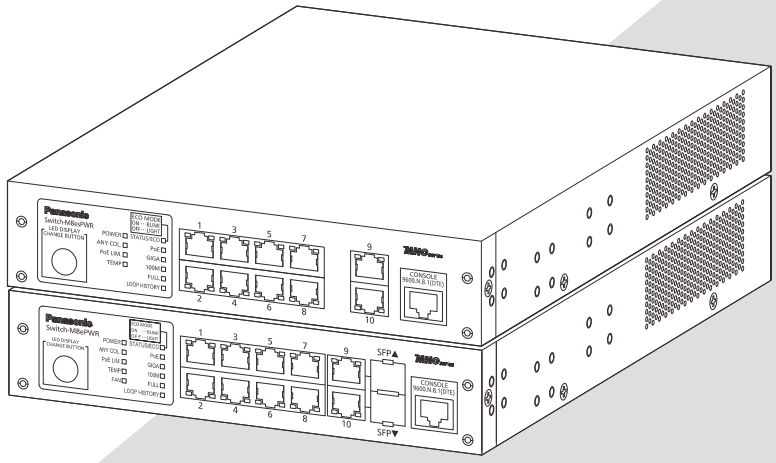
Panasonic

Operation Manual
For CLI Screens

Layer 2 Switching Hub

Model No. PN27089NA
PN27089KA

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



This operation manual is applicable to the following switches:

Product name	Model No.
Switch-M8esPWR	PN27089NA
Switch-M8ePWR	PN27089KA

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

⚠WARNING

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

⚠WARNING

- **Use the bundled power cord (AC 100 − 240V specifications).**
  Deviation could lead to electric shock, malfunction, and/or equipment failure.
  The warranty does not cover any problems resulting from the use of any power cord other than the one supplied.
- **Unplug the power cord in case of equipment failure.**
  Deviation, such as keeping connected for a long time, could lead to fire.
- **Connect this Switching Hub to ground.**
  Deviation could lead to electric shock, malfunction, and/or equipment failure.
- **Connect the power cord firmly to the power port.**
  Deviation could lead to electric fire, shock, and/or malfunction.
- **Unplug the power cord if the STATUS/ECO LED (Status/ECO mode), TEMP LED (temperature sensor) or FAN LED (fan sensor) blinks in orange (system fault).**
  Deviation, such as keeping connected for a long time, could lead to fire.
- **When this Switching Hub is installed on wall surface, mount it firmly so as not to drop down because of weight of the main body and connection cable.**
  Deviation could lead to injury and/or equipment failure.
- **Up to two Switching Hubs can be connected by using the connection brackets and connection bracket screws included with the optional PN71052 19-inch rack mount brackets (for two units). Attach the connection brackets to the connection bracket screw holes on the front and back panels to securely fix the Switching Hubs before installation.**
  If the Switching Hubs are not fixed securely, they may fall, leading 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.**

Important Requests on Protection from Lightning Strike

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

- A lightning surge current/voltage may be conducted to this Switching Hub through the power supply or ground wire connected to the power port, leading to malfunction. If a lightning surge current/voltage may flow in through the power supply or ground wire, it is recommended that you install a surge protective device (SPD) on the power port side of this Switching Hub.

Basic Instructions for the Use of This Product

- For inspection and/or repair, consult the retailer.
- Use commercial power supply from a wall socket, which is close and easily accessible to this Switching Hub.
- Unplug the power cord when installing or moving this Switching Hub.
- Unplug the power cord when cleaning this Switching Hub.
- Use this Switching Hub within the specifications. Deviation could lead to malfunction.
- When installing this Switching Hub using rubber feet (with built-in magnets), confirm that it does not move or fall down due to weight of cables.
  When connecting a cable, hold the Switching Hub firmly.
- If you install this Switching Hub at a high place, securely fix it on the wall with screws. If you install this Switching Hub at a high place with magnets alone, it may fall, leading to injury or failure of this Switching Hub.
- 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. 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 places where the ambient temperature is in the range from 0 to 40 degrees C.
  In case of Switch-M8ePWR, you can use it in places where the ambient temperature is in the range from 0 to 50 □degrees C if you set the fan speed to High or Mid and control the total power supply to 62 W or below.
  Failure to meet the above conditions may result in fire, electric shock, breakdown,

and/or malfunction. Please take notice because such cases are out of guarantee. Additionally, do not cover the bent hole of this Switching Hub.
Deviation could lead to high internal temperature, equipment failure and/or malfunction.

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

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

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

Table of Contents

1. Command Hierarchy

There are four hierarchical levels in command hierarchy.
(1) User mode:
The User mode is the mode right after login. The number of operations is limited.
(2) Privileged mode:
The Privileged mode allows to check the status of this switch and manipulate the configuration file.
(3) Global configuration mode:
The Global configuration mode allows general configuration of this switch.
(4) Interface configuration mode
The Interface configuration mode allows detailed configuration of this switch, such as for each port or VLAN.

```
M8esPWR> enable
M8esPWR# config
M8esPWR(config)# interface fa0/1
M8esPWR(config-if)# exit
M8esPWR(config)# interface vlan1
M8esPWR(config-if)# exit
M8esPWR(config)# exit
M8esPWR# disable
M8esPWR>
```

Fig. 1-1 Command hierarchy

enable command

• The enable command enables to move from User mode to Privileged mode.

M8esPWR>·····User mode
M8esPWR> enable·····User mode > Privileged mode
M8esPWR#·····Privileged mode
M8esPWR# disable·····Privileged mode > User mode
M8esPWR>·····User mode

disable command

• The disable command enables to return from Privileged mode to User mode.

M8esPWR#·····Privileged mode
M8esPWR# disable·····Privileged mode > User mode
M8esPWR>·····User mode

config command

• The config command enables to move from Privileged mode to Global configuration mode.

M8esPWR#·····Privileged mode
M8esPWR# configure·····Privileged mode > Global configuration mode
M8esPWR(config)#·····Global configuration mode

interface command

The interface command enables to move from Global configuration mode to Interface configuration mode.

M8esPWR(config)#·····Global configuration mode
M8esPWR(config)# interface vlan1·····Global configuration mode
> Interface configuration mode (vlan1)
M8esPWR(config-if)# exit·····Interface configuration mode
> Global configuration mode
M8esPWR(config)# interface fa0/1·····Global configuration mode > Interface configuration mode (interface1)
M8esPWR(config-if)# exit·····Interface configuration mode
> Global configuration mode
M8esPWR(config)#·····Global configuration mode

exit command

The exit command enables to return to the previous mode.

M8esPWR(config-if)# exit·····Interface configuration mode
> Global configuration mode
M8esPWR(config)# exit·····Global configuration mode > Privileged mode
M8esPWR# exit·····Privileged mode > User mode
M8esPWR>·····User mode

end command

The end command enables to move from configuration modes to Privileged mode.

M8esPWR(config-if)# end·····Interface configuration mode
> Privileged mode
M8esPWR# ·····Privileged mode

? command

Entering a question mark (?) in each mode displays executable elements in the mode.

```
M8esPWR# ?
 configure  Change mode to Global Configuration mode
 copy       To upload config file or download image/config file
 disable    Exit from Privileged EXEC mode
 exit       To exit from the present mode
 logout     To logout from the CLI shell
 mode       To display the available modes
 ping       To diagnose basic network connectivity
 reboot     To reboot system
 show       To display running system information

M8esPWR#
```

Fig. 1-2 ? Command

Re-entry assist

Entering the up arrow key displays a command that was entered immediately before.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# snmp-server location mno
M8esPWR(config)#
M8esPWR(config)# snmp-server location mno    ·····  Enter the up arrow key.
M8esPWR(config)#
M8esPWR(config)#
```

Fig. 1-3 Re-entry assist

Candidate assist command

Entering a command followed by a question mark (?) displays candidates of succeeding command.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# ip address ?
 <ip-address>  ex: 192.168.1.1
 dhcp          To enable DHCP client
 renew         To renew the IP address via DHCP

M8esPWR(config)# ip address
```

Fig. 1-4 Candidate assist command

Command autocomplete

For command and argument entry, when a word is uniquely identified after typing the first few letters, the rest of the word appears.

[Autocomplete examples]

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

[Example of exceptions]

- Typing "co" does not run autocomplete because there are two candidates "configure" and "copy."

Meanings of symbols in description are as follows:

< > : Essential element - Make sure to enter this element.
{ | }: Choice - Select and input either one.
[ ]: Option - Enter as required.

2. Displaying Basic Information

Enter "show sys-info" in "Privileged mode" to view the basic information of this switch as shown in **Fig. 2-1**.

Basic information display command

Privileged mode	show sys-info

```
M8esPWR# show sys-info

 System up for              : xxxday(s), xxhr(s), xxmin(s), xxsec(s)
 Boot / Runtime Code Version: x.x.x.xx / x.x.x.xx
 Hardware Information
   Version                  : Version1
   CPU Utilization          : xx.xx %
   DRAM / Flash Size        : 64MB / 8MB
   DRAM User Area Size      : Free: xxxxxxxx bytes / Total: xxxxxxxx bytes
   System Temperature       : CPU/xx ,System/xx degree(s) Celsius

 Administration Information
   Switch Name              :
   Switch Location          :
   Switch Contact           :

 System Address Information
   MAC Address              : xx:xx:xx:xx:xx:xx
   IP Address               : 0.0.0.0
   Subnet Mask              : 0.0.0.0
   Default Gateway          : 0.0.0.0
   DHCP Mode                : Disabled

M8esPWR#
```

Fig. 2-1 Display of the basic information (show sys-info)

3. Basic Switch Configuration

3.1. System Administration Configuration

Configure the administrator's name, installation location and contact information in "Global configuration mode." Confirm the configuration information by entering "show sys-info" in "Privileged mode."

Host name configuration command

Global configuration mode	hostname <hostname>

Host name delete command

Global configuration mode	no hostname

Installation location configuration command

Global configuration mode	snmp-server location <server location>

Installation location delete command

Global configuration mode	no snmp-server location

Contact information configuration command

Global configuration mode	snmp-server contact <server contact>

Contact information delete command

Global configuration mode	no snmp-server contact

Basic information display command

Privileged mode	show sys-info

Note: When configuring a host name containing a space, enter it embracing with double quotation marks (" ").
Example: hostname “Switch 1”

ex. Configuration example of host name as PoESW-1, installation location as Office-2F, and contact information as Manager.

```
M8esPWR>
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# hostname PoESW-1
PoESW-1(config)# snmp-server location Office-2F
PoESW-1(config)# snmp-server contact Manager
PoESW-1(config)# end
PoESW-1# show sys-info

 System up for              : OOOday(s), OOhr(s), OOmin(s), OOsec(s)
 Boot / Runtime Code Version: x.x.x.xx / x.x.x.xx
 Hardware Information
   Version                  : Version1
   CPU Utilization          : xx.xx %
   DRAM / Flash Size        : 64MB / 8MB
   DRAM User Area Size      : Free: xxxxxxxx bytes / Total: xxxxxxxx bytes
   System Temperature       : CPU/xx ,System/xx degree(s) Celsius

 Administration Information
   Switch Name              : PoESW-1
   Switch Location          : Office-2F
   Switch Contact           : Manager

 System Address Information
   MAC Address              : xx:xx:xx:xx:xx:xx
   IP Address               : 192.168.0.1
   Subnet Mask              : 255.255.255.0
   Default Gateway          : 192.168.1.254
   DHCP Mode                : Disabled

PoESW-1#
```

Fig. 3-1 Display of the administrator's name, installation location and contact information configuration (show sys-info)

3.2. IP Address Configuration

Configure the IP address settings of this switch in "Interface configuration mode."
Confirm the configuration information by entering "show ip conf" in "Privileged mode."

IP address configuration command

Global configuration mode	ip address <ip-address> <mask> [<default-gateway>]

Default gateway configuration command

Global configuration mode	ip default-gateway <ip-address>

DHCP client configuration command

Global configuration mode	ip address dhcp

DHCP address reacquisition command

Global configuration mode	ip address renew

DHCP client configuration disable command

Global configuration mode	no ip address dhcp

IP address display command

Privileged mode	show ip conf

ex1. Configuration example of IP address as 192.168.0.1, subnet mask as 255.255.255.0, and default gateway as 192.168.0.254.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# ip address 192.168.0.1 255.255.255.0
M8esPWR(config)# ip default-gateway 192.168.0.254
M8esPWR(config)# end
M8esPWR# show ip conf

 MAC Address       : xx:xx:xx:xx:xx:xx
 IP Address        : 192.168.0.1
 Subnet Mask       : 255.255.255.0
 Default Gateway   : 192.168.0.254
 DHCP Mode         : Disabled

M8esPWR#
```

Fig. 3-2 Display of the IP address configuration (show ip conf)

ex2. Configuration example of DHCP client

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# ip address dhcp
M8esPWR(config)# end
M8esPWR# show ip conf

 MAC Address       : xx:xx:xx:xx:xx:xx
 IP Address        : 0.0.0.0
 Subnet Mask       : 0.0.0.0
 Default Gateway   : 0.0.0.0
 DHCP Mode         : Enabled

M8esPWR#
```

Fig. 3-3 Display of the DHCP client and IP address configuration (show ip conf)

Note: The above items must be set in order to enable a remote connection by SNMP control function, Telnet, and SSH. If you don't know items to be configured, please consult with your network administrator. Any IP addresses on the local network must be unique and no duplication is allowed. In addition, you need to set the subnet mask and the default gateway, which are the same for other devices on the same subnet using this switch.

3.3. SNMP Configuration

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

SNMP enable command

Global configuration mode	snmp-server agent

SNMP disable command

Global configuration mode	no snmp-server agent

SNMP administration (Read only or Read/Write configuration) command

Global configuration mode	snmp-server community <index> <community> {RO|RW} [<ip>]

SNMP administration configuration delete command

Global configuration mode	no snmp-server community <index>

SNMP trap (type, IP address, community name configuration) command

Global configuration mode	snmp-server host <index> <ip> trap <community>

SNMP trap configuration delete command

Global configuration mode	no snmp-server host <index>

SNMP trap (authentication failure configuration) command

Global configuration mode	snmp-server enable traps snmp authentication

SNMP trap (authentication failure configuration) delete command

Global configuration mode	no snmp-server enable traps snmp authentication

SNMP trap (linkdown port configuration) command

Global configuration mode	snmp-server enable traps linkupdown <port-list>

SNMP trap (linkdown port configuration) delete command

Global configuration mode	no snmp-server enable traps linkupdown <port-list>

SNMP trap (PoE operation configuration) command

Global configuration mode	snmp-server enable traps poe

SNMP trap (PoE operation configuration) delete command

Global configuration mode	no snmp-server enable traps poe

SNMP trap (FAN error detection configuration) command (*only for Switch- M8ePWR)

Global configuration mode	snmp-server enable traps fan-fail

SNMP trap (FAN error detection configuration) delete command (* only for Switch-M8ePWR)

Global configuration mode	no snmp-server enable traps fan-fail

SNMP trap (temperature detection configuration) enable command

Global configuration mode	snmp-server enable traps temperature-control

SNMP trap (temperature detection) disable command

Global configuration mode	no snmp-server enable traps temperature-control

SNMP trap (temperature detection) temperature configuration command

Global configuration mode	snmp-server enable traps temperature-threshold < temperature >

SNMP display command

Privileged mode	show snmp

ex1. Configuration example of SNMP agent, SNMP manager, trap receiver, and various traps.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# snmp-server agent
M8esPWR(config)# snmp-server community 1 private rw 192.168.0.200
M8esPWR(config)# snmp-server community 2 public ro 192.168.0.201
M8esPWR(config)# snmp-server host 1 192.168.0.200 trap private
M8esPWR(config)# snmp-server enable traps linkupdown 1-10
M8esPWR(config)# snmp-server enable traps poe
M8esPWR(config)# snmp-server enable traps temperature-control
M8esPWR(config)# snmp-server enable traps temperature-threshold 60
M8esPWR(config)# end
M8esPWR#
```

Fig. 3-4 Configuration of SNMP

```
M8esPWR# show snmp

SNMP Agent: Enabled

SNMP Manager List:
 No.   Status    Privilege     IP Address         Community
----  --------  -----------  ---------------  ----------------------------
  1   Enabled   Read-Write   192.168.0.200    private
  2   Enabled   Read-Only    192.168.0.201    public
  3   Disabled  Read-Only    0.0.0.0
  4   Disabled  Read-Only    0.0.0.0
  5   Disabled  Read-Only    0.0.0.0
  6   Disabled  Read-Only    0.0.0.0
  7   Disabled  Read-Only    0.0.0.0
  8   Disabled  Read-Only    0.0.0.0
  9   Disabled  Read-Only    0.0.0.0
 10   Disabled  Read-Only    0.0.0.0

Trap Receiver List:
 No.   Status    IP Address         Community
----  --------  ---------------   ----------------------------
  1   Enabled   192.168.0.200     private
  2   Disabled  0.0.0.0
  3   Disabled  0.0.0.0
  4   Disabled  0.0.0.0
  5   Disabled  0.0.0.0
  6   Disabled  0.0.0.0
  7   Disabled  0.0.0.0
  8   Disabled  0.0.0.0
  9   Disabled  0.0.0.0
 10   Disabled  0.0.0.0

Individual Trap
SNMP Authentication Failure  : Disabled
Enable Link Up/Down Port     : 1-10
PoE Trap Control             : Enabled
Temperature Trap Control     : Enabled
Temperature Threshold        : 60 degree(s) Celsius
```

Fig. 3-5 Display of the SNMP configuration (show snmp)

3.4. Port Configuration

Display each port's status and configure the setting in "Interface configuration mode." Confirm the configuration information by entering "show interface info" in "Privileged mode."

Port status enable command

Interface configuration mode	no shutdown

Port status disable command

Interface configuration mode	shutdown

Port mode configuration command

Interface configuration mode	speed-duplex { auto | {10|100}-half | {10|100}-full }

Flow control enable command

Interface configuration mode	flow-control

Flow control disable command

Interface configuration mode	no flow-control

Port name configuration command

Interface configuration mode	name < string>

Auto MDI enable command

Interface configuration mode	mdix auto

Auto MDI disable command

Interface configuration mode	no mdix auto

EAP frame forwarding enable command

Interface configuration mode	eap-forward

EAP frame forwarding disable command

Interface configuration mode	no eap-forward

Power saving mode configuration command

Interface configuration mode	line power-saving <disable | full | half>

Port information display command

Privileged mode	show interface info

Extension port information display command

Privileged mode	show interface name

Power saving mode display command

Privileged mode	show line configuration

Module information display command

Interface configuration mode	getport

ex1. Configuration example of port speed and flow control.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# interface fastethernet0/1
M8esPWR(config-if)# speed-duplex 100-full
M8esPWR(config-if)# flow-control
M8esPWR(config-if)# end
M8esPWR# show interface info

 Port  Trunk      Type      Admin     Link       Mode       Flow Ctrl   Auto-MDI
 ----  -----  ----------  --------   ----  ------------  ---------   --------
   1    ---      100TX     Enabled    Down   100-FDx        Enabled    Disabled
   2    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   3    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   4    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   5    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   6    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   7    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   8    ---      100TX     Enabled    Down   Auto           Disabled   Disabled
   9    ---      1000T     Enabled    Down   Auto           Disabled   Enabled
  10    ---      1000T     Enabled    Down   Auto           Disabled   Enabled

M8esPWR#
```

Fig. 3-6 Display of the port information
(show interface info)

ex2. Configuration example of port name and EAP packet.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# interface fastethernet0/1
M8esPWR(config-if)# name Fa0/1
M8esPWR(config-if)# eap-forward
M8esPWR(config-if)# end
M8esPWR# show interface name

 Port  Trunk      Type      Link     Port Name       EAP Pkt FW
 ----  -----  ----------  ----  ---------------   ------------
   1    ---      100TX     Down  Fa0/1               Enabled
   2    ---      100TX     Down  Port_2              Disabled
   3    ---      100TX     Down  Port_3              Disabled
   4    ---      100TX     Down  Port_4              Disabled
   5    ---      100TX     Down  Port_5              Disabled
   6    ---      100TX     Down  Port_6              Disabled
   7    ---      100TX     Down  Port_7              Disabled
   8    ---      100TX     Down  Port_8              Disabled
   9    ---      1000T     Down  Port_9              Disabled
  10    ---      1000T     Down  Port_10             Disabled

M8esPWR#
```

Fig. 3-7 Display of the extension port name
(show interface name)

ex3. Configuration example of power saving mode.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# interface fastethernet0/1
M8esPWR(config-if)# line power-saving disable
M8esPWR(config-if)# end
M8esPWR# show line configuration

 Port  Trunk   Type     Link        Mode          Power-Saving
 ----  -----  ------   --------   -----------    -------------
   1    ---   100TX     Down      Auto            Disabled
   2    ---   100TX     Down      Auto            Half
   3    ---   100TX     Down      Auto            Half
   4    ---   100TX     Down      Auto            Half
   5    ---   100TX     Down      Auto            Half
   6    ---   100TX     Down      Auto            Half
   7    ---   100TX     Down      Auto            Half
   8    ---   100TX     Down      Auto            Half
   9    ---   1000T     Down      Auto            Half
  10    ---   1000T     Down      Auto            Half

M8esPWR#
```

Fig. 3-8 Display of the power saving mode
(show line configuration)

3.5. System Security Configuration

Configure access conditions to this switch for configuration and administration in "Global configuration mode."

Console timeout configuration command

Global configuration mode	console inactivity-timer <minute>

Console configuration display command

Privileged mode	show console

Telnet server timeout configuration command

Global configuration mode	telnet-server inactivity-timer <minute>

Telnet server enable command

Global configuration mode	telnet-server enable

Telnet server disable command

Global configuration mode	no telnet-server enable

Telnet access limitation enable command

Global configuration mode	telnet-server access-limitation enable

Telnet access limitation disable command

Global configuration mode	no telnet-server access-limitation enable

Telnet access permitted device configuration command

Global configuration mode	telnet-server <entry> <ip-address> <mask>

Telnet server configuration display command

Privileged mode	show telnet-server

SSH server enable command

Global configuration mode	crypto key generate rsa

SSH server disable command

Global configuration mode	crypto key zeroize rsa

SSH server timeout configuration command

Global configuration mode	ip ssh time-out <minutes>

SSH server timeout configuration command

Global configuration mode	ip ssh authentication-timeout <seconds>

SSH server authentication retry times configuration command

Global configuration mode	ip ssh authentication-retries <retries>

SSH server configuration display command

Privileged mode	show ip ssh

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# console inactivity-timer 10
M8esPWR(config)# end
M8esPWR# show console

 Console UI Idle Timeout: 10 Min.

 Console
---------
 Active

M8esPWR# configure
M8esPWR(config)# telnet-server inactivity-timer 10
M8esPWR(config)# telnet-server 1 192.168.0.100 255.255.255.255
M8esPWR(config)# telnet-server access-limitation enable
M8esPWR(config)# end
M8esPWR# show telnet-server

 Telnet UI Idle Timeout: 10 Min.

 Telnet Server
---------------
 Enabled

 Telnet Access Limitation :   Enabled

 No.      IP Address          Subnet Mask
 ---   ---------------     ---------------
  1    192.168.0.100       255.255.255.255
  2     <empty>              <empty>
  3     <empty>              <empty>
  4     <empty>              <empty>
  5     <empty>              <empty>

M8esPWR#
```

Fig. 3-9 Display of the console and Telnet server configuration
(show console)
(show telnet-server)

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# crypto key generate rsa
M8esPWR(config)# ip ssh time-out 1
M8esPWR(config)# ip ssh authentication-timeout 60
M8esPWR(config)# end
M8esPWR# show ip ssh

 SSH UI Idle Timeout:          1 Min.
 SSH Auth. Idle Timeout:       60 Sec.
 SSH Auth. Retries Time:       5
 SSH Server:                   Enabled(SSH)
 SSH Server key:               Key exists.

M8esPWR#
```

Fig. 3-10 Display of the SSH server configuration (show ip ssh)

SNMP enable command

Global configuration mode	snmp-server agent

SNMP disable command

Global configuration mode	no snmp-server agent

Username and password configuration command

Global configuration mode	username <new username>
* After entering the username, enter the old password and the new password (twice).	

ex. Configuration of username as mno and password as mno.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# username mno
Enter old password: *******
Enter new password: ***
Enter new password again: ***
M8esPWR(config)# end
M8esPWR#
```

Fig. 3-11 Configuration of the username and password

RADIUS server configuration command

Global configuration mode	radius-server host <index> ip <ip-address> [timeout <sec(s)>][retransmit <retries>] [key <string>]

RADIUS server configuration display command

Privileged mode	show radius-server

ex. Configuration example of RADIUS server's IP address as 192.168.0.100, timeout as 10 seconds, retransmission as 3 times, and key as secret.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# radius-server host 1 ip 192.168.0.100 timeout 10 retransmit 3 k
ey secret
M8esPWR(config)# end
M8esPWR# show radius-server
 NAS ID: Nas1

 Index Server IP Address    Shared Secret     Response Time Max Retransmission
 ----- ----------------- -------------------- ------------- ------------------
   1   192.168.0.100     secret                  10 seconds         3
   2   0.0.0.0                                   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

M8esPWR#
```

Fig. 3-12 Display of the RADIUS server configuration (show radius-server)

Login Method configuration command

Global configuration mode	login method <index> {Local | RADIUS | None}

Login Method configuration display command

Privileged mode	show login method

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# login method 1 radius
M8esPWR(config)# login method 2 local
M8esPWR(config)# end
M8esPWR# show login method

 Login Method 1:    RADIUS
 Login Method 2:    Local

M8esPWR#
```

Fig. 3-13 Display of the Login Method configuration (show login method)

IP address easy setup function configuration enable command

Global configuration mode	ip setup interface

IP address easy setup function disable command

Global configuration mode	no ip setup interface

IP address easy setup function display command

Privileged mode	show ip setup interface

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# ip setup interface
M8esPWR(config)# end
M8esPWR# show ip setup interface

 IP Setup Interface
 ------------------------
 Enabled

M8esPWR#
```

Fig. 3-14 Display of the IP address easy setup function (show ip setup interface)

On-screen line numbers display command

Privileged mode	show terminal length

On-screen line numbers configuration command

Global configuration mode	terminal length <LENGTH>

ex. Configuration of Terminal Length as 0 (Line numbers to be displayed on a screen is configured as unlimited.)

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# terminal length 0
M8esPWR(config)# end
M8esPWR# show terminal length

 Terminal Length: none

M8esPWR#
```

Fig. 3-15 Display of the Terminal Length configuration (show terminal length)

LED base mode configuration command

Global configuration mode	led base-mode <status l eco>

LED base mode display command

Privileged mode	show led base-mode

ex. Configuration of the LED base mode as the ECO mode.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# led base-mode eco
M8esPWR(config)# end
M8esPWR# show led base-mode

 LED base mode: ECO

M8esPWR#
```

Fig. 3-15 Display of the LED base mode configuration (led base-mode)

3.6. Displaying MAC Address Table

Configure the forwarding database (FDB: a list in which MAC address required for transferring packets is learned and recorded) in "Global configuration mode." Also, you can add or delete a static MAC address.

Aging time configuration command

Global configuration mode	mac-address-table aging-time <seconds>

FDB entry (static) configuration command

Global configuration mode	mac-address-table static <MAC address> <interface> vlan <vlan-id>

FDB entry delete command

Global configuration mode	no mac-address-table static <MAC address> vlan <vlan-id>

MAC learning enable command

Interface Global configuration mode	mac-learning

MAC learning disable command

Interface Global configuration mode	no mac-learning

FDB (static) display command

Privileged mode	show mac-address-table static

FDB (by MAC) display command

Privileged mode	show mac-address-table mac

FDB (by interface) display command

Privileged mode	show mac-address-table interface <interface>

FDB (by VLAN) display command

Privileged mode	show mac-address-table vlan <vlan-id>

FDB (multicast) display command

Privileged mode	show mac-address-table multicast

MAC address auto-learning display command

Privileged mode	show mac-address-table mac-learning

Aging time display command

Privileged mode	show mac-address-table aging-time

```
M8esPWR> enable
M8esPWR# show mac-address-table static

   MAC Address       Port    VLAN ID
 -----------------   ------   -------
 00:00:00:00:00:01      1         1

M8esPWR# show mac-address-table mac

   MAC Address       Port
 -----------------    ----
 00:00:00:00:00:01     1
 xx:xx:xx:xx:xx:xx     CPU

M8esPWR#
M8esPWR# show mac-address-table interface fa0/1

   MAC Address       Port
 -----------------    ----
 00:00:00:00:00:01     1

M8esPWR# show mac-address-table multicast

 VLAN ID  Group MAC address  Group members
 -------  -----------------  ------------------------------------------------

M8esPWR#
```

Fig. 3-16 Display of the MAC address table
(show mac-address-table static)
(show mac-address-table mac)
(show mac-address-table interface <interface>)
(show mac-address-table vlan <vlan-id>)
(show mac-address-table multicast)

3.7. SNTP Configuration

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

SNTP server IP address configuration command

Global configuration mode	sntp server <ip-address>

SNTP time acquisition interval configuration command

Global configuration mode	sntp poll-interval <min>

SNTP daylight-saving enable command

Global configuration mode	sntp daylight-saving

SNTP daylight-saving disable command

Global configuration mode	no sntp daylight-saving

SNTP time zone configuration command

Global configuration mode	sntp timezone [<location> / NULL to see time zones]

SNTP configuration information display command

Privileged mode	show sntp

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# sntp server 192.168.0.100
M8esPWR(config)# end
M8esPWR# show sntp

 Time ( HH:MM:SS )      : 01:37:57
 Date ( YYYY/MM/DD )    : 2001/01/01      Monday

 SNTP Server IP         : 192.168.0.100
 SNTP Polling Interval  : 1440 Min
 Time Zone              : (GMT+09:00) Osaka,Sapporo,Tokyo
 Daylight Saving        : N/A

M8esPWR#
```

Fig. 3-17 Display of the SNTP configuration (show sntp)

3.8. ARP Configuration

View and configure the ARP table in "Global configuration mode."

ARP aging time configuration command

Global configuration mode	arp timeout <value>

ARP (static) configuration command

Global configuration mode	arp <ip-address> <MAC address>

ARP (by MAC) display command

Privileged mode	show arp sort MAC

ARP (by IP) display command

Privileged mode	show arp sort IP

ARP (static) display command

Privileged mode	show arp sort type-static

ARP (dynamic) display command

Privileged mode	show arp sort type-dynamic

```
M8esPWR> enable
M8esPWR# show arp sort ip

 Sorting Method  : By IP
 ARP Age Timeout : 7200  seconds

   IP Address      Hardware Address     Type
 ---------------   -----------------   -------
 192.168.1.1       00:00:00:00:00:01   Static

M8esPWR#
```

Fig. 3-18 Display of the ARP table
(show arp sort ip)

4. Advanced Switch Configuration

4.1. VLAN Configuration

Configure the VLAN setting in "Global configuration mode" or "Interface configuration mode."

VLAN creation configuration command

Global configuration mode	interface vlan<vlan-id>

VLAN delete command

Global configuration mode	no interface vlan<vlan-id>

Internet Mansion configuration command

Global configuration mode	internet mansion <port-list>

Internet Mansion configuration disable command

Global configuration mode	no internet mansion

VLAN name configuration command

Interface configuration mode	name <name>

VLAN member configuration command

Interface configuration mode	member <port-list>

PVID configuration command

Interface configuration mode	pvid <vlan-id>

Frame type configuration command

Interface configuration mode	frame-type { all|tag-only }

VLAN configuration information display command

Privileged mode	show vlan {all | <vlan-id>}

VLAN port configuration display command

Privileged mode	show vlan-by-port

PVID display command

Privileged mode	show vlan port

Note: When configuring a VLAN name containing a space, enter it embracing with double quotation marks (" ").
Example: name “VLAN 1”

```
M8esPWR> enable
M8esPWR# show vlan all

 Internet Mansion : Disabled                Uplink :
 Total VLANs : 3

VLAN      Name                            Type    Mgmt     Ports
---- ------------------------------ --------- ---- -------------------------
   1                                 Permanent  UP  Fa5, Fa6, Fa7, Fa8, Gi9
                                                    Gi10

  10                                 Static    DOWN Fa1, Fa2

  20                                 Static    DOWN Fa3, Fa4
M8esPWR#
```

Fig. 4-1 Display of the VLAN configuration
(show vlan {all | <vlan-id>})

```
M8esPWR> enable
M8esPWR# show vlan-by-port

  Port     VLAN ID
 ------  ---------------------------------------------------------------------
    1    10
    2    10
    3    20
    4    20
    5    1
    6    1
    7    1
    8    1
    9    1
   10    1

M8esPWR#
```

Fig. 4-2 Display of the VLAN configuration
(show vlan-by-port)

4.2. Link Aggregation Configuration

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

Link aggregation configuration command

Global configuration mode	lacp <LACP-key> <1-2 or 1,2,3 or 1,2,3-5> {Active | Passive | Manual}

Link aggregation configuration delete command

Global configuration mode	no lacp <LACP-key>

LACP system priority configuration command

Global configuration mode	lacp system-priority <priority-value>

LACP port priority configuration command

Interface configuration mode	lacp port-priority <priority-value>

LACP configuration information display command

Privileged mode	show lacp

LACP key display command

Privileged mode	show lacp [<la-key>]

```
M8esPWR> enable
M8esPWR# show lacp
 System Priority  : 1

  Key    Mode      Member Port List
 ----- -------- ------------------------------------------------------------
     1  Active  1-2

M8esPWR# show lacp 1

 System Priority :   1
 System ID       :   xx:xx:xx:xx:xx:xx
 Key             :   1
 Aggregator  Pri         Attached Port List
 ---------- ----- --------------------------------
     1         1  1
     2         1  2

M8esPWR
```

Fig. 4-3 Display of the link aggregation
(show lacp)
(show lacp 1)

4.3. Port Monitoring Configuration

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

Port monitoring configuration command

Interface configuration mode	port monitor <monitored port> direction {rx|tx|both}

Port monitoring configuration disable command

Interface configuration mode	no port monitor

Monitoring configuration information display command

Privileged mode	show monitor

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# int fa0/9
M8esPWR(config-if)# port monitor 1-8 direction both
M8esPWR(config-if)# end
M8esPWR# show monitor

 Port monitor status  : Enabled
 Monitoring direction : Both
 Monitoring port      : 9
 Monitored port       : 1-8

M8esPWR#
```

Fig. 4-4 Display of the monitoring configuration (show monitor)

4.3. Spanning Tree Configuration

Configure the spanning tree setting in "Global configuration mode" or "Interface configuration mode."

Spanning Tree enable command

Global configuration mode	spanning-tree rst enabl

Spanning Tree disable command

Global configuration mode	no spanning-tree rst enable

Spanning Tree priority configuration command

Global configuration mode	spanning-tree rst priority <0x0000-0xF000>

Spanning Tree version select command

Global configuration mode	spanning-tree rst version {stpCompatible|rstp}

Spanning Tree max-age configuration command

Global configuration mode	spanning-tree rst max-age <seconds>

Spanning Tree hello time configuration command

Global configuration mode	spanning-tree rst hello-time <seconds>

Spanning Tree forward-delay configuration command

Global configuration mode	spanning-tree rst forward-time <seconds>

Spanning Tree port status configuration command

Interface configuration mode	spanning-tree rst shutdown

Spanning Tree port priority configuration command

Interface configuration mode	spanning-tree rst port-priority <0-240>

Spanning Tree cost configuration command

Interface configuration mode	spanning-tree rst cost <1-200000000>

Spanning Tree port initialization command

Interface configuration mode	spanning-tree rst init-migration

Spanning Tree edge-port configuration command

Interface configuration mode	spanning-tree rst edgeport

Spanning Tree point-to-point configuration command

Interface configuration mode	spanning-tree rst point-to-point {forcetrue|forcefalse|auto}

Spanning Tree configuration display command

Privileged mode	show spanning-tree rst config

Spanning Tree interface configuration display command

Privileged mode	show spanning-tree rst interface <port-list>

```
M8esPWR> enable
M8esPWR# show spanning-tree rst config

 Global RSTP Status: Enabled            Protocol Version    : RSTP
 Root Port         : 0                  Time Since Topology Change :    0 Sec.
 Root Path Cost    : 0                  Topology Change Count     : 0
 Designated Root   : 8000 xxxxxxxxxxxx  Bridge ID           : 8000 xxxxxxxxxxxx
 Hello Time        : 2 Sec.             Bridge Hello Time   : 2 Sec.
 Maximum Age       : 20 Sec.            Bridge Maximum Age  : 20 Sec.
 Forward Delay     : 15 Sec.            Bridge Forward Delay: 15 Sec.

M8esPWR# show spanning-tree rst interface 1
  Port          : 1                  STP Status    : Enabled
  Link          : Down               Trunk         : -
  Admin/OperEdge: False/False        Admin/OperPtoP: Auto /False
  Migration     : Init.
  Port State    : Discarding         Port Priority : 128
  Port Role     : Disabled           Port Path Cost: 200000(A)
  Desig. Root   : 0000 000000000000  Desig. Cost   : 0
  Desig. Bridge : 0000 000000000000  Desig. Port   : 00 00
  Regional Root : 0000 000000000000  Regional Cost : 0

M8esPWR#
```

Fig. 4-5 Display of the STP configuration
(show spanning-tree rst config)
(show spanning-tree rst interface 1)

4.5. QoS (Quality of Service) Configuration

Configure the QoS setting in "Global configuration mode." Confirm the basic information by entering "show mls qos" in "Privileged mode."

QoS enable configuration command

Global configuration mode	mls qos

QoS disable configuration command

Global configuration mode	no mls qos

DiffServ enable configuration command

Global configuration mode	mls diffserv

DiffServ disable configuration command

Global configuration mode	no mls diffserv

QoS scheduling methodconfiguration command

Global configuration mode	qos method {strict | wrr}

CoS traffic class mapping configuration command

Global configuration mode	priority-queue cos-map <traffic class> <priority>

WRR traffic class mapping configuration command

Global configuration mode	wrr-queue priority-queue <traffic class> <weight>

DiffServ mapping configuration command

Global configuration mode	priority-queue diffserv-map <DSCP> <priority>

QoS configuration display command

Privileged mode	show mls qos

DiffServ configuration display command

Privileged mode	show mls diffserv

CoS traffic class mapping configuration display command

Privileged mode	show priority-queue cos-map

DiffServ configuration display command

Privileged mode	show priority-queue diffserv-map

QoS scheduling method, weighted round-robin weight configuration display command

Privileged mode	show qos method

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# mls qos
M8esPWR(config)# end
M8esPWR# show mls qos

Quality of Service Status: Enabled

M8esPWR# show priority-queue cos-map

 Priority    Traffic Class
 --------    -------------
    0              0
    1              0
    2              1
    3              1
    4              2
    5              2
    6              3                        0: Lowest
    7              3                        3: Highest

M8esPWR#
```

Fig. 4-6 Display of the QoS configuration
(show mls qos)
(show priority-queue cos-map)

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# priority-queue diffserv-map 63 3
M8esPWR(config)# priority-queue diffserv-map 62 3
M8esPWR(config)# priority-queue diffserv-map 0 1
M8esPWR(config)# mls diffserv
M8esPWR(config)# end
M8esPWR# show mls diffServ

Diffserv Status: Enabled

M8esPWR# show priority-queue diffserv-map

 Diffserv Status : Enabled                                  0 : Lowest  3 : Highest
 DSCP  Priority  DSCP  Priority  DSCP  Priority  DSCP  Priority  DSCP  Priority
 ----- --------  ----- --------  ----- --------  ----- --------  ----- --------
   0       1       13       0       26       0       39       0       52       0
   1       0       14       0       27       0       40       0       53       0
   2       0       15       0       28       0       41       0       54       0
   3       0       16       0       29       0       42       0       55       0
   4       0       17       0       30       0       43       0       56       0
   5       0       18       0       31       0       44       0       57       0
   6       0       19       0       32       0       45       0       58       0
   7       0       20       0       33       0       46       0       59       0
   8       0       21       0       34       0       47       0       60       0
   9       0       22       0       35       0       48       0       61       0
  10       0       23       0       36       0       49       0       62       3
  11       0       24       0       37       0       50       0       63       3
  12       0       25       0       38       0       51       0


M8esPWR#
```

Fig. 4-7 Display of the DiffServ configuration
(show mls diffserv)
(show priority-queue diffserv-map)

4.7. IEEE802.1X Port-Based Authentication Configuration

Configure the IEEE802.1X port-based setting in "Global configuration mode" and "Interface configuration mode." Confirm the basic information by entering "show dot1x <1-2 or 1,2,3 or 1,2,3-5>" in "Privileged mode."

NAS ID configuration command

Global configuration mode	dot1x nas-id <NASID>

NAS ID delete command

Global configuration mode	no dot1x nas-id

Authentication status initialization command

Interface configuration mode	dot1x init

Maximum retry times configuration command for resending authentication

Interface configuration mode	dot1x max-req <value>

Authentication operation configuration command

Interface configuration mode	dot1x port-control {auto | force-authorized | force-unauthorized}

Local re-authentication interval configuration command

Interface configuration mode	dot1x re-auth-timer local

Re-authentication status initialization command

Interface configuration mode	dot1x re-authenticate

Re-authentication enable command

Interface configuration mode	dot1x re-authentication

Re-authentication disable command

Interface configuration mode	no dot1x re-authentication

Waiting time configuration command after authentication fails

Interface configuration mode	dot1x timeout quiet-period <seconds>

Re-authentication interval configuration command

Interface configuration mode	dot1x timeout re-authperiod <seconds>

Authentication server timeout configuration command

Interface configuration mode	dot1x timeout server <seconds>

Supplicant timeout configuration command

Interface configuration mode	dot1x timeout supp-timeout <seconds>

Interval configuration command for sending authentication request

Interface configuration mode	dot1x timeout tx-period <seconds>

Authentication configuration display command

Privileged mode	show dot1x <port-list>

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config-if)# interface fa0/2
M8esPWR(config-if)# dot1x port-control auto
M8esPWR(config-if)# dot1x re-authentication
M8esPWR(config-if)# dot1x re-auth-timer local
M8esPWR(config-if)# end
M8esPWR# show dot1x 1-2

 NAS ID                          : Nas1
 Port No                         : 1
 Port Status                     : Authorized
 Port Control                    : Force Authorized
 Transmission Period             : 30    seconds
 Supplicant Timeout              : 30    seconds
 Server Timeout                  : 30    seconds
 Maximum Request                 : 2
 Quiet Period                    : 60    seconds
 Re-authentication Period        : 3600  seconds
 Re-authentication Status        : Disabled

 Port No                         : 2
 Port Status                     : Unauthorized
 Port Control                    : Auto
 Transmission Period             : 30    seconds
 Supplicant Timeout              : 30    seconds
 Server Timeout                  : 30    seconds
 Maximum Request                 : 2
 Quiet Period                    : 60    seconds
 Re-authentication Period        : 3600  seconds
 Re-authentication Status        : Enabled_Local

M8esPWR#
```

Fig. 4-8 Display of the IEEE802.1X authentication configuration (show dot1x 1-2)

4.8. IGMP Snooping Configuration

Configure the IGMP snooping setting in "Global configuration mode" and "Interface configuration mode."

IGMP snooping enable command

Global configuration mode	ip igmp snooping enable

IGMP snooping disable command

Global configuration mode	no ip igmp snooping enable

IGMP snooping aging time configuration command

Global configuration mode	ip igmp snooping aging-time {router|host} <sec>

Multicast filtering enable command

Global configuration mode	ip multicast filtering enable

Multicast filtering disable command

Global configuration mode	no ip multicast filtering enable

Leave delay time configuration command

Global configuration mode	ip igmp snooping leave-delay-time <value>

Router port configuration command

Global configuration mode	ip igmp snooping mrouter interface <interface name>

Router port delete command

Global configuration mode	no ip igmp snooping mrouter interface <interface name>

Router port learning method command

Global configuration mode	ip igmp snooping mrouter learn {igmp | dvmrp | pim-dvmrp | both}

IGMP snooping transmission interval configuration command

Global configuration mode	ip igmp snooping report-forward-interval <sec>

Router port static configuration command

Global configuration mode	ip igmp snooping vlan <vlan-id> static <MAC address> interface <interface name>

Router port delete command

Global configuration mode	no ip igmp snooping vlan <vlan-id> static <MAC address> interface <interface name>

VLAN filter configuration command

Global configuration mode	ip igmp snooping vlan-filter vlan <vlan-id>

VLAN filter delete command

Global configuration mode	no ip igmp snooping vlan-filter vlan <vlan-id>

IGMP snooping leave mode configuration command

Interface configuration mode	ip igmp snooping immediate-leave

IGMP snooping leave mode configuration delete command

Interface configuration mode	no ip igmp snooping immediate-leave

IGMP snooping configuration display command

Privileged mode	show ip igmp snooping conf

IGMP snooping leave mode configuration display command

Privileged mode	show ip igmp snooping mrouter

IGMP snooping router port display command

Privileged mode	show ip igmp snooping mrouter

IGMP snooping VLAN filter configuration display command

Privileged mode	show ip igmp snooping vlan-filter-table

Note: If the VLAN function is disabled when you enable the IGMP Snooping function, VLAN is automatically changed to enabled. In that case, VLAN1 is created as an enabled control VLAN and all port PVIDs are set to 1.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# ip igmp snooping enable
M8esPWR(config)# ip multicast filtering enable
M8esPWR(config)# ip igmp snooping mrouter learn igmp
M8esPWR(config)# ip igmp snooping vlan-filter vlan 1
M8esPWR(config)# end
M8esPWR# show ip igmp snooping conf

 IGMP Snooping Status      : Enabled
 Multicast Filtering Status: Enabled
 Host Port Age-Out Time    : 260 sec
 Router Port Age-Out Time  : 125 sec
 Report Forward Interval   : 5 sec

M8esPWR# show ip igmp snooping mrouter

 Dynamic Detection: IGMP Query

 VLAN ID  Port List
 -------  ------------------------------------------------------------------------

M8esPWR# show ip igmp snooping vlan-filter-table

 VLAN ID     Status
 -------  ------------
       1     Filtered

M8esPWR#
```

Fig. 4-9 Display of the IGMP snooping configuration
(show ip igmp snooping conf)
(show ip igmp snooping mrouter)
(show ip igmp snooping vlan-filter-table)

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# interface fa0/1
M8esPWR(config-if)# ip igmp snooping immediate-leave
M8esPWR(config-if)# end
M8esPWR# show ip igmp snooping leave-mode

 Leave Delay Time : 5 sec

  Port       Mode
 ------  ------------
    1    Immediate
    2       Normal
    3       Normal
    4       Normal
    5       Normal
    6       Normal
    7       Normal
    8       Normal
    9       Normal
   10       Normal

M8esPWR#
```

Fig. 4-10 Display of the leave mode
(show ip igmp snooping leave-mode)

4.9. PoE Function Configuration

Configure the PoE setting in "Global configuration mode" and "Interface configuration mode."

PoE threshold value configuration command for sending SNMP traps

Global configuration mode	peth usage-threshold <percent>

Silent fan control configuration command (*only for Switch-M8ePWR)

Global configuration mode	fanspeed {high | low | mid}

PoE port limit configuration command

Interface configuration mode	peth limit <value>

PoE port priority configuration command

Interface configuration mode	peth priority {critical | high | low}

PoE port enable command

Interface configuration mode	no peth shutdown

PoE port disable command

Interface configuration mode	peth shutdown

PoE configuration display command

Privileged mode	show peth-conf

PoE port configuration display command

Privileged mode	show peth-port

```
M8esPWR> enable
M8esPWR# show peth-conf
 Power Budget :                          60W
 Power Consumption :                     0W
 Power Usage Threshold For Sending Trap:  50 %

M8esPWR# show peth-port
 No. Admin  Status        Class Prio.  Limit(mW)  Pow.(mW)   Vol.(V)   Cur.(mA)
 --- ----- -------------- ----- ------ ---------- ---------- ---------- ----------
  1   Up   Not Powered       0  Low       15400          0          0          0
  2   Up   Not Powered       0  Low       15400          0          0          0
  3   Up   Not Powered       0  Low       15400          0          0          0
  4   Up   Not Powered       0  Low       15400          0          0          0
  5   Up   Not Powered       0  Low       15400          0          0          0
  6   Up   Not Powered       0  Low       15400          0          0          0
  7   Up   Not Powered       0  Low       15400          0          0          0
  8   Up   Not Powered       0  Low       15400          0          0          0

M8esPWR#
```

Fig. 4-11 Display of the PoE configuration
(show peth-conf)
(show peth-port)

4.10. Storm Control Configuration

Configure the storm control in "Global configuration mode." Confirm the basic information by entering "show storm-control" in "Privileged mode."

Storm control (broadcast) enable command

Interface configuration mode	storm-control broadcast

Storm control (broadcast) disable command

Interface configuration mode	no storm-control broadcast

Storm control (multicast) enable command

Interface configuration mode	storm-control multicast

Storm control (multicast) disable command

Interface configuration mode	no storm-control multicast

Storm control (unknown address unicast) enable command

Interface configuration mode	storm-control unicast

Storm control (unknown address unicast) disable command

Interface configuration mode	no storm-control unicast

Threshold value configuration command

Interface configuration mode	storm-control threshold <threshold value>

Storm control configuration display command

Privileged mode	show storm-control

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# interface fa0/1
M8esPWR(config-if)# storm-control broadcast
M8esPWR(config-if)# storm-control multicast
M8esPWR(config-if)# storm-control threshold 80
M8esPWR(config-if)# end
M8esPWR# show storm-control


 Port Storm Control Setting:
  No.       DLF       Broadcast   Multicast   Threshold
 ----   ---------   ---------   ---------   ---------
   1     Disabled    Enabled     Enabled      80
   2     Disabled    Disabled    Disabled     1
   3     Disabled    Disabled    Disabled     1
   4     Disabled    Disabled    Disabled     1
   5     Disabled    Disabled    Disabled     1
   6     Disabled    Disabled    Disabled     1
   7     Disabled    Disabled    Disabled     1
   8     Disabled    Disabled    Disabled     1
   9     Disabled    Disabled    Disabled     1
  10     Disabled    Disabled    Disabled     1

M8esPWR#
```

Fig. 4-12 Display of the storm control configuration (show storm-control)

4.11. Ring Protocol Configuration

Configure the ring protocol in "Ring configuration mode." Confirm the basic information by entering "show rrp status[Domain Name]" in "Privileged mode."

Ring protocol enable command

Global configuration mode	enable rrp status

Ring protocol disable command

Global configuration mode	no enable rrp status

RRP domain creation configuration command

Global configuration mode	rrp domain <Domain Name>

RRP domain delete command

Global configuration mode	no rrp domain <Domain Name>

Ring control mode configuration command

Ring configuration mode	rrp type {master | transit}

Control VLAN configuration command

Ring configuration mode	control vlan<vlan-id>

Data VLAN configuration command

Ring configuration mode	data vlan<vlan-id>

Primary port configuration command

Ring configuration mode	primary port <port number>

Secondary port configuration command

Ring configuration mode	secondary port <port number>

Health check timeout configuration command

Ring configuration mode	fail-period <seconds>

Health check interval configuration command

Ring configuration mode	polling-interval <seconds>

Ring protocol configuration display command

Privileged mode	show rrp status <Domain Name>

Note: The Ring Redundant Protocol function and the Internet Mansion mode cannot be used simultaneously.

Note: Disable the Loop detection for a port configuring the ring protocol.

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# rrp domain ring-1
M8esPWR(config-rrp)# rrp type master
M8esPWR(config-rrp)# primary port 9
M8esPWR(config-rrp)# secondary port 10
M8esPWR(config-rrp)# control vlan1000
M8esPWR(config-rrp)# data vlan1
M8esPWR(config-rrp)# rrp type master
M8esPWR(config-rrp)# exit
M8esPWR(config)# enable rrp status
M8esPWR(config)# end
M8esPWR# show rrp status ring-1

 RRP Domain Name      : ring-1
 RRP Node Type        : Master
 RRP Ring Status      : Failed

 Primary Port         : 9
 Primary Port Status  : Down
 Primary Port Role    : Upstream

 Secondary Port       : 10
 Secondary Port Status: Down
 Secondary Port Role  : Downstream

 Polling Interval     : 1
 Fail Period          : 2

 Control VLAN         : 1000
 Data VLAN            : 1

M8esPWR#
```

Fig. 4-13 Ring protocol configuration display command (show rrp status)

4.12. Line Configuration

Configure the Loop detection and power saving settings in "Interface configuration mode."

4.12.1. Loop Detection Configuration

Enable or disable the Loop detection function and configure the auto-recovery setting in "Interface configuration mode." Confirm the loop history by entering "show line loopback history" in "Privileged mode."

Loop detection enable command

Global configuration mode	line loopback enable

Loop detection disable command

Interface configuration mode	no line loopback

Loop detection and blocking history delete command

Global configuration mode	line loopback history clear

Loop detection enable command

Interface configuration mode	line loopback

Auto-recovery function enable command

Interface configuration mode	line loopback shutdown <sec>

Auto-recovery function disable command

Interface configuration mode	no line loopback shutdown

Loop detection and blocking configuration display command

Privileged mode	show line loopback configuration

Loop detection and blocking history display command

Privileged mode	show line loopback history

```
M8esPWR> enable
M8esPWR# configuration
M8esPWR(config)# line loopback enable
M8esPWR(config)# interface fa0/1
M8esPWR(config-if)# line loopback
M8esPWR(config-if)# end
M8esPWR# show line loopback configuration

 Global Loop Detection Status: Enabled
 Port  Trunk  Link     State       Loop Detect    Recovery    Recovery Time
 ----  -----  ----  -----------  -------------- ----------- --------------
   1    ---   Up    Forwarding    Enabled        Enabled           60
   2    ---   Down  Forwarding    Enabled        Enabled           60
   3    ---   Down  Forwarding    Enabled        Enabled           60
   4    ---   Down  Forwarding    Enabled        Enabled           60
   5    ---   Down  Forwarding    Enabled        Enabled           60
   6    ---   Down  Forwarding    Enabled        Enabled           60
   7    ---   Down  Forwarding    Enabled        Enabled           60
   8    ---   Down  Forwarding    Enabled        Enabled           60
   9    ---   Down  Forwarding    Disabled       Enabled           60
  10    ---   Down  Forwarding    Disabled       Enabled           60
```

Fig. 4-14 Display of the loop detection and blocking configuration (line loopback) (show line loopback configuration)

```
M8esPWR> enable
M8esPWR# show line loopback history

 Entry  Time(YYYY/MM/DD HH:MM:SS)                    Event
 -----  ------------------------ ----------------------------------------------
    1   2001/01/01 00:00:33      The loop detected between port 1 and 9
    2   2001/01/01 00:01:33      Port 1 auto recovery

M8esPWR#
```

Fig. 4-15 Example of the loop history display command (line loopback)

Note: The loop detection uses its own frame. When a loop detection frame is detected on a port on which the Loop detection is disabled, the sender port is blocked.
For the detailed loop history messages, refer to Chapter 10 about system log.

5. Displaying Statistic Information

View the statistic information of this switch in "Privileged mode."

Statistic information (traffic) display command

Privileged mode	show interface counters <interface port> {since-reset | since-up}

Statistic information (error) display command

Privileged mode	show interface counters errors <interface port>

```
M8esPWR# show interface counters fa0/1

Elapsed Time Since System Reset: 000:01:51:06

Total RX Bytes    Total RX Pkts    Good Broadcast    Good Multicast
        438319              915               132                 7

  64-Byte Pkts      65-127 Pkts      128-255 Pkts
           817              650                22


  256-511 Pkts    512-1023 Pkts    Over 1024 Pkts
            10              745                 0

M8esPWR# show interface counters errors fa0/1

Elapsed Time Since System Reset: 000:01:51:11

 CRC/Align Errors    Undersize Pkts    Oversize Pkts
                0                 0                0

        Fragments           Jabbers       Collisions
                0                 0                0

M8esPWR#
```

Fig. 5-1 Display of the statistic information
(show interface counters fa0/1 sinde-up)
(show interface counters errors fa0/1)

6. Firmware Upgrade and Downloading/Uploading Configuration File

Upgrade the firmware version and download/upload the configuration file in "Privileged mode."

Firmware upgrade command

Privileged mode	copy tftp <ip-address> <filename> image

```
M8esPWR> enable
M8esPWR# copy tftp 192.168.1.1 PN27089N_NEW.rom image

 Downloading Image From Remote Server. (Press CTRL-C to quit downloading)
 Receive    134233 bytes
```

Fig. 6-1 Upgrading firmware
(copy tftp 192.168.1.2 PN27089N-NEW.rom)

Configuration file upload command

Privileged mode	copy running-config tftp <ip-address> <filename>

Configuration file download command

Privileged mode	copy tftp <ip-address> <filename> running-config

```
M8esPWR# copy running-config tftp 192.168.1.1 M8esPWR.cfg
Please wait a minute.

 510 bytes data transferred!
```

Fig. 6-2 Uploading the configuration file
(copy tftp 192.168.1.2 M8esPWR.cfg)

7. Reboot

Reboot the switch in "Privileged mode."

Reboot command

Privileged mode	reboot {normal | default | default-except-IP}

```
M8esPWR> enable
M8esPWR# reboot normal
 Are you sure to reboot the system? (Y/N) y

Memory test....OK

Decompressing...OK
System database initialization ... OK

MAC unit 0: SOC registers test ... Passed
MAC unit 0: PHY registers test ... Passed
MAC unit 0: PHY loopback test .... Passed
Temperature sensor test .......... Passed
PoE test ......................... Passed

Checking Image Bank Integrity ........ OK

Booting system
Decompressing...OK

Initializing ..........

Completing initialization...
```

Fig. 7-1 Reboot screen

8. Exception Handler

Select a reboot type and reboot the switch in "Global configuration mode."

Exception handler enable command

Global configuration mode	exception-handler enable

Exception handler disable command

Global configuration mode	no exception-handler enable

Exception handler configuration command

Global configuration mode	exception-handler mode { debug-message | system-reboot | both }

Exception handler configuration display command

Privileged mode	show exception-handler

```
M8esPWR> enable
M8esPWR# configure
M8esPWR(config)# exception-handler enable
M8esPWR(config)# exception-handler mode both
M8esPWR(config)# end
M8esPWR# show exception-handler

 Exception Handler:            Enabled
 Exception Handler Mode:       Debug Message & System Reboot

M8esPWR#
```

Fig. 8-1 Display of the exception handler configuration

9. Ping Execution

Ping can be used in all modes.

Ping command

All modes	ping <ip-address>

Ping (number of echo requests) command

All modes	ping <ip-address> [-n <count>]

Ping (timeout) command

All modes	ping <ip-address> [-w <timeout(sec)>]

```
M8esPWR> ping 192.168.1.1

Type Ctrl-C to abort.

Reply Received From :    192.168.1.1, TimeTaken : 8 ms
Reply Received From :    192.168.1.1, TimeTaken : 9 ms
Reply Received From :    192.168.1.1, TimeTaken : 7 ms

--- 192.168.1.1 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss

M8esPWR> enable
M8esPWR# ping 192.168.1.1

Type Ctrl-C to abort.

Reply Received From :    192.168.1.1, TimeTaken : 10 ms
Reply Received From :    192.168.1.1, TimeTaken : 7 ms
Reply Received From :    192.168.1.1, TimeTaken : 7 ms

--- 192.168.1.1 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss

M8esPWR# configure
M8esPWR(config)# ping 192.168.1.1

Type Ctrl-C to abort.

Reply Received From :    192.168.1.1, TimeTaken : 10 ms
Reply Received From :    192.168.1.1, TimeTaken : 9 ms
Reply Received From :    192.168.1.1, TimeTaken : 6 ms

--- 192.168.1.1 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss
```

Fig. 9-1 Ping execution
(ping 192.168.1.1)

10. Displaying System Log and System Log Configuration

View the system log in "Privileged mode" and configure the system log setting in "Global configuration mode."

System log display command

Privileged mode	show syslog [conf]

System log clear command

Global configuration mode	syslog clear

System log enable command

Global configuration mode	syslog enable

System log disable command

Global configuration mode	no syslog enable

System log server enable command

Global configuration mode	syslog server enable <index>

System log server disable command

Global configuration mode	no syslog server enable <index>

System log server IP address configuration command

Global configuration mode	syslog server-ip <index> <ip-address>

System log additional information configuration command

Global configuration mode	syslog header-info <index> {IP | None | SysName}

System log Facility configuration command

Global configuration mode	syslog facility <index> <Facility>

```
M8esPWR# show syslog

 Entry  Time(YYYY/MM/DD HH:MM:SS)                    Event
 -----  -------------------------   ----------------------------------------
    1   2001/01/01 00:00:29         Reboot: Factory Default
    2   2001/01/01 00:05:47         Login from console
    3   2001/01/01 00:06:16         Configuration changed
    4   2001/01/01 00:00:24         Switch start
    5   2001/01/01 00:00:56         Login from console
    6   2001/01/01 00:01:03         Set IP address <192.168.0.1>
    7   2001/01/01 00:02:25         Runtime code changes
    8   2001/01/01 00:03:33         Reboot: Normal
    9   2001/01/01 00:00:23         Switch start
   10   2001/01/01 00:01:48         Login from console
   11   2001/01/01 00:02:24         Configuration changed
   12   2001/01/01 00:00:23         Switch start
   13   2001/01/01 00:00:31         Login from console
   14   2001/01/01 00:00:37         Set IP address <192.168.0.1>
   15   2001/01/01 00:02:15         Runtime code changes
   16   2001/01/01 00:03:23         Reboot: Normal

M8esPWR# show syslog conf
 Syslog Transmission: Disabled

 Syslog Server List
  No.      Status        IP Address       Facility     Include
 ----  ------------   ---------------    ----------    ------------------
    1   Disabled       0.0.0.0            Facility0
    2   Disabled       0.0.0.0            Facility0
M8esPWR#
```

Fig. 10-1 Display of the system log and the system log configuration (show syslog) (show syslog conf)

11. Saving Configuration Information

Save the configuration information in "Privileged mode."

Configuration save command

Privileged mode	copy running-config startup-config

```
M8esPWR> enable
M8esPWR# copy running-config startup-config
Please wait a minute.

 Save current state to startup config successfully!!

M8esPWR#
```

Fig. 11-1 Saving the configuration information
(copy running-config startup-config)

12. Displaying Configuration Information

View the configuration information in "Privileged mode."

Configuration information display command

Privileged mode	show running-config

Saved configuration information display command

Privileged mode	show startup-config

```
M8esPWR> enable
M8esPWR# show running-config
Building Configuration...
Current Configuration:
! -- start of configuration --
! -- Software Version : x.x.x.xx --
!
enable
config
!
ip address 192.168.0.1 255.255.255.0
ip default-gateway 192.168.0.254
!
spanning-tree rst version rstp
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface GigabitEthernet0/9
!
interface GigabitEthernet0/10
!
interface vlan1
member 1-10
exit
!
! -- end of configuration --
M8esPWR#
```

Fig. 12-1 Display of the configuration information (show running-config)

Appendix A. Specifications

Refer to "Operation Manual for Menu Screens" for your switching hub to read the specifications.

Appendix B. Procedures for Console Port Configuration Using Windows HyperTerminal

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix C. Easy IP Address Setup Function

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

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

[User-settable items]
- IP address, subnet mask and default gateway
- System name
  * Can be configured only with the software "Easy Config."
    The software displays "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 "Easy Config" cannot be used.
  Auto setup function

* Please contact each manufacturer for information about network cameras.

Appendix D. Example of Network Configuration using Loop Detection Function and Its Precautions

Example of configuration using the 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.

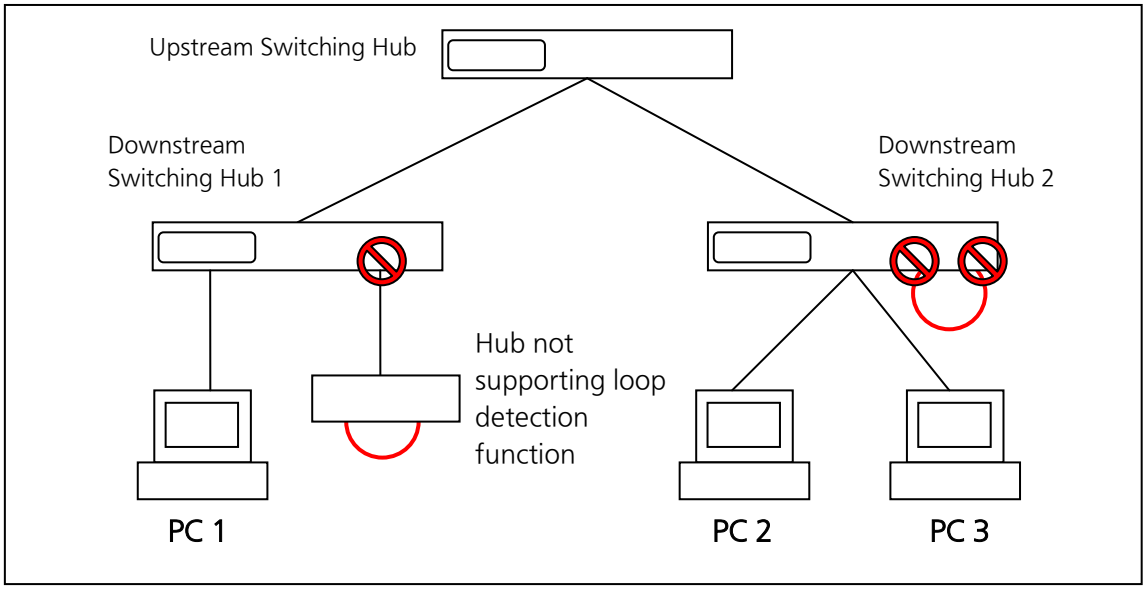
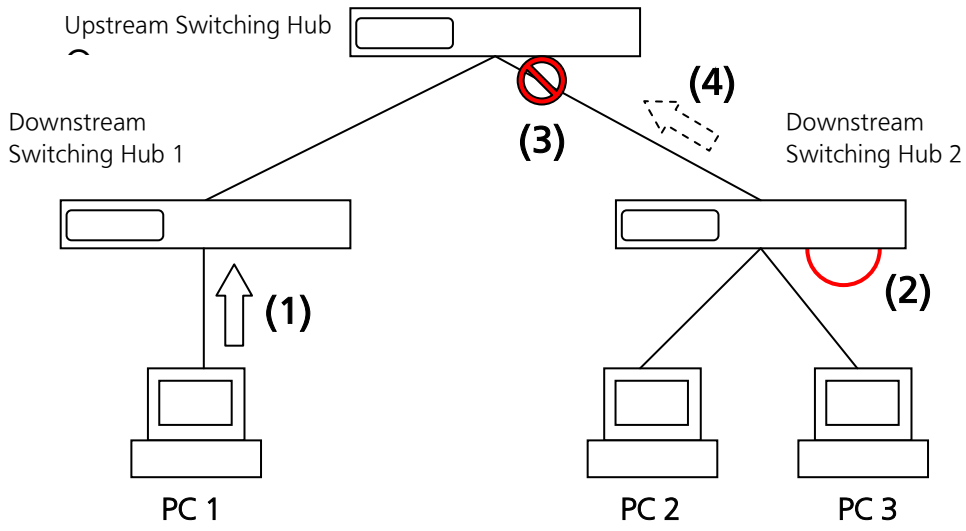


Fig. 1 Example of configuration using the loop detection function

Precautions in using loop detection function
➔ Disable loop detection at upstream port(s)

If a network is consisted of only Switching Hub 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(s).
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 Switching Hub settings.



[Occurrence conditions]

(1) Communications between PC 1 and PC 2, and between PC 1 and PC 3 are OK.
(2) A loop occurs in the downstream Switching Hub 2.
(3) The upstream Switching Hub detects the loop first, and shuts down the uplink port to downstream Switching Hub 2.
(Normally, only a port having loop connection is shut down.)
(4) The uplink port to downstream Switching Hub 2 is linked down, and communications to all other Switching Hubs are blocked.

Fig. 2 Precautions in using loop detection function

Troubleshooting

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

1. LED indicators

* The power LED (POWER) is not lit.
  - Is the correct port LED display mode selected by pressing the LED display change button?
  - Is the power cord connected? Please confirm that the power cord is securely connected to the power port.
  - Use the Switching Hub within the range of operating temperature.

* The port LED (left) is not lit on the Status mode.
  - Is the Switching Hub is 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 an appropriate cable used?
  - 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) is lit in orange.
  - A loop is occurring. When you recover the loop, orange LED is turned off.

* LOOP HISTORY LED is blinking green.
  - This is to notify that there is a port in which a loop is occurring, or has been recovered within three days.

2. Communications are slow.

* Communications with all ports are down 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 the bandwidth usage rate of the network to which this Switching Hub is connected excessively high?
  ➔ Try separating this Switching Hub from the network.

* Is the port LED (right) lit in orange?

➔ If the port LED (right) is lit in orange, the port is being blocked by the loop detection function. After the loop was recovered in the port, wait for more than the recovery time until a port starts to be automatically recovered, or unblock the port on the configuration screen.

3. PoE power supply is impossible.

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

* When the PoE mode LED is lit and a Port LED (left) is blinking orange:
  - Ensure that the total power supply demand from PoE-powered devices does not exceed the PoE power budget.

* When the power supply is suddenly shut off:
  - It is likely that a PoE-powered device in use has different power consumption in normal operation and standby states.
    After turning on the PoE LED (power supply mode), confirm that a single port is not overloaded [the Port LED (left) is not blinking orange] and that the maximum limit of the total power supply is not exceeded (the PoE LIM. LED is not blinking orange).

After-sales Service

1. Warranty card

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

2. Repair request

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

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

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

3. Inquiries about after-sales service and the product

Contact the shop where you purchased the product.

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-</td></tr>
<tr><td>Model No.</td><td>PN</td></tr>
<tr><td rowspan="2">Firmware version (*)</td><td colspan="2">Boot Code</td><td colspan="2"></td></tr>
<tr><td colspan="2">Runtime Code</td><td colspan="2"></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 section 4.5 of the Operation Manual – Menu Screens.)

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