

ALAXALA AX2200S/AX1250S/AX1240S

Hardware Instruction Manual

AX1240S-H001X-70

Alaxala

■ Relevant products

This manual applies to the AX2230S-24T and AX2230S-24P models of the AX2200S series switch, the AX1250S-24T2C model of the AX1250S series switch, and the AX1240S-24T2C, AX1240S-24P2C, and AX1240S-48T2C models of the AX1240S series switch.

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AX-2230-24T-B (AX2230S-24T)
AX-2230-24P-B (AX2230S-24P)
AX-1250-24T2C (AX1250S-24T2C)
AX-1240-24T2C (AX1240S-24T2C)
AX-1240-48T2C (AX1240S-48T2C)
AX-1240-24P2C (AX1240S-24P2C)

■ Editions history

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Preface

About this Manual

This manual provides the hardware instructions for the ALAXALA AX2200S series Gigabit Ethernet Layer 2 switches, and the ALAXALA AX1250S and AX1240S series Fast Ethernet Layer 2 switches. Before you operate the equipment, read this manual carefully and make sure that you understand all instructions and cautionary notes. After reading the manual, keep it in a convenient place for easy reference.

Intended readers

This manual is intended for engineers who install and handle the AX2200S, AX1250S, and AX1240S series of products. Readers are therefore required to have knowledge of electric circuits, wire connections, and network systems.

Structure of manual

Safety Information

Notes for the safe use of the AX2200S, AX1250S, and AX1240S series switches are described. Be sure to read and understand this section prior to using the Switch.

Chapter 1 Components Overview

An overview of the components of the Switch is provided.

Chapter 2 Preparation for Installation

Environmental conditions and required preparation for installation of the Switch are described.

Chapter 3 Preparation of Interface Cables and Terminals

Describes the interface cables and the terminals used for the Switch.

Chapter 4 Installing Components and Adding, Replacing, or Removing Switches

Explains the procedures for installing components and for adding, replacing, and removing Switches.

Chapter 5 Operations Required for Initial Installation

Describes the initial procedures for specifying the time, administrator password, user ID changes, and login passwords.

Appendix A Cleaning Optical Connectors

Explains the procedures for cleaning the optical connectors of the transceivers and the optical fiber cable connectors.

Appendix B Physical Specifications of Network Interfaces

Lists the specifications of the interfaces on the Switch.

Appendix C Specifications of setup terminal

Describes the setup terminal and its connection cables that are used with the Switch.

Reading sequence of the manuals for AX2200S, AX1250S, AX1240S series switches

- Details on basic settings at initial installation, hardware requirements, and instructions for handling the switch

AX2200S/AX1250S/AX1240S
Hardware Instruction Manual
(AX1240S-H001X)

- Software functionality, configuration, and operation commands

Configuration Guide Vol. 1
(AX1240S-S001X)
Vol. 2
(AX1240S-S002X)

- Proper syntax for configuration commands and details on parameters

Configuration Command
Reference
(AX1240S-S003X)

- Proper syntax for operation commands and details on parameters

Operation Command Reference
(AX1240S-S004X)

- Details on messages and logs

Message Log Reference
(AX1240S-S005X)

- Details on MIBs

MIB Reference
(AX1240S-S006X)

- Handling problems

Troubleshooting Guide
(AX1240S-T001X)

How to obtain this manual

You can view manuals for the AX2200S, AX1250S, and AX1240S series of switches from our Web site at:

<http://www.alaxala.com/en/>

Acronyms

EIA	Electronic Industries Alliance
IEEE	Institute of Electrical and Electronics Engineers, Inc.
JIS	Japanese Industrial Standards
LAN	Local Area Network
LED	Light Emitting Diode
MDI	Medium Dependent Interface
MDI - X	Medium Dependent Interface Crossover
PoE	Power over Ethernet
PS	Power Supply
RS-232C	Recommended Standard 232C
SD	Secure Digital
SFP	Small Form factor Pluggable
TCP/IP	Transmission Control Protocol/Internet Protocol
T/R	Transmitter/Receiver
URL	Uniform Resource Locator
UTP	Unshielded Twisted Pair

Conventions: The terms "Switch" and "switch"

The term *Switch* (upper-case "S") is an abbreviation for any or all of the following models:

- AX2200S series switch
- AX1250S series switch
- AX1240S series switch

The term *switch* (lower-case "s") might refer to a Switch, another type of switch from the current vendor, or a switch from another vendor. The context decides the meaning.



Safety Information



Using AX2200S, AX1250S, and AX1240S series switches correctly and safely

- This manual provides important information intended to ensure safe use of AX2200S, AX1250S, and AX1240S series switches. Please read this manual completely before using the Switches.
- Keep this manual handy after reading it, so that it is available for later reference.
- Operate the Switch according to the instructions and procedures provided in this manual.
- Heed all warnings and cautions regarding the Switch in this guide. Failure to do so could result in injury or damage to the Switch.

Before using the Switch

- Caution indications

These indications are intended to ensure safe and correct use of the Switch and to prevent serious injury, and equipment and property damage. Caution information in this manual and on the Switch is preceded by the indications shown below. Make sure you fully understand the meaning of the indications before continuing with the main body of this manual.

 WARNING	Ignoring instructions preceded by this indication and using the Switch incorrectly could result in death or serious injury to yourself and others.
 CAUTION	Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious injury to yourself and others.
CAUTION	Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious damage to the Switch or nearby property.
NOTE	Information preceded by this indication is supplementary information that, if ignored, will not result in physical injury or serious damage to the Switch.

Unauthorized operations

- Do not attempt to perform any operations that are not described in this guide.
In the event of a Switch problem, turn off the power, unplug the power cable, and contact maintenance personnel.

Using common sense

The warnings and cautions provided on the Switch and in this guide have been selected after careful consideration.

Nevertheless, there is always the possibility of the unexpected occurring. Therefore, while using a Switch, stay alert and use common sense in addition to all following instructions.



If anything seems wrong, immediately turn off the power.

- If smoke or an unusual smell is coming from the Switch, or if liquid is spilled into the Switch or a foreign object falls into the Switch, immediately turn off power to the Switch as described below. Continuing operation could result in a fire or electric shock.

Actions to take for abnormal conditions

Action to take

Turn off the Switch and unplug the power cable.

Do not allow any foreign objects to get into the Switch.

- Do not insert or drop any foreign objects, such as anything metallic or flammable, through the Switch's ventilation slots. Doing so could result in fire or electric shock.

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip.

- When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

Do not alter the physical makeup of the Switch.

- Do not alter the physical makeup of the Switch. Doing so could result in a fire or electric shock.

Do not subject the Switch to shocks.

- In the event that the Switch is dropped or any of its components damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Continuing operations could result in fire or electric shock.

Do not place anything on the Switch.

- Do not place any metallic object such as a small pin or a paper clip or any container with a liquid, such as a vase or a flower pot, on the Switch. Liquid or metallic objects falling into the Switch could result in a fire or electric shock.

Use the Switch only with the indicated power supply setting.

- Do not use the Switch at any voltage other than the indicated voltage. Doing so could result in a fire or electric shock.

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker.

- Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.



Ground the Switch.

- Always use a grounded outlet. Failure to do so might not only result in electric shock, but it might also introduce unwanted electrical noise that could cause a Switch failure.

Handle power cables carefully.

- Do not place anything heavy on a power cable. Do not pull, bend, or modify a cable. Doing so could damage the cable, resulting in a fire or electric shock. If the power cable is covered by a carpet, it is easy to forget that the cable is there and to place something heavy on it.
- Do not use any power cables other than those included with or specified for the AX2200S or AX1250S series switch. Using another power cable could result in a fire or electric shock. Do not use the power cable with another device. Doing so could result in a fire or electric shock.
- The AC power supply cable included with the AX1240S series is for use only with the Switch. It cannot be used with any other device. Using the power cable with another device is very dangerous and could result in fire or electric shock.
- When using the switch at 200 V AC, use a power cable that satisfies the specified specifications. Using another power cable could result in a fire or electric shock.
- If the power cable is damaged so that the wires underneath the covering are visible or cut, stop using it, and ask maintenance personnel to replace it. Discontinue using the cable to avoid the risk of a fire or electric shock.
- Make sure the power plug is free of dust, and insert the plug completely up to the base of the prongs, so that it is not loose. Using a power plug with dust on it or one that is imperfectly connected could result in a fire or electric shock.
- Do not touch the power plug with a wet hand. Doing so could result in electric shock.

Do not overload the power outlet.

- Do not overload the power outlet by connecting multiple power plugs to the same outlet. Overloading the outlet could result in fire or the circuit breaker tripping due to excessive power used, which can then affect other equipment.

Do not use an air duster near a flame.

- When cleaning the optical connectors, do not use an air duster that contains flammable gas near a flame. Doing so could result in a fire.

 **WARNING**

Do not remove the Switch cover.

- Do not remove the Switch cover. Doing so could result in electric shock. The following label is affixed to a Switch.



CAUTION

Do not place the Switch in a place where it is unstable.

- If placing the Switch on a desk, lay it on its side on a workbench capable of withstanding the weight of the Switch. If, for example, you place the Switch on a shaky table or a tilted surface, the Switch might fall and possibly injure someone.
- When installing the Switch in a rack, make sure the Switch in the rack is stably positioned. If the Switch is not positioned correctly, injury could result from falling equipment or stumbling over the equipment.

Do not position the Switch vertically or lean it against a wall

- When installing the Switch on a table, position the Switch horizontally. If the switch is positioned vertically or leaned against a wall, the switch might fall, which could result in injury or damage.

Leave at least 50 mm of space in front of ventilation slots.

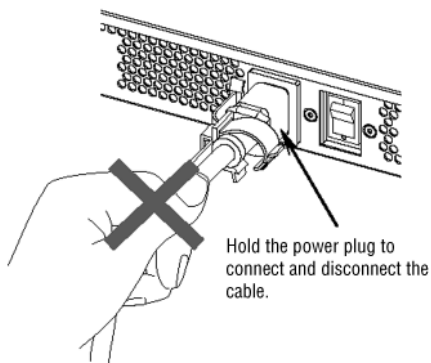
- The AX2230S-24P, AX1240S-24P2C, or AX1240S-48T2C is equipped with internal cooling fan units. Do not allow hair or other objects near the ventilation slots, because they might be sucked into the Switch, resulting in injury.

When moving the Switch

- Before moving the Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become damaged, resulting in a fire or electric shock.
- If you must stack multiple switches during transport, use appropriate packaging. Failure to do so might cause the Switch to become deformed or might damage the Switch, resulting in fire or electric shock.

Handle the power cable carefully.

- Do not place the power cable near a heat-generating apparatus. The heat could melt the cable coating, resulting in fire or electric shock.
- When connecting or disconnecting the AC power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.





Use the Switch's power button to turn off the Switch power.

Do not touch the Switch directly if you have a metal allergy.

- The Switch is coated with zinc, nickel, gold, and other elements. Do not touch the Switch directly if you have an allergic reaction to these metals. Doing so might cause eczema or skin irritation.

Avoid looking directly at laser beams.

- The Switch uses laser beams that are colorless and transparent, and invisible to the eye. Never look directly into the optical transceiver.

Do not install the Switch in a dusty or humid location.

- Do not install the Switch in a dusty or humid location. Doing so could result in fire or electric shock.
- Condensation might form on the surfaces and the inside of the Switch if it is moved from a cold location to a warm location. Using the Switch in this condition could result in fire or electric shock. After moving the Switch between two locations with a large temperature variation, let the Switch stand a few hours before using it.

Do not step on the Switch, lean against it, or place anything on it.

- Do not step on the Switch, lean against it, or place anything on it. Doing so might damage the Switch. Furthermore, the Switch might fall or lose its balance, resulting in injury.
- Do not place any objects on the Switch. Doing so might damage the Switch. Furthermore, the Switch might fall or lose its balance, resulting in injury.

Do not touch the inside of the Switch with your hands.

- Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

Cleaning

- Remove dust on and around the Switch regularly. In addition to possibly causing the Switch to stop, accumulated dust might result in fire or electric shock.

CAUTION

Ensure adequate heat dissipation from the Switch by not stacking devices.

- As the AX2230S-24T, AX1250S-24T2C, and AX1240S-24T2C are fanless models, heat also dissipates from the top panels of these switches. To ensure adequate heat dissipation, do not stack another device on top of or below the Switch. Contact could result in a malfunction.
When mounting these switches in a rack, keep a space of 1U or more between them.

Do not place the Switch in a high-temperature location.

- Do not place a Switch in direct sunlight or near a heater or other heat-generating apparatus. Doing so could adversely affect parts of the Switch.

Do not use a TV or a radio near the Switch.

- Placing the Switch near a TV or a radio could affect both devices. If you hear noise on the TV or radio, do the following:
 - Place the Switch as far away as possible from the TV or radio.
 - Adjust the orientation of the TV or radio antenna.
 - Use separate outlets.

Do not place the Switch in an undesirable environment.

- Using the switch in the following locations might shorten the life of the switch or result in a switch malfunction.
 - An area with salty air, such as near an ocean
 - An area where corrosive gases are present, such as an area with hot springs
 - An area where oily smoke is present
 - An area where continuous vibrations are present

Do not obstruct the ventilation slots.

- Do not block the ventilation slots. Doing so causes heat to accumulate inside the Switch, and could result in a malfunction. Maintain a space of at least 50 mm around the ventilation slots.

Turn off the power before connecting or disconnecting the power cable.

- Turn off the power of the Switch before connecting or disconnecting the power supply cable.

Ensure that voltage drop does not occur in the power facility due to an inrush current.

- Turning on the Switch causes an inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same electrical power equipment.

CAUTION

Handle memory cards carefully.

- When inserting a memory card, do not push the card too strongly or flick it with your finger. When removing a memory card, do not forcibly pull out the card if it is locked. Doing so might damage the connector of the memory card slot.
- When moving the Switch, remove memory cards. If a card is subjected to excessive force when the switch is moved, the connector of the memory card slot might be damaged.

When the ACC LED is lit, do not remove the memory card or turn off the power.

- When the ACC LED on the front panel of the Switch is lit, the memory card is being accessed. When a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card.

In addition, some commands require a certain amount of time after being entered to finish accessing the card. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Do not attach any labels to a transceiver.

- A label attached to the transceiver indicates that the transceiver is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or the mechanism that prevents the transceiver from coming loose from the cage.

Attaching a label on an interfering part with heat radiation or the mechanism to avoid dropping from the cage might cause a failure in the transceiver or damage to the device.

Make sure that you use a valid combination for the transceiver and the Switch.

- The switches below support SFP-FX. Use the transceiver only with the indicated switches. Not doing so could result in a Switch malfunction.
 - AX1250S-24T2C (ports 25 to 26)
- The switches below support SFP-SX2. Use the transceiver only with the indicated switches. Not doing so could result in a Switch malfunction.
 - AX2230S-24T (ports 25 to 28)
 - AX2230S-24P (ports 25 to 28)
 - AX1250S-24T2C (ports 25 to 26)
 - AX1240S-24T2C (ports 25 to 26)
 - AX1240S-24P2C (ports 25 to 26)
 - AX1240S-48T2C (ports 49 to 50)

CAUTION

Wear an antistatic wrist strap when carrying or packing a switch.

- Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

When carrying and packing optional modules, handle them carefully.

- Do not touch a connector when carrying or packing a transceiver or a memory card. Also, when storing a module, use an antistatic bag.

Use care when handling an air duster.

- Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.
- Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

Use care when handling an optical connector cleaner.

- Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.
- Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.
- Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.
- Rotate the optical connector cleaner (stick) clockwise only. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

Maintenance

- Clean any dirty areas on the exterior of the switch with a clean, dry cloth, or a cloth damp with (but not soaked with) water or a neutral detergent. Do not use volatile organic solutions (such as benzene or paint thinner), chemicals, chemically treated cloths, or pesticides because these substances might deform, discolor, or damage the switch.

If the Switch will not be used for a long time

- For safety reasons, unplug the power cable from the outlet if the Switch will not be used for a long time.

Disposing of a Switch

- When disposing of a switch, you should either follow local ordinances or regulations or contact your local waste disposal and treatment facility.

Contents

Preface	I
Safety Information.....	Safety-1
1. Components Overview.....	1
1.1 Main device.....	2
1.1.1 AX2230S-24T	3
1.1.2 AX2230S-24P	5
1.1.3 AX1250S-24T2C.....	8
1.1.4 AX1240S-24T2C.....	10
1.1.5 AX1240S-24P2C	13
1.1.6 AX1240S-48T2C.....	16
1.1.7 Accessories	19
1.2 Memory card	22
1.3 Transceiver	23
1.3.1 SFP.....	23
1.3.2 Transceiver accessories.....	27
1.4 Power cable	29
2. Preparation for Installation.....	31
2.1 Preparation workflow	32
2.2 Installation conditions	33
2.2.1 General installation conditions	33
2.2.2 Environmental requirements.....	35
2.3 Electrical power equipment.....	36
2.3.1 Electrical power equipment for 100 V AC.....	36
2.3.2 Electrical power equipment for 200 V AC.....	38
2.4 Notes on electrical noise.....	41
2.5 Leakage current.....	42
2.6 Environmental requirements	43
2.7 Installation location	45
2.8 Maintenance area	47
2.9 Cooling conditions	48
2.9.1 Air flow	48
2.9.2 Cooling conditions for the Switch on a table	49
2.9.3 Cooling conditions for a rack-mounted device	49
2.10 Noise of the Switch	51
3. Preparation of Interface Cables and Terminals	53
3.1 Connecting interface cables and terminals.....	54
3.2 Network interface specifications	57
3.2.1 Ethernet 10/100BASE-TX	57
3.2.2 Ethernet 10/100/1000BASE-T.....	58
3.2.3 Ethernet 100BASE-FX [AX1250S]	60
3.2.4 Ethernet 1000BASE-X.....	60
4. Installing Components and Adding, Replacing, or Removing Switches	61
4.1 Required tools.....	62
4.2 Precautions before starting an installation.....	63
4.3 Installation of the main device	64
4.3.1 Table mount	64
4.3.2 Rack mount	64
4.4 Connecting and disconnecting a power cable to and from the main device	67
4.4.1 AC power cable	67
4.5 Inserting and removing memory cards	69

Contents

4.6 Inserting and removing SFPs	71
4.7 Connecting a setup terminal	72
4.8 Connecting interface cables	73
4.9 Powering the main device on and off.....	75
4.10 Expansion, replacement and removal of main devices	76
5. Operations Required for Initial Installation.....	77
5.1 Notes before installing a Switch.....	78
5.2 Necessary operations for installing a Switch	79
5.2.1 Overview of the command input modes	79
5.2.2 Overview of operations when installing a Switch	80
5.3 Other Operations	84
Appendix	87
A. Cleaning Optical Connectors	88
A.1 Cleaning optical connectors of transceivers.....	88
A.2 Cleaning optical fiber cables	91
B. Physical Specifications of Network Interfaces.....	93
B.1 Ethernet 10BASE-T/100BASE-TX	93
B.2 Ethernet 10BASE-T/100BASE-TX/1000BASE-T	93
B.3 Ethernet 100BASE-FX [AX1250S]	94
B.4 Ethernet 1000BASE-X interface.....	94
C. Specifications of setup terminal	98
C.1 Specifications of setup terminal	98
C.2 Specifications of cable to connect setup terminal	98

1. Components Overview

This chapter provides an overview of the various parts of the Switch.

1.1 Main device

1.2 Memory card

1.3 Transceiver

1.4 Power cable

1.1 Main device

The AX2200S-series switches consist of Gigabit Ethernet Layer-2 switches that can be used as floor switches for local area networks, or as workgroup switches.

The AX1250S and AX1240S series switches provide Layer 2 Fast Ethernet switching and can be used as workgroup switches or as floor edge switches for local area networks.

The following models belong to the AS2200S, AX1250S, and AX1240S series.

Table 1-1 AX2200S, AX1250S, and AX1240S series switch models

No.	LAN interface					Model
	10/100/1000 BASE-T	10/100/1000B ASE-T (PoE)	10/100BAS E-TX	10/100BASE-TX (PoE)	SFP slot	
1	24 port	--	--	--	4 slots	AX2230S-24T (AC model)
2	--	24 port	--	--	4 slots	AX2230S-24P (AC model)
3	2 port	--	24 port	--	2 slots	AX1250S-24T2C (AC model) AX1240S-24T2C (AC model)
4	2 port	--	--	24 port	2 slots	AX1240S-24P2C (AC model)
5	2 port	--	48 port	--	2 slots	AX1240S-48T2C (AC model)

NOTE

Ports 25 to 26 of models AX1250S-24T2C, AX1240S-24T2C, and AX1240S-24P2C, and ports 49 to 50 of model AX1240S-48T2C are shared by SFP slots and 10/100/1000BASE-T. These ports cannot be assigned to both SFP and 10/100/1000BASE-T at the same time. Configure each port as an SFP slot or as a 10/100/1000BASE-T port. (Ports 25 to 26 of models AX1250S-24T2C, AX1240S-24T2C, and AX1240S-24P2C, and ports 49 to 50 of model AX1240S-48T2C are configured as SFP slots by default.)

For details about editing the configuration, see the Software Manual.

NOTE

The Switch contains a flash memory storage device to store software, configuration data, and log information. The number of times the memory can be written to is limited and should be noted during operation. For detailed notes about writing data to a flash disk, see 10 Switch Management in the Software Manual Configuration Guide Vol. 1.

1.1.1 AX2230S-24T

The AX2230S-24T model has the following hardware specifications:

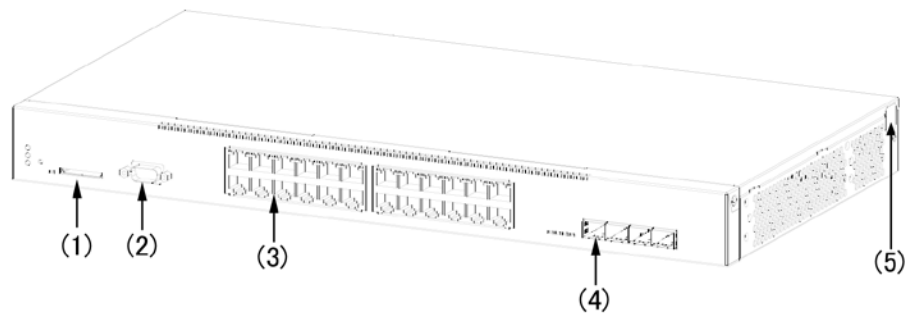
- Ethernet 10/100/1000BASE-T ports: 24
- SFP slots: 4
- Memory card slot: 1 slot
- CONSOLE port: 1

NOTE

For information about the SFPs supported by the Switch, see *1.3.1 SFP*.

(1) External appearance

Figure 1-1 Front view



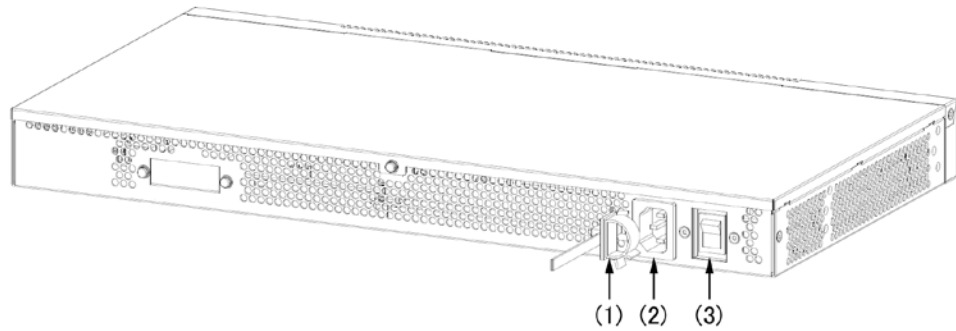
- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) Security tape

NOTE

Do not peel away the security tape.
If you do so, kaifuzumi.tif will be displayed. The device is no longer under warranty if kaifuzumi.tif is displayed.

1. Components Overview

Figure 1-2 Back view



- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in Figure 1-3 *Front panel layout*. The numbers in the figure correspond to those in Table 1-2 *LED indications, buttons, and connectors*.

Figure 1-3 Front panel layout

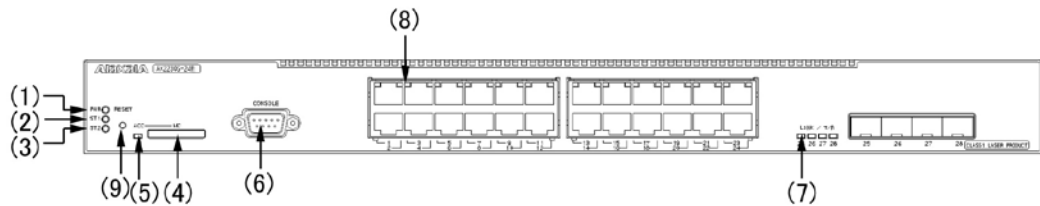


Table 1-2 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.
(3)	ST2	(Not used)	(Not used)	(Not used)
(4)	MC	Connector	Memory card slot	Memory card slot

No.	Name	Type	Description	Details
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal
(7)	LINK / T/R	LED: Green	Indicates the operating status of an SFP slot Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Blinking green: Sending or receiving frames. Off: Link failure or block when the green ST1 LED is on#4
(8)	1-24	LED: Green	Indicates the operating status of a 10/100/1000BASE-T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Blinking green: A link is established and frames are being sent or received. Off: Link failure or block when the green ST1 LED is on#4
(9)	RESET	Button (non-locking)	Manual RESET button of the device ^{#1}	Restarts the device.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.

WARNING

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.2 AX2230S-24P

The AX2230S-24P model has the following hardware specifications:

- Ethernet 10/100/1000BASE-T ports: (PoE supported): 24
- SFP slots: 4
- Memory card slot: 1
- CONSOLE port: 1

NOTE

The Alternative A and Alternative A+B PoE systems are used for the switch. For details, see 3.2.2 *Ethernet 10/100/1000BASE-T*.

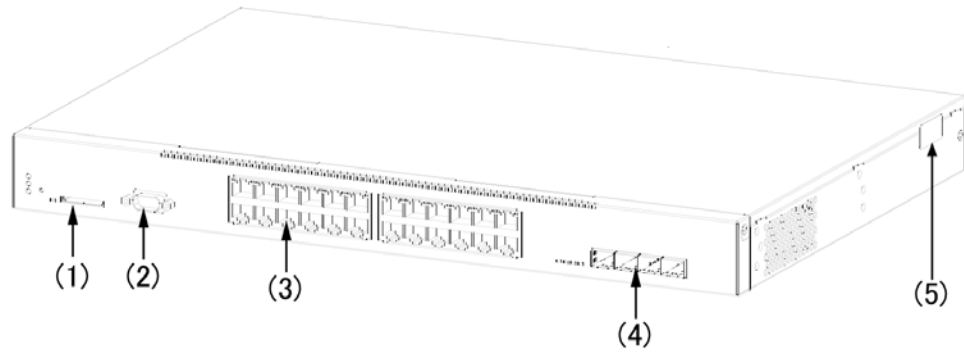
NOTE

For information about the SFPs supported by the Switch, see 1.3.1 *SFP*.

1. Components Overview

(1) External appearance

Figure 1-4 Front view

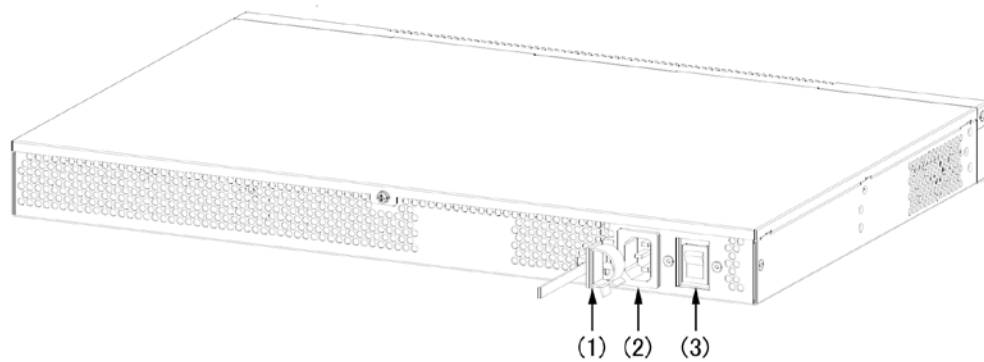


- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) Security tape

NOTE

Do not peel away the security tape.
If you do so, `kaifuzumi.tif` will be displayed. The device is no longer under warranty if `kaifuzumi.tif` is displayed.

Figure 1-5 Back view



- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in Figure 1-6 *Front panel layout*. The numbers in the figure correspond to those in Table 1-3 *LED indications, buttons, and connectors*.

Figure 1-6 Front panel layout

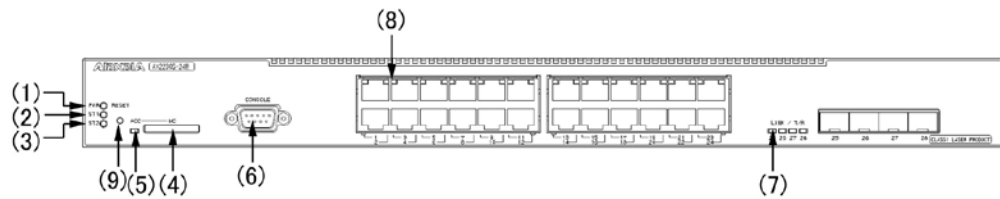


Table 1-3 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.
(3)	ST2	(Not used)	(Not used)	(Not used)
(4)	MC	Connector	Memory card slot	Memory card slot
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal
(7)	LINK / T/R	LED: Green	Indicates the operating status of an SFP slot Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Blinking green: Sending or receiving frames. Off: Link failure or block when the green ST1 LED is on#4
(8)	1-24	LED: Green	Indicates the operating status of a 10/100/1000BASE-T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Blinking green: A link is established and frames are being sent or received. Off: Link failure or block when the green ST1 LED is on#4
(9)	RESET	Button (non-locking)	Manual RESET button of the device#1	Restarts the device.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.

1. Components Overview

! WARNING

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.3 AX1250S-24T2C

The AX1250S-24T2C model has the following hardware specifications:

- Ethernet 10/100/1000BASE-T ports: 2
- Ethernet 10/100BASE-TX ports: 24
- SFP slots: 2
- Memory card slot: 1
- CONSOLE port: 1

NOTE

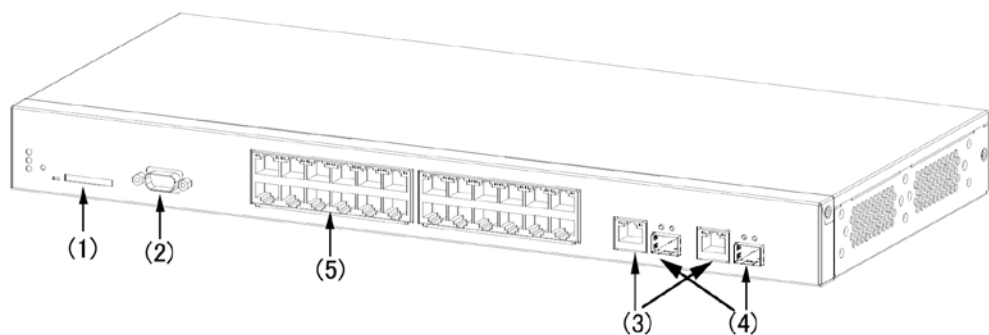
Since Switch ports 25 to 26 are shared by the SFP slots and 10/100/1000BASE-T, the ports cannot be assigned to both SFP and 10/100/1000BASE-T at the same time. Configure each port so that it is either assigned to an SFP slot or as a 10/100/1000BASE-T port. (By default, ports 25 to 26 are SFP slots.)
For details about editing the configuration, see the Software Manual.

NOTE

For information about the SFPs supported by the Switch, see *1.3.1 SFP*.

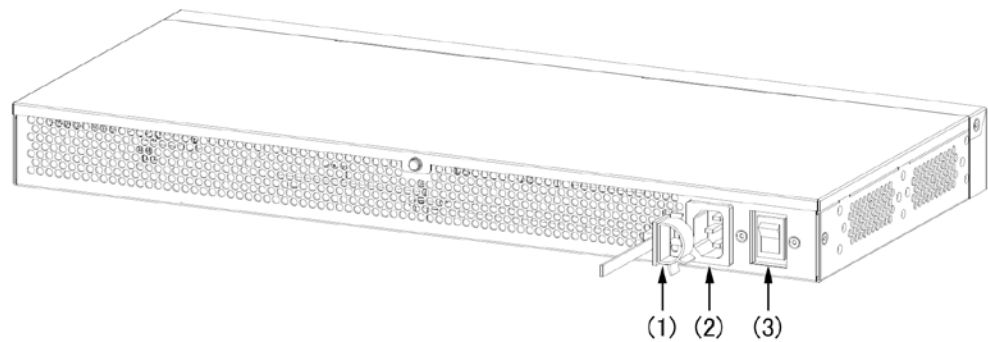
(1) External appearance

Figure 1-7 Front view



- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) 10/100BASE-TX Ethernet port

Figure 1-8 Back view



- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in Figure 1-9 *Front panel layout*. The numbers in the figure correspond to those in Table 1-4 *LED indications, buttons, and connectors*.

Figure 1-9 Front panel layout

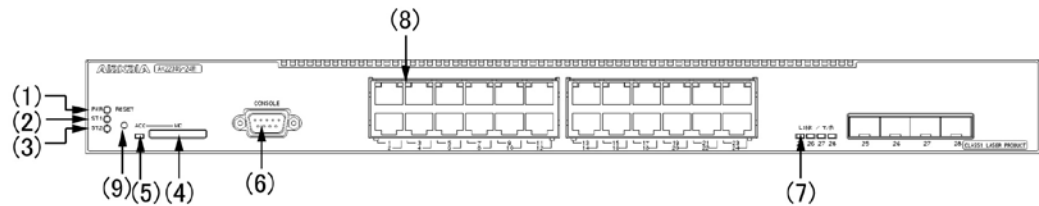


Table 1-4 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Blinking green at long intervals: Sleep mode Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Blinking green at long intervals: LED operation OFF setting Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.

1. Components Overview

No.	Name	Type	Description	Details
(3)	ST2	LED: Orange	(Not used)	Orange: Initial state at power-up Off: Unused after startup is complete
(4)	MC	Connector	Memory card slot	Memory card slot
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal
(7)	LINK	LED: Green	Indicates the operating status of a 1000BASE-X/T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Off: Link failure or block when the green ST1 LED is on#4
(8)	T/R	LED: Green		Blinking green: Sending or receiving frames.
(9)	1-24	LED: Green/Orange LED	Indicates the operating status of a 10/100BASE-TX Ethernet port.	Lit in green: A link is established. Blinking green: A link is established and frames are being sent or received. Orange: Initial state after the switch is turned on. Off: Link failure or block when the green ST1 LED is on#4
(10)	RESET	Button (non-locking)	Manual RESET button of the device ^{#1}	Restarts the device. When pressed continuously until all LEDs on the front panel are lit (3 seconds or more), the Switch is released from sleep mode.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.



WARNING

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.4 AX1240S-24T2C

The AX1240S-24T2C model has the following hardware specifications:

- Ethernet 10/100/1000BASE-T ports: 2
- Ethernet 10/100BASE-TX ports: 24
- SFP slots: 2
- Memory card slot: 1
- CONSOLE port: 1

NOTE

Since Switch ports 25 to 26 are shared by the SFP slots and 10/100/1000BASE-T, the ports cannot be assigned to both SFP and 10/100/1000BASE-T at the same time. Configure each port so that it is either assigned to an SFP slot or as a 10/100/1000BASE-T port. (By default, ports 25 to 26 are SFP slots.)

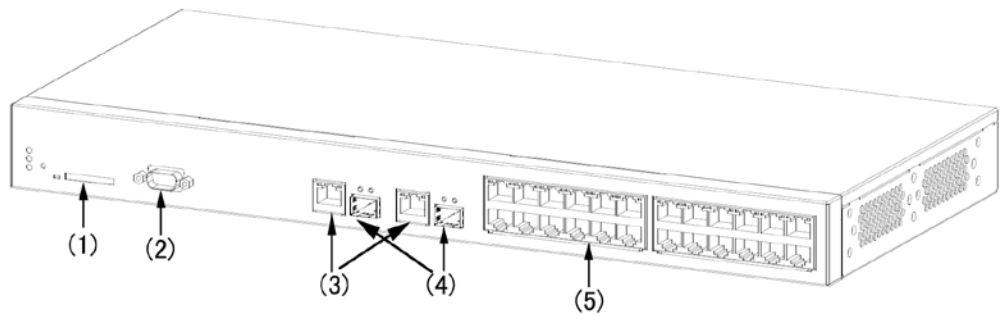
For details about editing the configuration, see the Software Manual.

NOTE

For information about the SFPs supported by the Switch, see *1.3.1 SFP*.

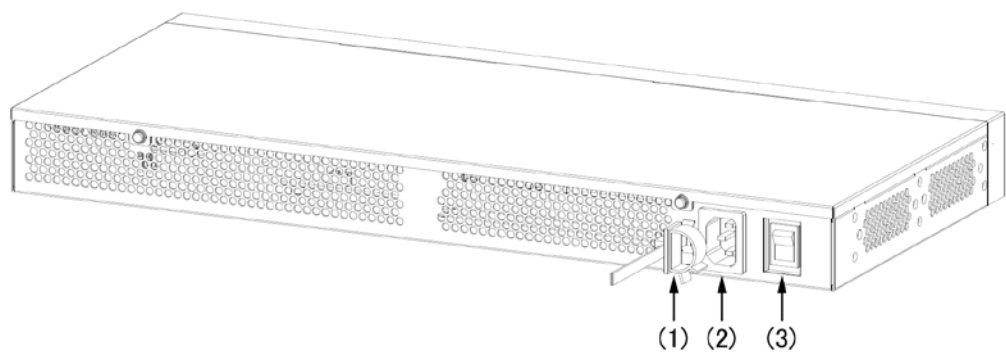
(1) External appearance

Figure 1-10 Front view



- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) 10/100BASE-TX Ethernet port

Figure 1-11 Back view



1. Components Overview

- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in Figure 1-12 *Front panel layout*. The numbers in the figure correspond to those in Table 1-5 *LED indications, buttons, and connectors*.

Figure 1-12 Front panel layout

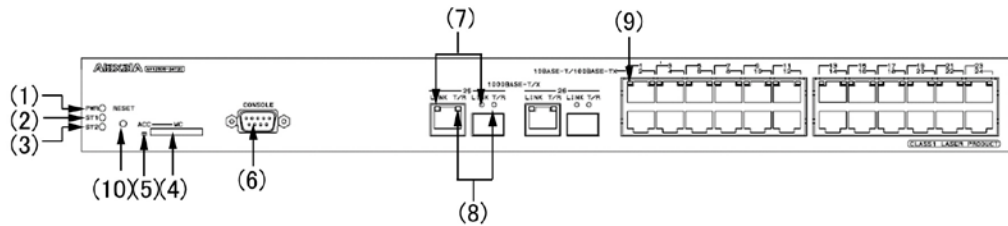


Table 1-5 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Blinking green at long intervals: Sleep mode Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Blinking green at long intervals: LED operation OFF setting Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.
(3)	ST2	LED: Orange	(Not used)	Orange: Initial state at power-up Off: Unused after startup is complete
(4)	MC	Connector	Memory card slot	Memory card slot
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal

No.	Name	Type	Description	Details
(7)	LINK	LED: Green	Indicates the operating status of a 1000BASE-X/T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Off: Link failure or block when the green ST1 LED is on#4
(8)	T/R	LED: Green		Blinking green: Sending or receiving frames.
(9)	1-24	LED: Green/Orange LED	Indicates the operating status of a 10/100BASE-T X Ethernet port.	Lit in green: A link is established. Blinking green: A link is established and frames are being sent or received. Orange: Initial state after the switch is turned on. Off: Link failure or block when the green ST1 LED is on#4
(10)	RESET	Button (non-locking)	Manual RESET button of the device#1	Restarts the device. When pressed continuously until all LEDs on the front panel are lit (3 seconds or more), the Switch is released from sleep mode.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.

**WARNING**

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.5 AX1240S-24P2C

The AX1240S-24P2C model has the following hardware specifications:

- Ethernet 10/100/1000BASE-T ports: 2
- Ethernet 10/100BASE-TX (supporting PoE) ports: 24
- SFP slots: 2
- Memory card slot: 1
- CONSOLE port: 1

NOTE

Since Switch ports 25 to 26 are shared by the SFP slots and 10/100/1000BASE-T, the ports cannot be assigned to both SFP and 10/100/1000BASE-T at the same time. Configure each port so that it is either assigned to an SFP slot or as a 10/100/1000BASE-T port. (By default, ports 25 to 26 are SFP slots.)
For details about editing the configuration, see the Software Manual.

NOTE

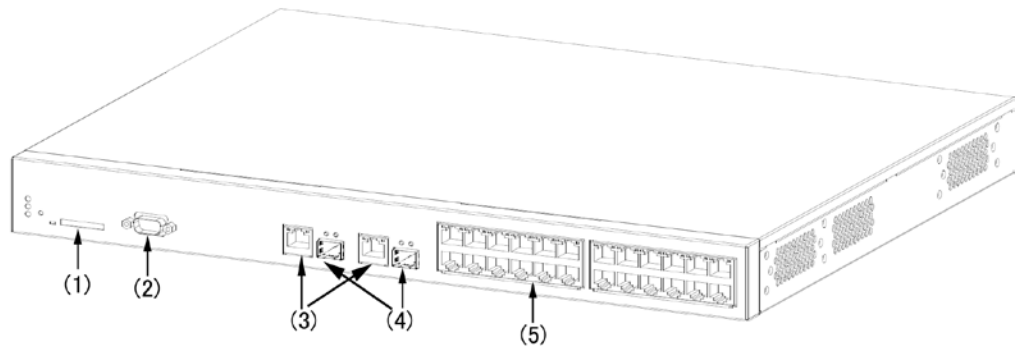
The Type A PoE system (Alternative A) is used for the Switch. For details, see 3.2.1 *Ethernet 10/100BASE-TX*.

NOTE

For information about the SFPs supported by the Switch, see [1.3.1 SFP](#).

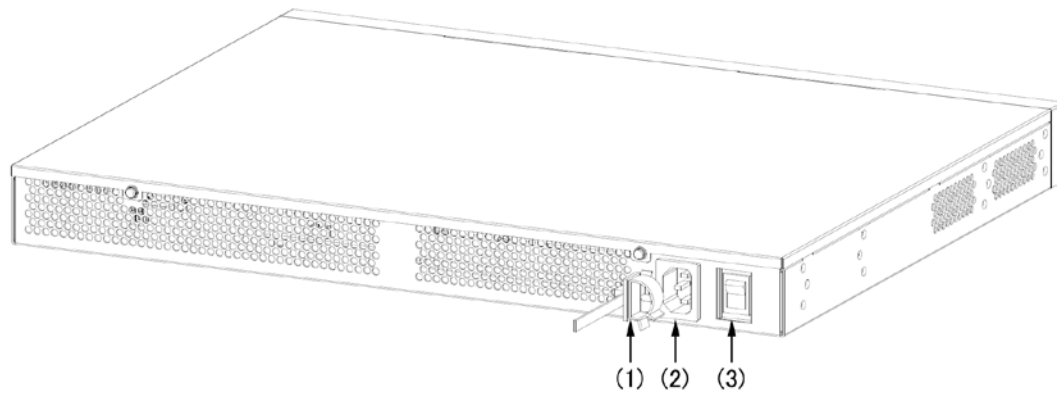
(1) External appearance

Figure 1-13 Front view



- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) 10/100BASE-TX Ethernet port

Figure 1-14 Back view



- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in [Figure 1-15 Front panel layout](#). The numbers in the figure correspond to those in [Table 1-6 LED indications, buttons, and connectors](#).

Figure 1-15 Front panel layout

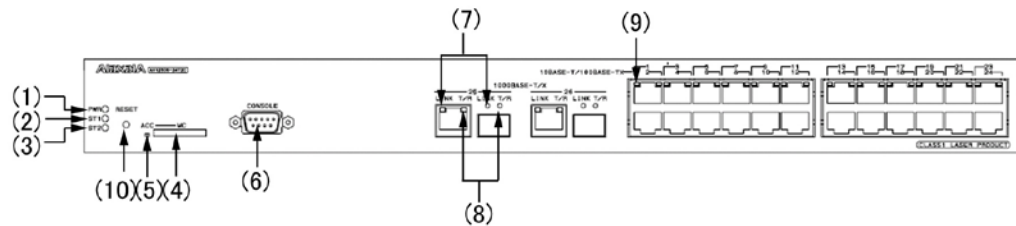


Table 1-6 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Blinking green at long intervals: Sleep mode Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Blinking green at long intervals: LED operation OFF setting Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.
(3)	ST2	LED: Orange	(Not used)	Orange: Initial state at power-up Off: Unused after startup is complete
(4)	MC	Connector	Memory card slot	Memory card slot
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal
(7)	LINK	LED: Green	Indicates the operating status of a 1000BASE-X/T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Off: Link failure or block when the green ST1 LED is on.
(8)	T/R	LED: Green		Blinking green: Sending or receiving frames.

1. Components Overview

No.	Name	Type	Description	Details
(9)	1-24	LED: Green/Orange LED	Indicates the operating status of a 10/100BASE-TX Ethernet port.	Lit in green: A link is established. Blinking green: A link is established and frames are being sent or received. Orange: Initial state after the switch is turned on. Off: Link failure or block when the green ST1 LED is on.
(10)	RESET	Button (non-locking)	Manual RESET button of the device ^{#1}	Restarts the device. When pressed continuously until all LEDs on the front panel are lit (3 seconds or more), the Switch is released from sleep mode.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.



WARNING

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.6 AX1240S-48T2C

The AX1240S-48T2C model has the following hardware specifications:

- Ethernet 10/100/1000BASE-T ports: 2
- Ethernet 10/100BASE-TX ports: 48
- SFP slots: 2
- Memory card slot: 1
- CONSOLE port: 1

NOTE

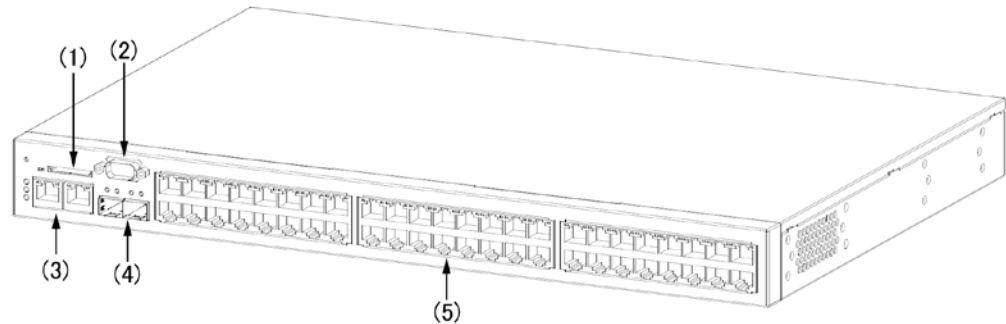
Since Switch ports 49 to 50 are shared by the SFP slots and 10/100/1000BASE-T, the ports cannot be assigned to both SFP and 10/100/1000BASE-T at the same time. Configure each port so that it is either assigned to an SFP slot or as a 10/100/1000BASE-T port. (By default, ports 49 to 50 are SFP slots.)
For details about editing the configuration, see the Software Manual.

NOTE

For information about the SFPs supported by the Switch, see *1.3.1 SFP*.

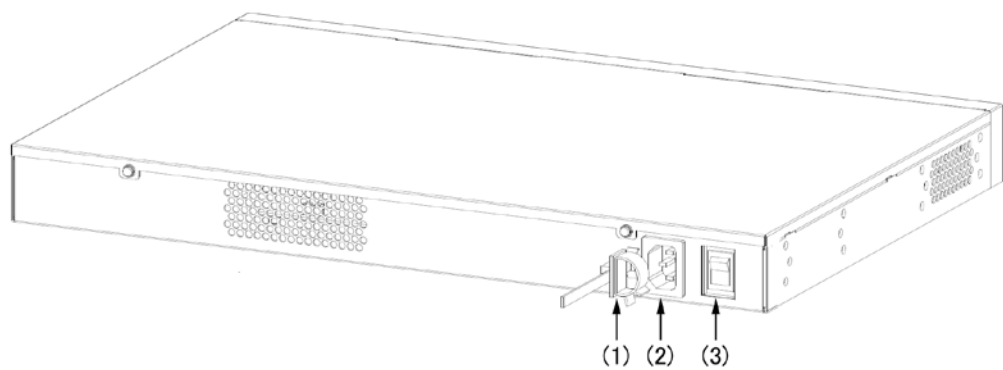
External appearance

Figure 1-16 Front view



- (1) Memory card slot
- (2) CONSOLE port
- (3) 10/100/1000BASE-T Ethernet port
- (4) SFP slot
- (5) 10/100BASE-TX Ethernet port

Figure 1-17 Back view



- (1) Cable clamp
- (2) AC power connector
- (3) Power switch

(2) Front panel

The front panel layout is shown in Figure 1-18 *Front panel layout*. The numbers in the figure correspond to those in Table 1-7 *LED indications, buttons, and connectors*.

1. Components Overview

Figure 1-18 Front panel layout

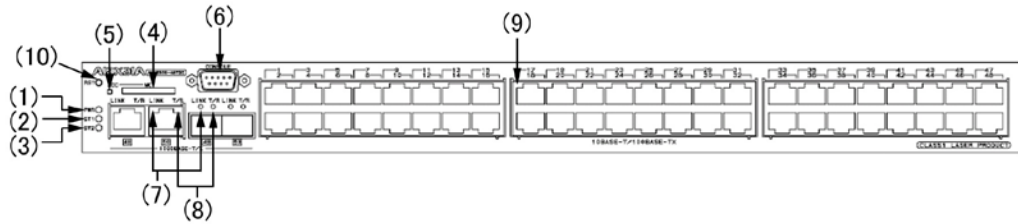


Table 1-7 LED indications, buttons, and connectors

No.	Name	Type	Description	Details
(1)	PWR	LED: Green	Indicates the power supply status.	Lit in green: Powered-on. Blinking green at long intervals: Sleep mode Off: Powered-off or a failure with a power supply unit.
(2)	ST1	Green, Orange, Red LED	Indicates the device status.	Lit in green: Standing by or operating. Blinking green: Getting ready (starting up). Blinking green at long intervals: LED operation OFF setting Orange: Initial state at power-up Blinking red: Partial failure with the switch Lit in red: Fatal failure in the device (operation cannot continue) Off: Powered-off or a failure with a power supply unit.
(3)	ST2	LED: Orange	(Not used)	Orange: Initial state at power-up Off: Unused after startup is complete
(4)	MC	Connector	Memory card slot	Memory card slot
(5)	ACC	LED: Green	Indicates the memory card status.	Lit: Accessing the memory card. (Do not remove the memory card.) Off: Memory card is in idle mode. (The memory card can be inserted or removed.)
(6)	CONSOLE	Connector	CONSOLE port	RS-232C port to connect a console terminal
(7)	LINK	LED: Green	Indicates the operating status of a 1000BASE-X/T Ethernet port.	Lit in green: Initial state after the switch is turned on, or when a link is established. Off: Link failure or block when the green ST1 LED is on#4
(8)	T/R	LED: Green		Blinking green: Sending or receiving frames.

No.	Name	Type	Description	Details
(9)	1-48	LED: Green/Orange LED	Indicates the operating status of a 10/100BASE-TX Ethernet port.	Lit in green: A link is established. Blinking green: A link is established and frames are being sent or received. Orange: Initial state after the switch is turned on. Off: Link failure or block when the green ST1 LED is on#4
(10)	RESET	Button (non-locking)	Manual RESET button of the device#1	Restarts the device. When pressed continuously until all LEDs on the front panel are lit (3 seconds or more), the Switch is released from sleep mode.

#1: The switch is behind the front panel. Use a screwdriver with a small head to press the button.

**WARNING**

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in a fire or electric shock.

1.1.7 Accessories

The items listed in Table 1-8 *Switch accessories* are included as accessories with shipment of the switch.

Table 1-8 Switch accessories

No.	Item	Quantity	Notes
1	Before using the Switch	1	Contains a checklist of the items included in the packaging. "switch" is replaced with the series name.
2	Safety Information	1	
3	Software license agreement	1	
4	Power cable	1	2-pin plugs, 3 m long
5	Rubber pad	4	
6	Rack mounting bracket	2	Brackets for 19-inch mounting racks
7	Screws	12	M3 x 6 [AX2200S] [AX1250S]
			M3 x 8 [AX1240S]

1. Components Overview

(1) Before using the AX2200S/AX1200S series switches

List of the bundled items with shipment of the Switch.

(2) For Safe Operation

Cautionary notes for safe use of the Switch are described.

Be sure to read through this document before using the switch.

(3) Software License Agreement

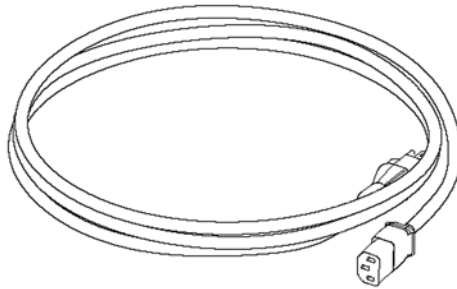
Terms and conditions regarding use of the software installed on the Switch.

Be sure to read through this document before using the switch.

(4) AC power cable

A 100 V AC power supply cable is included (3 m long; see Figure 1-19 AC power cable).

Figure 1-19 AC power cable



WARNING

When using the AX2200S or AX1250S series in a 100 V AC environment, use the supplied power cable or an optional cable available from ALAXALA. Using another cable could result in fire or electric shock. In addition, do not use an ALAXALA power cable with another switch. Doing so could result in a fire or electric shock.

WARNING

When using an AX1240S series switch in a 100 V AC environment, use the supplied power cable. This cable cannot be used with any other device. Using the power cable with another device is very dangerous and could result in fire or electric shock.

WARNING

When using a Switch in a 200 V AC environment, use only the separately sold ALAXALA power cable, or a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock. In addition, do not use an ALAXALA power cable with another switch. Doing so could result in a fire or electric shock.

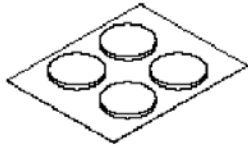
NOTE

For required specifications of power cables, see 2.3.2 *Electrical power equipment for 200 V AC*.

Rubber pad

Use these pads to install the product on a table.

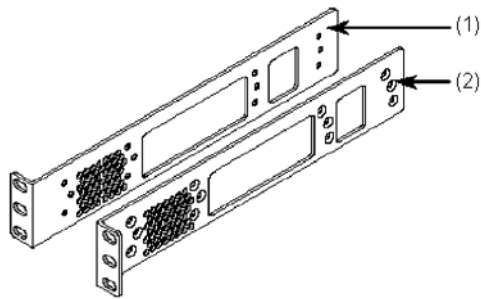
Figure 1-20 Rubber pad



Rack mounting bracket

Use these brackets to mount the device on a 19-inch cabinet rack.

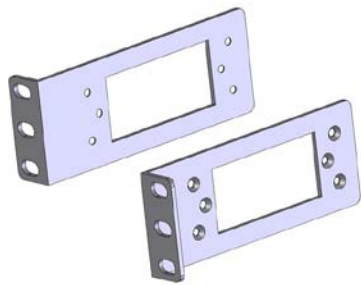
Figure 1-21 Rack mounting bracket (for AX2200S)



(1) Rack mounting bracket (L)

(2) Rack mounting bracket (R)

Figure 1-22 Rack mounting bracket (for AX1250S and AX1240S)



Screws

Use the screws to attach the rack mounting brackets to the device.

Figure 1-23 Screws



1.2 Memory card

A memory card is inserted in the memory card slot of the main device.

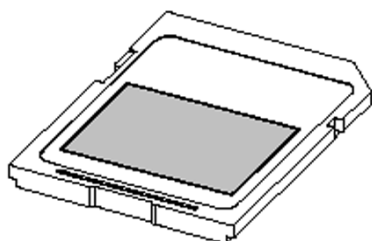
The memory card is used for the following:

- Saving failure information when a failure occurs
- Updating the Switch software

(1)SD128

Below is an SD memory card with a 128-MB capacity.

Figure 1-24 External appearance

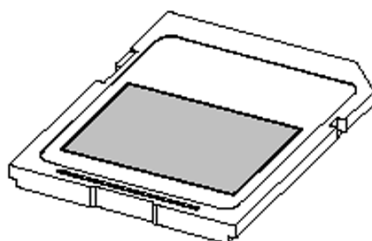


Label: AlaxalA SD128

(2)SD1G

Below is an SD memory card with a 1-GB capacity.

Figure 1-25 External appearance



Label: AlaxalA SD1G

NOTE

Make sure to use our standard products with the label shown in the figure. Otherwise, correct operation is not guaranteed.

NOTE

The memory card can be written to approximately ten thousand times.

1.3 Transceiver

1.3.1 SFP

To use the SFP, mount it to the SFP slot of the main device. Types of SFP transceivers can be distinguished by either of the following:

- Shape and lever color of the SFP transceiver (excluding SFP-FX and SFP-SX)
- Label information

Note that the supported SFP transceivers depend on the Switch model used. For compatibility between the switch and SFPs, see Table 1-9 *SFP list*.

NOTE

To distinguish between the SFP-FX and SFP-SX, please check the label.

NOTE

If the SFP is inserted into a switch, the SFP type can be identified by the interface information displayed by the show port command.
For details about the [show port](#) operation command, see 13. *Ethernet* in the *Software Manual Operation Command Reference*.

Table 1-9 SFP list

No.	Module name	Interface	Supported models
1	SFP-FX	Ethernet 100BASE-FX	AX1250S series
2	SFP-SX	Gigabit Ethernet 1000BASE-SX	AX2200S series, AX1250S series, AX1240S series
3	SFP-SX2	Gigabit Ethernet 1000BASE-SX2	
4	SFP-LX	Gigabit Ethernet 1000BASE-LX	
5	SFP-LH	Gigabit Ethernet 1000BASE-LH	
6	SFP-BX1U	Gigabit Ethernet 1000BASE--BX10-U ^{#1}	
7	SFP-BX1D	Gigabit Ethernet 1000BASE--BX10-D ^{#1}	
8	SFP-BX4U	Gigabit Ethernet 1000BASE--BX40-U ^{#2}	
9	SFP-BX4D	Gigabit Ethernet 1000BASE--BX40-D ^{#2}	

#1: 1000BASE-BX10-U and 1000BASE-BX10-D are paired to use.

#2: 1000BASE-BX40-U and 1000BASE-BX40-D are paired to use.

1. Components Overview

CAUTION

Laser beam, which is colorless and invisible, is used. Never look directly into the optical transceiver.

CAUTION

Do not attach any labels to a transceiver.

A label attached to the transceiver indicates that the transceiver is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or the mechanism that prevents the transceiver from coming loose from the cage.

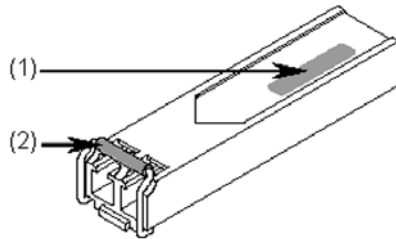
Attaching a label on an interfering part with heat radiation or the mechanism to avoid dropping from the cage might cause a failure in the transceiver or damage to the device.

NOTE

Make sure to use our standard products with the label shown in the figure. Otherwise, correct operation is not guaranteed.

(1)SFP-FX

Figure 1-26 External appearance



(1) Label: Alaxala SFP-FX

Label color: White

(2) Lever color: Black

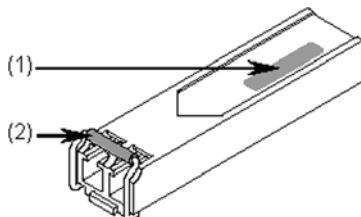
CAUTION

The switches below support SFP-FX (T). Use the transceiver only with the indicated switches. Not doing so could result in a Switch malfunction.

- AX1250S-24T2C (ports 25 to 26)

(2)SFP-SX

Figure 1-27 External appearance



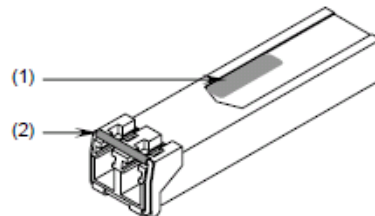
(1) Label: Alaxala SFP-SX

Label color: Black

(2) Lever color: Black

(3)SFP-SX2

Figure 1-28 External appearance



(1) Label: AlaxalA SFP-SX2

Label color: White

(2) Lever color: Silver

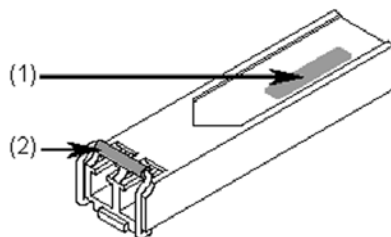
CAUTION

The switches below support SFP-SX2. Use the transceiver only with the indicated switches. Not doing so could result in a Switch malfunction.

- AX2230S-24T (ports 25 to 28)
- AX2230S-24P (ports 25 to 28)
- AX1250S-24T2C (ports 25 to 26)
- AX1240S-24T2C (ports 25 to 26)
- AX1240S-24P2C (ports 25 to 26)
- AX1240S-48T2C (ports 49 to 50)

(4)SFP-LX

Figure 1-29 External appearance



(1) Label: AlaxalA SFP-LX

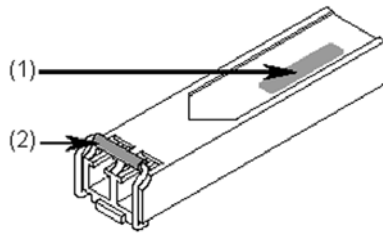
Label color: Blue

(2) Lever color: Blue

1. Components Overview

(5)SFP-LH

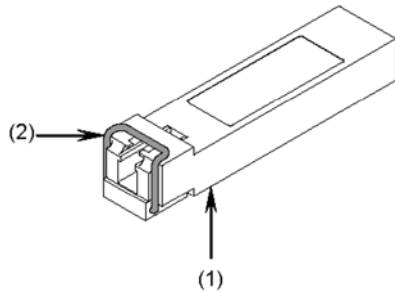
Figure 1-30 External appearance



- (1) Label: AlaxalA SFP-LH
Label color: Green
- (2) Lever color: Green

(6)SFP-BX1U

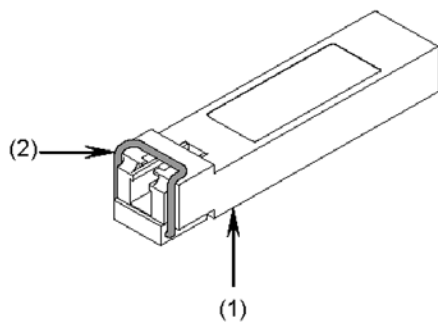
Figure 1-31 External appearance



- (1) Label: AlaxalA SFP-BX1U
Label color: White
- (2) Lever color: Blue

(7)SFP-BX1D

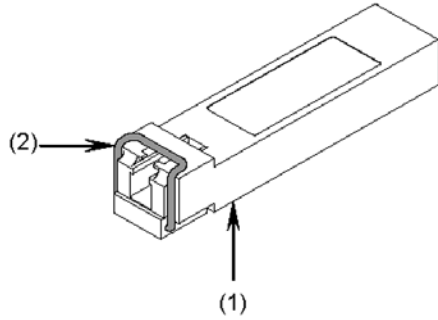
Figure 1-32 External appearance



- (1) Label: AlaxalA SFP-BX1D
Label color: White
- (2) Lever color: Magenta

(8)SFP-BX4U

Figure 1-33 External appearance



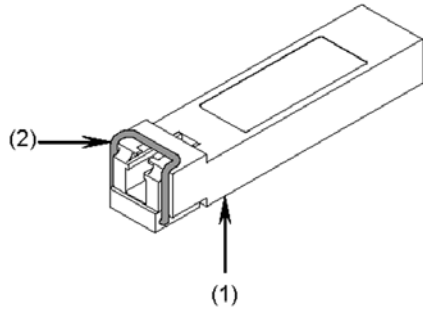
(1) Label: AlaxalA SFP-BX4U

Label color: White

(2) Lever color: Yellow

(9)SFP-BX4D

Figure 1-34 External appearance



(1) Label: AlaxalA SFP-BX4D

Label color: White

(2) Lever color: Green

1.3.2 Transceiver accessories

The items listed in Table 1-10 *Transceiver accessories* are included as accessories with shipment of the transceiver.

Table 1-10 Transceiver accessories

No.	Item	Quantity	Notes
1	Check list for bundled items	1	
2	For Safe Operation	1	

(1)Check list for bundled items

List of the bundled items with shipment of the transceiver

1. Components Overview

(2)For safe operation

This document includes important notes regarding safe use of the transceiver.
Be sure to read through this document before using the switch.

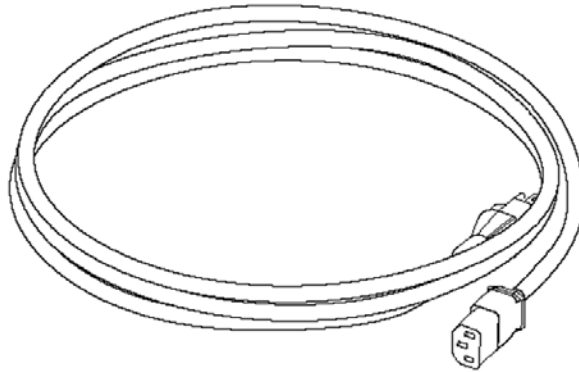
1.4 Power cable

(1) CBLACA

A 3.0-m long 100 V AC power cable (optional).

Use this cable when you use a switch in a 100 V AC environment.

Figure 1-35 External appearance



 **WARNING**

When using a switch in a 100 V AC environment, use the supplied power cable or an optional cable available from ALAXALA.

Using another cable could result in fire or electric shock.

In addition, do not use ALAXALA power cable with another switch.

Doing so could result in a fire or electric shock.

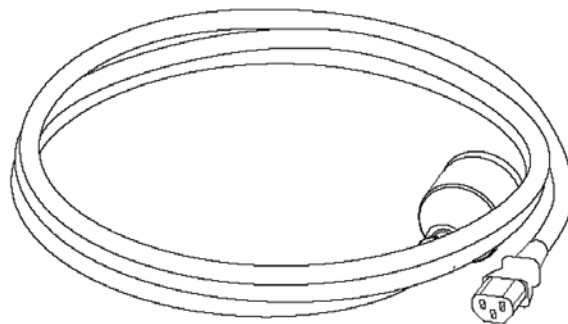
(2) CBL-A12

A 2.5 m 200 V AC power cable (sold separately).

Use this cable when you use a Switch in a 200 V AC environment.

Note that the disconnection-preventing bracket that comes with the CBL-A12 cable can be used only for the AX6300S, AX6600S, and AX6700S series switches. No disconnection-preventing bracket is necessary, since the Switch is equipped with a cable clamp for clamping cables.

Figure 1-36 External appearance



1. Components Overview

WARNING

When using a Switch in a 200 V AC environment, use only the separately sold ALAXALA power cable, or a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock. In addition, do not use ALAXALA power cable with another switch. Doing so could result in a fire or electric shock.

NOTE

If an optional ALAXALA power cable cannot be used with your electrical power equipment, use a power cable that meets ALAXALA specifications. For information about ALAXALA specified power cables, see 2.3.2 *Electrical power equipment for 200 V AC*.

2. Preparation for Installation

This chapter describes environmental conditions and the required preparation for installation of the Switch. Before preparing for an installation, read this chapter carefully and make sure that you understand all instructions and cautionary notes in this chapter.

2.1 Preparation workflow

2.2 Installation conditions

2.3 Electrical power equipment

2.4 Notes on electrical noise

2.5 Leakage current

2.6 Environmental requirements

2.7 Installation location

2.8 Maintenance area

2.9 Cooling conditions

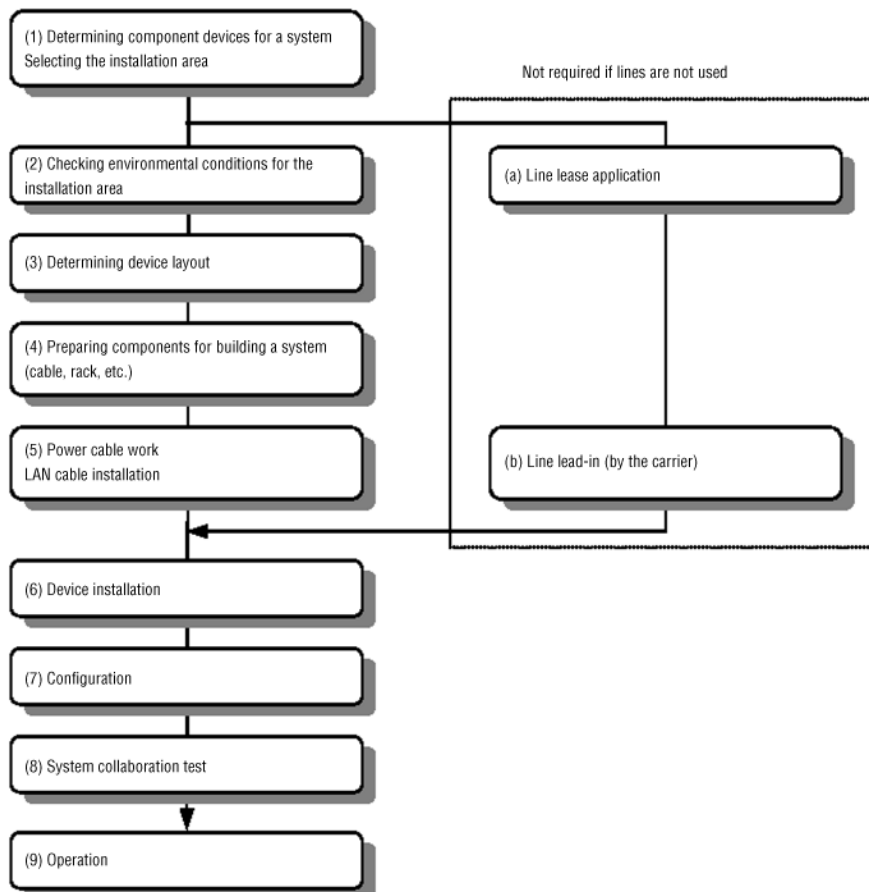
2.10 Noise of the Switch

2.1 Preparation workflow

The workflow to prepare for installation is shown in Figure 2-1 *Flowchart of the installation preparation*.

The workflow for supplying power, communication functions and LAN cable installation should be completed prior to carrying in the components. Make sure to schedule them in good time.

Figure 2-1 Flowchart of the installation preparation



2.2 Installation conditions

This section describes the requirements for installing the Switch. The installation environment must meet these conditions.

2.2.1 General installation conditions

The General Installation Conditions for the Switch are listed below.

Table 2-1 General installation requirements for AX2200S series switches

Item		Model	
		AX2230S-24T	AX2230S-24P
Dimensions (W x D x H) ^{#1}		445 x 230 x 43 mm	445 x 350 x 43 mm
Weight ^{#2}		3.0kg	5.0kg
Input voltage	Rating	Single phase 100 to 120 V AC, 200 to 240 V AC \pm ^{10%} #3	
Frequency		50/60 \pm 3 Hz	
Input current		0.5 @ AC100 V	6.7A @ 100 V AC
		0.3A @ 200 V AC	3.4A @ 200 V AC
Power consumption		30.0W	470.0W
Heat emission		108kJ/h	1,692kJ/h

#1: Excluding the dimensions of connectors.

#2: Weight of the main device only. The weight of cables, rack mounting brackets, memory cards and transceivers are excluded.

#3: The power supply cable included with the Switch supports only 100 V AC.

Table 2-2 General installation requirements for AX1250S series switches

Item		Model	
		AX1250S-24T2C	
Dimensions (W x D x H) ^{#1}		445 x 200 x 43 mm	
Weight ^{#2}		2.8kg	
Input voltage	Rating	Single phase 100 to 120 V AC, 200 to 240 V AC \pm ^{10%} #3	
Frequency		50/60 \pm 3 Hz	
Input current		0.18A @ 100 V AC	
		0.10A @ 200 V AC	

2. Preparation for Installation

Item	Model
	AX1250S-24T2C
Power consumption	18W/21W ^{#4}
Heat emission	65kJ/h

#1: Excluding the dimensions of connectors.

#2: Weight of the main device only. The weight of cables, rack mounting brackets, memory cards and transceivers are excluded.

#3: The power supply cable included with the Switch supports only 100 V AC.

#4: When using the two 1000BASE-LH (SFP) ports.

Table 2-3 General installation requirements for AX1240S series switches

Item	Model		
	AX1240S-24T2C	AX1240S-24P2C	AX1240S-48T2C
Dimensions (W x D x H) ^{#1}	445 x 200 x 43 mm	445 x 350 x 43 mm	445 x 250 x 43 mm
Weight ^{#2}	2.8kg	5.8kg	3.8kg
Input voltage	Rating	Single phase 100 to 120 V AC, 200 to 240 V AC \pm 10% ^{#3}	
Frequency	50/60 \pm 3 Hz		
Input current	0.18A @ 100 V AC	4.6A @ 100 V AC	0.31A @ 100 V AC
	0.10A @ 200 V AC	2.4A @ 200 V AC	0.17A @ 200 V AC
Power consumption	18W/21W ^{#4}	450W/453W ^{#4}	30W/33W ^{#4}
Heat emission	65kJ/h	1,620kJ/h	108kJ/h

#1: Excluding the dimensions of connectors.

#2: Weight of the main device only. The weight of cables, rack mounting brackets, memory cards and transceivers are excluded.

#3: The power supply cable included with the Switch supports only 100 V AC.

#4: When using the two 1000BASE-LH (SFP) ports.

2.2.2 Environmental requirements

The environmental conditions of the Switch are listed below.

Table 2-4 Environmental requirements

Item		Specification			
		AX2200S series		AX1250S series	AX1240S series
		AX2230S-24T	AX2230S-24P		
Noise ^{#1}		45 dB or less			
Vibration		0.25 G or less			
Dust		0.15 mg/m ³ or less			
Temperature	Operating	0 to 45 deg. C	0 to 50 deg. C	-10 to 50 deg. C ^{#3}	0 to 45 deg. C
	Not operating	-10 to 50 deg. C			
	During storage and transportation	-25 to 65 deg. C			
Humidity ^{#4}	Operating	10–90%RH			
	Not operating	8–90%RH			
	During storage and transportation	Less than 5–100%RH			

#1: Measured value according to ISO 7779.

#2: According to JIS Z 8813 Measuring Methods for Suspended Particulate Matter Concentration in Air - General Requirements.

#3: Temperature at startup is 0 to 50 deg. C.

#4: No condensation

2.3 Electrical power equipment

2.3.1 Electrical power equipment for 100 V AC

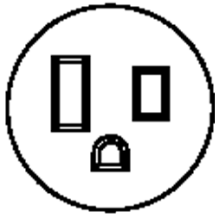
(1) Standards for electrical outlets

Use the electrical outlets conforming to the following JIS or NEMA standard. These electrical outlets are available at general electrical contractors.

Table 2-5 Standards for electrical outlets

Standards		Specifications
JIS	C-8303	15 A/125 V, 2-pole grounded straight-blade receptacle
NEMA	5-15R	

Figure 2-2 Two-pole grounded outlet (15 A/125 V)



⚠ WARNING

Always use a grounded power outlet for the Switch. Failure to do so might not only result in electric shock, but it might also introduce unwanted electrical noise that could cause a Switch failure.

(2) Distribution board

The branch circuit to supply power to the Switch requires circuit breakers or other devices. When selecting circuit breakers, make sure that they meet the following rating, considering the input current and inrush current/time.

- Rated breaking capacity: 15AT (for a 15 A circuit) or less

For details about input current of the Switch, see 2.2.1 *General installation conditions*, and for details about inrush current and time of the Switch, see Table 2-6 *Inrush current*.

Table 2-6 Inrush current

Series	Model	Current (peak value)	Time
AX2200S	AX2230S-24T	15A	10 ms or less
	AX2230S-24P	15A	
AX1200S	AX1250S-24T2C	30A	
	AX1240S-24T2C	15A	

Series	Model	Current (peak value)	Time
	AX1240S-24P2C	30A	
	AX1240S-48T2C	15A	

NOTE

For easy operation, it is recommended that the distribution board should be installed in the same room as the Switch or the adjacent room.

(3) Conditions for the incoming power to the distribution board

The capacity of electrical current supplied to the distribution board should be larger than that of the breaker operating current.

⚠ WARNING

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

NOTE

Generally, the breaker operating current is larger than the rated current. Check the specifications of the circuit breaker.

In addition, if you power on the Switch, it has inrush current listed in *Table 2-6 Inrush current*. Consider measures to prevent voltage reduction of the power supply due to inrush current.

⚠ WARNING

Turning on the Switch causes an inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same electrical power equipment.

2. Preparation for Installation

2.3.2 Electrical power equipment for 200 V AC

(1) AC power cable


An optional 200 V AC power cable is available that allows the Switch to be used in a 200 V AC environment. For information about the 200 V AC power cable, see *1.4 Power cable*.

NOTE

If an optional ALAXALA power cable cannot be used with your power equipment, use a power cable that meets the following ALAXALA specifications.

Use the power cable described below.

Table 2-7 Specifications for the 200 V AC power supply cable

Item	Connector (on the Switch side)	Cable	Plug (on the outlet side)
Rating	250 V 10 A or higher PSE approved product	250 V 10 A or higher PSE approved product	250 V 10 A or higher PSE approved product
Type		Three cores	Prepare a plug suitable for the outlet.

⚠ WARNING

When using a Switch in a 200 V AC environment, use only the separately sold ALAXALA power cable, or a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock. In addition, do not use the supplied power cable with another switch. Doing so could result in a fire or electric shock.

(2) Standards for electrical outlets

If you use the ALAXALA optional power cable, use the outlet below. These electrical outlets are available at general electrical contractors.

Table 2-8 Standards for electrical outlets

Standards		Specifications
JIS	C-8303	20 A 250 V grounding double-pole twist-locking socket
NEMA	L6-20R	

Figure 2-3 20 A 250 V grounding double-pole twist-locking socket



If you do not want to use the ALAXALA optional power cable, use the outlet below.

This type of electrical outlet is available from general contractors for electrical installation.

- Two-pin grounded twist-lock outlet 250 V 10 A or higher



WARNING

Always use a grounded power outlet for the Switch. Failure to do so might not only result in electric shock, but it might also introduce unwanted electrical noise that could cause a Switch failure.

Distribution board

The branch circuit to supply power to the Switch requires circuit breakers or other devices. When selecting circuit breakers, make sure that they meet the following rating, considering the input current and inrush current/time.

- Rated breaking capacity: 10AT (for a 10 A circuit) or less

For details about input current of the Switch, see 2.2.1 *General installation conditions*, and for details about inrush current and time of the Switch, see Table 2-9 *Inrush current*.

Table 2-9 Inrush current

Series	Model	Current (peak value)	Time
AX2200S	AX2230S-24T	30A	10 ms or less
	AX2230S-24P	30A	
AX1200S	AX1250S-24T2C	65A	
	AX1240S-24T2C	30A	
	AX1240S-24P2C	65A	
	AX1240S-48T2C	30A	

NOTE

For easy operation, it is recommended that the distribution board should be installed in the same room as the Switch or the adjacent room.

Conditions for the incoming power to the distribution board

The capacity of electrical current supplied to the distribution board should be larger than that of the breaker operating current.



WARNING

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

NOTE

Generally, the breaker operating current is larger than the rated current. Check the specifications of the circuit breaker.

2. Preparation for Installation

In addition, if you power on the Switch, it has inrush current listed in Table 2-9 *Inrush current*. Consider measures to prevent voltage reduction of the power supply due to inrush current.

CAUTION

Turning on the Switch causes an inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same electrical power equipment.

2.4 Notes on electrical noise

Electrical noise emitted by other instruments can cause failures.

Note the following points when designing an electrical power equipment plan:

- The branch circuit of a power supply to the Switch should not be accompanied with devices or instruments that have a relay or micro switches to turn it on and off repeatedly, such as air conditioners.
- The service ground terminal of the device (Type D grounding) should directly connect to the ground plate or, if possible, a dedicated ground system for the Switch.
- As for the devices and the instruments emitting electrical noise, embed a circuit to prevent noise generation.
- The cables connected to the Switch are roughly categorized into power cables and signal cables, which are basically different in electrical characteristics. Avoid banding or twisting both types of cables when laying them.
- Do not route the communication lines along the power cables.

2.5 Leakage current

The Switch is equipped with a noise filter to prevent failures due to electrical noise and leakage current through the protective ground line (Type D grounding). Each device has at most 1 mA of leakage current.

Be sure to take other factors into consideration, such as compliance with the Fire Service Act or other legislation.

2.6 Environmental requirements

(1) Dust

Do not install the Switch in a humid or dusty place. The dust conditions of the Switch are as follows:

- Airborne dust concentration: 0.15 mg/m³ or less (according to JIS Z 8813 Measuring Methods for Suspended Particulate Matter Concentration in Air: General Requirements)

NOTE

Generally, areas around printers or lots of people contain a lot of toner or dust. Do not install a switch in such places.

(2) Corrosive and flammable gases

Install a switch somewhere without corrosive or flammable gases. Corrosive gas can deteriorate the switch and reduce its reliability.

(3) Floor surface material

The Switch can be installed in an ordinary office room. However, it is recommended that the floor surface be the following:

- Fire resistance
- Dust-free

(4) Direct sunlight

Do not expose the switch to direct sunlight.

(5) Water

Keep the device away from spilt water when cleaning the floor.

(6) Electromagnetic interference

Note high-frequency equipment might emit interfering waves and affect normal operation of the Switch.

The Switch also generates faint high-frequency radio waves and might have an effect on indoor antennas for television, radio and transceivers within 30 m of the device.

(7) Protecting cables

Route the cables through ducts or cover them for protection.

Mice might bite off unprotected cables.

Optical fiber requires special handling; lay the cables with a bend radius of more than 100 mm along the major axis and 50 mm along the minor axis, and protect them with metal covers.

Regarding optical fiber cables containing the required number of cores, ensure that there is a protective structure against repeated mechanical stress due to bending, stretching, compressing and straightening during laying the cables as well as environmental stresses after installed.

(8) Spraying

Before using pesticide spray or disinfectant in the room where the device is installed, cover

2. Preparation for Installation

the device to prevent exposure to chemicals.

(9) Earthquake countermeasures

An earthquake can cause a switch to be moved, fall, or knocked out of a window, possibly resulting in death or injury. Take sufficient measures to prevent the switch from moving or falling.

NOTE

The actual seismic force on the device is different from that on land and varies based on the amplification factor affected by the building structure and the floor level of the room containing the switch. In general, the fifth floor and above of a nine-story medium-rise building causing two to three times the amount of shaking expected on land.

In actual earthquake cases in the past, the following has been discovered:

- A switch moved 10 to 30 cm.
- A rack fell down.
- An object on the fixture in the room dropped onto a switch.

2.7 Installation location

The Switch can be installed either on a table or a 19-inch cabinet rack.

(1) Table

Install the Switch on a level, stable and flat table. In addition, satisfy the requirements described in Table 2-10 *Conditions for installing the device on a table*.

Table 2-10 Conditions for installing the device on a table

Item	Conditions
Space for air intake and exhaust	Ensure more than 50 mm of free space around all air vents of the Switch. (For details, see 2.9 <i>Cooling conditions</i> .)
Space for cables	Ensure 100 mm of free space in front and rear of the Switch to deal with the cables.
Noise of the switch	For details about noise, see 2.10 <i>Noise of the Switch</i> .

CAUTION

If placing the Switch on a desk, lay it on its side on a workbench capable of withstanding the weight of the Switch. If, for example, you place the Switch on a shaky table or a tilted surface, the Switch might fall and possibly injure someone.

CAUTION

Because the AX2230S-24T, AX1250S-24T2C, and AX1240S-24T2C are fanless models, heat also dissipates from the top panels of these switches. To ensure adequate heat dissipation, do not stack another device on top of or below the Switch.

When mounting these Switches in a rack, keep a space of 1U or more between them.

(2) 19-inch cabinet rack

When mounting the device on a rack, satisfy the rack requirements described in Table 2-11 *Rack requirements*. In addition, provide the items listed in Table 2-12 *Required items for mounting the device on a rack*.

Table 2-11 Rack requirements

Item	Conditions
Rack standard	19-inch cabinet rack conforming to the EIA standard
Space for air intake and exhaust	Ensure more than 50 mm of free space from all air vents of the Switch, the rack pillars and side walls. (For details, see 2.9 <i>Cooling conditions</i> .)
Space for cables	Ensure 100 mm of free space in front and rear of the Switch to deal with the cables.

2. Preparation for Installation

Table 2-12 Required items for mounting the device on a rack

Item	Conditions
Screws supplied with the rack	M5 screws x 4

NOTE

The supplied rack mounting brackets are designed for M5 screws. Prepare a rack that accommodates M5 screws.

2.8 Maintenance area

Ensure the proper amount of space for maintenance of the Switch as described below.

(1) Maintenance area for a Switch on a table

The required space for maintenance varies depending on the models. For the required maintenance area in front and rear of the switch, see Table 2-13 *Front and rear maintenance space*.

Figure 2-4 Maintenance area for a Switch on a table

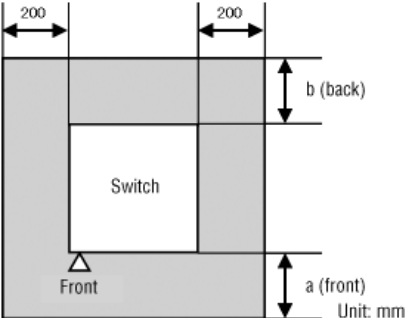
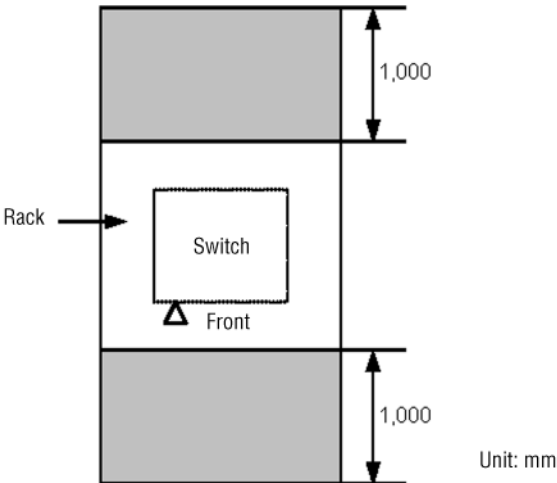


Table 2-13 Front and rear maintenance space

a (front)	b (rear)
200	200

Maintenance area for a rack-mounted Switch

Figure 2-5 Maintenance area for a rack-mounted Switch



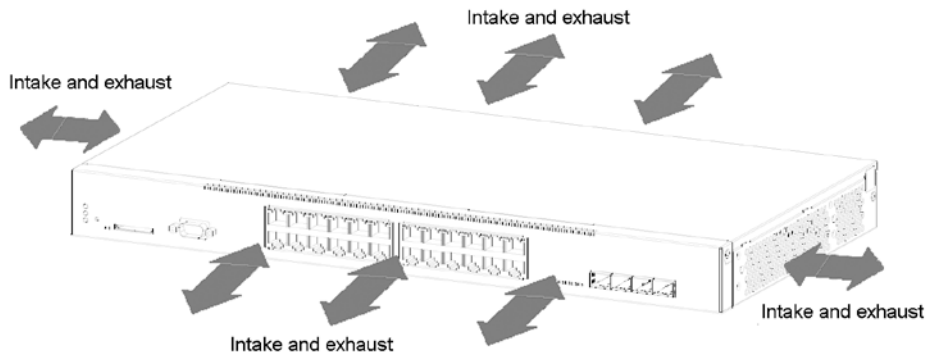
2.9 Cooling conditions

2.9.1 Air flow

(1) Switch (model AX2230S-24T)

The airflow into and out of the Switch is shown in Figure 2-6 *Airflow for model AX2230S-24T*.

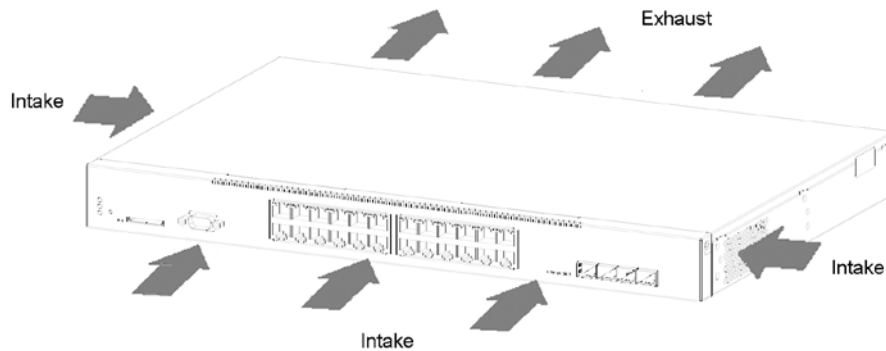
Figure 2-6 Airflow for model AX2230S-24T



(2) Switch (model AX2230S-24P)

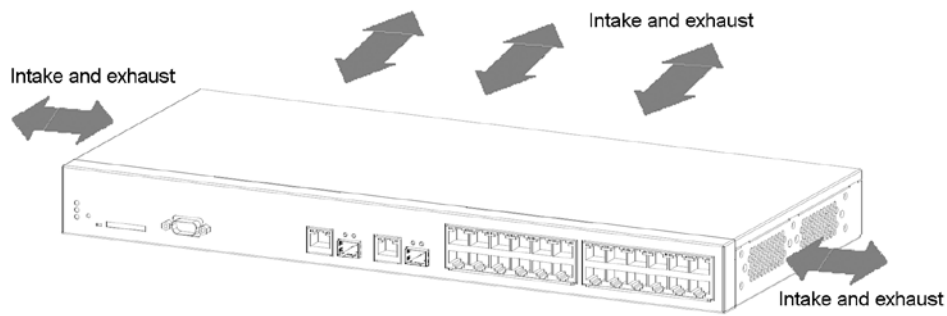
The airflow into and out of the Switch is shown in Figure 2-7 *Airflow for model AX2230S-24P*.

Figure 2-7 Airflow for model AX2230S-24P

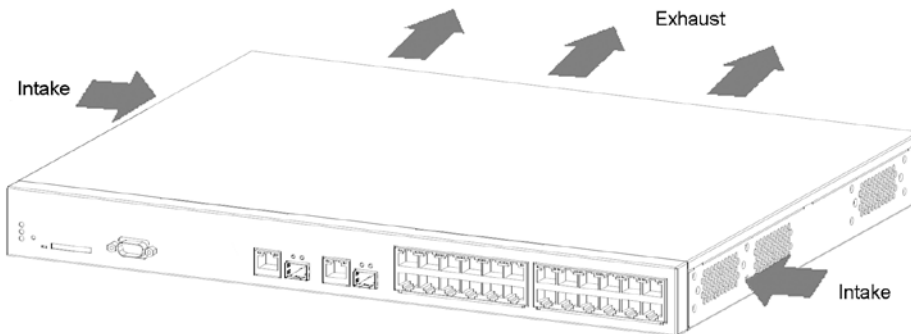


(3) Switch (models AX1250S-24T2C and AX1240S-24T2C)

The airflow into and out of the Switch is shown in Figure 2-8 *Airflow for models AX1250S-24T2C and AX1240S-24T2C*.

Figure 2-8 Airflow for models AX1250S-24T2C and AX1240S-24T2C**(4) Switch (models AX1240S-24P2C and AX1240S-48T2C)**

The airflow into and out of the Switch is shown in Figure 2-9 *Airflow for models AX1240S-24P2C and AX1240S-48T2C*.

Figure 2-9 Airflow for models AX1240S-24P2C and AX1240S-48T2C**2.9.2 Cooling conditions for the Switch on a table**

Ensure more than 50 mm of space for air flow from the sides of the device.

CAUTION

Do not block the ventilation slots. Otherwise, internal heat is not discharged, which may cause damage. Maintain a space of at least 50 mm around the ventilation slots.

NOTE

When other equipment with a forced air cooling system exists near this switch, air flow from different systems can interfere and adversely affect the cooling of the switch. Keep sufficient space or place a partition between the systems to prevent air flow interference.

Note that the partition should be more than 50 mm away from the side panel of the switch.

- The exhausted air from other equipment might be taken into the switch, and the intake air temperature of the switch might exceed the environmental specification limits.
- When other equipment has an intake or exhaust air system that is too strong, air moving in the opposite direction of the switch's air flow might be generated, affecting the internal cooling performance.

2.9.3 Cooling conditions for a rack-mounted device

Ensure more than 50 mm of space between the device and all structural components of the

2. Preparation for Installation

rack including the side walls, pillars, guide rails and front and rear doors.

CAUTION

Because the AX2230S-24T, AX1250S-24T2C, and AX1240S-24T2C are fanless models, heat also dissipates from the top panels of these switches. To ensure adequate heat dissipation, do not stack another device on top of or below the Switch.

When mounting these Switches in a rack, keep a space of 1U or more between them.

CAUTION

Do not block the ventilation slots. Otherwise, internal heat is not discharged, which may cause damage. Maintain a space of at least 50 mm around the ventilation slots.

NOTE

Make sure that the temperature inside the rack is within the operating temperature specified for the switch. Otherwise, the device might malfunction or fail. To meet the temperature requirements, consider the following means:

- Install fans inside the rack for sufficient ventilation.
- Replace the front and the rear doors with punched holes for cooling or remove the doors in order to achieve good ventilation.
- Reduce the number of items contained in the rack and mount the device under other heat emitting bodies when necessary.

NOTE

When equipment with forced air cooling systems is installed above or below the Switch, interference due to the airflow from nearby equipment can adversely affect the cooling of the Switch, which might result in a malfunction. Keep spaces between the systems in the rack to prevent air flow interference.

- The exhaust airflow from nearby equipment might be drawn into the Switch, and the Switch air intake temperature might exceed the environment requirements.
- When nearby equipment has too strong an intake or exhaust air system, reverse air pressure might affect the Switch airflow, decreasing the performance of internal cooling.

2.10 Noise of the Switch

With the exception of models AX2230S-24T, AX1250S-24T2C, and AX1240S-24T2C, Switches contain cooling fans that generate noise. Take noise into account when planning the switch installation layout.

For details about the noise from the switch, see *2.2 Installation conditions*.

NOTE

The following tips are for a layout design that takes noise into account:

- Separate the area by using partitions or shelves to block the direct propagation of noise.
- Do not install the Switch in frequently used areas (such as in offices, in meeting rooms, or on desks).
- Install the Switch in a corner of the office area.
- Install the Switch in a rack.
- Avoid installation near windows or other objects that easily reflect sound.

2. Preparation for Installation

3. Preparation of Interface Cables and Terminals

This chapter describes the interface cables and the terminals used for the Switch.

3.1 Connecting interface cables and terminals

3.2 Network interface specifications

3.1 Connecting interface cables and terminals

The applicable interfaces for the Switch and the cables to connect to the interfaces are listed in Table 3-1 *Interface cables and terminal connection cables*.

The user should provide these cables.

Table 3-1 Interface cables and terminal connection cables

Port/Slot	Transceiver	Interface	Cable	Connector
10/100BASE-TX port (PoE not supported)	–	10BASE-T	UTP cable (Category 3 or higher)	RJ45 Connector
		100BASE-TX	UTP cable (Category 5 or higher)	
10/100BASE-TX port (PoE supported)	–	10BASE-T	UTP cable (Category 5 or higher) ^{#1}	
		100BASE-TX	UTP cable (Category 5 or higher)	
10/100/1000BASE-T port (PoE not supported)	–	10BASE-T	UTP cable (Category 3 or higher)	
		100BASE-TX	UTP cable (Category 5 or higher)	
		1000BASE-T	UTP cable (Enhanced Category 5 or higher)	
10/100/1000BASE-T port (PoE supported)	–	10BASE-T	UTP cable (Category 5 or higher)	
		100BASE-TX	UTP cable (Category 5 or higher)	
		1000BASE-T	UTP cable (Enhanced Category 5 or higher) ^{#2}	
SFP slot	SFP-FX	100BASE-FX	Multiple-terminal mode optical fiber (core/cladding diameter = 50 μm/125 μm)	LC2 core Connector
			Multiple-terminal mode optical fiber (core/cladding diameter = 62.5 μm/125 μm)	
	SFP-SX	1000BASE-SX	Multiple-terminal mode optical fiber (core/cladding diameter = 50 μm/125 μm)	

3. Preparation of Interface Cables and Terminals

Port/Slot	Transceiver	Interface	Cable	Connector
			Multiple-terminal mode optical fiber (core/cladding diameter = 62.5 μm/125 μm)	
	SFP-SX 2	1000BASE-SX2	Multiple-terminal mode optical fiber (core/cladding diameter = 50 μm/125 μm)	
			Multiple-terminal mode optical fiber (core/cladding diameter = 62.5 μm/125 μm)	
	SFP-LX	1000BASE-LX	Multi-mode fiber optic cable ^{#3} (core/cladding diameter = 50 μm/125 μm)	
			Multi-mode fiber optic cable ^{#3} (core/cladding diameter = 62.5 μm/125 μm)	
			Single-terminal mode optical fiber (core/cladding diameter = 10 μm/125 μm)	
	SFP-LH	1000BASE-LH	Single-terminal mode optical fiber (core/cladding diameter = 10 μm/125 μm)	
			Single-terminal mode optical fiber (core/cladding diameter = 8 μm/125 μm)	
	SFP-BX1U	1000BASE-BX10-U	Single-terminal mode optical fiber (core/cladding diameter = 10 μm/125 μm)	LC1 core Connector
	SFP-BX1D	1000BASE-BX10-D		
	SFP-BX4U	1000BASE-BX40-U		
	SFP-BX4D	1000BASE-BX40-D		
CONSOLE port	–	RS-232C	RS-232C crossover cable	D-sub (9-pin)

#1: Category 5 or higher UTP cable is recommended for the PoE connection.

#2: When connecting a 30.0 W or higher powered device, use an enhanced category 5 or higher UTP cable.

#3: When using 1000BASE-LX with multi-mode fiber optic cable, depending on the kind of fiber optic cable, the BER (bit error rate) might increase. In such cases, use of mode-conditioning patch cords can clear the communication problem.

3. Preparation of Interface Cables and Terminals

NOTE

The optical fiber cables should be 3 m longer than the length needed to maintain the device. The extra part should be wound near the device. When optical fiber and other interface cables are used together, pay attention not to apply excessive stress on the optical fibers.

NOTE

Always have some extra optical fiber cables on hand.

NOTE

For details about interfaces, see *B. Physical Specifications of Network Interfaces*.

3.2 Network interface specifications

3.2.1 Ethernet 10/100BASE-TX

(1) Mode setting on the port

Any of the modes below can be specified for Ethernet 10/100BASE-TX ports. The factory default setting is auto-negotiation.

- Auto negotiation (default)
- 100BASE-TX full duplex (fixed)
- 100BASE-TX half duplex (fixed)
- 10BASE-T full duplex (fixed)
- 10BASE-T half duplex (fixed)

NOTE

The following modes are applicable under auto-negotiation on the 10/100BASE-TX port:

- 100BASE-TX full duplex
- 100BASE-TX half duplex
- 10BASE-T full duplex
- 10BASE-T half duplex

(2) Flow control functionality

This function is enabled when the connection is fixed to full duplex.

(3) Auto MDI/MDI-X functionality

This function is enabled when auto negotiation is specified.

In the fixed settings, MDI-X is always selected.

(4) PoE system

For the power supply pin configuration of the AC power supply (PoE) models, the Alternative A method defined in standards IEEE 802.3af and IEEE 802.3at is used. The power supply to equipment (powered devices) conforming to IEEE 802.3af and IEEE 802.3at standards is supported.

For power supply pin assignments on the Switch, see Table 3-2 *Power supply pin assignment*.

Table 3-2 Power supply pin assignment

RJ 45 pin number	Signal name
1	Negative Vport
2	Negative Vport
3	Positive Vport
4	-
5	-

3. Preparation of Interface Cables and Terminals

RJ 45 pin number	Signal name
6	Positive Vport
7	-
8	-

3.2.2 Ethernet 10/100/1000BASE-T

(1) Mode setting on the port

Any of the following modes can be specified for the Ethernet 10/100/1000BASE-T port. The factory default setting is auto-negotiation.

- Auto negotiation (default)
- 100BASE-TX full duplex (fixed)
- 100BASE-TX half duplex (fixed)
- 10BASE-T full duplex (fixed)
- 10BASE-T half duplex (fixed)

NOTE

The following modes and auto negotiation are applicable to the Ethernet 10/100/1000BASE-T port:

- 100BASE-T full duplex
- 100BASE-TX full duplex
- 100BASE-TX half duplex
- 10BASE-T full duplex
- 10BASE-T half duplex

NOTE

As for 1000BASE-T, the fixed settings and half-duplex communication are not supported.

(2) Flow control functionality

This function is enabled when the connection is fixed to full duplex.

(3) Auto MDI/MDI-X functionality

This function is enabled when auto negotiation is specified.

In the fixed settings, MDI-X is always selected.

(4) PoE system

For the power supply pin configuration of the AC power supply (PoE) models, the Alternative A method defined in standards IEEE 802.3af and IEEE 802.3at is used. The power supply to equipment (powered devices) conforming to IEEE 802.3af and IEEE 802.3at standards is supported.

For power supply pin assignments on the Switch, see Table 3-3 *Power supply pin assignment*.

Table 3-3 Power supply pin assignment

RJ 45 pin number	Pair	Signal name
1	A	Negative Vport
2	A	Negative Vport
3	B	Positive Vport
4	C	–
5	C	–
6	B	Positive Vport
7	D	–
8	D	–

When using the 60 W power source function, combine the Alternative A and Alternative B systems specified in IEEE802.3af and IEEE802.3at to use all of the four pairs in RJ45 pins to supply power.

For the power supply pin assignment of the Switches when using the 60 W power supply function, see *Table 3-4 Power supply ping assignment when using the 60 W power supply function*.

Table 3-4 Power supply ping assignment when using the 60 W power supply function

RJ 45 pin number	Pair	Signal name
1	A	Negative Vport
2	A	Negative Vport
3	B	Positive Vport
4	C	Positive Vport
5	C	Positive Vport
6	B	Positive Vport
7	D	Negative Vport
8	D	Negative Vport

NOTE

When using the 60 W power supply function, connect a power device that meets *Table 3-4 Power supply ping assignment when using the 60 W power supply function*.

3. Preparation of Interface Cables and Terminals

3.2.3 Ethernet 100BASE-FX [AX1250S]

(1) Mode setting on the port

The available mode setting for Ethernet 100BASE-FX ports is fixed to full duplex.

NOTE

Auto-negotiation and half-duplex (fixed) communication are not supported.

(2) Flow control functionality

This function is enabled when the connection is fixed to full duplex.

3.2.4 Ethernet 1000BASE-X

(1) Mode setting on the port

The available mode setting for Ethernet 1000BASE-X ports is fixed to full duplex.

NOTE

Half-duplex (fixed) communication is not supported.

(2) Flow control functionality

This function is enabled when the connection is fixed to full duplex.

4. Installing Components and Adding, Replacing, or Removing Switches

This chapter provides the procedures for installing components and for adding, replacing, or removing Switches.

4.1 Required tools

4.2 Precautions before starting an installation

4.3 Installation of the main device

4.4 Connecting and disconnecting a power cable to and from the main device

4.5 Inserting and removing memory cards

4.6 Inserting and removing SFPs

4.7 Connecting a setup terminal

4.8 Connecting interface cables

4.9 Powering the main device on and off

4.10 Expansion, replacement and removal of main devices

4.1 Required tools

The following tools are necessary for installing the components:

Phillips screwdriver no. 1:

Used to attach the rack mounting brackets to the Switch.

Phillips screwdriver no. 2:

Used to attach the rack mounting brackets to the rack.

Antistatic wrist strap:

Protect the device from electrostatic discharge.

4.2 Precautions before starting an installation

 CAUTION

When installing the Switch on a table, position the Switch horizontally. If the Switch is positioned vertically or leaned against a wall, the Switch might fall, which could result in injury or damage.

 CAUTION

For switches on tables, avoid an unstable places including wobbly tables and tilted surfaces. Install the switch horizontally on a solid table. Otherwise, the switch might fall and cause injury.

 CAUTION

Do not place anything on the Switch. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

CAUTION

Do not block the ventilation slots. Otherwise, internal heat is not discharged, which may cause damage. Maintain a space of at least 50 mm around the ventilation slots.

CAUTION

Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

NOTE

Install the device somewhere where the LEDs can be easily seen.

NOTE

Route the cables through ducts or cover them for protection. Optical fiber requires special handling; lay the cables with a bend radius of more than 100 mm on the major axis and 50 mm on the minor axis, and protect them with metal covers.

NOTE

The optical fiber cables should be 3 m longer than the length needed to maintain the device. The extra part should be wound near the device. When optical fiber and other interface cables are used together, be sure to not to apply excessive stress on the optical fibers.

4.3 Installation of the main device

This section describes the way to install the device on a table or a rack. Follow the procedures below.

4.3.1 Table mount

This device can be installed on the level, stable, flat surface. The installation procedures are as follows:

[Step 1]

Flip the EPU upside down on a flat surface.

[Step 2]

Attach the four rubber pads within the marks on the bottom of the EPU.

Figure 4-1 Attaching the rubber pads



(1) Rubber pad

(2) Mark

NOTE

Confirm that the position to attach the rubber pad has no dirt. Wipe any dirt off with a dry cloth before attaching the rubber pad.

[Step 3]

Flip the EPU back over and mount it on the table.

4.3.2 Rack mount

This device can be installed into a 19-inch cabinet rack conforming to the EIA standard. The procedure is as follows:

NOTE

The supplied rack mounting brackets are designed for M5 screws. Prepare a rack that accommodates M5 screws.

NOTE

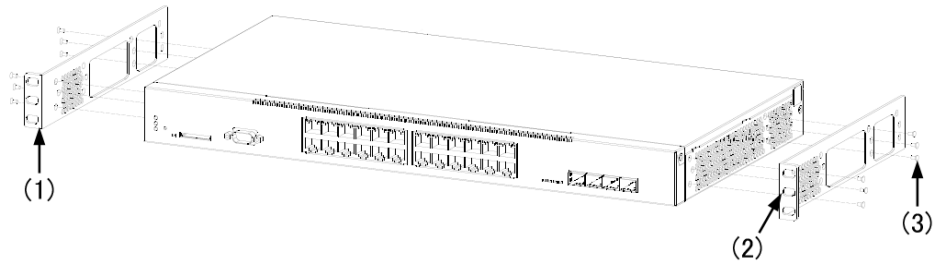
For rack-mounting conditions, see *2.7 Installation location (2) 19-inch cabinet rack*.

4. Installing Components and Adding, Replacing, or Removing Switches

[Step 1]

Attach the rack mounting brackets to the Switch.

Figure 4-2 Attaching rack mounting brackets (AX2200S)



(1) Rack mounting bracket (L)

(2) Rack mounting bracket (R)

(3) Screws (M3 x 6 for each bracket, 12 screws in all)

NOTE

Rack mounting brackets are provided on the left and right sides. The left rack mounting bracket is marked with an "L", and the right with an "R".

NOTE

When installing a Switch in a rack, if you cannot maintain 100 mm of space (for cables), slide the brackets 50 mm toward you and attach them as shown in *Figure 4-4 Attaching the rack mounting brackets (50 mm adjustment) (AX2200S)*.

Figure 4-3 Attaching rack mounting brackets (AX1250S and AX1240S series switches)

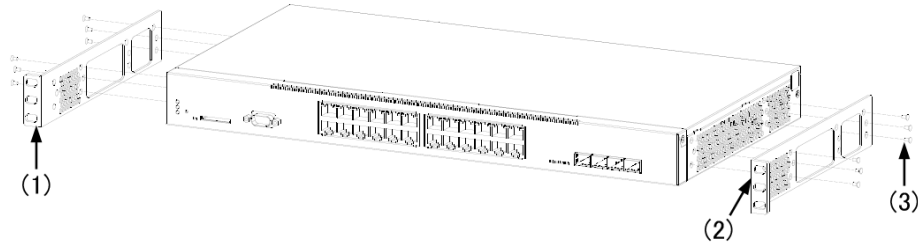


(1) Rack mounting bracket

(2) Screws (M3 x 6, 12 screws for the AX1250S, M3 x 8, 12 screws for the AX1240S)

4. Installing Components and Adding, Replacing, or Removing Switches

Figure 4-4 Attaching the rack mounting brackets (50 mm adjustment) (AX2200S)



- (1) Rack mounting bracket (L)
- (2) Rack mounting bracket (R)
- (3) Screws (M3 x 6 for each bracket, 12 screws in all)

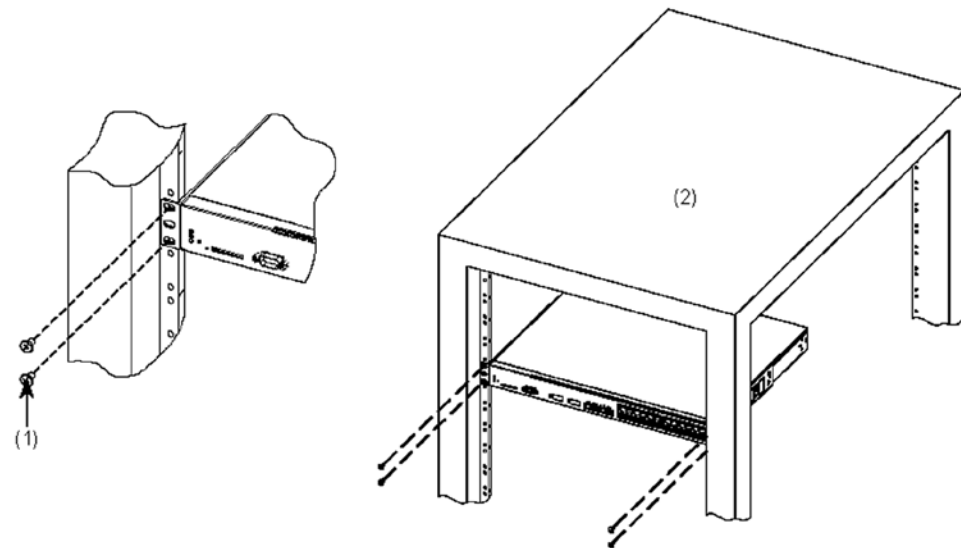
NOTE

Use the supplied screws when attaching the rack mounting brackets to the EPU.

[Step 2]

Mount the EPU into the rack.

Figure 4-5 Mounting into the rack



- (1) Screws (M5 x 4)
- (2) 19-inch cabinet rack

CAUTION

Before installing an EPU in a rack, make sure the device is stable. If the Switch is not positioned correctly, injury could result from falling equipment or stumbling over the equipment.

NOTE

When installing an EPU in a rack, use the supplied M5 screws.

4.4 Connecting and disconnecting a power cable to and from the main device

This section describes how to connect and disconnect a power cable to and from the main device.

Follow the procedures below to connect or disconnect the power cable.

4.4.1 AC power cable

WARNING

Always use a grounded outlet. Failure to do so might not only result in electric shock, but it might also introduce unwanted electrical noise that could cause a Switch failure.

NOTE

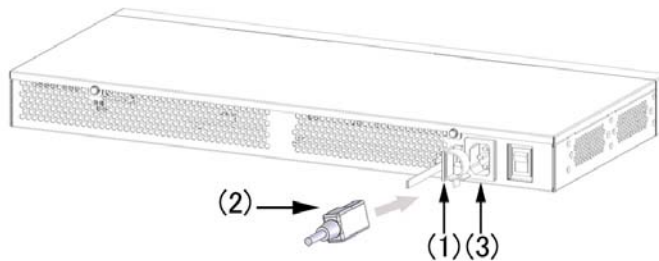
When a switch is installed in a rack, use the cable holder supplied with the rack to fix the power cable in order to prevent stress on the cable base.

(1) Installing

[Step 1]

Connect the supplied power cable to the AC power connector on the rear of the Switch.

Figure 4-6 Attaching the power cable



- (1) Cable clamp
- (2) AC power cable
- (3) AC power connector

WARNING

When using an AX2200S- or AX1250S-series switch in a 100 VAC environment, use the supplied power cable or an optional cable available from ALAXALA.

Using another cable could result in fire or electric shock.

In addition, do not use the supplied power cable with another switch.

Doing so could result in a fire or electric shock.

WARNING

The AC power supply cable included with the AX1240S series is for use only with the Switch. It cannot be used with any other device. Using the power cable with another device is very dangerous and could result in fire or electric shock.

4. Installing Components and Adding, Replacing, or Removing Switches

⚠ WARNING

When using a Switch in a 200 V AC environment, use only the separately sold ALAXALA power cable, or a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock. In addition, do not use the supplied power cable with another switch. Doing so could result in a fire or electric shock.

CAUTION

Before connecting or disconnecting a power cable, use the power switch to turn the Switch off.

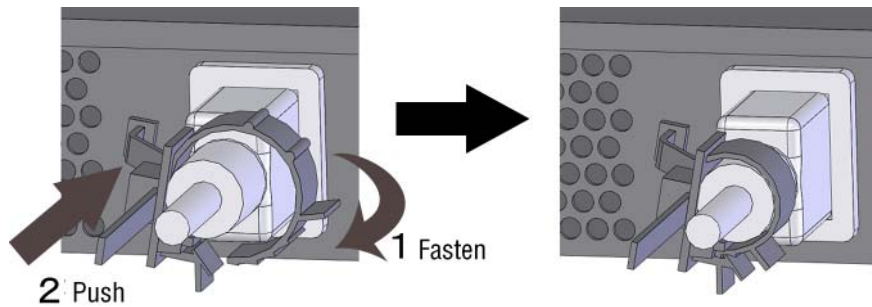
NOTE

For required specifications of power cables, see 2.3.2 *Electrical power equipment for 200 V AC*.

[Step 2]

Hold the power cable connector with the cable clamp.

Figure 4-7 Clamping the power cable



(2) Removing

Unfasten the cable clamp to detach the power cable.

CAUTION

Before connecting or disconnecting a power cable, use the power switch to turn the Switch off.

4.5 Inserting and removing memory cards

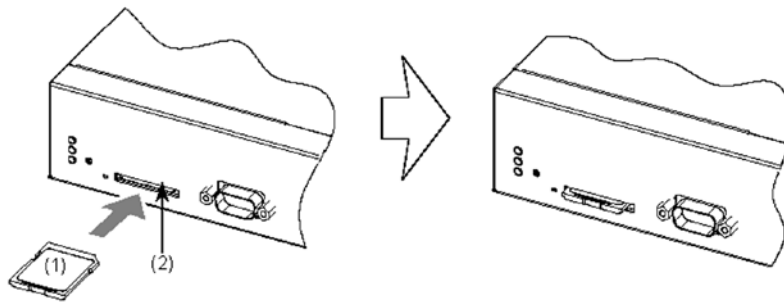
CAUTION

When moving the Switch, remove memory cards. If a card is subjected to excessive force when the switch is moved, the connector of the memory card slot might be damaged.

(1) Installing

Insert it into the device until you hear a click, and then release your finger slowly. (Hold the memory card with the cut-off corner on the right.)

Figure 4-8 Inserting the memory card



(1) Memory card

(2) Memory card slot

CAUTION

When inserting a memory card, do not push the card too strongly or flick it with your finger. Doing so might damage the connector of the memory card slot.

NOTE

To avoid deleting and writing data, slide the protection switch to Lock.

NOTE

Before installing a memory card, remove any dust in and around the memory card slot with a dry cloth.

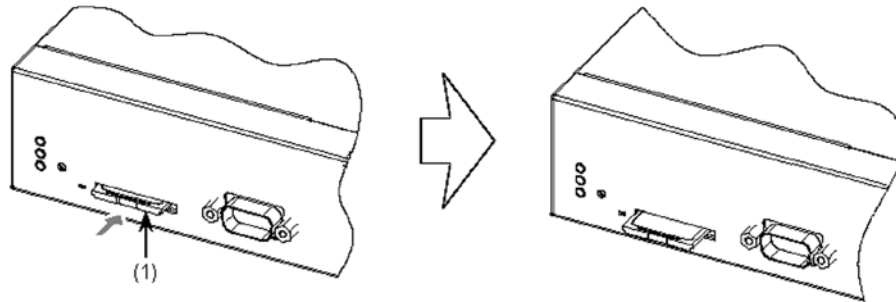
(2) Removing

[Step 1]

Push the memory card in until you hear a click. (The lock is released, and the memory card is ejected slightly.)

4. Installing Components and Adding, Replacing, or Removing Switches

Figure 4-9 Removing the memory card

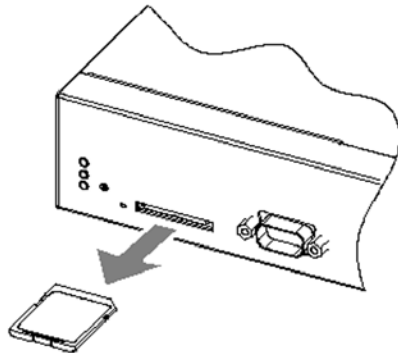


(1) Memory card

[Step 2]

Remove the memory card.

Figure 4-10 Removing the memory card



CAUTION

The device is accessing the memory card whenever the ACC LED is lit. While a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card.

In addition, some commands require a certain amount of time after being entered to finish accessing the card. Confirm that access has ended before removing the memory card or turning the power supply unit off.

CAUTION

Do not forcibly pull the locked memory card to remove it. Doing so might damage the connector of the memory card slot.

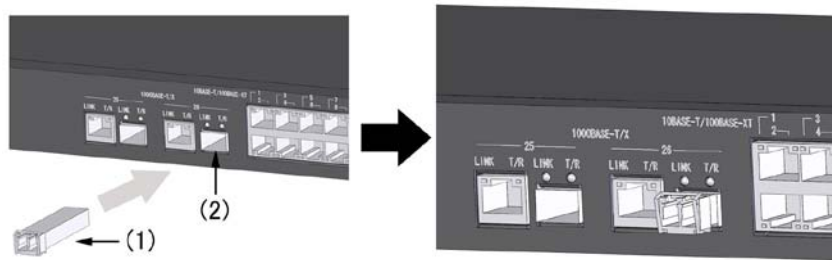
4.6 Inserting and removing SFPs

SFPs can be inserted and removed without turning off the switch.

(1) Installing

Keep the handle upright as shown in the figure and insert the SFP until you hear a click.

Figure 4-11 Inserting an SFP transceiver

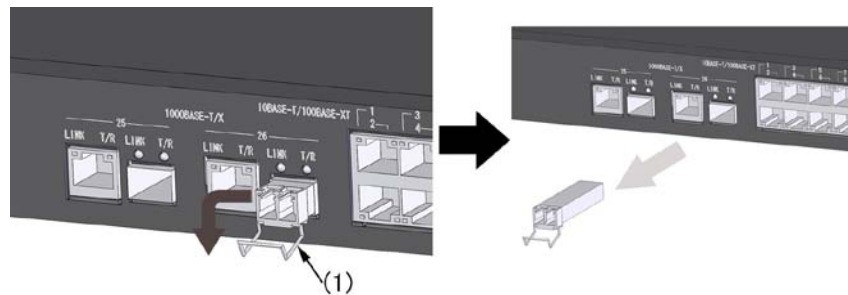


- (1) SFP
- (2) SFP slot

(2) Removing

Move down the handle in the direction of the arrow. Hold the handle to pull out the SFP.

Figure 4-12 Removing the SFP



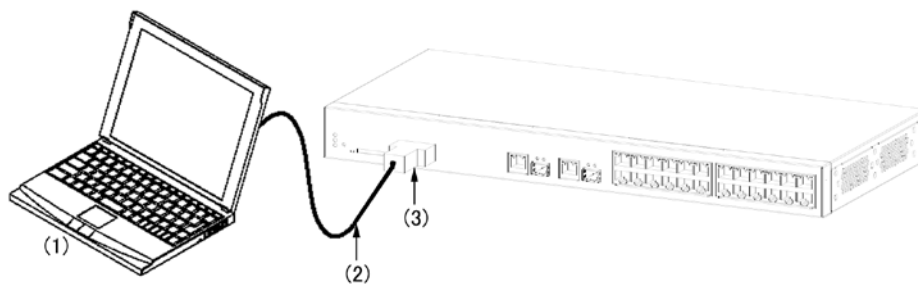
- (1) Handle

4.7 Connecting a setup terminal

Connect a setup terminal to the CONSOLE port of the Switch.

For this connection, use an RS-232C crossover cable with D-sub 9-pin female connectors on both ends.

Figure 4-13 Connection schematic of the setup terminal

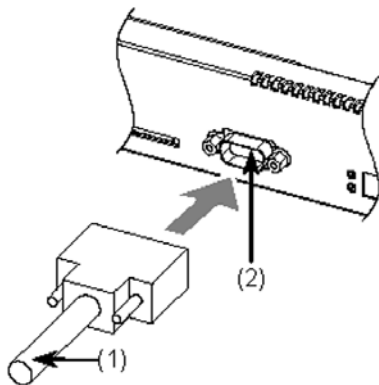


- (1) Setup terminal
- (2) RS-232C cable
- (3) CONSOLE port

[Step 1]

Connect an RS-232C cable to the CONSOLE port of the Switch.

Figure 4-14 Connecting the RS-232C cable



- (1) RS-232C cable
- (2) CONSOLE port

NOTE

After the setup terminal is connected to the port, tighten the screws. Also make sure the terminal is firmly connected.

[Step 2]

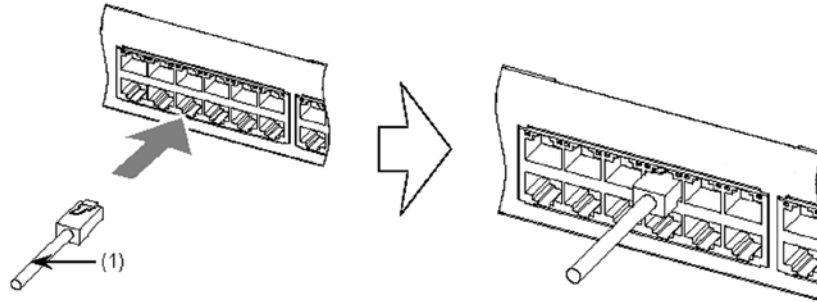
Connect an RS-232C cable to the setup terminal in the same way.

4.8 Connecting interface cables

(1) UTP cable

Insert the connector until you hear a click.

Figure 4-15 Attaching the UTP cable



(1) UTP cable

NOTE

For detaching the cable, pull out the connector with the tab held down.

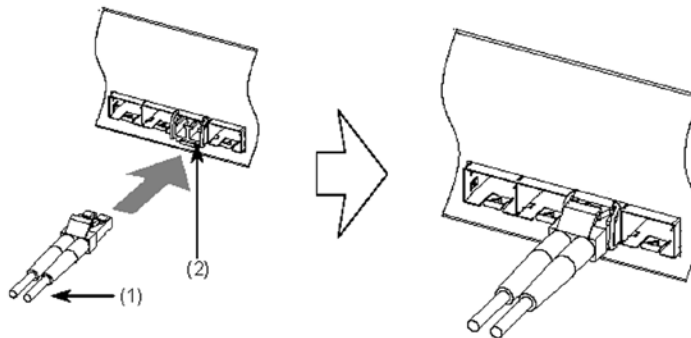
NOTE

For a PoE connection, if you disconnect and then re-connect a UTP cable within two seconds of connecting the cable, the power class of the equipment on the power-receiving side might not be recognized correctly. Wait for more than two seconds before attaching the cable again.

(2) Optical fiber cable (LC duplex connector)

Insert the connector until you hear a click.

Figure 4-16 Optical fiber cable (LC duplex connector)



(1) Optical fiber cable (LC duplex connector)

(2) Transceiver

4. Installing Components and Adding, Replacing, or Removing Switches

NOTE

To clean the optical connector, see *A. Cleaning Optical Connectors*.

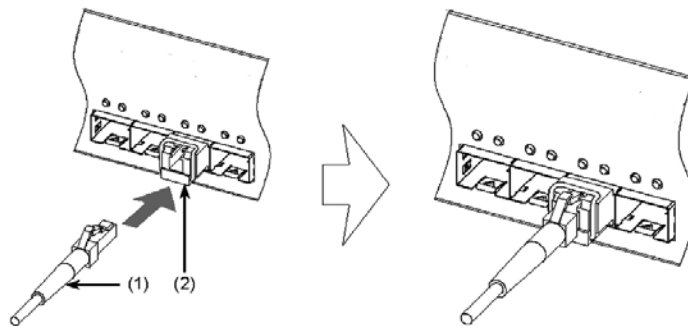
NOTE

For detaching the cable, pull out the connector with the tab held down.

(3) Optical fiber cable (LC simplex connector)

Insert the connector until you hear a click.

Figure 4-17 Optical fiber cable (LC simplex connector)



(1) Optical fiber cable (LC simplex connector)

(2) Transceiver

NOTE

To clean the optical connector, see *A. Cleaning Optical Connectors*.

NOTE

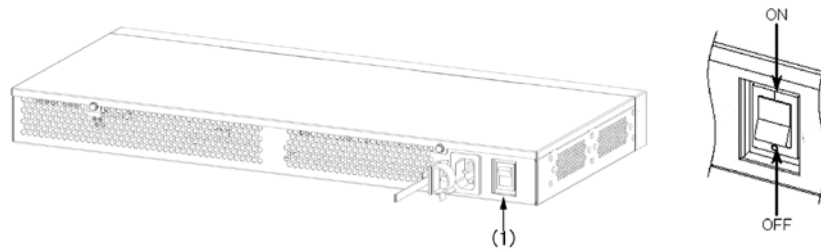
For detaching the cable, pull out the connector with the tab held down.

4.9 Powering the main device on and off

(1) Turning on the power

Turn on the power switch on the back face of the device.

Figure 4-18 Turning on the power



(1) Power switch

(2) Power off

Turn off the power switch on the back face of the device.

CAUTION

The device is accessing the memory card whenever the ACC LED is lit. While a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card.

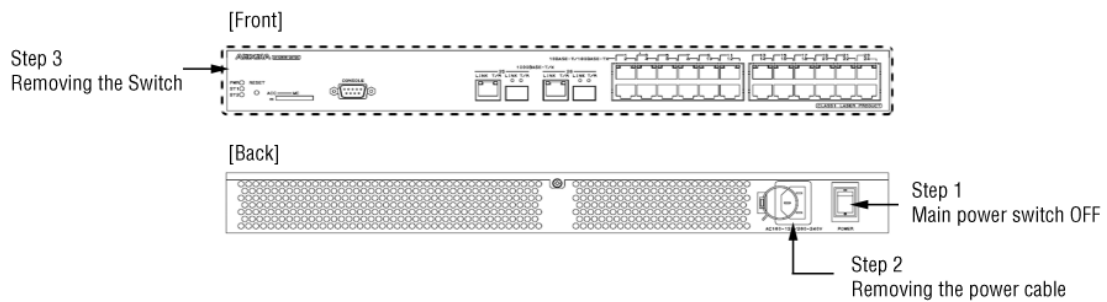
In addition, some commands require a certain amount of time after being entered to finish accessing the card. Confirm that access has ended before removing the memory card or turning the power supply unit off.

4.10 Expansion, replacement and removal of main devices

This section describes the procedures for installing or uninstalling the main device.

Follow the steps shown in Figure 4-19 *Steps to uninstall the device* to uninstall the device. For installations, perform the steps in reverse.

Figure 4-19 Steps to uninstall the device



CAUTION

Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

(1) Removing

[Step 1]

Turn off the main device.

[Step 2]

Disconnect the AC power cable from the main device.

[Step 3]

Remove the main device.

(2) Installing

[Step 1]

Install the switch.

[Step 2]

Connect the AC power cable to the switch.

[Step 3]

Set the power switch of the Switch to ON.

5. Operations Required for Initial Installation

The initial procedures for specifying the time, administrator password, user ID changes, and login passwords are described in this chapter.

5.1 Notes before installing a Switch

5.2 Necessary operations for installing a Switch

5.3 Other Operations

5.1 Notes before installing a Switch

The following must be done when installing a Switch.

(1) Checking the progress of Switch startup

The progress of the Switch from the time the power is turned on until the Switch has started is tracked as follows:

- After the power is turned on, the ST1 LED on the front panel begins blinking green, and the boot process starts.
- After the Switch has completely started, the ST1 LED turns green.

(2) Remove the memory card before starting the Switch

Memory cards are used in the following situations:

- Saving error information in the event of a failure.
- Updating software.

For further information on inserting and removing the memory card, see *4.5 Inserting and removing memory cards*.

5.2 Necessary operations for installing a Switch

This section describes the operations necessary for initial installation.

5.2.1 Overview of the command input modes

Command input mode of the command line interface (CLI) for the Switch has a normal user mode, an administrator mode, and a configuration command mode.

To set up or change a Switch configuration, or to view the status of a switch, you must switch to the appropriate command input mode and enter a configuration or operation command.

The following table describes the features of each command input mode.

For details regarding how to use a command to switch to each command input mode and exit the mode, see *Table 5-1 Command input modes*.

Table 5-1 Command input modes

Command input mode	Command to change modes	Prompt	Exit command	Description
Normal user mode	<code>login:</code> <code><user-ID></code>	<code>></code>	<code>> logout</code>	Allows normal operating commands.
Administrator	<code>>enable</code>	<code>#</code>	<code>#disable</code>	Allows all operating commands.
Configuration command mode	<code>#configure</code>	<code>(config)</code> <code>#</code>	<code>(config)#</code> <code>exit</code>	Allows all configuration commands.

(1) User mode

After a user logs in, the Switch is in normal user mode. In user mode, most operation commands can be executed.

(2) Administrator mode

When you enter the `enable` command while in user mode, the mode changes to administrator mode. In this mode, all operating commands can be executed.

When the Switch is initially installed, no password is specified for the `enable` command. To enhance the security level, setting a password for the `enable` command is highly recommended.

(3) Configuration command mode

If you enter the `configure` command in administrator mode, the Switch enters configuration command mode. In this mode, all configuration commands are available in order to set and change the configuration of the Switch.

5. Operations Required for Initial Installation

NOTE

Configuration command mode has a hierarchical structure. Under the above (**config**) #, which is called global configuration mode, there are sub-configuration modes categorized by command characteristics. For details about configuration command mode, see the applicable *Software Manual Configuration Guide*.

NOTE

For further information on operation commands available in each command input mode, see the *Software Manual Operation Command Reference*. For further information on configuration commands available in each command input mode, see the *Software Manual Configuration Command Reference*.

5.2.2 Overview of operations when installing a Switch

This section provides an overview of the operations required when a Switch is initially installed.

NOTE

The operations below are the minimum required operations when a switch is installed. For details about other operations, see the manuals listed in *5.3 Other Operations*.

(1) Login

Log in to the Switch. Use the default user ID **operator**. (Since no password is set for the operator, there is no authentication process for logging in.)

(2) Administrator password setting

Set the administrator password. Initially, no password is set for the administrator account. In order to enhance the security level, setting the administrator password is highly recommended.

(3) Changing the user ID and setting a login password

Change the user ID **operator** to a different name, and then set a login password.

(4) Setting the time

Set the time zone and the time. The clock is not set initially. Because the time is important information for collecting failure information, set the exact time.

NOTE

The time setting for the Switch is retained for about ten days after being shut down. After more than ten days, the clock needs to be reset when the device is turned on the next time.

(a) Login

When the Switch is started, the **login** prompt appears. Enter the user ID at the prompt to log in to the Switch.

```
login: operator                                Type the user ID operator.

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>
```

(b) Administrator password setting

Set the administrator password.

```
> enable                                     Enter administrator mode.

# password enable-mode                       Enable the administrator password setting.

Changing local password for admin.

New password: *****                       Set the administrator password.

Retype new password: *****                Re-type the password for confirmation.

#
```

NOTE

Passwords can be between 6 and 16 characters. (If a password longer than 16 characters is entered, only the first 16 characters are registered.)
A password cannot contain only lowercase letters. We recommend using a combination of uppercase letters, numbers, and special characters.

(c) Changing the user ID and setting a login password

[Step 1] Changing a user login ID

Change the user ID **operator** to a different name, and then set a login password.

```
# rename user                                Enter the command for changing the user ID.

Changing username.

Old username: operator                       Type the current user ID.
```

5. Operations Required for Initial Installation

<code>New username: ax12-01</code>	Type the new user ID.
<code># password</code>	Enable the login password setting.
Changing the local password for ax12-01.	The login user ID is displayed (in this case, <code>ax12-01</code>).
<code>New password: *****</code>	Set a login password.
<code>Retype new password: *****</code>	Re-type the password for confirmation.
<code>#</code>	

NOTE

Login user IDs can be between 1 and 8 characters.
Up to between six and 16 characters can be entered for the password. (If a password longer than 16 characters is entered, only the first 16 characters are registered.)
A password cannot contain only lowercase letters. We recommend using a combination of uppercase letters, numbers, and special characters.

(d) Setting the time

Set the time zone and the time. The following example shows the procedure for setting the time zone as "Japan" and the time to "February 22, 2011, 15:30".

<code># configure</code>	Enter configuration command mode.
<code>(config)# clock timezone JST +9</code>	Set the time zone to JST, which is a +9 hour-offset from UTC.
<code>!(config)# save</code>	Save the time zone setting.
<code>(config)# exit</code>	Return to administrator mode.
<code># set clock 1102221530</code>	Enter a date and time as a set of two-digit values (in year-month-day-hour-minute).
<code>Tue Feb 22 15:30:00 JST 2011</code>	
<code>#</code>	

NOTE

When the configuration is modified, `!` is displayed at the prompt. After the configuration is saved, `!` is no longer displayed.

NOTE

The time setting for the Switch is retained for about ten days after being shut down. After more than ten days, the clock needs to be reset when the device is turned on the next time.

NOTE

The time zone setting for the Switch is retained in the configuration, even if the Switch is turned off. Even after 10 days, the time zone does not have to be reset.

This concludes the initial settings, which include setting the time, the administrator password, changing the login user ID, and setting a login password.

NOTE

For details about operation maintenance and configuration settings after the initial settings, see *5.3 Other Operations*.

5.3 Other Operations

Operation management and configuration settings

For details about operation management and configuration settings, see the corresponding manuals in Table 5-2 *Manuals for operation management and configuration settings*.

For details about operation commands, see the respective manuals in Table 5-3 *Manuals for detailed operation commands*. For details about configuration commands, see the respective manuals in Table 5-4 *Manuals for detailed configuration commands*.

Table 5-2 Manuals for operation management and configuration settings

Series name	Reference manual
AX2200S series AX1250S series AX1240S series	AX2200S/AX1250S/AX1240S Software Manual Configuration Guide Vol.1 AX2200S/AX1250S/AX1240S Software Manual Configuration Guide Vol. 2

Table 5-3 Manuals for detailed operation commands

Series name	Reference manual
AX2200S series AX1250S series AX1240S series	AX2200S/AX1250S/AX1240S Software Manual Operation Command Reference

Table 5-4 Manuals for detailed configuration commands

Series name	Reference manual
AX2200S series AX1250S series AX1240S series	AX2200S/AX1250S/AX1240S Software Manual Configuration Command Reference

NOTE

After setting up a configuration, be sure to back up the operation information. This enables the information to be restored easily in the event of a switch failure or switch replacement. For details about back up operations, see 10. *Device Management* in the *Software Manual Configuration Guide Vol. 1*.

(3) System interoperation tests

Before actual system operation, conduct a test to check the configuration settings.

Troubleshooting

For countermeasures against problems, see the corresponding manual shown below.

Table 5-5 Troubleshooting manual

Series name	Reference manual
AX2200S series AX1250S series AX1240S series	AX2200S/AX1250S/AX1240S Troubleshooting Guide

5. Operations Required for Initial Installation

Appendix

A. Cleaning Optical Connectors
B. Physical Specifications of Network Interfaces
C. Specifications of setup terminal

A. Cleaning Optical Connectors

A.1 Cleaning optical connectors of transceivers

Follow the procedures below to clean the optical connector of the transceiver.

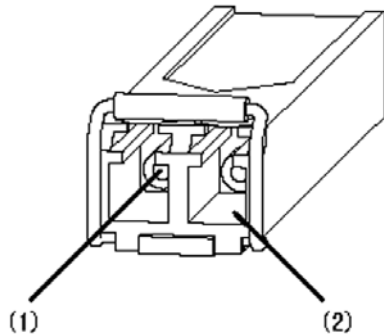
CAUTION

Laser beam, which is colorless and invisible, is used. Never look directly into the optical transceiver.

[Step 1]

Use an air duster to remove foreign particle and dust in the optical connector.

Figure A-1 Optical Connector and the End of the Ferrule



(1) Ferrule end (inner position from the line)

(2) Optical connector

WARNING

When the air duster gas is combustible, do not use it near fire. Doing so could result in a fire.

CAUTION

Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.

CAUTION

Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

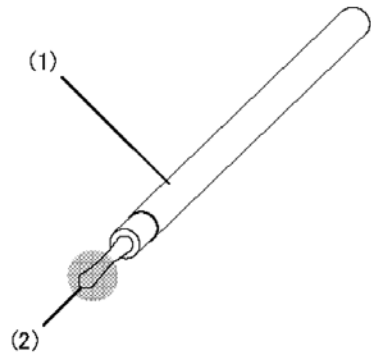
NOTE

See the instructions of the air duster before use.

[Step 2]

Check the tip of the stick-type optical connector cleaner for torn surface fabric, stains and foreign substances.

Figure A-2 Check of the Optical Connector Cleaner



- (1) Stick-type optical connector cleaner
- (2) Part to check

CAUTION

Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.

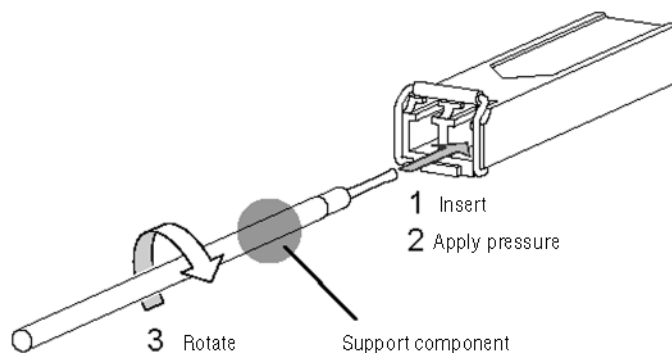
CAUTION

Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.

[Step 3]

Use the stick-type optical connector cleaner to clear any adhered dirt from the ferrule end.

Figure A-3 Cleaning the Ferrule End



CAUTION

Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.

A. Cleaning Optical Connectors

CAUTION

Rotate the optical connector cleaner only clockwise. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

NOTE

See the instructions of the optical connector cleaner before use.

A.2 Cleaning optical fiber cables

Follow the procedures below to clean the connector of the optical fiber cable.

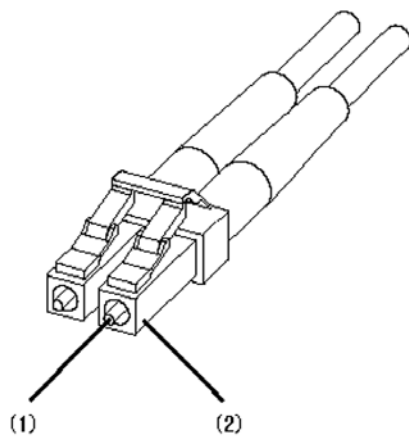
CAUTION

Laser beam, which is colorless and invisible, is used. Never look directly into the optical transceiver.

[Step 1]

Use the air duster to remove foreign particles and dust on the tip of the connector.

Figure A-4 Connector and the End of Ferrule



(1) Ferrule end

(2) Connector

WARNING

When the air duster gas is combustible, do not use it near fire. Doing so could result in a fire.

CAUTION

Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.

CAUTION

Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

NOTE

See the instructions of the air duster before use.

A. Cleaning Optical Connectors

[Step 2]

Use a reel-type optical connector cleaner to clear any adhered dirt from the ferrule end.

Figure A-5 Cleaning the Ferrule End



CAUTION

Make sure to use the dedicated optical connector cleaner. Otherwise, the ferrule end might be damaged.

CAUTION

Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.

NOTE

See the instructions of the optical connector cleaner before use.

B. Physical Specifications of Network Interfaces

B.1 Ethernet 10BASE-T/100BASE-TX

Table B-1 Physical specifications for 10BASE-T/100BASE-TX

Item		Physical specifications	
		10BASE-T	100BASE-TX
UTP cable	Non-PoE	Category 3 and higher	Category 5 and higher
	PoE	Category 5 or higher ^{#1}	
Transmission distance (max.)		100 m	100 m

^{#1}: Category 5 or higher UTP cable is recommended for the PoE connection.

B.2 Ethernet 10BASE-T/100BASE-TX/1000BASE-T

Table B-2 Physical specifications for 10BASE-T/100BASE-TX/1000BASE-T

Item		Physical specifications		
		10BASE-T	100BASE-TX	1000BASE-T
UTP cable	Non-PoE	Category 3 and higher	Category 5 and higher	Enhanced category 5 and higher
	PoE			Enhanced category 5 and higher ^{#1}
Transmission distance (max.)		100 m	100 m	100 m

^{#1} When connecting a 30.0 W or higher powered device, use an enhanced category 5 or higher cable.

Table B-3 10BASE-T/100BASE-TX/1000BASE-T pin assignment

RJ45 pin number	Physical specifications		
	10BASE-T	100BASE-TX	1000BASE-T
1	Receive (+) (A)	Receive (+) (A)	Send/Receive A (+) (A)
2	Receive (-) (a)	Receive (-) (a)	Send/Receive A (-) (a)
3	Send (+) (B)	Send (+) (B)	Send/Receive B (+) (B)
4	Not used ^{#1} (C)	Not used ^{#1} (C)	Send/Receive C (+) (C)

RJ45 pin number	Physical specifications		
	10BASE-T	100BASE-TX	1000BASE-T
5	Not used ^{#1} (c)	Not used ^{#1} (c)	Send/Receive C (-) (c)
6	Send (-) (b)	Send (-) (b)	Send/Receive B (-) (b)
7	Not used ^{#1} (D)	Not used ^{#1} (D)	Send/Receive D (+) (D)
8	Not used ^{#1} (d)	Not used ^{#1} (d)	Send/Receive D (-) (d)

#1: Use when connecting to a cable rated enhanced category 5 or higher.

B.3 Ethernet 100BASE-FX [AX1250S]

Table B-4 Physical specifications of 100BASE-FX

Item	Physical specifications	
Cable Type	Multi-mode	
Core/cladding diameter	50/125 μm	62.5/125 μm
Transmission band	500MHz · km	500MHz · km
Laser center wavelength	1.270 to 1.380 μm	
Optical transmission power (mean)	-23.0 to -14.0 dBm	-20.0 to -14.0 dBm
Optical reception power (mean)	-31.0 to -14.0 dBm	
Optical transmission loss (max.)	8.0 dB	11.0 dB
Transmission distance	2 m to 2 km	

B.4 Ethernet 1000BASE-X interface

Table B-5 Physical specifications of 1000BASE-SX

Item	Physical specifications			
Cable Type	Multi-mode			
Core/cladding diameter	50/125 μm		62.5/125 μm	
Transmission band	400MHz · km	500MHz · km	160MHz · km	200 MHz · km
Laser center wavelength	0.770 to 0.860 μm			

Appendix B Physical Specifications of Network Interfaces

Item	Physical specifications			
Optical transmission power (mean)	-9.5 to 0 dBm			
Optical reception power (mean)	-17.0 to 0 dBm			
Optical transmission loss (max.)	7.5 dB			
Transmission distance	2 to 500 m	2 to 550 m	2 to 220 m	2 to 275 m

Table B-6 Physical specifications of 1000BASE-SX2

Item	Physical specifications	
Cable Type	Multi-mode	
Core/cladding diameter	50/125 μm	62.5/125 μm
Transmission band	500MHz · km	500MHz · km
Laser center wavelength	1.270 to 1.355 μm	
Optical transmission power (mean)	-9.0 to -3.0 dBm	
Optical reception power (mean)	-19.0 to -3.0 dBm	
Optical transmission loss (max.)	10.0 dB	
Transmission distance	2 m to 2 km	2 m to 1 km ^{#1}

#1: Use of mode-conditioning patch cords can extend the transmission distance. However, the maximum distance for transmission is 2 km, which might result in transmission loss. To ensure transmissions can be made at a distance of 2 km, it is necessary to keep the transmission loss at 10 dB or less.

Table B-7 Physical specifications of 1000BASE-LX

Item	Physical specifications			
Cable Type	Multiple-terminal mode ^{#1}			Single mode
Core/cladding diameter	50/125 μm		62.5/125 μm	10 / 125 μm
Transmission band	400MHz · km	500MHz · km	500MHz · km	-
Laser center wavelength	1.270 to 1.355 μm			
Optical transmission power (mean)	-11.5 to -3.0 dBm			-11.0 to -3.0 dBm
Optical reception power (mean)	-19.0 to -3.0 dBm			

Appendix B Physical Specifications of Network Interfaces

Item	Physical specifications	
Optical transmission loss (max.)	7.5 dB	8.0 dB
Transmission distance	2 to 550 m	2 m to 5 km

#1: When using 1000BASE-LX with multi-mode fiber optic cable, depending on the kind of fiber optic cable, the BER (bit error rate) might increase. In such a case, use a mode-conditioning patch cord to resolve the communication problem.

Table B-8 Physical specifications of 1000BASE-LH

Item	Physical specifications	
Cable Type	Single mode	Single-terminal mode (DSF)
Core/cladding diameter	10 / 125 μm	8 / 125 μm
Laser center wavelength	1.540 to 1.570 μm	
Optical transmission power (mean)	0 to +5.0 dBm	
Optical reception power (mean)	-22.0 to 0 dBm	
Optical transmission loss (max.)	22dB ^{#1}	
Transmission distance	2 m to 70 km	

#1: When optical transmission loss is 5.0 dB or less, use an optical attenuator to adjust the loss.

Table B-9 Physical specifications of 1000BASE-BX

Item	Physical specifications			
Interface	1000BASE-BX10-U ^{#1}	1000BASE-BX10-D ^{#1}	1000BASE-BX40-U ^{#2}	1000BASE-BX40-D ^{#2}
Cable Type	Single mode			
Core/cladding diameter	10 / 125 μm			
Laser center wavelength	1.260 to 1.360 μm	1.480 to 1.500 μm	1.260 to 1.360 μm	1.480 to 1.500 μm
Receiving wavelength	1.480 to 1.500 μm	1.260 to 1.360 μm	1.480 to 1.500 μm	1.260 to 1.360 μm
Optical transmission power (mean)	-9.0 to -3.0 dBm		-3.0 to 3.0 dBm	
Optical reception power (mean)	-19.5 to -3.0 dBm		-23.0 to -3.0 dBm	

Appendix B Physical Specifications of Network Interfaces

Item	Physical specifications	
Optical transmission loss (max.)	10.5 dBm	20.0 dBm ^{#3}
Transmission distance	0.5 m to 10 km	-0.5 m to 40 km

#1: 1000BASE-BX10-U and 1000BASE-BX10-D are paired to use.

#2: 1000BASE-BX40-U and 1000BASE-BX40-D are paired to use.

#3: When optical transmission loss is 6.0 dB or less, use an optical attenuator to adjust the loss.

C. Specifications of setup terminal

C.1 Specifications of setup terminal

Use a personal computer or a workstation that meets the specifications listed in Table C-1.

Table C-1 Specifications of the terminal

Item		Specification
Communication port		RS-232C port
Communication software		Tera Term Pro (Version 2.3) or communication software that supports the following communication settings.
Operation mode		VT100 emulation mode
Communication settings	Communication parameters	8 bits, 1 stop bit, no parity
	Communication speed	19,200 bit/s, 9,600 bit/s, 4,800 bit/s, 2,400 bit/s, 1,200 bit/s

#1: The factory default communication speed of the Switch is 9,600 bit/s.

C.2 Specifications of cable to connect setup terminal

The RS-232C crossover cable of inch screws (#4-40) with D-sub 9-pin female connectors on both ends is required for connection between the main device and the setup terminal. For pin assignment of the RS-232C crossover cable, see Table C-1 Figure C-1 *Pin assignment of the cable to connect the setup terminal*.

Figure C-1 Pin assignment of the cable to connect the setup terminal

9 pins (female) on the Switch

9 pins on the terminal

