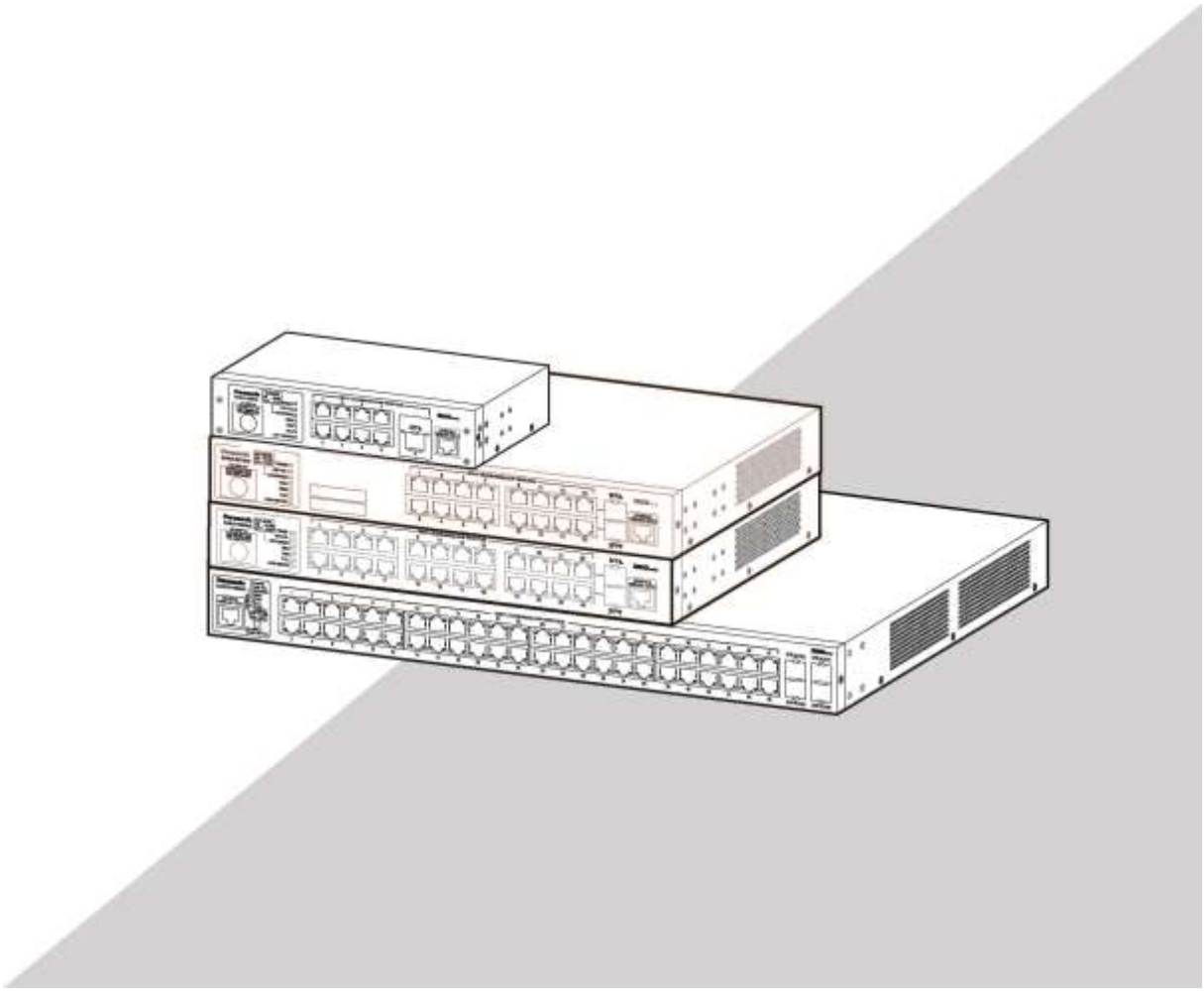
Panasonic

Operation Manual
for CLI

Layer 2 Switching Hub

Model Number: PN28080K/PN28160K
PN28240K/PN28480K

- Thank you for purchasing our product.
- This manual provides you with important information about safe and proper operations of this Switching Hub.
- **Please read the "Important Safety Warnings" on pages 3 to 4.**
- Any problems or damage resulting from disassembly of this Switching Hub by customers are note covered by the warranty.
- Applicable product names and model numbers are described on page 2.



This operation manual is applicable to the following Switching Hubs:

Product name	Model No.	Firmware version
Switch-M48eG	PN28480K-ID PN28480K-TH PN28480K-MY PN28480K-SG	2.0.1.06 or higher
Switch-M24eG	PN28240K-ID PN28240K-TH PN28240K-MY PN28240K-SG	2.0.1.07 or higher
Switch-M16eG	PN28160K-ID PN28160K-TH PN28160K-MY PN28160K-SG	2.0.1.07 or higher
Switch-M8eG	PN28080K-ID PN28080K-TH PN28080K-MY PN28080K-SG	2.0.1.07 or higher

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 do.	This symbol is used to alert users to what they must do.

⚠ WARNING

- **Do not use power supply 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 power 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.

⚠WARNING

- **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.
- **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 the separately sold SFP module (PN54021K/PN54023K) to SFP extension slot.**
  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.
- **Do not place this Switching Hub under direct sun light and or high temperature.**
  Deviation could lead to fire to high internal temperature and fire.

⚠ WARNING

- **Use the bundled power cord (AC 100 – 240V specifications).**
  Deviation could lead to electric shock, malfunction, and/or equipment failure.
- **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/ECO LED (Status/ECO mode) 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.

⚠ 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.**

Basic Instructions for the Use of This Product

- For inspection and/or repair, consult the shop.
- 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.
- When connecting a cable, hold the Switching Hub firmly.
- Do not put a floppy disk or a magnetic card near the rubber feet (with built-in magnets). Otherwise, recorded content may be lost.
- After installing this Switching Hub on an OA desk, do not move either without dismounting it. Otherwise, the desk surface may be damaged.
- 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 50°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 stacking Switching Hubs, leave a minimum of 20 mm space between them.
- Operation is not guaranteed if a module other than the optional SFP extension modules (PN54021K/PN54023K) is inserted into the SFP extension slot. For the latest information about compatible SFP extension modules, check our website.

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

There are four levels in the hierarchy.

(1) User mode:
This is the default mode after login. Limited operations are allowed.

(2) Privileged mode:
This mode allows you to check the state of the Switching Hub, to edit configuration files, etc.

(3) Global configuration mode:
This mode allows you to set the general configuration of the Switching Hub.

(4) Interface configuration mode:
This mode allows you to set individual items, such as each port and each VLAN, in detail.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface gi0/1
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 1-1 Command hierarchy

enable Command

• Enter this command to switch from the User mode to the Privileged mode.

M24eG> ····· User mode
M24eG> enable ····· User mode → Privileged mode
M24eG# ····· Privileged mode
M24eG# disable ····· Privileged mode → User mode
M24eG> ····· User mode

disable Command

• Enter this command to switch from the Privileged mode to the User mode.

M24eG# ····· Privileged mode
M24eG# disable ····· Privileged mode → User mode
M24eG> ····· User mode

configure Command

- Enter this command to switch from the Privileged mode to the Global configuration mode.

```
M24eG# ····· Privileged mode
M24eG# configure ····· Privileged mode
                       → Global configuration mode
M24eG(config)# ····· Global configuration mode
```

interface Command

- Enter this command to switch from the Global configuration mode to the Interface configuration mode.

```
M24eG(config)# ····· Global configuration mode
M24eG(config)# interface vlan1 ·· Global configuration mode
                       → Interface
                         configuration mode (vlan1)
M24eG(config-if)# exit ····· Interface configuration mode
                       → Global configuration mode
M24eG(config)# interface Gigabitethernet0/1
                  ····· Global configuration mode
                       → Interface
                         configuration mode (interface1)
M24eG(config-if)# exit ····· Interface configuration mode
                       → Global configuration mode
M24eG(config)# ····· Global configuration mode
```

exit Command

- Enter this command to return to the previous mode.

```
M24eG(config-if)# exit ····· Interface configuration mode
                       → Global configuration mode
M24eG(config)# exit ····· Global configuration mode
                       → Privileged mode
M24eG# exit ····· Privileged mode → User mode
M24eG> ····· User mode
```

end Command

- Enter this command to switch from configuration modes to the Privileged mode.

M24eG(config-if)# end ・・・・・・・・ Interface configuration mode
→ Privileged mode
M24eG# configure
M24eG(config)# end ・・・・・・・・・・ Global configuration mode
→ Privileged mode

logout Command

- Enter this command to return to the menu screen from any command mode.

M24eG(config)# logout ・・・・・・・ Configuration mode → Menu

? Command

- Enter a question mark (?) to view available commands in that command mode.

```
M24eG> ?
enable              Privilege level to go to.
exit                Exit from current mode
logout              To logout from the CLI shell
ping                Send ICMP ECHO_REQUEST to network hosts

M24eG>
```

Fig. 1-2 ? command

Command History Support

- Press the ↑ (up arrow) key to view the history of the entered commands.

Command-line Completion Support

- Enter a question mark (?) immediately after a command. This will show command candidates to complete the entered command.

```
M24eG# configure
M24eG(config)# ip address ?
<ip-address>        ex: 192.168.1.1

M24eG(config)# ip address
```

Fig. 1-3 Command-line completion support

Abbreviated Command Entry

After entering just enough characters of a command or an argument to identify it uniquely, you can omit the rest of the command or the argument.

[Example of Abbreviated Command Entry]

- enable → en
- show running-config → sh ru

[Bad Example of Abbreviated Command Entry]

- co → Because both "configure" and "copy" are possible, an error occurs.

Symbols used in the command description are as follows:

< > : Required - You must enter this.
{ | } : Selections - Select one from the selections.
[ ] : Option - Enter as required.

Commands are case sensitive. Uppercase and lower case letters are treated as different letters.

Note that in this manual, ports are specified for Switch-M24eG (24 ports) except for a few commands. When entering a command, make sure to specify existing port numbers of your switch.

2. Displaying Basic Information

Enter the commands listed below in the "Privileged mode" to show this Switching Hub's basic information.

Command to show the system information (up time and version information)

M24eG#	show sys-info

Command to show the address information (MAC address and IP address information)

M24eG#	show ip conf

Command to show the ipv6 address information (MAC address and IPv6 address information)

M24eG#	show ipv6 conf

Command to show the CPU information (CPU utilization information)

M24eG#	show cpuload

<Command Entry Example>

An example of executing the command to show the system information is shown below.

```
M24eG> enable
M24eG# show sys-info

(1)  System up for             : 0 days, 0:1:29
(2)  Boot Code Version         : 1.00.17
(3)  Runtime Code Version      : 1.0.0.07
(4)  Serial Number             : xxxxxxxxxxx
(5)  Hardware Information
(6)    Version                 : A1
(7)    DRAM Size               : 128MB
(8)    Fixed Baud Rate         : 9600bps
(9)    FLASH Size              : 32MB

(10) Administration Information
(11)   Switch Name             :
(12)   Switch Location         :
(13)   Switch Contact          :

(14) System Address Information
(15)   MAC Address             : 00:C0:8F:A0:13:98
(16)   IP Address              : 0.0.0.0
(17)   Subnet Mask             : 0.0.0.0
(18)   Default Gateway         : 0.0.0.0

     System Address Information
(19)   IPv6 Status             : Disable
       MAC Address             : 00:C0:8F:A0:13:98
(20)   IPv6 Address/prefixlen  : ::/128
(21)   IPv6 Link Local Address : ::
(22)   IPv6 Default Gateway    : ::

M24eG#
```

Fig. 2-1 Example of executing the command to show the system information

(1) System up for

Shows the Switching Hub's up duration in days and time.

(2) Boot Code Version

Shows the Switching Hub's boot code version.

(3) Runtime Code Version

Shows the Switching Hub's firmware version.

(4) Serial Number

Shows the Switching Hub's Serial Number.

(5) Hardware Information

Shows the Switching Hub's hardware information.

(6) Version

Shows the Switching Hub's hardware version.

(7) DRAM Size

Shows the Switching Hub's DRAM memory size.

(8) Fixed Baud Rate

Shows the baud rate of the Switching Hub's console port.

(9) Flash Size

Shows the Switching Hub's flash memory size.

(10) Administration Information

Shows the Switching Hub's administration information.

(11) Switch Name

Shows the Switching Hub's current host name.

(12) Switch Location

Shows the Switching Hub's current installation location name.

(13) Switch Contact

Shows the Switching Hub's current contact information.

(14) System Address Information

Shows the Switching Hub's address information.

(15) MAC Address

Shows the Switching Hub's MAC address.

(16) IP Address

Shows the Switching Hub's current IP address in operation.

(17) Subnet Mask

Shows the Switching Hub's current subnet mask in operation.

(18) Default Gateway

Shows the Switching Hub's current default gateway in operation.

(19) IPv6 Status

Shows the IPv6 Status (Enabled or Disabled).	
Enabled	The IPv6 function is enabled.
Disabled	The IPv6 function is disabled.

(20) IPv6 Address/prefixlen

Shows the Switching Hub's current ipv6 address and prefix length in operation.

(21) IPv6 Link Local Address

Shows the Switching Hub's current ipv6 link local address in operation.

(22) IPv6 Default Gateway

Shows the Switching Hub's current ipv6 default gateway in operation.

<Command Entry Example>

An example of executing the command to show the address information is shown below.

```
M24eG> enable
M24eG# show ip conf

(1) MAC Address       : 00:C0:8F:A0:13:98
(2) IP Address        : 0.0.0.0
(3) Subnet Mask       : 0.0.0.0
(4) Default Gateway   : 0.0.0.0

M24eG#
```

Fig. 2-2 Example of executing the command to show the address information

(1) MAC Address

Shows the Switching Hub's MAC address.

(2) IP Address

Shows the Switching Hub's current IP address in operation.

(3) Subnet Mask

Shows the Switching Hub's current subnet mask in operation.

(4) Default Gateway

Shows the Switching Hub's current default gateway in operation.

<Command Entry Example>

The following example shows the Ipv6 address information by executing the command below.

```
M24eG> enable
M24eG# show ipv6 conf

(1) IPv6 Status             : Disable
(2) MAC Address             : 00:C0:8F:A0:13:98
(3) IPv6 Address/prefixlen  : ::/128
(4) IPv6 Link Local Address : ::
(5) IPv6 Default Gateway    : ::

M24eG#
```

Fig. 2-3 Example of executing the command to show the Ipv6 address information

(1) IPv6 Status

Shows the IPv6 Status: enabled or disabled.	
Enabled	The IPv6 function is enabled.
Disabled	The IPv6 function is disabled.

(2) MAC Address

Shows the Switching Hub's MAC address.

(3) IPv6 Address/prefixlen

Shows the Switching Hub's current IPv6 address in operation.

(4) IPv6 Link Local Address

Shows an Ipv6 link local address in operation, which is configured on the Switching Hub.

(5) IPv6 Default Gateway

Shows the Switching Hub's current IPv6 default gateway in operation.

<Command Entry Example>

The following example shows information on the CPU utilization by executing the command below.

```
M24eG# show cpuload

 CPU Utilization

 Five seconds -   7 %         One minute -   7 %         Five minutes -   7 %

M24eG#
```

Fig. 2-4 Example of executing the command to show CPU information

1. CPU Utilization

Indicates the CPU utilization of the Switching Hub, which is calculated by taking five seconds, one minute or five minutes.

show sys-info

Shows the Switching Hub's system information --- such as up time and version information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show ip conf

Shows the address information --- such as MAC address and IP address --- of the Switching Hub.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show ipv6 conf

Shows the ipv6 address information --- such as MAC address and IPv6 address --- of the Switching Hub.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show cpuload

Shows the information on the CPU utilization of the Switching Hub.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

3. Basic Switch Configuration

3.1. System Administration Configuration

Configure the host name, installation location and contact information in "Global configuration mode." Confirm the configuration information by executing the "show sys-info" command in "Privileged mode."

Command to show the system information

M24eG#	show sys-info

Command to set the host name

M24eG(config)#	hostname <hostname>

Command to delete the host name

M24eG(config)#	no hostname

Command to set the installation location

M24eG(config)#	snmp-server location <server location>

Command to delete the installation location

M24eG(config)#	no snmp-server location

Command to set the contact information

M24eG(config)#	snmp-server contact <server contact>

Command to delete the contact information

M24eG(config)#	no snmp-server contact

<Command Entry Example>

An example of executing the command to show the system information is shown below.

```
M24eG> enable
M24eG# show sys-info

 System up for             : 0 days, 0:1:29
 Boot Code Version         : 1.00.17
 Runtime Code Version      : 1.0.0.07

 Hardware Information
   Version                 : A1
   DRAM Size               : 128MB
   Fixed Baud Rate         : 9600bps
   FLASH Size              : 32MB

(1) Administration Information
(2)   Switch Name           :
(3)   Switch Location       :
(4)   Switch Contact        :

 System Address Information
   MAC Address             : 00:C0:8F:A0:13:98
   IP Address              : 0.0.0.0
   Subnet Mask             : 0.0.0.0
   Default Gateway         : 0.0.0.0

 System Address Information
   IPv6 Status             : Disable
   MAC Address             : 00:C0:8F:A0:13:98
   IPv6 Address/prefixlen  : ::/128
   IPv6 Link Local Address : ::
   IPv6 Default Gateway    : ::

M24eG#
```

Fig. 3-1-1 Example of executing the command to show the system information

Terms related to this section are explained below.

(1) Administration Information

Shows the Switching Hub's administration information.

(2) Switch Name

Shows the Switching Hub's current host name.

(3) Switch Location

Shows the Switching Hub's current installation location name.

(4) Switch Contact

Shows the Switching Hub's current contact information.

show sys-info

Shows the system information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

hostname <hostname>

Sets or edits the system name.

no hostname

Deletes the system name.

[Parameter]

Parameter name	Description
<hostname>	Set the system name.

[Factory Default Setting]

Parameter name	Factory default setting
<hostname>	None

[Setting Range]

Parameter name	Setting range
<hostname>	Up to 50 one-byte characters Allowed characters: alphanumeric character (A-Z, a-z, 0-9) symbol (!@#$&_-.) white space

[Note]

Parameter name	Note
<hostname>	To set a system name containing white spaces, enclose the entire name with a pair of double-quotation marks (" "). Example: hostname "switch a"

snmp-server location <server location>

Sets or edits the installation location information.

no snmp-server location

Deletes the installation location information.

[Parameter]

Parameter name	Description
<server location>	Set the installation location.

[Factory Default Setting]

Parameter name	Factory default setting
<server location>	None

[Setting Range]

Parameter name	Setting range
<server location>	Up to 50 one-byte characters Allowed characters: alphanumeric character (A-Z, a-z, 0-9) symbol (!@#$&_-.) white space

[Note]

Parameter name	Note
<server location>	To set a location name containing white spaces, enclose it with a pair of double-quotation marks (" "). Example: snmp-server location "Office 2F"

snmp-server contact <server contact>

Sets or edits the contact information.

no snmp-server contact

Deletes the contact information.

[Parameter]

Parameter name	Description
<server contact>	Set the contact information.

[Factory Default Setting]

Parameter name	Factory default setting
<server contact>	None

[Setting Range]

Parameter name	Setting range
<server contact>	Up to 50 one-byte characters Allowed characters: alphanumeric character (A-Z, a-z, 0-9) symbol (!@#$&_-.) white space

[Note]

Parameter name	Note
<server contact>	To set contact information containing white spaces, enclose it with a pair of double-quotation marks (" "). Example: snmp-server contact "network manager"

<Configuration Example>

Overview: Set this Switching Hub's administration information (host name, installation location, and contact information).

(1) Set this Switching Hub's name to "Switch."
(2) Set this Switching Hub's installation location to "Office-2F."
(3) Set this Switching Hub's contact information to "manager."

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# hostname Switch
(2) Switch(config)# snmp-server location Office-2F
(3) Switch(config)# snmp-server contact manager
Switch(config)# exit
Switch#
```

Fig. 3-1-2 Example of configuring the Switching Hub's administration information

3.1.1. Username and Password Configuration

Configure the username and password for this Switching Hub in "Global configuration mode."

Command to set the username and password

M24eG(config)#	username <new username>

username <new username>

Sets or edits the username and password.

* Upon entering this command, you are required to enter your old password once and your new password twice to set the new password.

[Parameter]

Parameter name	Description
<new username>	Enter a new username. (Enter the current username to keep the same name.)

[Factory Default Setting]

Parameter name	Factory default setting
<new username>	None

[Setting Range]

Parameter name	Setting range
<new username>	0 to 12 one-byte characters Allowed characters: alphanumeric character (A-Z, a-z, 0-9) symbol (!@#$&_-.)

[Note]

Parameter name	Note
<new username>	None

Note: Make sure to remember the changed or new username and password.

<Configuration Example>

Overview: Set a username and password for the Switching Hub.

(1) Set a new username to "user1."
(2) Enter the current password.
(The factory default setting is "manager.")
(3) Enter a new password.
(4) Enter the new password again.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# username user1
(2) Enter old password: *******
(3) Enter new password: *******
(4) Enter new password again: *******
M24eG(config)#
```

Fig. 3-1-1-1 Example of the username and password configuration

3.2. IP Address Configuration

Configure the IP address settings of this Switching Hub in "Interface configuration mode." Confirm the configuration information by executing the "show ip conf" command in "Privileged mode."

Command to show the IP address

M24eG#	show ip conf

Command to show the IPv6 address

M24eG#	show ipv6 conf

Command to set the IP address

M24eG(config)#	ip address <ip-address> <mask> [<default-gateway>]

Command to delete the IP address

M24eG(config)#	no ip address

Command to set the IPv6 enable

M24eG(config)#	ipv6 enable

Command to delete the IPv6 enable

M24eG(config)#	no ipv6 enable

Command to set the IPv6 address

M24eG(config)#	Ipv6 address <ipv6-address> prefixlen <prefixlen> [<gateway>]

Command to delete the IPv6 address

M24eG(config)#	no Ipv6 address

Command to set the IPv6 Link Local address

M24eG(config)#	ipv6 address link-local <link-local-address>

Command to delete the IPv6 Link Local address

M24eG(config)#	no Ipv6 address link-local

<Command Entry Example>

An example of executing the command to show the address information is shown below.

```
M24eG> enable
M24eG# show ip conf

(1) MAC Address      : 00:C0:8F:A0:13:98
(2) IP Address       : 0.0.0.0
(3) Subnet Mask      : 0.0.0.0
(4) Default Gateway  : 0.0.0.0

M24eG#
```

Fig. 3-2-1 Example of executing the command to show the address information

(1) MAC Address

Shows the Switching Hub's MAC address.

(2) IP Address

Shows the Switching Hub's current IP address in operation.

(3) Subnet Mask

Shows the Switching Hub's current subnet mask in operation.

(4) Default Gateway

Shows the Switching Hub's current default gateway in operation.

<Command Entry Example>

An example of executing the command to show the ipv6 address information is shown below.

```
M24eG# show ipv6 conf

 IPv6 Status             : Disable
 MAC Address             : 00:C0:8F:A0:13:98
 IPv6 Address/prefixlen  : ::/128
 IPv6 Link Local Address : ::
 IPv6 Default Gateway    : ::

M24eG#
```

(1)
(2)
(3)
(4)
(5)

Fig. 3-2-2 Example of executing the command to show the ipv6 address information

(1) IPv6 Status

Shows the IPv6 Status (Enabled or Disabled).	
Enabled	The IPv6 function is enabled.
Disabled	The IPv6 function is disabled.

(2) MAC Address

Shows the Switching Hub's MAC address.

(3) IPv6 Address/prefixlen

Shows the Switching Hub's current IPv6 address in operation.

(4) IPv6 Link Local Address

Shows the Switching Hub's current ipv6 link local address in operation.

(5) IPv6 Default Gateway

Shows the Switching Hub's current IPv6 default gateway in operation.

ip address <ip-address> <mask> [<default-gateway>]

Sets or edits the IP address, subnet mask and/or default gateway.

no ip address

Deletes the IP address, subnet mask and/or default gateway.

[Parameter]

Parameter name	Description
<ip-address>	Enter an IP address to be set or edited.
<mask>	Enter a subnet mask to be set or edited.
[<default-gateway>]	Enter a default gateway to be set or edited.

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	0.0.0.0
<mask>	0.0.0.0
[<default-gateway>]	0.0.0.0

[Setting Range]

Parameter name	Setting range
<ip-address>	0.0.0.1 to 223.255.255.254
<mask>	128.0.0.0 to 255.255.255.255 (One-bits and zero-bits must be consecutive in binary.)
[<default-gateway>]	0.0.0.1 to 223.255.255.254

[Note]

Parameter name	Note
<ip-address>	None
<mask>	None
[<default-gateway>]	None

Note: The above items must be set in order to use the SNMP management function and to enable a remote connection by telnet. Any IP addresses on the network must be unique and no duplication is allowed. If you are unsure, consult the network administrator.

<Configuration Example>

(1) Set the Switching Hub's IP address to "192.168.1.1," subnet mask to "255.255.255.0" and default gateway to "192.168.1.254."

(1)

```
M24eG> enable
M24eG# configure
M24eG(config)# ip address 192.168.1.1 255.255.255.0 192.168.1.254
Interface vlan1
     my HWaddr: 00:c0:8f:a0:13:98
     my IPaddr: 192.168.1.1
  Options:
        subnet mask: 255.255.255.0
       IP broadcast: 192.168.1.255
            gateway: 192.168.1.254
M24eG(config)#
```

Fig. 3-2-3 Example of the address configuration

ipv6 enable

Enables the IPv6 stack.

no ipv6 enble

Disables the IPv6 stack.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no ipv6 enable The IPv6 stack is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

ipv6 address <ipv6-address> prefixlen <prefixlen> [<gateway>]

Sets or edits the IPv6 address, prefix length and/or ipv6 default gateway.

no ipv6 address

Deletes the IPv6 address, prefix length and/or ipv6 default gateway.

[Parameter]

Parameter name	Description
<ipv6-address>	Enter an IPv6 address to be set or edited.
<prefixlen>	Enter a prefix length to be set or edited.
[<gateway>]	Enter a ipv6 default gateway to be set or edited.

[Factory Default Setting]

Parameter name	Factory default setting
<ipv6-address>	0::0
<prefixlen>	128
[<default-gateway>]	0::0

[Setting Range]

Parameter name	Setting range
<ipv6-address>	::2 to FE7F:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF, FEC0:: to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
<prefixlen>	1 to 128
[<default-gateway>]	::2～FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF

[Note]

Parameter name	Note
<ipv6-address>	None
<prefixlen>	None
[<gateway>]	None

Note: The above items must be set in order to use the SNMP management function and to enable a remote connection by telnet. Any IPv6 addresses on the network must be unique and no duplication is allowed. If you are unsure, consult the network administrator.

ipv6 address link-local < link-local-address>

Sets or edits the IPv6 link local address.

no ipv6 address link-local

Deletes the IPv6 link local address.

[Parameter]

Parameter name	Description
<ipv6-link-local address>	Enter an IPv6 link local address to be set or edited.

[Factory Default Setting]

Parameter name	Factory default setting
<ipv6-link-local-address>	The switch automatically assigns itself ipv6 link local address (EUI-64 format) when ipv6 is enabled.

[Setting Range]

Parameter name	Setting range
<ipv6-link-local-address>	FE80:: to FEBF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF

[Note]

Parameter name	Note
<ipv6-link-local-address>	None

<Configuration Example>

(1) Set the Switching Hub's IPv6 address to "2001::100," prefix length to "64" and ipv6 default gateway to "2001::1."

(1)

```
M24eG> enable
M24eG# configure
M24eG(config)# ipv6 enable
M24eG(config)# ipv6 address 2001::100 prefixlen 64 2001::1
M24eG(config)# exit
M24eG#
```

Fig. 3-2-4 Example of the ipv6 address configuration

3.3. SNMP Configuration

Configure the SNMP agent setting in "Global configuration mode." Confirm the configuration information by executing the "show snmp" command in "Privileged mode."

Command to show the SNMP information

M24eG#	show snmp

Command to enable the SNMP agent

M24eG(config)#	snmp-server agent

Command to disable the SNMP agent

M24eG(config)#	no snmp-server agent

Command to set the SNMP management (access permission from/to SNMP manager)

M24eG(config)#	snmp-server community <id> <community> <ro/rw> <ip-address>

Command to delete the SNMP management (access permission from/to SNMP manager)

M24eG(config)#	no snmp-server community <id>

Command to set the SNMP trap (type, IP address, community name)

M24eG(config)#	snmp-server host <id> type <v1/v2> <ip-address> trap <community>

Command to delete the SNMP trap (type, IP address, community name)

M24eG(config)#	no snmp-server host <id>

Command to create the SNMP group

M24eG(config)#	snmp-server group <string> <v1/v2c/v3>

Command to delete the SNMP group

M24eG(config)#	no snmp-server group <string> <v1/v2c/v3>

Command to set the read/write/notify view for the SNMP group

M24eG(config-snmp-group)#	<read/write/notify> <string>

Command to set the seculity level for the SNMP group

M24eG(config-snmp-group)#	security-level <noauth_nopriv/auth_nopriv/auth_priv>

Command to create the SNMP user

M24eG(config)#	snmp-server user <1-10> <string>

Command to delete the SNMP user

M24eG(config)#	no snmp-server user <1-10>

Command to set the SNMP group for the SNMP user

M24eG(config-snmp-user)#	group <string>

Command to set the authentication parameters for the user

M24eG(config-snmp-user)#	authentication {<md5/sha> <string> / encrypted <md5/sha> <string>}

Command to set the encryption parameters for the user

M24eG(config-snmp-user)#	privilege {des <string>/ encrypted des <string>}

Command to set the SNMP user IP address

M24eG(config-snmp-user)#	snmp-server ip <ip-address>

Command to set the SNMP user IPv6 address

M24eG(config-snmp-user)#	snmp-server ipv6 <ipv6-address>

Command to create the SNMP view

M24eG(config)#	snmp-server view <string>

Command to delete the SNMP view

M24eG(config)#	no snmp-server view <string>

Command to set the SNMP view sub tree

M24eG(config-snmp-view)#	<oid> <included/excluded>

Command to set the SNMP trap (authentication failure)

M24eG(config)#	snmp-server enable traps snmp authentication

Command to delete the SNMP trap (authentication failure)

M24eG(config)#	no snmp-server enable traps snmp authentication

Command to set the SNMP trap (cold start)

M24eG(config)#	snmp-server enable traps snmp coldstart

Command to delete the SNMP trap (cold start)

M24eG(config)#	no snmp-server enable traps snmp coldstart

Command to set the SNMP trap (notification of port link up/down status)

M24eG(config)#	snmp-server enable traps linkupdown <1-2 or 1,2,3 or 1,2,3-5>

Command to delete the SNMP trap (notification of port link up/down status)

M24eG(config)#	no snmp-server enable traps linkupdown <1-2 or 1,2,3 or 1,2,3-5>

Command to set the SNMP trap (login failure)

M24eG(config)#	snmp-server enable traps login failure

Command to delete the SNMP trap (login failure)

M24eG(config)#	no snmp-server enable traps login failure

Command to set the SNMP trap (ddm trap)

M24eG(config)#	snmp-server enable traps ddm

Command to delete the SNMP trap (ddm trap)

M24eG(config)#	no snmp-server enable traps ddm

<Command Entry Example>

An example of executing the command to show the SNMP information is shown below.

```
M24eG# show snmp
(1)SNMP Agent: Disabled

(2)SNMP Manager List:
  No.   Status    IP Address                  Access  SNMP Community String
  -(3)- ---(4)--  --(5)--------------------  --(6)-  ---------(7)---------
  1     Enabled   0.0.0.0                     ro      public
  2     Enabled   0.0.0.0                     rw      private
  3     Disabled  0.0.0.0                     ro
  4     Disabled  0.0.0.0                     ro
  5     Disabled  0.0.0.0                     ro
  6     Disabled  0.0.0.0                     ro
  7     Disabled  0.0.0.0                     ro
  8     Disabled  0.0.0.0                     ro
  9     Disabled  0.0.0.0                     ro
  10    Disabled  0.0.0.0                     ro

  No.   IPv6 Address
  ----  -(8)-------------------------------------
  1     0::0
  2     0::0
  3     0::0
  4     0::0
  5     0::0
  6     0::0
  7     0::0
  8     0::0
  9     0::0
  10    0::0

(9) Trap Reciever List:
  No.   Status    IP Address       Version  Trap Community String
  -(10) -(11)---  ---(12)--------  --(13)-  ---(14)-------------------------
  1     Enabled   0.0.0.0          v1       public
  2     Disabled  0.0.0.0          v1
  3     Disabled  0.0.0.0          v1
  4     Disabled  0.0.0.0          v1
  5     Disabled  0.0.0.0          v1
  6     Disabled  0.0.0.0          v1
  7     Disabled  0.0.0.0          v1
  8     Disabled  0.0.0.0          v1
  9     Disabled  0.0.0.0          v1
  10    Disabled  0.0.0.0          v1
```

```
No.    IPv6 Address
----  --(15)-----------------------------------
1     2001::1
2     0::0
3     0::0
4     0::0
5     0::0
6     0::0
7     0::0
8     0::0
9     0::0
10    0::0

(16)Individual Trap
(17)Coldstart                  : Enabled
(18)SNMP Authentication Failure: Disabled
(19)Login Failure              : Disabled
(20)Enable Link Up/Down Port   : all
M24eG#
```

Fig. 3-3-1 Example of executing the command to show the SNMP information

(1) SNMP Agent

Shows the SNMP agent settings.	
Enabled	The SNMP agent is enabled.
Disabled	The SNMP agent is disabled.

(2) SNMP Manager List

Lists the administrative information about SNMP manager.

(3) No.

Shows the entry number assigned to the SNMP manager.

(4) Status

Shows the status of the SNMP manager.	
Enabled	Access by the SNMP manager for the entry number is enabled.
Disabled	Access by the SNMP manager for the entry number is disabled.

(5) IP Destination

Shows the IP address of the SNMP manager.

(6) Access

Shows the access privilege of the SNMP manager.	
Ro	"Read only" is allowed.
Rw	Both "read" and "write" are allowed.

(7) SNMP Community String

Shows the community name to access via SNMP.

(8) IPv6 Destination

Shows the IPv6 address of the SNMP manager.

(9) Trap Reciever List

Lists the settings of the SNMP trap receivers.

(10) No.

Shows the entry number assigned to the trap receiver.

(11) Status

Shows the status of the SNMP trap receiver.	
Enabled	The SNMP trap receiver for the entry number is enabled.
Disabled	The SNMP trap receiver for the entry number is disabled.

(12) IP Destination

Shows the IP address of the SNMP trap receiver.

(13) Version

Shows the SNMP trap type.	
v1	SNMP v1 traps are sent.
v2	SNMP v2 traps are sent.

(14) Trap Community String

Shows the current community name, used for sending SNMP traps.

(15) IPv6 Destination

Shows the IPv6 address of the SNMP trap receiver.

(16) Individual Trap

Shows the setting of SNMP trap events.

(17) Cold start

Shows the status of Cold start trap.	
Enabled	The Cold start trap is enabled.
Disabled	The Cold start failure trap is disabled.

(18) SNMP Authentication Failure

Shows the status of SNMP authentication failure trap.	
Enabled	The SNMP authentication failure trap is enabled.
Disabled	The SNMP authentication failure trap is disabled.

(19) Login Failure

Shows the status of SNMP login failure trap.	
Enabled	The SNMP login failure trap is enabled.
Disabled	The SNMP login failure trap is disabled.

(20) Enable Link Up/Down Port

Shows the port number to which the trap is sent when the link status changes. ("All" indicates that all ports are targeted.)

<Command Entry Example>

An example of executing the command to show the SNMP group information is shown below.

```
M24eG# show snmp-server group

(1) Total Entry: 5
Group Name                      Ver.  Level
---(2)-------------------------  -(3)-  --(4)----------
public                          v1    NoAuth/NoPriv
public                          v2c   NoAuth/NoPriv
initial                         v3    NoAuth/NoPriv
private                         v1    NoAuth/NoPriv
private                         v2c   NoAuth/NoPriv

Group Name                      Read View Name
------------------------------  ---(5)-------------------------
public                          CommunityView
public                          CommunityView
initial                         restricted
private                         CommunityView
private                         CommunityView

Group Name                      Write View Name
------------------------------  ---(6)-------------------------
public                          None
public                          None
initial                         None
private                         CommunityView
private                         CommunityView

Group Name                      Notify View Name
------------------------------  ---(7)-------------------------
public                          CommunityView
public                          CommunityView
initial                         restricted
private                         CommunityView
private                         CommunityView

M24eG#
```

Fig. 3-2-2 Example of executing the command to show the SNMP group information

(1) Total Entries

Shows the number of the SNMP group entries.

(2) Group Name

Shows the SNMP group name.

(3) Version

Shows the SNMP version for the SNMP group	
v1	SNMP version 1
v2c	SNMP version 2C
v3	SNMP version 3

(4) Security level

Shows the Security level for the SNMP group	
NoAuth/NoPriv	No authentication, no privacy
Auth/Priv	Authentication, privacy
Auth/NoPriv	Authentication, no privacy

(5) Read View Name

Shows the Read View Name for the SNMP group

(6) Write View Name

Shows the Write View Name for the SNMP group

(7) Notify View Name

Shows the Notify View Name for the SNMP group

<Command Entry Example>

An example of executing the command to show the SNMP user information is shown below.

```
M24eG# show snmp-server user

SNMP User List:
No.   User Name                        Group
(1)   (2)                              (3)
1     initial                          initial
2     test                             public
3
4
5
6
7
8
9
10

No.   User Name                        Auth  Pri.
----  -------------------------------  (4)   (5)
1     initial                          None  None
2     test                             MD5   DES
3
4
5
6
7
8
9
10

M24eG#
```

Fig. 3-2-2 Example of executing the command to show the SNMP user information

(1) Number

Shows the entry number assigned to the SNMP user.

(2) User Name

Shows the SNMP user name.

(3) Group name

Shows the SNMP group name for the SNMP user

(4) Authentication Protocol

Shows the Authentication Protocol for the SNMP user	
None	None
MD5	Use HMAC MD5 algorithm for authentication
SHA	Use HMAC SHA algorithm for authentication

(5) Privacy Protocol

Shows the Privacy Protocol for the SNMP user	
None	None
DES	Use DES encryption algorithm

<Command Entry Example>

An example of executing the command to show the SNMP view information is shown below.

```
M24eG# show snmp-server view

(1)Total Entry: 8
View Name                       Subtree                 View Type
--(2)---------------------------  --(3)-----------------  --(4)-----
restricted                      1.3.6.1.2.1.1           Included
restricted                      1.3.6.1.2.1.11          Included
restricted                      1.3.6.1.6.3.10.2.1      Included
restricted                      1.3.6.1.6.3.11.2.1      Included
restricted                      1.3.6.1.6.3.15.1.1      Included
CommunityView                   1                       Included
CommunityView                   1.3.6.1.6.3             Excluded
CommunityView                   1.3.6.1.6.3.1           Included

M24eG#
```

Fig. 3-2-2 Example of executing the command to show the SNMP user information

(1) Total Entry

Shows the number of the SNMP view entries

(2) View Name

Shows the SNMP view name

(3) Subtree

Shows the SNMP view subtree OID

(4) View Type

Shows the View type for the SNMP view	
Included	OID is included into the view
Excluded	OID is excluded from the view

show snmp

Shows the SNMP configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

snmp-server agent

Enables the SNMP agent.

no snmp-server agent

Disables the SNMP agent.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no snmp-server agent The SNMP agent is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

snmp-server community <id> <community> <ro / rw> {<ip-address> | ipv6 <ipv6-address> } [<string>]

Sets or edits the SNMP manager administrative information.

no snmp-server community <id>

Deletes the SNMP manager administrative information.

[Parameter]

Parameter name	Description
<id>	Set the entry number of the SNMP manager.
<community>	Set the community name for the SNMP manager.
<ro/rw>	Set the access privilege of the SNMP manager.
<ip-address>	Set the IP address of the SNMP manager.
<ipv6-address>	Set the IPv6 address of the SNMP manager
<string>	Set the SNMP View name to access control

[Factory Default Setting]

Parameter name	Factory default setting
<id>	No. 1 to 2: Enabled No. 3 to 10: Disabled
<community>	No. 1: private No. 2: public
<ro/rw>	Privilege No. 1: Read-Write No. 2 to 10: Read-Only
<ip-address>	0.0.0.0
<ipv6-address>	0::0
<string>	No.1: CommunityView No.2: CommunityView

[Setting Range]

Parameter name	Setting range
<id>	1 to 10
<community>	1 to 32 one-byte alphanumeric characters
<ro/rw>	Either "ro" or "rw" (ro: Read-Only, rw: Read-Write)
<ip-address>	Class A: 1.x.x.x to 126.x.x.x Class B: 128.1.x.x to 191.254.x.x Class C: 192.0.1.x to 223.255.254.x
<ipv6-address>	::2 to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
<string>	Up to 32 one-byte characters

[Note]

Parameter name	Note
—	None

snmp-server host <id> type <v1/v2c/v3> {<ip-address> | ipv6 <ipv6-address>} trap <string>

Sets or edits the SNMP trap receiver settings.

no snmp-server host <id>

Deletes the SNMP trap receiver settings.

[Parameter]

Parameter name	Description
<id>	Set the entry number of the SNMP trap receiver.
<v1/v2c/v3>	Set the type of the SNMP trap receiver.
<ip-address>	Set the IP address of the SNMP trap receiver.
<ipv6-address>	Set the IPv6 address of the SNMP trap receiver.
<string>	Set the community name or the SNMP user name for the SNMP trap receiver.

[Factory Default Setting]

Parameter name	Factory default setting
<id>	None. The SNMP trap receiver setting is disabled.
<v1/v2c/v3>	None
<ip-address>	0.0.0.0
<ipv6-address>	0::0
<string>	None

[Setting Range]

Parameter name	Setting range
<id>	1 to 10
<v1/v2c/v3>	Either "v1" or "v2" or “v3”
<ip-address>	Class A: 1.x.x.x to 126.x.x.x Class B: 128.1.x.x to 191.254.x.x Class C: 192.0.1.x to 223.255.254.x
<ipv6-address>	::2 to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
<string>	1 to 32 one-byte alphanumeric characters

[Note]

Parameter name	Note
—	None

snmp-server group <string> <v1/v2c/v3>

Sets or edits the SNMP group settings.

no snmp-server group <string> <v1/v2c/v3>

Deletes the SNMP group settings.

[Parameter]

Parameter name	Description
<string>	Set the SNMP group name.
<v1/v2c/v3>	Set the type of the SNMP group.

[Factory Default Setting]

Parameter name	Factory default setting
<string>	public private
<v1/v2c/v3>	public : v1 private : v1

[Setting Range]

Parameter name	Setting range
<string>	Up to 32 one-byte characters
<v1/v2c/v3>	Either "v1" or "v2c" or “v3”

[Note]

Parameter name	Note
—	None

<read/write/notify> <string>

Sets or edits the SNMP view settings for the SNMP group.
read : the read view for the SNMP group
write : the write view for the SNMP group
notify : the notify view for the SNMP group

* This command is executed in the SNMP group configuration mode.

[Parameter]

Parameter name	Description
<string>	Set the SNMP view name.

[Factory Default Setting]

Parameter name	Factory default setting
<string>	CommunityView

[Setting Range]

Parameter name	Setting range
<string>	Up to 32 one-byte characters

[Note]

Parameter name	Note
—	None

security-level <noauth_nopriv/auth_nopriv/auth_priv>

Sets or edits the security level for the SNMP group.

* This command is executed in the SNMP group configuration mode.

[Parameter]

Parameter name	Description
<noauth_nopriv/ auth_nopriv/ auth_priv>	Set the security level for the SNMP group.

[Factory Default Setting]

Parameter name	Factory default setting
<noauth_nopriv/ auth_nopriv/ auth_priv>	public : CommunityView (Read/Notify) private : CommunityView (Read/Write/Notify)

[Setting Range]

Parameter name	Setting range
<noauth_nopriv/ auth_nopriv/ auth_priv>	noauth_nopriv : no authentication, no private auth_nopriv : authentication, no private auth_priv : authentication, private

[Note]

Parameter name	Note
—	None

snmp-server user <1-10> <string>

Sets or edits the SNMP user settings.

no snmp-server user <1-10>

Deletes the SNMP user settings.

[Parameter]

Parameter name	Description
<1-10>	Set the entry number of the SNMP user.
<string>	Set the SNMP user name.

[Factory Default Setting]

Parameter name	Factory default setting
<1-10>	1
<string>	initial

[Setting Range]

Parameter name	Setting range
<1-10>	1 to 10
<string>	Up to 32 one-byte characters

[Note]

Parameter name	Note
—	None

group <string>

Sets or edits the SNMP group settings for the SNMP user.

* This command is executed in the SNMP user configuration mode.

[Parameter]

Parameter name	Description
<string>	Set the SNMP group name.

[Factory Default Setting]

Parameter name	Factory default setting
<string>	public private initial

[Setting Range]

Parameter name	Setting range
<string>	Up to 32 one-byte characters

[Note]

Parameter name	Note
—	None

authentication {<md5/sha> <string> / encrypted <md5/sha> <string>}

Sets or edits the authentication settings for the SNMP user.

* This command is executed in the SNMP user configuration mode.

[Parameter]

Parameter name	Description
<md5/sha>	Set the authentication method for the SNMP user.
<string>	Set the password or encrypted key

[Factory Default Setting]

Parameter name	Factory default setting
<md5/sha>	None
<string>	None

[Setting Range]

Parameter name	Setting range
<md5/sha>	MD5 or SHA
<string>	MD5 : 8 to 16 one-byte characters or 32 one-byte characters (Encrypted) SHA : 8 to 20 one-byte characters or 40 one-byte characters (Encrypted)

[Note]

Parameter name	Note
—	None

privilege {des <string> / encrypted des <string>}

Sets or edits the private settings for the SNMP user.
Only supports DES encryption algorithm.

* This command is executed in the SNMP user configuration mode.

[Parameter]

Parameter name	Description
<string>	Set the password or encrypted key

[Factory Default Setting]

Parameter name	Factory default setting
<string>	None

[Setting Range]

Parameter name	Setting range
<string>	DES : 8 to 20 one-byte characters or 32 one-byte characters (Encrypted)

[Note]

Parameter name	Note
—	None

snmp-server ip <ip-address>

Sets or edits the IP address settings for the SNMP user.

* This command is executed in the SNMP user configuration mode.

[Parameter]

Parameter name	Description
<ip-address>	Set the ip address for the SNMP user

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	0.0.0.0

[Setting Range]

Parameter name	Setting range
<ip-address>	Class A: 1.x.x.x to 126.x.x.x Class B: 128.1.x.x to 191.254.x.x Class C: 192.0.1.x to 223.255.254.x

[Note]

Parameter name	Note
—	None

snmp-server ipv6 <ipv6-address>

Sets or edits the IPv6 address settings for the SNMP user.

* This command is executed in the SNMP user configuration mode.

[Parameter]

Parameter name	Description
<ipv6-address>	Set the ipv6 address for the SNMP user

[Factory Default Setting]

Parameter name	Factory default setting
<ipv6-address>	0::0

[Setting Range]

Parameter name	Setting range
<ip-address>	::2 to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF

[Note]

Parameter name	Note
—	None

snmp-server view <string>

Sets or edits the SNMP view settings.

no snmp-server view <string>

Deletes the SNMP view settings.

[Parameter]

Parameter name	Description
<string>	Set the SNMP view name.

[Factory Default Setting]

Parameter name	Factory default setting
<string>	restricted CommunityView

[Setting Range]

Parameter name	Setting range
<string>	Up to 32 one-byte characters

[Note]

Parameter name	Note
—	None

<oid> <included/excluded>

Sets or edits the subtree for the SNMP view.

* This command is executed in the SNMP group configuration mode.

[Parameter]

Parameter name	Description
<oid>	Set OID for SNMP view.
<included/excluded>	Included : OID is included into the view Excuded : OID is excluded from the view

[Factory Default Setting]

Parameter name	Factory default setting
<oid> <included/excluded>	Restricted 1.3.6.1.2.1.1 (Included) 1.3.6.1.2.1.11 (Included) 1.3.6.1.6.3.10.2.1 (Included) 1.3.6.1.6.3.11.2.1 (Included) 1.3.6.1.6.3.15.1.1 (Included) CommunityView 1 (Included) 1.3.6.1.6.3 (Excluded) 1.3.6.1.6.3.1 (Included)

[Setting Range]

Parameter name	Setting range
<oid>	SNMP OID
<included/excluded>	Included or Excluded

[Note]

Parameter name	Note
—	None

snmp-server enable traps snmp authentication

Enables the trap sending settings for an SNMP authentication failure.

no snmp-server enable traps snmp authentication

Disables the trap sending settings for an SNMP authentication failure.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no snmp-server enable traps snmp authentication

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

snmp-server enable traps snmp coldstart

Enables the trap sending settings for the SNMP coldstart.

no snmp-server enable traps snmp coldstart

Disables the trap sending settings for the SNMP coldstart.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no snmp-server enable traps snmp coldstart

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

snmp-server enable traps linkupdown <port>

Adds a port to which the trap is sent when the link status changes.

no snmp-server enable traps linkupdown <port>

Deletes a port to which the trap is sent when the link status changes.

[Parameter]

Parameter name	Description
<port>	Set the target port number.

[Factory Default Setting]

Parameter name	Factory default setting
<port>	None

[Setting Range]

Parameter name	Setting range
<port>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Multiple ports can be set. Example: 1-3,5

[Note]

Parameter name	Note
<port>	None

snmp-server enable traps login failure

Enables the trap sending settings for login failure.

no snmp-server enable traps snmp coldstart

Disables the trap sending settings for login failure.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no snmp-server enable traps login failure

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

snmp-server enable traps ddm

Enables the trap sending settings for ddm.

no snmp-server enable traps ddm

Disables the trap sending settings for ddm.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no snmp-server enable traps ddm

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Enable the SNMP function, then set the community name and the address information.

(1) Enable the SNMP agent.
(2) Set the SNMP manager administrative information as below.
community 1, private, Read-Write, 192.168.1.200
(3) Set the SNMP manager administrative information as below.
community 2, public, Read-Only, 192.168.1.200
(4) Set the SNMP trap receiver settings as below.
trap receiver 1, SNMP v1, 192.168.1.200, community public

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# snmp-server agent
(2) M24eG(config)# snmp-server community 1 private rw 192.168.1.200
(3) M24eG(config)# snmp-server community 2 public ro 192.168.1.200
(4) M24eG(config)# snmp-server host 1 type v1 192.168.1.200 trap public
M24eG(config)# end
M24eG#
```

Fig. 3-3-2 Example of executing the command to show the SNMP information

<Configuration Example>

Overview: Enable the SNMP function, then set the SNMP group and the SNMP user.

(1) Enable the SNMP agent.
(2) Set the SNMP group as below.
group name : test, Read/Notify : CommunityView
(3) Set the SNMP user as below.
user name : test, group : test, authentication MD5, password panasonic
(4) Set the SNMP trap receiver settings as below.
trap receiver 1, SNMP v3, 192.168.1.200, user : test

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# snmp-server agent
(2) M24eG(config)# snmp-server group test v3
M24eG(config-snmp-group)# read CommunityView
M24eG(config-snmp-group)# notify CommunityView
M24eG(config-snmp-group)# security-level auth_nopriv
M24eG(config-snmp-group)# exit
(3) M24eG(config)# snmp-server user 1 test

 NOTICE: Must set Auth. if the user group is an auth_nopriv group;
         Must set both Auth. and Priv. if the user group is an auth_priv group
M24eG(config-snmp-user)# group test
M24eG(config-snmp-user)# authentication md5 panasonic
M24eG(config-snmp-user)# exit
(4) M24eG(config)# snmp-server host 1 type v3 192.168.1.200 trap test
M24eG(config)# end
M24eG#
```

Fig. 3-3-2 Example of executing the command to show the SNMP information

3.4. Port Configuration

Configure the port setting in "Interface configuration mode." Confirm the configuration information by executing the "show interface info" command in "Privileged mode."

Command to show the port information

M24eG#	show interface info

Command to show the detailed port information

M24eG#	show interface [<interface name>]

Command to enable the port status

M24eG(config-if)#	no shutdown

Command to disable the port status

M24eG(config-if)#	Shutdown

Command to set the port mode

M24eG(config-if)#	speed-duplex < auto | {10|100}-half | {10|100}-full >

Command to enable the flow control

M24eG(config-if)#	flow-control

Command to disable the flow control

M24eG(config-if)#	no flow-control

Command to set the port name

M24eG(config-if)#	name <string>

Command to enable the Auto MDI

M24eG(config-if)#	mdix auto

Command to disable the Auto MDI

M24eG(config-if)#	no mdix auto

Command to enable the jumbo frame

M24eG(config)#	Jumbo

Command to disable the jumbo frame

M24eG(config)#	no jumbo

<Command Entry Example>

An example of executing the command to show the port information is shown below.

```
M24eG> enable
M24eG# show interface info

(1) Jumbo Status : Enabled
 Port  Trunk      Type       Admin     Link      Mode       Flow Ctrl  Auto-MDI
 (2)   (3)   -----(4)----  ---(5)---  (6)-  -----(7)-----  ---(8)---  ---(9)---
    1   ---     1000T      Disabled   Down     Auto         Disabled   Disabled
    2   ---     1000T      Enabled    Down     100-FDx      Disabled   Disabled
    3   ---     1000T      Enabled    Down     Auto         Enabled    Disabled
    4   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
    5   ---     1000T      Enabled    Down     Auto         Disabled   Enabled
    6   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
    7   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
    8   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
    9   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   10   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   11   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   12   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   13   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   14   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   15   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   16   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   17   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   18   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   19   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   20   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   21   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   22   ---     1000T      Enabled    Down     Auto         Disabled   Disabled
   23   ---     1000T      Enabled    Down     Auto         Disabled   Enabled
   24   ---     1000T      Enabled    Down     Auto         Disabled   Enabled

M24eG#
```

Fig. 3-4-1 Example of executing the command to show the port information

(1) Jumbo

Shows the jumbo frame setting.	
Enabled	The jumbo frame is enabled.
Disabled	The jumbo frame is disabled.

(2) Port

Shows the port number.

(3) Trunk

Shows the group number for a trunked port.

(4) Type

Shows the port type.	
100TX	The port type is 10/100BASE-TX.
1000T	The port type is 10/100/1000BASE-T.
1000X	The port type is SFP port.

(5) Admin

Shows the current port status. The factory default setting is “Enabled” for all ports.	
Enabled	The port is available for use.
Disabled	The port is not available for use.

(6) Link

Shows the current link status.	
Up	The Link is established successfully.
Down	The Link is not established.

(7) Mode

Shows the port communication speed and duplex mode (full or half).	
Auto	The auto negotiation function is enabled when the port link is down. While the link is up, the string enclosed in parentheses shows the communication speed and full-duplex/half-duplex mode.
1000F	The port is in the 1000 Mbps full-duplex mode.
100-FDx ("100F" under the "Auto" mode)	The port is in the 100 Mbps full-duplex mode.
100-HDx ("100H" under the "Auto" mode)	The port is in the 100 Mbps half-duplex mode.
10-FDx ("10F" under the "Auto" mode)	The port is in the 10 Mbps full-duplex mode.
10-HDx ("10H" under the "Auto" mode)	The port is in the 10 Mbps half-duplex mode.

(8) FlowCtrl

Shows the flow control setting.	
Enabled	The flow control is enabled.
Disabled	The flow control is disabled.

(9) Auto-MDI

Shows the Auto MDI/MDI-X setting.	
Enabled	The Auto MDI/MDI-X is enabled.
Disabled	The Auto MDI/MDI-X is disabled.

<Command Entry Example>

An example of executing the command to show the port name information is shown below.

```
M24eG> enable
M24eG# sh interface name

(1) Jumbo Status : Enabled
 Port  Trunk       Type      Link     Port Name        EAP Pkt FW
 (2)   (3)   -----(4)----   (5)   ------(6)-------    -----(7)-----
    1   ---      1000T      Down  PORT_1             Disabled
    2   ---      1000T      Down  PORT_2             Disabled
    3   ---      1000T      Down  PORT_3             Disabled
    4   ---      1000T      Down  PORT_4             Disabled
    5   ---      1000T      Down  PORT_5             Disabled
    6   ---      1000T      Down  PORT_6             Disabled
    7   ---      1000T      Down  PORT_7             Disabled
    8   ---      1000T      Down  PORT_8             Disabled
    9   ---      1000T      Down  PORT_9             Disabled
   10   ---      1000T      Down  PORT_10            Disabled
   11   ---      1000T      Down  PORT_11            Disabled
   12   ---      1000T      Down  PORT_12            Disabled
   13   ---      1000T      Down  PORT_13            Disabled
   14   ---      1000T      Down  PORT_14            Disabled
   15   ---      1000T      Down  PORT_15            Disabled
   16   ---      1000T      Down  PORT_16            Disabled
   17   ---      1000T      Down  PORT_17            Disabled
   18   ---      1000T      Down  PORT_18            Disabled
   19   ---      1000T      Down  PORT_19            Disabled
   20   ---      1000T      Down  PORT_20            Disabled
   21   ---      1000T      Down  PORT_21            Disabled
   22   ---      1000T      Down  PORT_22            Disabled
   23   ---      1000T      Down  PORT_23            Disabled
   24   ---      1000T      Down  PORT_24            Disabled

M24eG#
```

Fig. 3-4-1 Example of executing the command to show the port name information

(1) Jumbo

Shows the jumbo frame setting.	
Enabled	The jumbo frame is enabled.
Disabled	The jumbo frame is disabled.

(2) Port

Shows the port number.

(3) Trunk

Shows the group number for a trunked port.

(4) Type

Shows the port type.	
100TX	The port type is 10/100BASE-TX.
1000T	The port type is 10/100/1000BASE-T.
1000X	The port type is SFP port.

(5) Link

Shows the current link status.	
Up	The Link is established successfully.
Down	The Link is not established.

(6) Port Name

Shows the port name.

(7) EAP Pkt FW

Shows the EAP packet forwarding setting.	
Enabled	The EAP packet forwarding is enabled.
Disabled	The EAP packet forwarding is disabled.

show interface [<interface name>]

Shows the interface setting at the specific ports.

[Parameter]

Parameter name	Description
[<interface name>]	Target ports to show the setting.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
[<interface name>]	<Switch-M48eG> GigabitEthernet0/1 to GigabitEthernet0/48 <Switch-M24eG> GigabitEthernet0/1 to GigabitEthernet0/24 <Switch-M16eG> GigabitEthernet0/1 to GigabitEthernet0/16 <Switch-M8eG> GigabitEthernet0/1 to GigabitEthernet0/9 The name can be abbreviated. Example: GigabitEthernet0/1 → gi0/1

[Note]

Parameter name	Note
None	None

show interface info

Shows the interface setting information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show interface name

Shows the interface name setting information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

shutdown

Shuts down a port.

no shutdown

Releases a port.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no shutdown

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

speed-duplex < auto | {10|100}-half | {10|100}-full >

Sets the port mode.

[Parameter]

Parameter name	Description	
< auto | {10|100}-half | {10|100}-full >	Set the port mode.	
	auto	Set the mode to "auto negotiation."
	10-half	Set the mode to "10 Mbps half-duplex."
	10-full	Set the mode to "10 Mbps full-duplex."
	100-half	Set the mode to "100 Mbps half-duplex."
	100-full	Set the mode to "100 Mbps full-duplex."

[Factory Default Setting]

Parameter name	Factory default setting
< auto | {10|100}-half | {10|100}-full >	auto

[Setting Range]

Parameter name	Setting range
< auto | {10|100}-half | {10|100}-full >	None

[Note]

Parameter name	Note
< auto | {10|100}-half | {10|100}-full >	None

flow-control

Enables the flow control function.

no flow-control

Disables the flow control function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no frow-control The flow control function is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

name <string>

Sets the port name.

[Parameter]

Parameter name	Description
< string >	Set the port name.

[Factory Default Setting]

Parameter name	Factory default setting
< string >	Nothing is set.

[Setting Range]

Parameter name	Setting range
< string >	Up to 15 one-byte characters Allowed characters: alphanumeric character (A-Z, a-z, 0-9) symbol (!@#$&_-.) white space

[Note]

Parameter name	Note
< string >	To set a system name containing white spaces, enclose the entire name with a pair of double-quotation marks (" "). Example: name "port A"

mdix auto

Enables the Auto MDI/MDI-X function.

no mdix auto

Disables the Auto MDI/MDI-X function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	<Switch-M48eG> Ports 1 to 44: no mdix auto The Auto MDI/MDI-X function is disabled. Ports 45 to 48: mdix auto The Auto MDI/MDI-X function is enabled. <Switch-M24eG> Ports 1 to 22: no mdix auto The Auto MDI/MDI-X function is disabled. Ports 23 to 24: mdix auto The Auto MDI/MDI-X function is enabled. <Switch-M16eG> Ports 1 to 14: no mdix auto The Auto MDI/MDI-X function is disabled. Ports 15 to 16: mdix auto The Auto MDI/MDI-X function is enabled. <Switch-M8eG> Ports 1 to 7: no mdix auto The Auto MDI/MDI-X function is disabled. Ports 8: mdix auto The Auto MDI/MDI-X function is enabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

jumbo

Enables jumbo frames.

no jumbo

Disables jumbo frames.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no jumbo Jumbo frame is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	When jumbo frame is enabled, the maximum frame size is set at 9220 bytes (including a VLAN tag).

eap-forward

Enables EAP frame forwarding.

no eap-forward

Disables EAP frame forwarding.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no eap-forward EAP frame forwarding is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example 1>

Overview: Set the status of Port 1 to be closed.

(1) Move to the interface configuration mode for Port 1.

(2) Shut down Port 1.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/1
(2) M24eG(config-if)# shutdown
M24eG(config-if)# exit
M24eG(config)#
M24eG#
```

Fig. 3-4-3 Example of shutting down a port

<Configuration Example 2>

Overview: Set the modes of Ports 2 to 4 to be "100 Mbps full-duplex."

(1) Move to the interface configuration mode for Port 2 to 4.

(2) Set the modes of Ports 2 to 4 at 100 Mbps full-duplex.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/2-4
(2) M24eG(config-if)# speed-duplex 100-full
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 3-4-4 Example of configuring the duplex mode for a port

<Configuration Example 3>

Overview: Enable the Auto MDI/MDI-X function for Ports 5 to 8.

(1) Move to the interface configuration mode for Port 5 to 8.

(2) Set auto to the Auto MDI/MDI-X function for Ports 5 to 8.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/5-8
(2) M24eG(config-if)# mdix auto
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 3-4-5 Example of configuring the Auto MDI/MDI-X

3.5. System Security Configuration

Configure the system settings to access this Switching Hub in "Global configuration mode." Confirm the configuration information by executing the "show terminal length" command in "Privileged mode."

Command to show the number of lines on a screen

M24eG#	show terminal length

Command to set the number of lines on a screen

M24eG(config)#	terminal length <LENGTH>

<Command Entry Example>

An example of executing the command to show the number of lines on a screen is shown below.

```
M24eG> enable
M24eG# show terminal length

(1) Terminal Length: 24 rows

M24eG#
```

Fig. 3-5-1 Example of executing the command to show the number of lines on a screen

(1) Terminal Length

Shows the number of lines displayed on a screen. ("none" is shown if this value is set to "0.")

show terminal length

Shows the number of lines displayed on a screen.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

terminal length <LENGTH>

Sets the number of lines displayed on a screen.

[Parameter]

Parameter name	Description
<LENGTH>	Set the number of lines displayed on a screen. Assigning the value "0" sets no limit on the number of lines displayed on a screen.

[Factory Default Setting]

Parameter name	Factory default setting
<LENGTH>	24

[Setting Range]

Parameter name	Setting range
<LENGTH>	0, or 24 to 512

[Note]

Parameter name	Note
<LENGTH>	None

<Configuration Example>

Overview: Set the number of lines displayed on a screen to unlimited.

(1) Set no limit on the number of lines displayed on a screen.

(1)

```
M24eG> enable
M24eG# conf
M24eG(config)# terminal length 0
M24eG(config)# exit
M24eG#
```

Fig. 3-5-2 Example of configuring the number of lines displayed on a screen

3.5.1. Console Configuration

Configure the settings to access this Switching Hub via console in "Global configuration mode." Confirm the configuration information by executing the "show console" command in "Privileged mode."

Command to show the console configuration

M24eG#	show console

Command to set the console timeout

M24eG(config)#	console inactivity-timer <minutes>

<Command Entry Example>

An example of executing the command to show the console configuration is shown below.

```
M24eG> enable
M24eG# show console

(1) Console UI Idle Timeout: 5 minutes

M24eG#
```

Fig. 3-5-1-1 Example of executing the command to show the console configuration

(1) Console UI Idle Timeout

Shows the maximum inactivity time to wait for a user input in a console session. Upon expiration, the session is automatically terminated. (If the auto disconnection is disabled, "no timeout" is shown.)

show console

Shows the maximum inactivity time to wait for a user input in a console session. Upon expiration, the session is automatically terminated.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

console inactivity-timer <minutes>

Changes the maximum inactivity time to wait for a user input in a console session. Upon expiration, the session is automatically terminated.

[Parameter]

Parameter name	Description
<minutes>	Set the maximum inactivity time in minutes to wait for a user input in a console session. Upon expiration, the session is automatically terminated.

[Factory Default Setting]

Parameter name	Factory default setting
<minutes>	5 (minutes)

[Setting Range]

Parameter name	Setting range
<minutes>	0 to 60 (minutes) Entering "0" disables the automatic disconnection.

[Note]

Parameter name	Note
<minutes>	None

<Configuration Example>

Overview: Disable the inactivity-time-based automatic disconnection of a console session.

(1) Disable the automatic disconnection for the console inactivity time.

(1)

```
M24eG> enable
M24eG# conf
M24eG(config)# console inactivity-timer 0
M24eG(config)# exit
M24eG#
```

Fig. 3-5-1-2 Example of configuring the automatic disconnection time for inactivity

3.5.2. Telnet Configuration

Configure the telnet-related settings in "Global configuration mode." Confirm the configuration information by executing the "show telnet-sever" command in "Privileged mode."

Command to show the telnet server configuration

M24eG#	show telnet-server

Command to enable the telnet server

M24eG(config)#	telnet-server enable

Command to disable the telnet server

M24eG(config)#	no telnet-server enable

Command to set the telnet server timeout

M24eG(config)#	telnet-server inactivity-timer <minutes>

Command to enable the telnet access limitation

M24eG(config)#	telnet-server [ipv6] access-limitation enable

Command to disable the telnet access limitation

M24eG(config)#	no telnet-server [ipv6] access-limitation enable

Command to set the device to allow telnet access

M24eG(config)#	telnet-server <entry> {<ip-address> <mask> | ipv6 <ipv6-address> prefixlen <prefixlen>}

<Command Entry Example>

An example of executing the command to show the telnet server configuration is shown below.

```
M24eG> enable
M24eG# show telnet-server

(1) Telnet UI Idle Timeout: 5 minutes

 Telnet Server
---------------
(2) Enabled

(3) Telnet Access Limitation: Disabled

 No.       IP Address            Subnet Mask
(4)  ------(5)-------       -----(6)--------
 1       <empty>               <empty>
 2       <empty>               <empty>
 3       <empty>               <empty>
 4       <empty>               <empty>
 5       <empty>               <empty>

(7) IPv6 Telnet Access Limitation: Disabled

 No.              Server IPv6 address                 Prefix
(8)  ----------------(9)--------------------      -(10)-
 1                     <empty>                      <empty>
 2                     <empty>                      <empty>
 3                     <empty>                      <empty>
 4                     <empty>                      <empty>
 5                     <empty>                      <empty>
M24eG#
```

Fig. 3-5-2-1 Example of executing the command to show the telnet server configuration

(1) Telnet UI Idle Timeout

Shows the maximum inactivity time to wait for a user input in a telnet client session. Upon expiration, the session is automatically terminated.

(2) Telnet Server

Shows the telnet server settings.	
Enabled	The telnet server is enabled.
Disabled	The telnet server is disabled.

(3) Telnet Access Limitation

Shows the access limitation settings from telnet clients.	
Enabled	The access limitation from telnet clients is enabled.
Disabled	The access limitation from telnet clients is disabled.

(4) No.

Shows the entry number assigned to the access-limited address of a telnet client.

(5) IP Address

Shows the IP address or the IP address range to allow access from telnet clients. (If no IP address has been entered, <empty> is shown.)

(6) Subnet Mask

Shows the subnet mask value for IP addresses to allow access from telnet clients. (If no subnet mask value has been entered, <empty> is shown.)

(7) IPv6 Telnet Access Limitation

Shows the ipv6 access limitation settings from telnet clients.	
Enabled	The ipv6 access limitation from telnet clients is enabled.
Disabled	The ipv6 access limitation from telnet clients is disabled.

(8) No.

Shows the entry number assigned to the access-limited ipv6 address of a telnet client.

(9) IPv6 Address

Shows the IPv6 address or the IPv6 address range to allow access from telnet clients. (If no IPv6 address has been entered, <empty> is shown.)

(10) Prefix length

Shows the IPv6 Prefix length value for IPv6 addresses to allow access from telnet clients. (If no IPv6 prefix length value has been entered, <empty> is shown.)

show telnet-server

Shows the telnet server configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

telnet-server enable

Enables the telnet server.

no telnet-server enable

Disables the telnet server.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	telnet-server enable The telnet server is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

telnet-server inactivity-timer <minutes>

Sets the maximum inactivity time to wait for a user input in a telnet client session. Upon expiration, the session is automatically terminated.

[Parameter]

Parameter name	Description
<minutes>	Set the maximum inactivity time in minutes to wait for a user input in a telnet client session. Upon expiration, the session is automatically terminated.

[Factory Default Setting]

Parameter name	Factory default setting
<minutes>	5 (minutes)

[Setting Range]

Parameter name	Setting range
<minutes>	1 to 60 (minutes)

[Note]

Parameter name	Note
<minutes>	None

telnet-server [ipv6] access-limitation enable

Enables the access limitation from telnet clients.

no telnet-server [ipv6] access-limitation enable

Disables the access limitation from telnet clients.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no telnet-server access-limitation enable The access limitation from telnet clients is disabled. no ipv6 telnet-server access-limitation enable The ipv6 access limitation from telnet clients is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

telnet-server <entry> {<ip-address> <mask> | ipv6 <ipv6-address> prefixlen <prefixlen>}

Sets IP addresses to allow access from telnet clients when the access limitation is enabled.

[Parameter]

Parameter name	Description
<entry>	Set an entry number.
<ip-address>	Set an IP address to allow access.
<mask>	Set a subnet mask to allow access from the IP address range.
<ipv6-address>	Set an IPv6 address to allow access.
<prefixlen>	Set a prefix length to allow access from the IPv6 address range.

[Factory Default Setting]

Parameter name	Factory default setting
<entry>	None
<ip-address>	None
<mask>	None
<ipv6-address>	None
<prefixlen>	None

[Setting Range]

Parameter name	Setting range
<entry>	Enter an entry number from 1 to 5.
<ip-address>	1.0.0.1 to 223.255.254.254
<mask>	128.0.0.0 to 255.255.255.255 (One-bits and zero-bits must be consecutive in binary.)
<ipv6-address>	::2 to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
<prefixlen>	1 to 128

[Note]

Parameter name	Note
<entry>	None
<ip-address>	None
<mask>	None
<ipv6-address>	None
<prefixlen>	None

<Configuration Example>

Overview: Configure the telnet connection so that the sessions are allowed only from specific network addresses (192.168.1.1 to 192.168.1.254).

(1) Enable the access limitation from telnet.
(2) Add the network address 192.168.1.0 (subnet mask 255.255.255.0), as a source address for telnet connections, to Entry No. 1.

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# telnet-server access-limitation enable
(2)M24eG(config)# telnet-server 1 192.168.1.0 255.255.255.0
M24eG(config)# exit
M24eG#
```

Fig. 3-5-2-2 Example of configuring the telnet access limitation

<Configuration Example>

Overview: Configure the telnet connection so that the sessions are allowed only from specific ipv6 network addresses (2001::1:1 to 2001::1:FFFF).

(1) Enable the ipv6 access limitation from telnet.
(2) Add the network address 2001::1:0 (prefix length 112), as a source address for telnet connections, to Entry No. 1.

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# telnet-server ipv6 access-limitation enable
(2)M24eG(config)# telnet-server 1 ipv6 2001::1:0 prefixlen 112
M24eG(config)# exit
M24eG#
```

Fig. 3-5-2-2 Example of configuring the ipv6 telnet access limitation

3.5.3. SSH Configuration

Configure the SSH-related settings in "Global configuration mode." Confirm the configuration information by executing the "show ip ssh" command in "Privileged mode."

Command to show the SSH configuration

M24eG#	show ip ssh

Command to enable the SSH server

M24eG(config)#	crypto key generate rsa

Command to delete the SSH server

M24eG(config)#	crypto key zeroize rsa

Command to set the SSH server timeout

M24eG(config)#	ip ssh time-out <minutes>

Command to set the SSH server authentication timeout

M24eG(config)#	ip ssh authentication-timeout <seconds>

Command to set the number of SSH server authentication retries

M24eG(config)#	ip ssh authentication-retries <retries>

<Command Entry Example>

An example of executing the command to show the SSH configuration is shown below.

```
M24eG> enable
M24eG# show ip ssh

(1) SSH UI Idle Timeout:    5 Min.
(2) SSH Auth. Idle Timeout: 120 Sec.
(3) SSH Auth. Retries Time: 5
(4) SSH Server:             Enabled(SSH)
(5) SSH Server Key:         Key exists.

M24eG#
```

Fig. 3-5-3-1 Example of executing the command to show the SSH configuration

(1) SSH UI Idle Timeout

Shows the maximum inactivity time to wait for a user input in an SSH session. Upon expiration, the session is automatically terminated.

(2) SSH Auth. Idle Timeout

Shows the response timeout time for SSH authentication.

(3) SSH Auth. Retries Time

Shows the maximum number of SSH authentication retries.

(4) SSH Server

Shows whether or not the access via SSH is allowed.

(5) SSH Server Key

Shows the status of the SSH server key.

show ip ssh

Shows the SSH server configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

crypto key generate rsa

Generates SSH server keys. Enables the access via SSH.

crypto key zeroize rsa

Deletes SSH server keys. Disables the access via SSH.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	crypto key zeroize rsa The access via SSH is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	Up to two users can access the Switching Hub concurrently via SSH. For the SSH login procedure, follow the operation procedure for each SSH client.

ip ssh time-out <minutes>

Sets the maximum inactivity time to wait for a user input in an SSH session. Upon expiration, the session is automatically terminated.

[Parameter]

Parameter name	Description
<minutes>	Set the maximum inactivity time in minutes to wait for a user input. Upon expiration, the session is automatically terminated.

[Factory Default Setting]

Parameter name	Factory default setting
<minutes>	5 (minutes)

[Setting Range]

Parameter name	Setting range
<minutes>	1 to 60 (minutes)

[Note]

Parameter name	Note
<minutes>	None

ip ssh authentication-timeout <seconds>

Sets the response timeout time for SSH authentication.

[Parameter]

Parameter name	Description
<seconds>	Set the response timeout time in seconds for SSH authentication.

[Factory Default Setting]

Parameter name	Factory default setting
<seconds>	120 (seconds)

[Setting Range]

Parameter name	Setting range
<seconds>	1 to 120 (seconds)

[Note]

Parameter name	Note
<seconds>	None

ip ssh authentication-retries <retries>

Sets the maximum number of SSH authentication retries.

[Parameter]

Parameter name	Description
<retries>	Set the maximum number of SSH authentication retries. The first try is counted as a retry.

[Factory Default Setting]

Parameter name	Factory default setting
<retries>	5 (times)

[Setting Range]

Parameter name	Setting range
<retries>	0 to 5 (times)

[Note]

Parameter name	Note
<retries>	None

<Configuration Example>

Overview: Enable the access via SSH.
Set the timeout time to 40 seconds. This is the maximum inactivity time to wait for a user input. Upon expiration, the session is automatically terminated.

(1) Enable the access via SSH.
(2) Set the timeout time to 40 seconds. If no input is made before it expires, the session is automatically terminated.

```
M24eG> enable
M24eG# conf
(1) M24eG(config)# crypto key generate rsa
(2) M24eG(config)# ip ssh time-out 40
M24eG(config)# exit
M24eG#
```

Fig. 3-5-3-2 Example of the SSH server configuration

3.5.4. Web Configuration

Configure the web access settings in "Global configuration mode." Confirm the configuration information by executing the "show ip http server" command in "Privileged mode."

Command to show the Web configuration

M24eG#	show ip http server

Command to enable the Web server

M24eG(config)#	ip http server

Command to disable the Web server

M24eG(config)#	no ip http server

<Command Entry Example>

An example of executing the command to show the Web configuration is shown below.

```
M24eG> enable
M24eG# show ip http server


(1) Web Server
------------
 Enabled

M24eG#
```

Fig. 3-5-4-1 Example of executing the command to show the Web configuration

(1) Web Server

Shows whether or not the access via Web is allowed.

show ip http server

Shows the Web server configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

ip http server

Enables the access via Web.

no ip http server

Disables the access via Web.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	The access via Web is disabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	

<Configuration Example>

Overview: Enable the access via Web.

(1) Enable the access via Web.

```
M24eG> enable
M24eG# conf
(1) M24eG(config)# ip http server
M24eG(config)# exit
M24eG#
```

Fig. 3-5-4-2 Example of the Web server configuration

3.5.5. RADIUS Server Configuration

Configure the access settings of a RADIUS server for user login authentication in "Global configuration mode." Confirm the configuration information by executing the "show radius-server" command in "Privileged mode."

Command to show the RADIUS configuration

M24eG#	show radius-server

Command to configure the RADIUS server access settings

M24eG(config)#	radius-server host <index> {ip <ip-address> | ipv6 <ipv6-address>} [timeout <sec(s)>][retransmit <retries>] {[key <string> [encrypt]] | [encrypted-key <encrypted-string>]}

Command to set the NAS ID

M24eG(config)#	dot1x nasid <string>

Command to delete the NAS ID

M24eG(config)#	no dot1x nasid

Command to show the login method configuration

M24eG#	show login method

Command to set the login method

M24eG(config)#	login method <index> {Local | RADIUS | None}

<Command Entry Example>

An example of executing the command to show the RADIUS configuration is shown below.

```
M24eG# show radius-server
(1) NAS ID: Nas1
  (2)       (3)              (4)              (5)            (6)
Index Server IP address    Shared Secret     Response Time Max Retransmission
----- ----------------- -------------------- ------------- ------------------
  1   192.168.1.200     admin                   10 Seconds         3
  2   192.168.1.201     [encrypted]             10 Seconds         3
  3   0.0.0.0                                   10 Seconds         3
  4   0.0.0.0                                   10 Seconds         3
  5   0.0.0.0                                   10 Seconds         3
M24eG#
```

Fig. 3-5-5-1 Example of executing the command to show the RADIUS configuration

```
M24eG# show login method

(7) login method 1 is Local (Method 1 Fail Action: Method 2)
(8) login method 2 is None

M24eG#
```

Fig. 3-5-5-2 Example of executing the command to show the login method

(1) NAS ID

Shows the authentication ID (NAS Identifier). This parameter is used as a NAS-Identifier (RADIUS attribute 32) in a RADIUS packet (Access-Request) sent by this Switching Hub.

(2) Index

Shows the authentication order to RADIUS server. The authentication is carried out starting from Index No. 1. If the communications with the RADIUS server fails, then the authentication is carried out for Index No. 2 and so on in ascending order.

(3) Server IP address

Shows the IP address of RADIUS server.

(4) Shared Secret

Shows the common key (Shared Secret) that is used in authentication. The same key must be set between the server side and the client side. In general, system manager set this common key.

(5) Response Time

Shows the maximum response time for authentication request to RADIUS server.

(6) Max Retransmission

Shows the maximum number of retransmissions of authentication request to RADIUS server.

(7) login method 1

Shows the first login method to authenticate, using the username and password.

(8) login method 2

Shows the second login method to authenticate, using the username and password.

show radius-server

Shows the RADIUS server configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

radius-server host <index> {ip <ip-address> | ipv6 <ipv6-address>} [timeout <sec(s)>][retransmit <retries>] {[key <string> [encrypt]] | [encrypted-key <encrypted-string>]}

Configures access settings of a RADIUS server for user login authentication.

[Parameter]

Parameter name	Description
<index>	Set the authentication order to RADIUS server.
<ip-address>	Set the IP address of RADIUS server.
<ipv6-address>	Set the IPv6 address of RADIUS server.
<sec(s)>	Set the maximum response time for authentication request to RADIUS server.
<retries>	Set the maximum number of retransmissions of authentication request to RADIUS server.
<string>	Set the common key (Shared Secret) that is used in authentication.
<encrypted-string>	Set the encrypted common key (Shared Secret) that is used in authentication.

[Factory Default Setting]

Parameter name	Factory default setting
<index>	None
<ip-address>	0.0.0.0
<ipv6-address>	0::0
<sec(s)>	10
<retries>	3
<string>	None
<encrypted-string>	None

[Setting Range]

Parameter name	Setting range
<index>	1 to 5
<ip-address>	Class A: 1.x.x.x to 126.x.x.x Class B: 128.1.x.x to 191.254.x.x Class C: 192.0.1.x to 223.255.254.x
<ipv6-address>	::2 to FEFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF:FFFF
<sec(s)>	1 to 120 (seconds)
<retries>	1 to 254
<string>	Up to 20 one-byte characters
<encrypted-string>	Up to 40 one-byte characters (Encrypted string)

[Note]

Parameter name	Note
encrypt	When uses this option, The entered string will be encrypted and will be saved into configuration file.
encrypt-key	When uses this option, The entered string will not be encrypted and will be saved into configuration file. (It needs to enter the encrypted string.)

dot1x nasid <string>

Changes the authentication ID (NAS Identifier).

[Parameter]

Parameter name	Description
<string>	Set a new authentication ID.

[Factory Default Setting]

Parameter name	Factory default setting
<string>	Nas1

[Setting Range]

Parameter name	Setting range
<string>	Up to 16 one-byte characters

[Note]

Parameter name	Note
<string>	None

show login method

Shows the login method to authenticate, using the username and password.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

login method <index> {{Local | RADIUS | None} | | auth-fail-action {method2 | stop}}

Sets the login method to authenticate, using the username and password.

[Parameter]

Parameter name	Description	
<index>	1： The first method for authentication. 2： The second method for authentication.	
{Local | RADIUS | None}	Set a login method to authenticate, using the username and password.	
	Local	Login to the device is carried out by using the username and password stored in the device.
	RADIUS	Login to the device is carried out by using RADIUS server authentication.
	None	Login Method 2 is not used.
auth-fail-action	Set the next action after the login method 1 authentication is failed.	
	method2	Use the login method 2 authentication
	stop	Stop the authentication

[Factory Default Setting]

Parameter name	Factory default setting
<index>	None
{Local | RADIUS | None}	1： Local 2： None

[Setting Range]

Parameter name	Setting range
<index>	1 to 2
{Local | RADIUS | None}	None

[Note]

Parameter name	Note
—	None

<Configuration Example>

Overview: Configure access settings of a RADIUS server for user login authentication.

(1) Configure the access settings of a RADIUS server as follows: Authentication order: 1, IP address: 192.168.1.200, Common key for authentication: admin.

(2) Configure the first login method to a RADIUS server for authentication using the username and password.

(3) Set the second login method to the information stored locally in this Switching Hub for authentication using the username and password.

```
M24eG> enable
M24eG# conf
(1)M24eG(config)# radius-server host 1 ip 192.168.1.200 key admin
(2)M24eG(config)# login method 1 radius
(3)M24eG(config)# login method 2 local
M24eG(config)# exit
M24eG#
```

Fig. 3-5-5-3 Example of the RADIUS server access configuration

3.5.6. Configuration of the Easy IP Address Setup Function

Configure the easy IP address setup function in "Global configuration mode." Confirm the configuration information by executing the "show ip setup interface" command in "Privileged mode."

Command to show the easy IP address setup function

M24eG#	show ip setup interface

Command to enable the easy IP address setup function configuration

M24eG(config)#	ip setup interface

Command to disable the easy IP address setup function configuration

M24eG(config)#	no ip setup interface

<Command Entry Example>

An example of executing the command to show the easy IP address setup function is shown below.

```
M24eG> enable
M24eG# show ip setup interface
       (1)
IP Setup Interface
------------------
Enabled


M24eG#
```

Fig. 3-5-6-1 Example of executing the command to show the easy IP address setup function

(1) IP Setup Interface

Shows the easy IP address setup function configuration.	
Enabled	The easy IP address setup function is enabled.
Disabled	The easy IP address setup function is disabled.

show ip setup interface

Shows the easy IP address setup function configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

ip setup interface

Enables the easy IP address setup function.

no ip setup interface

Disables the easy IP address setup function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	ip setup interface The easy IP address setup function is enabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Enable the easy IP address setup function.

(1) Enable the easy IP address setup function.

(1)

```
M24eG> enable
M24eG# configure
M24eG(config)# no ip setup interface
M24eG(config)# exit
M24eG#
```

Fig. 3-5-6-2 Example of configuration of the easy IP address setup function

3.5.7. Configuration of the Syslog Transmission Function

Configure the syslog transmission function in "Global configuration mode." Confirm the configuration information by executing the "show syslog conf" command in "Privileged mode."

Command to show the syslog transmission function

M24eG#	show syslog conf

Command to enable the syslog transmission function configuration

M24eG(config)#	syslog server enable

Command to disable the syslog transmission function configuration

M24eG(config)#	syslog server disable

Command to enable the syslog transmission configuration

M24eG(config)#	syslog server enable <index>

Command to disable the syslog transmission configuration

M24eG(config)#	syslog server disable <index>

Command to set the facility configuration

M24eG(config)#	syslog facility <index> <facilities>

Command to delete the syslog server configuration

M24eG(config)#	clear syslog server <index>

Command to set the syslog server ip address configuration

M24eG(config)#	syslog server-ip <index> {<ip-address> | ipv6 <ipv6-address>}

Command to set the syslog header information configuration

M24eG(config)#	syslog header-info <index> {none | ip | sysname}

<Command Entry Example>

An example of executing the command to show the syslog transmission function is shown below.

```
M24eG> enable
M24eG# show syslog conf
(1) Syslog Transmission: Disabled                                    ・・・1

Syslog Server List                                                   ・・・2
  No.      Status          Ip Address       Facility     Include SysName/IP
 (2)    -- (3) -----   ----- (4) ------   -- (5) ----   ------ (6) -------
 1       Disabled       0.0.0.0          Facility0
 2       Disabled       0.0.0.0          Facility0

  No.      Status                    IPv6 Address
 ----   ------------   --------------- (7) --------------------
 1       Disabled       1::1
 2       Disabled       0::0
M24eG#
```

Fig. 3-5-7-1 Example of executing the command to show the syslog transmittion function

(1) Syslog Transmission

Shows the syslog transmission function configuration.	
Enabled	The syslog transmission function is enabled.
Disabled	The syslog transmission is disabled.

show ip setup interface

Shows the easy IP address setup function configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

ip setup interface

Enables the easy IP address setup function.

no ip setup interface

Disables the easy IP address setup function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	ip setup interface The easy IP address setup function is enabled.

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Enable the easy IP address setup function.

(1) Enable the easy IP address setup function.

(1)

```
M24eG> enable
M24eG# configure
M24eG(config)# no ip setup interface
M24eG(config)# exit
M24eG#
```

Fig. 3-5-7-2 Example of configuration of the easy IP address setup function

3.6. MAC Address Table Display, Registration, and Configuration

Configure the MAC address table and register/delete static MAC addresses in "Global configuration mode," and show the MAC address table in "Privileged mode."

Command to show the MAC address auto-learning status

M24eG#	show mac-learning

Command to show the aging time

M24eG#	show mac-address-table aging-time

Command to show the MAC address table (dynamic entries)

M24eG#	show mac-address-table mac

Command to show the MAC address table (static entries)

M24eG#	show mac-address-table static

Command to set the aging time

M24eG(config)#	mac-address-table aging-time <aging time>

Command to register the static MAC address entry

M24eG(config)#	mac-address-table static <MAC addr.> <interface name> vlan <VLAN ID>

Command to delete the static MAC address entry

M24eG(config)#	no mac-address-table static <MAC addr.> vlan <VLAN ID>

Command to enable MAC address auto-learning

M24eG(config-if)#	mac-learning

Command to disable MAC address auto-learning

M24eG(config-if)#	no mac-learning

Command to set the limit of the number of auto-learned MAC addresses

M24eG(config-if)#	mac-learning limit <limit>

Command to delete the limit of the number of auto-learned MAC addresses

M24eG(config-if)#	no mac-learning limit

<Command Entry Example>

An example of executing the command to show the MAC address auto-learning status is shown below.

```
M24eG> enable
M24eG# show mac-learning
(1)          (2)             (3)
Interface    MAC Learning    MAC Learning Limit
---------    ------------    ------------------
gi0/1        Auto            Disabled
gi0/2        Auto            Disabled
gi0/3        Auto            Disabled
gi0/4        Auto            Disabled
gi0/5        Auto            Disabled
gi0/6        Auto            Disabled
gi0/7        Auto            Disabled
gi0/8        Auto            Disabled
gi0/9        Auto            Disabled
gi0/10       Auto            Disabled
gi0/11       Auto            Disabled
gi0/12       Auto            Disabled
gi0/13       Auto            Disabled
gi0/14       Auto            Disabled
gi0/15       Auto            Disabled
gi0/16       Auto            Disabled
gi0/17       Auto            Disabled
gi0/18       Auto            Disabled
gi0/19       Auto            Disabled
gi0/20       Auto            Disabled
gi0/21       Auto            Disabled
gi0/22       Auto            Disabled
gi0/23       Auto            Disabled
gi0/24       Auto            Disabled
```

Fig. 3-6-1 Example of executing the command to show the MAC address auto-learning status

(1) Interface

Shows the interface name.	
gi0/1	Refers to "Gigabit Ethernet Port 1." (The number after "gi0/" indicates the port number.)

(2) MAC Learning

Shows the MAC address auto-learning status of each port.	
Auto	MAC address auto-learning is enabled.
Disabled	MAC address auto-learning is disabled.

(3) MAC Learning Limit

Shows the status of the limit of the number of auto-learned MAC addresses for each port.	
Disabled	The number of MAC addresses that can be auto-learned is not limited.
1 to 256	Indicates the limit of the number of auto-learned MAC addresses.

<Command Entry Example>

An example of executing the command to show the aging time is shown below.

(1)

```
M24eG> enable
M24eG# show mac-address-table aging-time
MAC address table aging time: 300 seconds.
M24eG#
```

Fig. 3-6-2 Example of executing the command to show the aging time

(1) MAC address table aging time

Shows the aging time, which is the time until the learned entries in the MAC address table are deleted.

<Command Entry Example>

An example of executing the command to show the MAC address table (dynamic entries) is shown below.

```
M24eG> enable
M24eG# show mac-address-table mac
 (1)               (2)          (3)   (4)
  MAC Address       Address Type  VLAN  Port
  ----------------  ------------  ----  ---------
  xx:xx:xx:xx:xx:xx  Dynamic       1     gi0/1
  xx:xx:xx:xx:xx:xx  Dynamic       1     gi0/1
M24eG#
```

Fig. 3-6-3 Example of executing the command to show the MAC address table (dynamic entries)

(1) MAC Address

Lists MAC address entries existing in the MAC address table.

(2) Address Type

Shows the MAC address entry type.	
Dynamic	Dynamically learned MAC address entry

(3) VLAN

Shows the VLAN ID that is learning the MAC address entry.

(4) Port

Shows the interface name.	
gi0/1	Refers to "Gigabit Ethernet Port 1." (The number after "gi0/" indicates the port number.)

<Command Entry Example>

An example of executing the command to show the MAC address table (static entries) is shown below.

```
M24eG> enable
M24eG# show mac-address-table static
 (1)               (2)          (3)   (4)
  MAC Address       Address Type  VLAN  Port
  ----------------  ------------  ----  ---------
  xx:xx:xx:xx:xx:xx  Static         1     gi0/1
  xx:xx:xx:xx:xx:xx  Static         1     gi0/1
M24eG#
```

Fig. 3-6-4 Example of executing the command to show the MAC address table (static entries)

(1) MAC Address

Lists MAC address entries existing in the MAC address table.

(2) Address Type

Shows the MAC address entry type.	
Static	Statically registered MAC address entry

(3) VLAN

Shows the VLAN ID that is learning the MAC address entry.

(4) Port

Shows the interface name.	
gi0/1	Refers to "Gigabit Ethernet Port 1." (The number after "gi0/" indicates the port number.)

show mac-address-table mac-learning

Shows the MAC address auto-learning status of each port.

show mac-address-table aging-time

Shows the MAC address table aging time.

show mac-address-table mac

Shows dynamically learned MAC address entries.

show mac-address-table static

Shows statically registered MAC address entries.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

mac-address-table aging-time <aging time>

Sets the aging time until the dynamically learned entries in the MAC address table are deleted.

[Parameter]

Parameter name	Description
<aging time>	Set the time in seconds between frame receiving and dynamic entry deletion.

[Factory Default Setting]

Parameter name	Factory default setting
<aging time>	300 (seconds)

[Setting Range]

Parameter name	Setting range
<aging time>	10 to 1000000 (seconds)

[Note]

Parameter name	Note
<aging time>	None

mac-address-table static <MAC addr.> <interface name> vlan <VLAN ID>

Statically enters a MAC address in the MAC address table.

no mac-address-table static <MAC addr.> vlan <VLAN ID>

Deletes a static MAC address from the MAC address table.

[Parameter]

Parameter name	Description
<MAC addr.>	Set the MAC address to be statically entered.
<interface name>	Set the interface name of the target port.
<VLAN ID>	Set the target VLAN ID.

[Factory Default Setting]

Parameter name	Factory default setting
<MAC addr.>	None
<interface name>	None
<VLAN ID>	None

[Setting Range]

Parameter name	Setting range
<MAC addr.>	00:00:00:00:00:01 to FF:FF:FF:FF:FF:FE
<interface name>	<Switch-M48eG> GigabitEthernet0/1 to GigabitEthernet0/48 <Switch-M24eG> GigabitEthernet0/1 to GigabitEthernet0/24 <Switch-M16eG> GigabitEthernet0/1 to GigabitEthernet0/16 <Switch-M8eG> GigabitEthernet0/1 to GigabitEthernet0/9 The name can be abbreviated. Example: GigabitEthernet0/1 → gi0/1
<VLAN ID>	1 to 4094

[Note]

Parameter name	Note
<MAC addr.>	None
<interface name>	None
<VLAN ID>	Set an existing VLAN ID.

mac-learning

Enables the MAC address auto-learning of each port.

no mac-learning

Disables the MAC address auto-learning of each port.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	mac-learning

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	If MAC address auto-learning is disabled, communication cannot be established unless a MAC address is registered statically.

mac-learning limit <limit>

Sets the limit of the number of auto-learned MAC addresses for each port. Assuming that the number of learned MAC addresses reaches the limit, and if a frame with new source MAC address that has not been learned is received, this frame is discarded.

no mac-learning limit

Deletes the limit of the number of auto-learned MAC addresses for each port.

[Parameter]

Parameter name	Description
limit	Set the limit of the number of auto-learned MAC addresses for each port.

[Factory Default Setting]

Parameter name	Factory default setting
limit	None

[Setting Range]

Parameter name	Setting range
limit	1 to 256

[Note]

Parameter name	Note
limit	1. To use this function, MAC address auto-learning must be enabled. 2. Static MAC address is not included in the limit value.

<Configuration Example 1>

Overview: Set the MAC address table aging time.

(1) Set the time until the dynamically learned entries in the MAC address table are automatically deleted to 1,200 seconds.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# mac-address-table aging-time 1200
M24eG(config)# exit
M24eG#
```

Fig. 3-6-5 Example of setting the MAC address table aging time

<Configuration Example 2>

Overview: Disable communications with devices connected to Port 1 other than statically entered ones (MAC address: 00:00:00:00:00:01).

(1) Statically enter MAC address 00:00:00:00:00:01 in Port 1 (VLAN 1).

(2) Move to the interface configuration mode for Port 1.

(3) Disable the MAC address auto-learning of Port 1.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# mac-address-table static 00:00:00:00:00:01 gi0/1 vlan 1
(2) M24eG(config)# interface GigabitEthernet0/1
(3) M24eG(config-if)# no mac-learning
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 3-6-6 Example of static MAC address entry

<Configuration Example 3>

Overview: Set the limit of the number of auto-learned MAC addresses for Port 1 to 1.

(1) Set the limit of the number of auto-learned MAC addresses for Port 1 to 1.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface GigabitEthernet0/1
(1) M24eG(config-if)# mac-learning limit 1
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 3-6-7 Example of setting the limit of the number of auto-learned MAC addresses

3.7. Time Configuration

Configure the time setting and time synchronization by SNTP in "Global configuration mode." Confirm the configuration information by executing the "show sntp" command in "Privileged mode."

Command to show the SNTP configuration

M24eG#	show sntp

Command to manually set the time

M24eG(config)#	sntp clocktime <date> <time>

Command to enable SNTP

M24eG(config)#	sntp enable

Command to disable SNTP

M24eG(config)#	sntp disable

Command to set the SNTP server IP address

M24eG(config)#	sntp server <ip-address>

Command to set the interval of SNTP time acquisition

M24eG(config)#	sntp polling-interval <min>

Command to enable SNTP daylight saving

M24eG(config)#	sntp daylight-saving

Command to disable SNTP daylight saving

M24eG(config)#	no sntp daylight-saving

Command to set the SNTP time zone

M24eG(config)#	sntp timezone [<location>]

Command to reacquire time

M24eG(config)#	sntp update

<Command Entry Example>

An example of executing the command to show the SNTP configuration is shown below.

```
M24eG> enable
M24eG# show sntp
(1) Clock Time            : Wed, 21 Jul 2010 12:00:00
(2) SNTP                  : Enabled
(3) SNTP Server           : 192.168.1.1
(4) SNTP Polling Interval: 60 (min)
(5) Time Zone             : (GMT+09:00) Osaka,Sapporo,Tokyo
(6) Daylight Saving       : Disabled
M24eG#
```

Fig. 3-7-1 Example of executing the command to show the SNTP configuration

(1) Clock Time

Shows the present Switching Hub clock time.

(2) SNTP

Shows the SNTP status (Enabled or Disabled).	
Enabled	The SNTP function is enabled.
Disabled	The SNTP function is disabled.

(3) SNTP Server

Shows the SNTP server address configuration.

(4) SNTP Polling Interval

Shows the time acquisition interval.

(5) Time Zone

Shows the time zone configuration.

(6) Daylight Saving

Shows the daylight saving configuration.	
Enabled	Daylight saving is enabled.
Disabled	Daylight saving is disabled.

show sntp

Shows the present time and SNTP configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

sntp clocktime <date> <time>

Manually sets the time.

[Parameter]

Parameter name	Description
<date>	Set the date in YYYY/MM/DD format.
<time>	Set the time in HH:MM:SS format.

[Factory Default Setting]

Parameter name	Factory default setting
<date>	"1970/01/01"
<time>	"00:00:00"

[Setting Range]

Parameter name	Setting range
<date>	YYYY: 1970 to 2037 MM: 1 to 12 DD: 1 to 31
<time>	HH: 00 to 23 MM: 00 to 59 SS: 00 to 59

[Note]

Parameter name	Note
<date>	None
<time>	None

sntp enable

Enables the SNTP function.

sntp disable

Disables the SNTP function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	disable

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

sntp server <ip-address>

Sets an address of SNTP server.

[Parameter]

Parameter name	Description
<ip-address>	Set an IP address of SNTP server.

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	0.0.0.0

[Setting Range]

Parameter name	Setting range
<ip-address>	0.0.0.0 to 223.254.254.254

[Note]

Parameter name	Note
<ip-address>	None

Note: If you set SNTP server to 0.0.0.0, SNTP is automatically disabled.

sntp polling-interval <min>

Sets the time acquisition interval.

[Parameter]

Parameter name	Description
<min>	Set the time acquisition interval. The unit is minutes.

[Factory Default Setting]

Parameter name	Factory default setting
<min>	1440 (minutes)

[Setting Range]

Parameter name	Setting range
<min>	1 to 1440 (minutes)

[Note]

Parameter name	Note
<min>	None

sntp daylight-saving

Enables daylight saving.

no sntp daylight-saving

Disables daylight saving.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no sntp daylight-saving

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

sntp timezone [<location>]

Sets the time zone.

[Parameter]

Parameter name	Description
<location>	Set the time zone.
None	The time zone list is displayed.

[Factory Default Setting]

Parameter name	Factory default setting
<location>	51 (Osaka, Sapporo, Tokyo)

[Setting Range]

Parameter name	Setting range
<location>	1 to 63

[Note]

Parameter name	Note
<location>	None

sntp update

Acquires time.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

Note: SNTP function must be enabled to execute the "sntp update" command.

<Configuration Example 1>

Overview: Manually set the Switching Hub clock time.

(1) Set the time to July 21, 2010, 12:00.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# sntp clocktime 2010/7/21 12:00:00
M24eG(config)# exit
M24eG#
```

Fig. 3-7-2 Example of setting the Switching Hub time

<Configuration Example 2>

Overview: Set the Switching Hub to automatically acquire time from the SNTP server at intervals of 60 minutes.

(1) Set the address of the SNTP server from which time is acquired to 192.168.1.1.

(2) Set the time acquisition interval to 60 minutes.

(3) Enable the SNTP function.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# sntp server 192.168.1.1
(2) M24eG(config)# sntp polling-interval 60
(3) M24eG(config)# sntp enable
M24eG(config)# exit
M24eG#
```

Fig. 3-7-3 Example of the SNTP server configuration

Note: If you set SNTP server to 0.0.0.0, SNTP is automatically disabled.

3.8. ARP Configuration

Configure the ARP table in "Global configuration mode." Confirm the configuration information by executing the "show arp sort ip" command in "Privileged mode."

Command to show the ARP table information

M24eG#	show arp sort ip

Command to set the ARP aging time

M24eG(config)#	arp timeout <timeout>

ARP (static) registration command

M24eG(config)#	arp <ip-address> <MAC address>

ARP (static) deletion command

M24eG(config)#	no arp <ip-address>

<Command Entry Example>

An example of executing the command to show the ARP table information is shown below.

```
M24eG> enable
M24eG# show arp sort ip
   (1)               (2)                (3)
   IP Address        HWaddress          Type
   ---------------   -----------------  ----------
   192.168.0.100     00:00:00:00:00:01  Static
M24eG#
```

Fig. 3-8-1 Example of executing the command to show the ARP table information

(1) IP Address

Lists learned IP addresses in the ARP table.

(2) HWaddress

Lists learned MAC addresses in the ARP table.

(3) Type

Shows the learning type for the ARP table.	
Dynamic	Auto-learned address information
Static	Information of an address registered according to the configuration

show arp sort ip

Shows the ARP table registration status.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

arp timeout <timeout>

Sets the timeout for the ARP table.

[Parameter]

Parameter name	Description
<timeout>	Set the timeout for the ARP table in seconds.

[Factory Default Setting]

Parameter name	Factory default setting
<timeout>	7200 (seconds)

[Setting Range]

Parameter name	Setting range
<timeout>	30 to 86400 (seconds)

[Note]

Parameter name	Note
<timeout>	None

arp <ip-address> <MAC address>

Registers addresses in the ARP table.

no arp

Deletes registered addresses in the ARP table.

[Parameter]

Parameter name	Description
<ip-address>	Set the IP address to be registered in the ARP table.
<MAC address>	Set the MAC address to be registered in the ARP table.

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	None
<MAC address>	None

[Setting Range]

Parameter name	Setting range
<ip-address>	1.0.0.0 to 223.255.255.255
<MAC address>	Unicast address

[Note]

Parameter name	Note
<ip-address>	None
<MAC address>	None

Note: Up to 256 static and dynamic entries in total can be registered in the ARP table.

<Configuration Example 1>

Overview: Set the aging time to 14,400 seconds.

(1) Set the ARP information aging time to 14,400 seconds.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# arp timeout 14400
M24eG(config)# exit
M24eG#
```

Fig. 3-8-2 Example of setting the ARP aging time

<Configuration Example 2>

Overview: Manually register addresses in the ARP table.

(1) Manually register addresses (IP - 192.168.0.100, MAC - 00:00:00:00:00:01) in the ARP table.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# arp 192.168.0.100 00:00:00:00:00:01
M24eG(config)# exit
M24eG#
```

Fig. 3-8-3 Example of manual registration in the ARP table

4. Advanced Switch Configuration

4.1. VLAN Configuration

Features

- Corresponding to IEEE802.1Q compatible Tag VLAN, it is possible to send frames attaching a VLAN tag (hereinafter, called as just "tag").

- Having two different parameters of VLAN ID and PVID, destination of transferring untagged frames is determined by a combination of these parameters.

- VLAN ID
  VLAN ID is a VLAN identifier placed on each frame in processing tagged frames. As for an untagged frame, ports are divided into groups by this ID, and the forwarding destination of the frame is determined by referring to this ID. Multiple VLANs can be assigned to each port.

- PVID (Port VLAN ID)
  Only one PVID can be set to each port. When an untagged frame is received, this ID determines to which VLAN the frame should be forwarded. As for a tagged frame, this ID is not referred and VLAN ID in the tag is used instead.

Configure the VLAN setting in "Global configuration mode" or "Interface configuration mode." Confirm the configuration information by executing the "show vlan all" command in "Privileged mode."

Command to show the VLAN configuration

M24eG#	show vlan {all | <vlan-id-list>}

Command to create and configure VLAN

M24eG(config)#	interface vlan<vlan-id>

Command to set the VLAN name

M24eG(config-if)#	name <name>

Command to delete the VLAN name

M24eG(config-if)#	no name

Command to set the VLAN members

M24eG(config-if)#	member <port-list>

Command to set the management VLAN

M24eG(config-if)#	management

Command to delete the management VLAN

M24eG(config-if)#	no management

Command to set the PVID

M24eG(config-if)#	pvid <vlan-id>

Command to set the frame type

M24eG(config-if)#	frame-type { all|tag-only }

<Command Entry Example>

An example of executing the command to show the VLAN configuration is shown below.

```
M24eG> enable
M24eG# show vlan all

(1) NOTE -- 'U' : Untagged port member
        'T' : Tagged port member
        '-' : Not a port member
  (2)       (3)          (4)
    VLAN-ID | Status     |Name
              Port No.(5)|1234|5678|9012|3456|7890|1234
    -------   ----------  ---- ---- ---- ---- ---- ----
    1       | static     |VLAN1
            | management |
                         |---- ---- UUUU UUUU UUUU UUUU
    10      | static     |VLAN10
                         |UUUU ---- ---- ---- ---- --TT
    20      | static     |VLAN20
                         |---- UUUU ---- ---- ---- --TT

M24eG#
```

Fig. 4-1-1 Example of executing the command to show the VLAN configuration

(1) NOTE

Describes the symbols output when the command to show the VLAN configuration is entered.	
'U' : Untagged port member	'U' denotes an untagged port.
'T' : Tagged port member	'T' denotes a tagged port.
'-' : Not a port member	'-' denotes a port that does not belong to the VLAN-ID.

(2) VLAN-ID

Lists VLAN IDs currently registered in this Switching Hub.

(3) Status

Shows the VLAN-ID status in two lines.	
static	Indicates that the VLAN-ID has been manually registered in this Switching Hub. (Only the data for VLAN-ID 1 is created at the factory.)
management	Indicates that the VLAN is a management VLAN that responds to Ping, Telnet, and other remote access.

* The Command Entry Example shows that only VLAN 1 belongs to the management VLAN, and VLAN 10 and 20 do not.

(4) NAME

Shows the VLAN name set for the VLAN-ID.

(5) Port

Shows the port numbers that belong to the VLAN and their status (tagged/untagged). (The ports are shown in shortened form in ascending order from the left as shown below.) Port 1 ← 1234|5678|9012|3456|7890|1234 → Port 24	
U	Untagged ports are indicated with 'U.'
T	Tagged ports are indicated with 'T.'
-	Ports that do not belong to the VLAN-ID are indicated with '-.'

* The following shows the port status of M24eG VLAN-ID 10 in the Command Entry Example.

```
VLAN-ID | Status     |Name
          Port No.   |1234|5678|9012|3456|7890|1234
-------   ----------  ---- ---- ---- ---- ---- ----
10      | static     |VLAN10
                     |UUUU ---- ---- ---- ---- --TT
```

Port No.	VLAN-ID 10 member	Tagged/Untagged
1	Yes	Untagged
2	Yes	Untagged
3	Yes	Untagged
4	Yes	Untagged
5	No	-
6	No	-
7	No	-
8	No	-
9	No	-
10	No	-
11	No	-
12	No	-
13	No	-
14	No	-
15	No	-
16	No	-
17	No	-
18	No	-
19	No	-
20	No	-
21	No	-
22	No	-
23	Yes	Tagged
24	Yes	Tagged

show vlan {all | <vlan-id-list>}

Shows the VLAN configuration.

[Parameter]

Parameter name	Description	
{ all|<vlan-id-list> }	Set a VLAN to be displayed.	
	all	All VLANs are displayed.
	<vlan-id-list>	Only specified VLANs are displayed.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<vlan-id-list>	1 to 4094 Multiple VLANs can be specified. Example: 1-3,5

[Note]

Parameter name	Note
<vlan-id-list>	None

interface vlan<vlan-id>

Creates and configures VLAN. Execution of this command enables interface configuration mode for the specified VLAN.

[Parameter]

Parameter name	Description
<vlan-id>	Set the VLAN ID of the VLAN to be created.

[Factory Default Setting]

Parameter name	Factory default setting
<vlan-id>	Only VLAN 1 (default VLAN) has been created.

[Setting Range]

Parameter name	Setting range
<vlan-id>	1 to 4094

[Note]

Parameter name	Note
<vlan-id>	Execute the command in "vlan<vlan-id>" form like vlan10. No spaces are allowed between vlan and <vlan-id>.

Note: When creating a new VLAN, PVID (after-mentioned) is not changed in conjunction with this new creation. Make sure to confirm the configuration. When you wish to delete a VLAN, you cannot delete it if the VLAN ID of the VLAN to be deleted still remains as a PVID. Delete the VLAN after changing the PVID to another ID.

Note: To delete a created VLAN ID, execute the command to configure the VLAN members without setting any VLAN member parameter in interface configuration mode for the VLAN ID to be deleted. (The VLAN member is left blank.)

name <name>

Sets/Changes the name of VLAN.

no name

Deletes the name of VLAN.

[Parameter]

Parameter name	Description
<name>	Set the name of VLAN.

[Factory Default Setting]

Parameter name	Factory default setting
<name>	None

[Setting Range]

Parameter name	Setting range
<name>	Up to 32 one-byte characters Allowed characters: alphanumeric character (A–Z, a–z, 0–9) symbol (!@#$&_-.) white space

[Note]

Parameter name	Note
<name>	To set a VLAN name containing white spaces, enclose it with a pair of double-quotation marks (" "). Example: name "VLAN 1"

member <port-list>

Sets/Changes members of the VLAN.

[Parameter]

Parameter name	Description
<port-list>	Set member ports belonging to the VLAN.

[Factory Default Setting]

Parameter name	Factory default setting
<port-list>	<Switch-M48eG> VLAN1 (default VLAN): 1 to 48 <Switch-M24eG> VLAN1 (default VLAN): 1 to 24 <Switch-M16eG> VLAN1 (default VLAN): 1 to 16 <Switch-M8eG> VLAN1 (default VLAN): 1 to 9 Other VLANs: None

[Setting Range]

Parameter name	Setting range
<port-list>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Multiple ports can be specified. Example: 1-3,5

[Note]

Parameter name	Note
<port-list>	If you execute the command without specifying the parameter, all ports belonging to the VLAN will be cleared, and the VLAN will be deleted.

management

Sets VLAN as a management VLAN.

no management

Disables the use of VLAN as a management VLAN.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	VLAN 1: management Other than VLAN 1: no management

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

pvid <vlan-id>

Changes the PVID (Port VLAN ID). Packets sent by a configured port to the VLAN identified by the PVID are untagged. Received untagged packets are handled as packets for the VLAN identified by the PVID.

* This command is executed in interface configuration mode of each port.

[Parameter]

Parameter name	Description
<vlan-id>	Set the PVID (Port VLAN ID). Only one PVID can be set for each port.

[Factory Default Setting]

Parameter name	Factory default setting
<vlan-id>	1

[Setting Range]

Parameter name	Setting range
<vlan-id>	1 to 4094

[Note]

Parameter name	Note
<vlan-id>	None

frame-type { all|tag-only }

Changes the type of frames received by ports.

* This command is executed in interface configuration mode of each port.

[Parameter]

Parameter name	Description	
{ all|tag-only }	Set the type of received frames.	
	all	Receives all frames.
	tag-only	Receives only VLAN-tagged frames.

[Factory Default Setting]

Parameter name	Factory default setting
{ all|tag-only }	all

[Setting Range]

Parameter name	Setting range
{ all|tag-only }	Either "all" or "tag-only"

[Note]

Parameter name	Note
{ all|tag-only }	None

<Configuration Example 1>

Overview: Create VLAN with the following conditions.

- VLAN-ID: 10
- VLAN name: VLAN10
- Belonging to a management VLAN
- Member ports: 1 and 2 (untagged), 24 (tagged [PVID=1])

(1) Create VLAN10 and transits to the interface configuration mode for VLAN10.
(2) Register Ports 1, 2, and 24 as members of VLAN 10.
(3) Set the VLAN name of VLAN10 to "VLAN10."
(4) Set VLAN10 as a management VLAN.
(5) Move to the global configuration mode.
(6) Move to the interface configuration mode for Ports 1 and 2.
(7) Set PVID for Ports 1 and 2 to 10.
(Since the VLAN-ID and PVID are identical, the port is untagged.)

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# interface vlan10
(2)M24eG(config-if)# member 1-2,24
(3)M24eG(config-if)# name VLAN10
(4)M24eG(config-if)# management
(5)M24eG(config-if)# exit
(6)M24eG(config)# interface gi0/1-2
(7)M24eG(config-if)# pvid 10
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 4-1-2 Example of the VLAN creation configuration

* Since PVID of Port 24 is 1, the port is tagged.

<Configuration Example 2>

Overview: Delete VLAN10 created in Configuration Example 1.

(1) Move to the interface configuration mode for VLAN10.
(2) Delete member ports.
(3) Move to the global configuration mode.
(4) Move to the interface configuration mode for Ports 1 and 2.
(5) Set PVID to 1. (Factory-set PVID)
(6) Confirm that VLAN-ID 10 has been deleted.

```
M24eG> en
M24eG# configure
(1)M24eG(config)# interface vlan10
(2)M24eG(config-if)# member
(3)M24eG(config-if)# exit
(4)M24eG(config)# interface gi0/1-2
(5)M24eG(config-if)# pvid 1
M24eG(config-if)# exit
M24eG(config)# exit
M24eG#
```

Fig. 4-1-3 Example of the VLAN deletion configuration

```
(6)M24eG# show vlan 10
NOTE -- 'U' : Untagged port member
        'T' : Tagged port member
        '-' : Not a port member

    VLAN-ID|Status    |Name
            Port No.  |1234|5678|9012|3456|7890|1234
    ------- ---------- ---- ---- ---- ---- ---- ----
    VLAN<10> not available!
M24eG#
```

4.1.1. Internet Mansion Function Configuration

Configure the Internet mansion function in "Global configuration mode." Confirm the configuration information by executing the "show internet mansion" command in "Privileged mode."

Command to show the Internet mansion configuration

M24eG#	show internet mansion

Command to configure the Internet mansion

M24eG(config)#	internet mansion <port-list>

Command to disable the Internet mansion configuration

M24eG(config)#	no internet mansion

<Command Entry Example>

An example of executing the command to show the Internet mansion configuration is shown below.

```
M24eG> enable
M24eG# show internet mansion
(1)Internet Mansion:  Enabled
(2)  Promiscuous Port Members : gi0/23-24
(3)  Internet Mansion Members : gi0/1-22
M24eG#
```

Fig. 4-1-1-1 Example of executing the command to show the Internet mansion configuration

(1) Internet Mansion

Shows the Internet mansion function status (Enabled or Disabled).	
Enabled	The Internet mansion function is enabled.
Disabled	The Internet mansion function is disabled.

(2) Promiscuous Port Members

Shows the uplink port number set during configuration of the Internet mansion function.

(3) Internet Mansion

Shows the downlink port number.

show internet mansion

Shows the Internet mansion configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

internet mansion <port-list>

Configures the Internet mansion function.

no internet mansion

Disables the Internet mansion configuration.

[Parameter]

Parameter name	Description
<port-list>	Enter a port number you wish to configure as an uplink port. This setting optimizes the Switching Hub configuration for an Internet-ready mansion. The designated port is used as an uplink port. Other ports can be used for downlink communication only, and downlink ports cannot communicate with one another. Therefore, it becomes possible to ensure security between each resident.

[Factory Default Setting]

Parameter name	Factory default setting
<port-list>	None. The Internet mansion function is disabled.

[Setting Range]

Parameter name	Setting range
<port-list>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Up to two ports can be set. Example: 1-2 or 1,3

[Note]

Parameter name	Note
<port-list>	None

Note: When Internet mansion mode is enabled, there are constraint conditions as follows. Please confirm the conditions before use.
(1) Combined usage with the link aggregation function is not possible.
(2) Only the uplink port belongs to the management VLAN.

Note: When Internet mansion mode is enabled, all VLAN configurations are overwritten.

<Configuration Example 1>

Overview: Enable the Internet mansion function with Ports 23 and 24 set as uplink ports.

(1) Configure the Internet mansion function with Ports 23 and 24 set as uplink ports.

(2) Enter y to enable the Internet mansion function.
(All VLAN configuration and PVID of each port are reset.)

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# internet mansion 23,24
This command will remove all VLANs other than VLAN1, and the PVID of all ports will
(2) be VLAN1. [Y/N] : y
M24eG(config)# exit
M24eG#
```

Fig. 4-1-1-2 Example of configuration of the Internet mansion function

4.2. Link Aggregation Configuration

4.2.1. About Link Aggregation

Link aggregation is a function that can increase the bandwidth between Switching Hubs by dividing multiple switch ports into groups and connecting the grouped ports to each other.

When using both link aggregation and access control functions, assign a practical physical port number to a port list of access control, not a logical port created in link aggregation. For details, refer to 4.4.

The maximum number of ports and groups is as follows.

Product name	Max. number of ports/group	Max. number of groups
Switch-M24eG Switch-M16eG	8	8

Note: Depending on number of ports in a group or the traffic condition, traffic may not be assigned uniformly to all the ports.

Note: If you shutdown one of the ports where the Link Aggregation is configured, this action shutdowns all the ports of the same group member of the Link Aggregation.

Configure the link aggregation setting in "Global configuration mode" or "Interface configuration mode."

Command to show the link aggregation configuration

M24eG#	show aggregation-link group [Aggregation-link group ID]

Command to configure the link aggregation

M24eG(config)#	aggregation-link group <Aggregation-link group ID> <port-list>

Command to delete the link aggregation configuration

M24eG(config)#	no aggregation-link group <Aggregation-link group ID>

<Command Entry Example>

An example of executing the command to show the link aggregation configuration is shown below.

```
M24eG> enable
M24eG# show aggregation-link group
Aggregation Group <1>
  Status      : Static
  Criterion   : src-dst-mac / src-dst-ip / src-dst-L4-port
  Admin Ports : gi0/9-10
  Oper Ports  : gi0/9-10

Aggregation Group <2>
  Status      : Static
  Criterion   : src-dst-mac / src-dst-ip / src-dst-L4-port
  Admin Ports : gi0/20-24
  Oper Ports  : (none)

M24eG#
```

(1)
(2)
(3)
(4)
(5)

Fig. 4-2-1 Example of executing the command to show the link aggregation configuration

(1) Aggregation Group <1-8>

Shows the aggregation group ID.

(2) Status

Shows the aggregation group configuration status.	
Static	Indicates that the aggregation link is statically registered.

(3) Criterion

Shows the traffic distribution type.	
src-dst-mac src-dst-ip src-dst-L4-port	Traffic distribution is performed based on the destination and the source MAC address, IP address and L4 port value of the transmitted frame.

(4) Admin Ports

Shows the list of ports set in the aggregation group.

(5) Oper Ports

Shows the list of ports currently belonging to the aggregation group. Shows "(none)" if none of the Admin Ports are linked up.

show aggregation-link group [Aggregation-link group ID]

Shows the link aggregation configuration.

[Parameter]

Parameter name	Description
[Aggregation-link group ID]	Specify the group number of the link aggregation. If you don't specify it, all groups are displayed.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<Aggregation-link group ID>	1 to 8 (A range can be specified with a hyphen.) None (All groups are displayed.)

[Note]

Parameter name	Note
None	None

aggregation-link group <Aggregation-link group ID> <port-list>

Configures the link aggregation.

no aggregation-link group <Aggregation-link group ID>

Deletes the link aggregation.

[Parameter]

Parameter name	Description
<Aggregation-link group ID>	Specify the group number of the link aggregation.
<port-list>	Specify ports belonging to the link aggregation.

[Factory Default Setting]

Parameter name	Factory default setting
<Aggregation-link group ID>	None
<port-list>	None

[Setting Range]

Parameter name	Setting range
<Aggregation-link group ID>	<Switch-M8eG> 1 to 4 <Other> 1 to 8 Up to eight groups can be set for each switch.
<port-list>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Up to eight ports can be set for each group. Multiple ports can be specified simultaneously. Example: 1-3,5

[Note]

Parameter name	Note
<Aggregation-link group ID>	None
<port-list>	None

<Configuration Example>

Overview: Set Ports 1 to 8 in an aggregation link.

(1) Create an aggregation link as Group 1 including Ports 1 to 8.

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# aggregation-link group 1 1-8
M24eG(config)# exit
M24eG#
```

Fig. 4-2-2 Example of the link aggregation configuration

4.3. Port Monitoring Configuration

Configure the port monitoring in "Interface configuration mode." Confirm the configuration information by executing the "show monitor" command in "Privileged mode."

Command to show the monitoring configuration

M24eG#	show monitor

Command to configure the port monitoring

M24eG(config-if)#	port monitor <monitored port> direction {rx|tx|both}

<Command Entry Example>

An example of executing the command to show the monitoring configuration is shown below.

```
M16eG> enable
M16eG# show monitor

(1) Port monitor status  : Disabled
(2) Monitoring direction : Both
(3) Monitoring port      : 1
(4) Monitored port       : 2

M16eG#
```

Fig. 4-3-1 Example of executing the command to show the monitoring configuration

(1) Port monitor status

Shows the status of the port monitoring function (Enabled or Disabled).	
Enabled	The port monitoring function is enabled.
Disabled	The port monitoring function is disabled.

(2) Monitoring direction

Indicates which packet should be monitored, the transmit packet or the receive packet.	
Tx	The transmit packet is monitored.
Rx	The receive packet is monitored.
Both	Both of the transmit and receive packet are monitored.

(3) Monitoring port

Shows the port number of a port to monitor other port's packets.

(4) Monitored port

Shows the port number of a port to be monitored.

show monitor

Shows the port monitoring function configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

port monitor <monitored port> direction <rx|tx|both>

Enables the port monitoring function.

no port monitor

Disables the port monitoring function.

[Parameter]

Parameter name	Description	
<monitored port>	Specify a port number of a port to be monitored.	
<rx|tx|both>	Specify which packet should be monitored, the transmit packet or the receive packet.	
	Tx	The transmit packet is monitored.
	Rx	The receive packet is monitored.
	Both	Both of the transmit and receive packet are monitored.

[Factory Default Setting]

Parameter name	Factory default setting
<monitored port>	None
<rx|tx|both>	None

[Setting Range]

Parameter name	Setting range
<monitored port>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Multiple ports can be specified. Example: 1-3,5
<rx|tx|both>	None

[Note]

Parameter name	Note
<monitored port>	None
<rx|tx|both>	None

<Configuration Example 1>

Overview: Configure port monitoring so that Port 1 monitors packets transmitted/received on Ports 2 to 5.

(1) Move to the interface configuration mode for Port 1.

(2) Enable monitoring of packets transmitted/received on Ports 2 to 5. (After the command is executed, the function is automatically enabled, starting monitoring.)

```
M16eG> enable
M16eG# configure
(1) M16eG(config)# interface GigabitEthernet0/1
(2) M16eG(config-if)# port monitor 2-5 direction both
M16eG(config-if)# exit
M16eG(config)# exit
M16eG#
```

Fig. 4-3-2 Example of the port monitoring configuration

<Configuration Example 2>

Overview: Disable the port monitoring function enabled as Configuration Example 1 shows.

(1) Move to the interface configuration mode for Port 1.

(2) Disable packet monitoring.

```
M16eG> enable
M16eG# configure
(1) M16eG(config)# interface GigabitEthernet0/1
(2) M16eG(config-if)# no port monitor
M16eG(config-if)# exit
M16eG(config)# exit
M16eG#
```

Fig. 4-3-3 Example of the configuration for disabling port monitoring

4.4. Access Control Configuration

Configure access control in "Global configuration mode."
When using both access control and link aggregation functions, assign a practical physical port number to a port list, not a logical port created in link aggregation.

Command to show the classifier configuration

M24eG#	show AccessControl classifier {all | <classifier-number>}

Command to show the in-profile configuration

M24eG#	show AccessControl inprofile

Command to show the out-profile configuration

M24eG#	show AccessControl outprofile

Command to show the port list configuration

M24eG#	show AccessControl portlist

Command to show the policy configuration

M24eG#	show AccessControl policy {all | <policy-number>}

Command to show the policy sequence configuration

M24eG#	show AccessControl policy-sequence port <port num> sort {policy-index | sequence}

Command to configure the classifier

M24eG(Config)#	AccessControl classifier <id> [src-mac <MAC>] [dst-mac <MAC>] [src-net <ip-mask>] [dst-net <ip-mask>] [src-port <layer4-port-list>] [dst-port <layer4-port-list>] [vlan-id <vid>] [dot1p-priority <priority>] [dscp <value>] [protocol <pro-num>] [icmp-type <icmptype>] [tcp-syn-flag{true/false}]

Command to delete the classifier

M24eG(Config)#	no AccessControl classifier <index>

Command to configure the in-profile

M24eG(Config)#	AccessControl inprofile <index> {deny | permit { dscp <dscp-value> | precedence <p-value>| cos <c-value>}}

Command to delete the in-profile

M24eG(Config)#	no AccessControl inprofile <index>

Command to configure the out-profile

M24eG(Config)#	AccessControl outprofile <index> committed-rate <unit> burst-size <volume> {deny | permit [dscp <value>]}

Command to delete the out-profile

M24eG(Config)#	no AccessControl outprofile <index>

Command to configure the port list

M24eG(Config)#	AccessControl portlist <port-list-index> <port num>

Command to delete the port list

M24eG(Config)#	no AccessControl portlist <port-list-index>

Command to configure the policy

M24eG(Config)#	AccessControl policy <index> portlist <port-list-index> classifier <c-index> policy-sequence <value> inprofile <i-index> [outprofile <o-index>]

Command to enable the policy

M24eG(Config)#	AccessControl policy <index> enable

Command to disable the policy

M24eG(Config)#	no AccessControl policy <index> enable

Command to delete the policy

M24eG(Config)#	no AccessControl policy <index>

<Command Entry Example>

An example of executing the command to show the access control is shown below.

```
M24eG> enable
M24eG# show AccessControl classifier all

(1) Classifier Index         :1
(2) VLAN ID  :Ignore (3) 802.1p Priority :Ignore (4) DSCP      :Ignore
(5) Protocol :Ignore (6) TCP SYN Flag    :Ignore (7) ICMP Type :Ignore
(8) Source MAC Address       :Ignore      (9) Source MAC Mask Length      :Ignore
(10) Destination MAC Adress  :Ignore      (11) Destination MAC Mask Length :Ignore
(12) Source IP Address       :Ignore      (13) Source IP Mask Length       :Ignore
(14) Destination IP Address  :Ignore      (15) Destination IP Mask Length  :Ignore
(16) Source Layer 4 Port     :Ignore      (17) Destination Layer 4 port    :Ignore

M24eG#
```

Fig. 4-4-1 Classifier configuration display
(show AccessControl classifier all)

(1) Classifier Index

Shows the index number of the classifier.

(2) VLAN ID

Shows whether or not VLAN ID should be included in the target.

(3) 802.1p Priority

Shows whether or not IEEE 802.1p priority should be included in the target.

(4) DSCP

Shows whether or not DHCP should be included in the target.

(5) Protocol

Shows whether or not the protocol number should be included in the target.

(6) TCP SYN Flag

Shows whether or not TCP SYN flag should be included in the target.

(7) ICMP Type

Shows whether or not ICMP type should be included in the target.

(8) Source MAC Address

Shows whether or not the source MAC address should be included in the target.

(9) Source MAC Mask Length

Shows whether or not the mask length of the source MAC address should be included in the target.

(10) Destination MAC Address

Shows whether or not the destination MAC address should be included in the target.

(11) Destination MAC Mask Length

Shows whether or not the mask length of the destination MAC address should be included in the target.

(12) Source IP Address

Shows whether or not the source IP address should be included in the target.

(13) Source IP Mask Length

Shows whether or not the mask length of the source IP address should be included in the target.

(14) Destination IP Address

Shows whether or not the destination IP address should be included in the target.

(15) Destination IP Mask Length

Shows whether or not the mask length of the destination IP address should be included in the target.

(16) Source Layer 4 Port

Shows whether or not the source port number should be included in the target.

(17) Destination Layer 4 Port

Shows whether or not the destination port number should be included in the target.

```
M24eG> enable
M24eG# show AccessControl inprofile

 In-Profile Action:   (1) Total Entries:1
(2)ndex(3)eny/Permit(4)olicied-DSCP(5)olicied-Precedence(6)olicied-CoS
 -----  -----------  -------------  --------------------  ------------
 1      Permit       Ignore         Ignore                Ignore

M24eG# show AccessControl outprofile

 Out-Profile Action:   (7)Total Entries:1
(8)ndex(9)ommitted Rate(10)rst Size(KB)(11)ny/Permit(12)licied-DSCP
 -----  --------------  --------------  -----------  -------------
 1      1               4KB             Permit       Ignore

M24eG#
```

Fig. 4-4-2 In-profile and out-profile configuration display
(show AccessControl inprofile)
(show AccessControl outprofile)

(1) Total Entries

Shows the number of in-profile entries created.

(2) Index

Shows the in-profile index number.

(3) Deny/Permit

Shows whether or not communications are denied or permitted.	
Deny	Permits communications.
Permit	Denies communications.

(4) Policied-DSCP

Marks the DSCP value.

(5) Policied-Precedence

Marks the precedence value.

(6) Policied-CoS

Marks the CoS value.

(7) Total Entries

Shows the number of out-profile entries created.

(8) Index

Shows the out-profile index number.

(9) Committed Rate

Shows the destination MAC address.

(10) Burst Size (KB)

Shows the traffic burst size that can be transmitted exceeding the committed rate.

(11) Deny/Permit

Shows whether or not communications are denied or permitted.	
Deny	Permits communications.
Permit	Denies communications.

(12) Policied-DSCP

Marks the DSCP value.

```
M24eG> enable
M24eG# show AccessControl portlist

Port List : Total Entries : 1
(2) Index (3) Port List
-----    -------------------------------------------------
1        3,6-9

M24eG# show AccessControl policy 1

(4) Policy Index              : 1   (5) Status : Enabled
(6) Classifier Index          : 1
(7) Source MAC Addr/Mask      : Ignore
(8) Destination MAC Addr/Mask : Ignore
(9) 802.1P Priority           : Ignore
(10) VLAN ID                  : Ignore
(11) Source IP Addr/Mask      : Ignore
(12) Destination IP Addr/Mask : Ignore
(13) DSCP                     : Ignore
(14) Protocol                 : Ignore
(15) Source L4 Port           : Ignore
(16) Destination L4 Port      : Ignore
(17) TCP SYN Flag             : Ignore
(18) ICMP Type                : Ignore
-------------------------------------------------------------
(19) Policy Sequence    : 1
(20) In-Profile Action  : Index = 1      Action = Permit
(21) Out-Profile Action : Index = 1      Action = Permit
     Committed Rate     : 1       Mbps   Burst Size : 4KB
(22) Port List          : Index = 1      Port = 3,6-9

M24eG#
```

Fig. 4-4-3 Display of the port list and policy configuration
(show AccessControl portlist)
(show AccessControl policy 1)

(1) Total Entries

Shows the number of port lists created.

(2) Index

Shows the port list index number.

(3) Port List

Shows a list of the target ports of the policy.

(4) Policy Index

Shows the policy index number.

(5) Status

Shows the policy status.	
Enabled	The policy is enabled.
Disabled	The policy is disabled.

(6) Classifier Index

Shows the classifier index number.

(7) Source MAC Addr/Mask

Shows the source MAC address and the mask length.

(8) Destination MAC Addr/Mask

Shows the destination MAC address and the mask length.

(9) 802.1P Priority

Shows the IEEE 802.1p priority.

(10) VLAN ID

Shows the VLAN ID.

(11) Source IP Addr/Mask

Shows the destination IP address and the mask length.

(12) Destination IP Addr/Mask

Shows the source IP address and the mask length.

(13) DSCP

Shows the DSCP value.

(14) Protocol

Shows the protocol number.

(15) Source L4 Port

Shows the source port number.

(16) Destination L4 Port

Shows the destination port number.

(17) TCP SYN Flag

Shows the TCP SYN flag.

(18) ICMP Type

Shows the ICMP type.

(19) Policy Sequence

Shows the policy sequence.

(20) In Profile Action

Shows details of the in-profile action used in the policy.

(21) Out Profile Action

Shows details of the out-profile action used in the policy.

(22) Port List Action

Shows details of the port list used in the policy.

show AccessControl classifier {all | <classifier-number>}

Shows the classifier configuration used for the access control function.

[Parameter]

Parameter name	Description	
{all | <classifier-number> }	Specify the classifier to be displayed.	
	all	The configuration of all classifiers is displayed.
	<classifier-number>	The configuration of the classifier with the specified index number is displayed.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<classifier-number>	1 to 65535

[Note]

Parameter name	Note
None	None

show AccessControl inprofile

Shows the list of the in-profile configuration used for the access control function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show AccessControl outprofile

Shows the list of the out-profile configuration used for the access control function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show AccessControl portlist

Shows the list of the port list configuration used for the access control function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show AccessControl policy {all | <policy-number>}

Shows the policy configuration used for the access control function.

[Parameter]

Parameter name	Description	
{all | <policy-number> }	Specify a policy index number to be displayed.	
	all	The configuration of all policies is displayed.
	<policy-number>	The configuration of the policy with the specified policy number is displayed.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<policy-number>	1 to 65535

[Note]

Parameter name	Note
None	None

show AccessControl policy-sequence port <port num> sort {policy-index | sequence}

Shows the list of the policy sequence configuration used for the access control function.

[Parameter]

Parameter name	Description	
<port num>	Specify a Switching Hub port number.	
{policy-index | sequence}	Specify a policy sequence display mode.	
	policy-index	The sequence is in order of the policy number.
	sequence	The sequence is in order of the sequence number.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<port num>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Only a single port can be specified.

[Note]

Parameter name	Note
None	None

AccessControl classifier <id>
[src-mac <MAC>] [dst-mac <MAC>] [src-net <ip-mask>]
[dst-net <ip-mask>] [src-port <layer4-port-list>] [dst-port <layer4-port-list>]
[vlan-id <vid>] [dot1p-priority <priority>] [dscp <value>] [protocol <pro-num>]
[icmp-type <0-18>] [tcp-syn-flag{true/false}]

Configures the classifier used for the access control function.

no AccessControl classifier <id>

Deletes the classifier used for the access control function.

[Parameter]

Parameter name	Description	
<id>	Specify the classifier index number.	
[src-mac <MAC>]	Specify the source MAC address.	
[dst-mac <MAC>]	Specify the destination MAC address.	
[src-net <ip-mask>]	Specify the source IP network and mask.	
[dst-net <ip-mask>]	Specify the destination IP network and mask.	
[src-port <layer4-port-list>]	Specify the TCP/UDP source port number.	
[dst-port <layer4-port-list>]	Specify the TCP/UDP destination port number.	
[vlan-id <vid>]	Specify the VLAN ID.	
[dot1p-priority <priority>]	Specify the IEEE 802.1p priority.	
[dscp <value>]	Specify the DSCP value.	
[protocol <pro-num>]	Specify the protocol type with the protocol number.	
[icmp-type <icmptype>]	Specify the ICMP type with the type number.	
[tcp-syn-flag{true/false}]	Specify whether a TCP SYN flag is set for filtering.	
	true	A TCP SYN flag is set for filtering.
	false	A TCP SYN flag is not set for filtering.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<id>	1 to 65535
<MAC>	00:00:00:00:00:00 to FF:FF:FF:FF:FF:FF
<ip-mask>	0.0.0.0/0 to 255.255.255.255/32 <Example> - 192.168.1.10/32 or 192.168.1.10 → Only one unit is specified. - 192.168.1.20/31 → Two units (192.168.1.20 and 192.168.1.21) are specified. - 192.168.2.1/25 → 127 units (192.168.2.1 to 192.168.2.127) are specified. - 192.168.2.1/24 → 254 units (192.168.2.1 to 192.168.2.254) are specified.
<layer4-port-list>	0 to 65535 You can set a range of port numbers. Example: 137-139
<vid>	1 to 4094
<priority>	0 to 7
<value>	0 to 63
<pro-num>	1 to 255 <Example> 1: ICMP, 2: IGMP, 6: TCP, 17: UDP, 46: RSVP
<icmptype>	0 to 18 <Example> 0: Echo Reply, 3: Destination Unreachable

[Note]

Parameter name	Note
None	None

AccessControl inprofile <index> {deny | permit { dscp <dscp-value> | precedence <p-value>| cos <c-value>}}

Configures the in-profile used for the access control function.

no AccessControl inprofile <index>

Deletes the in-profile used for the access control function.

[Parameter]

Parameter name	Description	
<index>	Specify the in-profile index number.	
{deny | permit { dscp <dscp-value> | precedence <p-value>| cos <c-value>}}	Specify whether packets are denied or permitted.	
	deny	Packets are denied.
	permit	Packets are permitted. You can select the value type from the following for marking at the permission. - DSCP value - ToS precedence value - CoS value

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<index>	1 to 65535
<dscp-value>	0 to 63
<p-value>	0 to 7
<c-value>	0 to 7

[Note]

Parameter name	Note
None	None

AccessControl outprofile <index> committed-rate <unit> burst-size <volume> {deny | permit [dscp <value>]}

Configures the out-profile used for the access control function.

no AccessControl outprofile <index>

Deletes the out-profile used for the access control function.

[Parameter]

Parameter name	Description	
<index>	Specify the out-profile index number.	
<unit>	Specify the committed rate in Mbps.	
<volume>	Specify the burst size with the burst size number.	
{deny | permit [dscp <value>]}	Specify whether packets are denied or permitted.	
	deny	Packets are denied.
	permit	Packets are permitted. You can select the value type from the following for marking at the permission. - DSCP value

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<index>	1 to 65535
<unit>	1 to 1000
<volume>	1 to 5 Select a number from the following to specify the burst size. 1: 4K, 2: 8K, 3: 16K, 4: 32K, 5: 64K
<dscp-value>	0 to 63

[Note]

Parameter name	Note
None	None

AccessControl portlist <port-list-index> <port num>

Configures the port list used for the access control function.

no AccessControl portlist <port-list-index>

Deletes the port list used for the access control function.

[Parameter]

Parameter name	Description
<port-list-index>	Specify the port list index number.
<port num>	Specify the Switching Hub port number.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<port-list-index>	1 to 65535
<port num>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Multiple ports can be specified. Example: 1-3,5

[Note]

Parameter name	Note
None	None

AccessControl policy <index> portlist <port-list-index> classifier <c-index> policy-sequence <value> inprofile <i-index> [outprofile <o-index>]

Configures the policy used for the access control function.

no AccessControl policy <index>

Deletes the policy configuration used for the access control function.

[Parameter]

Parameter name	Description
<index>	Specify the policy index number.
<port-list-index>	Specify the port list index number.
<c-index>	Specify the classifier index number.
<value>	Specify the policy sequence value.
<i-index>	Specify the in-profile index number.
[outprofile <o-index>]	Specify the out-profile index number.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<index>	1 to 65535
<port-list-index>	1 to 65535
<c-index>	1 to 65535
<value>	1 to 65535
<i-index>	1 to 65535
<o-index>	1 to 65535

[Note]

Parameter name	Note
<value>	Access control applies in ascending order of the sequence value.

AccessControl policy <index> enable

Enables access control of the specified policy.

no AccessControl policy <index> enable

Disables access control of the specified policy.

[Parameter]

Parameter name	Description
<index>	Specify the policy index number.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<index>	1 to 65535

[Note]

Parameter name	Note
None	None

<Configuration Example 1>

Overview: Configure the access control to discard packets destined for 192.168.1.0/24.

(1) Configure the classifier to target packets destined for an IP address of 192.168.1.0/24.
(2) Configure the in-profile to discard the target packets.
(3) Configure the port list to target all ports.
(4) Associate configuration items above with policy 1 and set the policy sequence to 1 for application with top priority.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# AccessControl classifier 1 dst-net 192.168.1.0/24
(2) M24eG(config)# AccessControl inprofile 1 deny
(3) M24eG(config)# AccessControl portlist 1 1-24
(4) M24eG(config)# AccessControl policy 1 portlist 1 classifier 1 policy-sequence 1
inprofile 1
M24eG(config)#
```

Fig. 4-4-4 Example of the access control configuration 1

<Configuration Example 2>

Overview: Configure the access control to mark CoS in the VLAN tag in order to have this Switching Hub preferentially control packets of IP phones that support DSCP only.

(1) Configure the classifier to target packets with DSCP set to 32.
(2) Configure the in-profile to mark the target packets with a CoS value of 6.
(3) Configure the port list to set uplink ports 22 to 24 as target ports of the access control.
(4) Configure the out-profile to discard traffic exceeding 100 Mbps.
(5) Associate configuration items above with policy 2 and set the policy sequence to 10.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# AccessControl classifier 5 dscp 32
(2) M24eG(config)# AccessControl inprofile 5 permit cos 6
(3) M24eG(config)# AccessControl outprofile 5 committed-rate 100 burst-size 5 deny
(4) M24eG(config)# AccessControl portlist 5 22-24
(5) M24eG(config)# AccessControl policy 2 portlist 5 classifier 5 policy-sequence 10
inprofile 5 outprofile 5
M24eG(config)#
```

Fig. 4-4-5 Example of the access control configuration 2

4.5. QoS (Quality of Service) Configuration

Configure the QoS settings in "Global configuration mode." Confirm the basic information by executing the "show mls qos" command in "Privileged mode."

Command to show the QoS configuration

M24eG#	show mls qos

Command to show the CoS-to-que mapping configuration

M24eG#	show priority-queue cos-map

Command to enable the QoS function

M24eG(config)#	mls qos

Command to disable the QoS function

M24eG(config)#	no mls qos

Command to configure the CoS-to-que mapping

M24eG(config)#	priority-queue cos-map <priority> <traffic class>

<Command Entry Example>

An example of executing the command to show the QoS configuration is shown below.

```
M24eG> enable
M24eG# show mls qos
(1) Quality of Service Status:  Disabled
M24eG# show priority-queue cos-map
(2) Priority (3)CoS Queue
--------    ---------
   0            0
   1            0
   2            1
   3            1
   4            2
   5            2
   6            3
   7            3
M24eG#
```

Fig. 4-5-1 Example of executing the command to show the QoS configuration

(1) Quality of Service Status

Shows the QoS operation status.	
Enabled	QoS is enabled.
Disabled	QoS is disabled.

(2) Priority

Shows the priority level of the VLAN frame.

(3) CoS Queue

Shows the priority level of the queue.

show mls qos

Shows the QoS configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show priority-queue cos-map

Shows the frame priority level and mapping between the CoS value and queue.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

mls qos

Enables the QoS function.

no mls qos

Disables the QoS function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no mls qos (The QoS function is disabled.)

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

priority-queue cos-map <PRIORITY> <QUEUE>

Changes the frame priority level and mapping between the CoS value and queue.

[Parameter]

Parameter name	Description
<PRIORITY>	Priority level of the frame (CoS value)
<QUEUE>	Traffic class corresponding to the priority level

[Factory Default Setting]

Parameter name	Factory default setting
<PRIORITY> <QUEUE>	The factory default mapping (initial state) is as follows.

Priority	CoS Queue
0	0
1	0
2	1
3	1
4	2
5	2
6	3
7	3

[Setting Range]

Parameter name	Setting range
<PRIORITY>	0 to 7
<QUEUE>	0 to 3

[Note]

Parameter name	Note
<PRIORITY>	None
<QUEUE>	None

<Configuration Example>

Overview: Enable the QoS function and configure the mapping.

(1) Map the Priority value 0 to the Queue 1.

(2) Map the Priority value 1 to the Queue 0.

(3) Enable the QoS function.

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# priority-queue cos-map 0 1
(2)M24eG(config)# priority-queue cos-map 1 0
(3)M24eG(config)# mls qos
M24eG(config)# exit
M24eG#
```

Fig. 4-5-2 Example of the QoS configuration

4.6. Bandwidth Control Configuration

Configure the bandwidth control in "Interface configuration mode." Confirm the basic information by executing the "show egress-rate-limit" command in "Privileged mode."

Command to configure the bandwidth control

Interface configuration mode	egress-rate-limit [<unit(1Mbps/unit)>]

Command to enable the bandwidth control

Interface configuration mode	egress-rate-limit

Command to disable the bandwidth control

Interface configuration mode	no egress-rate-limit

Command to show the bandwidth control configuration

Privileged mode	show egress-rate-limit

<Command Entry Example>

An example of executing the command to show the bandwidth control configuration is shown below.

```
M24eG> enable
M24eG# show egress-rate-limit
(1) Port      (2) Bandwidth    (3) Status
    ---------    ------------     ---------
    1            1000             disabled
    2            1000             disabled
    3            1000             disabled
    4            1000             disabled
    5            1000             disabled
    6            1000             disabled
    7            1000             disabled
    8            1000             disabled
    9            1000             disabled
    10           1000             disabled
    11           1000             disabled
    12           1000             disabled
    13           1000             disabled
    14           1000             disabled
    15           1000             disabled
    16           1000             disabled
    17           1000             disabled
    18           1000             disabled
    19           1000             disabled
    20           1000             disabled
    21           1000             disabled
    22           1000             disabled
    23           1000             disabled
    24           1000             disabled
M24eG#
```

Fig. 4-6-1 Example of executing the command to show the bandwidth control configuration

(1) Port

Shows the port number.

(2) Bandwidth

Shows the bandwidth. The factory default setting is 1000. (The unit is Mbps.)

(3) Status

Shows the bandwidth control status (Enabled or Disabled).	
enabled	The bandwidth control is enabled.
disabled	The bandwidth control is disabled.

egress-rate-limit [<unit(1Mbps/unit)>]

Changes the configuration of bandwidth control.

[Parameter]

Parameter name	Description
<unit(1Mbps/unit)>	Set the bandwidth.

[Factory Default Setting]

Parameter name	Factory default setting
<unit(1Mbps/unit)>	1000 (Mbps)

[Setting Range]

Parameter name	Setting range
<unit(1Mbps/unit)>	1 to 1000

[Note]

Parameter name	Note
<unit(1Mbps/unit)>	None

egress-rate-limit

Enables the bandwidth control function.

no egress-rate-limit

Disables the bandwidth control function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	disabled

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show egress-rate-limit

Shows the configuration of bandwidth control.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Enable the bandwidth control for Port 1, and set the bandwidth.

(1) Enable the bandwidth control function.

(2) Set the bandwidth to 100 (Mbps).

```
M24eG> enable
M24eG# configure
M24eG(config)# interface gi0/1
(1) M24eG(config-if)# egress-rate-limit
(2) M24eG(config-if)# egress-rate-limit 100
M24eG(config-if)# end
M24eG#
```

Fig. 4-6-2 Example of the bandwidth control configuration

4.7. Storm Control Configuration

Configure the storm control in "Interface configuration mode." Confirm the configuration information by executing the "show storm-control" command in "Privileged mode."

Command to enable the storm control (broadcast)

M24eG(config-if)#	storm-control broadcast

Command to disable the storm control (broadcast)

M24eG(config-if)#	no storm-control broadcast

Command to enable the storm control (multicast)

M24eG(config-if)#	storm-control multicast

Command to disable the storm control (multicast)

M24eG(config-if)#	no storm-control multicast

Command to enable the storm control (unicast)

M24eG(config-if)#	storm-control unicast

Command to disable the storm control (unicast)

M24eG(config-if)#	no storm-control unicast

Command to set the threshold value

M24eG(config-if)#	storm-control threshold <pps>

Command to show the storm control configuration

M24eG#	show storm-control

<Command Entry Example>

An example of executing the command to show the storm control configuration is shown below.

```
M24eG> enable
M24eG# show storm-control
(1) Interface  (2) DLF          Broadcast      Multicast      (3) Threshold
    ---------      ---------      ---------      ---------      ---------
    1              disabled       disabled       disabled       0
    2              disabled       disabled       disabled       0
    3              disabled       disabled       disabled       0
    4              disabled       disabled       disabled       0
    5              disabled       disabled       disabled       0
    6              disabled       disabled       disabled       0
    7              disabled       disabled       disabled       0
    8              disabled       disabled       disabled       0
    9              disabled       disabled       disabled       0
    10             disabled       disabled       disabled       0
    11             disabled       disabled       disabled       0
    12             disabled       disabled       disabled       0
    13             disabled       disabled       disabled       0
    14             disabled       disabled       disabled       0
    15             disabled       disabled       disabled       0
    16             disabled       disabled       disabled       0
    17             disabled       disabled       disabled       0
    18             disabled       disabled       disabled       0
    19             disabled       disabled       disabled       0
    20             disabled       disabled       disabled       0
    21             disabled       disabled       disabled       0
    22             disabled       disabled       disabled       0
    23             disabled       disabled       disabled       0
    24             disabled       disabled       disabled       0
M24eG#
```

Fig. 4-7-1 Example of executing the command to show the storm control configuration

(1) Interface

Shows the interface for operating the storm control function.

(2) DLF/Broadcast/Multicast

Shows the status of storm control for unicast packets with unknown destination (Destination Lookup Fail), broadcast packets, or multicast packets.	
enabled	The storm control is enabled.
disabled	The storm control is disabled.

(3) Threshold

Shows the threshold value for the number of packets (Packet Per Second).

show storm-control

Shows the storm control configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

storm-control broadcast

Enables the storm control for broadcast packets.

no storm-control broadcast

Disables the storm control for broadcast packets.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no storm-control broadcast (The storm control for broadcast packets is disabled.)

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

storm-control multicast

Enables the storm control for multicast packets.

no storm-control multicast

Disables the storm control for multicast packets.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no storm-control multicast (The storm control for multicast packets is disabled.)

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

storm-control unicast

Enables the storm control for unicast packets with unknown destination.

no storm-control unicast

Disables the storm control for unicast packets with unknown destination.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	no storm-control unicast (The storm control for unicast packets with unknown destination is disabled.)

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

storm-control threshold <pps>

Sets the storm control threshold.

[Parameter]

Parameter name	Description
<pps>	Set the threshold to control the reception of unicast packets with unknown destination, broadcast packets, or multicast packets. The unit is the number of packets received per second (Packet Per Second).

[Factory Default Setting]

Parameter name	Factory default setting
<pps>	0

[Setting Range]

Parameter name	Setting range
<pps>	0 to 262143

[Note]

Parameter name	Note
<pps>	The threshold is not a total number of thresholds for unknown destination unicast, broadcast, and multicast packets. The threshold is applied to each packet in each type.

<Configuration Example>

Overview: Enable the storm control for broadcast packets on Port 1. Set the threshold for receiving broadcast packets to 10000 pps.

(1) Move to the interface configuration mode for Port 1.
(2) Enable the storm control for broadcast packets on Port 1.
(3) Set the threshold for receiving broadcast packets on Port 1 to 10000 pps.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/1
(2) M24eG(config-if)# storm-control broadcast
(3) M24eG(config-if)# storm-control threshold 10000
M24eG(config-if)# end
M24eG#
```

Fig. 4-7-2 Example of the storm control configuration

4.8. Authentication Function Configuration

Configure the authentication function in "Global configuration mode" and "Interface configuration mode." Display the basic information in "Privileged mode."

Authentication aging time configuration command

M24eG(config)#	authentication aging-time <0-65535 min>

Authentication cancel command for authorized host

M24eG(config)#	no authentication mac <mac addr>

Command with RADIUS Attribute

M24eG(config)#	authentication dynamic-vlan radius-attribute

Command without RADIUS Attribute

M24eG(config)#	no authentication dynamic-vlan radius-attribute

Guest VLAN configuration command

M24eG(config-if)#	authentication guest-vlan <vlan-id>

Guest VLAN delete command

M24eG(config-if)#	no authentication guest-vlan

Default VLAN configuration command

M24eG(config-if)#	authentication default-vlan <vlan-id>

Default VLAN delete command

M24eG(config-if)#	no authentication default-vlan

Authentication function configuration display command

M24eG#	show authentication

Authentication status table display command

M24eG#	show authentication sort {mac | port [<portlist>]}

Dynamic VLAN configuration display command

M24eG#	show dynamic-vlan

<Setting display example>

The following is an execution example of the authentication function configuration display command.

```
M24eG> enable
M24eG# show authentication

 Global MAC Auth Status : Disabled        Global WEB Auth Status : Disabled    ···1

 802.1X Port-based Auth Ports :1-48                                            ···2
 802.1X MAC-based Auth Ports  :
 MAC Auth Ports               :
 WEB Auth Ports               :
```

Fig. 4-8-1 Execution example of the authentication function configuration display command

1. Configuring Global Authentication Function

Global MAC Auth Status	Indicates the MAC authentication operation of entire device.	
	Enabled	Indicates that the MAC authentication is enabled.
	Disabled	Indicates that the MAC authentication is disabled.
Global WEB Auth Status	Indicates the WEB authentication operation of entire device.	
	Enabled	Indicates that the WEB authentication is enabled.
	Disabled	Indicates that the WEB authentication is disabled.

2. Configuring Target Port for Authentication

802.1X Port-based Auth Ports	Displays ports with IEEE802.1X port-based authentication enabled.
802.1X MAC-based Auth Ports	Displays ports with IEEE802.1X MAC-based authentication enabled.
MAC Auth Ports	Displays ports with MAC authentication enabled.
WEB Auth Ports	Displays ports with WEB authentication enabled.

<Setting display example>

The following is an execution example of the authentication status table display command.

```
M24eG> enable
M24eG# show authentication sort port 1

Total Hosts      :0
Authorized Hosts :0
Auth Aging Time  :1440 minutes


Port      MAC Address       Auth Type  Auth Status     Remaining Aging Time
--------- ----------------- ---------- --------------- --------------------
```

Fig. 4-8-2 Execution example of the authentication status table display command

Total Hosts	Displays the total number of hosts registered to the authentication status table. Maximum number of hosts retained is 384 for M8eG/M16eG/M24eG and 1024 for M48eG.	
Authorized Hosts	Displays the number of authorized hosts.	
Auth Aging Time	Displays the authentication aging time in minutes. (factory default setting: 1440)	
Port	Displays the port number to which the terminal is connected.	
MAC Address	Displays the MAC address of the target terminal for authentication.	
Auth Type	Displays the authentication method. Displays the authentication method in successful authentication if the authentication status is "Authorized," or the authentication method while listening if the authentication status is "Unauthorized."	
	1X/MAC/WEB	Indicates one of 802.1X, MAC, and WEB authentications.
	1X/MAC	Indicates either of 802.1X or MAC authentication.
	1X/WEB	Indicates either of 802.1X or WEB authentication.
	MAC/WEB	Indicates either of MAC or WEB authentication.
	802.1X	Indicates the 802.1X authentication.
	MAC	Indicates the MAC authentication.

	WEB	Indicates the WEB authentication.
Auth Status	Displays the authentication status.	
	Authorized	Indicates that the authentication is authorized.
	Unauthorized	Indicates that the authentication is unauthorized. The communication in this status is limited to within Guest VLAN.
Remaining Aging Time	Displays the remaining time before re-authentication. When the remaining time reaches 0, the authentication status becomes "Unauthorized" and the authentication process is executed again.	

<Setting display example>

The following is an execution example of the dynamic VLAN configuration display command.

```
M24eG> enable
M24eG# show authentication dynamic-vlan

 Accept RADIUS Attribute: Enabled

 Port Current PVID Auth Status  Guest  Default
 ---- ------------ ------------ ------ -------
 1    1            Authorized   ----   ----
 2    1            Unauthorized ----   ----
 3    1            Authorized   ----   ----
 4    1            Authorized   ----   ----
 5    1            Authorized   ----   ----
 6    1            Authorized   ----   ----
 7    1            Authorized   ----   ----
 8    1            Authorized   ----   ----
 9    1            Authorized   ----   ----
```

Fig. 4-8-3 Execution example of the dynamic VLAN configuration display command

Accept RADIUS Attribute	Displays the availability of Attribute notified by the RADIUS server. Following is the target Attribute: Tunnel-Private-Group-ID	
	Enabled	Use notified Attribute. (factory default setting)
	Disabled	Use the configuration of this device.
Port	Displays a port number.	
Current PVID	Displays current PVID.	
Auth Status	Displays the current authentication state.	
	Authorized	Indicates that authentication function is disable, or ports that have been authorized by IEEE802.1X port-based authentication.
	Unauthorized	Indicates listening ports for IEEE802.1X MAC-based, MAC, and WEB authentications.
Guest	Displays VLAN ID of Guest VLAN. You can only specify existing VLAN.	
Default	Displays VLAN ID of default VLAN. You can only specify existing VLAN. Specify VLAN you assign when approval for "RADIUS Attribute" is "Enabled" and also "Tunnel-Private-Group-ID" is not notified by the RADIUS server.	

authentication aging-time <min>

Configure the remaining time before re-authentication against authenticated host.

[Parameter]

Parameter name	Description
<min>	Configure the remaining time before re-authentication in minutes.

[Factory default setting]

Parameter name	Factory default setting
<min>	60

[Value setting range]

Parameter name	Setting range
<min>	0 to 65535

[Instructions]

Parameter name	Instruction
<min>	None

no authentication mac <mac addr>

Cancel the authentication status of authorized host on the authentication status table.

[Parameter]

Parameter name	Description
<mac addr>	Specify MAC address on the authentication status table.

[Factory default setting]

Parameter name	Factory default setting
<mac addr>	None

[Value setting range]

Parameter name	Setting range
<mac addr>	Only MAC address on the authentication status table.

[Instructions]

Parameter name	Instruction
<mac addr>	None

authentication guest-vlan <vid>

Enables Guest VLAN of the target port.

no authentication guest-vlan

Disables Guest VLAN of the target port.

[Parameter]

Parameter name	Description
<vid>	Specify existing VLAN ID.

[Factory default setting]

Parameter name	Factory default setting
<vid>	None

[Value setting range]

Parameter name	Setting range
<vid>	Only existing VLAN ID.

[Instructions]

Parameter name	Instruction
<vid>	None

authentication default-vlan <vid>

Enables default VLAN of the target port.

no authentication default-vlan

Disables default VLAN of the target port.

[Parameter]

Parameter name	Description
<vid>	Specify existing VLAN ID.

[Factory default setting]

Parameter name	Factory default setting
<vid>	None

[Value setting range]

Parameter name	Setting range
<vid>	Only existing VLAN ID.

[Instructions]

Parameter name	Instruction
<vid>	None

show authentication

Displays the authentication function configuration.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

show authentication sort {mac | port [<portlist>]}

Displays the authentication status table.

[Parameter]

Parameter name	Description	
mac	Displays in ascending order of MAC address.	
port [<portlist>]	Displays in ascending order of the port number.	
	port	Displays in ascending order of both the port number and MAC address.
	[<portlist>]	Only Displays MAC address of the specified port (optional).

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
[<portlist>]	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter name	Instruction
None	None

show authentication dynamic-vlan

Displays the dynamic VLAN configuration.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

<Configuration example>

Overview: Set Guest VLAN for Port 1 to existing VLAN 100.

1. Move to the interface configuration mode of port 1.
2. Set Guest VLAN for Port 1 to100.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface gi0/1                          ···1
M24eG(config-if)# authentication guest-vlan 100         ···2
M24eG(config-if)# end
M24eG#
```

Fig. 4-8-4. Configuration example of authentication function

4.9. AAA Configuration

Configure AAA in "Global configuration mode." Display the basic information in "Privileged mode."

Authentication method configuration command for MAC/WEB authentication

M24eG(config)#	aaa authentication {mac | web} primary {radius secondary {local | none} | local secondary {radius | none}

IEE802.1X authentication method configuration command

M24eG(config)#	aaa authentication dot1x primary {radius secondary {local | none} | local secondary none}

Authentication method configuration initialization command

M24eG(config)#	no aaa authentication {dot1x | mac | web}

Action configuration command for MAC/WEB authentication after authentication fails

M24eG(config)#	aaa authentication {mac | web} auth-fail-action {stop | secondary-db}

Local MAC database registration command

M24eG(config)#	aaa authentication auth-mac <mac addr> vlan <vid>

Local MAC database delete command

M24eG(config)#	no aaa authentication auth-mac <mac addr>

Local user database registration command

M24eG(config)#	aaa authentication auth-user <username> {password <plain-text> [encrypt] | encrypt-password <encrypted-password>} vlan <vid> auth-type {both | web | dot1x}

Local user database delete command

M24eG(config)#	no aaa authentication auth-user <username>

Authentication method configuration display command

M24eG#	show aaa authentication {dot1x | mac | web}

Local MAC/user database display command

M24eG#	show aaa {auth-mac | auth-user}

<Setting display example>

The following is an execution example of the authentication function configuration display command.

```
M24eG> enable
M24eG# show aaa authentication mac

 Primary Database       : Local       Auth Fail Action     : Stop
 Secondary Database     : None        Auth Fail Block Time : 60    seconds
```

Fig. 4-9-1 Execution example of the authentication function configuration display command

Primary Database	Displays where to query initial authentication.	
	RADIUS	Indicates RADIUS server.
	Local	Indicates local user database. (factory default setting)
Secondary Database	Displays where to query when authentication fails on Primary Database.	
	RADIUS	Indicates RADIUS server.
	Local	Indicates local user database.
	None	Indicates that the permission is given without authentication process. (factory default setting)
Auth Fail Action	Displays action taken when authentication fails on Primary Database. You cannot change it for IEEE802.1X authentication.	
	Stop	Stop authentication process without execution of authentication on Secondary Database. (factory default setting) Move to Secondary Database when both of the following conditions are met: Primary Database is RADIUS and RADIUS server timeout occurs.
	Secondary DB	Execute authentication on Secondary Database.
Auth Fail Block Time	Displays the time period (in seconds) before authentication process is accepted again when authentication fails. (factory default setting: 60)	

<Setting display example>

The following is an execution example of the local database display command.

```
M24eG> enable
M24eG# show aaa authentication auth-mac                                    ···1

Auth MAC Address  VLAN
----------------- ----
XX:XX:XX:XX:XX:XX  1

M24eG# show aaa authentication auth-user                                   ···2

User Name                        Password                         VLAN Auth Type
-------------------------------- -------------------------------- ---- ---------
test                             test                              1   Both
```

Fig. 4-9-2 Execution example of the local database display command

1. Local MAC database display

Auth MAC Address	Displays the MAC address on which authentication is permitted.
VLAN	Displays VLAN ID assigned after the authentication.

2. Local user database display

User Name	Displays a user name.	
Password	Displays a user password. *encrypted* is displayed if encryption is used.	
VLAN	Displays VLAN ID assigned after the authentication.	
Auth Type	Displays the authentication method that uses this account.	
	Both	Indicates that it is used for 802.1X and WEB authentications.
	WEB	Indicates that it is only used for WEB authentication.
	802.1X	Indicates that it is only used for 802.1X authentication.

aaa authentication {mac | web} primary {radius secondary {local | none} | local secondary {radius | none}}

Configure the authentication method for MAC/WEB authentication.

[Parameter]

Parameter name	Description	
{mac | web}	Specify the type of authentication.	
	mac	Configure for MAC authentication.
	web	Configure for WEB authentication.
{local | none}	Specify Secondary Database in case that Primary Database is RADIUS server.	
	local	Specify the local database.
	none	No authentication.
{radius | none}	Specify Secondary Database in case that Primary Database is Local.	
	radius	Specify RADIUS server.
	none	No authentication.

[Factory default setting]

Parameter name	Factory default setting
-	primary local secondary none

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

aaa authentication dot1x primary {radius secondary {local | none} | local secondary none}

Configure the authentication method for IEEE802.1X authentication.

[Parameter]

Parameter name	Description	
primary radius secondary {local | none}	Specify Secondary Database in case that Primary Database is RADIUS server.	
	local	Specify the local database.
	none	No authentication.
primary local secondary none	Specify Primary Database to the local database, Secondary Database to no authentication.	

[Factory default setting]

Parameter name	Factory default setting
-	primary local secondary none

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

aaa authentication auth-mac <mac addr> vlan <vid>

Register local MAC address.

no aaa authentication auth-mac <mac addr>

Delete local MAC address.

[Parameter]

Parameter name	Description
<mac addr>	Specify the target MAC address.
<vid>	Specify VLAN ID assigned after the authentication.

[Factory default setting]

Parameter name	Factory default setting
<mac addr>	None
<vid>	None

[Value setting range]

Parameter name	Setting range
<mac addr>	Unicast MAC address
<vid>	1 to 4094

[Instructions]

Parameter name	Instruction
<mac addr>	None

aaa authentication auth-user <username> {password <plain-text> [encrypt] | encrypt-password <encrypted-password>} vlan <vid> auth-type {both | web | dot1x}

Register the local user account.

no aaa authentication auth-user <username>

Delete the local user account.

[Parameter]

Parameter name	Description	
<username>	Specify the local user name.	
<plain-text>	Specify the local user password.	
[encrypt]	Specify encryption for the input password (optional).	
<encrypted-password>	Specify the encrypted password. Usually, it is not used.	
<vid>	Specify VLAN ID assigned after the authentication.	
{both | web | dot1x}	Specify the authentication method that uses the account. Authentication is denied if accessed with the authentication method other than the one specified here.	
	both	Specify that the method is used for both WEB and 802.1X authentications.
	web	Specify that the method is only used for WEB authentication.
	dot1x	Specify that the method is only used for 802.1X authentication.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<username>	1 to 32 alphanumeric characters.
<plain-text>	1 to 32 alphanumeric characters.
<vid>	1 to 4094

[Instructions]

Parameter name	Instruction
<encrypted-password>	Usually it is not used.

	With encrypt option, it is reflected in the configuration file or running-config after configuration.

show aaa authentication {dot1x | mac | web}

Displays the authentication method configuration.

[Parameter]

Parameter name	Description	
{dot1x | mac | web}	Specify the target authentication type.	
	dot1x	Specify the authentication method for IEEE802.1X authentication.
	mac	Specify the authentication method for MAC authentication.
	web	Specify the authentication method for WEB authentication.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

show aaa authentication {auth-mac | auth-user}

Displays the local account configuration.

[Parameter]

Parameter name	Description	
{auth-mac | auth-user}	Specify the target local account type.	
	auth-mac	Specify the local MAC account.
	auth-user	Specify the local user account.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

<Configuration example>

Overview: - Set primary database of MAC authentication to RADIUS server and secondary database to local database. Make configuration so that the authentication is executed using local database if there is no applicable account on RADIUS server.
- Add the local MAC account assigned to VLAN 1 following authentication.

1. Set primary database of MAC authentication to RADIUS and secondary database to Local.
2. Set "Auth Fail Action" of MAC authentication to secondary database.
3. Add XX:XX:XX:XX:XX:XX to local MAC database. Specify VLAN 1 to VLAN following authentication.

```
M24eG> enable
M24eG# configure
M24eG(config)# aaa authentication mac primary radius secondary local      ···1
M24eG(config)# aaa authentication mac auth-fail-action secondary-db       ···2
M24eG(config)# aaa authentication auth-mac XX:XX:XX:XX:XX:XX vlan 1       ···3
M24eG(config)# end
M24eG#
```

Fig. 4-9-3 Configuration example of authentication function

4.10. Authentication Log Configuration

Configure authentication log setting in "Global configuration mode." Display the authentication log in "Privileged mode."

Authentication log retention period configuration command

M24eG(config)#	syslog authentication save-interval <min>

Authentication log delete command

M24eG(config)#	syslog authentication clear

Authentication log display command

M24eG#	show syslog authentication [tail <line>]

<Setting display example>

The following is an execution example of the authentication log display command.

```
M24eG> enable
M24eG# show syslog authentication tail 5
2001/01/01 09:33:26 [MAC](RADIUS)Rejected 00:00:07:00:09:07 on Port 3
2001/01/01 09:33:26 [MAC](RADIUS)Rejected 00:00:07:00:09:08 on Port 3
2001/01/01 09:33:26 [MAC](RADIUS)Rejected 00:00:07:00:09:09 on Port 3
2001/01/01 09:33:26 [MAC](RADIUS)Rejected 00:00:07:00:09:0A on Port 3
2001/01/02 08:33:25 [WEB](Local)Authorized user test (xx:xx:xx:xx:xx:xx) on Port 1 to
VLAN 1
M24eG#
```

Fig. 4-10-1 Execution example of the authentication log display command

syslog authentication save-interval <min>

Configure the interval of the write operation to the authentication log flash.

[Parameter]

Parameter name	Description
<min>	Configure the interval of the write operation (in minutes).

[Factory default setting]

Parameter name	Factory default setting
<min>	60

[Value setting range]

Parameter name	Setting range
<min>	1 to 1440

[Instructions]

Parameter name	Instruction
None	None

syslog authentication clear

Clear the authentication log.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

show syslog authentication [tail <line>]

Displays the authentication log.

[Parameter]

Parameter name	Description
[tail <line>]	Specify for the latest log displayed with the specified number of rows (optional).
<line>	Specify the number of rows displayed.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<line>	1 to 512

[Instructions]

Parameter name	Instruction
None	None

<Configuration example>

Overview: Set the interval of the write operation to the authentication log flash to 10 minutes.

1. Configure the interval to 10 minutes.

```
M24eG> enable
M24eG# configure
M24eG(config)# syslog authentication save-interval 10                    ···1
M24eG(config)# end
M24eG#
```

Fig. 4-10-2 Configuration example of authentication log

4.11. IEEE802.1X Port-Based Authentication Configuration

Configure for the IEEE802.1X port-based authentication function in "Global configuration mode" and "Interface configuration mode." Display the basic information by entering "show dot1x port-based <port-list>" in "Privileged mode."

IEEE802.1X port-based authentication status display command

M24eG#	show dot1x port-based <port-list>

NAS ID configuration command. Refer to [3.5.4. RADIUS Configuration] for details.

M24eG(config)#	dot1x nasid <NASID>

NAS ID delete command. Refer to [3.5.4. RADIUS Configuration] for details.

M24eG(config)#	no dot1x nas-id

IEEE802.1X port-based authentication mode configuration command

M24eG(config-if)#	dot1x port-auth-mode port-based

Authentication status initialization command

M24eG(config-if)#	dot1x init

Maximum resend count configuration command

M24eG(config-if)#	dot1x max-req <value>

Authentication operation configuration command

M24eG(config-if)#	dot1x port-control {auto | force-authorized | force-unauthorized}

Local re-authentication interval configuration and enable command

M24eG(config-if)#	dot1x re-auth-timer local

Local re-authentication interval configuration and enable delete command

M24eG(config-if)#	no dot1x re-auth-timer local

Re-authentication status initialization command

M24eG(config-if)#	dot1x re-authenticate

Re-authentication enable command

M24eG(config-if)#	dot1x re-authentication

Re-authentication disable command

M24eG(config-if)#	no dot1x re-authentication

Waiting time configuration command after authentication fails

M24eG(config-if)#	dot1x timeout quiet-period <seconds>

Re-authentication interval configuration command

M24eG(config-if)#	dot1x timeout re-authperiod <seconds>

Authentication server timeout configuration command

M24eG(config-if)#	dot1x timeout server <seconds>

Supplicant timeout configuration command

M24eG(config-if)#	dot1x timeout supp-timeout <seconds>

Authentication request transmission interval configuration command

M24eG(config-if)#	dot1x timeout tx-period <seconds>

<Setting display example>

The following is an execution example of the IEEE802.1X port-based authentication configuration display command.

```
M24eG> enable
M24eG# show dot1x port-based 1

 NAS ID: Nas1

 Port No: 1          Authorized MAC Address: --:--:--:--:--:--
 Port Status       : Authorized            OperControlDirection : Both
 Port Control      : Force Authorized      AdminControlDirection: Both
 Quiet Period      : 60    seconds         Transmission Period  : 30    seconds
 Supplicant Timeout: 30    seconds         Server Timeout       : 30    seconds
 Maximum Request   : 2                     Re-auth Period       : 3600  seconds
 Per Port Re-auth  : Disabled              Current PVID         : 1
 Guest VLAN ID     : ----                  Default VLAN ID      : ----
 Re-Auth Timer Mode: RADIUS
M24eG#
```

Fig. 4-11-1 Execution example of the IEEE802.1X port-based authentication configuration display command

NAS ID	Displays authentication ID (NAS Identifier).	
Port No	Displays a port number.	
Authorized MAC Address	Displays the MAC address for the authorized host.	
Port Status	Displays the authentication status. The following Port Control configuration is reflected.	
	Unauthorized	Authentication is not authorized.
	Authorized	Authentication is authorized.
Port Control	Displays the operation mode for authentication requests.	
	Auto	The access control function is enabled. The authentication process relay is performed between the client and authentication server.
	Force Unauthorized	The access control function is disabled. All authentication requests from the client are ignored.
	Force Authorized	The access control function is disabled. Communication of the port is possible without authorization. (factory default setting)
Transmission Period	The number of seconds to wait before requesting the client to reattempt authentication.	

	The factory default setting is 30 seconds.	
Supplicant Timeout	Displays the timeout for the client. The factory default setting is 30 seconds.	
Server Timeout	Displays the timeout for the authentication server. The factory default setting is 30 seconds.	
Maximum Request	The maximum number of times of retransmitting an authentication request. The factory default setting is 2.	
Quiet Period	The number of seconds to wait before reattempting a failed authentication. The factory default setting is 60 seconds.	
Re-auth Period	The periodic re-authentication time interval. The factory default setting is 3600 seconds.	
Per Port Re-auth	Displays whether periodic re-authentication is enabled or disabled.	
	Enabled	Re-authentication is performed periodically.
	Disabled	Periodic re-authentication is not performed. (factory default setting)
OperControlDirection	Displays the operation status at the time of authentication request.	
	Both	In an unauthorized status, the packet transmission/reception is not executed.
	In	In an unauthorized status, the packet reception is not executed.
AdminControlDirection	Displays the operation configuration at the time of authentication request.	
	Both	In an unauthorized status, the packet transmission/reception is not executed.
	In	In an unauthorized status, the packet reception is not executed.
Current PVID	Displays the PVID currently applied.	
Guest VLAN ID	Displays VLAN ID applied in an unauthorized status. Displays "----" when it is disabled.	
Default VLAN ID	Displays VLAN ID assigned when no VLAN information was notified by RADIUS server while Dynamic VLAN is enabled. Displays "----" when it is disabled.	
Re-Auth Timer Mode	Displays whether this value is used or not when Session-Timeout Attribute was notified by RADIUS server.	
	RADIUS	The value of "Session-Timeout" is given priority and used. (factory default setting)

	Local	The value of "Re-auth Period" of this device is always used.

show dot1x port-based <port-list>

Displays the IEEE802.1X port-based authentication configuration.

[Parameter]

Parameter name	Description
<port-list>	Specify the port number list displayed.

[Factory default setting]

Parameter name	Factory default setting
<port-list>	None

[Value setting range]

Parameter name	Setting range
<port-list>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter name	Instruction
<port-list>	None

dot1x port-auth-mode port-based

Set the authentication method of the target interface to port-based authentication.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x init

Initialize the authentication status.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x max-req <value>

Configure the maximum number of times of retransmitting an authentication request.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<value>	Configure the maximum number of times of retransmitting an authentication request.

[Factory default setting]

Parameter name	Factory default setting
<value>	2

[Value setting range]

Parameter name	Setting range
<value>	1 to 10

[Instructions]

Parameter name	Instruction
<value>	None

dot1x port-control {auto | force-authorized | force-unauthorized}

Set the authentication operation.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description	
{auto | force-authorized | force-unauthorized }	Set the IEEE802.1X port authentication operation.	
	auto	The access control function is enabled. The authentication process relay is performed between the client and authentication server.
	force-authorized	The access control function is disabled. Communication of the port is possible without authorization.
	force-unauthorized	The access control function is disabled. All authentication requests from the client are ignored.

[Factory default setting]

Parameter name	Factory default setting
{auto | force-authorized | force-unauthorized }	force-authorized

[Value setting range]

Parameter name	Setting range
{auto | force-authorized | force-unauthorized }	Enter "auto", "force-authorized", or "force-unauthorized."

[Instructions]

Parameter name	Instruction
{auto |	None

force-authorized | force-unauthorized}	

dot1x re-auth-timer local

Align the number of seconds to wait before requesting the client to reattempt authentication with the switch configuration (dot1x timeout re-authperiod).

no dot1x re-auth-timer local

Align the number of seconds to wait before requesting the client to reattempt authentication with the authentication server configuration.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	Align the number of seconds to wait before requesting the client to reattempt authentication with the switch configuration.

[Factory default setting]

Parameter name	Factory default setting
None	Align the number of seconds to wait before requesting the client to reattempt authentication with the authentication server configuration.

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x re-authenticate

Initialize the re-authentication status to the client.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x re-authentication

Enable periodic client re-authentication.

no dot1x re-authentication

Disable periodic client re-authentication.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	Periodic re-authentication is disabled.

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x timeout quiet-period <seconds>

Configure the number of seconds to wait before reattempting a failed authentication.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<seconds>	Configure the number of seconds to wait before reattempting a failed authentication.

[Factory default setting]

Parameter name	Factory default setting
<seconds>	60

[Value setting range]

Parameter name	Setting range
<seconds>	1 to 65535

[Instructions]

Parameter name	Instruction
<seconds>	None

dot1x timeout re-authperiod <seconds>

Configure the number of seconds to wait before requesting the client to reattempt authentication.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<seconds>	The periodic re-authentication time interval.

[Factory default setting]

Parameter name	Factory default setting
<seconds>	3600

[Value setting range]

Parameter name	Setting range
<seconds>	1 to 65535

[Instructions]

Parameter name	Instruction
<seconds>	None

dot1x timeout server <seconds>

Configure the timeout for the authentication server.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<seconds>	Configure the timeout for the authentication server.

[Factory default setting]

Parameter name	Factory default setting
<seconds>	30

[Value setting range]

Parameter name	Setting range
<seconds>	1 to 65535

[Instructions]

Parameter name	Instruction
<seconds>	None

dot1x timeout supp-timeout <seconds>

Configure the timeout for the client.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<seconds>	Configure the timeout for the client.

[Factory default setting]

Parameter name	Factory default setting
<seconds>	30

[Value setting range]

Parameter name	Setting range
<seconds>	1 to 65535

[Instructions]

Parameter name	Instruction
<seconds>	None

dot1x timeout tx-period <seconds>

Configure the number of seconds to wait before requesting the client to reattempt authentication when the authentication is unauthorized.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<seconds>	Configure the number of seconds to wait before requesting to reattempt authentication.

[Factory default setting]

Parameter name	Factory default setting
<seconds>	30

[Value setting range]

Parameter name	Setting range
<seconds>	1 to 65535

[Instructions]

Parameter name	Instruction
<seconds>	None

<Configuration example>

Overview: Enable the authentication function for Port 1. Enable the periodic client re-authentication. Change the number of seconds to wait before requesting to reattempt authentication so that the value obeys the switch configuration. Set the number of seconds to wait before requesting to reattempt authentication to 6000 seconds.

1. Move to the interface configuration mode for Port 1.
2. Enable the authentication function for Port 1.
3. Enable periodic re-authentication to the client for Port 1.
4. Make change to align the number of seconds to wait before requesting to reattempt authentication for Port 1 with the switch configuration.
5. Set the number of seconds to wait before requesting to reattempt authentication for Port 1 to 6000 seconds.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface gi0/1                              ･･･1
M24eG(config-if)# dot1x port-control auto                   ･･･2
M24eG(config-if)# dot1x re-authentication                   ･･･3
M24eG(config-if)# dot1x re-auth-timer local                 ･･･4
M24eG(config-if)# dot1x timeout re-authperiod 6000          ･･･5
M24eG(config-if)# end
M24eG#
```

Fig. 4-11-2. Configuration example of IEEE802.1X port-based authentication

4.12. IEEE802.1X MAC-Based Authentication Configuration

Configure for the IEEE802.1X MAC-based authentication function in "Global configuration mode" and "Interface configuration mode." Display the basic information by entering "show dot1x mac-based <port num>" in "Privileged mode."

IEEE802.1X MAC-based authentication status display command

M24eG#	show dot1x mac-based <port num>

Force Authorized MAC Address configuration display command

M24eG#	show dot1x forceAuthorized-mac {all | single <MAC>}

Unauthorized MAC address table display command

M24eG#	show dot1x unauthorized mac-address-table {interface <interface> | mac}

EAP-Request configuration display command

M24eG#	show dot1x eap-request port config

IEEE802.1X statistic information display command

M24eG#	show dot1x statistics <port num> {since-reset | since-up}

IEEE802.1X MAC-based authentication mode configuration command

M24eG(config-if)#	dot1x port-auth-mode mac-based

Maximum resend count configuration command

M24eG(config-if)#	dot1x max-req <value>

Authentication operation configuration command

M24eG(config-if)#	dot1x port-control {auto | force-authorized | force-unauthorized}

Local re-authentication interval configuration and enable command

M24eG(config-if)#	dot1x re-auth-timer local

Local re-authentication interval configuration and enable delete command

M24eG(config-if)#	no dot1x re-auth-timer local

Re-authentication status initialization command

M24eG(config-if)#	dot1x re-authenticate

Re-authentication enable command

M24eG(config-if)#	dot1x re-authentication

Re-authentication disable command

M24eG(config-if)#	no dot1x re-authentication

Waiting time configuration command after authentication fails

M24eG(config-if)#	dot1x timeout quiet-period <seconds>

Re-authentication interval configuration command

M24eG(config-if)#	dot1x timeout re-authperiod <seconds>

Authentication server timeout configuration command

M24eG(config-if)#	dot1x timeout server <seconds>

Supplicant timeout configuration command

M24eG(config-if)#	dot1x timeout supp-timeout <seconds>

Authentication request transmission interval configuration command

M24eG(config-if)#	dot1x timeout tx-period <seconds>

Control target communication direction configuration command in an unauthorized status

M24eG(config-if)#	dot1x control-direction {both | in}

Authentication status initialization command

M24eG(config-if)#	dot1x mac-based init [<MAC>]

Re-authentication execution command

M24eG(config-if)#	dot1x mac-based re-authenticate [<MAC>]

Re-authentication enable command

M24eG(config-if)#	dot1x mac-based re-authentication [<MAC>]

Re-authentication disable command

M24eG(config-if)#	dot1x mac-based re-authentication [<MAC>]

Interval configuration command for sending EAP-Request

M24eG(config)#	dot1x eap-request interval <sec>

EAP-Request enable command

M24eG(config-if)#	dot1x eap-request

EAP-Request disable command

M24eG(config-if)#	no dot1x eap-request

Force Authorized MAC Address configuration command

M24eG(config)#	dot1x forceAuthorized mac <MAC> mask-bit <mask-len> auth-mode {authorized | unauthorized} portlist <port-list>

Force Authorized MAC Address delete command

M24eG(config)#	no dot1x forceAuthorized mac <MAC>

Unauthorized MAC address table age timeout configuration command

M24eG(config)#	dot1x unauthorized age-out time <sec>

Unauthorized MAC address registration command

M24eG(config)#	dot1x unauthorized mac <MAC> <interface>

<Setting display example>

The following is an execution example of the IEEE802.1X MAC-based authentication configuration display command.

```
M24eG> enable
M24eG# show dot1x mac-based 1

 NAS ID: Nas1            Port No: 1         Number of Supplicant: 512
 Operational Control Direction: Both   Administrative Control Direction: Both
 Transmission Period : 30    seconds    Maximum Request         : 2
 Supplicant Timeout  : 30    seconds    Quiet Period            : 60    seconds
 Server Timeout      : 30    seconds    Re-authentication Period: 3600  seconds
 Force Auth Timeout  : 3600  seconds    Per Port Re-auth        : Disabled
 Re-Auth Timer Mode  : RADIUS
 Supplicant MAC Addr  Type      MAC Control     Auth Status  Re-auth
 ------------------- ------- ------------------ ------------ --------

 No entry exist!


M24eG#
```

Fig. 4-12-1 Execution example of the IEEE802.1X MAC-based authentication configuration display command

NAS ID	Displays authentication ID (NAS Identifier).	
Port No	Displays a port number.	
Number of Supplicant	Displays the number of supplicants on which authentication is permitted. The factory default setting is 512.	
Operational Control Direction	Displays the packet control status in an unauthorized status.	
	Both	In an unauthorized status, the packet transmission/reception is not executed.
	In	In an unauthorized status, the packet reception is not executed.
Administrative Control Direction	Displays the packet control configuration in an unauthorized status.	
	Both	In an unauthorized status, the packet transmission/reception is not executed.
	In	In an unauthorized status, the packet reception is not executed.
Transmission Period	Displays the number of seconds to wait before requesting the supplicant to reattempt authentication. The factory default setting is 30 seconds.	
Supplicant Timeout	Displays the timeout for the client. The factory default setting is 30 seconds.	

Server Timeout	Displays the timeout for the authentication server. The factory default setting is 30 seconds.	
Maximum Request	Displays the maximum number of times of retransmitting an authentication request. The factory default setting is 2.	
Quiet Period	The number of seconds to wait before reattempting a failed authentication. The factory default setting is 60 seconds.	
Re-authentication Period	Displays the periodic re-authentication time interval. The factory default setting is 3600 seconds.	
Force Auth Timeout	Displays the timeout for the forced authentication MAC address. The factory default setting is 3600 seconds.	
Per Port Re-auth	Displays whether periodic re-authentication is enabled or disabled for entire ports.	
	Enabled	Re-authentication is performed periodically.
	Disabled	Periodic re-authentication is not performed. (factory default setting)
Re-Auth Timer Mode	Displays whether this value is used or not when "Session-Timeout Attribute" was notified by RADIUS server.	
	RADIUS	The value of "Session-Timeout" is given priority and used. (factory default setting)
	Local	The value of "Re-auth Period" of this device is always used.
Supplicant MAC Addr	Displays the supplicant MAC address.	
Type	Displays the authentication method.	
	Dynamic	Indicates that the authentication is dynamically authorized by RADIUS server.
	Static	Indicates that the authentication is authorized by statically registered information.
MAC Control	Displays the authentication type.	
	Auto	Indicates the authentication by RADIUS server.
	Force Authorized	Indicates the forced authentication configuration.
	Force Unauthorized	Indicates the forced unauthorized authentication configuration.

Auth Status	Indicates the authentication status.	
	Authorized	Indicates that the authentication is authorized.
	Unauthorized	Indicates it is in an unauthorized status.
Re-auth	Displays the re-authentication status for each supplicant.	
	Enabled	Re-authentication is performed.
	Disabled	Re-authentication is not performed.

show dot1x mac-based <port num>

Displays the MAC-based authentication status.

[Parameter]

Parameter name	Description
<port num>	Specify the target port number.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<port num>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9

[Instructions]

Parameter name	Instruction
None	None

show dot1x forceAuthorized-mac {all | single <MAC>}

Displays the forced authentication MAC address.

[Parameter]

Parameter name	Description	
{all | single <MAC>}	Specify the display range.	
	all	Displays all the entries.
	single	Only displays specified MAC address.
	<MAC>	Specify the target MAC address.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<MAC>	Forced authentication MAC address

[Instructions]

Parameter name	Instruction
None	None

show dot1x unauthorized mac-address-table {interface <interface name> | mac}

Displays unauthorized MAC address table.

[Parameter]

Parameter name	Description	
{interface <interface name> | mac}	Specify the display range.	
	interface	Indicates the display of each interface.
	<interface name>	Specify the target interface name.
	mac	Displays in the order of MAC address.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<interface name>	<Switch-M48eG> GigabitEthernet0/1-GigabitEthernet0/48 <Switch-M24eG> GigabitEthernet0/1-GigabitEthernet0/24 <Switch-M16eG> GigabitEthernet0/1-GigabitEthernet0/16 <Switch-M8eG> GigabitEthernet0/1-GigabitEthernet0/9 Abbreviations can be used. Example: GigabitEthernet0/1→gi0/1

[Instructions]

Parameter name	Instruction
None	None

show dot1x eap-request port config

Displays the EAP Request configuration.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

show dot1x statistics <port num> {since-reset | since-up}

Displays statistic information of IEEE802.1X control packets.

[Parameter]

Parameter name	Description	
<port num>	Specify the target port number.	
{since-reset | since-up}	Specify the type of statistic information displayed.	
	since-reset	Displays the value from the counter reset.
	since-up	Displays the value from device start-up.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<port num>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9

[Instructions]

Parameter name	Instruction
None	None

dot1x port-auth-mode mac-based

Set the authentication method of the target interface to MAC-based authentication.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x control-direction {both | in}

Configure the packet control operation in an unauthorized status.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
both	In the unauthorized status, transmitting and receiving packets through the target port are not executed on this device.
in	In the unauthorized status, receiving packets through the target port is not executed on this device.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x mac-based init [<MAC>]

Initialize the authentication status of entire ports or supplicants.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
<MAC>	Specify the MAC address of supplicants for which authentication is initialized (optional).

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<MAC>	MAC address on the authentication table.

[Instructions]

Parameter name	Instruction
None	None

dot1x mac-based re-authenticate [<MAC>]

Initialize the re-authentication status of the supplicant.
Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
[<MAC>]	Only specify to specific supplicants (optional).

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
[<MAC>]	MAC address on the authentication table.

[Instructions]

Parameter name	Instruction
None	None

dot1x re-authentication [<MAC>]

Enable periodic re-authentication for the supplicant.

no dot1x re-authentication [<MAC>]

Disable periodic re-authentication for the supplicant.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
[<MAC>]	Only specify to specific supplicants (optional).

[Factory default setting]

Parameter name	Factory default setting
None	Periodic re-authentication is disabled.

[Value setting range]

Parameter name	Setting range
[<MAC>]	MAC address on the authentication table.

[Instructions]

Parameter name	Instruction
None	None

dot1x eap-request interval <sec>

Configure the transmission interval (in minutes) of EAP Request sent to unauthorized MAC address.

[Parameter]

Parameter name	Description
<sec>	Configure the transmission interval (in minutes) of EAP Request.

[Factory default setting]

Parameter name	Factory default setting
<sec>	5

[Value setting range]

Parameter name	Setting range
<sec>	1 to 3600

[Instructions]

Parameter name	Instruction
None	None

dot1x eap-request

Enable the transmission of EAP Request.

no dot1x eap-request

Disable the transmission of EAP Request.

Note: This command is executed from interface configuration mode of each port.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

dot1x forceAuthorized mac <MAC> mask-bit <mask-len> auth-mode {authorized | unauthorized} portlist <portlist>

Add forced authentication MAC address.

no dot1x forceAuthorized mac <MAC>

Delete forced authentication MAC address.

[Parameter]

Parameter name	Description	
<MAC>	Specify target MAC address for forced authentication.	
<mask-len>	Specify the mask length of specified MAC address.	
{authorized | unauthorized}	Specify the authentication method.	
	authorized	Indicates the forced authentication.
	unauthorized	Indicates the forced unauthorized authentication.
<portlist>	Specify the target port list.	

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<MAC>	Unicast MAC address
<mask-len>	1 to 48
<portlist>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter	Instruction

name	
None	None

dot1x unauthorized age-out time <sec>

Configure the age timeout (in seconds) of the unauthorized MAC address table to which EAP Request is sent.

[Parameter]

Parameter name	Description
<sec>	Configure the age timeout (in seconds) of the unauthorized MAC address table.

[Factory default setting]

Parameter name	Factory default setting
<sec>	300

[Value setting range]

Parameter name	Setting range
<sec>	0 to 65535

[Instructions]

Parameter name	Instruction
None	None

dot1x unauthorized mac <MAC> <interface name>

Add MAC address to the unauthorized MAC address table.

[Parameter]

Parameter name	Description
<MAC>	Specify the target MAC address.
<interface name>	Specify the target interface name.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<MAC>	Unicast MAC address
<interface name>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter name	Instruction
None	None

<Configuration example>

Overview: Change the IEEE802.1X authentication method for Port 1 to MAC-based authentication. Enable the EAP Request transmission function.

1. Move to the interface configuration mode for Port 1.
2. Set the IEEE802.1X authentication method for Port 1 to MAC-based authentication.
3. Enable the transmission function of EAP Request for Port 1.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface gi0/1                              ···1
M24eG(config-if)# dot1x port-auth-mode mac-based            ···2
M24eG(config-if)# dot1x eap-request                         ···3
M24eG(config-if)# end
M24eG#
```

Fig. 4-12-2. Configuration example of IEEE802.1X MAC-based authentication

4.13. MAC Authentication Configuration

Configure for MAC authentication function in "Global configuration mode." Display the basic information by entering "show mac-authentication" in "Privileged mode."

MAC authentication enable command

M24eG(config)#	mac-authentication

MAC authentication disable command

M24eG(config)#	no mac-authentication

MAC authentication and authentication block time configuration command

M24eG(config)#	mac-authentication auth-fail block-time <sec>

RADIUS server user name format configuration command (upper case/lower case)

M24eG(config)#	mac-authentication mac-format case {upper | lower}

RADIUS server user name format configuration command (type of delimiter)

M24eG(config)#	mac-authentication mac-format delimiter {hyphen | colon | dot | none}

RADIUS server user name format configuration command (number of characters delimited)

M24eG(config)#	mac-authentication mac-format delimited-char-num {2 | 4 | 6}

RADIUS server password format configuration command

M24eG(config)#	mac-authentication password {mac | manual}

RADIUS server fixed password configuration command

M24eG(config)#	mac-authentication password manual <string>

RADIUS server fixed password delete command

M24eG(config)#	no mac-authentication password manual

MAC authentication port configuration command

M24eG(config)#	mac-authentication port <portlist>

MAC authentication port delete command

M24eG(config)#	no mac-authentication port

MAC authentication configuration display command

M24eG#	show mac-authentication

<Setting display example>

The following is an execution example of the MAC authentication configuration display command.

```
M24eG> enable
M24eG# show mac-authentication

 MAC Address Format for RADIUS Username

   Case               : Upper

   Delimiter          : Hyphen

   Delimited Characters : 2


 RADIUS Password Type   : MAC Address

 Manual Password       :

M24eG#
```

Fig. 4-13-1 Execution example of the MAC authentication configuration display command

Case	Specify upper or lower case for MAC address sent to RADIUS server as a user name.	
	Upper	Indicates upper case. (factory default setting)
	Lower	Indicates lower case.
Delimiter	Specify the type of delimiter in MAC address sent to RADIUS server as a user name.	
	Hyphen	Indicates that a hyphen (-) is used. (factory default setting)
	Colon	Indicates that a colon (:) is used.
	Dot	Indicates that a dot (.) is used.
	None	Indicates that no delimiter is used.
Delimited Characters	Specify the number of characters delimited in MAC address sent to RADIUS server as a user name.	
	2	Indicates delimiting every two characters. (factory default setting)
	4	Indicates delimiting every four characters.
	6	Indicates delimiting every six characters.
RADIUS Password Type	Indicates the format of a password string sent to RADIUS server when using RADIUS server for MAC authentication.	

	MAC	Indicates using the same string as MAC address. (factory default setting)
	Manual	Indicates using an arbitrary fixed string.
Manual Password	Displays a fixed string sent as a password when "RADIUS Password Type" is set to "Manual."	

show mac-authentication

Displays the MAC authentication configuration.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication

Enable the MAC authentication function.

no mac-authentication

Disable the MAC authentication function.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication auth-fail block-time <sec>

Displays the time period (in seconds) before authentication process is accepted again after MAC authentication fails.

[Parameter]

Parameter name	Description
<sec>	Specify the time period (in seconds) before authentication process is accepted.

[Factory default setting]

Parameter name	Factory default setting
<sec>	60

[Value setting range]

Parameter name	Setting range
<sec>	1 to 65535

[Instructions]

Parameter name	Instruction
None	None

mac-authentication mac-format case {upper | lower}

Specify upper or lower case for MAC address sent to RADIUS server as a user name when RADIUS server is used for MAC authentication.

[Parameter]

Parameter name	Description	
{upper | lower}	Specify upper or lower case.	
	upper	Indicates upper case.
	lower	Indicates lower case.

[Factory default setting]

Parameter name	Factory default setting
{upper | lower}	upper

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication mac-format delimiter {hyphen | colon | dot | none}

Specify the type of delimiter in MAC address sent to RADIUS server as a user name when RADIUS server is used for MAC authentication.

[Parameter]

Parameter name	Description	
{hyphen | colon | dot | none}	Specify the type of delimiter.	
	hyphen	Indicates that a hyphen (-) is used.
	colon	Indicates that a colon (:) is used.
	dot	Indicates that a dot (.) is used.
	none	Indicates that no delimiter is used.

[Factory default setting]

Parameter name	Factory default setting
{hyphen | colon | dot | none}	hyphen

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication mac-format delimited-char-num {2 | 4 | 6}

Specify the type of delimiter in MAC address sent to RADIUS server as a user name when RADIUS server is used for MAC authentication.

[Parameter]

Parameter name	Description	
{2 | 4 | 6}	Specify the type of delimiter.	
	2	Indicates delimiting every two characters.
	4	Indicates delimiting every four characters.
	6	Indicates delimiting every six characters.

[Factory default setting]

Parameter name	Factory default setting
{2 | 4 | 6}	2

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication password type {mac | manual}

Configure the type of a password string sent to RADIUS server when using RADIUS server for MAC authentication.

[Parameter]

Parameter name	Description	
{mac | manual}	Indicates the type of a password string sent to RADIUS server.	
	mac	Indicates using the same MAC address format string as a user name.
	manual	Indicates using an arbitrary fixed string.

[Factory default setting]

Parameter name	Factory default setting
{mac | manual}	mac

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

mac-authentication password manual <string>

Configure the fixed string sent to RADIUS server as a password when using RADIUS server for MAC authentication.

no mac-authentication password manual

Clear the configuration of the fixed string.

[Parameter]

Parameter name	Description
<string>	Specify the fixed string.

[Factory default setting]

Parameter name	Factory default setting
<string>	None

[Value setting range]

Parameter name	Setting range
<string>	1 to 32 alphanumeric characters

[Instructions]

Parameter name	Instruction
None	None

mac-authentication port <portlist>

Configure the target port for MAC authentication.

no mac-authentication port

Clear the target port for MAC authentication.

[Parameter]

Parameter name	Description
<portlist>	Specify the target port for MAC authentication.

[Factory default setting]

Parameter name	Factory default setting
<portlist>	None

[Value setting range]

Parameter name	Setting range
<portlist>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter name	Instruction
None	None

<Configuration example 1>

Overview: Enable MAC authentication for Port 1 to 2. Only allow a specific terminal registered to local MAC database to communicate with VLAN1.
Isolate the unregistered terminal to VLAN 100.

1. Move to the interface configuration mode for Port 1, 2.
2. Change PVID for Port 1, 2 to 100.
3. Register XX:XX:XX:XX:XX:XX to local MAC database to assign it to VLAN 1.
4. Specify Port 1, 2 as target ports for MAC authentication.
5. Enable MAC authentication.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface GigabitEthernet0/1-2                          ···1
M24eG(config-if)# pvid 100                                             ···2
M24eG(config-if)# exit
M24eG(config)# aaa authentication auth-mac XX:XX:XX:XX:XX:XX vlan 1     ···3
M24eG(config)# mac-authentication port 1-2                             ···4
M24eG(config)# mac-authentication                                      ···5
M24eG(config)# end
M24eG#
```

Fig. 4-13-2 Configuration example of MAC authentication (local database authentication)

<Configuration example 2>

Overview: Enable MAC authentication for Port 1 to 2.
Isolate the unregistered terminal to VLAN 100.
Specify the authentication destination to RADIUS server. Send the user name and password in the format of "XX-XX-XX-XX-XX-XX" for both of them.
Note: Create the following user account to RADIUS server to have it assigned to VLAN 1 after authentication.
User name: XX-XX-XX-XX-XX-XX
Password: XX-XX-XX-XX-XX-XX
Tunnel-Private-Group-Id=1

1. Set Primary Database for MAC authentication to RADIUS.
2. Move to the interface configuration mode for Port 1, 2.
3. Change PVID for Port 1, 2 to 100.
4. Specify Port 1, 2 as target ports for MAC authentication.
5. Enable MAC authentication.

```
M24eG> enable
M24eG# configure
M24eG(config)# aaa authentication mac primary radius secondary none       ···1
M24eG(config)# interface GigabitEthernet0/1-2                             ···2
M24eG(config-if)# pvid 100                                                ···3
M24eG(config-if)# exit
M24eG(config)# mac-authentication port 1-2                                ···4
M24eG(config)# mac-authentication                                         ···5
M24eG(config)# end
M24eG#
```

Fig. 4-13-3 Configuration example of MAC authentication (RADIUS authentication)

4.14. WEB Authentication Configuration

Configure for WEB authentication function in "Global configuration mode." Display the basic information by entering "show web-authentication" in "Privileged mode."

WEB authentication enable command

M24eG(config)#	web-authentication

WEB authentication disable command

M24eG(config)#	no web-authentication

WEB authentication and authentication block time configuration command

M24eG(config)#	web-authentication auth-fail block-time <sec>

WEB authentication port configuration command

M24eG(config)#	web-authentication port <portlist>

WEB authentication port delete command

M24eG(config)#	no web-authentication port

Virtual IP address configuration command

M24eG(config)#	web-authentication virtual-ip <IP>

Virtual IP address delete command

M24eG(config)#	no web-authentication virtual-ip

WEB authentication login screen and HTTP port configuration command

M24eG(config)#	web-authentication web-port http <l4-port>

WEB authentication login screen and HTTP port initialization command

M24eG(config)#	no web-authentication web-port

Redirect URL configuration command

M24eG(config)#	web-authentication redirect <URL>

Redirect URL delete command

M24eG(config)#	no web-authentication redirect

WEB authentication login screen and title configuration command

M24eG(config)#	web-authentication contents title <string>

WEB authentication login screen and user name string configuration command

M24eG(config)#	web-authentication contents username <string>

WEB authentication login screen and password string configuration command

M24eG(config)#	web-authentication contents password <string>

WEB authentication login screen and logo data upload command

M24eG(config)#	copy tftp <IP> <filename> logo-data

WEB authentication login screen and message field configuration command

M24eG(config)#	web-authentication contents message <string>

WEB authentication login screen and description field configuration command

M24eG(config)#	web-authentication contents description <string>

WEB authentication login screen configuration and delete command

M24eG(config)#	no web-authentication contents {title | logo-data | username | password | message | description}

Temporary use DHCP server function enable command

M24eG(config)#	web-authentication dhcp enable

Temporary use DHCP server function disable command

M24eG(config)#	web-authentication dhcp disable

Delivery start IP address configuration command

M24eG(config)#	web-authentication dhcp start-ip <IP>

Delivery IP address count configuration command

M24eG(config)#	web-authentication dhcp ip-num <ip-num>

IP address lease time configuration command

M24eG(config)#	web-authentication dhcp lease-time <sec>

Default router configuration command

M24eG(config)#	web-authentication dhcp default-router <IP>

Default router configuration and delete command

M24eG(config)#	no web-authentication dhcp default-router

DNS server address configuration command

M24eG(config)#	web-authentication dhcp dns <IP>

DNS server address configuration and delete command

M24eG(config)#	no web-authentication dhcp dns

WEB authentication configuration display command

M24eG#	show web-authentication

WEB authentication login screen configuration display command

M24eG#	show web-authentication contents

Temporary use DHCP server configuration display command

M24eG#	show web-authentication dhcp

<Setting display example 1>

The following is an execution example of the WEB authentication configuration display command.

```
M24eG> enable
M24eG# show web-authentication

 Virtual IP Address : 0.0.0.0
 HTTP Port Number   : 80
 Redirect URL       :

M24eG#
```

Fig. 4-14-1 Execution example of the WEB authentication configuration display command

Virtual IP Address	Displays the virtual IP address used in the WEB authentication login screen.
HTTP Port Number	Used in the WEB authentication login screen.
Redirect URL	Displays URL viewed as redirection occurs after successful WEB authentication.

<Setting display example 2>

The following is an execution example of the WEB authentication page view configuration display command.

```
M24eG> enable
M24eG# show web-authentication contents

 Page Title       :
 Logo Data        : None
 User Name String : User Name
 Password String  : Password
 Message     :
 Description :

M24eG#
```

Fig. 4-14-2 Execution example of the WEB authentication page configuration display command

Page Title	Displays the title string of the WEB authentication login page. You can enter the title in Japanese using Unicode.	
Logo Data	Displays the availability of logo data. You can transfer image data in JPG/PNG/GIF format with the size of up to 512KB via TFTP server. You can also check the actual image in the WEB configuration screen.	
	Existed	Indicates that logo data is saved.
	None	Indicates that logo data is not saved. (factory default)
User Name String	Displays a string in the user name input field. (factory default setting: User Name) You can enter the user name in Japanese using Unicode.	
Password String	Displays a string in the password input field. (factory default setting: Password) You can enter the password in Japanese using Unicode.	
Message	Displays the text shown in the Message filed. You can enter the text in Japanese using Unicode and use the following HTML tags. (Other HTML tags are disabled.) <a> <b> <i> <u> <right> <left> <font> <h1> to <h5> <p>	
Description	Displays the text shown in the Description filed. You can enter the text in Japanese using Unicode and use the following HTML tags. (Other HTML tags are	

	disabled.) <a> <b> <i> <u> <right> <left> <font> <h1> to <h5> <p>

<Setting display example 3>

The following is an execution example of the temporary use DHCP server configuration display command.

```
M24eG> enable
M24eG# show web-authentication dhcp

 Temporary DHCP Server Status : Disabled

 DHCP Lease Time              : 30 seconds
 Start of Leased IP Address   : 0.0.0.0
 Number of Leased IP Address  : 32
 Default Router Address       : 0.0.0.0
 DNS Server Address           : 0.0.0.0

M24eG#
```

Fig. 4-14-3 Execution example of the temporary use DHCP server configuration display command

Temporary DHCP Server Status	Displays the temporary use DHCP server status. Execute IP address delivery, needed for access performed on WEB authentication, against the port for which Guest VLAN as well as WEB authentication are enabled. To use this function, configure Guest VLAN for which management VLAN is enabled against the target port for WEB authentication.	
	Enabled	Temporary use DHCP server is enabled.
	Disabled	Temporary use DHCP server is disabled. (factory default setting)
DHCP Lease Time	Displays IP address lease time (in seconds). (factory default setting: 30)	
Start of Leased IP Address	Displays start address of leased IP address. Subnet mask is fixed to 255.255.255.0.	
Number of Leased IP Address	Displays the number of leased IP addresses. (factory default setting: 32)	
Default Router Address	Displays the value of default router address notified in DHCP. **Specify IP address actually existing in Guest VLAN.** **Note: IP address of this device is recommended.**	
DNS Server Address	Displays the value of DNS server address notified in DHCP.	

show web-authentication

Displays the WEB authentication configuration.

show web-authentication contents

Displays WEB authentication login screen page configuration.

show web-authentication dhcp

Displays the temporary use DHCP server configuration.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

web-authentication

Enable the WEB authentication function.

no web-authentication

Disable the WEB authentication function.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

web-authentication auth-fail block-time <sec>

Displays the time period (in seconds) before authentication process is accepted again after WEB authentication fails.

[Parameter]

Parameter name	Description
<sec>	Specify the time period (in seconds) before authentication process is accepted.

[Factory default setting]

Parameter name	Factory default setting
<sec>	60

[Value setting range]

Parameter name	Setting range
<sec>	1 to 65535

[Instructions]

Parameter name	Instruction
None	None

web-authentication port <portlist>

Configure the target port for WEB authentication.

no web-authentication port

Clear the target port for WEB authentication.

[Parameter]

Parameter name	Description
<portlist>	Specify the target port for WEB authentication.

[Factory default setting]

Parameter name	Factory default setting
<portlist>	None

[Value setting range]

Parameter name	Setting range
<portlist>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 You can configure multiple ports. Example: 1 to 3,5

[Instructions]

Parameter name	Instruction
None	None

web-authentication virtual-ip <IP>

Configure the virtual IP address used in the WEB authentication login screen.

no web-authentication virtual-ip

Clear the IP address configuration.

[Parameter]

Parameter name	Description
<IP>	Specify the virtual IP address used in the WEB authentication login screen.

[Factory default setting]

Parameter name	Factory default setting
<IP>	0.0.0.0

[Value setting range]

Parameter name	Setting range
<IP>	Arbitrary IP address other than 0.0.0.0, 224.0.0.0 to 255.255.255.255 as well as network address actually connected.

[Instructions]

Parameter name	Instruction
<IP>	**Specify IP address (such as 1.1.1.1) for network address used for a network different from that actually connected.**

web-authentication web-port http <l4-port>

Configure the HTTP port number used in the WEB authentication login screen.

no web-authentication web-port

Initialize the HTTP port number configuration.

[Parameter]

Parameter name	Description
<l4-port>	Specify the HTTP port number used in the WEB authentication login screen.

[Factory default setting]

Parameter name	Factory default setting
<l4-port>	80

[Value setting range]

Parameter name	Setting range
<l4-port>	1 to 65535

[Instructions]

Parameter name	Instruction
<l4-port>	When changing this setting, the HTTP port number in the WEB configuration screen is also changed. You cannot specify the HTTP port number in use.

web-authentication redirect <URL>

Configure URL viewed as redirection occurs after successful WEB authentication.

no web-authentication redirect

Clear the Redirect URL configuration.

[Parameter]

Parameter name	Description
<URL>	Specify the virtual IP address used in the WEB authentication login screen.

[Factory default setting]

Parameter name	Factory default setting
<URL>	None

[Value setting range]

Parameter name	Setting range
<URL>	URL starting with "http://" containing 64 characters or less.

[Instructions]

Parameter name	Instruction
None	None

web-authentication contents title <string>

Configure the title string of the WEB authentication login screen.

no web-authentication contents title

Clear the title string.

[Parameter]

Parameter name	Description
<string>	Specify the title string.

[Factory default setting]

Parameter name	Factory default setting
<string>	None

[Value setting range]

Parameter name	Setting range
<string>	64 alphanumeric and Unicode (UTF-8) characters or less.

[Instructions]

Parameter name	Instruction
None	None

web-authentication contents username <string>

Configure the string in the user name input field in the WEB authentication login screen.

no web-authentication contents username

Clear the string in the user name input field.

[Parameter]

Parameter name	Description
<string>	Specify a string in the user name input field.

[Factory default setting]

Parameter name	Factory default setting
<string>	User Name

[Value setting range]

Parameter name	Setting range
<string>	32 alphanumeric and Unicode (UTF-8) characters or less.

[Instructions]

Parameter name	Instruction
None	None

web-authentication contents password <string>

Configure the string in the password input field in the WEB authentication login screen.

no web-authentication contents password

Clear the string in the password input field.

[Parameter]

Parameter name	Description
<string>	Specify a string in the password input field.

[Factory default setting]

Parameter name	Factory default setting
<string>	Password

[Value setting range]

Parameter name	Setting range
<string>	32 alphanumeric and Unicode (UTF-8) characters or less.

[Instructions]

Parameter name	Instruction
None	None

copy tftp <server IP> <filename> logo-data

Upload the logo (image) data shown in the WEB authentication login screen via TFTP server.

no web-authentication contents logo-data

Clear the logo data.

[Parameter]

Parameter name	Description
<server IP>	Specify the IP address of TFTP server with the logo data stored.
<filename>	Specify the logo data file name on TFTP server.

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
<server IP>	Unicast IP address
<filename>	39 alphanumeric characters or less

[Instructions]

Parameter name	Instruction
<filename>	You can specify a JPG/GIF/PNG file with the size of up to 512KB.

web-authentication contents message <string>

Configure a string in the message field in the WEB authentication login screen.

no web-authentication contents message

Clear the string in the message field.

[Parameter]

Parameter name	Description
<string>	Specify a string in the message field.

[Factory default setting]

Parameter name	Factory default setting
<string>	None

[Value setting range]

Parameter name	Setting range
<string>	256 alphanumeric and Unicode (UTF-8) characters or less.

[Instructions]

Parameter name	Instruction
<string>	You can use the following HTML tags. <a> <b> <i> <u> <right> <left> <font> <h1> to <h5> <p>

web-authentication contents description <string>

Configure a string in the description field in the WEB authentication login screen.

no web-authentication contents description

Clear the string in the message field.

[Parameter]

Parameter name	Description
<string>	Specify a string in the description field.

[Factory default setting]

Parameter name	Factory default setting
<string>	None

[Value setting range]

Parameter name	Setting range
<string>	256 alphanumeric and Unicode (UTF-8) characters or less.

[Instructions]

Parameter name	Instruction
<string>	You can use the following HTML tags. <a> <b> <i> <u> <right> <left> <font> <h1> to <h5> <p>

web-authentication dhcp enable

Enable temporary use DHCP server.

web-authentication dhcp disable

Disable temporary use DHCP server.

[Parameter]

Parameter name	Description
None	None

[Factory default setting]

Parameter name	Factory default setting
None	None

[Value setting range]

Parameter name	Setting range
None	None

[Instructions]

Parameter name	Instruction
None	None

web-authentication dhcp start-ip <IP>

Configure start address of leased IP address.

[Parameter]

Parameter name	Description
<IP>	Specify start address of leased IP address.

[Factory default setting]

Parameter name	Factory default setting
<IP>	0.0.0.0

[Value setting range]

Parameter name	Setting range
<IP>	Unicast IP address

[Instructions]

Parameter name	Instruction
None	None

web-authentication dhcp ip-num <ip-num>

Configure the number of leased IP addresses.

[Parameter]

Parameter name	Description
<ip-num>	Specify the number of leased IP addresses.

[Factory default setting]

Parameter name	Factory default setting
<ip-num>	32

[Value setting range]

Parameter name	Setting range
<ip-num>	1 to 64

[Instructions]

Parameter name	Instruction
None	None

web-authentication dhcp lease-time <sec>

Configure IP address lease time (in seconds).

[Parameter]

Parameter name	Description
<sec>	Specify IP address lease time (in seconds).

[Factory default setting]

Parameter name	Factory default setting
<sec>	30

[Value setting range]

Parameter name	Setting range
<sec>	30 to 60

[Instructions]

Parameter name	Instruction
None	None

web-authentication dhcp default-router <IP>

Configure default router IP address notified in DHCP.

no web-authentication dhcp default-router

Clear the default router configuration.

[Parameter]

Parameter name	Description
<IP>	Specify default router IP address notified in DHCP.

[Factory default setting]

Parameter name	Factory default setting
<IP>	None

[Value setting range]

Parameter name	Setting range
<IP>	**Communication-capable IP address existing in Guest VLAN**

[Instructions]

Parameter name	Instruction
<IP>	**Specify IP address actually existing in Guest VLAN.**

web-authentication dhcp dns <IP>

Configure IP address of DNS server notified in DHCP.

no web-authentication dhcp dns

Clear the configuration of DNS server.

[Parameter]

Parameter name	Description
<IP>	Specify IP address of DNS server notified in DHCP.

[Factory default setting]

Parameter name	Factory default setting
<IP>	None

[Value setting range]

Parameter name	Setting range
<IP>	Unicast IP address

[Instructions]

Parameter name	Instruction
None	None

<Configuration example>

Overview: Enable WEB authentication for Port 1 to 2. Only allow users registered to local user database to communicate with VLAN1. Isolate the unregistered terminal to VLAN 100.

1. Move to the interface configuration mode for Port 1, 2.
2. Change PVID for Port 1, 2 to 100.
3. Register the following account to local user database to assign it to VLAN 1.
   User name: user1
   Password: user1-password (encrypted)
   Authentication method: WEB authentication only.
4. Specify Port 1, 2 as target ports for WEB authentication.
5. Specify virtual IP address to 1.1.1.1.
6. Enable WEB authentication.

```
M24eG> enable
M24eG# configure
M24eG(config)# interface GigabitEthernet0/1-2                                  ···1
M24eG(config-if)# pvid 100                                                     ···2
M24eG(config-if)# exit
M24eG(config)# aaa authentication auth-user user1 password user1-password encrypt
vlan 1 auth-type web                                                           ···3
M24eG(config)# web-authentication port 1-2                                     ···4
M24eG(config)# web-authentication virtual-ip 1.1.1.1                          ···5
M24eG(config)# web-authentication                                              ···6
M24eG(config)# end
M24eG#
```

Fig. 4-14-2 Configuration example of WEB authentication (local database authentication)

4.8. LED Base Mode Configuration

Configure the LED base mode in "Global configuration mode." Confirm the configuration information by executing the "show led base-mode" command in "Privileged mode."

Command to show the LED base mode

M24eG#	show led base-mode

Command to configure the LED base mode

M24eG(config)#	led base-mode <status l eco>

<Command Entry Example>

An example of executing the command to show the LED base mode is shown below.

```
M24eG> enable
M24eG# show led base-mode
(1) System LED base-mode:  Status
M24eG#
```

Fig. 4-8-1 Example of executing the command to show the LED base mode

(1) System LED base-mode

Shows the LED base mode.	
Status	Operating in the status mode.
Eco	Operating in the eco mode.

show led base-mode

Shows the LED base mode configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

led base-mode <status | eco>

Configures the LED base mode.

[Parameter]

Parameter name	Description	
<status | eco>	Configure the LED base mode.	
	status	Automatically Switching Hubs to the status mode if the LED display change button is not pressed for 1 minute.
	eco	Automatically switches to the eco mode if the LED display change button is not pressed for 1 minute.

[Factory Default Setting]

Parameter name	Factory default setting
<status | eco>	status

[Setting Range]

Parameter name	Setting range
<status | eco>	Either "status" or "eco"

[Note]

Parameter name	Note
<status | eco>	None

<Configuration Example>

Overview: Change the LED base mode.

(1) Set to the eco mode.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# led base-mode eco
M24eG(config)# exit
M24eG#
```

Fig. 4-8-2 Example of the LED base mode configuration

Note: Change in configuration of the LED base mode is automatically saved.

4.9. Line Configuration

Configure the settings related to loop detection function and the power saving mode in "Interface configuration mode."

4.9.1. Loop Detection Configuration

Enable or disable the loop detection function and configure the auto-recovery in "Interface configuration mode." Confirm the loop history by executing the "show line loopback history" command in "Privileged mode."

Command to show the loop history

M24eG#	show line loopback history [tail <line>]

Command to delete the loop history

M24eG#	line loopback history clear

Command to enable the loop detection function

M24eG(config-if)#	line loopback

Command to disable the loop detection function

M24eG(config-if)#	no line loopback

Command to configure the loop detection mode

M24eG(config-if)#	line loopback mode <block I shutdown>

Command to enable the auto-recovery function

M24eG(config-if)#	line loopback shutdown <sec>

Command to disable the auto-recovery function

M24eG(config-if)#	no line loopback shutdown

<Command Entry Example>

An example of executing the command to show the loop history is shown below.

```
M24eG> enable
M24eG# show line loopback history
(1) Jan 01 06:34:17 kern.info [LINE-PROTOCOL] The loop detected on port 1.
(2) Jun 01 06:35:17 kern.info [LINE-PROTOCOL] Port1 auto recovery.
(3) Jan 01 10:39:26 kern.info [LINE-PROTOCOL] The loop detected between port 2 and port 3.
M24eG#
```

Fig. 4-9-1 Example of executing the command to show the loop history

(1) History display example 1

Shows that a loop was detected on Port 1 at 6:34:17 on January 1st, and was shut off.

(2) History display example 2

Shows that auto-recovery was executed from the shut-off state of Port 1 at 6:35:17 on January 1st.

(3) History display example 3

Shows that loops were detected on Port 2 and Port 3 at 10:39:26 on January 1st, and were shut off.

Note: For details of loop history messages, refer to the section of system log in chapter 10.

show line loopback history [tail <line>]

Shows the log of events occurred to the Switching Hub.

[Parameter]

Parameter name	Description
<line>	Set the number of lines to be displayed from the log end.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<line>	1 to 64

[Note]

Parameter name	Note
None	None

line loopback

Enables the loop detection/shut-off function.

no line loopback

Disables the loop detection/shut-off function.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	<Switch-M48eG> Ports 1 to 44: line loopback Ports 45 to 48: no line loopback <Switch-M24eG> Ports 1 to 22: line loopback Ports 23 to 24: no line loopback <Switch-M16eG> Ports 1 to 14: line loopback Ports 15 to 16: no line loopback <Switch-M8eG> Ports 1 to 7: line loopback Ports 8 to 9: no line loopback

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

line loopback mode <block | shutdown>

Configures the loop detection mode.

[Parameter]

Parameter name	Description	
<block | shutdown>	Configures the loop detection mode.	
	block	When the Switching Hub detects loop, the ports are blocked. (Factory default setting)
	shutdown	When the Switching Hub detects loop, the ports are shut down.

[Factory Default Setting]

Parameter name	Factory default setting
<block | shutdown>	block

[Setting Range]

Parameter name	Setting range
<block | shutdown>	Either " block ", or " shutdown "

[Note]

Parameter name	Note
None	None

line loopback shutdown <sec>

Enables the auto-recovery function.

no line loopback shutdown

Disables the auto-recovery function.

[Parameter]

Parameter name	Description
<sec>	Set the time between the loop shut-off and the auto-recovery. The unit is seconds.

[Factory Default Setting]

Parameter name	Factory default setting
<sec>	60

[Setting Range]

Parameter name	Setting range
<sec>	60 to 86400

[Note]

Parameter name	Note
<sec>	None

<Configuration Example>

Overview: Configure the loop detection/shut-off function and the auto-recovery function.

(1) Move to the interface configuration mode for Port 1.
(2) Enable the loop detection/shut-off function of Port 1.
(3) Set the auto-recovery time to 300 seconds, which is the period after detecting a loop on Port 1 and shutting down the port.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/1
(2) M24eG(config-if)# line loopback
(3) M24eG(config-if)# line loopback shutdown 300
M24eG(config-if)# end
M24eG#
```

Fig. 4-9-2 Example of configuration of the loop detection/shut-off and auto-recovery functions

Note: For loop detection, a unique frame is used. If a loop detection frame is received on a port whose loop detection/shut-off function is disabled, the destination port is shut down.

4.9.2. Configuration of MNO Series Power Saving Mode

Configure the MNO series power saving mode in "Interface configuration mode."
The MNO series power saving mode is our unique function for automatically detecting the port connection status and minimizing power consumption if not connected. This Switching Hub supports two modes: the Half mode for giving priority to connectivity with other device, and the Full mode for minimizing power consumption.

Command to configure the MNO series power saving mode

M24eG(config-if)#	line power-saving <disable | full | half>

line power-saving <disable | full | half>

Configures the MNO series power saving mode.

[Parameter]

Parameter name	Description	
<disable | full | half>	Configure the MNO series power saving mode.	
	disable	The MNO series power saving mode is disabled.
	full	The MNO series power saving mode is enabled.
	half	The MNO series power saving mode that gives priority to connectivity with other device is adopted.

[Factory Default Setting]

Parameter name	Factory default setting
<disable | full | half>	half

[Setting Range]

Parameter name	Setting range
<disable | full | half>	Either "disable", "full", or "half"

[Note]

Parameter name	Note
<disable | full | half>	None

<Configuration Example>

Overview: Enable the MNO series power saving mode on all ports.

(1) Move to the interface configuration mode for Ports 1 to 24.

(2) Enable the MNO series power saving mode on Ports 1 to 24.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# interface gi0/1-24
(2) M24eG(config-if)# line power-saving full
M24eG(config-if)# end
M24eG#
```

Fig. 4-9-3 Example of executing the command to configure the MNO series power saving mode

4.9.3. Line Configuration Display

Confirm the configuration of loop detection/shut-off function and MNO series power saving mode in "Interface configuration mode."

Command to show the configuration of MNO series power saving mode

M24eG#	show line configuration

<Command Entry Example>

An example of executing the command to show the MNO series power saving mode is shown below.

```
M24eG> enable
M24eG# show line configuration
Interface   Status   Mode         Loop detection   Power-saving
(1)         (2)      (3)          (4)              (5)
---------   ------   ----------   --------------   ------------
gi0/1       Down     Auto         Enabled          Half
gi0/2       Down     Auto         Enabled          Half
gi0/3       Down     Auto         Enabled          Half
gi0/4       Down     Auto         Enabled          Half
gi0/5       Down     Auto         Enabled          Half
gi0/6       Down     Auto         Enabled          Half
gi0/7       Down     Auto         Enabled          Half
gi0/8       Down     Auto         Enabled          Half
gi0/9       Down     Auto         Enabled          Half
gi0/10      Down     Auto         Enabled          Half
gi0/11      Down     Auto         Enabled          Half
gi0/12      Down     Auto         Enabled          Half
gi0/13      Down     Auto         Enabled          Half
gi0/14      Down     Auto         Enabled          Half
gi0/15      Down     Auto         Enabled          Half
gi0/16      Down     Auto         Enabled          Half
gi0/17      Down     Auto         Enabled          Half
gi0/18      Down     Auto         Enabled          Half
gi0/19      Down     Auto         Enabled          Half
gi0/20      Down     Auto         Enabled          Half
gi0/21      Down     Auto         Enabled          Half
gi0/22      Down     Auto         Enabled          Half
gi0/23      Down     Auto         Disabled         Half
gi0/24      Down     Auto         Disabled         Half
M24eG#
```

Fig. 4-9-4 Example of executing the command to show the MNO series power saving mode

(1) Interface

Shows the interface name.	
gi0/1	Refers to "Gigabit Ethernet Port 1." (The number after "gi0/" indicates the port number.)

(2) Status

Shows the port status.	
Up	The port link is up.
Down	The port link is down.
Disabled	The port is shut down. (The port is closed, or it is disconnected by the loop detection/shut-off function.)

(3) Mode

Shows the port communication speed and duplex mode (full or half).	
Auto	The auto negotiation function is enabled when the port link is down. While the link is up, the string enclosed in parentheses shows the communication speed and full-duplex/half-duplex mode.
1000F	The port is in the 1000 Mbps full-duplex mode.
100-FDx ("100F" under the "Auto" mode)	The port is in the 100 Mbps full-duplex mode.
100-HDx ("100H" under the "Auto" mode)	The port is in the 100 Mbps half-duplex mode.
10-FDx ("10F" under the "Auto" mode)	The port is in the 10 Mbps full-duplex mode.
10-HDx ("10H" under the "Auto" mode)	The port is in the 10 Mbps half-duplex mode.

(4) Loop detection

Shows the status of the loop detection/shut-off function.	
Enabled	The loop detection/shut-off function is enabled.
Disabled	The loop detection/shut-off function is disabled.

(5) Power-saving

Shows the status of the MNO series power saving mode.	
Disabled	The MNO series power saving mode is disabled.
Full	The MNO series power saving mode is enabled.
Half	The MNO series power saving mode of giving priority to connectivity with other device.

4.10. Port Group Configuration

Configure port grouping in "Global configuration mode." If a port group is configured, ports designated as members of the port group can communicate only among member ports in the same group. Each port can be assigned to multiple port groups. Confirm the configuration information by executing the "show port-group" command in "Privileged mode."

Command to show the port group information

M24eG#	show port-group

Command to configure port grouping

M24eG(config)#	port-group <ID> name <Name> member <Portlist>

Command to enable port grouping

M24eG(config)#	port-group <ID> enable

Command to disable port grouping

M24eG(config)#	no port-group <ID> enable

<Command Entry Example>

An example of executing the command to show the port group information is shown below.

```
M24eG> enable
M24eG# show port-group
 (1)       (2)              (3)                                (4)
Total Groups : 3
Group ID  Group Name       Group Member                       Status
--------  ---------------  ---------------------------------  --------
1         Group_1          1-2                                Enabled
2         Group_2          2-4                                Disabled

M24eG#
```

Fig. 4-10-1 Example of executing the command to show the port group information

(1) Group ID

Shows the port group ID.

(2) Group Name

Shows the port group name.

(2) Group Member

Shows member ports in the port group.

(3) Status

Shows the status of port grouping.	
Enabled	Port grouping is enabled.
Disabled	Port grouping is disabled.

show port-group

Shows the port group configuration.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

port-group <ID> name <Name> member <Portlist>

Creates a port group.

no port-group <ID>

Deletes a port group.

[Parameter]

Parameter name	Description
<ID>	Set a port group ID. You can set up to 256 port groups.
<Name>	Set a port group name.
<PortList>	Set member ports belonging to the port group.

[Factory Default Setting]

Parameter name	Factory default setting
<ID>	None
<Name>	None
<PortList>	None

[Setting Range]

Parameter name	Setting range
<ID>	1 to 256
<Name>	Up to 15 one-byte characters Allowed characters: alphanumeric character (A−Z, a−z, 0−9) symbol (!@#$&_-.) white space
<PortList>	<Switch-M48eG> 1 to 48 <Switch-M24eG> 1 to 24 <Switch-M16eG> 1 to 16 <Switch-M8eG> 1 to 9 Multiple ports can be specified. Example: 1-3,5

[Note]

Parameter name	Note
<ID>	None
<Name>	None
<PortList>	None

port-group <ID> enable

Enables port grouping.

no port-group <ID> enable

Disables port grouping.

[Parameter]

Parameter name	Description
<ID>	Specify the port group ID.

[Factory Default Setting]

Parameter name	Factory default setting
<ID>	port-group <ID> enable Port grouping is enabled at the time of configuration.

[Setting Range]

Parameter name	Setting range
<ID>	1 to 256

[Note]

Parameter name	Note
<ID>	None

<Configuration Example 1>

Overview: Set up port group 1 and port group 2. Port 3 is to be the shared port. Then, disable the port group 2.

(1) Set up port group 1 (member ports: 1 to 3).
(2) Set up port group 2 (member ports: 2 to 4).
(3) Disable the port group 2.

```
M24eG> enable
M24eG# configure
(1) M24eG(config)# port-group 1 name Group_1 member 1-3
(2) M24eG(config)# port-group 2 name Group_2 member 2-4
(3) M24eG(config)# no port-group 2 enable
M24eG(config)# end
M24eG#
```

Fig. 4-10-2 Example of the port group configuration

5. Statistical Information Display

Show the statistical information of packet counters in "Privileged mode."

Command to show the statistical information (normal)

M24eG#	show interface counters [IFNAME]

Command to show the statistical information (error)

M24eG#	show interface counters error [IFNAME]

<Command Entry Example>

Displayed below are the normal counters and the error counters for the port 24.

```
M24eG> enable
M24eG# show interface counters gi0/24
Interface GigabitEthernet0/24 is active, which has statistics
    Inbound:
        Total Octets:  135616937
        BroadcastPkts:  802649, MulticastPkts:  195421
        UnicastPkts:  5019, Non-unicastPkts:  998008
    Outbound:
        Total Octets:  1932746
        UnicastPkts:  27577, Non-unicastPkts:  62
    Inbound packets distribution:
        64 Octets:  527240, 65to127 Octets:  290459
        128to255 Octets:  19582, 256to511 Octets:  175625
        512to1023 Octets:  17739, 1024to1518 Octets:  21
M24eG# show interface counters error gi0/24
Interface GigabitEthernet0/24 is active, which has statistics
    Inbound:
        FragmentsPkts:  0, UndersizePkts:  0, OversizePkts:  0
        DisacrdsPkts:  605385, ErrorPkts:  0, UnknownProtos:  0
        AlignError:  0, CRCAlignErrors:  0, Jabbers:  0, DropEvents:  0
    Outbound:
        Collisions:  0, LateCollision:  0
        SingleCollision:  0, MultipleCollision:  0
        DisacrdsPkts:  0, ErrorPkts:  0
M24eG#
```

Fig. 5-1 Example of display of the port statistical information (counters)

<Command Entry Example>

Displayed below are the error counters for the link-up port 1 and the link-down port 2.

```
M24eG> enable
M24eG# show interface counters error gi0/1-2
Interface GigabitEthernet0/1 is active, which has statistics
    Inbound:
        FragmentsPkts:  0, UndersizePkts:  0, OversizePkts:  1
        DisacrdsPkts:  625074, ErrorPkts:  2, UnknownProtos:  0
        AlignError:  0, CRCAlignErrors:  1, Jabbers:  0, DropEvents:  0
    Outbound:
        Collisions:  0, LateCollision:  0
        SingleCollision:  0, MultipleCollision:  0
        DisacrdsPkts:  0, ErrorPkts:  0
Interface GigabitEthernet0/2 is inactive, no available statistics
M24eG#
```

Fig. 5-2 Example of display of the port statistical information (error counters)

<Command Entry Example>

Displayed below are the counters for the port 24 when jumbo frame is enabled.

```
M24eG> enable
M24eG# show interface counters gi0/24
Interface GigabitEthernet0/24 is active, which has statistics
    Inbound:
        Total Octets:  135616937
        BroadcastPkts:  802649, MulticastPkts:  195421
        UnicastPkts:  5019, Non-unicastPkts:  998008
    Outbound:
        Total Octets:  1932746
        UnicastPkts:  27577, Non-unicastPkts:  62
    Inbound packets distribution:
        64 Octets:  527240, 65to127 Octets:  290459
        128to255 Octets:  19582, 256to511 Octets:  175625
        512to1023 Octets:  17739, Over1024 Octets:  21
M24eG#
```

Fig. 5-3 Example of display of the port statistical information (counters) when jumbo frame is enabled

show interface counters [IFNAME]

Shows the statistical information (normal).

[Parameter]

Parameter name	Description
[IFNAME]	Specify the interface name.

[Factory Default Setting]

Parameter name	Factory default setting
[IFNAME]	None

[Setting Range]

Parameter name	Setting range
[IFNAME]	<Switch-M48eG> gi0/1 to gi0/48 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M24eG> gi0/1 to gi0/24 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M16eG> gi0/1 to gi0/16 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M8eG> gi0/1 to gi0/9 (A range can be specified with a hyphen.) None (All ports are displayed.)

[Note]

Parameter name	Note
[IFNAME]	None

Note: If the specified interface is not connected, statistical information is not displayed.

show interface counters error [IFNAME]

Shows the statistical information (error).

[Parameter]

Parameter name	Description
[IFNAME]	Specify the interface name.

[Factory Default Setting]

Parameter name	Factory default setting
[IFNAME]	None

[Setting Range]

Parameter name	Setting range
[IFNAME]	<Switch-M48eG> gi0/1 to gi0/48 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M24eG> gi0/1 to gi0/24 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M16eG> gi0/1 to gi0/16 (A range can be specified with a hyphen.) None (All ports are displayed.) <Switch-M8eG> gi0/1 to gi0/9 (A range can be specified with a hyphen.) None (All ports are displayed.)

[Note]

Parameter name	Note
[IFNAME]	None

Note: If the specified interface is not connected, statistical information is not displayed.

6. Configuration File Transfer

You can transfer the configuration information of this Switching Hub to TFTP server or retrieve it from TFTP server in "Privileged mode."

Command to transfer the configuration file

M24eG#	copy running-config tftp <ip-address> <filename>

Command to retrieve the configuration file

M24eG#	copy tftp <ip-address> <filename> running-config

copy running-config tftp <ip-address> <filename>

Transfers the configuration information of this Switching Hub to TFTP server using a specified file name.

copy tftp <ip-address> <filename> running-config

Retrieves the configuration file with a specified name from a specified TFTP server.

[Parameter]

Parameter name	Description
<ip-address>	Specify the IP address of TFTP server.
<filename>	Specify the configuration file name.

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	None
<filename>	None

[Setting Range]

Parameter name	Setting range
<ip-address>	1.0.0.1 to 223.255.254.254
<filename>	1 to 39 one-byte alphanumeric characters

[Note]

Parameter name	Note
<ip-address>	None
<filename>	None

<Configuration Example>

Overview: Transfer the current configuration information to a TFTP server whose IP address is 192.168.1.1, specifying the file name as "switch-1.cfg".
(To cancel the TFTP transfer process, press Ctrl+C during transfer.)

```
M24eG> enable
M24eG# copy running-config tftp 192.168.1.1 switch-1.cfg
M24eG#
```

Fig. 6-1 Example of transferring the configuration information (this Switching Hub → TFTP server)

<Configuration Example>

Overview: Reflect the configuration file on a TFTP server to this Switching Hub.

(1) Retrieve the configuration file "switch-2.cfg" from a TFTP server whose IP address is 172.16.1.1.
(2) Save the retrieved configuration information. (For details, refer to chapter 11.)
(To cancel the TFTP transfer process, press Ctrl+C during transfer.)

```
M24eG> enable
(1) M24eG# copy tftp 172.16.1.1 switch-2.cfg running-config
(2) M24eG# copy running-config startup-config
Configuration saved to startup_config
M24eG#
```

Fig. 6-2 Example of transferring the configuration information (TFTP server → this Switching Hub)

Note: The configuration information is not automatically saved in this Switching Hub just by retrieving the configuration file from the TFTP server. Make sure to save the configuration information.

7. Firmware Upgrade

You can upgrade the firmware version of this Switching Hub in "Privileged mode."

Firmware upgrade command

M24eG#	copy tftp <ip address> <file_name> image

copy tftp <ip address> <file_name> image

Upgrades the firmware version, and automatically reboots.
If the reboot timer is set as in section 8.3, the reboot timer starts and the Switching Hub is rebooted after the set time.

[Parameter]

Parameter name	Description
<ip-address>	Set the IP address of the TFTP server.
<filename>	Set the file name of the firmware.

[Factory Default Setting]

Parameter name	Factory default setting
<ip-address>	None
<filename>	None

[Setting Range]

Parameter name	Setting range
<ip-address>	1.0.0.1 to 223.255.254.254
<filename>	1 to 39 one-byte alphanumeric characters

[Note]

Parameter name	Note
<ip-address>	None
<filename>	None

Note: Make sure not to turn off power while upgrading. Otherwise, the Switching Hub may not be able to boot up.

<Configuration Example>

Overview: Upgrade the firmware version.

(1) Upgrade the firmware with the file named pn28240v1000.rom on a TFTP server whose IP address is 192.168.1.1.

(2) It is an indicator showing that download is in progress. (To cancel the TFTP transfer process, press Ctrl+C during transfer.)

(3) The downloaded firmware is verified and saved.

(4) The system is automatically rebooted when upgrade is successful.

```
M24eG> enable
(1)M24eG# copy tftp 192.168.1.1 pn28240v1000.rom image
This command will proceed system firmware update [Y/N] : y
(2)/
Verifying Firmware File ..............................  PASSED
Firmware File Size ...................................  1823015 bytes
Verifying Checksum ...................................  0x4deb
Check Firmware Type ..................................  FIRMWARE
(3)Checking Firmware Version ...........................  x.x.x.xx, PASSED
Unmount File System ..................................  OK
Erasing Flash Memory .................................  OK
Writing Flash Memory .................................  OK

(4)Firmware successfully update!! System is rebooting ...
```

Fig. 7-1 Example of upgrading the firmware version

8. Reboot

You can perform a reboot of the Switching Hub in "Privileged mode." Reboot type can be selected from the following three options: "Normal," "Restore to the factory default settings," and "Restore to the factory default settings except for IP address."

8.1. Normal Reboot

Reboot of the Switching Hub is executed.

Reboot command

M24eG#	reboot normal

reboot normal

Reboots the Switching Hub.

[Parameter]

Parameter name	Description	
normal	Specify an option for the reboot type of the Switching Hub.	
	normal	Reboot

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Perform a reboot.

(1) Execute the reboot command.

(2) In execution confirmation, press "y" to continue, and "n" to cancel.

```
M24eG> enable
(1)M24eG# reboot default
(2)Are you sure to reboot the system?(Y/N) y
```

Fig. 8-1-1 Example of reboot

8.2. Restoration to Factory Default Settings

You can entirely initialize saved configuration and system information, and restore to the factory default settings in "Global configuration mode."

Reboot timer configuration command

M24eG(config)#	reboot {default | default-except-ip}

reboot {default | default-except-ip}

After the system is rebooted, initializes all stored configuration and system information and restores them to the factory default settings.

[Parameter]

Parameter name	Description	
{ default | default-except-ip}	Specify an option for the reboot type of the Switching Hub.	
	Default	Restores to the factory default settings after reboot.
	default-except-ip	Restores to the factory default settings after reboot, except for the IP address setting.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

Note: Once initialized, the configuration and system information cannot be restored. Pay full attention on execution.

<Configuration Example>

Overview: Initialize the configuration to restore to the factory default settings.

(1) Restore to the factory default settings.

(2) In execution confirmation, press "y" to continue, and "n" to cancel.

```
M24eG> enable
(1)M24eG# reboot default
(2)Are you sure to reboot the system?(Y/N) y
```

Fig. 8-2-1 Example of reboot

8.3. Reboot Timer Configuration

You can reboot the Switching Hub after a set time from execution of the reboot command by setting the reboot timer in advance.

Reboot timer configuration command

M24eG(config)#	reboot timer <time>

reboot timer <time>

Changes the time period between execution of the reboot command and reboot of the Switching Hub.

[Parameter]

Parameter name	Description
<time>	Set the time until the Switching Hub is rebooted by seconds.

[Factory Default Setting]

Parameter name	Factory default setting
<time>	0 (Reboot timer is disabled.)

[Setting Range]

Parameter name	Setting range
<time>	0 to 86400

[Note]

Parameter name	Note
<time>	None

<Configuration Example>

Overview: Set the time until the Switching Hub reboot to 10 seconds, and execute the reboot.

(1) Set the reboot timer to 10 seconds.
(2) Execute the reboot command.
(3) Press "y" in reboot confirmation.
(4) The Switching Hub is rebooted after 10 seconds according to the reboot timer.
(To cancel the reboot, press Ctrl and C.)

```
M24eG> enable
M24eG# configure
(1)M24eG(config)# reboot timer 10
M24eG(config)# exit
(2)M24eG# reboot normal
(3)Are you sure to reboot the system?(Y/N) y
(4)The system will reboot 10 seconds later. You can press CTRL+c to cancel it.
M24eG#
```

Fig. 8-3-1 Example of executing the reboot timer

9. Ping Execution

You can confirm connectivity using the ping command.

Ping command

All modes	ping <IP address> [-n <count>] [-w <timeout>]

ping <IP address> [-n <count>] [-w <timeout>]

Confirm connectivity to specified IP address.

[Parameter]

Parameter name	Description
<IP address>	Specify the IP address of a target host.
<count>	Set the number of ping requests to send.
<timeout>	Set the timeout in seconds.

[Factory Default Setting]

Parameter name	Factory default setting
<IP address>	None
<count>	3
<timeout>	3

[Setting Range]

Parameter name	Setting range
<IP address>	0.0.0.1 to 223.255.255.255
<count>	1 to 10
<timeout>	1 to 5

[Note]

Parameter name	Note
<IP address>	None
<count>	None
<timeout>	None

<Execution Example 1>

Overview: Test connectivity to the host.

(1) Test connectivity to the host whose IP address is 192.168.1.10 five times, setting the timeout to 2 seconds.
(2) Request number and response time are displayed.
(3) Connectivity test results are displayed.

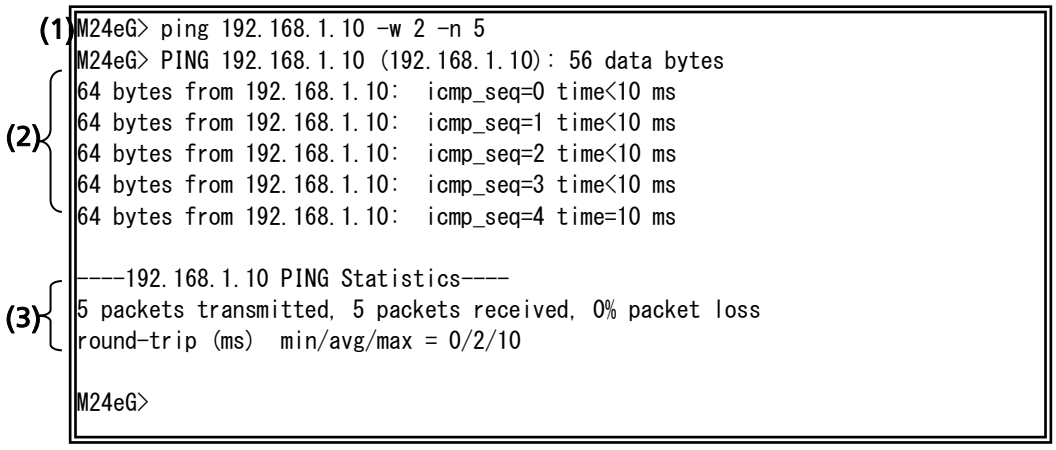


Fig. 9-1 Example of ping execution 1

<Execution Example 2>

Overview: Test connectivity to a host that does not exist.

(1) Test connectivity to the host whose IP address is 192.168.0.1, which does not exist.
(2) A timeout error is displayed because there is no response.
(3) Connectivity test results are displayed.

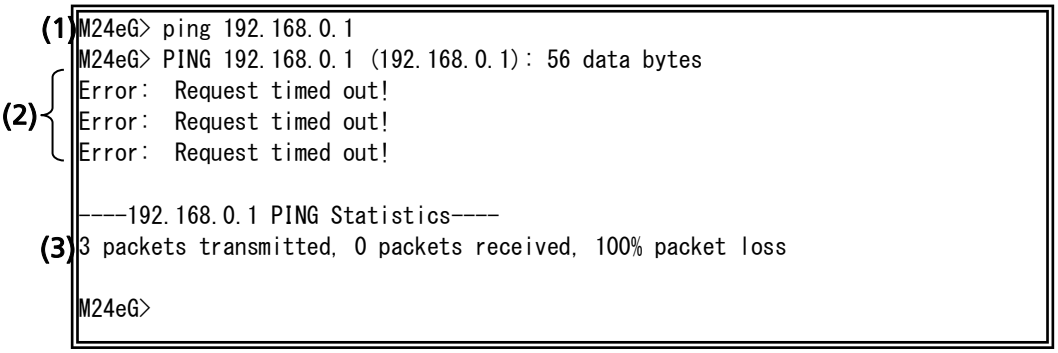


Fig. 9-2 Example of ping execution 2

10. System Log Display

Display or delete the system log in "Privileged mode."

Command to show the system log

M24eG#	show syslog [tail <line>]

Command to delete the system log

M24eG#	syslog clear

<Command Entry Example>

Ten most recent system logs are displayed.

```
M24eG> enable
M24eG# show syslog tail 10
(1)    (2)      (3)          (4)       (5)
Jan 01 09:01:55 kern.info [SYSTEM] Reboot the system!
Jan 01 09:00:12 kern.info [PORT] Port-1 link-up.
Jan 01 09:00:38 kern.info [SNTP] SNTP first update to 2010/06/28 15:00:53.
Jun 28 15:00:55 kern.info [SYSTEM] Login from console.
Jun 29 19:21:04 kern.info [SYSTEM] Configuration changed!
Jun 30 10:43:31 kern.info [PORT] Port-17 link-up.
Jun 30 10:43:32 kern.info [LINE-PROTOCOL] The loop detected between port18 and port17.
Jun 30 10:43:33 kern.info [PORT] Port-18 link-down.
Jun 30 10:44:34 kern.info [LINE-PROTOCOL] Port17 auto recovery.
Jan 01 09:05:47 kern.info [PORT] Port-23 link-up.
```

Fig. 10-1 Example of executing the command to show system logs

(1) Mmm dd

Shows the date on which the log was recorded.

(2) hh:mm:ss

Shows the time at which the log was recorded.

(3) kern.xxxx

Shows the importance of the log.	
emerg	Indicates "abnormality."
err	Indicates "error."
warn	Indicates "warning."
info	Indicates "information."

(4) Shows the log classification.

Counter	A log relating to Counter
Loop Detect	A log relating to Loop Detct
Port Monitoring	A log relating to PortMonitering
RADIUS	A log relating to RADIUS
SNTP	A log relating to SNTP
Storm	A log relating to Storm
System	A log relating to System
DDM	A log relating to DDM

(5) Details of logs are as follows.

Counter	
Error	Received error packets. (CRC/Align Errors)
	Indicates that receiving CRC/Align error packet.
	Received the error packets. (Undersize Pkts)
	Indicates that receiving the packet under 64 Bytes.
	Received the error packets. (Oversize Pkts)
	Indicates that receiving the packet over 1518 Bytes.
	Received the error packets. (Fragments)
	Indicates that receiving Fragment frame.
	Received the error packets. (Jabbers)
	Indicates that receiving Jabber frame.
	Received the error packets. (Collisions)
	Indicates the detecting Collision.
	Cannot send the packets. (Ping)
	Indicate that cannot send the packet.
	Cannot send the packets. (Telnet)
	Indicate that cannot send the packet.
	Cannot send the packets. (SNMP)
	Indicate that cannot send the packet.
	Cannot send the packets. (Syslog)
	Indicate that cannot send the packet.
	Cannot send the packets. (RADIUS)
	Indicate that cannot send the packet.
	Cannot send the packets. (SSH)
	Indicate that cannot send the packet.
	Cannot send the packets. (SNTP)
	Indicate that cannot send the packet.
	Cannot send the packets. (ARP)
	Indicate that cannot send the packet.
	Cannot send the packets. (EAP)

	Indicate that cannot send the packet.
	Cannot send the packets. (TFTP)
	Indicate that cannot send the packet.
Loop Detect	
Error	The loop detected between port xx and yy.
	Indicates that a loop was detected between Port A and Port B.
	The loop detected port xx
	Indicates that a loop was detected on Port X.
Info	Port xx aute recovery
	Indicates that Port X has auto-recovered from shutoff after loop detection.
Port Monitoring	
Info	Start monitoring function
	Indicates that the monitoring function started.
	Stop monitoring function
	Indicates that the monitoring function stopped.
RADIUS	
Info	Accept Login via RADIUS
	Indicates that the login operation was executed via RADIUS, and was successful.
Error	Reject Login via RADIUS
	Indicates that the login operation was executed via RADIUS, and was rejected.
	RADIUS Timeout
	Indicates that the login operation was executed via RADIUS, and was timeout.
SNTP	
Info	SNTP update to yyyy/mm/dd hh:mm:ss
	Indicates the time synchronized with SNTP server.
	SNTP first update to yyyy/mm/dd hh:mm:ss
	Indicates that communication has failed due to no transmission route to configured SNTP server.
	No response from SNTP server.
	Indicates that time-out occurred in time synchronized with SNTP server.
Storm	
Info	Detect the storm. (DLF)
	Indicates that storm occurred.
	Detect the storm. (Multicast)
	Indicates that multicast storm occurred.

	Detect the storm. (Broadcast)
	Indicates that broadcast storm occurred.
System	
Info	System Cold Start.
	Indicates that the power of the Switching Hub was turned on.
	Port-X Link-up.
	Indicates that Port-X was linked up.
	Port-X Link-down.
	Indicates that Port-X was linked down.
	Connect SFP module(Port-x).
	Indicates that SFP module was connected.
	Disconnect SFP module(Port-x).
	Indicates that SFP module was disconnected.
Error	Copied configuration 2 to 1
	Indicates that detected the configuration file 1 is broken, and was copied the configuration file 2 to 1.
	Copied configuration 1 to 2
	Indicates that detected the configuration file 2 is broken, and was copied the configuration file 1 to 2.
	Reset configuration 1 & 2 to default
	Indicates that detected the configuration file 1 and 2 is broken, and the configuration is initialized.
	Copy configuration 2 to 1 is failed
	Indicates that detected the configuration file 1 is broken, the copying the configuration file 2 to 1 is failed.
	Copy configuration 1 to 2 is failed
	Indicates that detected the configuration file 2 is broken, the copying the configuration file 1 to 2 is failed.
	Save of configuration 1 is failed
	Indicates that the saving to the configuration file 1 was failed.
	Save of configuration 2 is failed
	Indicates that the saving to the configuration file 2 was failed.
Info	Login from console.
	Indicates that the login operation was executed via console, and was successful.
	Login from telnet. (IP:xxx.xxx.xxx.xxx)
	Indicates a login from the host with IP address xxx.xxx.xxx.xxx via TELNET.

	Login from SSH (IP:xxx.xxx.xxx.xxx).
	Indicates a login from the host with IP address xxx.xxx.xxx.xxx via SSH.
Error	Login Failed from console.
	Indicates that the login operation was executed via console, and was failed.
	Login Failed from telnet(IP: xxx.xxx.xxx.xxx).
	Indicates that the login operation was executed via TELNET, and was failed.
	Login Failed from ssh(IP: xxx.xxx.xxx.xxx).
	Indicates that the login operation was executed via SSH, and was failed.
	Not authorized!（IP: xxx.xxx.xxx.xxx）.
	Indicates that the login operation was executed via TELNET or SSH, and was failed three times.
	Reject Telnet Access.
	Indicates that the loginf operation was executed via TELNET, and was rejected based on TELNET access limitation function.
	System authentication failure.
	Indicates that authentication from the SNMP manager failed.
Info	Set IP via ipsetup interface (IP:xxx.xxx.xxx.xxx)
	Indicates that IP address was set from the host with IP address xxx.xxx.xxx.xxx via IP setup interface function.
Error	Failed to set IP via ipsetup interface
	Indicates that IP address setting operation was executed via IP setup interface function, and was failed.
	IP setup interface timeout.
	Indicates that IP address setting operation was executed via IP setup interface function, and was failed. Because it takes over 20 minutes from booting.
Info	Console timeout.
	Indicates that console was time out.
	Telnet Timeout (IP: xxx.xxx.xxx.xxx).
	Indicates that telnet from the host with IP address xxx.xxx.xxx.xxx was timeout.
	SSH Timeout (IP: xxx.xxx.xxx.xxx).
	Indicates that SSH from the host with IP address xxx.xxx.xxx.xxx was timeout.
	Changed user name.
	Indicates that username was changed.
	Chagned password.
	Indicates that password was changed.

Error	CPU drop the packet. (xx Bytes)
	Indicates that the packet to CPU was dropped.
Info	Runtime code changes.
	Indicates that runtime code was changed.
	Configuration file download.
	Indicates that the receiving the configuration from TFTP server, and was applied to running-config.
	Configuration file upload.
	Indicates that the sending running-config to TFTP server.
	Configuration changed.
	Indicates that the configuration was saved.
	Reboot: Normal.
	Indicates that Switching Hub was rebooted.
	Reboot: Factory Default.
	Indicates that Switching Hub was rebooted in the mode to return all settings to the factory default.
	Reboot: Factory Default Except IP.
	Indicates that Switching Hub was rebooted in the mode to return settings other than IP address to the factory default.
	Start reboot timer (xxx sec)
	Indicates that started the reboot timer.
	Stop reboot timer
	Indicates that stopped the reboot timer.
	Cleared system log
	Indicates that System log was cleared.
Error	Watch dog timer is expired.
	Indicates that Watch dog timer was expired.
	Cannot write in Flash (addr: 0x0000000000)
	Indicates that cannot write in FLASH.
	Cannot read in Flash (addr: 0x0000000000)
	Indicates that cannot read in FLASH.
	Cannot access to temperature sensor.
	Indicates that cannot access to temperature sensor.
	System exception in thread:THREAD freeMem:FREE_MEM!
	System information indicating that exception handler is called in the Switching Hub. THREAD indicates the thread name, and FREE_MEM indicates the free memory capacity.
	Duplication of IP address: IP ADDRESS (MAC ADDRESS).
	Indicates that IP address of Switching Hub is already used and conflicting.
	Logout by user

	Indicates that connection via console was terminated by user.	
	Logout by user(IP: IP ADDRESS).	
	Indicates that connection via TELENT or SSH was terminated by user.	
DDM		
Info	[DDM] {RX power|TX power|Temperature|Votage|Bias current} is {exceeded|recovered from} { High|Low} {Alarm|Warning} on Port-x.	
	Indicates that SFP module status was changed.	
	RX power	Indicates that SFP Rx power status was changed.
	TX power	Indicates that SFP Tx power status was changed..
	Temperature	Indicates that SFP temarature status was changed..
	Votage	Indicates that SFP voltage status was changed..
	Bias current	Indicates that SFP bias current status was changed..
	Exceeded	Indicates that SFP status exceeded the threshold.
	recovered from	Indicates that SFP status recovered from threshold.
	High	Indicates that upper limit.
	Low	Indicates that lower limit.
	Alarm	Indicates the alarm.
	Warning	Indicates the warning.

show syslog [tail <line>]

Shows the log of events occurred to the Switching Hub.

[Parameter]

Parameter name	Description
<line>	Set the number of lines to be displayed from the log end.

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
<line>	1 to 256

[Note]

Parameter name	Note
None	None

syslog clear

Clears all logs.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Example of use>

Overview: Display system logs of the Switching Hub, and then delete the logs.

(1) Display the system logs of the Switching Hub.
(2) Delete the system logs of the Switching Hub.
(3) Confirm that the system logs of the Switching Hub are deleted.

```
M24eG> enable
(1) M24eG# show syslog
Jan 01 20:14:34 kern.info [PORT] Port1 is authorized!
Jan 01 20:14:34 kern.info [LINE-PROTOCOL]  The loop detected on port 1.
Jan 01 20:16:00 kern.info [PORT] Port1 is authorized!
Jan 01 20:16:00 kern.info [LINE-PROTOCOL]  The loop detected on port 1.
Jan 01 20:17:06 kern.info [PORT] Port1 is authorized!
Jan 01 20:17:06 kern.info [LINE-PROTOCOL]  The loop detected on port 1.
Jan 01 22:42:29 kern.info [SYSTEM] Success:  Reload system default-config!
Jan 01 22:42:32 kern.info [CLI]  System reboot via CLI.
Jan 01 22:42:32 kern.info [SYSTEM] Reboot the system!
(2) M24eG# syslog clear
(3) M24eG# show syslog
Syslog history is empty!
M24eG#
```

Fig. 10-2 Example of display and deletion of system logs

11. Save and Display of Configuration Information

Save and display the configuration information in "Privileged mode."

Command to show the running configuration information

M24eG#	show running-config

Command to show the saved configuration information

M24eG#	show startup-config

Command to save the configuration information

M24eG#	copy running-config startup-config

copy running-config startup-config

Saves the configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show running-config

Shows the configuration information that is currently running.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

show startup-config

Shows the saved configuration information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Overview: Save the current configuration, and then display the saved configuration information.

(1) Save the current configuration to the Switching Hub.

(2) Display the saved configuration information.

```
M24eG> enable
(1)M24eG# copy running-config startup-config
Configuration saved to startup_config
(2)M24eG# show startup-config
! -- M24eG start of config file --
! -- Software Version : x.x.x.xx -
! -- Save date : 20xx/xx/xx xx:xx:xx
!
enable
config
!
ip address 192.168.0.1 255.255.255.0 192.168.0.254
!
terminal length 0
led base-mode status
console inactivity-timer 0
telnet-server inactivity-timer 60
!
password manager:426D5A334B743077674359486F:1D0258C2440A8D19E716292B231E3190
!
interface vlan1
 member 1-24
 exit

～～～～～～～～～～～～ abbreviated ～～～～～～～～～～～～
interface GigabitEthernet0/23
!
interface GigabitEthernet0/24
!
exit
!
! -- end of configuration --
M24eG#
```

Fig. 11-1 Example of saving the configuration and displaying the saved configuration information

12. Obtaining Technical Support Information

Obtain the technical support information in "Privileged mode." It is useful if obtained before making inquiry.

It is recommended to set the terminal length to "0," because display contents are extremely large.

Command to show the technical support information

M24eG#	show tech

show tech

Obtains the technical support information.

[Parameter]

Parameter name	Description
None	None

[Factory Default Setting]

Parameter name	Factory default setting
None	None

[Setting Range]

Parameter name	Setting range
None	None

[Note]

Parameter name	Note
None	None

<Configuration Example>

Obtain the technical support information.

```
M24eG> enable
M24eG# show tech
***** System clock *****
...

***** System CPU load *****
...

***** BSD Syslog Protocol (RFC-3164) *****
...

***** System running configuration *****
...

***** System information *****
...

***** Interface operating status *****
...

***** Interface configuration *****
...

***** Interface packet counter *****
...

***** Interface error packet counter *****
...

***** IEEE 802.1Q Virtual Local Area Networks (VLAN) *****
...

***** IEEE 802.3 Link Aggregation *****
...

***** System ARP information *****
...

***** Dynamic unicast MAC addresses aging time *****
...

***** MAC address table *****
...

***** System startup configuration *****
...
M24eG#
```

Fig. 12-1 Example of executing the command to show the technical information

Appendix A. Specifications

Refer to **"Operation Manual — Menu Screens"** for your Switching Hub to read the specifications.

Appendix B. Easy IP Address Setup Function

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

[Known compatible software]
Panasonic Corporation; "Easy IP Address Setup Software" V3.01/V4.00/V4.24R00
Panasonic System Networks Co., Ltd.; "Easy Config" Ver3.10R00
Panasonic Eco Solutions Networks Co., Ltd.; “ZEQUO assist” Ver.2.1.1.1

[User-settable items]
- *IP address, subnet mask and default gateway
- *System name
  * This item can be configured only with the software "Easy Config." In the software, the item is displayed as "Camera name."

[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.

Appendix C. Example of Network Configuration using Loop Detection Function and Its Precautions

Example of configuration using loop detection function

By using the loop detection function, you can prevent a loop failure that is likely to be caused in a downstream Switching Hub that the user directly uses.
In addition, if a downstream Switching Hub is connected with a device, such as a hub without loop detection function, and a loop failure occurs under the device, the downstream Switching Hub shuts down the corresponding port to prevent the failure from extending to the entire network.

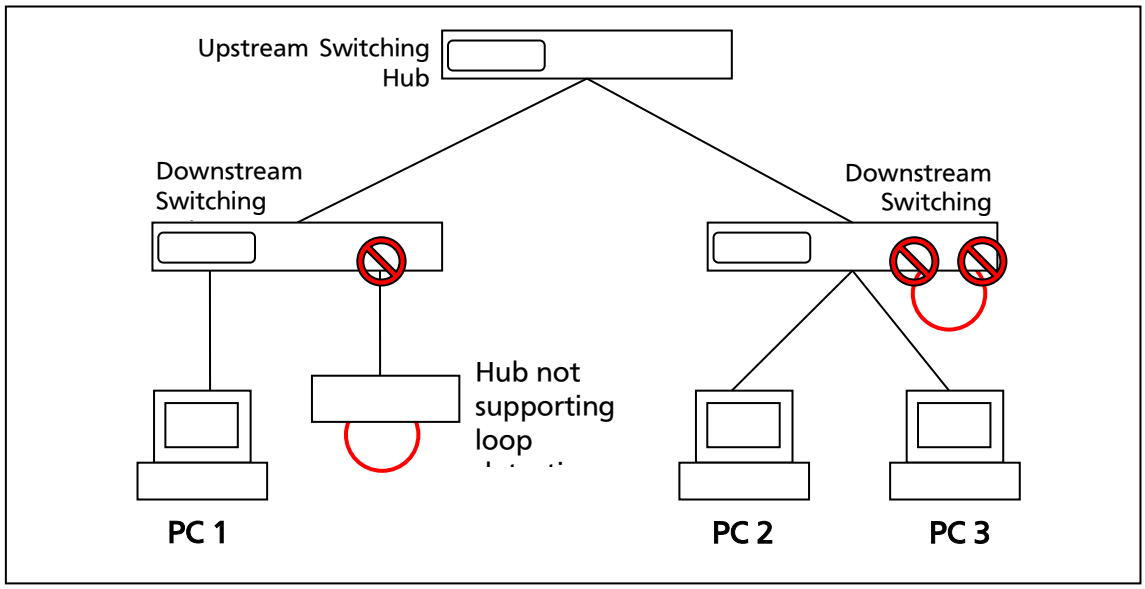
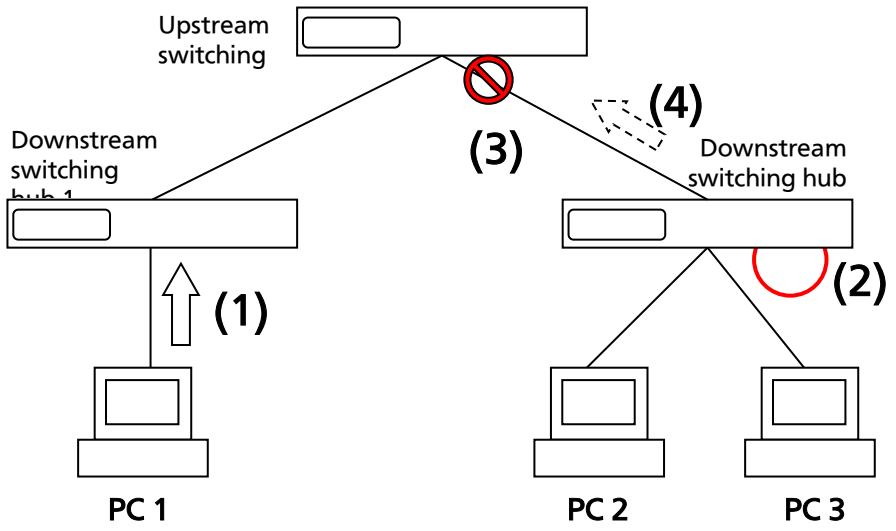


Fig. 1 Example of configuration using loop detection function

Precautions in using loop detection function
− Disable loop detection at upstream port(s)

If a network is consisted of only Switching Hubs equipped with loop detection function, an upstream switching hub may detect on ahead and block a loop occurred in a downstream switching hub. This may block all communications to the downstream switching hub.
To minimize the communication failure by loop detection, disable the loop detection function of the upstream switching hub so that only a port of the switching hub causing loop will be blocked. You need to examine this type of network configuration and the switching hub settings.



[Conditions of occurrence]
(1) Communications between PC1 and PC2, and between PC1 and PC3.
(2)A loop occurs in downstream switching hub 2.
(3)The upstream switching hub detects the loop first, and blocks the uplink port of downstream switching hub 2. (Normally, only a port having loop connection is shut down.)
(4)The uplink port of downstream switching hub 2 is linked down, and communications to all other switching hubs are blocked.

Fig. 2 Precautions in using loop detection function

Appendix D. MIB List

The MIB list of this Switching Hub is as follows.

<port_num> is a port number.
<ip_address> is an IP address.

1.1. system group			
MIB object	**Access**	**Identifier**	**Remarks**
sysDescr	RO	sysDescr.0	
sysObjectID	RO	sysObjectID.0	
sysUpTime	RO	sysUpTimeInstance.0	
sysContact	R/W	sysContact.0	
sysName	R/W	sysName.0	
sysLocation	R/W	sysLocation.0	
sysServices	RO	sysServices.0	
sysORLastChange	RO	sysORLastChange.0	
sysORID	RO	sysORID.1	
sysORDescr	RO	sysORDescr.1	
sysORUpTime	RO	sysORUpTime.1	
1.2. interfaces group			
MIB object	**Access**	**Identifier**	
ifNumber	RO	ifNumber.0	
ifIndex	RO	ifIndex.<port_num>	
ifDescr	RO	ifDescr.<port_num>	
ifType	RO	ifType.<port_num>	
ifMtu	RO	ifMtu.<port_num>	Shows the size without a header (1500 bytes).
ifSpeed	RO	ifSpeed.<port_num>	Shows the maximum port speed (1 Gbps).
ifPhysAddress	RO	ifPhysAddress.<port_num>	
ifAdminStatus	R/W	ifAdminStatus.<port_num>	Supports up and down.
ifOperStatus	RO	ifOperStatus.<port_num>	
ifOLastChange	RO	ifOLastChange.<port_num>	
ifInOctets	RO	ifInOctets.<port_num>	
ifHCInOctets	RO	ifHCInOctets.<port_num>	
ifInUcastPkts	RO	ifInUcastPkts.<port_num>	
ifInNUcastPkts	RO	ifInNUcastPkts.<port_num>	
ifInDiscards	RO	ifInDiscards.<port_num>	
ifInErrors	RO	ifInErrors.<port_num>	
ifInUnknownProtos	RO	ifInUnknownProtos.<port_num>	
ifOutOctets	RO	ifOutOctets.<port_num>	
ifHCOutOctets	RO	ifHCOutOctets.<port_num>	
ifOutUcastPkts	RO	ifOutUcastPkts.<port_num>	
ifOutNUcastPkts	RO	ifOutNUcastPkts.<port_num>	
ifOutDiscards	RO	ifOutDiscards.<port_num>	
ifOutErrors	RO	ifOutErrors.<port_num>	

	ifOutQLen	RO	ifOutQLen.<port_num>	
	ifSpecific	RO	ifSpecific.<port_num>	

1.3. IP group			
MIB object	Access	Identifier	
ipForwarding	R/W	ipForwarding.0	
ipDefaultTTL	R/W	ipDefaultTTL.0	
ipInReceives	RO	ipInReceives.0	
ipInHdrErrors	RO	ipInHdrErrors.0	
ipInAddrErrors	RO	ipInAddrErrors.0	
ipInUnknownProtos	RO	ipInUnknownProtos.0	
ipInDiscards	RO	ipInDiscards.0	
ipInDelivers	RO	ipInDelivers.0	
ipOutRequests	RO	ipOutRequests.0	
ipOutDiscards	RO	ipOutDiscards.0	
ipOutNoRoutes	Ro	ipOutNoRoutes.0	
ipReasmTomeout	RO	ipReasmTomeout .0	
ipReasmReqds	RO	ipReasmReqds.0	
ipReasmOKs	RO	ipReasmOKs.0	
ipReasmFails	RO	ipReasmFails.0	
ipFragOKs	RO	ipFragOKs.0	
ipFragFails	RO	ipFragFails.0	
ipFragCreates	RO	ipFragCreates.0	
ipRoutingDiscards	RO	ipRoutingDiscards	
ipAdEntAddr	RO	ipAdEntAddr.<ip_address>	
ipAdEntIfIndex	RO	ipAdEntIfIndex.<ip_address>	
ipAdEntNetMask	RO	ipAdEntNetMask.<ip_address>	
ipAdEntBcastAddr	RO	ipAdEntBcastAddr.<ip_address>	
ipAdEntReasmMaxSize	RO	ipAdEntReasmMaxSize.<ip_address>	
ipNetToMediaIfIndex	RO	ipNetToMediaIfIndex.<ip_address>	
ipNetToMediaPhysAddress	RO	ipNetToMediaPhysAddress.<ip_address>	
ipNetToMediaNetAddress	RO	ipNetToMediaNetAddress.<ip_address>	
ipNetToMediaType	RO	ipNetToMediaType.<ip_address>	
1.4. TCP group			
MIB object	Access	Identifier	
tcpRtoAlgorithm	RO	tcpRtoAlgorithm.0	
tcpRtoMin	RO	tcpRtoMin.0	
tcpRtoMax	RO	tcpRtoMax.0	
tcpMaxConn	RO	tcpMaxConn.0	
tcpPassiveOpens	RO	tcpPassiveOpens.0	
tcpAttemptFails	RO	tcpAttemptFails.0	
tcpEstabResets	RO	tcpEstabResets.0	
tcpCurrEstab	RO	tcpCurrEstab.0	
tcpInSegs	RO	tcpInSegs.0	
tcpOutSegs	RO	tcpOutSegs.0	
tcpRetransSegs	RO	tcpRetransSegs.0	
tcpInErrs	RO	tcpInErrs.0	
tcpOutRsts	RO	tcpOutRsts.0	
tcpConnState	RO		

	tcpConnLocalAddress	RO		
	tcpConnLocalPort	RO		
	tcpConnRemAddress	RO		
	tcpConnRemPort	RO		
1.5. UDP group				
	MIB object	**Access**	**Identifier**	
	udpInDatagrams	RO	udpInDatagrams.0	
	udpNoPorts	RO	udpNoPorts.0	
	udpInErrors	RO	udpInErrors.0	
	udpOutDatagrams	RO	udpOutDatagrams.0	
	udpLocalAddress	RO		
	udpLocalPort	RO		
1.6. SNMP group				
	MIB object	**Access**	**Identifier**	
	snmpInPkts	RO	snmpInPkts.0	
	snmpOutPkts	RO	snmpOutPkts.0	
	snmpInBadVersions	RO	snmpInBadVersions.0	
	snmpInASNParseErrs	RO	snmpInASNParseErrs.0	
	snmpInTotalReqVars	RO	snmpInTotalReqVars.0	
	snmpInTotalSetVars	RO	snmpInTotalSetVars.0	
	snmpInGetRequests	RO	snmpInGetRequests.0	
	snmpInGetNexts	RO	snmpInGetNexts.0	
	snmpInSetRequests	RO	snmpInSetRequests.0	
	snmpInGetResponses	RO	snmpInGetResponses.0	
	snmpInTraps	RO	snmpInTraps.0	
	snmpOutGetResponses	RO	snmpOutGetResponses.0	
	snmpOutTraps	RO	snmpOutTraps.0	
1.7. dot1dBase group				
	MIB object	**Access**	**Identifier**	
	dot1dBaseBridgeAddress	RO	dot1dBaseBridgeAddress.0	
	dot1dBaseNumPorts	RO	dot1dBaseNumPorts.0	
	dot1dBaseType	RO	dot1dBaseType.0	
	dot1dBasePort	RO	dot1dBasePort.<port_num>	
	dot1dBasePortIfIndex	RO	dot1dBasePortIfIndex.<port_num>	
	dot1dBasePortCircuit	RO	dot1dBasePortCircuit.<port_num>	
	dot1dBasePortDelayExceededDiscards	RO	dot1dBasePortDelayExceededDiscards.<port_num>	
	dot1dBasePortMtuExceededDiscards	RO	dot1dBasePortMtuExceededDiscards.<port_num>	
1.8. dot1dTp group				
	MIB object	**Access**	**Identifier**	
	dot1dTpLearnedEntryDiscards	RO	dot1dTpLearnedEntryDiscards.0	
	dot1dTpAgingTime	R/W	dot1dTpAgingTime.0	
	dot1dTpFdbAddress	RO		
	dot1dTpFdbPort	RO		
	dot1dTpFdbStatus	RO		
	dot1dTpPort	RO	dot1dTpPort.<port_num>	
	dot1dTpPortMaxInfo	RO	dot1dTpPortMaxInfo.<port_num>	

	dot1dTpPortInFrames	RO	dot1dTpPortInFrames.<port_num>	
	dot1dTpPortOutFrames	RO	dot1dTpPortOutFrames.<port_num>	
	dot1dTpPortInDiscards	RO	dot1dTpPortInDiscards.<port_num>	
2.1. Supporting trap				
	Trap description	**Access**	**Identifier**	
	Link Up/Down			
	Login Failure			
	Authentication Failure			
	mnoLoopDetection		ObjectID: 1.3.6.1.4.1.396.5.5.2.1	
	mnoLoopRecovery		ObjectID: 1.3.6.1.4.1.396.5.5.2.2	
	mnoDdmAlarmTrap		ObjectID: 1.3.6.1.4.1.396.5.5.1.4.0.1	
	mnoDdmWarningTrap		ObjectID: 1.3.6.1.4.1.396.5.5.1.4.0.2	
	mnoFanFailure		ObjectID: 1.3.6.1.4.1.396.5.5.1.1	Only support at Switch-M48eG (PN28480K)
	mnoTemperatureRisingAlarm		ObjectID: 1.3.6.1.4.1.396.5.5.1.2.0.1	
	mnoTemperatureFallingAlarm		ObjectID: 1.3.6.1.4.1.396.5.5.1.2.0.2	

Troubleshooting

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

1. LED indicators
   * The POWER LED is not lit.
   - Is the power cord connected?
     → Please confirm that the power cord is securely connected to the power port.
   * The port LED (left) is not lit in Status mode.
   - Is the Switching Hub set to Status mode?
     If the Switching Hub is set to the ECO mode, all LEDs are turned off regardless of terminal connection state.
   - Is the cable correctly connected to the target port?
   - Is the cable appropriate to use?
   - Is each 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.
   * The port LED (right) lights in orange.
   - A loop has occurred. By removing the loop, orange LED will be turned off.
   * LOOP HISTORY LED blinks in orange.
   - This is to notify that there is a port in which a loop is occurring, or has been removed within 3 days.

2. Communications are slow.
   * Communications with all ports are impossible or 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 link up?
     → If the power saving mode is set to "Full," change it to "Half" or "Disabled."
   - Is not the utilization ratio of the network to which this Switching Hub is connected too high?
     → Try separating this Switching Hub from the network.
   - Doesn't the port LED (right) light in orange?
     → When the port LED (right) lights in orange, the port has been shut down by loop detection function. After removing the loop under this port, wait for the auto-recovery time set in loop detection function, or unblock the port on the configuration screen.

After-sales Service

1. Warranty card

A warranty card is included in the operating instructions (paper) 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.

Memo (Fill in for future reference.)

<table>
<tr><td rowspan="2">Date of purchase</td><td colspan="2" rowspan="2">/ /</td><td>Product name</td><td>Switch-M</td></tr>
<tr><td>Model No.</td><td>PN28</td></tr>
<tr><td rowspan="2">Firmware version (*)</td><td>Boot Code</td><td colspan="3"></td></tr>
<tr><td>Runtime Code</td><td colspan="3"></td></tr>
<tr><td rowspan="2">Serial No.</td><td colspan="4"></td></tr>
<tr><td colspan="4">(11 alphanumeric characters labeled on the product)</td></tr>
<tr><td>Shop/Sales company</td><td colspan="4">Tel:</td></tr>
<tr><td>Customer service contact</td><td colspan="4">Tel:</td></tr>
</table>

(* You can check the version on the screen described in chapter 3 of this manual.)

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