	Access is enabled.
	Disabled	Access is disabled.
SNMP Agent Status	Shows the SNMP access settings. The factory default setting is "Disabled."	
	Enabled	Access is enabled.
	Disabled	Access is disabled.
Web Server Status	Shows the web access settings. The factory default setting is "Disabled."	
	Enabled	Access is enabled.
	Disabled	Access is disabled.
IP Setup Interface Status	Shows the access settings for the IP address configuration software, bundled with the Panasonic network cameras. The factory default setting is "Enabled." * For instructions, refer to Appendix C.	
	Enabled	Access is enabled.
	Disabled	Access is disabled.

4.1.9. Syslog Transmission Configuration

Select "Basic Config," select "System Security " and then select "Syslog Transmission." A screen, as shown in **Fig. 4-1-9**, appears. In this screen, you can set Syslog server information to send a system log.

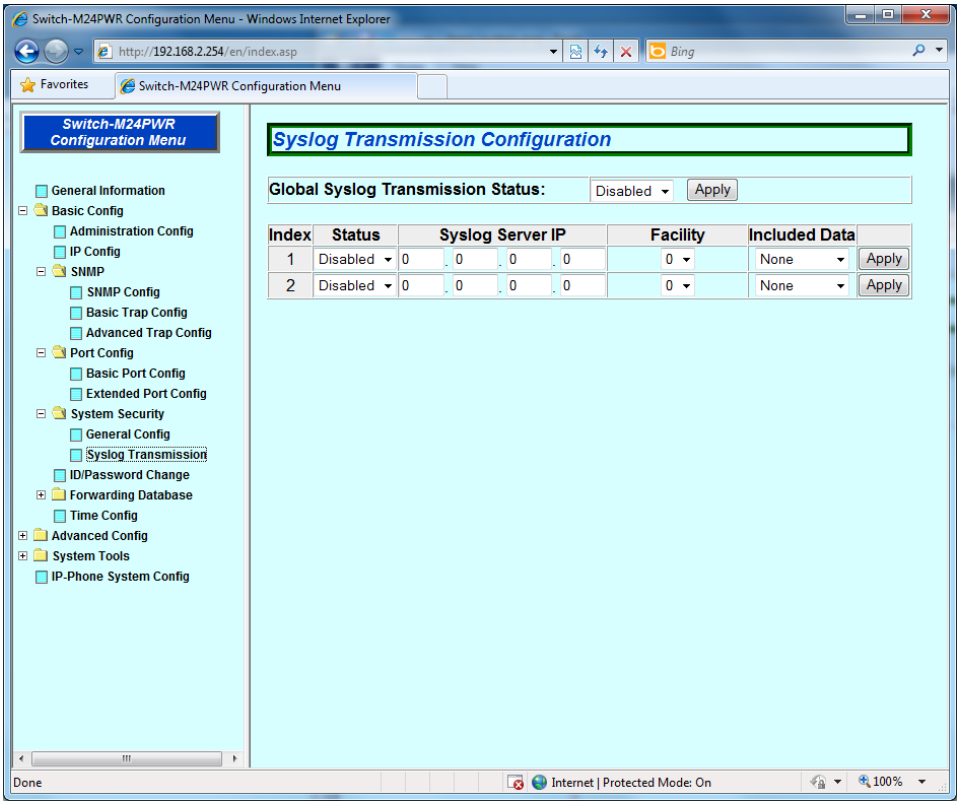


Fig. 4-1-9 Syslog Transmission Configuration

Screen Description

Global Syslog Transmission Status	Shows the status of Global Syslog Transmission function. The factory default setting is "Disabled."	
	Enabled	Transmits to the syslog server.
	Disabled	Does not transmit to the syslog server.
Index	Shows the entry number for the syslog transmission destination.	
Status	Shows the status of Syslog Transmission. The factory default setting is "Disabled."	
	Enabled	Transmits to the syslog server.
	Disabled	Does not transmit to the syslog server.
Syslog Server IP	Shows the IP address of syslog server.	
Facility	Shows the value of facility.	
Included Data	Shows information to be added to syslog packets.	
	SysName	Adds a SysName of this Switching Hub to a system log to be transmitted.
	IP address	Adds an IP address of this Switching Hub to a system log to be transmitted.

4.1.10. Username and Password Configuration

Select "Basic Config" and then select "ID/Password Change." A screen, as shown in **Fig.4-1-10**, appears. On this screen, you can set a username and a password.

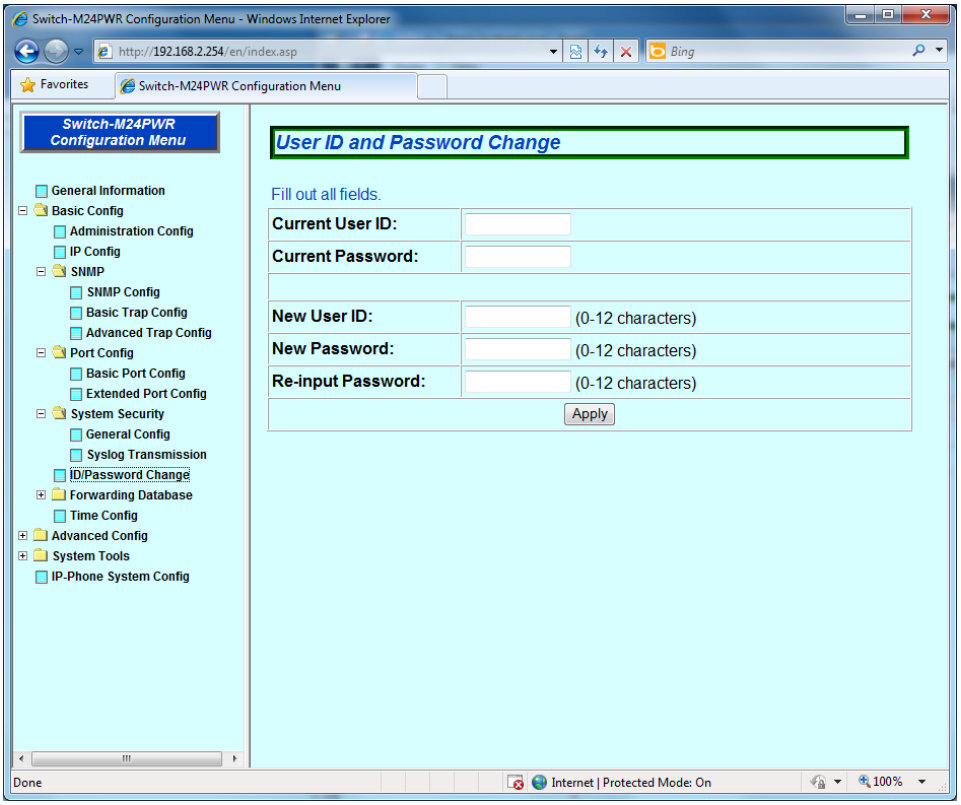


Fig. 4-1.10 User ID and Password Change

Screen Description

Current User ID	Enter the current username. This is used when logging in to this Switching Hub. The factory default setting is "manager."
Current Password	Enter the current password. This is used when logging in to this Switching Hub. The factory default setting is "manager."
New User ID	Enter a new username.
New Password	Enter a new password.
Re-input Password	To confirm the password, enter the same password again.

Note: Make sure to remember the username and password.
The username and password are required to login to the Switching Hub via console, Telnet or web.

4.1.11. FDB Static Address Table

Select "Basic Config," select "Forwarding Database" and then select "Static Addr. Table." A screen, as shown in **Fig. 4-1-11**, appears. On this screen, you can enter static MAC addresses in the FDB table.

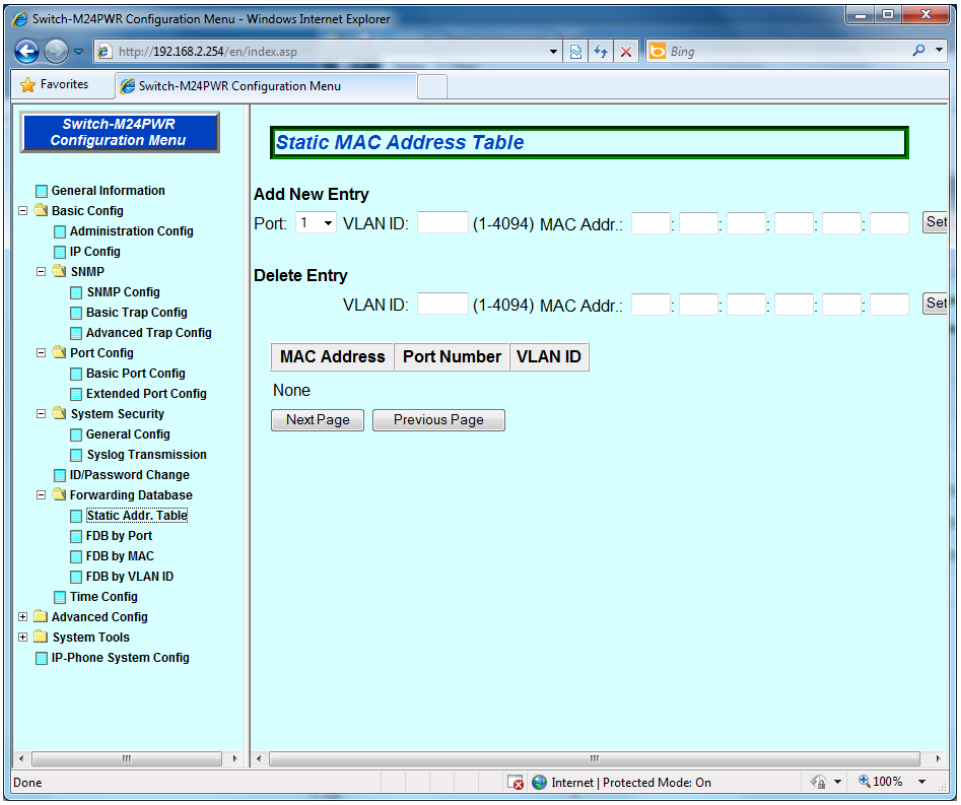


Fig. 4-1-11 Static Address Table

Screen Description

Port (Add)	Select a port to which an MAC address is added.
VLAN ID (Add)	Enter the VLAN ID of the MAC address to be added.
MAC Addr.(Add)	Enter the MAC address to be added, and then click the button to setup.
VLAN ID (Delete)	Enter the VLAN ID of an MAC address to be deleted.
MAC Addr. (Delete)	Enter the MAC address to be deleted, and then click the button to setup.

4.1.12. FDB by Port

Select "Basic Config," select "Forwarding Database" and then select "FDB by Port." A screen, as shown in **Fig. 4-1-12**, appears. On this screen, the FDB table shows learned MAC addresses for each port.

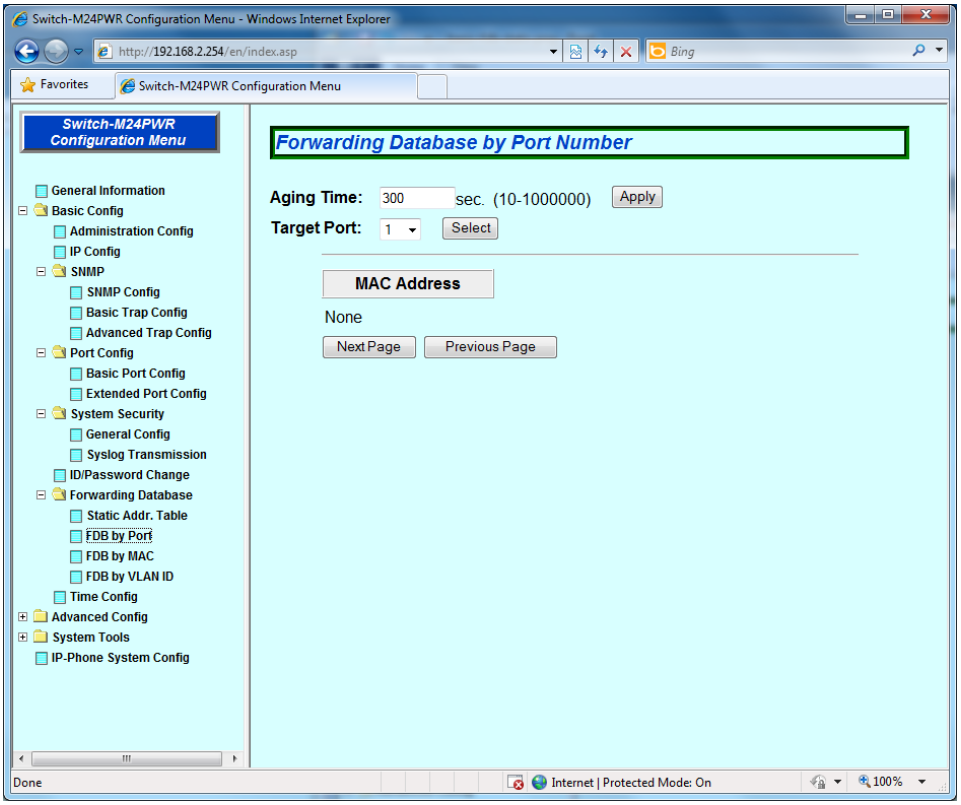


Fig. 4-1-12 FDB Table (By Port)

Screen Description

Aging Time	Shows a time to keep the FDB table. It is equal to the time after receiving the last packet. The factory default setting is 300 seconds (5 minutes).
Target Port	Shows the selected port number.
MAC Address	Shows a MAC address in the FDB table.

4.1.13. FDB Table (By MAC Address)

Select "Basic Config," select "Forwarding Database" and then select "FDB by MAC." A screen, as shown in **Fig. 4-1-13**, appears. This screen shows learned MAC addresses in the FDB table, sorted by MAC address.

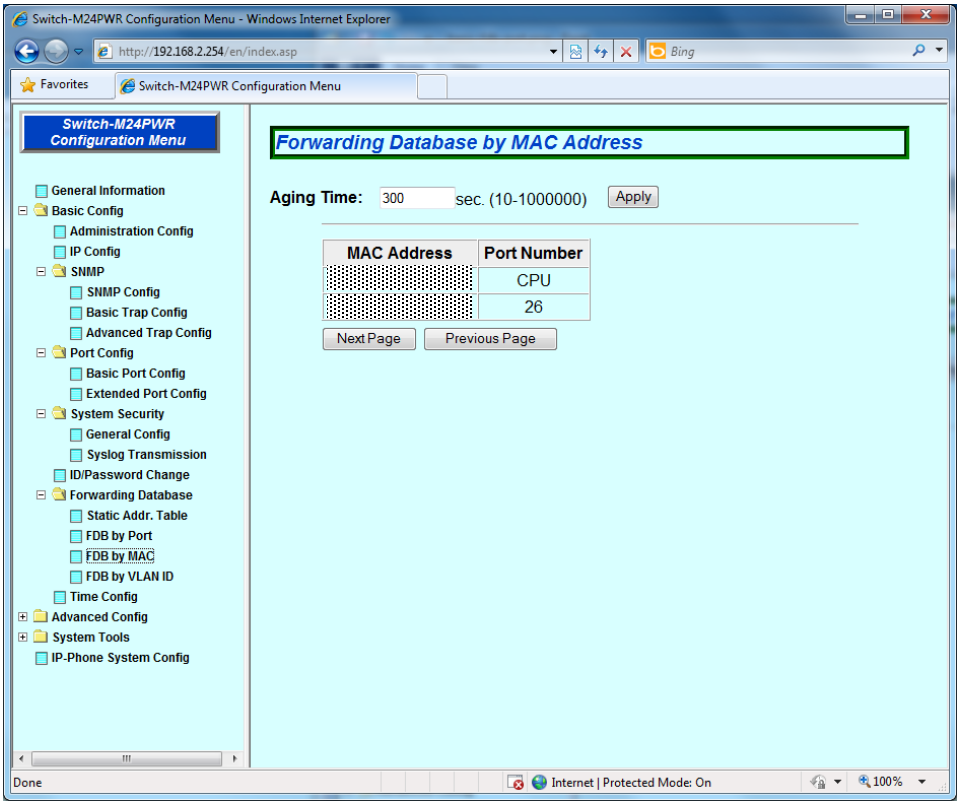


Fig. 4-1-13 FDB Table (by MAC Address)

Screen Description

Aging Time	Shows a time to keep the FDB table. It is equal to the time after receiving the last packet. The factory default setting is 300 seconds (5 minutes).
MAC Address	Shows a MAC address in the FDB table.
Port Number	Shows a port to which the MAC address belongs.

4.1.14. FDB Table (by VLAN)

Select "Basic Config," select "Forwarding Database" and then select "FDB by VLAN ID." A screen, as shown in **Fig. 4-1-14**, appears. This screen shows learned MAC addresses in the FDB table for each VLAN.

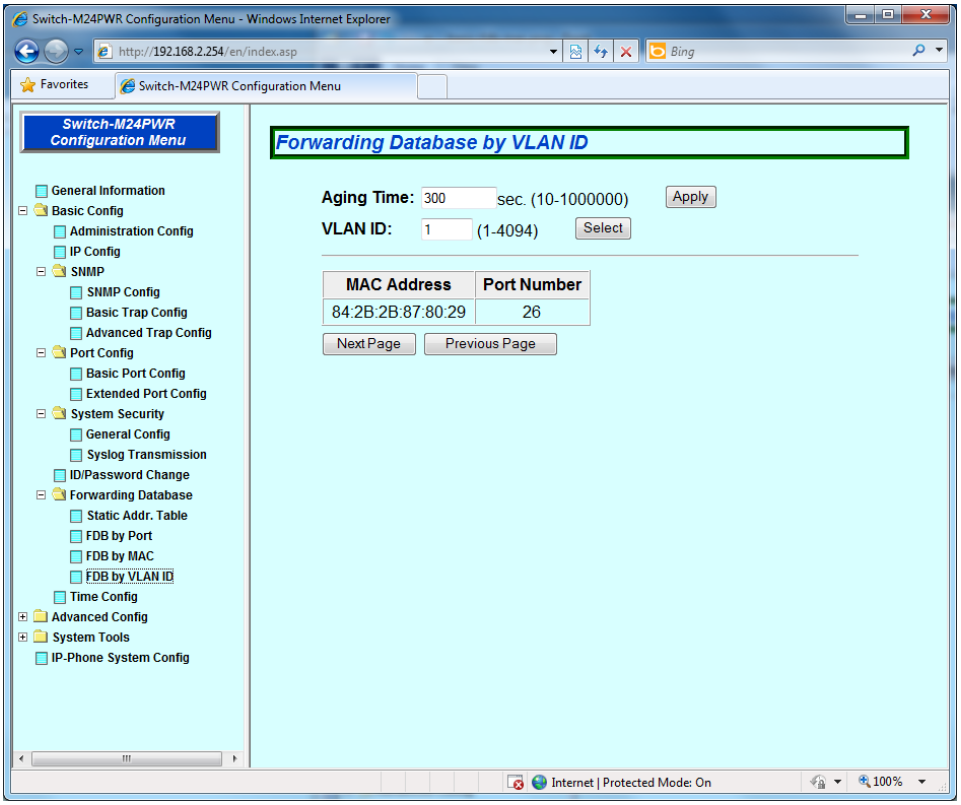


Fig. 4-1-14 FDB Table (by VLAN ID)

Screen Description

Aging Time	Shows a time to keep the FDB table. It is equal to the time after receiving the last packet. The factory default setting is 300 seconds (5 minutes).
VLAN ID	Shows the selected VLAN ID.
MAC Address	Shows a MAC address in the FDB table.
Port Number	Shows a port to which the MAC address belongs.

4.1.15. Time Configuration

Select "Basic Config" and then select "Time Config." A screen, as shown in **Fig. 4-1-15**, appears. In this screen, you can configure the time setting and the time synchronization setting by SNTP.

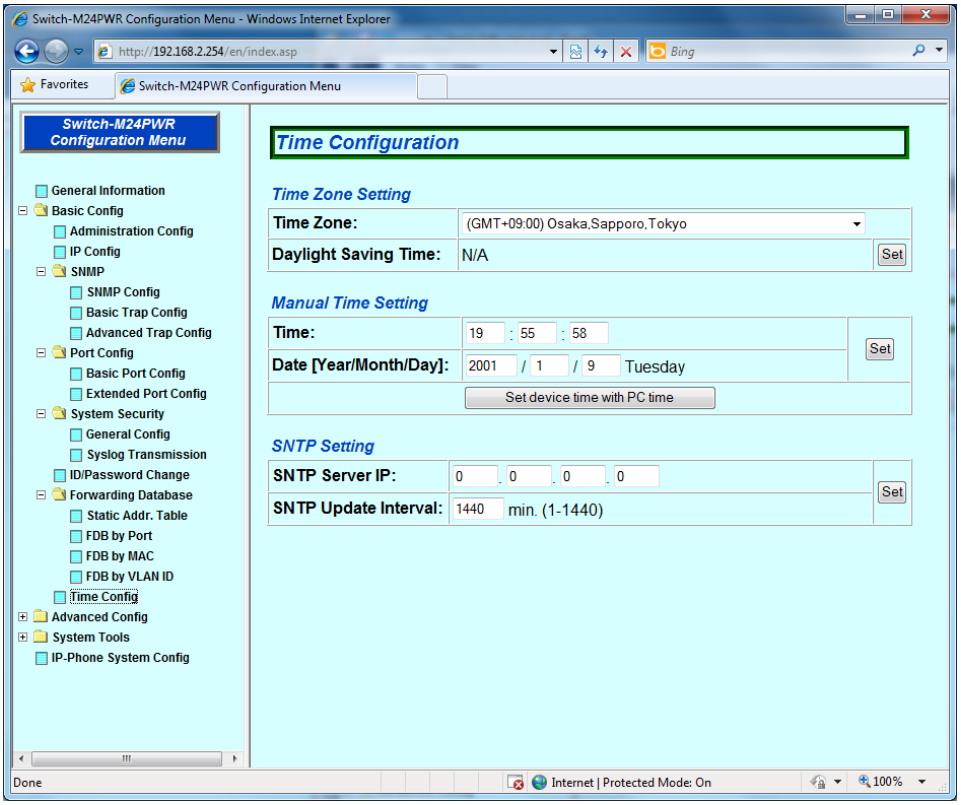


Fig. 4-1-15 Time Configuration

Screen Description

Time Zone	Shows time zone.
Daylight Saving Time	Shows application status of Daylight Saving (Summer time).
Time	Shows time of internal clock.
Date [Year/Month/Day]	Shows date of internal clock.
Set device time with PC time	Set the time with PC's time.
SNTP server IP	Shows an IP address of SNTP server that executes time synchronization.
SNTP Update Interval	Shows an interval of time synchronization with SNTP server.

Note: If SNTP server is located outside of firewall, connection with SNTP server may not be possible depending on settings by system administrator. For details, ask your system administrator.

4.2. Advanced Switch Configuration

4.2.1. VLAN Management

Select "Advanced Config," select “VLAN” and then select "VLAN Management." A screen, as shown in **Fig. 4-2-1**, appears. On this screen, you can configure VLAN-related settings.

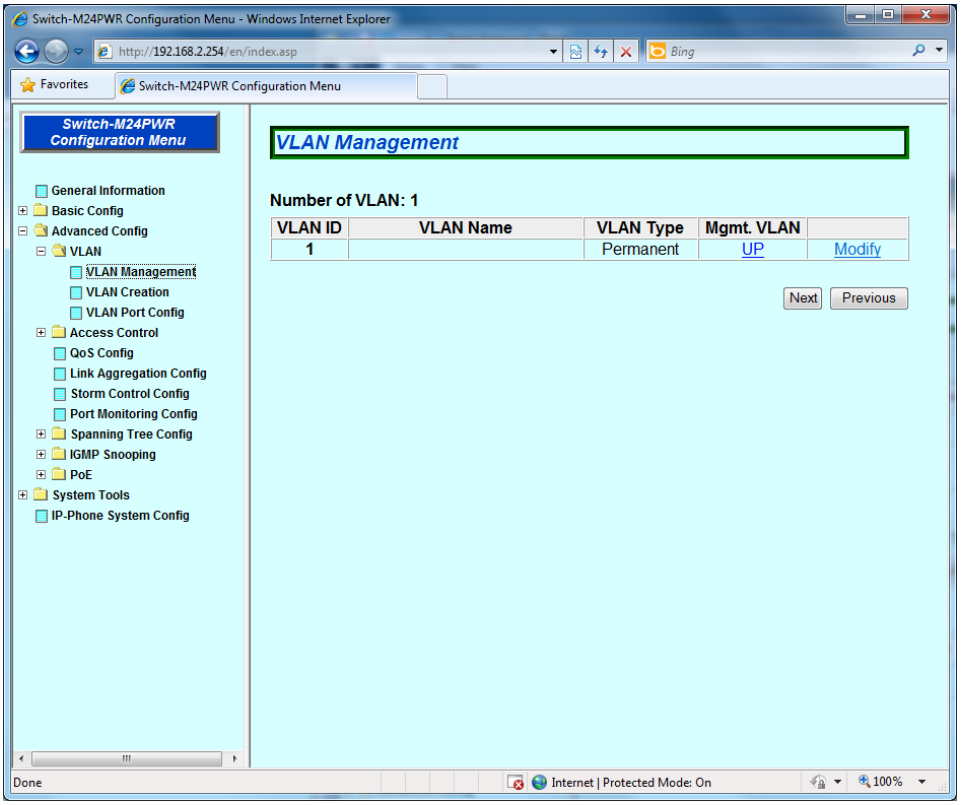


Fig. 4-2-1 VLAN Management

Screen Description

Number of VLAN	Shows the number of VLANs being configured on the Switching Hub.	
VLAN ID	Shows a VLAN ID of VLAN.	
VLAN Name	Shows a VLAN name being configured.	
VLAN Type	Shows a type of VLAN.	
	Permanent	Indicates that the VLAN is the one of initial setting. At least one VLAN must exist and this VLAN cannot be deleted.
	Static	Indicates that the VLAN is the newly configured one.
Mgmt. VLAN	Shows whether the VLAN is a management VLAN or not.	
	UP	Indicates that the VLAN is a management VLAN (which is able to communicate with CPU).
	DOWN	Indicates that the VLAN is not a management VLAN.

4.2.1.a. VLAN Modification

On the "VLAN Management" screen, select "Modify." A screen, as shown in **Fig. 4-2-1-a**, appears. On this screen, you can modify VLAN-related settings.

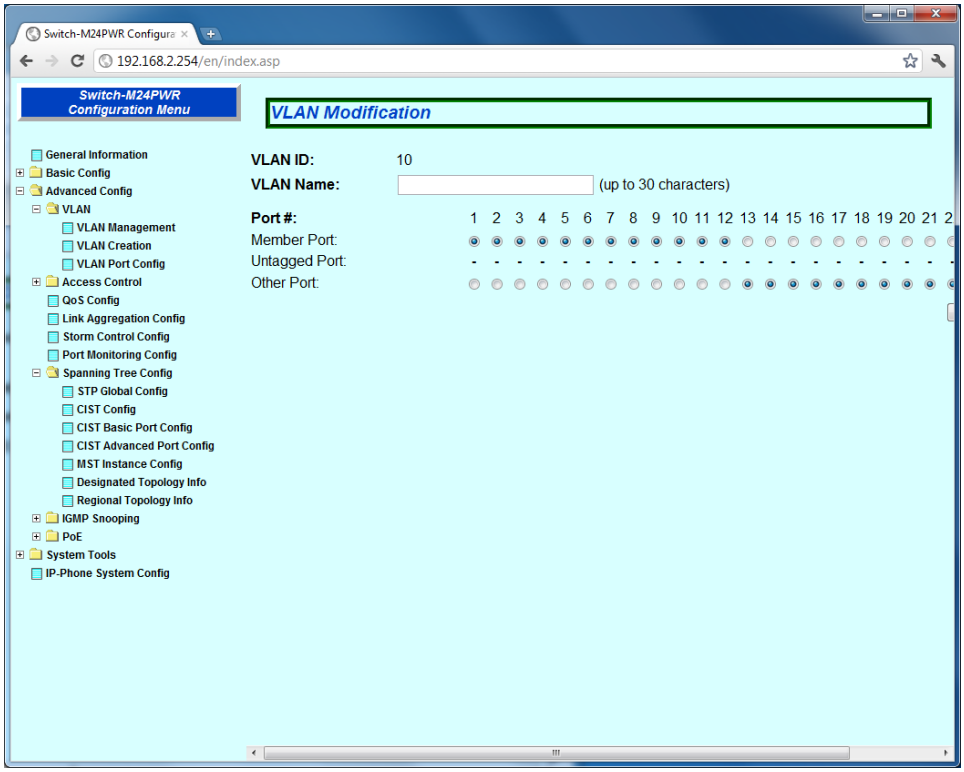


Fig. 4-2-1-a VLAN Modification Screen

Screen Description

VLAN ID	Shows the VLAN ID.
VLAN Name	Shows the VLAN name.
Member Port	Shows ports, belonging to the VLAN.
Untagged Port	Shows ports that do not use tags.
Other Port	Shows ports, not belonging to the VLAN.

4.2.2. VLAN Creation

Select "Advanced Config," select “VLAN” and then select "VLAN Creation." A screen, as shown in **Fig. 4-2-2**, appears. On this screen, you can create a new VLAN.

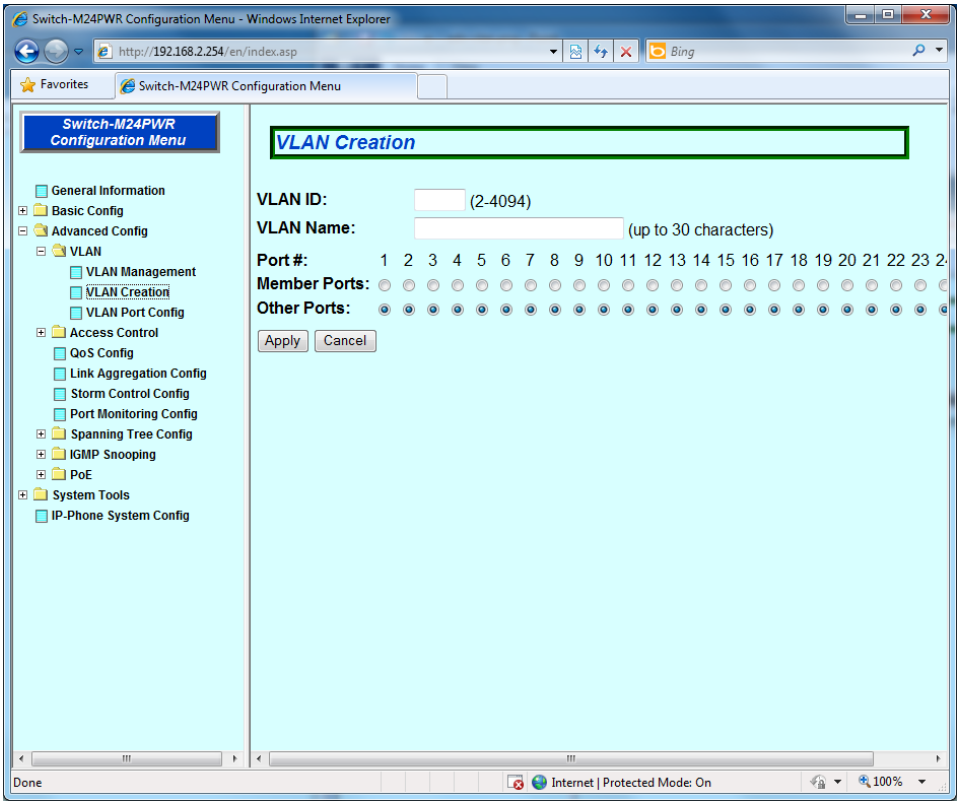


Fig. 4-2-2 VLAN Creation Screen

Screen Description

VLAN ID	Set the VLAN ID (VLAN Identifier).
VLAN Name	Set the name of VLAN.
Member Ports	Select ports to be added to the VLAN.
Other Ports	Select ports not to be added to the VLAN.

4.2.3. VLAN Port Configuration

Select "Advanced Config," select “VLAN” and then select "VLAN Port Config." A screen, as shown in **Fig. 4-2-3**, appears. On this screen, you can configure VLAN port settings.

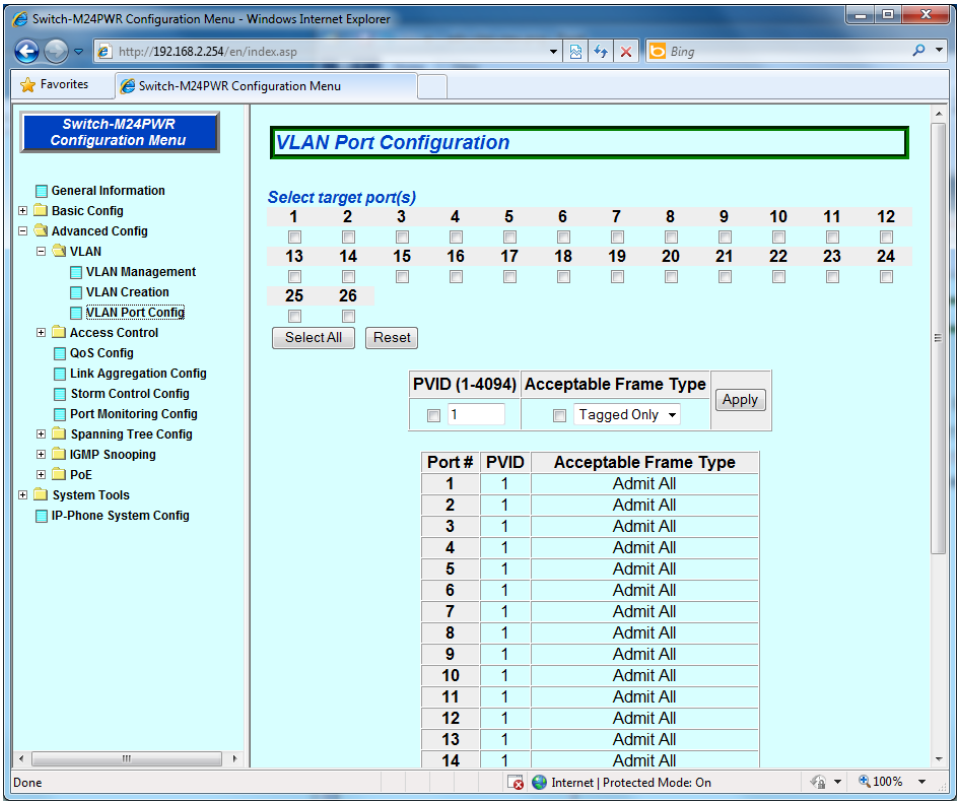


Fig. 4-2-3 VLAN Port Configuration

Screen Description

Port No.	Shows the port number.	
PVID	Shows the PVID (Port VLAN ID) being set to the port. PVID indicates VLAN ID to which an untagged packet should be forwarded when it is received. The factory default setting is 1. When a tagged packet is received, destination port will be determined according to the tag, regardless of PVID.	
Acceptable frame type	Indicates type of received frame. The factory default setting is "Admit All" for all ports.	
	Admit All	Receives all the frames.
	Tagged Only	Receives only the tagged frames.

4.2.4. Access Control Configuration(Classifier Configuration)

Select "Advanced Config," select “Access Control” and then select "Classifier." A screen, as shown in **Fig. 4-2-4**, appears. On this screen, you can set the classifier settings.

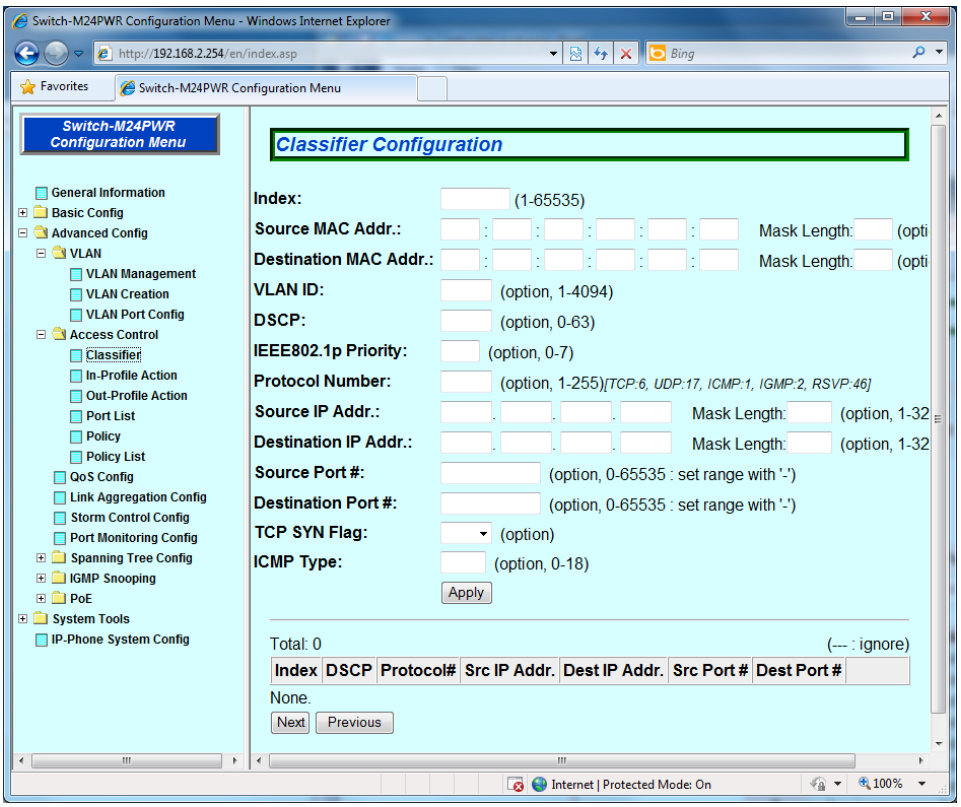


Fig. 4-2-4 Classifier Configuration

Screen Description

Index	Enter the index No. for the class.
Source MAC Addr.	Enter the MAC address of sender.
Destination MAC Addr.	Enter the MAC address of receiver.
VLAN ID	Enter a VLAN ID.
Source IP Addr.	Enter the IP address of sender.
Destination IP Addr.	Enter the IP address of receiver.
DSCP	Enter a DSCP value.
Protocol Number	Enter a protocol type.
Source Port #	Enter the source port number for TCP/UDP.
Destination Port #	Enter the destination port number for TCP/UDP.
IEEE802.1p Priority	Enter a priority of IEEE802.1p.
TCP SYN Flag	Enable/disable a TCP SYN flag filter.
ICMP Type	Enter an ICMP type.

4.2.5. Access Control Configuration (In-Profile Action Configuration)

Select "Advance Switch Configuration," select “Access Control” and then select "In-Profile Action." A screen, as shown in **Fig. 4-2-5**, appears. On this screen, you can configure In-Profile actions.

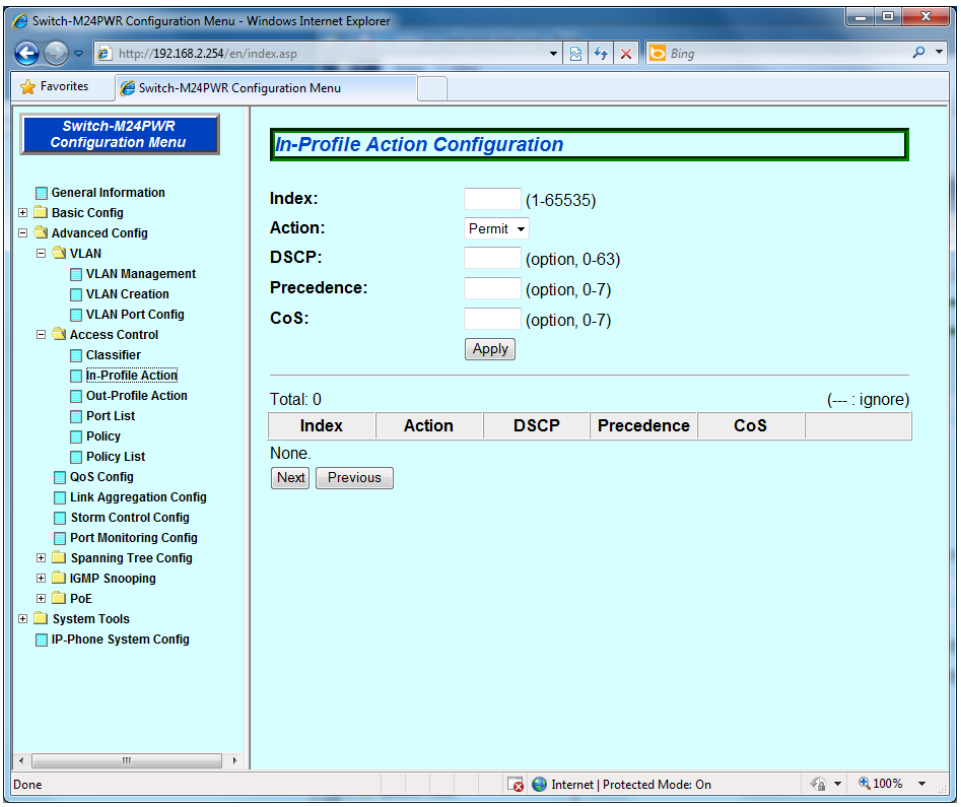


Fig. 4-2-5 In-Profile Action Configuration

Screen Description

Index	Shows the index number for the In-Profile action.
Action	Select an action to apply.
DSCP	Marks DSCP value.
Precedence	Marks precedence value.
CoS	Marks CoS value.

4.2.6. Access Control Configuration (Out-Profile Action Configuration)

Select "Advanced Config," select “Access Control” and then select "Out-Profile Action." A screen, as shown in **Fig. 4-2-6**, appears. On this screen, you can configure Out-Profile actions for Diffserv.

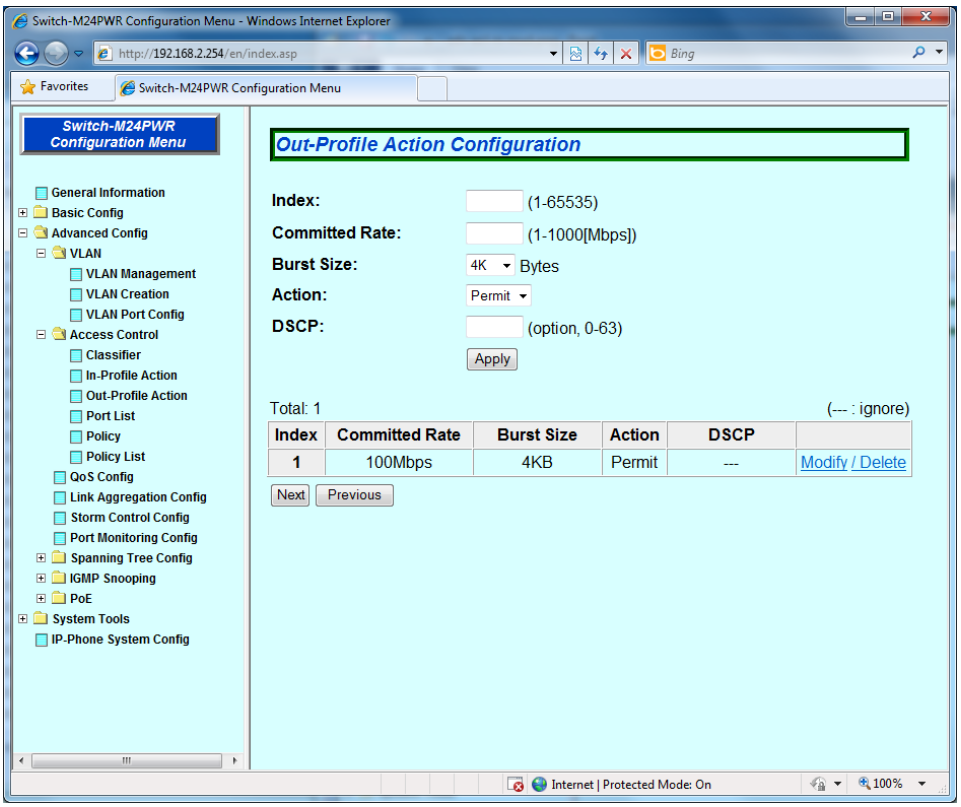


Fig. 4-2-6 Out-Profile Action Configuration

Screen Description

Index	Shows the index number for the Out-Profile action.
Committed Rate	Shows the packet buffer rate.
Burst size	Shows the maximum storage size in a token buffer. The burst size is either 4 K, 8 K, 32 K, or 64 K.
Action	Select an action to apply.
DSCP	Marks DSCP value.

4.2.7. Access Control Configuration(Port List Configuration)

Select "Advanced Config," select “Access Control” and then select "Port List." A screen, as shown in **Fig. 4-2-7**, appears. On this screen, you can configure a port list.

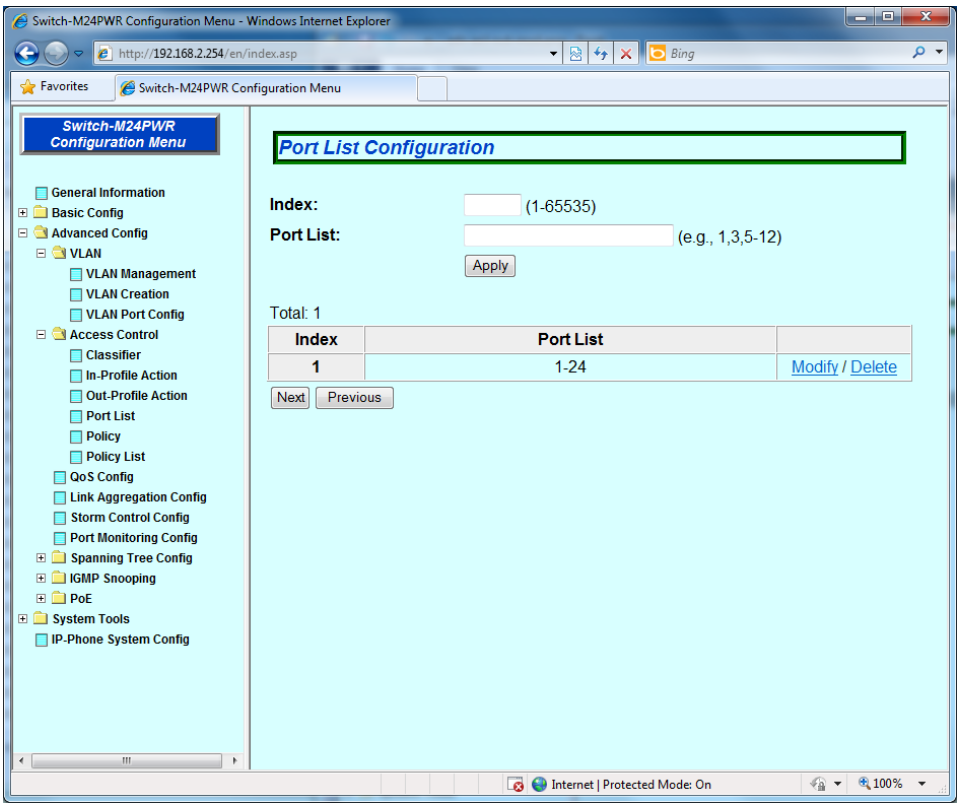


Fig. 4-2-7 Port List Configuration

Screen Description

Index	Shows the port list Index number.
Port List	Shows the port number in the port list.

4.2.8. Access Control Configuration(Policy Configuration)

Select "Advanced Config," select “Access Control” and then select "Policy." A screen, as shown in **Fig. 4-2-8**, appears. On this screen, you can configure the policy settings.

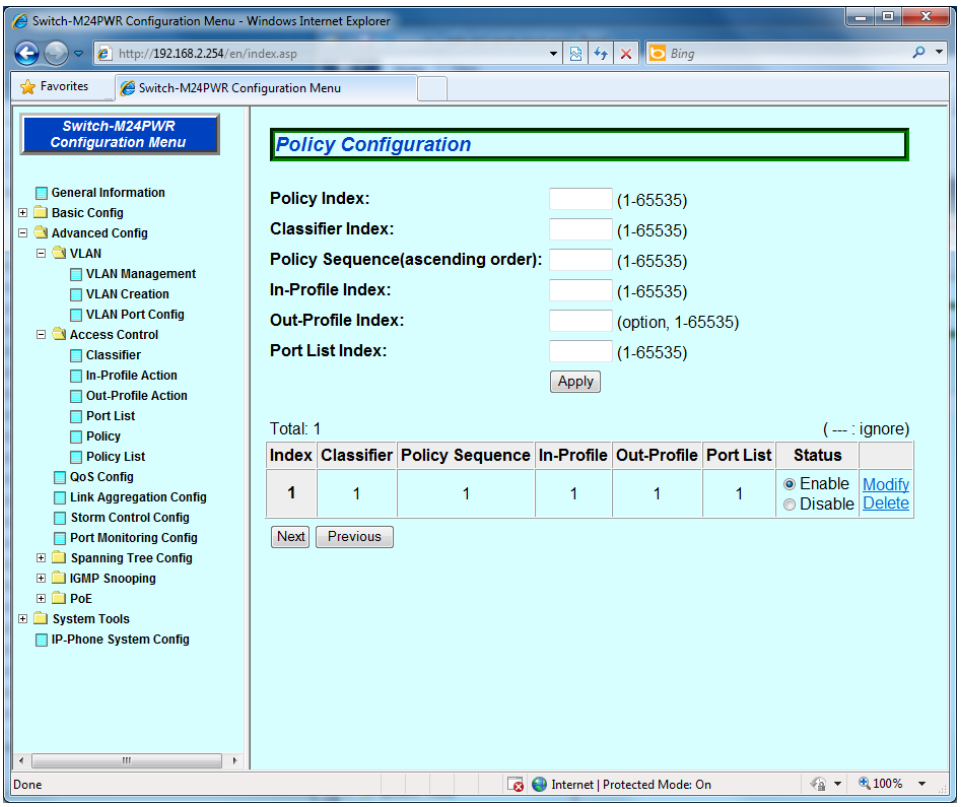


Fig. 4-2-8 Policy Configuration

Screen Description

Policy Index	Shows the policy index number.
Classifier Index	Shows the class index, created in the classifier configuration.
Policy Sequence	Shows the sequence number.
In-Profile Index	Shows the In-Profile action index, created in the In-Profile action configuration.
Out-Profile Index	Shows the Out-Profile action index, created in the Out-Profile action configuration.
Port List Index	Shows the port list index, created in the port list configuration.

4.2.9. Access Control Configuration(Policy List)

Select "Advanced Config," select “Access Control” and then select "Policy List." A screen, as shown in **Fig. 4-2-9**, appears. This screen shows policies and sequence numbers.

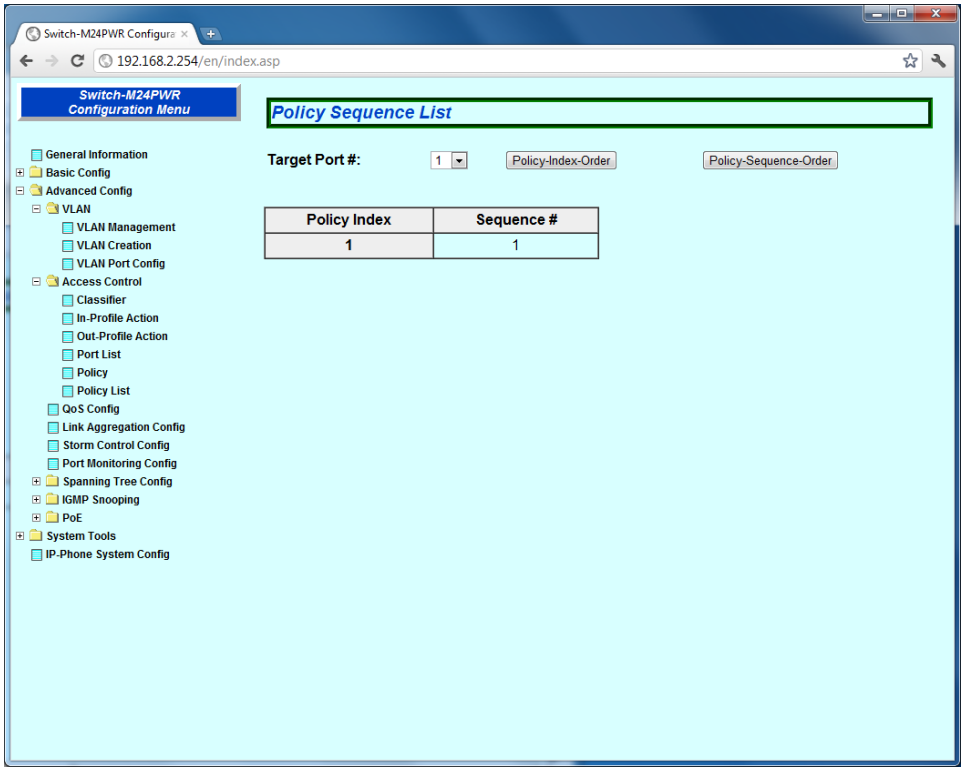


Fig. 4-2-9 Policy Sequence List

Screen Description

Target Port #	Select a port No. to view.
Policy-Index-Order	Shows configured policies, sorted by policy index.
Policy-Sequence-Order	Shows configured policies, sorted by sequence number.

4.2.10. QoS Configuration

Select "Advanced Config" and then select "QoS Config." A screen, as shown in **Fig. 4-2-10**, appears. On this screen, you can configure the QoS settings.

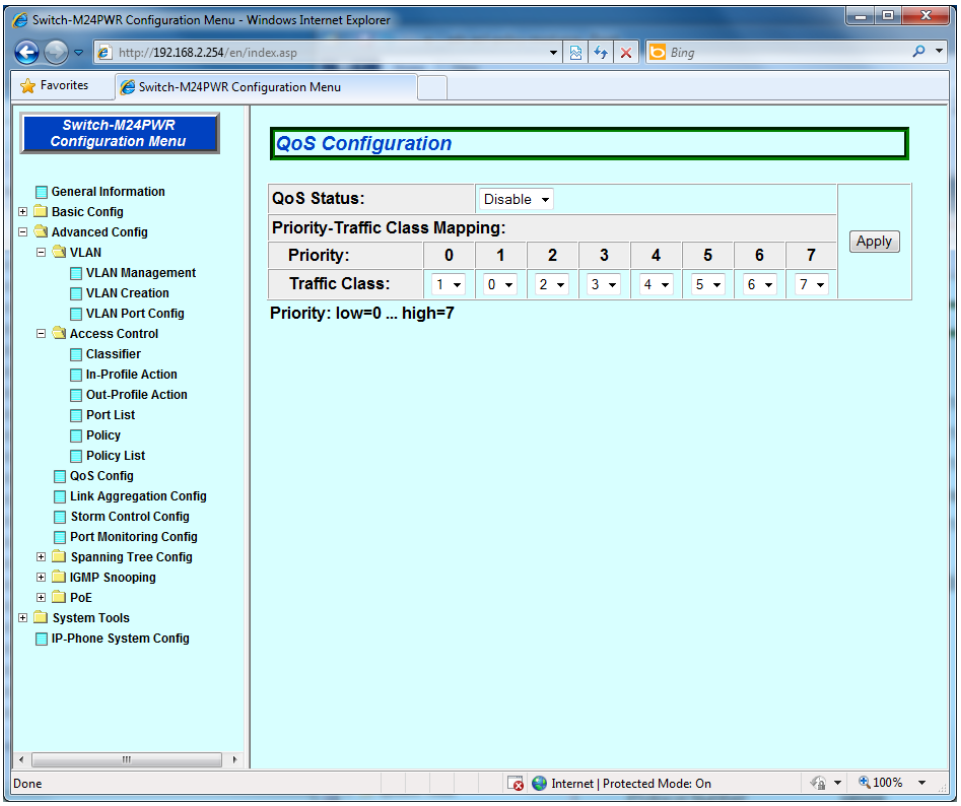


Fig. 4-2-10 QoS Configuration

Screen Description

QoS Status	Shows the status (enabled/disabled) of QoS function using IEEE802.1p. The factory default setting is "Disabled."	
	Enabled	QoS is enabled.
	Disabled	QoS is disabled.
Priority	Shows the priority value of the packet.	
Traffic Class	Shows the packet transmission priority.	

4.2.11. Link Aggregation Configuration

Select "Advanced Config" and then select "Link Aggregation Config." A screen, as shown in **Fig. 4-2-11**, appears. On this screen, you can configure the trunk group settings.

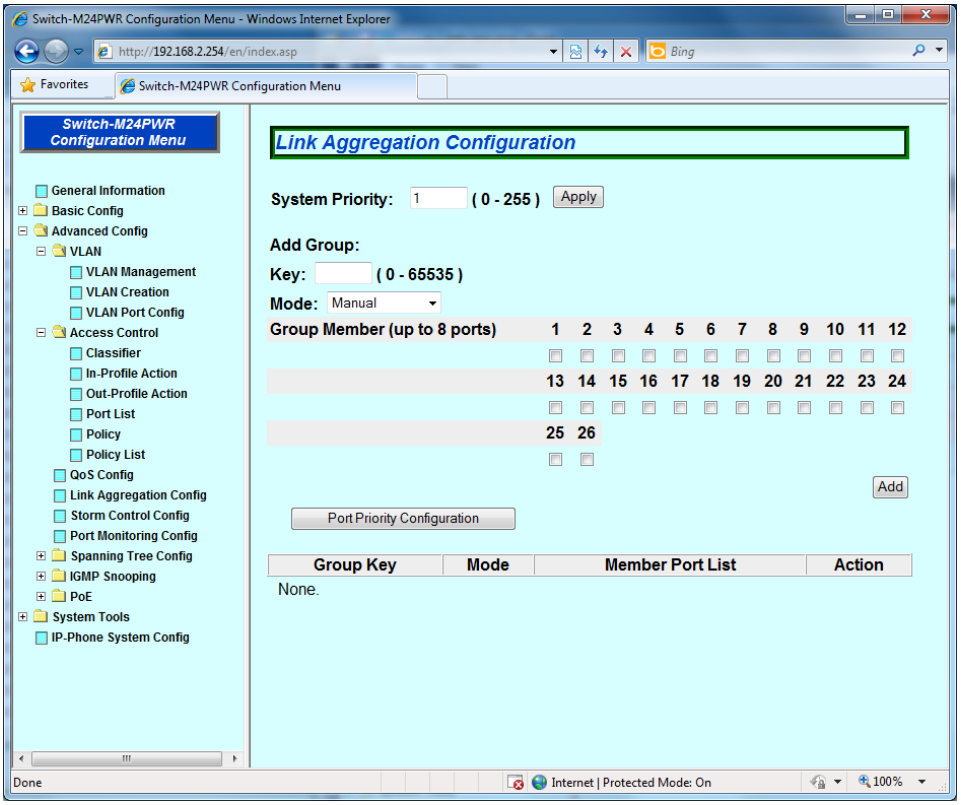


Fig. 4-2-11 Link Aggregation Configuration

Screen Description

System Priority	System priority is an order of priority in this Switching Hub required for constructing link aggregation on the network using LACP. Smaller number has higher priority. The factory default setting is 1.	
Key	Shows the group number of a link aggregation.	
Mode	Shows the operation mode of a link aggregation.	
	Active	Sends out LACP packet from this Switching Hub and constructs a link aggregation by negotiating with other side. The mode of the other side must be Active or Passive.
	Passive	Does not send out LACP packet from this Switching Hub and constructs a link aggregation by negotiating with other side using LACP packet received from other side. The mode of the other side must be Active.
	Manual	Constructs a link aggregation forcibly without using LACP packet. It is required that the other side is the same configuration as this side.
Group Member	Shows the port belonging to the link aggregation group.	

4.2.11.a. LACP Config Modification

Select "Advanced Config," select "Link Aggregation Config" and then click the "Modify" button for each group. A screen, as shown in **Fig. 4-2-11-a**, appears. On this screen, you can modify a link aggregation.

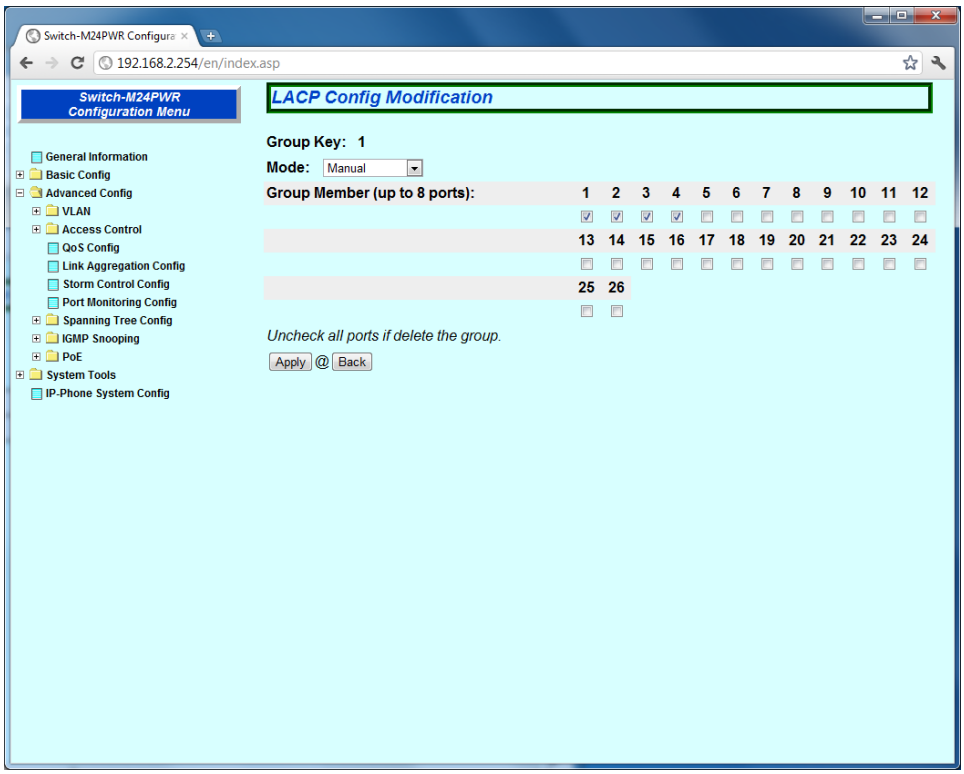


Fig. 4-2-11-a LACP Config Modification

Screen Description

Mode	Shows the operation mode of a link aggregation.	
	Active	Sends out LACP packet from this Switching Hub and constructs a link aggregation by negotiating with other side. The mode of the other side must be Active or Passive.
	Passive	Does not send out LACP packet from this Switching Hub and constructs a link aggregation by negotiating with other side using LACP packet received from other side. The mode of the other side must be Active.
	Manual	Constructs a link aggregation forcibly without using LACP packet. It is required that the other side is the same configuration as this side.
Group Member	Shows the port belonging to the link aggregation group.	

4.2.12. Port Priority Configuration

Select "Advanced Config," select "Link Aggregation Config" and then click the "Port Priority" button. A screen, as shown in **Fig. 4-2-12**, appears. On this screen, you can configure the port priority settings.

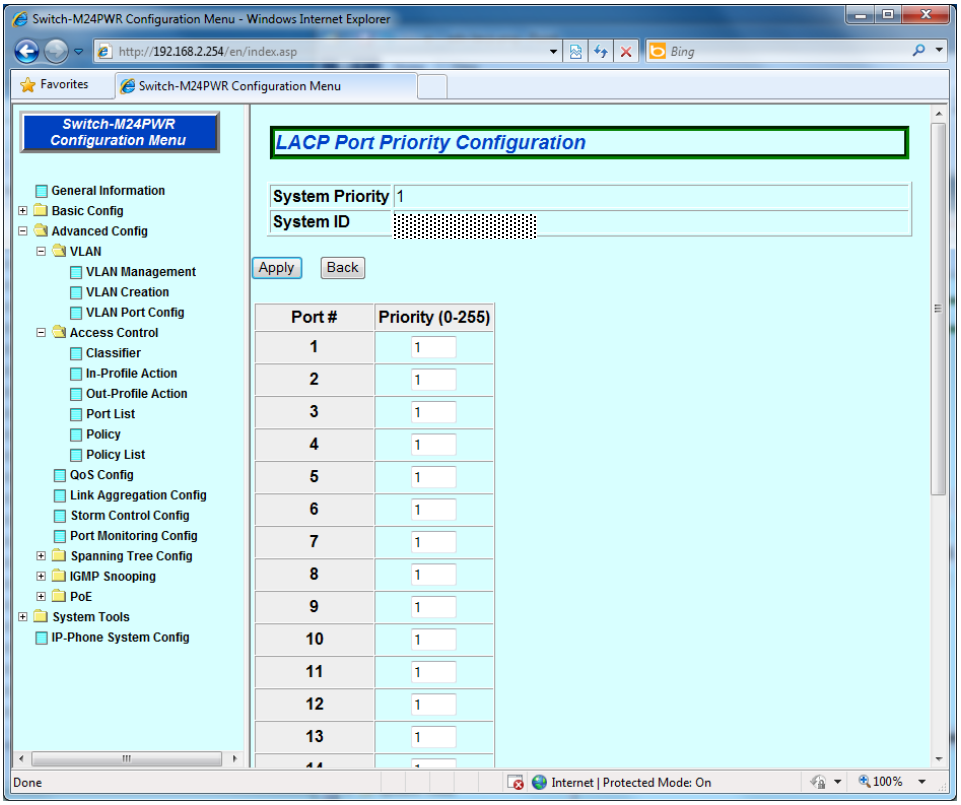


Fig. 4-2-12 Port Priority Configuration

Screen Description

System Priority	System priority is an order of priority in this Switching Hub required for constructing link aggregation on the network using LACP. Smaller number has higher priority. The factory default setting is 1.
System ID	System ID is an identifier of this Switching Hub required for constructing a link aggregation on the network using LACP. MAC Address of this Switching Hub becomes this System ID. It cannot be changed.
Port #	Shows the port number of this Switching Hub.
Priority	This is a priority order of this Switching Hub by port in link aggregation. Smaller number has higher priority. It is effective when configuring a trunking group of 9 ports or more. The factory default setting is 1 for all ports.

4.2.13. Storm Control Configuration

Select "Advanced Config" and then select "Storm Control Config." A screen, as shown in **Fig. 4-2-13**, appears. On this screen, you can configure the storm control settings.

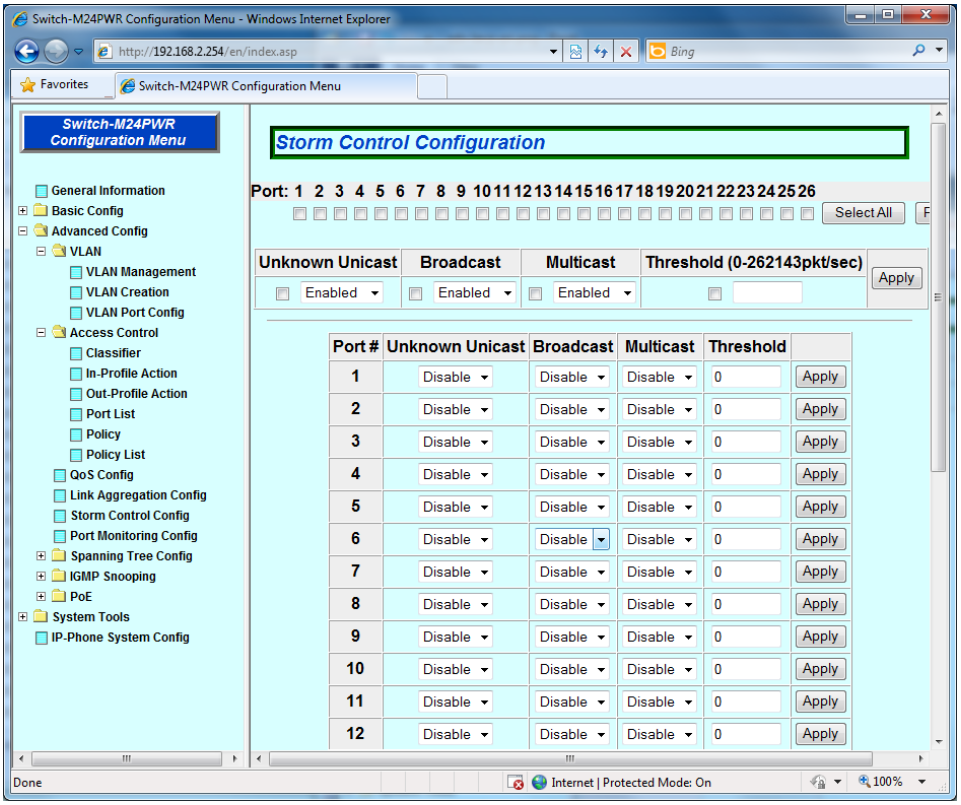


Fig. 4-2-13 Storm Control Configuration

Screen Description

Port #	Shows the port number.	
Unknown Unicast	Enables/disables the storm control for unknown unicast.	
	Enabled	The storm control for unknown unicast is enabled.
	Disabled	The storm control for unknown unicast is disabled. (Factory default setting)
Broadcast	Enables/disables the storm control for broadcast.	
	Enabled	The storm control for broadcast is enabled.
	Disabled	The storm control for broadcast is disabled. (Factory default setting)
Multicast	Enables/disables the storm control for multicast.	
	Enabled	The storm control for multicast is enabled.
	Disabled	The storm control for multicast is disabled. (Factory default setting)
Threshold	Shows the threshold value for the number of packets.	

4.2.14. Port Monitoring Configuration

Select "Advanced Config" and then select "Port Monitoring Config." A screen, as shown in **Fig. 4-2-14**, appears. On this screen, you can configure the port monitoring settings.

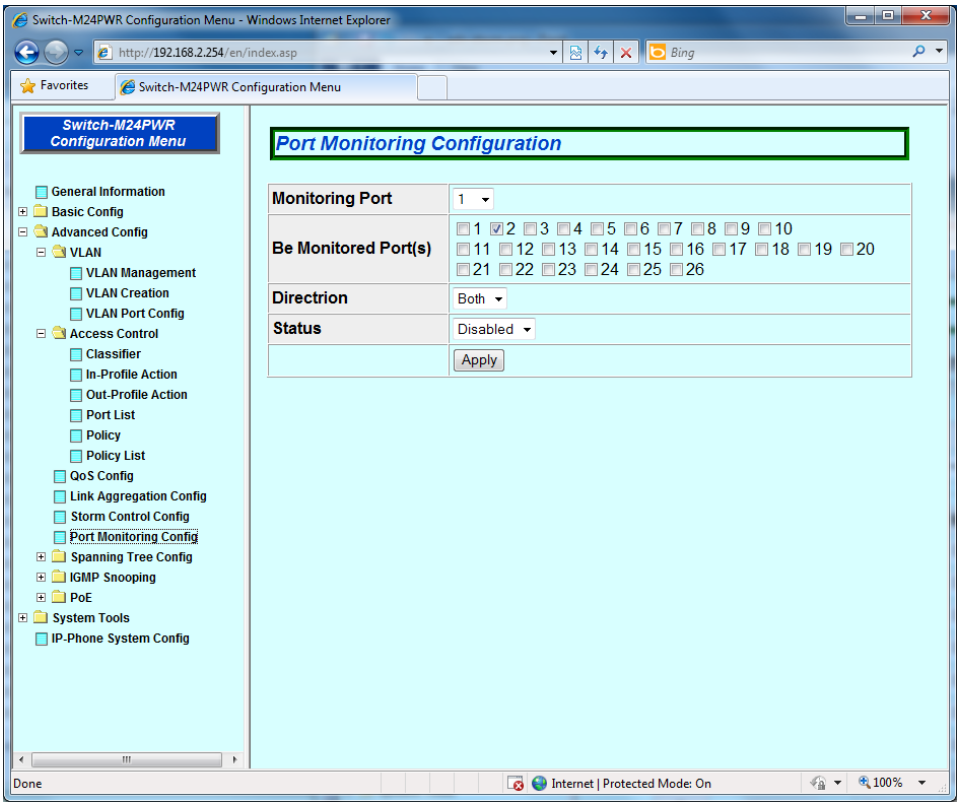


Fig. 4-2-14 Port Monitoring Configuration

Screen Description

Monitoring Port	Indicates a port number of a port that is possible to monitor other port's packet.	
Be Monitored Port(s)	Indicates a port number(s) of a port to be monitored.	
Direction	Indicates which packet should be monitored either the transmit packet or the receive packet of a monitored port. The factory default setting is "Both."	
	Tx	Monitors the transmit packet.
	Rx	Monitors the receive packet.
	Both	Monitors both of the transmit and receive packets.
Status	Indicates whether monitoring is underway or not. The factory default setting is "Disabled."	
	Enabled	Monitoring the packet is underway.
	Disabled	Monitoring the packet is not underway.

Note: VLAN tag of received VLAN ID is attached to a mirror packet in Tx-direction.

Note: Management packet such as Ping or ARP transmitted from this Switching Hub cannot be captured.

4.2.15. Spanning Tree Configuration (STP Global Configuration)

Select "Advanced Config," select “Spanning Tree Config” and then select "STP Global Configuration." A screen, as shown in **Fig. 4-2-15**, appears. On this screen, you can configure the basic settings of the spanning tree.

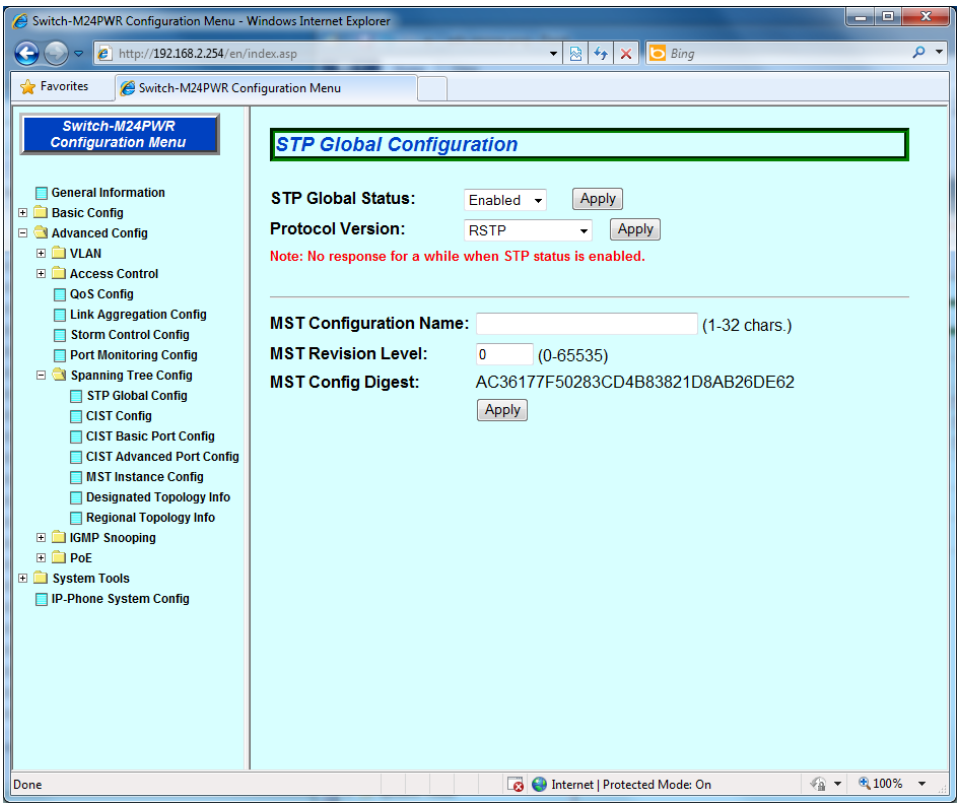


Fig. 4-2-15 STP Global Configuration

Screen Description

STP Global Status	Shows the operation status of Spanning Tree.	
	Enabled	The spanning tree is enabled.
	Disabled	The spanning tree is disabled. (Factory default setting)
Protocol Version	Shows a version of Spanning Tree.	
	STP-Compatible	Operates with IEEE802.1D compatible Spanning Tree Protocol.
	RSTP	Operates with IEEE802.1w compatible Rapid Spanning Tree Protocol.
	MSTP	Operates with IEEE802.1s compatible Multiple Spanning Tree Protocol.
MST Configuration name	Shows MST configuration name. No MST region name is set at default setting.	
MST Revision Level	Shows a revision of MST region setting. The factory default setting is 0.	
MST Config Digest	Shows a message digest of MST configuration. (Shows the list, associating MST instance and VLAN.)	

Note: When STP global status is changed to Enabled, the response is temporarily stopped.

4.2.15.a. CIST Configuration

Select "Advanced Config," select “Spanning Tree Config” and then select "CIST Configuration." A screen, as shown in **Fig. 4-2-16**, appears. On this screen, you can configure the basic settings of CIST.

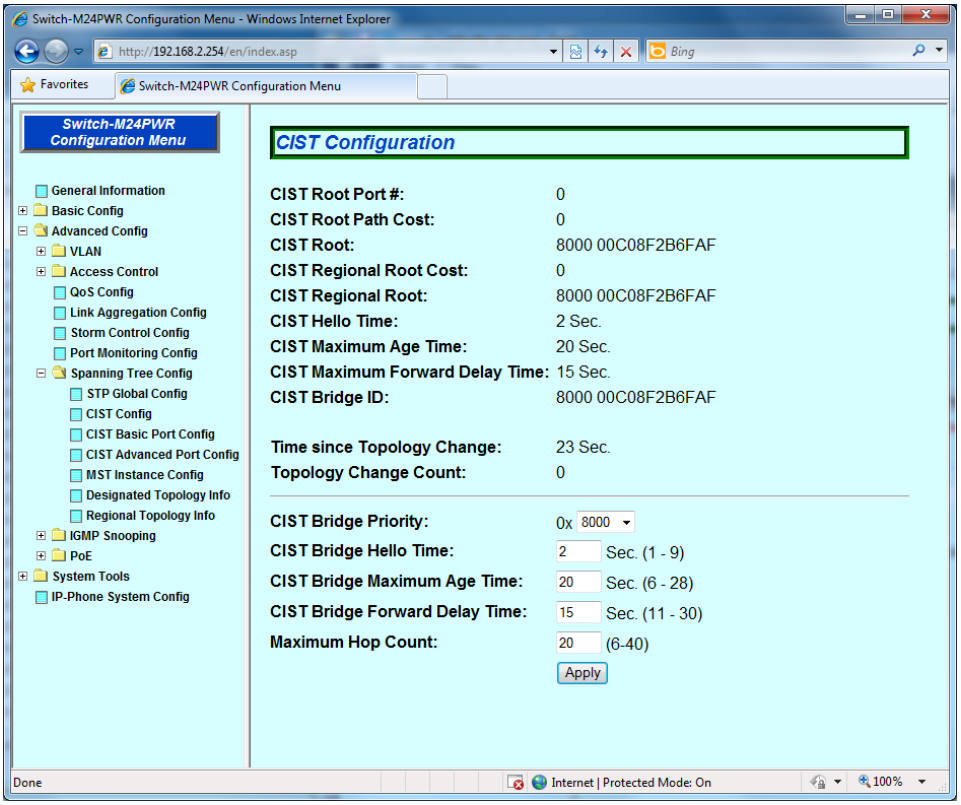


Fig. 4-2-16 CIST Configuration

Screen Description

CIST Root Port #	Shows the present root port.
CIST Root Path Cost	Shows a cost from the root port to root bridge.
CIST Root	Shows bridge ID of a root bridge.
CIST Regional Root Cost	Shows a path cost to a regional root bridge (root bridge of CIST tree in the MST region).
CIST Regional Root	Shows bridge ID of a regional root bridge (root bridge of CIST tree in the MST region).
CIST Hello Time	Shows an access interval with a root bridge for confirming the spanning tree configuration.
CIST Maximum Age Time	Shows a timeout period of the Hello message.
CIST Maximum Forward Delay Time	Shows transition time of spanning tree status, such as from Listening to Learning or Learning to Forwarding.
CIST Bridge ID	Shows bridge ID of the Switching Hub. Bridge ID is configured with bridge priority and MAC address. The factory default setting of the bridge priority is 8000.
Topology since Topology Change	Shows the elapsed time (sec.) since the configuration of spanning tree changed.
Topology Change Count	Shows the number of changes in configuration of spanning tree.
CIST Bridge Priority	Set the priority of the CIST bridge. The factory default setting of the bridge priority is 8000.
CIST Bridge Hello Time	Set the hello time when the Switching Hub becomes the root bridge. The factory default setting is 2 seconds.
CIST Bridge Maximum Age Time	Set the max aging time when the Switching Hub becomes the root bridge. The factory default setting is 20 seconds.
CIST Bridge Forward Delay Time	Set the forward delay time when the Switching Hub becomes the root bridge. The factory default setting is 15 seconds.
Maximum Hop Count	Set the maximum number of hops. The factory default setting is 20.

4.2.15.b. CIST Basic Port Configuration

Select "Advanced Config," select “Spanning Tree Config” and then select "CIST Basic Port Configuration." A screen, as shown, in **Fig. 4-2-17**, appears. On this screen, you can configure basic CIST settings by port.

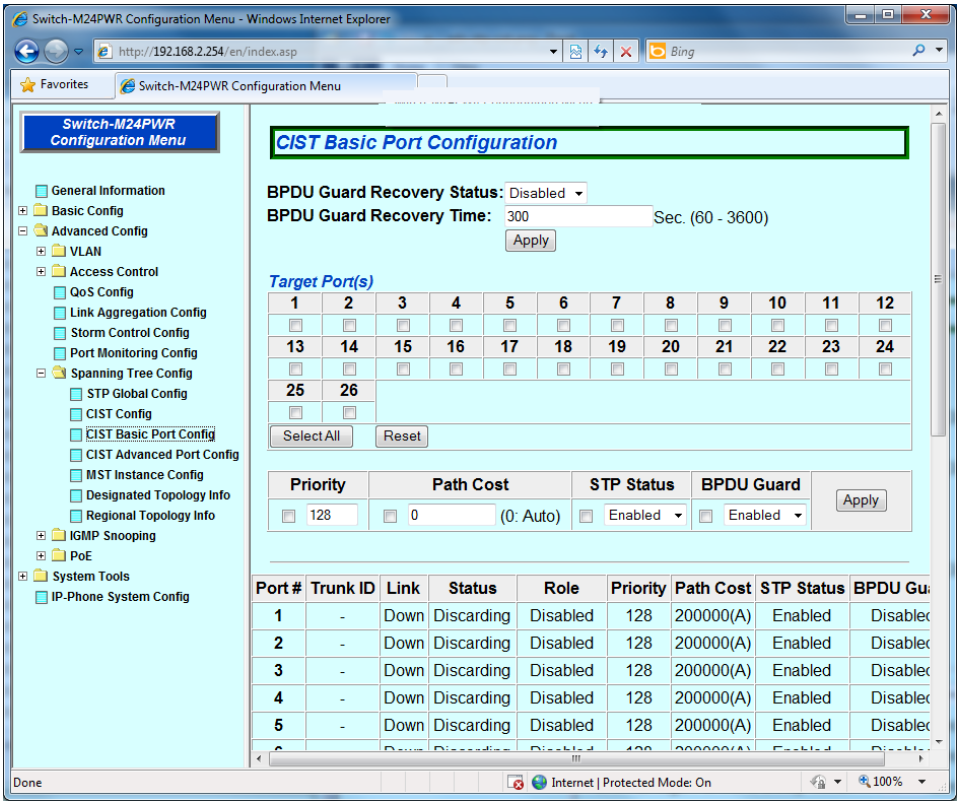


Fig. 4-2-17 CIST Basic Port Configuration

Screen Description

BPDU Guard Recovery Status	Enable/disable the auto-recovery function of BPDU guard. The factory default setting is "Disabled."	
	Enabled	Auto-recovery is enabled.
	Disabled	Auto-recovery is disabled.
BPDU Guard Recovery Time	Set the time to auto-recovery. The factory default setting is 300 seconds.	
Port #	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the state of link.	
	UP	Link is established successfully.
	DOWN	Link is not established.
Status	Shows the current port status.	
	Forwarding	Indicates normal communication status based on the calculation result.
	Learning	Indicates that calculation is being carried out based on information.
	Discarding	Indicates that calculation is not carried out.
Role	Shows the role of port in the spanning tree.	
	Designated	Operating as a designated port.
	Root	Operating as a root port.
	Alternate	Operating as an alternate port.
	Backup	Operating as a backup port.
	Disabled	STP is not working.
Priority	Shows priority of each port in the Switching Hub. Higher number has higher priority. The factory default setting is 128 for all ports. (A value must be a multiple of 16.)	
Path Cost	Shows the cost of each port. Ports 1-24 are set to 200000 and Ports 25-26 are set to 20000 at default setting.	
STP Status	Shows enable/disable of the spanning tree of each port.	
	Enabled	The spanning tree is enabled.
	Disabled	The spanning tree is disabled.
BPUD Guard	Shows enable/disable of the BPDU guard of each port. The factory default setting is "Disabled."	
	Enabled	The BPDU guard is enabled.
	Disabled	The BPDU guard is disabled.

4.2.15.c. CIST Advanced Port Configuration

Select "Advanced Config," select “Spanning Tree Config” and then select "CIST Advanced Port Configuration." A screen, as shown in **Fig. 4-2-18**, appears. On this screen, you can configure advance settings of CIST for each port.

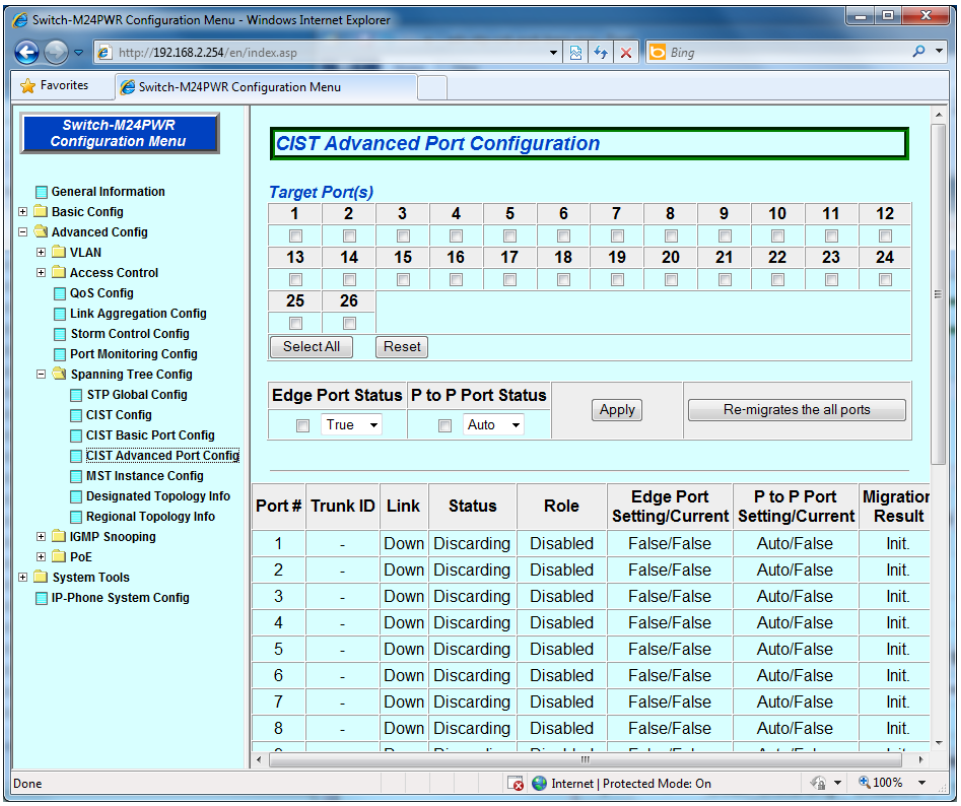


Fig. 4-2-18 CIST Advanced Port Configuration

Screen Description

Re-migrates the all ports	Restarts the spanning tree protocol negotiation for the selected port to re-detect.	
Port #	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the state of link.	
	UP	Link is established successfully.
	DOWN	Link is not established.
Status	Shows the current port status.	
	Forwarding	Indicates normal communication status based on the calculation result.
	Learning	Indicates that calculation is being carried out based on information.
	Discarding	Indicates that calculation is not carried out.
Role	Shows the role of port in the spanning tree.	
	Designated	Operating as a designated port.
	Root	Operating as a root port.
	Alternate	Operating as an alternate port.
	Backup	Operating as a backup port.
	Disabled	STP is not working.
Edge Port Setting/Current	Shows the setting of the edge port (a port that can transition to the forwarding state immediately) and the current status.	
	True	Can be set to the edge port.
	False	Cannot be set to the edge port.
P to P Port Setting/Current	Shows the setting of the Point-to-Point link of this Switching Hub and the current status.	
	Auto	Automatically recognized according to the port status. (Only Admin)
	True	P-to-P link is established.
	False	P-to-P link is not established.
Migration Result	Shows the current operation status of the spanning tree.	
	STP	STP is working.
	M/RSTP	MSTP or RSTP is working.
	Init.	STP is not working.

4.2.15.d. MST Instance Configuration

Select "Advanced Config," select “Spanning Tree Config” and then select "MST Instance Configuration." A screen, as shown in **Fig. 4-2-19**, appears. On this screen, you can configure the settings for spanning tree instances.

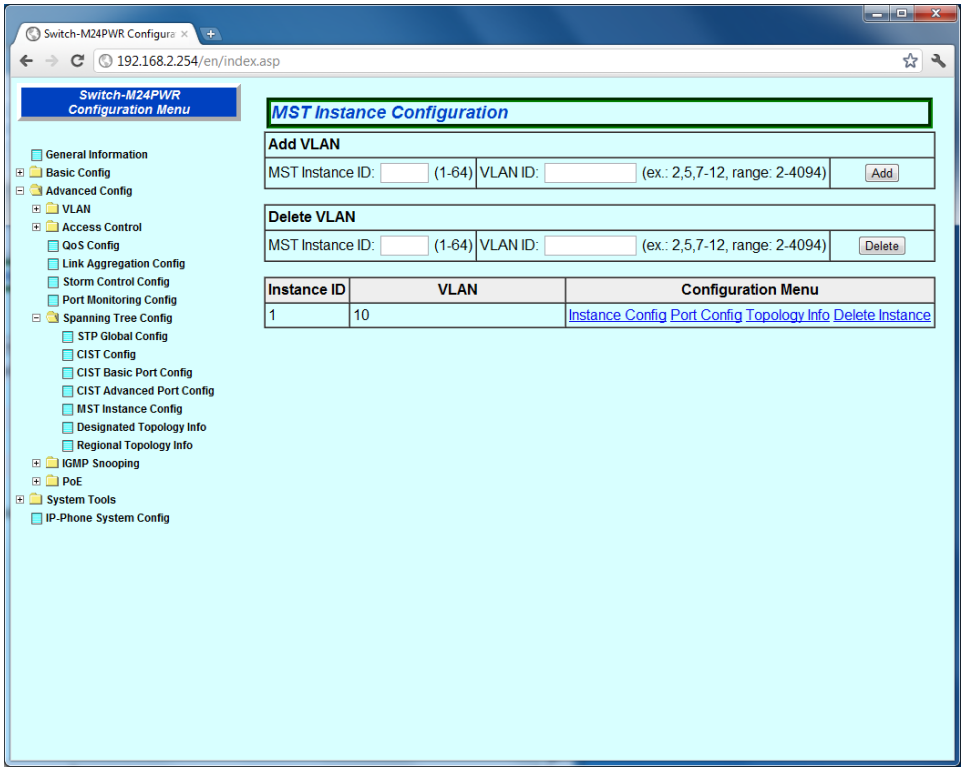


Fig. 4-2-19 MST Instance Configuration

Screen Description

Add VLAN	Add VLAN ID to be associated with MST instance.	
	MST Instance ID	Enter a target MST instance ID. If a target MST instance ID does not exist, a new MST instance ID is added.
	VLAN ID	Enter a VLAN ID to be associated with an MST instance ID.
Delete VLAN	MST Instance ID	Enter a target MST instance ID. Canceling all associations with VLAN IDs and the target MST instance ID deletes the MST instance ID.
	VLAN ID	Enter a VLAN ID to cancel its association with the MST instance ID.
Instance ID	Shows MST instance ID. No instance ID is created at default setting.	
Configuration Menu	Shows VLAN ID associated with MST instance.	

4.2.15.d.1. MST Instance Configuration (Configuration for Each Instance ID)

On the "MST Instance Configuration" screen, select "Instance Config." A screen, as shown in **Fig. 4-2-19-a**, appears. On this screen, you can configure the advanced settings of an MST instance.

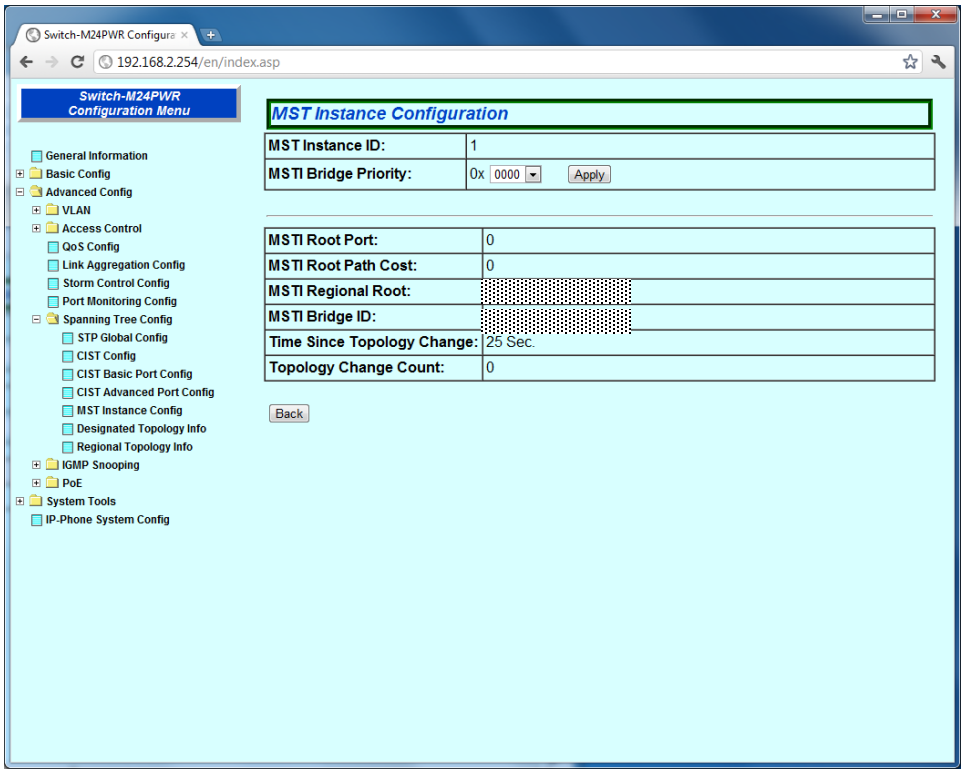


Fig. 4-2-19-a MST Instance Configuration

Screen Description

MST instance ID	Shows the target MST instance ID.
MSTI Bridge Priority	Select a bridge priority for the target MST instance. 0000 is set when a new MST instance is created.
MSTI Root Port	Shows a root port number of MST instance.
MSTI Root Path Cost	Shows a root path cost value of MST instance.
MSTI Regional Root	Shows bridge ID of the regional root bride of MST instance.
MSTI Bridge ID	Shows bridge ID of MST instance.
Topology Since Topology Change	Shows the elapsed time (sec.) since the configuration of spanning tree changed.
Topology Change Count	Shows the number of changes in configuration of spanning tree.

4.2.15.d.2. MST Instance Port Configuration

On the "MST Instance Configuration" screen, select "Port Config." A screen, as shown in **Fig. 4-2-19-b**, appears. On this screen, you can configure the MST instance settings for each port.

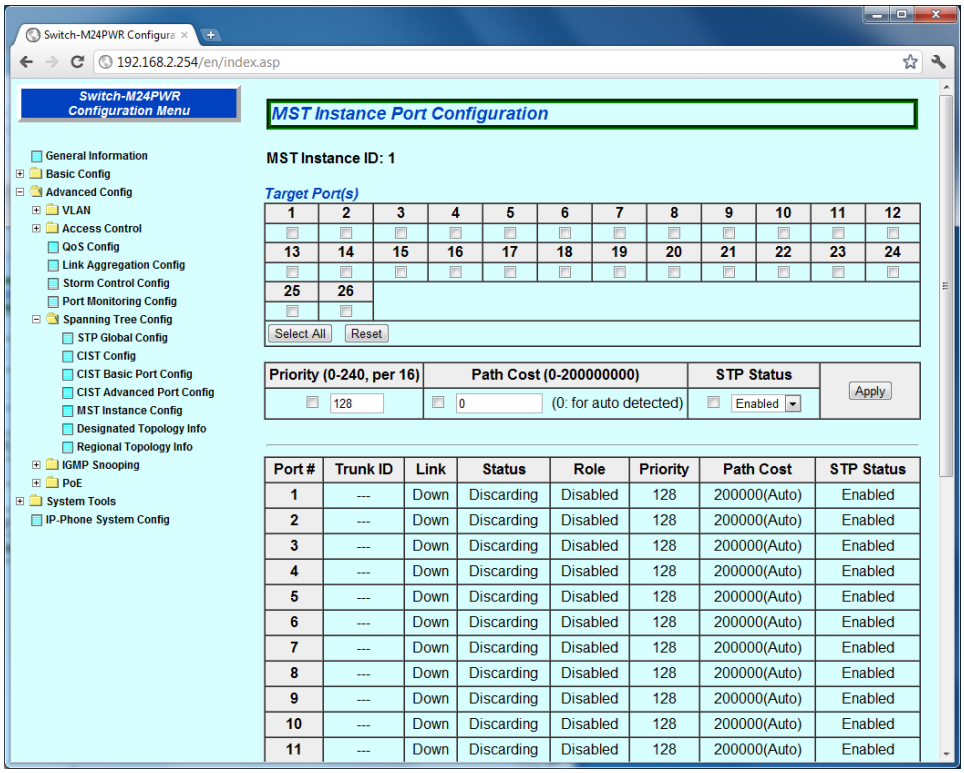


Fig. 4-2-19-b MST Instance Port Configuration

Screen Description

MST instance ID	Shows selected MST instance ID.	
Port No.	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the state of link.	
	UP	Link is established successfully.
	DOWN	Link is not established.
Status	Shows the current port status.	
	Forwarding	Indicates normal communication status based on the calculation result.
	Learning	Indicates that calculation is being carried out based on information.
	Discarding	Indicates that calculation is not carried out.
	N/A	Indicates that port is not associated with the selected MST instance.
Role	Shows the role of port in the spanning tree.	
	Designated	Operating as a designated port.
	Root	Operating as a root port.
	Alternate	Operating as an alternate port.
	Backup	Operating as a backup port.
	Disabled	STP is not working.
	N/A	Indicates that port is not associated with the selected MST instance.
Priority	Shows priority of each port in the Switching Hub. Higher number has higher priority. The factory default setting is 128 for all ports. (A value is a multiple of 16.)	
Path Cost	Shows the cost of each port. Ports 1-24 are set to 200000 and Ports 25-26 are set to 20000 at default setting.	
STP Status	Shows enable/disable of the spanning tree of each port.	
	Enabled	The spanning tree is enabled.
	Disabled	The spanning tree is disabled.
	N/A	Indicates that port is not associated with the selected MST instance.

4.2.15.d.3. MST instance Topology Information

On the "MST Instance Configuration" screen, select "Topology Info." A screen, as shown in **Fig. 4-2-19-c**, appears. This screen shows MST instance topology configurations.

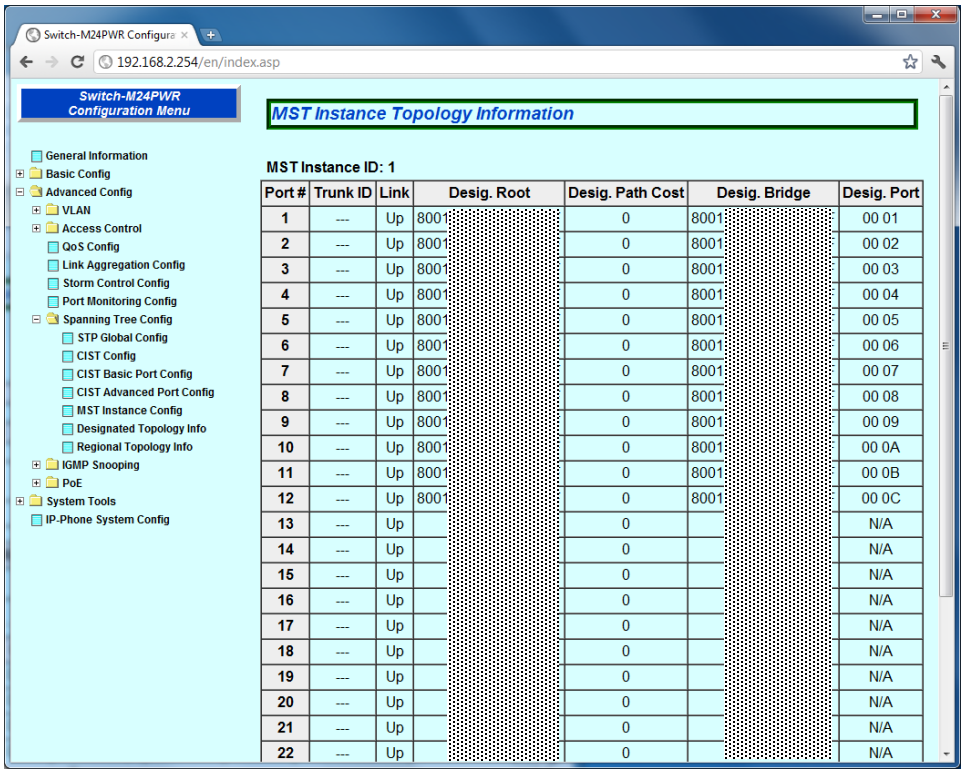


Fig. 4-2-19-c MST Instance Topology Information

Screen Description

MST instance ID	Shows selected MST instance ID.	
Port No.	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the state of link.	
	UP	Link is established successfully.
	DOWN	Link is not established.
Desig. Root	Shows root bridge ID.	
Desig. Cost	Shows cost under transmission.	
Desig. Bridge	Shows bridge ID of a designated bridge.	
Desig. Port	Shows port ID of a designated port. (Port ID is a combination of port priority value and port number.)	

4.2.15.e. Designated Topology Information

Select "Advanced Config," select “Spanning Tree Config” and then select "Designated Topology Information." A screen, as shown in **Fig. 4-2-20**, appears. This screen shows configuration information of the spanning tree for each port.

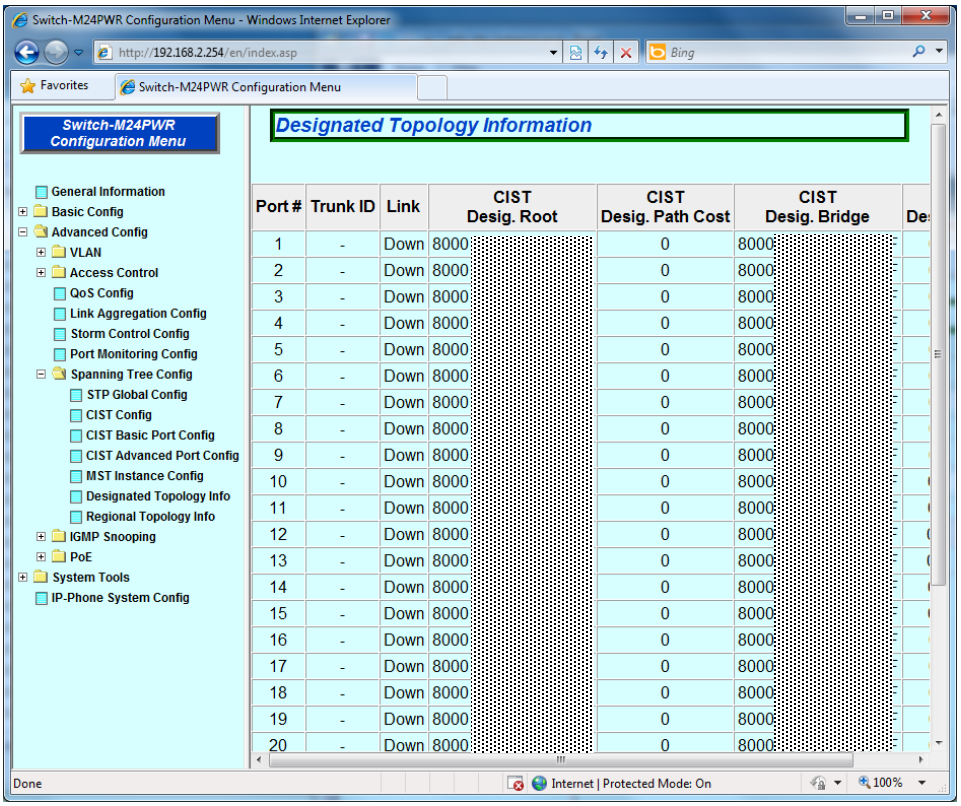


Fig. 4-2-20 Designated Topology Information

Screen Description

Port No.	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the state of link.	
	UP	Link is established successfully.
	DOWN	Link is not established.
Cist Desig. Root	Shows root bridge ID.	
Cist Desig. Cost	Shows cost under transmission.	
Cist Desig. Bridge	Shows bridge ID of a designated bridge.	
Cist Desig. Port	Shows port ID of a designated port. (Port ID is a combination of port priority value and port number.)	

4.2.15.f. Regional Topology Information

Select "Advanced Config," select “Spanning Tree Config” and then select "Regional Topology Information." A screen, as shown in **Fig. 4-2-21**, appears. This screen shows configuration information of the spanning tree for each port.

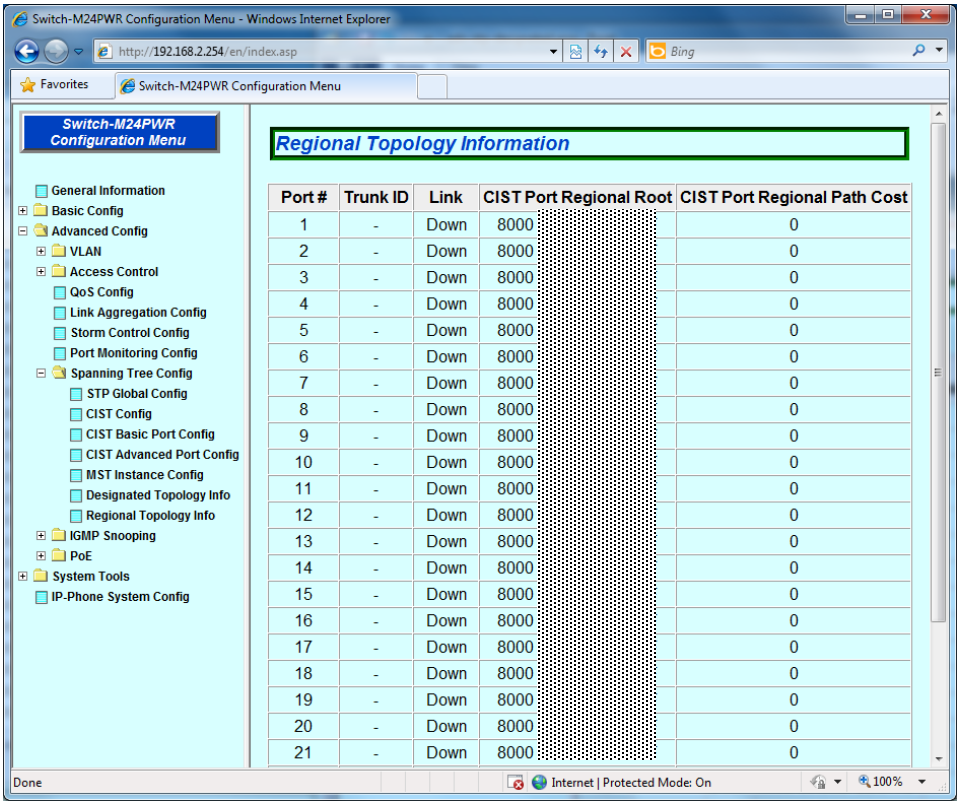


Fig. 4-2-21 Regional Topology Information

Screen Description

Port No.	Shows the port number.	
Trunk ID	Shows the group number (key) of the trunk if trunking is set.	
Link	Shows the link status.	
	UP	Link is established successfully.
	DOWN	Link is not established.
CIST port Regional Root	Shows root bridge ID.	
CIST Port Regional Path Cost	Shows cost under transmission.	

4.2.16. IGMP Snooping Configuration

Select "Advanced Config," select “IGMP Snooping” and then select "IGMP Snooping Config." A screen, as shown in **Fig. 4-2-22**, appears. On this screen, you can configure the IGMP snooping settings.

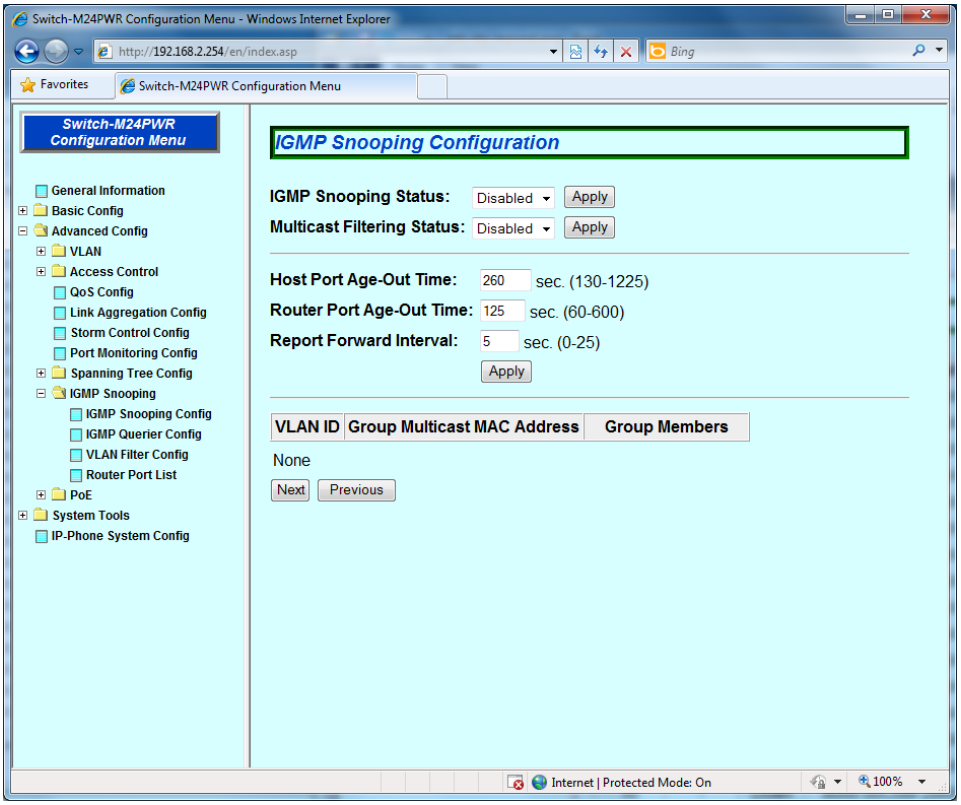


Fig. 4-2-22 IGMP Snooping Configuration

Screen Description

IGMP Snooping Status	Shows whether IGMP Snooping is enabled or disabled.	
	Enabled	IGMP snooping is enabled.
	Disabled	IGMP snooping is disabled.
Multicast Filtering Status	Shows whether the multicast filtering function is enabled or disabled.	
	Enabled	The multicast filtering function is enabled.
	Disabled	The multicast filtering function is disabled.
Host Port Age-Out Time	Shows the time between leaving a multicast group and automatically opening the port. The factory default setting is 260 seconds.	
Router Port Age-Out Time	Shows the time before the router port is automatically opened. The factory default setting is 5 seconds.	
Report Forward Interval	Shows the Proxy Report waiting time.	
VLAN ID	Shows the VLAN ID of the multicast group.	
Group Multicast MAC Address	Shows the MAC address of the multicast group.	
Group Members	Shows member ports of the multicast group.	

4.2.16.a. IGMP Querier Configuration

Select "Advanced Config," select “IGMP Snooping” and then select "IGMP Querier Config." A screen, as shown in **Fig. 4-2-23**, appears. On this screen, you can configure the IGMP querier settings.

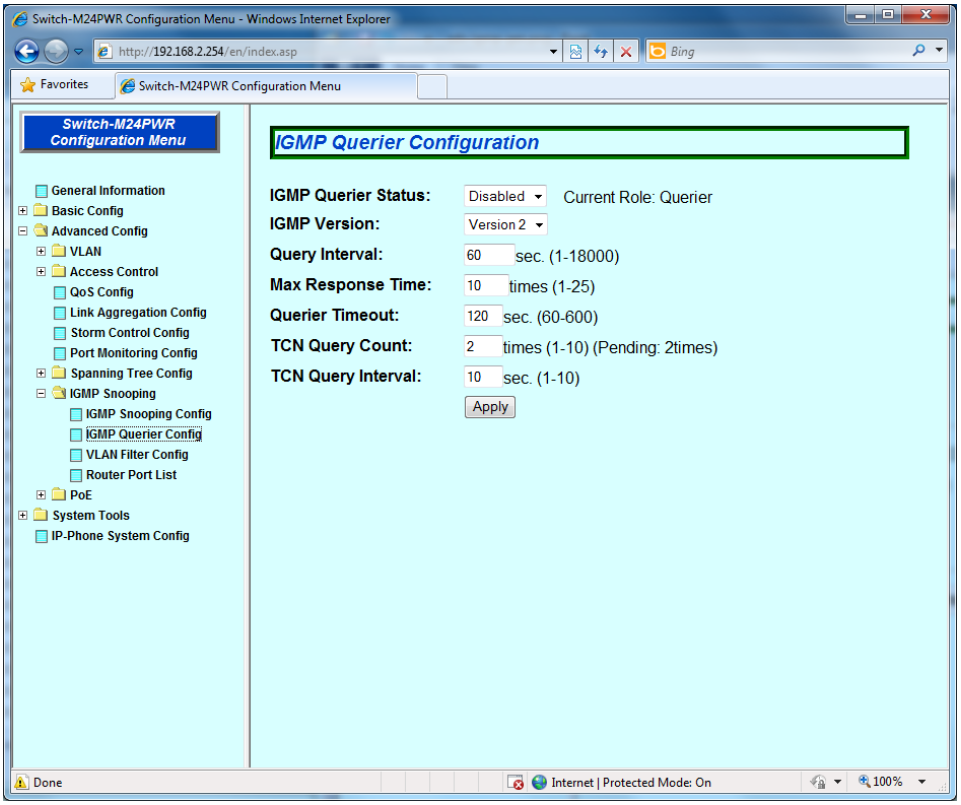


Fig. 4-2-23 IGMP Querier Configuration

Screen Description

IGMP Querier Status	Shows whether IGMP Querier is enabled or disabled.	
Current Role	Shows the IGMP querier status.	
	Querier	This Switching Hub is the current Querier.
	None	Since there is another device that sends queries, this Switching Hub has stopped sending queries.
IGMP Version	Shows the version of IGMP queries to be sent.	
Query Interval	Shows the query sending interval.	
Max Response Time	Shows the time to wait for a response to a query.	
Querier Timeout	Shows the time before determining that there is no longer another querier.	
TCN Query Count	Shows the number of queries sent when an STP topology change is made.	
TCN Query Interval	Shows the interval of sending queries when an STP topology change is made.	

4.2.16.b. VLAN Filter Configuration

Select "Advanced Config," select “IGMP Snooping” and then select "VLAN Filter Config." A screen, as shown in **Fig. 4-2-24**, appears. On this screen, you can configure the VLAN filter settings of the IGMP snooping function.

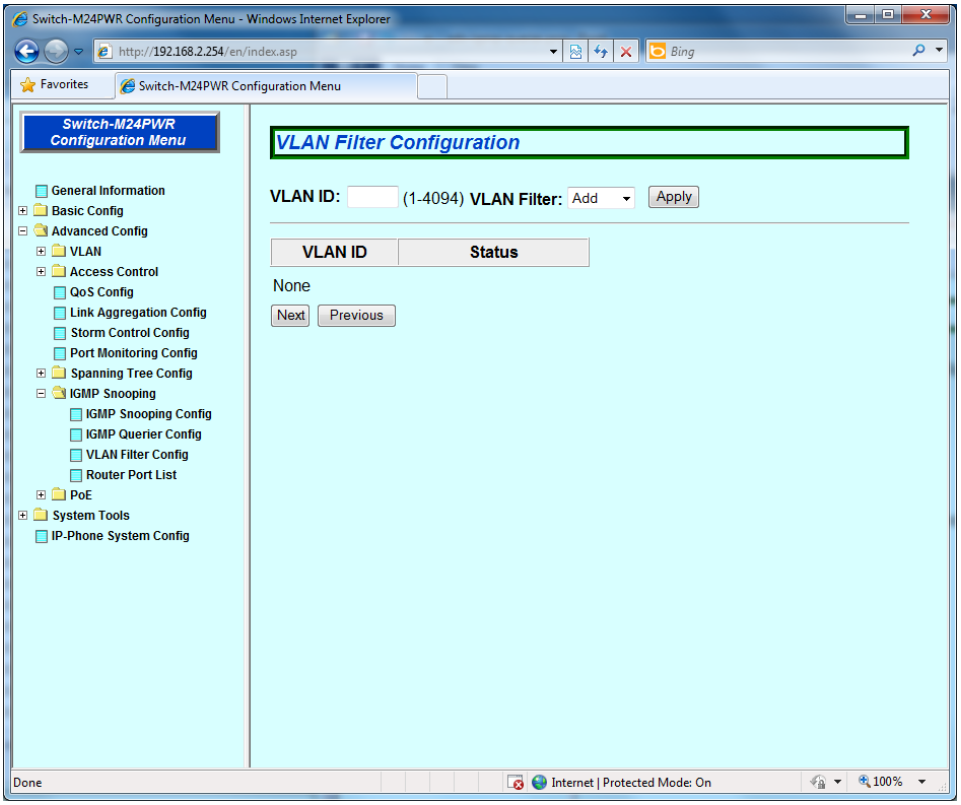


Fig. 4-2-24 VLAN Filter Configuration

Screen Description

VLAN ID	Shows the VLAN ID.
Status	Shows the filter status.

4.2.16.c. Router Port List

Select "Advanced Config," select “IGMP Snooping” and then select "Router Port List." A screen, as shown in **Fig. 4-2-25**, appears. This screen shows the router port table.

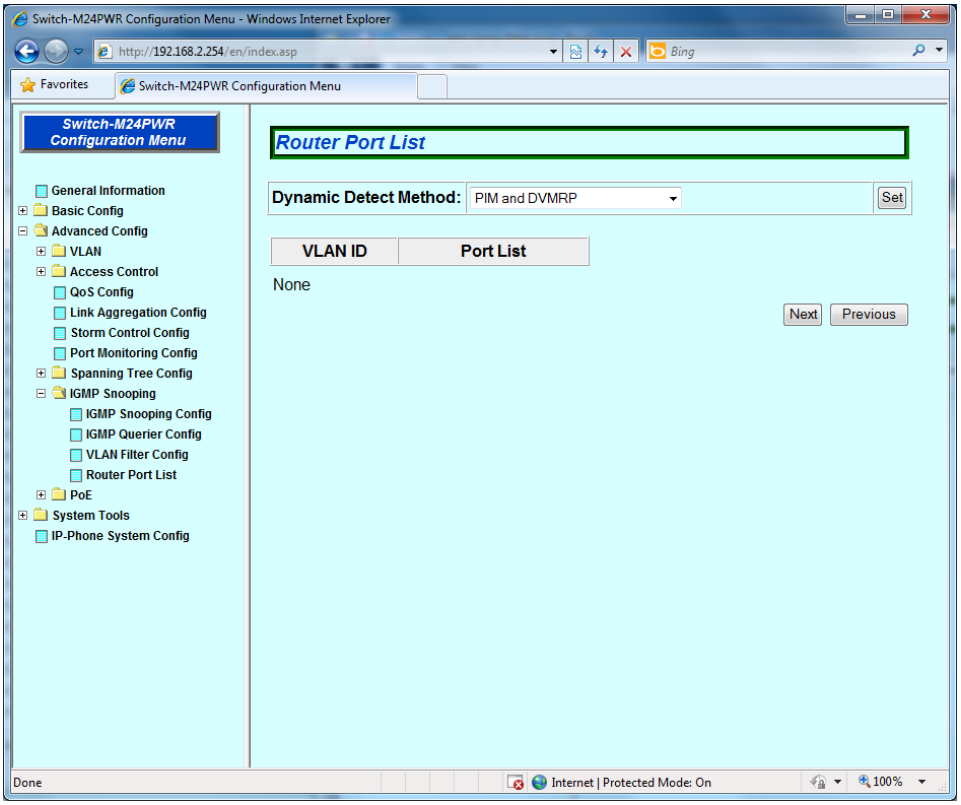


Fig. 4-2-25 Router Port List

Screen Description

Dynamic Detect Method	Shows the method to learn a router port. The factory default setting is "PIM and DVMRP."	
	PIM and DVMRP	Learns by using PIM or DVMRP.
	IGMP Query	Learns by using IGMP Query.
	PIM, DVMRP, and IGMP Query	Learns by using the methods above.
VLAN ID	Shows the VLAN ID.	
Port List	Shows the port list.	

4.2.17. PoE Global Configuration

Select "Advanced Config," select “PoE” and then select "PoE Global Config." A screen, as shown in **Fig. 4-2-26**, appears. On this screen, you can configure the general settings of the PoE function.

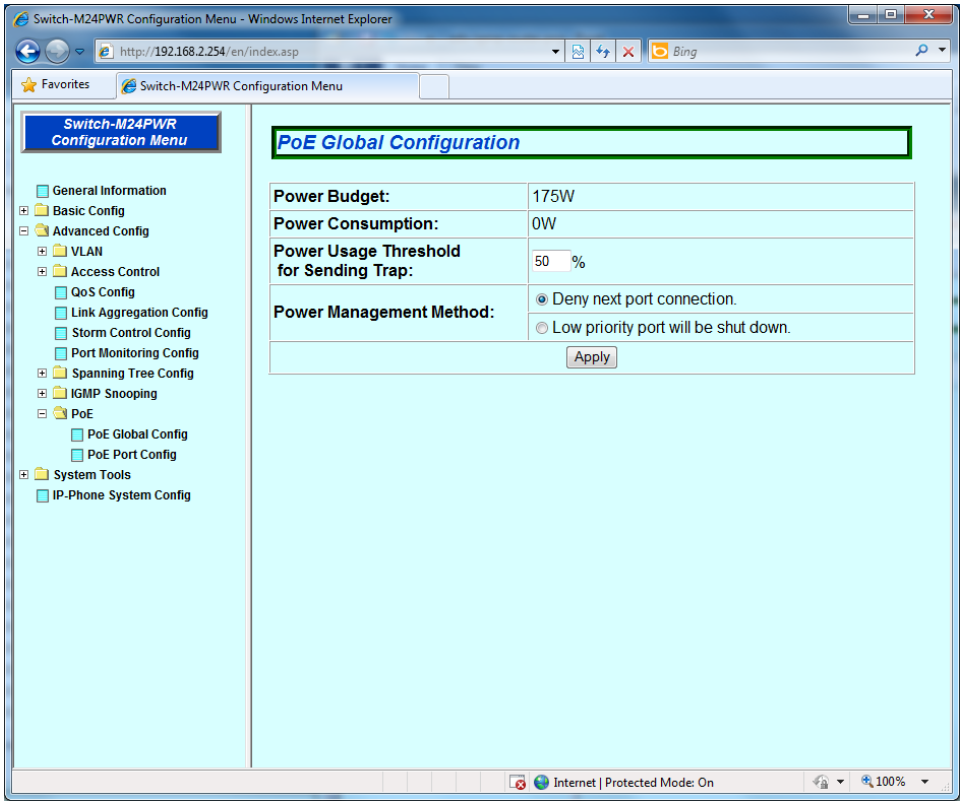


Fig. 4-2-26 PoE General Configuration

Screen Description

Power Budget	Shows the maximum amount of power this Switching Hub can supply.
Power Consumption	Shows the amount of power, currently supplied by this Switching Hub.
Power Usage Threshold for Sending Trap	Shows the power supply threshold for sending a trap.
Power Management Method	Shows the power supply management method. The factory default setting is "Deny next port connection."

4.2.17.a. PoE Port Configuration

Select "Advanced Config," select “PoE” and then select "PoE Port Config." A screen, as shown in **Fig. 4-2-27**, appears. On this screen, you can configure the power supply settings for each port.

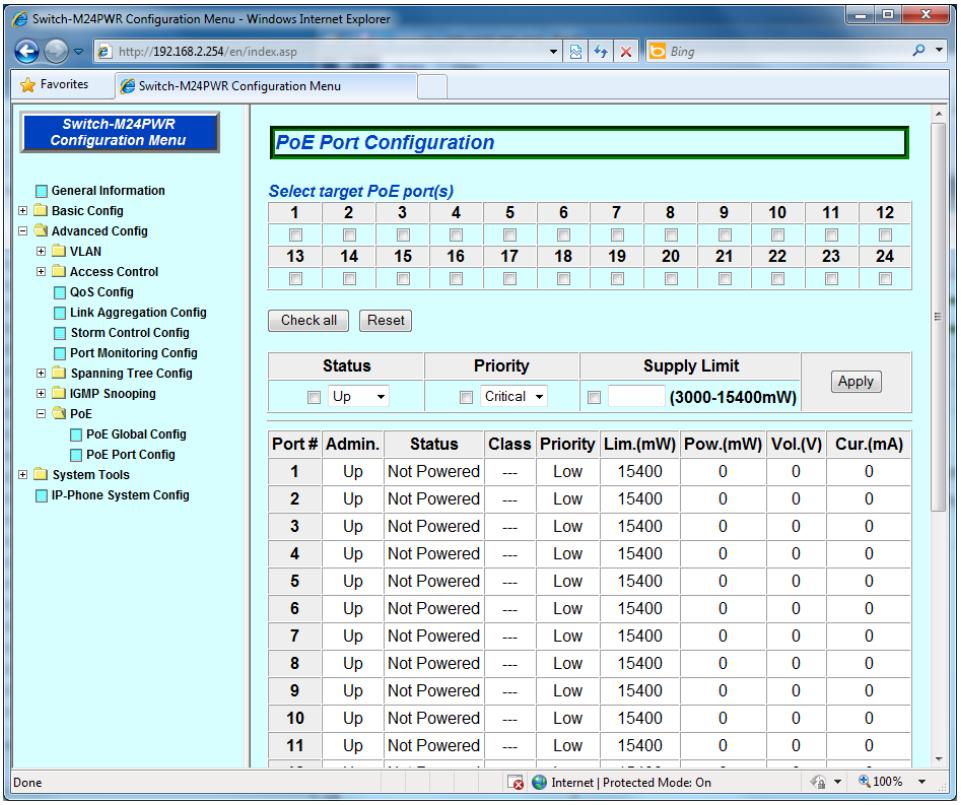


Fig. 4-2-27 PoE Port Configuration

Screen Description

Port #	Shows the port number.	
Admin.	Shows whether power can be supplied or not.	
	Up	Power can be supplied.
	Down	Power cannot be supplied.
Status	Show the power supply status.	
	Powered	Indicates that power is supplied.
	Not Powered	Indicates that power is not supplied.
	Overload	Indicates that power exceeding the limit is supplied.
Class	Shows the class detected by the classification function.	
Priority	Shows the power supply priority.	
	Critical	Indicates that top priority is given.
	High	Indicates that priority second to Critical is given.
	Low	Shows that the lowest priority is given.
Lim. (mW)	Shows the upper limit of power supply amount. (in units of 200 mW)	
Power (mW)	Shows the amount of power supply. (in units of 100 mW)	
Vol. (V)	Shows the voltage.	
Cur. (mA)	Shows the current.	

4.3. System Tools

4.3.1. Software Update

Select “System Tools” and then select "Software Update." A screen, as shown in **Fig. 4-3-1**, appears. On this screen, you can update the firmware.

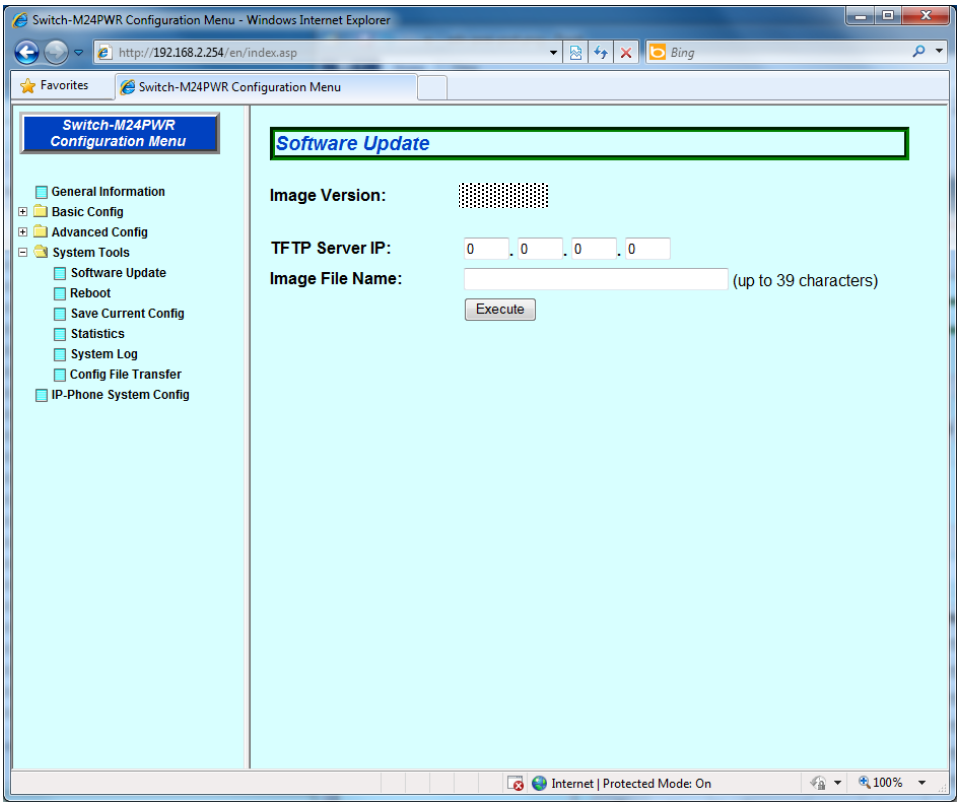


Fig. 4-3-1 Software Update

Screen Description

Image Version	Shows the current firmware version.
TFTP Server IP	Shows the IP address of the TFTP server with the firmware to be used for update.
Image File Name	Shows the file name of the firmware to be updated.

Note: Before updating the firmware, the configuration must be saved, as described in 4.3.3. If you don't save the configuration, it will be deleted when the system is rebooted.

4.3.2. Reboot

Select “System Tools” and then select "Reboot." A screen, as shown in **Fig. 4-3-2**, appears. On this screen, you can reboot the Switching Hub.

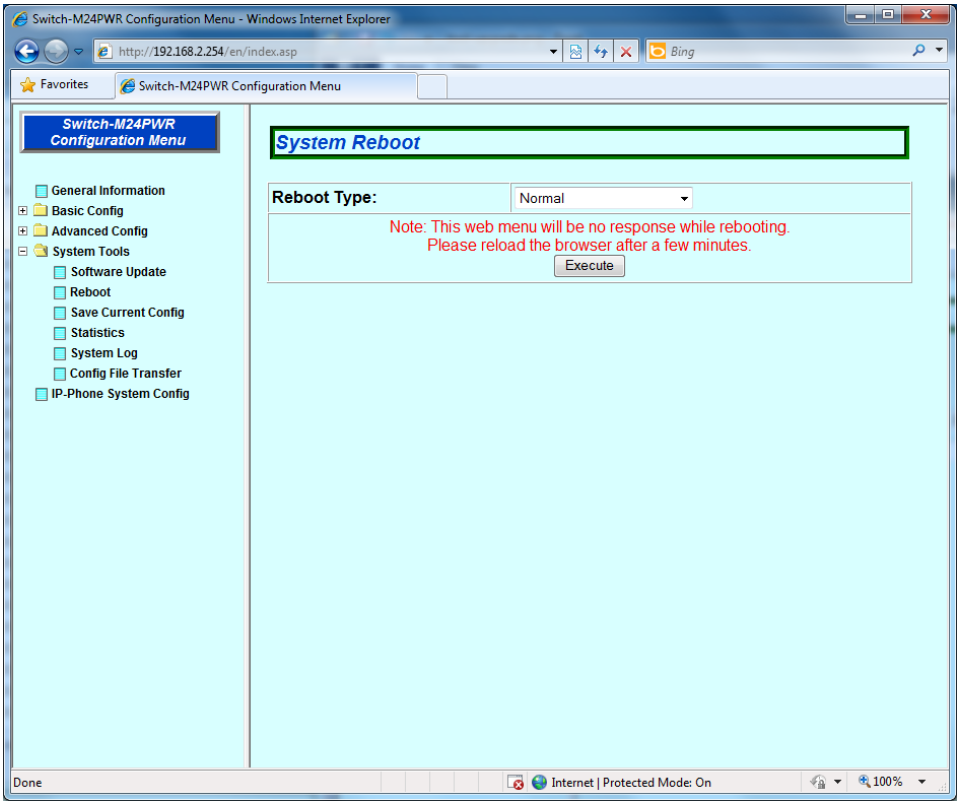


Fig. 4-3-2 Reboot

Screen Description

Reboot Type	Shows the reboot type. The factory default setting is "Normal."	
	Normal	Normal reboot is performed.
	Factory Default	All settings are reset to factory default.
	Factory Default Except IP	All settings except the IP address are reset to factory default.

Note: No response is received during a reboot. Reload after reboot.

4.3.3. Save Current Configuration

Select “System Tools” and then select "Save Current Config." A screen, as shown in **Fig. 4-3-3**, appears. On this screen, you can save the configuration to flash.

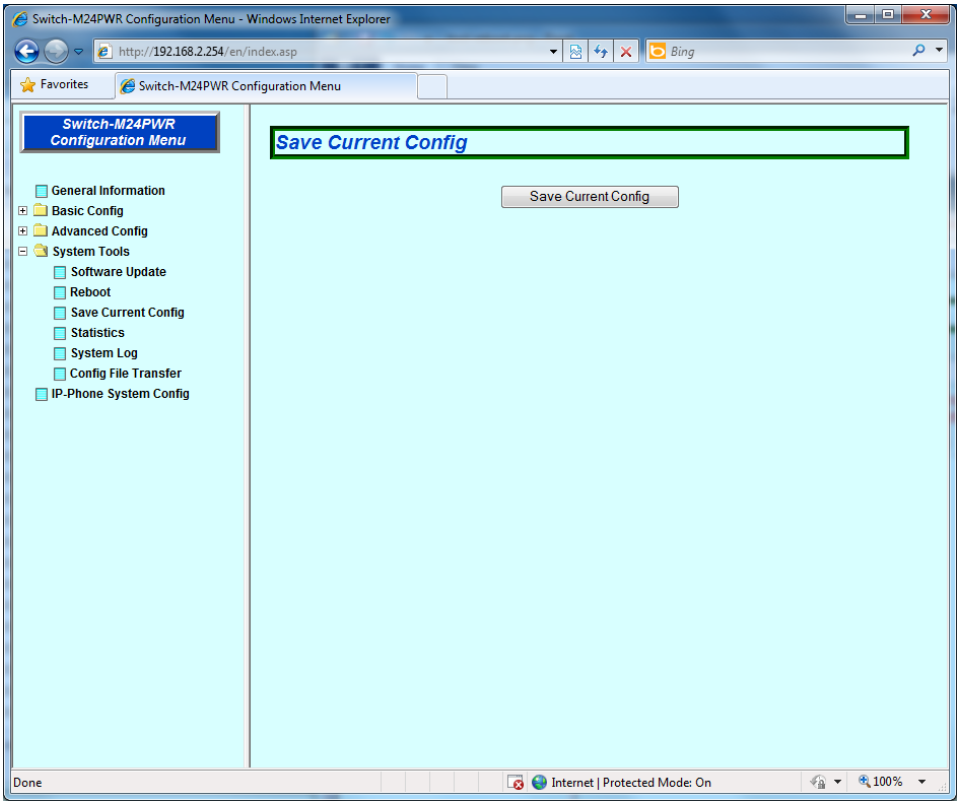


Fig. 4-3-3 Save Current Configuration

When you click the save button, the configuration of the Switching Hub is saved in the internal flash. Without this operation, the change will not be applied upon rebooting the Switching Hub.

After saving the information, the message **"Config save is successful"** is displayed.

4.3.4. Statistics

Select “System Tools” and then select "Statistics." A screen, as shown in **Fig. 4-3-4-a**, appears. On this screen, you can check statistic information.

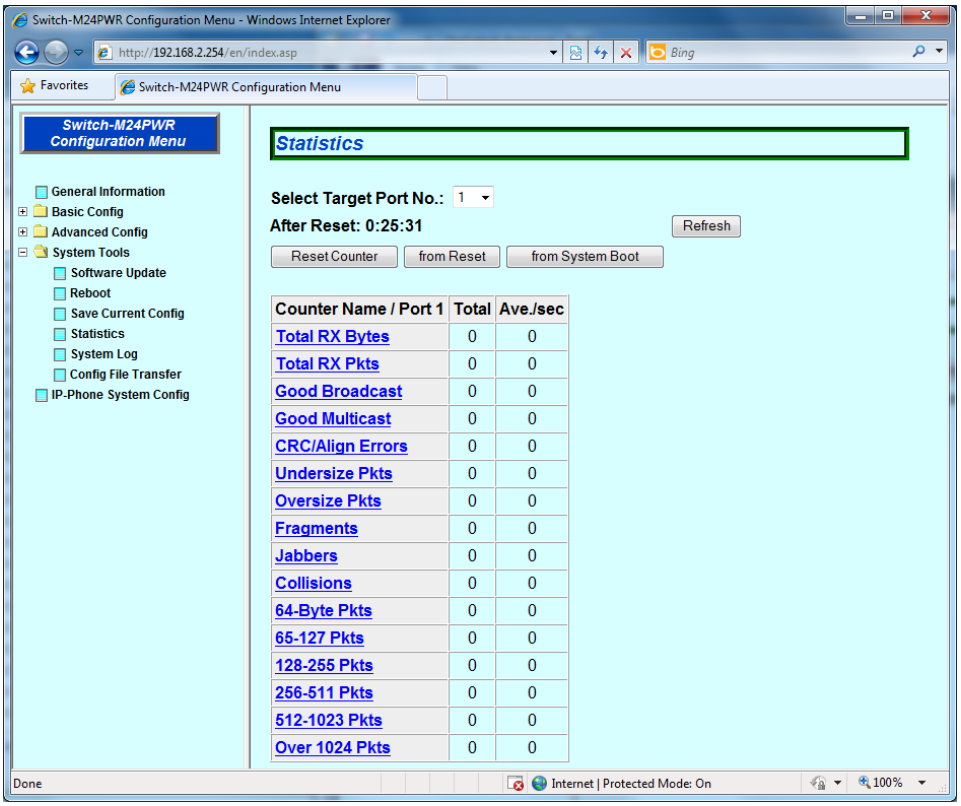


Fig. 4-3-4-a Statistics

Screen Description

Select Target Port No.	Shows the port number.
After Reset:	Shows the time elapsed since booting or since resetting of the counters.
Counter Name	Shows the counter name.
Total	Shows the counter value.
Ave. / sec	Shows the average per second.

The counters are described below.

Total RX Bytes	Shows the number of bytes of all packets received.
Total RX Pkts	Shows the number of all packets received.
Good Broadcast	Shows the number of broadcast packets received.
Good Multicast	Shows the number of multicast packets received.
CRC/Align Errors	Shows the number of error packets that have a normal packet length (64 to 1518 bytes); however, have an error found by an error detection code (FCS). If the packet length is an integral multiple of one byte, the error is a CRC (FCS) error. If not, it is an alignment error.
Undersize Pkts	Shows the number of error packets that have a packet length less than 64 bytes; however, have no other errors.
Oversize Pkts	<When the Jumbo status is disabled> Shows the number of packets having a packet length greater than 1518 bytes. <When the Jumbo status is enabled> Shows the number of packets having a packet length greater than 9216 bytes.
Fragments	Shows the number of error packets that have a packet length less than 64 bytes and have a CRC or alignment error.
Jabbers	Shows the number of error packets that have a packet length greater than 1518 bytes and have a CRC or alignment error.
Collisions	Shows the number of packet collisions.
64-Byte Pkts	Shows the total number of packets having a packet length of 64 bytes.
65-127 Pkts	Shows the total number of packets having a packet length of 65 to 127 bytes.
128-255 Pkts	Shows the total number of packets having a packet length of 128 to 255 bytes.
256-511 Pkts	Shows the total number of packets having a packet length of 256 to 511 bytes.
512-1023 Pkts	Shows the total number of packets having a packet length of 512 to 1023 bytes.
Over 1024 Pkts	Shows the total number of packets having a packet length of 1024 bytes or greater. * This field is displayed when the Jumbo status is disabled.
1024-1518 Pkts	Shows the total number of packets having a packet length of 1024 to 1518 bytes. * This field is displayed when the Jumbo status is enabled.

Clicking a counter name opens a screen, as shown in **Fig. 4-3-4-b**. The total and average per second of each port are shown for each counter.

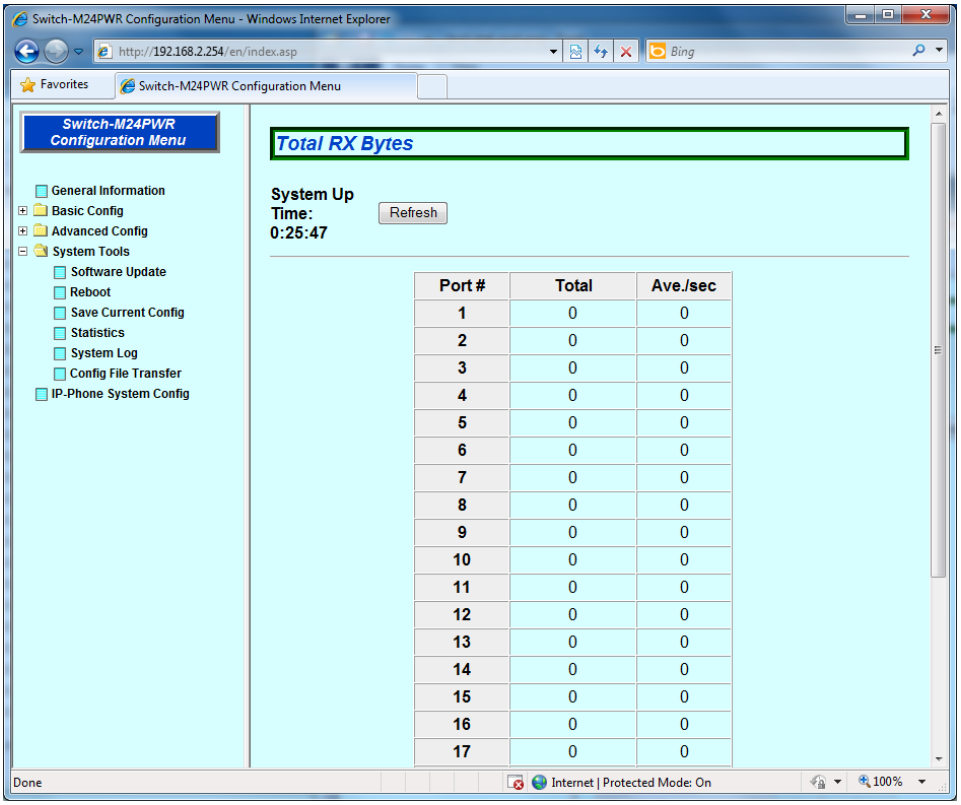


Fig. 4-3-4-b Statistics Information of Ports for Each Counter

Screen Description

Port #	Shows the port number.
Total	Shows the counter value.
Ave. / sec	Shows the average per second.

4.3.5. System Log

Select “System Tools” and then select "System Log." A screen, as shown in **Fig. 4-3-5**, appears. This screen shows logs of events occurred on the Switching Hub. This allows you to grasp the events occurred on the Switching Hub and utilize them for network management.

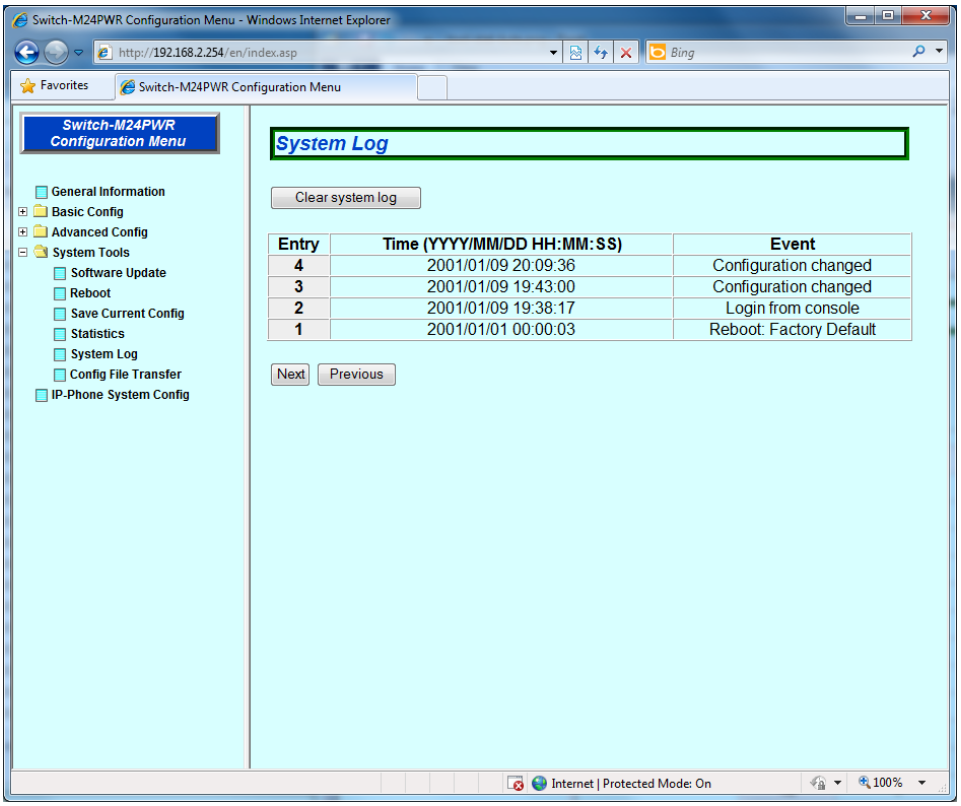


Fig. 4-3-5 System Log

Some events displayed on this screen are linked to SNMP traps. An event for which a trap is set is displayed here. The relationships with traps are described below.

Screen Description

Entry	Shows the event number.	
Time	Shows the time when the event occurred. If the time is not set, the accumulated running time since boot is shown.	
Event	Shows the description of the event caused to the Switching Hub.	
	Login from console	Indicates a login from a console port.
	Login from telnet, xxx.xxx.xxx.xxx	Indicates a login via Telnet.
	Runtime code changes	Indicates that the firmware was updated.
	Configuration changed	Indicates that the configuration was changed.
	Write configuration to primary file failed	Indicates that writing the configuration into the primary area failed.
	Write configuration to secondary file failed	Indicates that writing the configuration into the secondary area failed.
	Configuration file upload	Indicates that the configuration file was transferred to the TFTP server.
	Configuration file download	Indicates that the configuration file was transferred from the TFTP server.
	(Bridge) Topology Change	Indicates that the spanning tree topology was changed.
	Reboot: Normal	Indicates that this Switching Hub rebooted.
	Reboot: Factory Default	Indicates that this Switching Hub rebooted to reset to factory default.
	Reboot: Factory Default Except IP	Indicates that this Switching Hub rebooted to reset to factory default, except the IP address.
	Not authorized! (IP: xxx.xxx.xxx.xxx)	Indicates that an unauthorized manager accessed by SNMP.
	SNTP first update to yyyy/mm/dd hh:mm:ss	Indicates that time data was obtained by accessing the SNTP server.
	Found other multicast router. Stopped querier function.	Indicates that the function was stopped because another IGMP querier exists.
	Other multicast router is expired. Restarted querier function.	Indicates that the function was restarted because another IGMP querier no longer exists.
	FAN status changed from good to failed.	Indicates that a cooling fan problem occurred.
	Temperature over threshold.	Indicates that the internal temperature exceeded the threshold.
	Temperature under threshold.	Indicates that the internal temperature decreased below the threshold.
	(BPDU) BPDU guard worked on Port-*xx*	Indicates that the BPDU guard function worked on the port.
	(BPDU) Port-*xx* is recovered.	Indicates that the port recovered automatically.
	(RRP) FDB Flush	Indicates that Forwarding Database has been flushed.
	(RRP) Ring Recover	Indicates that the ring topology recovered. This log is displayed for the master nodes only.
	(RRP) Ring Failure	Indicates a ring topology error. This log is displayed for the master nodes only.

	(RRP) Change to Link-Up Status	Indicates that a ring topology has been established. This log is displayed for the transit nodes only.
	(RRP) Change to Link-Down Status	Indicates a ring topology error. This log is displayed for the transit nodes only.
	(RRP) Change to Pre-Forwarding Status	Indicates that a ring topology is being established. This log is displayed for the transit nodes only.
	! Stus: xxxxxxxx IP: x Code: x Add: xxxxxxxx ! Tsk: "xxxx" P: xxxxxxxxx Pri: xx	Indicates the system information when an exception was raised.
	(TRAP) Port-*xx* Link-up	Indicates that the port was linked up. This event occurs if Individual Trap is enabled and a corresponding port is set.
	(TRAP) Port-*xx* Link-down	Indicates that the port was linked down. This event occurs if Individual Trap is enabled and a corresponding port is set.
	(TRAP) Port-*xx* Power ON notification	Indicates that the power supply to the target port is turned on.
	(TRAP) Port-*xx* Power OFF notification	Indicates that the power supply to the target port is turned off.
	(TRAP) Usage power is above the threshold	Indicates that the PoE power supply exceeded the threshold.
	(TRAP) Usage power is below the threshold	Indicates that the PoE power supply exceeded the threshold and then decreased below the threshold.
	(TRAP) System authentication failure	Indicates that authentication from the SNMP manager failed.

Note: Up to 256 system logs are saved. After reaching this limit, a new log is saved by deleting the oldest log.

4.3.6. Configuration File Transfer

Select “System Tools” and then select "Config File Transfer." A screen, as shown in **Fig. 4-3-6**, appears. On this screen, you can upload or download the configuration file.

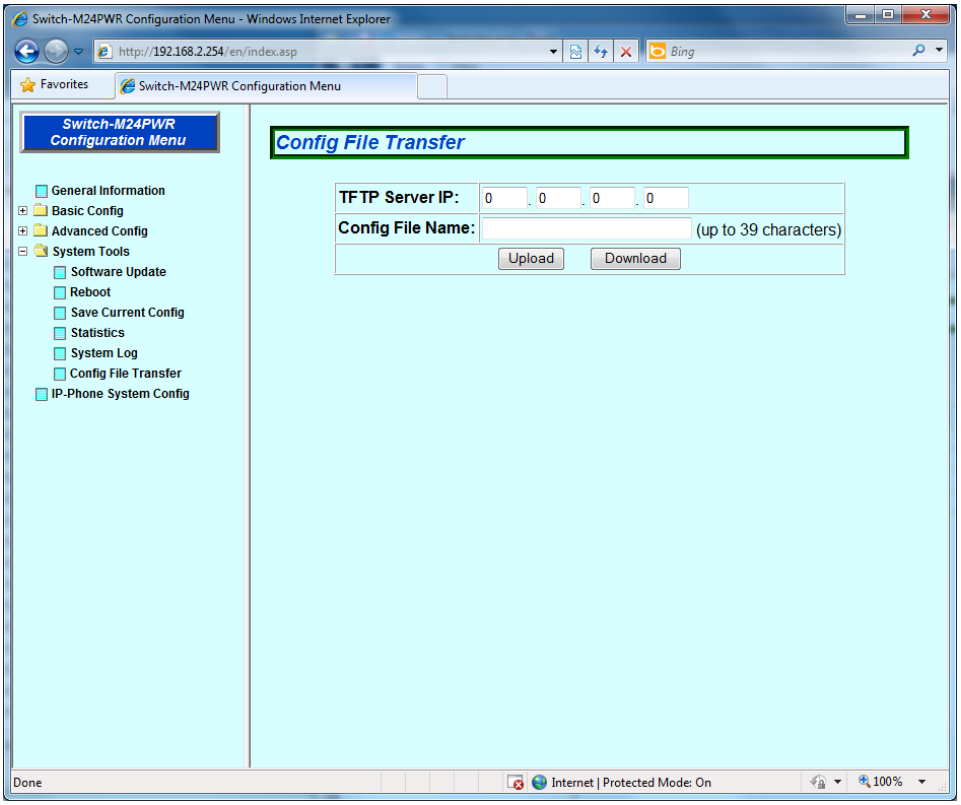


Fig. 4-3-6 Configuration File Transfer

Screen Description

TFTP server IP	Shows the IP address of the TFTP server to upload/download the configuration file.
Config File Name	Shows the configuration file name.

Select "Upload" to save the setting information on the TFTP server. Select "Download" to read the configuration into the Switching Hub.

Appendix A. Specifications

Refer to "**Operation Manual for Menu Screens**" for your switch to read the specifications.

Appendix B. Procedures for Console Port Connection using Windows HyperTerminal

Connect a Windows-based PC to this Switching Hub with a console cable and follow the procedures shown below to activate HyperTerminal.

(If your PC is using Windows Vista or later, you need to install a terminal emulator first.)

(1) On Windows, click Start on Task Bar > All Programs > Accessories > Communications > HyperTerminal.

(2) The Connection Description window opens. Enter a name (e.g. Switch), choose an icon, and click OK.

(3) The Connect To window opens. Click on the pull-down menu of the Connect Using field, choose **COM1**, and click OK.
Note that the above setting applies to cases where the console cable is connected to COM1.

(4) At the COM1 Properties window, click on the pull-down menu of the Bits per second field, and choose **9600**.

(5) Click on the pull-down menu of the Flow control field, choose **None**, and click OK.

(6) Click File in the main menu of HyperTerminal and choose Properties.

(7) The <name> Properties window appears (<name>: the name you entered in step 2 is indicated). Click the Settings tab and click on the pull-down menu of the Emulation field. In the list, choose **VT100** and click OK.

(8) Configure this Switching Hub in accordance with chapter 4 of the Operation Manual.

(9) After completing the configuration, click File in the main menu of HyperTerminal and Exit. Click Yes when asked if you want to disconnect the terminal. Then click Yes when asked if you want to save the session for HyperTerminal configuration.

(10) A file named "<name>.ht" (<name>: the name you entered in step 2 is indicated) is created in the HyperTerminal window.

From the next session, you can activate HyperTerminal by double-clicking "<name>.ht" and configure this Switching Hub by following step 8.

Appendix C. Easy IP Address Setup Function

The following are points to note when using an easy IP address setup function.

[Known compatible software]
Panasonic Eco Solutions Networks Co., Ltd. "Support Tool" Ver.1.2.0.1
Panasonic Corporation "Easy IP Address Setup Software" V3.01/V4.00/V4.24R00
Panasonic System Networks Co., Ltd. "Easy Configurator" V3.10R00

[User-settable items]
- IP address, subnet mask and default gateway
- System name
  * Settable with only the software of Panasonic System Networks Co., Ltd. The software shows "Camera name."
- If you use this function for configuration, "Enabled" is automatically displayed in the Web Server Status.

[Restrictions]
- The time for accepting setting changes is limited to 20 minutes after power-on to ensure security.
  However, you can change settings regardless of the time limit if the IP address, subnet mask, default gateway, user name and password values are the factory defaults.
  * You can check the current settings because the list is displayed even after the time limit elapses.
- The following function of the software of Panasonic System Networks Co., Ltd. cannot be used.
  - Auto setup function

* Please contact each manufacturer for information about network cameras.

Troubleshooting

If you find any problem, please take the following steps to check.

1. LED indicators

The power LED (PWR) is not lit.

- Check if the power cord is disconnected. Please confirm that the power cord is securely connected to the power port.
- Is the Switching Hub operated at temperature in the range from 0 to 40 degrees C?
  Ensure that the operating temperature is within the specified range.

The LINK/ACT. LED (Link/Activity) is not lit.

- Is the cable correctly connected to the target port?
- Is the cable appropriate to use?
- Is the terminal connected to the relevant port conforming with 10BASE-T, 100BASE-TX, or 1000BASE-T standard?
- Auto-negotiation may have failed.
  Set the port of this Switching Hub or the terminal to half-duplex mode.

2. Communications are slow.

- Are the communication speed and mode settings correct?
  If the communication mode signal cannot be properly obtained, apply half-duplex mode. Switch the communication mode of the connection target to half-duplex mode. Do not fix the communication mode of the connected terminal to full-duplex mode.
- Is the utilization ratio of the network to which this Switching Hub is connected too high?
  Try separating this Switching Hub from the network.

3. Communications fail.

- Is the link-up correct?
  If embedded power saving mode is set to Full, change the setting to Half or Disabled.

4. PoE power supply is impossible.

* Power is not supplied to a Powered Device.
  - If you use an STP cable, PoE power supply may not be possible depending on the installation environment. In such cases, use a UTP cable.
  - Is a CAT5e or better straight cable (RJ45-8/8) used?
  - Is the cable connected to the port 1−16 that supports PoE power supply?
  - Ensure that either the port alone or the entire equipment is not overloaded.
  - Is the Powered Device connected to the port compliant with the IEEE802.3af standard or IEEE802.3 at Type 1 (15.4W) standard?

* When the power supply is suddenly shut off:
  - It is likely that a PoE-powered device in use has different power consumption in normal operation and standby states. Please confirm PoE LED.

After-sales Service

1. Warranty card

A warranty card is provided with this Switching Hub. Be sure to confirm that the date of purchase, shop (company) name, etc., have been entered in the warranty card and then receive it from the shop. Keep it in a safe place. The warranty period is one year from the date of purchase.

2. Repair request

If a problem is not solved even after taking the steps shown in the "Troubleshooting" section in this manual, please use the Memo shown on the next page and make a repair request with the following information to the shop where you purchased this Switching Hub.

- ◆ **Product name**
- ◆ **Model No.**
- ◆ **Product serial No.** (11 alphanumeric characters labeled on the product)
- ◆ **Firmware version** (The number after "Ver." labeled on the unit package)
- ◆ **Problem status (Please give as concrete information as possible.)**

- Within the warranty period:
  Repair service will be provided in accordance with the conditions stipulated in the warranty card.
  Please bring your product and warranty card in the shop where you purchased it.
- After the warranty period expires:
  If our check determines that your product is repairable, a chargeable repair service is available upon your request.
  Please contact the shop where you purchased the product.

3. Inquiries about after-sales service and the product

Contact the shop where you purchased the product or call/fax the following number.

Memo (Fill in for future reference)

<table>
<tr><td rowspan="2">Date of purchase</td><td colspan="6" rowspan="2"></td><td>Product name</td><td colspan="4">Switch-M</td></tr>
<tr><td>Model No.</td><td colspan="4">PN23</td></tr>
<tr><td rowspan="2">Firmware version (*)</td><td colspan="2">Boot Code</td><td colspan="8"></td></tr>
<tr><td colspan="2">Runtime Code</td><td colspan="8"></td></tr>
<tr><td rowspan="2">Serial No.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="11">(11 alphanumeric characters labeled on the product)</td></tr>
<tr><td>Shop/Sales company</td><td colspan="11">Tel:</td></tr>
<tr><td>Customer service contact</td><td colspan="11">Tel:</td></tr>
</table>

(* You can check the version on the screen described in section 4.5 of the Operation Manual — Menu Screens.)

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