ALAXALA AX6300S

Hardware Instruction Manual

AX63S-H001-50X

Reading and storing this manual:

- Before you use the equipment, carefully read the manual and make sure that you understand all safety precautions.
- After reading the manual, store it in a convenient place for easy reference.

AlaxalA

■ **Relevant products**

This manual applies to the AX6304S and AX6308S models.

■ **Export Restrictions**

If you export this product, please check all restrictions, such as Japan's Foreign Exchange and Foreign Trade Law and USA export control laws and regulations, and carry out all required procedures. If you require more information, please contact an ALAXALA Networks Corporation sales representative.

■ **Trademarks**

- Ethernet is a product name of Xerox Corporation.
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■ **Reading and storing this manual:**

Before you use the equipment, carefully read the manual and make sure that you understand all safety precautions. After reading the manual, store it in a convenient place for easy reference.

■ **Note**

Information in this document is subject to change without notice.

■ **Radio interference**

This is a Class A product that supports the Voluntary Control Council for Interference by Information Technology Equipment standard. In a home environment, this product might cause radio interference, in which case the user might be required to take appropriate measures.

■ **About harmonic regulations**

Products to which the harmonic current emissions standard JIS C 61000-3-2 applies
Applicable products:
AX6304S
AX6308S

■ **Edition history**

April 2009 (Edition 6), AX63S-H001-50X

■ **Copyright**

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Preface

About this manual

This manual provides hardware instructions for the ALAXALA AX6300S series of multilayer Switches. Before you operate the Switch, read this manual carefully and make sure that you understand all instructions and safety precautions. After reading the manual, store it in a convenient place for easy reference.

Intended readers

This document is intended for the technical personnel responsible for setting up and handling AX6300S series switches. Readers are therefore required to have a knowledge of electric circuits, wiring, and networks.

Structure of this manual

Safety Information

This document includes important notes regarding safe use of AX6300S series switches. Be sure to read and understand this section prior to using the Switch.

Chapter 1 Components Overview

Provides an overview of the components of the Switch.

Chapter 2 Preparation for Installation

Describes all environmental conditions and required preparation for installation of the Switch.

Chapter 3 Preparing Interface Cables and Terminals

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

Chapter 4 Installing a Switch

Describes how to install the Switch.

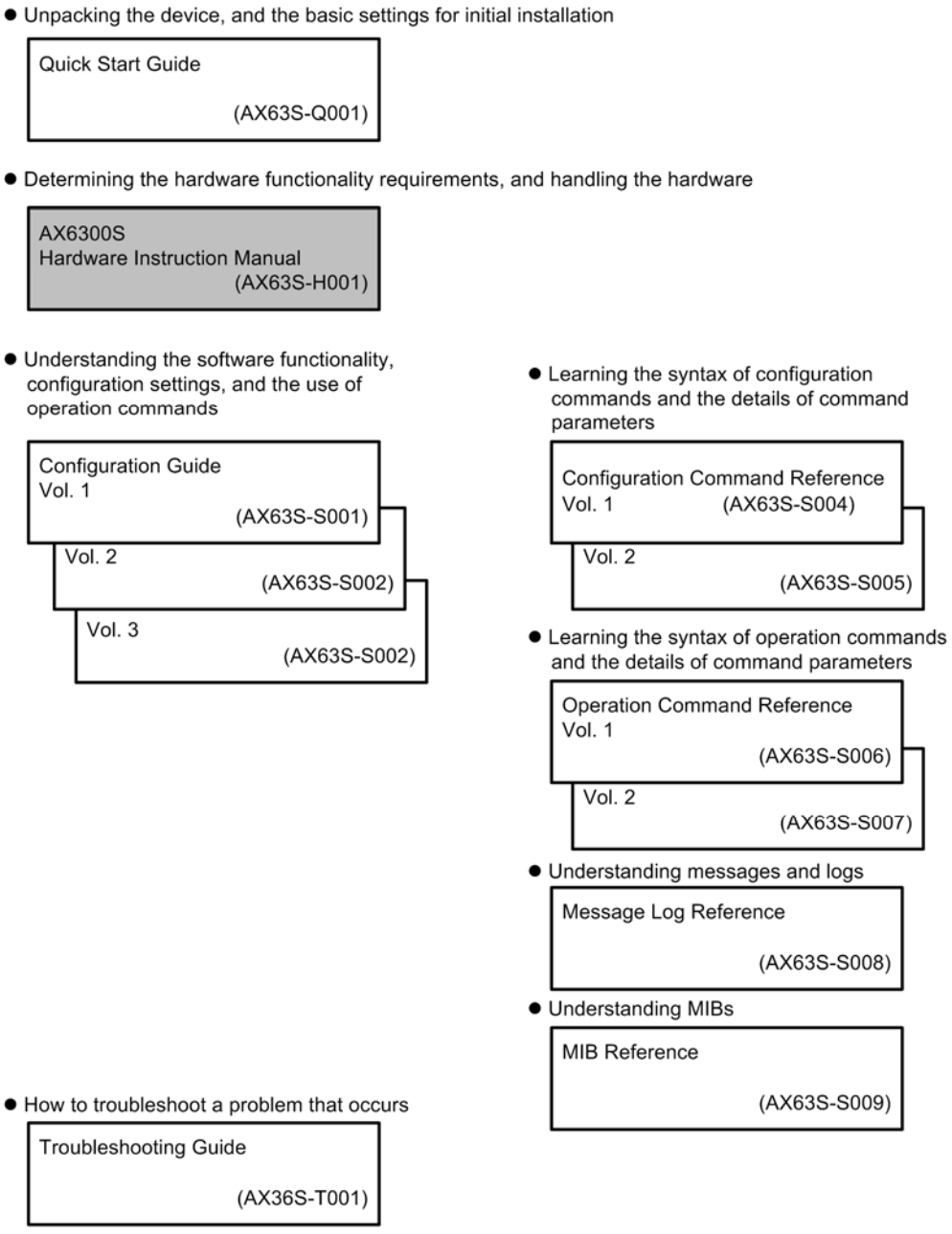
Chapter 5 Adding and Replacing Options

Describes how to add and replace the fan unit, power supply unit, management and switching unit, and the network interface unit.

Appendix A. Cleaning Optical Connectors

Explains how to clean the optical connectors of the transceivers and the fiber optic cable connectors.

Reading sequence of AX6300S series manuals



NOTE

The *Troubleshooting Guide* is common to the AX2400S, AX3600S, AX6300S, AX6600S, and AX6700S series.

Conventions: The terms "Switch" and "switch"

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

- AX6300S 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.

How to obtain this manual

The AX6300S series manuals are available on the ALAXALA website at the following address:

http://www.alaxala.com/en/index.html

Acronyms

DSF	Dispersion Shifted Fiber
EIA	Electronic Industries Alliance
JIS	Japanese Industrial Standards
LAN	Local Area Network
LED	Light Emitting Diode
MC	Memory Card
MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface Crossover
MSU	Management and Switching Unit
NIF	Network Interface
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
XFP	10 gigabit small Form factor Pluggable

Contents

⚠ Safety Information

■ Using the AX6300S series switches correctly and safely

- This guide provides important information for ensuring safe use of the AX6300S series switches. Please read this guide completely before using your Switch.
- Keep this guide 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 for 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, perform the operations below, and contact maintenance personnel.

- For a Switch with an AC power supply unit installed, turn off the Switch power before unplugging the power cable from the outlet.
- For a Switch with a DC power supply unit installed, turn off the Switch power, and then set the power supply circuit breaker of the power supply facility to OFF.

■ Stay alert and pay careful attention

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, in addition to the following instructions, always stay alert and pay careful attention to what you are doing.

⚠WARNING

■ If anything seems wrong, immediately turn off the power.

If smoke or an unusual smell is emanating 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 fire or electric shock.

- For a Switch with an AC power supply unit installed, turn off the Switch power before unplugging the power cable from the outlet.
- For a Switch with a DC power supply unit installed, turn off the Switch power, and then set the power supply circuit breaker of the power supply facility to OFF.

■ Do not place the Switch in an unstable location.

When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in injury.

■ Do not remove the Switch cover.

Do not remove the Switch cover. Doing so could result in electric shock.

■ 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.

■ Do not modify the Switch.

Do not modify the Switch. Doing so could result in fire or electric shock.

■ Do not subject the Switch to shocks

In the event that the Switch is dropped or any of its components is damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Discontinue using the cable to avoid the risk of fire or electric shock.

■ Do not place any objects 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 fire or electric shock.

■ Use the Switch only with the indicated power supply.

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

⚠WARNING

■ 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 fire.

■ Ground the Switch.

Each Switch has at most 3.5 mA of leakage current. To connect a Switch to an AC power supply, always use a grounded power outlet for the Switch. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

If you use a DC power supply, always connect the ground terminals. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

■ Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel.

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. Terminal connections are required for connection of the DC power cable. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

■ Set the circuit breaker of the power supply facility to OFF before connecting or disconnecting the DC power cable.

Make sure the circuit breaker of the power supply facility is set to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker of the power supply facility set to ON could result in fire or electric shock.

⚠WARNING

■ Place an insulation cover over the 0 V and −48 V terminals of a DC power cable.

Place an insulation cover over the 0 V and −48 V terminals of a DC power cable before using them. Using the terminals without an insulation cover could result in fire or electric shock.

■ Do not use a DC power supply with the cover of the terminal board removed.

After attaching a power cable, attach the cover to the terminal board when using a DC power supply. Using the power supply unit without the cover could result in electric shock.

■ Do not touch the terminal used to measure voltage.

A power supply unit has a terminal used to measure voltage. This terminal is used for inspection before the unit is shipped from the factory. Customers must not use this terminal. In addition, do not insert anything with a narrow tip, such as a pin or paper clip, into the terminal. Doing so could result in fire or electric shock.

■ The Switch must be installed and carried by at least three people.

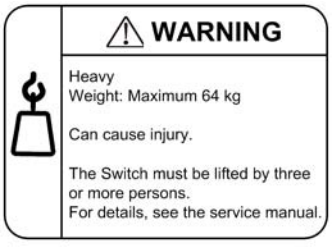
The table below lists the weight of each Switch. A Switch must be installed and carried by at least three people. Installing or carrying a Switch with too few people could result in the Switch being dropped or falling, possibly leading to injury.

Number of people required to carry a Switch:

Model	Weight	Number of people
AX6304S	45 kg	Three or more
AX6308S	64 kg	

The following label is attached to a Switch.

AX6304S



AX6308S

⚠WARNING

■ 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 fire or electric shock. If the power cable is covered with a carpet or the like, it is easy to forget that the cable is there and to place something heavy on it.

Use the supplied or a designated power cable. Using another cable could result in fire or electric shock.

In addition, do not use the supplied cable with other devices. Doing so could result in 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 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 to prevent any looseness. Using a power plug with dust on it or one that is imperfectly connected could result in fire or electric shock.

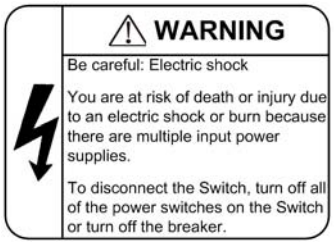
■ Do not overload the power outlet.

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. This can affect other equipment.

■ Before turning off the power, set all power switches or the circuit breaker for the Switch to OFF.

A Switch has multiple input power supplies. When turning off the Switch power, set all power supply switches (with an AC power supply unit installed) or the circuit breaker (with a DC power supply unit installed) to OFF.

The following label is attached to a Switch.



■ Adding or replacing an option must be performed by a trained technician or maintenance personnel.

Adding or replacing an optional module must be performed by a trained technician or maintenance personnel.

Adding or replacing a power supply unit requires connecting or disconnecting the power cable. If an untrained person performs the operation and mishandles the power cable, fire or electric shock could result.

Also, mishandling other optional modules could result in injury or damage.

⚠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.

When pressing the reset button on the front panel, 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 fire or electric shock.

■ When adding or replacing a power supply unit, disconnect the power supply cable.

When adding or replacing a power supply unit, disconnect the power cable from the power supply unit that will be replaced.

If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. For this reason, adding or replacing a power supply unit with the power cable connected could result in fire or electric shock.

■ 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 fire.

⚠ CAUTION

■ 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 stack Switches.

Do not stack Switches. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

■ 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 become unbalanced, resulting in injury.

■ When mounting a Switch into a rack, use a fixture that can support the weight of the Switch.

It is not possible for the provided rack fixture alone to support the weight of a Switch. Its purpose is merely to hold a Switch in the rack. Accordingly, use the following fixtures:

- AX6304S : Guide rails, shelves, and support brackets
- AX6308S : Guide rails and shelves

You must use the guide rails and shelves provided with the rack, and these must be able to support the weight of the Switch (with the maximum number of optional modules installed).

■ Do not use support brackets with a Switch other than the AX6304S.

The support bracket supports the AX6304S only. Do not use the bracket with another Switch.

Using a bracket with another Switch might cause the Switch to drop or fall, resulting in injury.

■ Be careful when using support brackets.

When using support brackets to mount a switch on a rack, hold the front and back of the Switch and mount it horizontally. You must hold the Switch until the screws have been tightened. If the Switch tilts, it could drop or fall, resulting in injury. In addition, other devices mounted in the same rack might be damaged.

When support brackets are used to mount a Switch on a rack, the weight of the Switch is borne by the rack fixture and the support brackets only. Securely tighten the screws on the rack fixtures and the support brackets.

■ Do not obstruct the ventilation slots.

Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in fire. Maintain a space of at least 70 mm around the ventilation slots.

⚠ CAUTION

■ Do not allow hair or objects near the ventilation slots.

Because a Switch is equipped with internal cooling fan units, do not allow anything near ventilation slots. Doing so causes heat to accumulate inside the Switch and could cause a failure. Do not allow hair or other light material or objects near the ventilation slots because they might be sucked into the Switch, resulting in injury.

■ When moving a Switch, do not hold the handles of optional modules.

When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

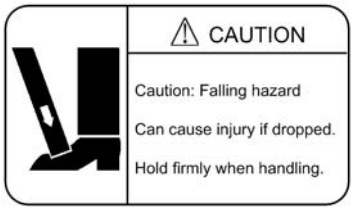
■ Unplug the cables before moving a Switch.

Before moving a Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become deformed, or might damage the Switch, resulting in fire or electric shock.

■ Do not drop an optional module.

Handle an optional module carefully so that you do not drop it. Dropping it could result in injury.

The weight of a DC power supply unit is 5.6 kg and the front-to-back measurement is 163 mm. When removing a DC power supply unit from a Switch, support the DC power supply unit itself. If you pull the unit carelessly, it might fall, possibly resulting in injury. The following label is attached to a DC power supply unit.



■ 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.

■ When removing a management and switching unit or a network interface unit, use care because it might be very hot.

The components in a management and switching unit and a network interface unit might be very hot. Do not touch any components with your hands. Doing so could result in burns.

CAUTION

■ When removing a fan unit, do not place your hands near the fan if it is rotating.

Immediately after a fan unit is removed, the blades might still be rotating. While the fan blades are rotating, do no place your hands near them. Doing so might result in injury. The following label is attached to a fan unit.

■ Handle the power cable carefully.

Do not place a power cable near a heat-generating apparatus, because the heat could melt the cable coating, resulting in fire or electric shock.

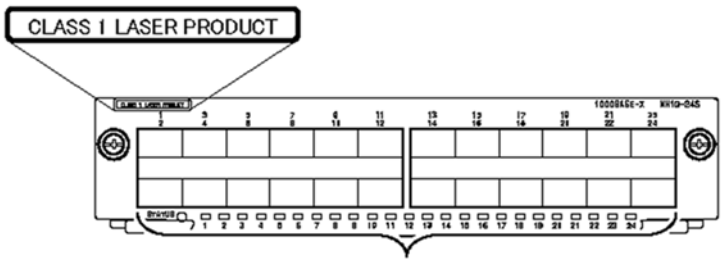
When plugging or unplugging a power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.

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

A Switch is plated with zinc, nickel, or gold. If you are allergic to these metals, do not directly touch the Switch. Doing so might cause a skin eruption or a rash.

■ Avoid looking directly at laser beams.

A network interface unit attached with the label below uses a laser beam. Never look directly into the optical transceiver.



Optical transceiver

■ Lithium batteries

A Switch uses a lithium battery for the real-time clock. Mishandling the battery might cause the battery to generate heat, explode, or catch fire, resulting in injury or fire. Do not remove the battery from a Switch, disassemble it, heat it to 100°C or more, burn it, or allow it to become wet.

⚠ CAUTION

■ Cleaning

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

CAUTION

■ Do not turn off the Switch power while software is being updated (when the `ppupdate` command is being executed).

When the `ppupdate` command is executed, the Switch restarts automatically. Do not turn off the Switch until it is restarted (until the STATUS LED on the management and switching unit changes from blinking green to constant green). Failure to do so could result in a Switch failure.

■ If 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. 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. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

■ 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.

Remove the memory card before moving the Switch. If a card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

■ 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 to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the Switch.

■ For power supply facility, avoid a voltage drop caused by inrush current.

When a Switch is turned on, inrush current flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same power supply facility.

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

Before connecting or disconnecting a power cable, turn off the power to the device to be installed or removed.

CAUTION

■ When replacing a fan unit with the Switch turned on, observe the time limit.

When replacing a fan unit with the Switch on, you must remove and replace the unit within one minute. If the operation takes longer than one minute, the temperature inside the Switch will rise and possibly cause a failure.

■ When carrying or packing a Switch and an optional module, wear a wrist strap to protect against static electricity.

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.

■ If you remove an optional module, attach a blank panel.

If you remove an optional module, attach a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure.

■ Install a network interface unit with the tray attached.

Install a network interface unit (NIF) with the tray attached to the Switch.

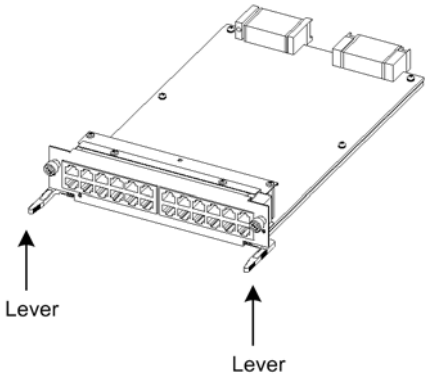
If you insert an NIF without a tray, the NIF cannot fit into the connector on the Switch, and the Switch or the NIF connector itself might be damaged.

CAUTION

■ Install an optional module carefully.

Follow the procedure below when you install an optional module. Failure to do so could result in a failure or a malfunction of the Switch.

1. Open the levers as shown in the figure.



2. While holding the levers, push the optional module carefully until the levers touch the Switch.
3. Use the levers to push the optional module as far as it will go. When moving a lever, move it slowly (for one second or longer) without exerting strain.

■ Before removing the optional module, loosen the screws.

When removing a management and switching unit or a network interface unit, use the levers.

If the screws are not loose enough, the optional module might be damaged when the levers are opened.

■ When carrying and packing an optional module, handle it carefully.

Do not touch any components or a soldered surface with your hands when carrying or packing an optional module, such as a management and switching unit, network interface unit, memory card, transceiver, or power supply unit. Also, when storing it, use an antistatic bag.

■ Do not place a 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.

CAUTION

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

Placing a 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 a Switch where it will be exposed to hydrogen sulfide or salt.

Placing a Switch in an area where sulfides are present, such as a hot-springs area, or in an area with salty-air, such as along a coast could shorten the life of the Switch.

■ 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. If you are using a DC power supply, set the circuit breaker of the power supply facility to OFF.

CAUTION

■ 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.

1. Components Overview

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

1.1 Switch

The AX6300S series switches are Layer 3 switches suitable for the backbone of a large-scale independent network, the core of a medium-scale network, or the edge of a service provider's Layer 3 network.

The following are the features of AX6300S series switches:

- High-density 10-Gigabit Ethernet
- Excellent performance, reliability, availability, and security
- Environment-friendly low power consumption

The following table lists the models of the AX6300S series.

Table 1-1 Model list

Model	Number of slots			
	Fan unit	**Power supply unit**	**Management and switching unit**	**Network interface unit**
AX6304S	2	4#1	2	4#3
AX6308S	3	6#1#2	2	8#3

#1: An AC power supply unit uses 1 slot per Switch, and a DC power supply unit uses 2 slots per Switch.

#2: A maximum of four AC power supply units or two DC power supply units can be used.

#3: A single-size network interface unit uses 1 slot, and a double-size network interface unit uses 2 slots.

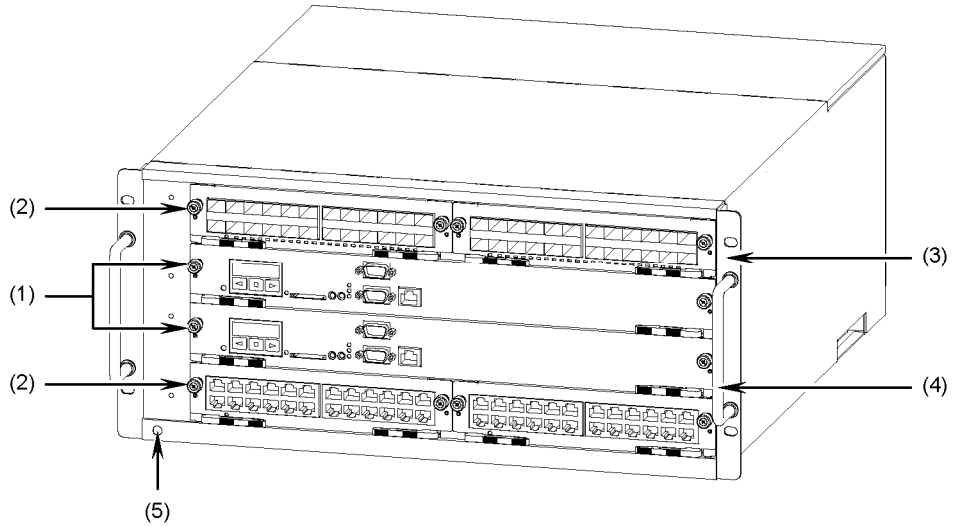
1.1.1 AX6304S

The AX6304S has the following hardware specifications:

- Management and switching unit (MSU) slot: 2 slots
- Network interface unit (NIF) slot: 4 slots
- Power supply unit (PS) slot: 4 slots
- Fan unit (FAN) slot: 2 slots

(1) External appearance

Figure 1-1 Front view



(1) Management and switching unit (MSU) slot

(2) Network interface unit (NIF) slot

(3) Rack fixture

(4) Handles

(5) Wrist strap terminal

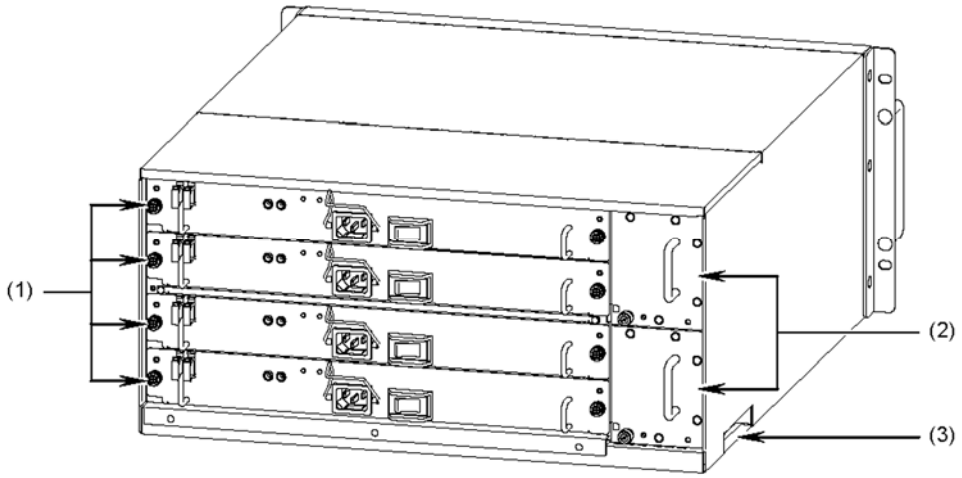
NOTE

A rack fixture attached to a Switch is used to secure the rack pillars and the front of the Switch so that they are flat when the Switch is installed in a rack.

If a 100 mm space cannot be maintained between the rack door and the front of the Switch, you can use another fixture (sold separately) that fixes the front of a Switch so that it is recessed 50 mm from a rack pillar.

For information about this separately sold fixture, see *1.10 Rack fixture*.

Figure 1-2 Rear view (with an AC power supply unit installed)

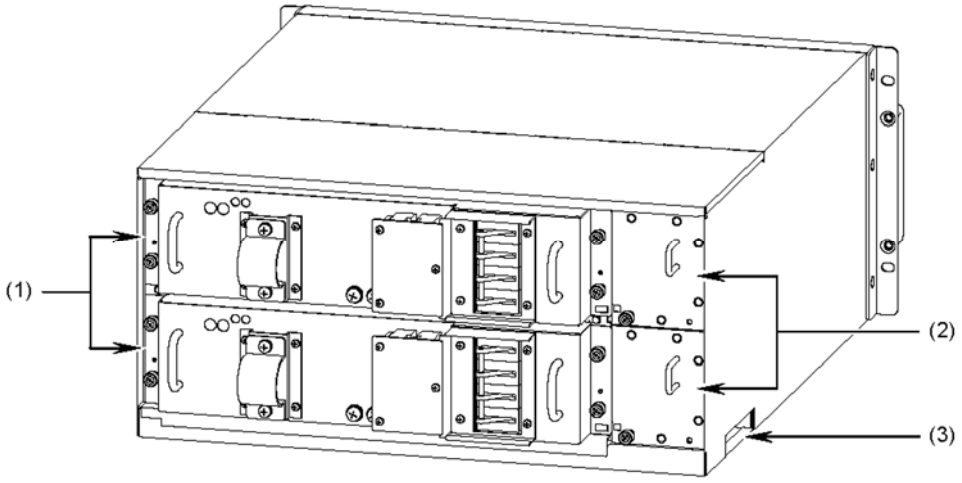


(1) Power supply unit (PS) slot

(2) Fan unit (FAN) slot

(3) Handles

Figure 1-3 Rear view (with a DC power supply unit installed)



(1) Power supply unit (PS) slot

(2) Fan unit (FAN) slot

(3) Handles

(2) Slot number

The following figures show the slot numbers of optional modules for the Switch.

Figure 1-4 Front of the Switch

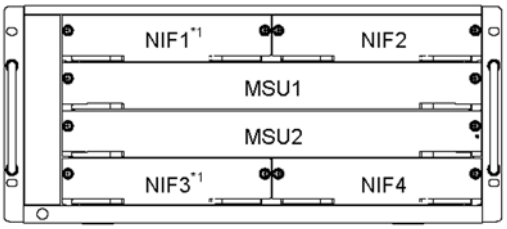


Figure 1-5 Rear of the Switch (with an AC power supply unit installed)

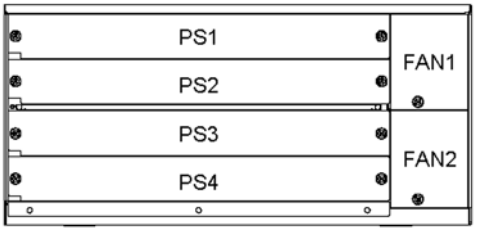
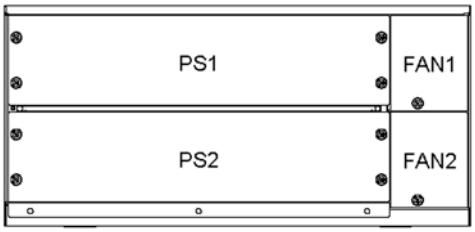


Figure 1-6 Rear of the Switch (with a DC power supply unit installed)



NOTE

A network interface unit comes in a single-size model and a double-size model. The NIF number when a double-size network interface unit is installed is the number indicated by *1.

(3) Number of installed power supply units and installation location

NOTE

Power supply units come in an AC model and a DC model. Do not install both an AC power supply unit and DC power supply unit on a single Switch.
If you install both units, they will not operate properly.

■ **When installing AC power supply units**

When AC power supply units are installed on a Switch, the redundancy method is 2+2 redundancy.

In this method, two basic power supply units and two additional power supply units for redundancy are required.

For the installation locations of the power supply units, see the following table.

Table 1-2 Installation locations of AC power supply units

Power supply redundancy method	Power supply redundancy	Basic		Redundancy	
		PS1	PS2	PS3	PS4
2+2 redundancy	None	Y	Y	N	N
	Required	Y	Y	Y	Y

NOTE

If you install a power supply unit in a location other than those above, it will not operate properly.

■ **When installing a DC power supply unit**

When installing a DC power supply unit on a Switch, the power supply redundancy method is 1+1 redundancy.

One basic power supply unit and one power supply unit for redundancy are required.

For the installation locations of the power supply units, see the following table.

Table 1-3 Installation locations of DC power supply units

Power supply redundancy method	Power supply redundancy	Basic	Redundancy
		PS1	PS2
1+1 redundancy	None	Y	N
	Required	Y	Y

NOTE

If you install a power supply unit in a location other than those above, it will not operate properly.

(4) LEDs and switches

LEDs and switches are located on each optional module.

For information about the LEDs and switches on the front of the Switch, see *1.4 Management and switching unit (MSU)* and *1.5 Network interface unit (NIF)*.

For information about the LEDs on the rear of the Switch, see *1.2 Fan unit (FAN)* and *1.3 Power supply unit (PS)*.

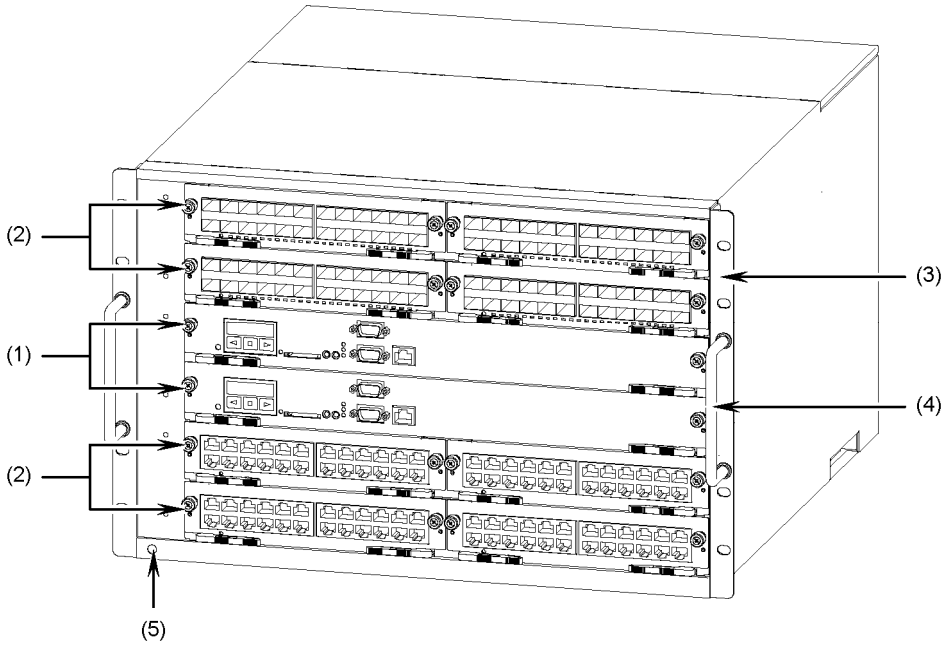
1.1.2 AX6308S

The AX6308S has the following hardware specifications:

- Management and switching unit (MSU) slot: 2 slots
- Network interface unit (NIF) slot: 8 slots
- Power supply unit (PS) slot: 6 slots
- Fan unit (FAN) slot: 3 slots

(1) External appearance

Figure 1-7 Front view



(1) Management and switching unit (MSU) slot

(2) Network interface unit (NIF) slot

(3) Rack fixture

(4) Handles

(5) Wrist strap terminal

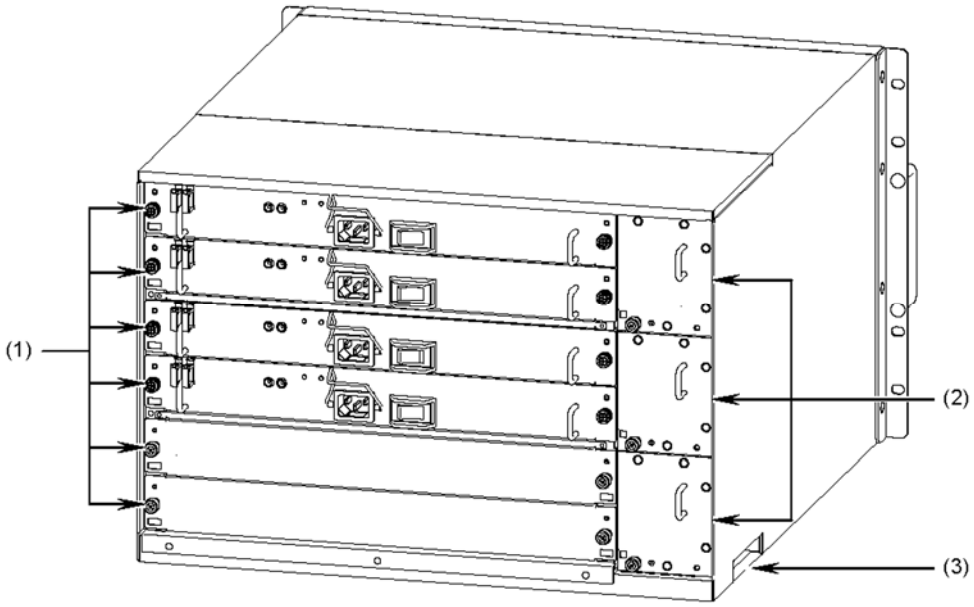
NOTE

A rack fixture attached to a Switch is used to secure the rack pillars and the front of the Switch so that they are flat when the Switch is installed in a rack.

If a 100 mm space cannot be maintained between the rack door and the front of the Switch, you can use another fixture (sold separately) that fixes the front of a Switch so that it is recessed 50 mm from a rack pillar.

For information about this separately sold fixture, see *1.10 Rack fixture*.

Figure 1-8 Rear view (with an AC power supply unit installed)

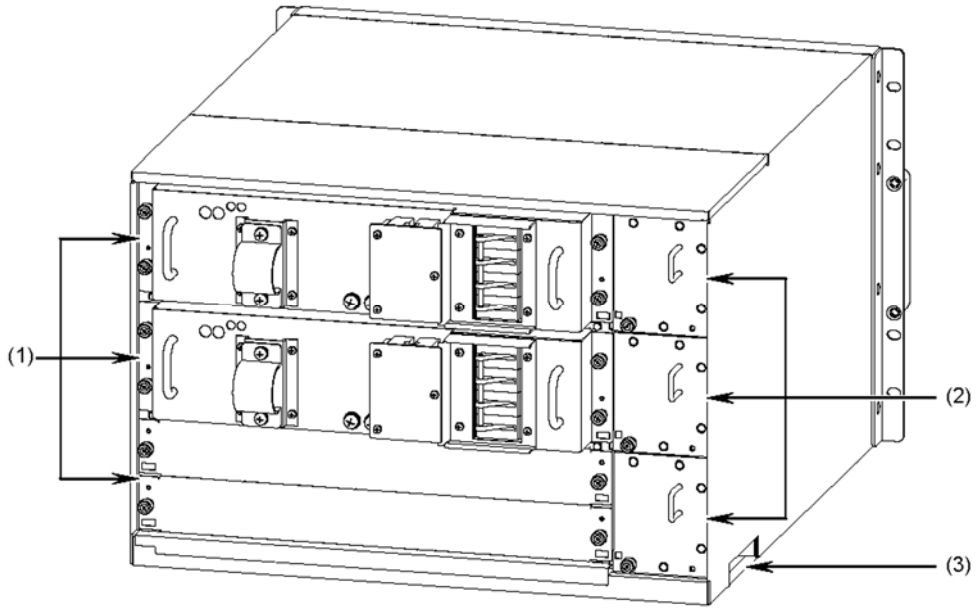


(1) Power supply unit (PS) slot

(2) Fan unit (FAN) slot

(3) Handles

Figure 1-9 Rear view (with a DC power supply unit installed)



(1) Power supply unit (PS) slot

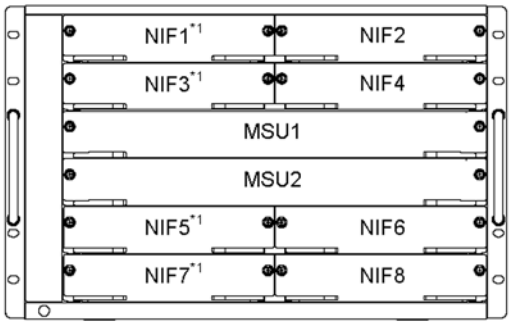
(2) Fan unit (FAN) slot

(3) Handles

(2) Slot number

The following figures show the slot numbers of optional modules for the Switch.

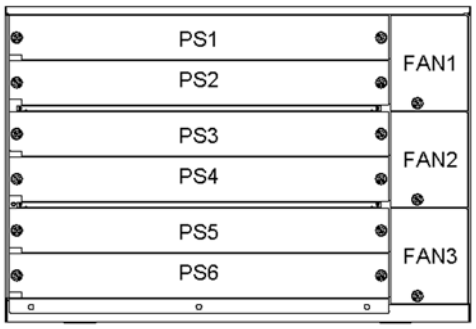
Figure 1-10 Front of the Switch



NOTE

A network interface unit comes in a single-size model and a double-size model. The NIF number when a double-size network interface unit is installed is the number indicated by *1.

Figure 1-11 Rear of the Switch (with an AC power supply unit installed)



NOTE

A power supply unit can be installed in the PS1 to PS4 slots. The PS5 and PS6 slots cannot be used.

Figure 1-12 Rear of the Switch (with a DC power supply unit installed)

NOTE

A power supply unit can be installed in the PS1 and PS2 slots. The PS3 slot is not used.

(3) Number of installed power supply units and installation location

NOTE

Power supply units come in an AC model and a DC model. Do not install both an AC power supply unit and DC power supply unit on a single Switch.

If you install both units, they will not operate properly.

■ When installing AC power supply units

When AC power supply units are installed on a Switch, the redundancy method is 2+2 redundancy.

In this method, two basic power supply units and two additional power supply units for redundancy are required.

For the installation locations of the power supply units, see the following table.

Table 1-4 Installation locations of AC power supply units

Power supply redundancy method	Power supply redundancy	Basic		Redundancy		For expansion	
		PS1	PS2	PS3	PS4	PS5	PS6
2+2 redundancy	None	Y	Y	N	N	N	N
	Required	Y	Y	Y	Y	N	N

NOTE

If you install a power supply unit in a location other than those above, it will not operate properly.

■ **When installing a DC power supply unit**

When installing a DC power supply unit on a Switch, the power supply redundancy method is 1+1 redundancy.

One basic power supply unit and one power supply unit for redundancy are required.

For the installation locations of the power supply units, see the following table.

Table 1-5 Installation locations of DC power supply units

Power supply redundancy method	Power supply redundancy	Basic	Redundancy	For expansion
		PS1	PS2	PS3
1+1 redundancy	None	Y	N	N
	Required	Y	Y	N

NOTE

If you install a power supply unit in a location other than those above, it will not operate properly.

(4) LEDs and switches

LEDs and switches are located on each optional module.

For information about the LEDs and switches on the front of the Switch, see *1.4 Management and switching unit (MSU)* and *1.5 Network interface unit (NIF)*.

For information about the LEDs on the rear of the Switch, see *1.2 Fan unit (FAN)* and *1.3 Power supply unit (PS)*.

1.1.3 Accessories

The items listed in *Table 1-6 Switch accessories* are shipped with the Switch when it is shipped from the factory.

Table 1-6 Switch accessories

Number	Name	Quantity	Remarks
1	Before using an AX6300S series switch	1	
2	Using the Switch Safely	1	

(1) Before using an AX6300S series switch

This document lists the items supplied with a Switch when it is shipped from the factory.

(2) Using the Switch Safely

This document includes important notes regarding safe use of the Switch.

Be sure to read this document before use.

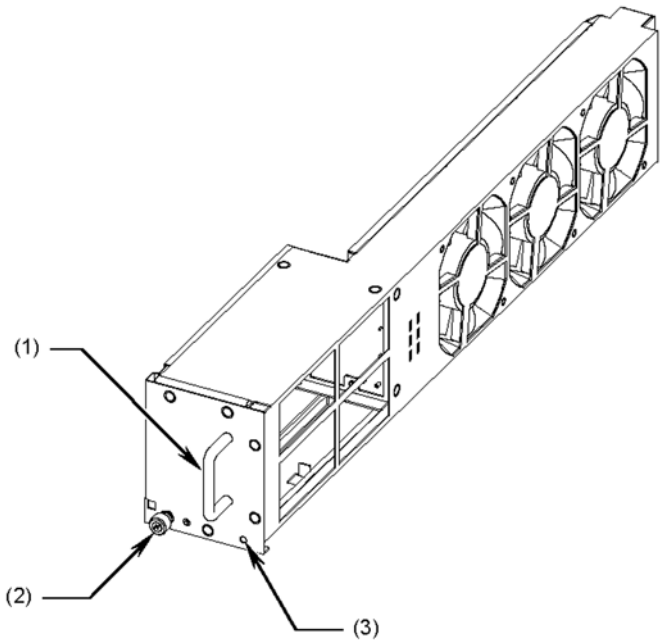
1.2 Fan unit (FAN)

1.2.1 FAN-11

The FAN-11 fan unit is common to AX6300S series switches, and is included in each Switch.

(1) External appearance

Figure 1-13 External appearance



(1) Handles

(2) Installation screw

(3) LEDs

(2) LED

Table 1-7 LED indications

Type	Status	Description
LED: Green, orange, or red	Indicates the operating status of the fan unit.	Green: Normal operation
		Orange: A lamp test is in progress.
		Red: A failure has been detected.

1.3 Power supply unit (PS)

NOTE

Power supply units come in an AC model and a DC model.
Do not install both an AC power supply unit and DC power supply unit on a single Switch.
If you install both units, they will not operate properly.

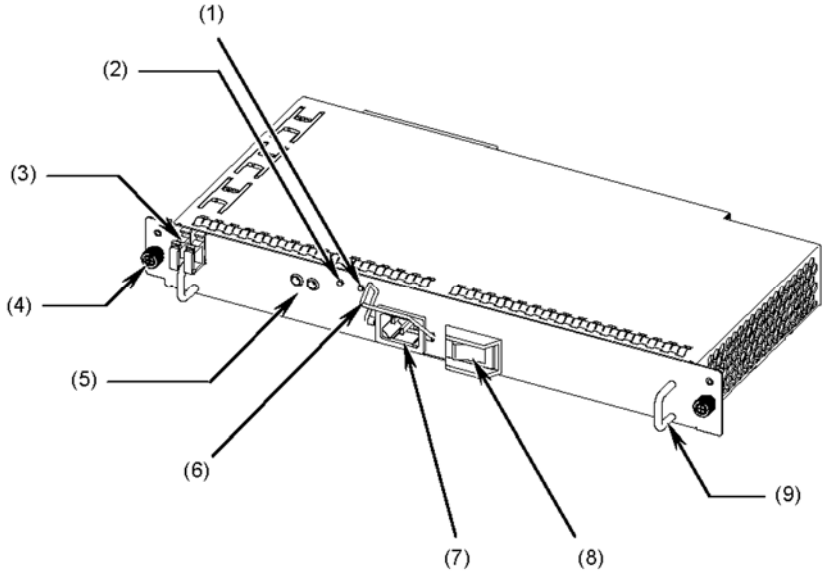
1.3.1 PS-A11

The PS-D11 power supply unit is common to AX6300S series switches.

This power supply unit supports 100 V AC and 200 V AC.

(1) External appearance

Figure 1-14 External appearance



(1) ALARM LED

(2) POWER LED

(3) Cable clamp

(4) Installation screw

(5) Terminal for measuring voltage

(6) Bracket preventing disconnection of the power cable

(7) Power supply connector

(8) Power switch

(9) Handles

⚠WARNING

A power supply unit has a terminal for measuring voltage. This terminal is used for inspection before the unit is shipped from the factory. Customers must not use this terminal. In addition, do not insert anything with a narrow tip, such as a pin or paper clip, into the terminal. Doing so could result in fire or electric shock.

(2) LED

A power supply unit indicates its status with a combination of two LEDs, as described in the following table.

Table 1-8 LED indications

Name		Description
POWER (LED: Green)	**ALARM (LED: Red)**	
ON	OFF	The power supply output voltage is normal.
OFF	ON	A power supply output voltage error has occurred.
OFF	OFF	The power is off or a power supply output voltage error has occurred.#1

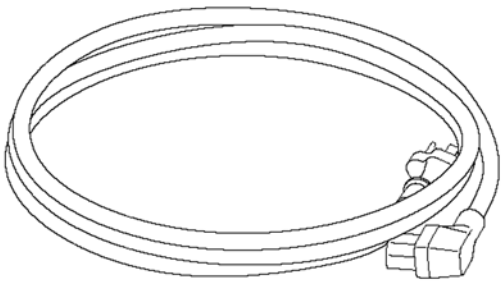
#1: Depending on the kind of error, both the POWER LED and the ALARM LED might be off.

(3) Accessories

A 100 V AC, 2.5 m power cable is available as an accessory.

A 100 V AC power cable is supplied with the PS-A11.

Figure 1-15 Power cable



⚠WARNING When using a Switch at 100 V AC, use the supplied power cable. 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 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 the supplied power cable with another switch. Doing so could result in fire or electric shock.

NOTE For the specifications defined by ALAXALA for power cables, see *2.4.2 Power supply facility for 200 V AC*.

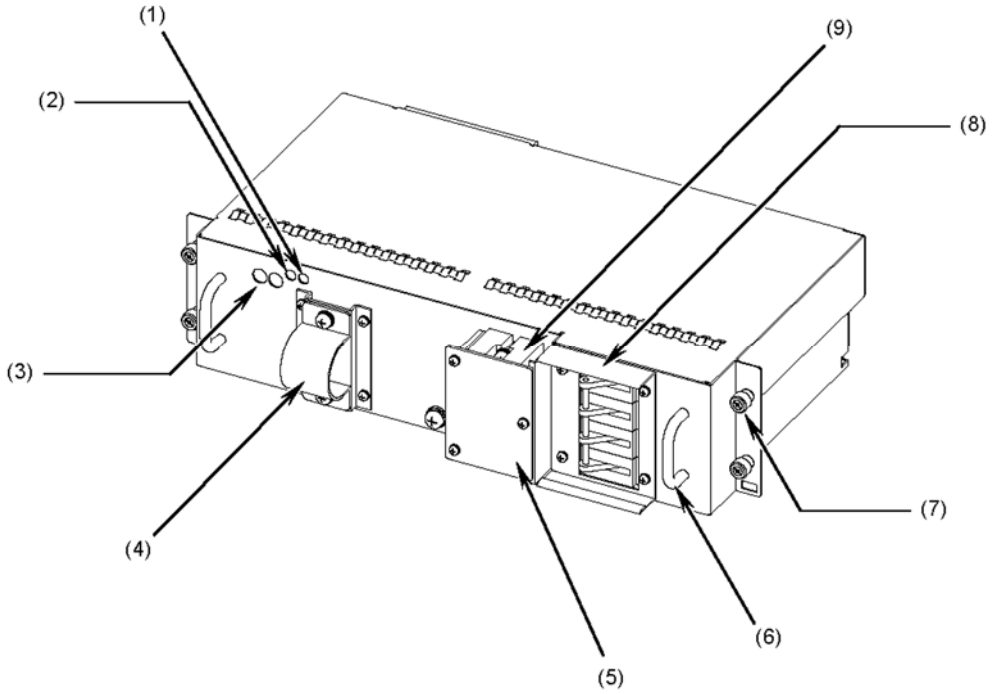
1.3.2 PS-D11

The PS-D11 power supply unit is common to AX6300S series switches.

The power supply unit supports −48 V DC.

(1) External appearance

Figure 1-16 External appearance



(1) ALARM LED

(2) POWER LED

(3) Terminal for measuring voltage

(4) Cable clamp

(5) Terminal board cover

(6) Handles

(7) Installation screw

(8) Circuit breaker

(9) Terminal board

⚠WARNING	A power supply unit has a terminal for measuring voltage. This terminal is used for inspection before the unit is shipped from the factory. Customers must not use this terminal. In addition, do not insert anything with a narrow tip, such as a pin or paper clip, into the terminal. Doing so could result in fire or electric shock.

(2) LED

A power supply unit indicates its status with a combination of two LEDs, as described in the following table.

Table 1-9 LED indications

Name		Description
POWER (LED: Green)	**ALARM (LED: Red)**	
ON	OFF	The power supply output voltage is normal.
OFF	ON	A power supply output voltage error has occurred.
OFF	OFF	The power is off or a power supply output voltage error has occurred.#1

#1: Depending on the kind of error, both the POWER LED and the ALARM LED might be off.

(3) Accessories

No accessories are available.

The customer must provide a power cable.

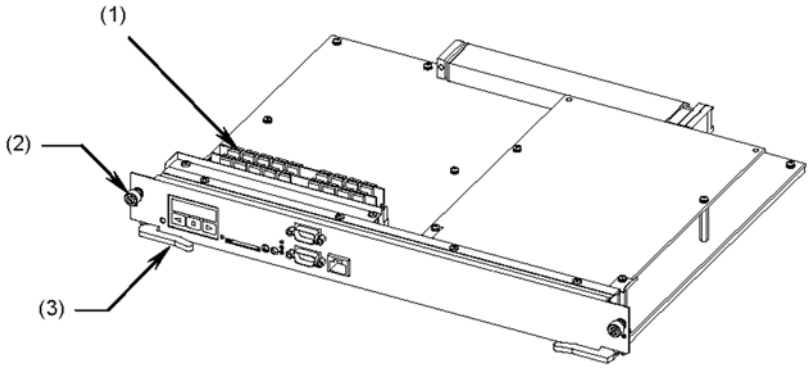
⚠WARNING When using a Switch in a −48 V DC environment, use only a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock.

NOTE For the specifications defined by ALAXALA for power cables, see *2.4.3 Power supply facility for −48 V DC*.

1.4 Management and switching unit (MSU)

The following figures show the external appearance of the management and switching units.

Figure 1-17 External appearance of the MSU-1A and the MSU-1B

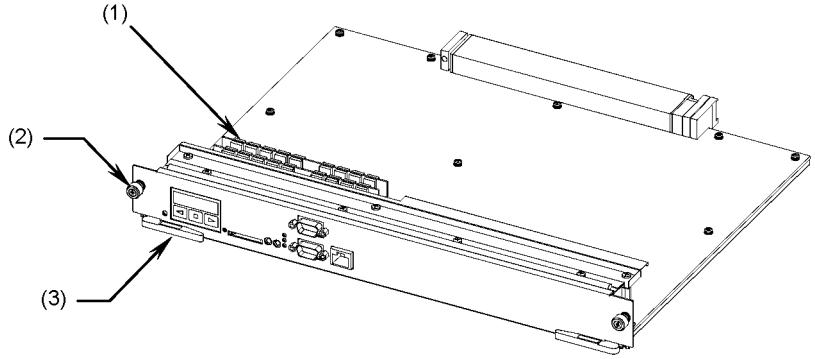


(1) Memory

(2) Installation screw

(3) Lever

Figure 1-18 External appearance of the MSU-1A1 and the MSU-1B1



(1) Memory

(2) Installation screw

(3) Lever

NOTE

The management and switching unit comes in two sizes: a standard table size and an extended table size.
Standard table size: MSU-1A and MSU-1A1
Extended table size: MSU-1B and MSU-1B1
Do not install both types in a single Switch.
If you install both types, they will not operate properly.

NOTE

Memory cannot be added or replaced. Do not remove, add, or replace memory. If you do so, operation is not guaranteed.

NOTE

In a management and switching unit, a flash disk is used as a storage device for storing base software, configuration information, and log information.

The number of times the flash disk can be written to is limited and should be noted during operation.

For detailed notes about writing data to a flash disk, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

1.4.1 MSU-1A and MSU-1A1

The MSU-1A and MSU-1A1 management and switching units (standard table size) are common to the AX6300S series switches.

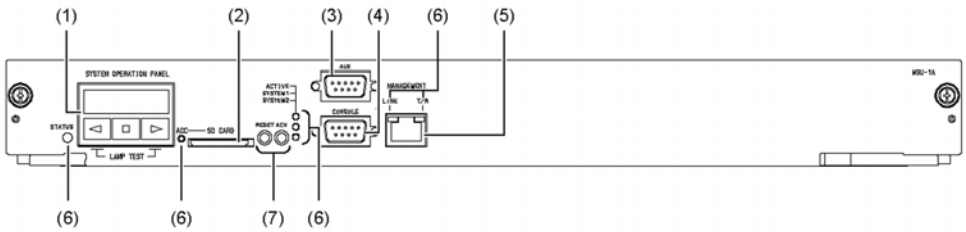
The MSU-1A and the MSU-1A1 have the following hardware specifications:

- Memory card slot: 1 slot
- AUX port (RS-232C): 1 port (In the MSU-1A, the AUX port is supported by software version 10.3 and later.)
- CONSOLE port (RS-232C): 1 port
- MANAGEMENT port (10BASE-T/100BASE-TX): 1 port

(1) Front view

The front view of the MSU-1A and the MSU-1A1 is shown below.

Figure 1-19 Front view



(1) System operation panel

(2) Memory card slot

(3) AUX port (RS-232C)

(4) CONSOLE port (RS-232C)

(5) MANAGEMENT port (10BASE-T/100BASE-TX)

(6) LEDs

(7) Switches

(2) System operation panel

The figure below shows the external appearance of the system operation panel.

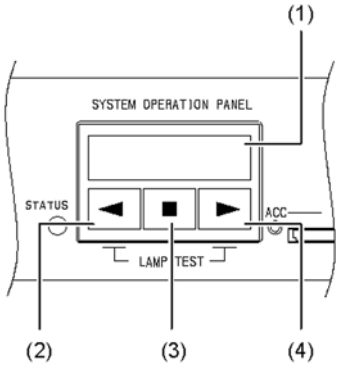
As shown in the figure, the system operation panel has an LCD and three operating buttons (back, enter, and forward).

The LCD displays information about the Switch.

Pressing the back, enter, or forward button allows you to switch among the menus

that can be displayed on the LCD.

Figure 1-20 External appearance of the system operation panel



(1) LCD

(2) Back button

(3) Enter button

(4) Forward button

NOTE

If you press the back and forward buttons at the same time, you can perform a lamp test. For details about operations in addition to the lamp test and the information that can be displayed on the LCD, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

NOTE

If you perform a lamp test, LEDs light up for fan units, power units, management and switching units, and network interface units whose power is on.

NOTE

The LCD has a backlight.

The backlight turns on in the following cases:

- When the Switch is turned on
- When a button is pressed

If no buttons are pressed for 60 seconds, the backlight turns off automatically.

If a Switch failure occurs, the failure information appears on the LCD, and the backlight blinks.

(3) LEDs and switches

Table 1-10 LED indications and switches

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the management and switching unit.	Green: Operation is possible. Orange: Self-diagnosis is in progress. Blinking green: Software is being loaded. Red: A failure has been detected. Off: Power is off. (The management and switching unit can be replaced.)[#1]

Name	Type	Status	Description
ACC	LED: Green	Indicates the memory card status.	Green: The memory card is being accessed. (Do not remove the memory card.) Off: The memory card is in idle mode. (A memory card can be plugged in or removed.)
RESET	Switch (non-locking)	Used to reset the Switch manually.[#2]	Press one second: Use this method when a Switch failure has occurred.[#3] Press five seconds: Use this method when you have forgotten the password.[#4]
ACH	Switch (non-locking)	Used to switch the system of the management and switching unit.[#2 #5]	When the management and switching unit is duplicated, use this switch to switch between the active system and the standby system.
ACTIVE	LED: Green	Indicates whether the management and switching unit is the active system or the standby system.	Green: Indicates the active system. Off: Indicates the standby system.
SYSTEM1	LED: Green, orange, or red	Indicates the Switch status.	Green: Operation is possible. Orange: A partial Switch failure was detected. Red: A Switch failure was detected.
SYSTEM2	LED: Green, orange, or red	This LED is not supported and is always off.	
LINK	LED: Green or yellow	Indicates the operation status of the MANAGEMENT port.	Green: A link is established. Lit in yellow: A failure has been detected. Off: A link failure occurred[#6] or operation has stopped.[#7]
T/R	LED: Green		Green: A packet is being sent or received. Off: No packets are being sent or received.

#1: A management and switching unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: The switch is recessed from the surface of the front panel. Use a screwdriver with a small head to press it.

#3: If you press the switch for one second or less, the Switch might not be reset.

#4: After a restart, a login password and an administrator password are no longer required. Be especially careful if you restart the unit with this method.

#5: The system can be switched only if you press the ACH switch on the management and switching unit of the active system.

#6: Cable disconnection is also included.

#7: You can stop operation by entering a command.

⚠WARNING When pressing a switch, 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 fire or electric shock.

1.4.2 MSU-1B and MSU-1B1

This is a management and switching unit (extended table size type) which is used in common among the AX6300S series switches.

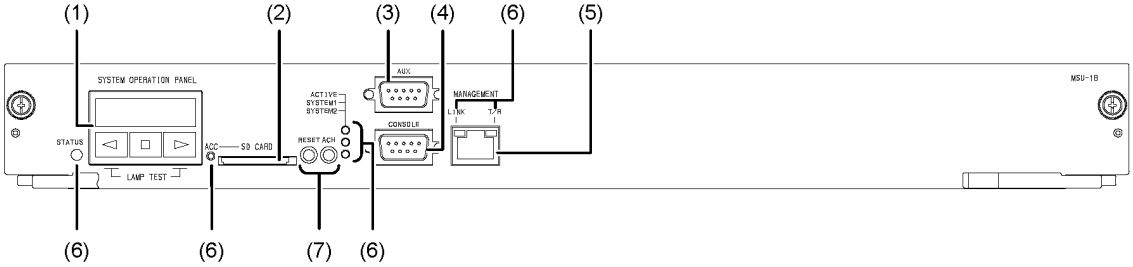
The MSU-1B and the MSU-1B1 have the following hardware specifications:

- Memory card slot: 1 slot
- AUX port (RS-232C): 1 port (In the MSU-1B, the AUX port is supported by software version 10.3 and later.)
- CONSOLE port (RS-232C): 1 port
- MANAGEMENT port (10BASE-T/100BASE-TX): 1 port

(1) Front view

The front view of the MSU-1B and the MSU-1B1 is shown below.

Figure 1-21 Front view



(1) System operation panel

(2) Memory card slot

(3) AUX port (RS-232C)

(4) CONSOLE port (RS-232C)

(5) MANAGEMENT port (10BASE-T/100BASE-TX)

(6) LEDs

(7) Switches

(2) System operation panel

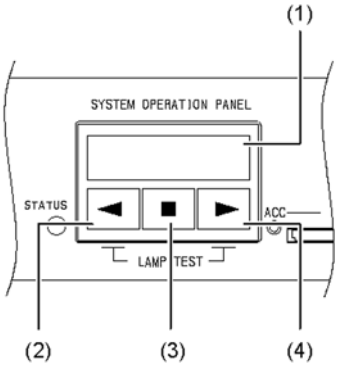
The figure below shows the external appearance of the system operation panel.

As shown in the figure, the system operation panel has an LCD and three operating buttons (back, enter, and forward).

The LCD displays information about the Switch.

Pressing the back, enter, or forward button allows you to switch among the menus that can be displayed on the LCD.

Figure 1-22 External appearance of the system operation panel



(1) LCD

(2) Back button

(3) Enter button

(4) Forward button

NOTE

If you press the back and forward buttons at the same time, you can perform a lamp test. For details about operations in addition to the lamp test and the information that can be displayed on the LCD, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

NOTE

If you perform a lamp test, LEDs light up for fan units, power units, management and switching units, and network interface units whose power is on.

NOTE

The LCD has a backlight.

The backlight turns on in the following cases:

- When the Switch is turned on
- When a button is pressed

If no buttons are pressed for 60 seconds, the backlight turns off automatically.

If a Switch failure occurs, the failure information appears on the LCD, and the backlight blinks.

(3) LEDs and switches

Table 1-11 LED indications and switches

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the management and switching unit.	Green: Operation is possible. Orange: Self-diagnosis is in progress. Blinking green: Software is being loaded. Red: A failure has been detected. Off: Power is off. (The management and switching unit can be replaced.)[#1]

Name	Type	Status	Description
ACC	LED: Green	Indicates the memory card status.	Green: The memory card is being accessed. (Do not remove the memory card.) Off: The memory card is in idle mode. (A memory card can be plugged in or removed.)
RESET	Switch (non-locking)	Used to reset the Switch manually.#2	Press one second: Use this method when a Switch failure has occurred.#3 Press five seconds: Use this method when you have forgotten the password.#4
ACH	Switch (non-locking)	Used to switch the system of the management and switching unit.#2 #5	When the management and switching unit is duplicated, use this switch to switch between the active system and the standby system.
ACTIVE	LED: Green	Indicates whether the management and switching unit is the active system or the standby system.	Green: Indicates the active system. Off: Indicates the standby system.
SYSTEM1	LED: Green, orange, or red	Indicates the Switch status.	Green: Operation is possible. Orange: A partial Switch failure was detected. Red: A Switch failure was detected.
SYSTEM2	LED: Green, orange, or red	This LED is not supported and is always off.	
LINK	LED: Green or yellow	Indicates the operation status of the MANAGEMENT port.	Green: A link is established. Lit in yellow: A failure has been detected. Off: A link failure occurred#6 or operation has stopped.#7
T/R	LED: Green		Green: A packet is being sent or received. Off: No packets are being sent or received.

#1: A management and switching unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: The switch is recessed from the surface of the front panel. Use a screwdriver with a small head to press it.

#3: If you press the switch for one second or less, the Switch might not be reset.

#4: After a restart, a login password and an administrator password are no longer required. Be especially careful if you restart the unit with this method.

#5: The system can be switched only if you press the ACH switch on the management and switching unit of the active system.

#6: Cable disconnection is also included.

#7: You can stop operation by entering a command.

⚠WARNING

When pressing a switch, 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 fire or electric shock.

1.5 Network interface unit (NIF)

The following table lists network interface units supported by the Switch.

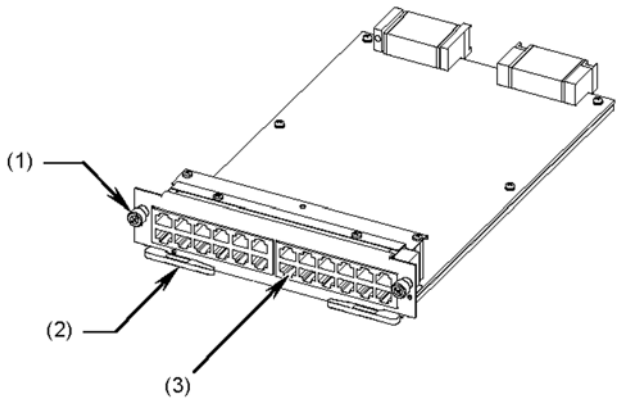
Table 1-12 Network interface units

Size	Name	Interface		
		10/100/1000BASE-T	1000BASE-X	10GBASE-R
Single-size	NH1G-24T	24 ports	--	--
	NH1G-16S	--	16 ports	--
	NH1G-24S	--	24 ports	--
	NH1GS-6M	4 ports	2 ports	--
	NH10G-1RX	--	--	1 port
	NH10G-4RX	--	--	4 ports
	NH10G-8RX	--	--	8 ports
Double-size	NH1G-48T	48 ports	--	--

1.5.1 Single-size

The following figure shows the external appearance of a single-size network interface unit.

Figure 1-23 External appearance



(1) Installation screw

(2) Lever

(3) Interface port

NOTE

The above figure shows an example of the NH1G-24T. Depending on the type of the network interface unit, the interface port or the LEDs vary. For details about single-size network interface units, see *(1)* and the following subsections.

(1) NH1G-24T

The NH1G-24T is a network interface unit with the following hardware specification:

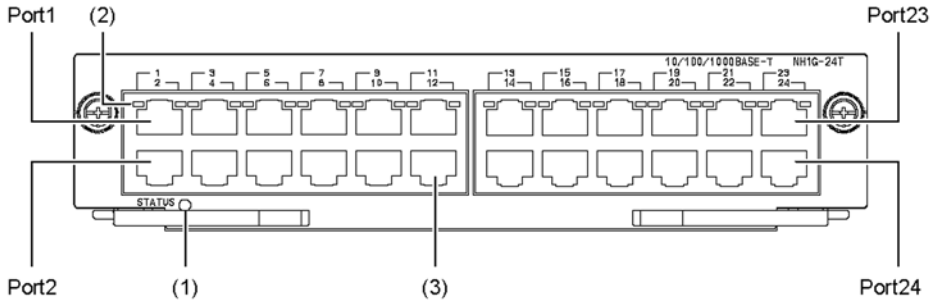
- Ethernet port (10/100/1000BASE-T): 24 ports

■ **Front view**

The front view is shown below.

For information about LEDs, see *Table 1-13 LED indications*.

Figure 1-24 Front view



(1) STATUS LED

(2) LINK/TR LED

(3) Ethernet port (10/100/1000BASE-T)

■ **LED**

Table 1-13 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2
LINK/TR	LED: Green or Orange	Indicates the operating status of the Ethernet port.#6	Green: A link is established. Blinking green: A frame is being sent or received. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(2) NH1G-16S

The NH1G-16S is a network interface unit with the following hardware specification:

- Ethernet port (1000BASE-X): 16 ports

NOTE

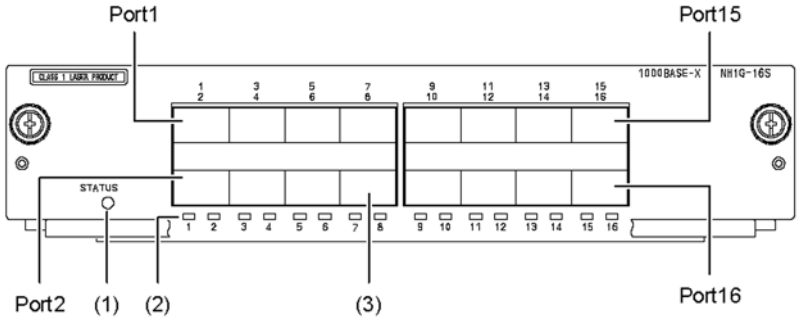
For information about the SFP transceivers supported by the Switch, see *1.7.1 SFP*.

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-14 LED indications*.

Figure 1-25 Front view



(1) STATUS LED

(2) LINK/TR LED

(3) Ethernet port (1000BASE-X)

■ LED

Table 1-14 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Indicates the operating status of the network interface unit. Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2

Name	Type	Status	Description
LINK/TR	LED: Green or Orange	Indicates the operating status of the Ethernet port.#6	Indicates the operating status of the Ethernet port.#6 Green: A link is established. Blinking green: A frame is being sent or received. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(3) NH1G-24S

The NH1G-24S is a network interface unit with the following hardware specification:

- Ethernet port (1000BASE-X): 24 ports

NOTE

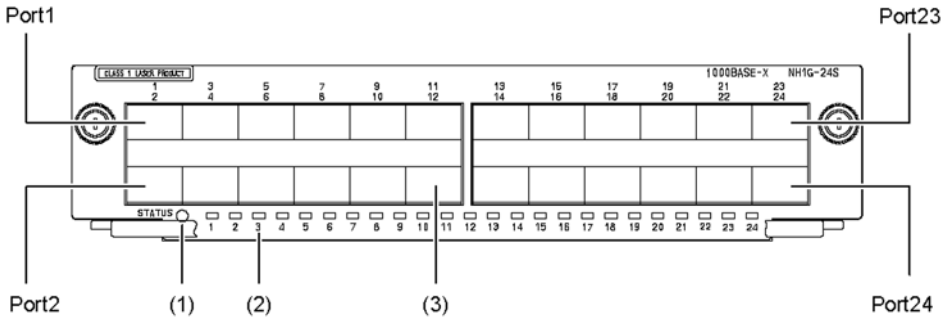
For information about the SFP transceivers supported by the Switch, see *1.7.1 SFP*.

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-15 LED indications*.

Figure 1-26 Front view



(1) STATUS LED

(2) LINK/TR LED

(3) Ethernet port (1000BASE-X)

■ LED

Table 1-15 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2
LINK/TR	LED: Green or Orange	Indicates the operating status of the Ethernet port.#6	Green: A link is established. Blinking green: A frame is being sent or received. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(4) NH1GS-6M

The NH1GS-6M is a network interface unit with the following hardware specifications:

- Ethernet port (10/100/1000BASE-T): 4 ports
- Ethernet port (1000BASE-X): 2 ports

NOTE

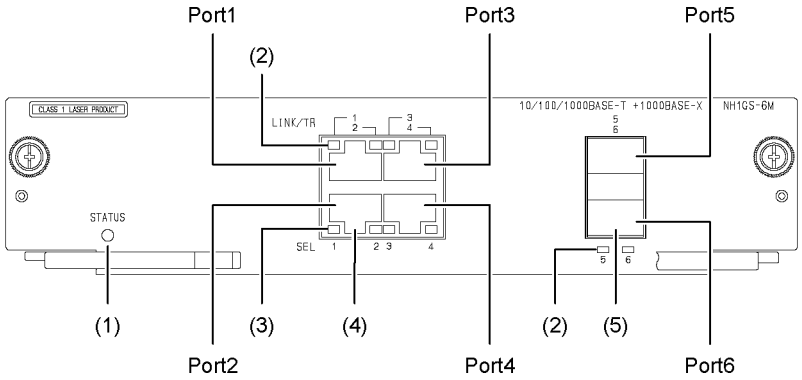
For information about the SFP transceivers supported by the Switch, see *1.7.1 SFP*.

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-16 LED indications*.

Figure 1-27 Front view



(1) STATUS LED

(2) LINK/TR LED

(3) SEL LED

(4) Ethernet port (10/100/1000BASE-T)

(5) Ethernet port (1000BASE-X)

■ **LED**

Table 1-16 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)[#1 #2]
LINK/TR	LED: Green or Orange	Indicates the operating status of the Ethernet port.[#6]	Green: A link is established. Blinking green: A frame is being sent or received. Orange: A failure has been detected. Off: A link failure occurred[#3 #4] or operation has stopped.[#3 #5]
SEL	LED: Green	Always green after the network interface unit is ready to operate.[#6]	

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(5) NH10G-1RX

The NH10G-1RX is a network interface unit with the following hardware specification:

- Ethernet port (10GBASE-R): 1 port

NOTE

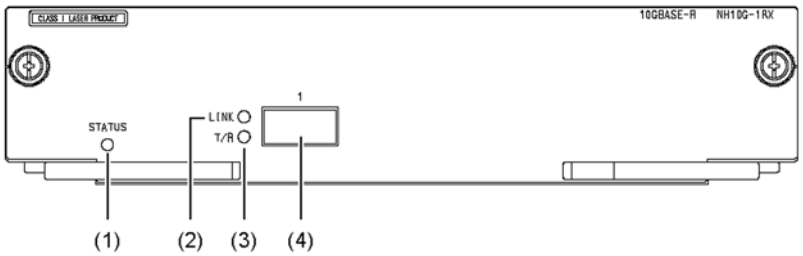
For information about the XFP transceivers supported by the Switch, see *1.7.2 XFP*.

■ **Front view**

The front view is shown below.

For information about LEDs, see *Table 1-17 LED indications*.

Figure 1-28 Front view



(1) STATUS LED

(2) LINK LED

(3) T/R LED

(4) Ethernet port (10GBASE-R)

■ **LED**

Table 1-17 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2
LINK	LED: Green or Orange	Indicates the operating status of the Ethernet port.#6	Green: A link is established. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5
T/R	LED: Green		Blinking green: A frame is being sent or received. Off: No frames are being sent or received.

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on

the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(6) NH10G-4RX

The NH10G-4RX is a network interface unit with the following hardware specification:

- Ethernet port (10GBASE-R): 4 ports

NOTE

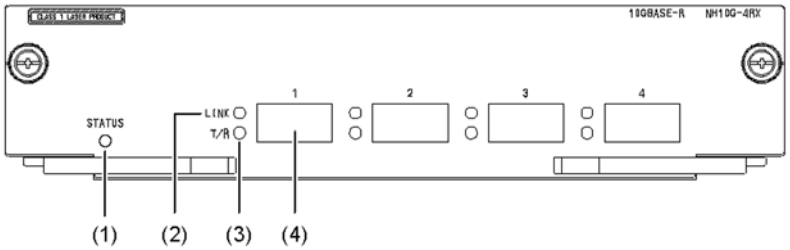
For information about the XFP transceivers supported by the Switch, see *1.7.2 XFP*.

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-18 LED indications*.

Figure 1-29 Front view



(1) STATUS LED

(2) LINK LED

(3) T/R LED

(4) Ethernet port (10GBASE-R)

■ LED

Table 1-18 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2
LINK	LED: Green or Orange	Indicates the operating status of the Ethernet port.#6	Green: A link is established. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5

Name	Type	Status	Description
T/R	LED: Green		Blinking green: A frame is being sent or received. Off: No frames are being sent or received.

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

(7) NH10G-8RX

The NH10G-8RX is a network interface unit with the following hardware specification:

- Ethernet port (10GBASE-R): 8 ports

NOTE

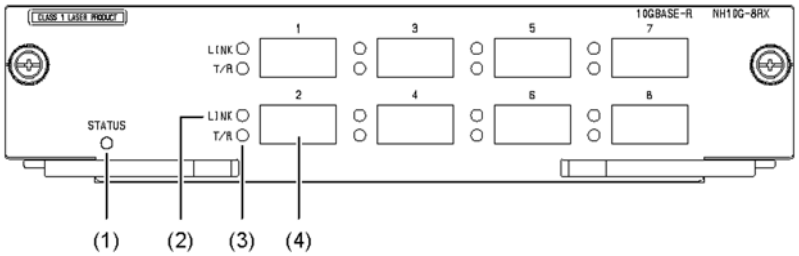
For information about the XFP transceivers supported by the Switch, see *1.7.2 XFP*.

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-19 LED indications*.

Figure 1-30 Front view



(1) STATUS LED

(2) LINK LED

(3) T/R LED

(4) Ethernet port (10GBASE-R)

■ **LED**

Table 1-19 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)[#1 #2]
LINK	LED: Green or Orange	Indicates the operating status of the Ethernet port.[#6]	Green: A link is established. Orange: A failure has been detected. Off: A link failure occurred[#3 #4] or operation has stopped.[#3 #5]
T/R	LED: Green		Blinking green: A frame is being sent or received. Off: No frames are being sent or received.

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

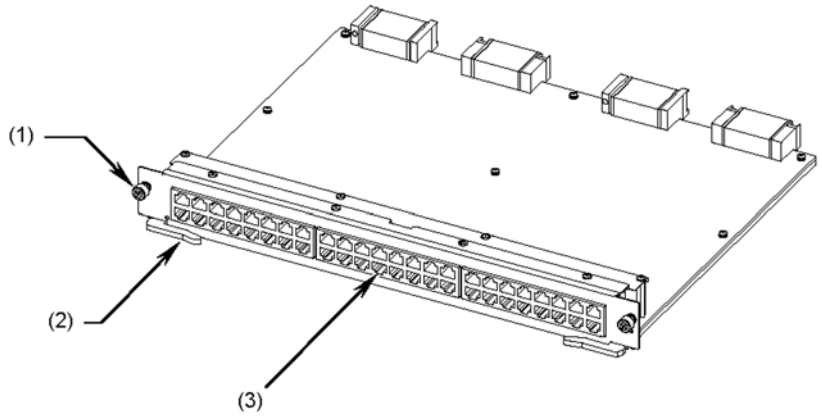
If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.

This function is supported by software version 10.3 and later.

1.5.2 Double-size

The external appearance of a double-size network interface unit is shown below.

Figure 1-31 External appearance



(1) Installation screw

(2) Lever

(3) Interface port

(1) NH1G-48T

The NH1G-48T is a network interface unit with the following hardware specification:

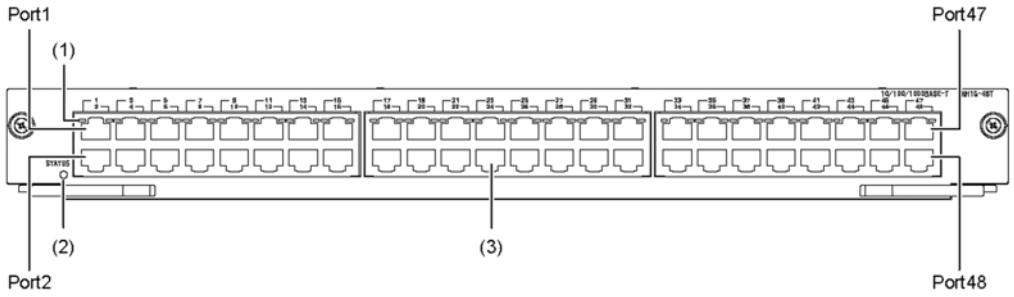
- Ethernet port (10/100/1000BASE-T): 48 ports

■ Front view

The front view is shown below.

For information about LEDs, see *Table 1-20 LED indications*.

Figure 1-32 Front view



(1) LINK/TR LED

(2) STATUS LED

(3) Ethernet port (10/100/1000BASE-T)

■ **LED**

Table 1-20 LED indications

Name	Type	Status	Description
STATUS	LED: Green, orange, or red	Indicates the operating status of the network interface unit.	Green: Operation is possible. Orange: A reset is in progress. Blinking green: Startup is in progress. Red: A failure has been detected. Off: Power is off. (The network interface unit can be replaced.)#1 #2
LINK/TR	LED: Green or orange	Indicates the operating status of the Ethernet port.#6	Green: A link is established. Blinking green: A frame is being sent or received. Orange: A failure has been detected. Off: A link failure occurred#3 #4 or operation has stopped.#3 #5

#1: A network interface unit can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: If no system recovery is set, the network interface unit is turned off in the following situations:

- When a failure occurred in the network interface unit (the STATUS LED turns red, and then it turns off).
- When a failure occurred in a management and switching unit (when the management and switching unit is not duplicated).

#3: When the STATUS LED is green.

#4: Cable disconnection is also included.

#5: Operation of an Ethernet port can be stopped by entering a command from the operation terminal.

#6: Always turns off if the interface port LED is set to off. When an operation key on the system operation panel is used, the LED lights up, and the operating status can be checked. If no keys are used for 60 seconds, the LED turns off again.

NOTE

If no system recovery is set and a failure occurs in a Switch, the Switch can stay stopped without recovering the failed part.
This function is supported by software version 10.3 and later.

1.6 Memory card (MC)

To use a memory card, install it in a management and switching unit.

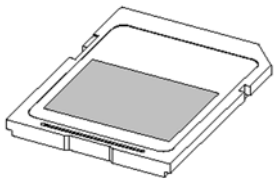
The memory card is used for the following:

- Backing up operating information
- Saving troubleshooting information in the event of a failure
- Updating the Switch software

(1) SD128

This memory card is an SD memory card with a capacity of 128 MB.

Figure 1-33 External appearance



Label: ALAXALA SD128

NOTE

Make sure that you use standard ALAXALA memory cards labeled as shown in the figure. If non-standard products are used, correct operation is not guaranteed.

NOTE

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

1.7 Transceiver

1.7.1 SFP

To use an SFP transceiver, connect it to an Ethernet port on the network interface unit.

The SFP transceivers supported by the Switch are listed in Table 1-21 List of SFP transceivers.

Table 1-21 List of SFP transceivers

Number	Module name	Interface
1	SFP-SX	Gigabit Ethernet 1000BASE-SX
2	SFP-SX2	Gigabit Ethernet 1000BASE-SX2
3	SFP-LX	Gigabit Ethernet 1000BASE-LX
4	SFP-LH	Gigabit Ethernet 1000BASE-LH
5	SFP-LHB	Gigabit Ethernet 1000BASE-LHB
6	SFP-BX1U	Gigabit Ethernet 1000BASE-BX10-U#1
7	SFP-BX1D	Gigabit Ethernet 10000BASE-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 used in pairs.

#2: 1000BASE-BX40-U and 1000BASE-BX40-D are used in pairs.

⚠CAUTION

The Switch uses laser beams that are colorless and transparent, and invisible to the eye. 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.

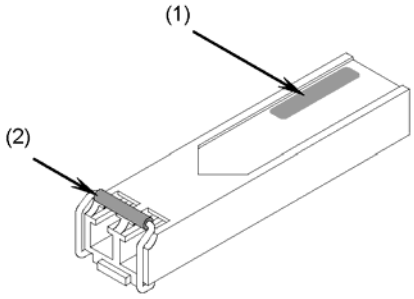
Attaching a label to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the Switch.

NOTE

Make sure that you use standard ALAXALA products labeled as shown in the figures. If non-standard products are used, correct operation is not guaranteed.

(1) SFP-SX

Figure 1-34 External appearance

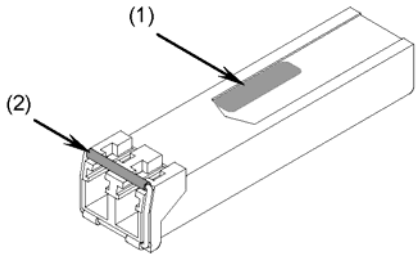


(1) Label: ALAXALA SFP-SX
Label color: Black

(2) Lever color: Black

(2) SFP-SX2

Figure 1-35 External appearance

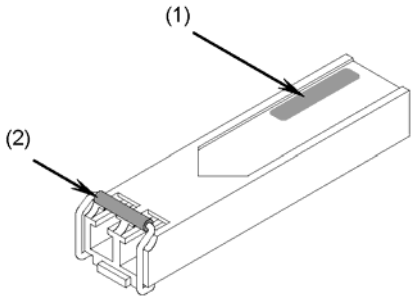


(1) Label: ALAXALA SFP-SX2
Label color: White

(2) Lever color: Silver

(3) SFP-LX

Figure 1-36 External appearance

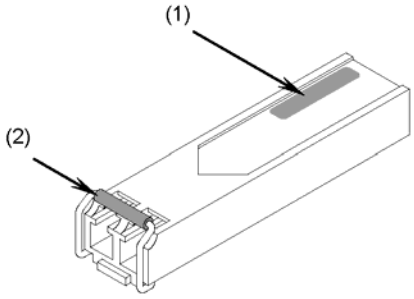


(1) Label: ALAXALA SFP-LX
Label color: Blue

(2) Lever color: Blue

(4) SFP-LH

Figure 1-37 External appearance

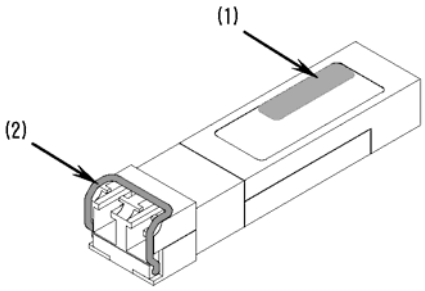


(1) Label: ALAXALA SFP-LH
Label color: Green

(2) Lever color: Green

(5) SFP-LHB

Figure 1-38 External appearance

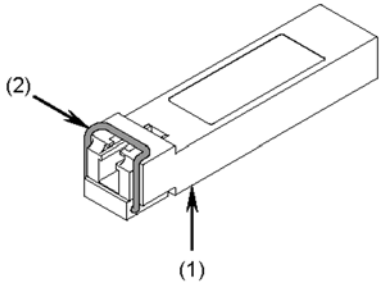


(1) Label: ALAXALA SFP-LHB
Label color: White

(2) Lever color: Yellow-green

(6) SFP-BX1U

Figure 1-39 External appearance

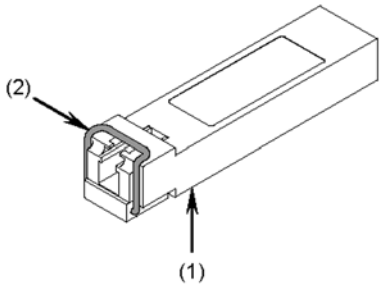


(1) Label at the back of the transceiver: ALAXALA SFP-BX1U
Label color: White

(2) Lever color: Blue

(7) SFP-BX1D

Figure 1-40 External appearance

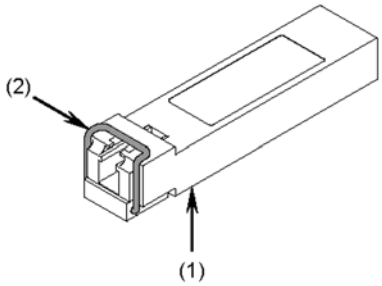


(1) Label at the back of the transceiver: ALAXALA SFP-BX1D
Label color: White

(2) Lever color: Magenta

(8) SFP-BX4U

Figure 1-41 External appearance

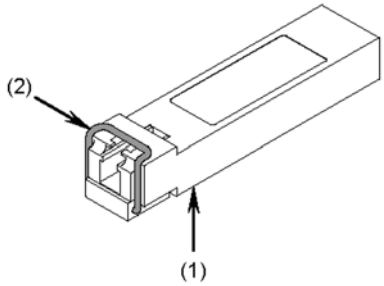


(1) Label at the back of the transceiver: ALAXALA SFP-BX4U
Label color: White

(2) Lever color: Yellow

(9) SFP-BX4D

Figure 1-42 External appearance



(1) Label at the back of the transceiver: ALAXALA SFP-BX4D
Label color: White

(2) Lever color: Green

1.7.2 XFP

To use an XFP transceiver, connect it to an Ethernet port on the network interface

unit.

The XFP transceivers supported by the Switch are listed in *Table 1-22 List of XFP transceivers*.

Table 1-22 List of XFP transceivers

Number	Module name	Interface
1	XFP-SR	10 Gigabit Ethernet 10GBASE-SR
2	XFP-LR	10 Gigabit Ethernet 10GBASE-LR
3	XFP-ER	10 Gigabit Ethernet 10GBASE-ER
4	XFP-ZR	10 Gigabit Ethernet 10GBASE-ZR

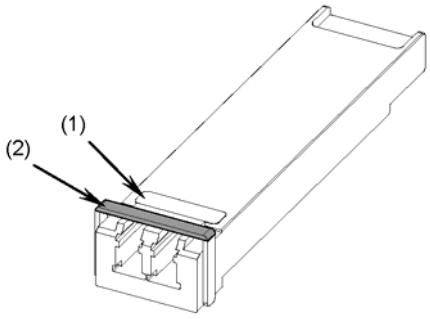
⚠CAUTION	The Switch uses laser beams that are colorless and transparent, and invisible to the eye. Never look directly into the optical transceiver.

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 to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the Switch.

NOTE	Make sure that you use standard ALAXALA products labeled as shown in the figures. If non-standard products are used, correct operation is not guaranteed.

(1) XFP-SR

Figure 1-43 External appearance

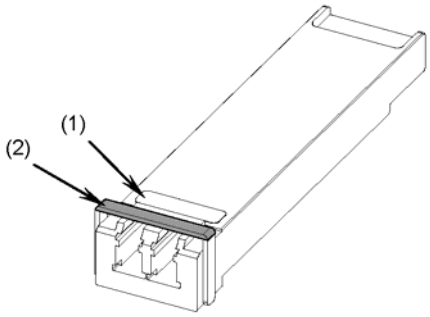


(1) Label: ALAXALA XFP-SR

(2) Lever color: Ivory

(2) XFP-LR

Figure 1-44 External appearance

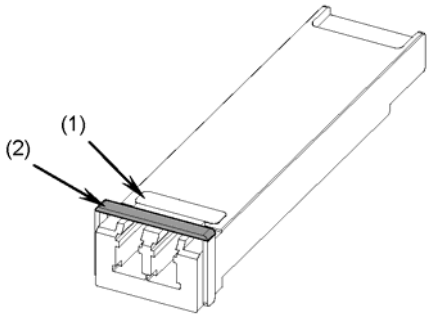


(1) Label: ALAXALA XFP-LR

(2) Lever color: Blue

(3) XFP-ER

Figure 1-45 External appearance

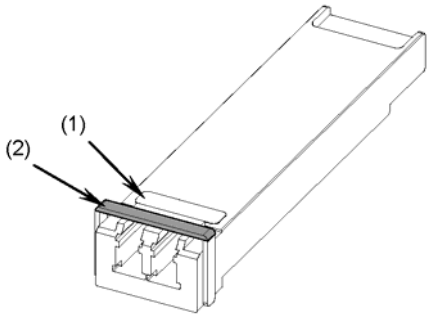


(1) Label: ALAXALA XFP-ER

(2) Lever color: Red

(4) XFP-ZR

Figure 1-46 External appearance



(1) Label: ALAXALA XFP-ZR

(2) Lever color: White

1.8 Blank panel

When a slot does not contain an optional module, a blank panel is inserted in the slot.

The blank panel serves the following purposes:

- Ensures the flow of air inside the Switch.
- Reduces radio interference from the Switch.
- Protects the Switch from radio interference by another device.

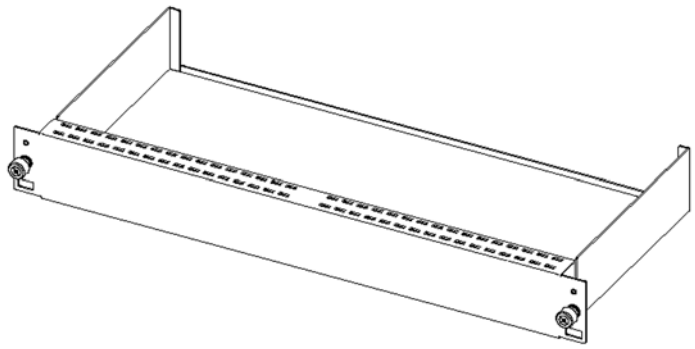
CAUTION

Insert a blank panel in a slot in which there is no optional module. If you continue using the Switch without attaching a blank panel, the airflow inside the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure. In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

(1) BPNL-PS11

The blank panel for a power supply unit.

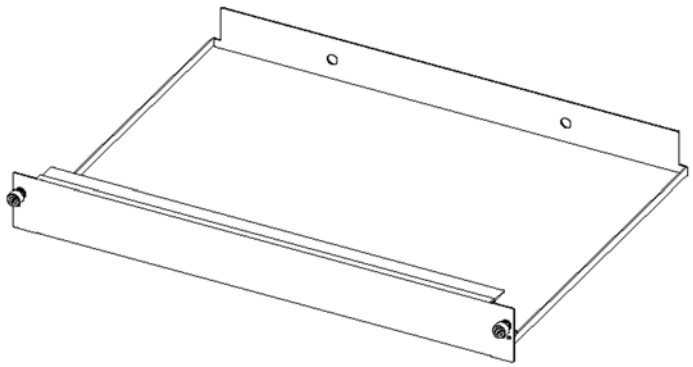
Figure 1-47 BPNL-PS11



(2) BPNL-SU11

The blank panel for a management and switching unit.

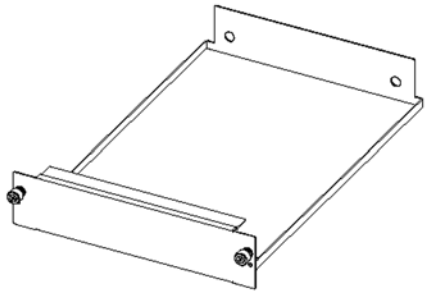
Figure 1-48 BPNL-SU11



(3) BPNL-NF11

The blank panel for a network interface unit.

Figure 1-49 BPNL-NF11



1.9 Power cable

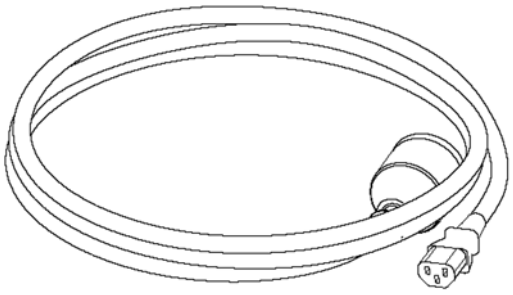
1.9.1 CBL-A12

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.

(1) External appearance

Figure 1-50 CBL-A12



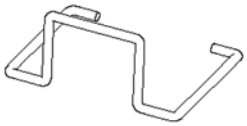
⚠WARNING	When using a Switch in a 200 V AC environment, use only the separately sold ALAXALA power cable, or a power cable that meets ALAXALA specifications. Using another cable could result in fire or electric shock. In addition, do not use the supplied power cable with another switch. Doing so could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

NOTE	If an optional ALAXALA power cable cannot be used with your power supply facility, use a power cable that meets ALAXALA specifications. For information about ALAXALA specified power cables, see *2.4.2 Power supply facility for 200 V AC*.

(2) Accessories

Bracket that protects the power cable from being disconnected. This bracket can be used only for the CBL-A12.

Figure 1-51 Bracket protecting disconnection of the power cable



1.10 Rack fixture

A bracket (sold separately) used to attach the Switch to a 19-inch cabinet rack.

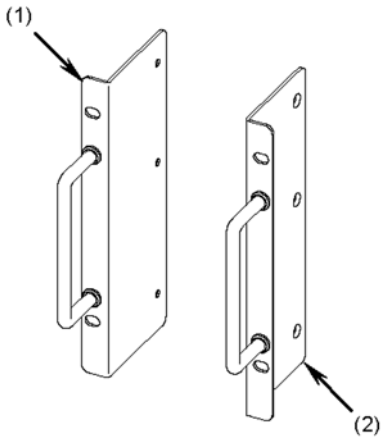
With this bracket, you can fix a Switch so that it is recessed 50 mm from the rack pillar.

1.10.1 BRK-11

The BRK-11 is a rack fixture for the AX6304S.

(1) External appearance

Figure 1-52 BRK-11



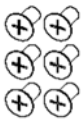
(1) Left: L

(2) Right: R

(2) Accessories

Installation screws for the BRK-11.

Figure 1-53 Screws (M4 x 8, 6 screws)

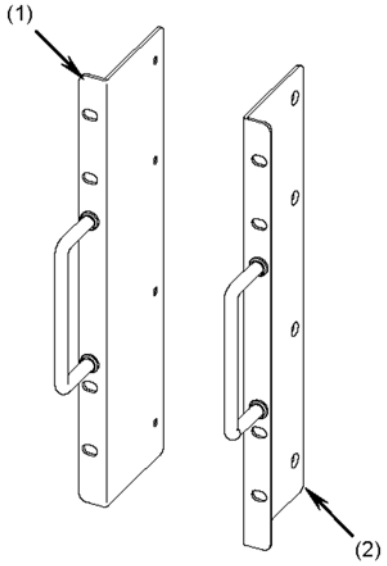


1.10.2 BRK-12

The BRK-12 is a rack fixture for the AX6308S.

(1) External appearance

Figure 1-54 BRK-12



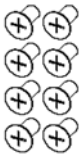
(1) Left: L

(2) Right: R

(2) Accessories

Installation screws for the BRK-12.

Figure 1-55 Screws (M4 x 8, 8 screws)



1.11 Support bracket

1.11.1 BRK-14

The BRK-14 support brackets are a pair of brackets used for installation of the AX6304S in a rack.

When the support brackets are used together with the rack fixture, the Switch can be installed in the rack without using a guide rail.

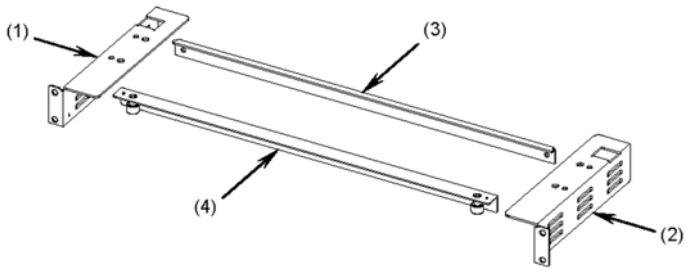
The support brackets can be used for a 19-inch cabinet rack that conforms to the EIA standard.

⚠CAUTION	The support bracket supports the AX6304S only. Do not use the bracket with another Switch. Using a bracket with another Switch might cause the Switch to drop or fall, resulting in injury.

NOTE	The support brackets can be used with the BRK-11, a rack fixture (sold separately) that fixes a Switch recessed 50 mm from the rack pillar. For information about the BRK-11, see *1.10 Rack fixture*.

(1) External appearance

Figure 1-56 BRK-14



(1) Bracket L

(2) Bracket R

(3) Cross bar A

(4) Cross bar B

(2) Accessories

Screws used to attach crossbar A to the bracket.

Figure 1-57 Screws (M4 x 10, 2 screws)

NOTE	Mounting a Switch on a rack requires the screws supplied with the rack. Have on hand the eight M5 or M6 screws (four for fixing the BRK-14 brackets, and four for fixing the Switch) that were supplied with the rack.

2. Preparation for Installation

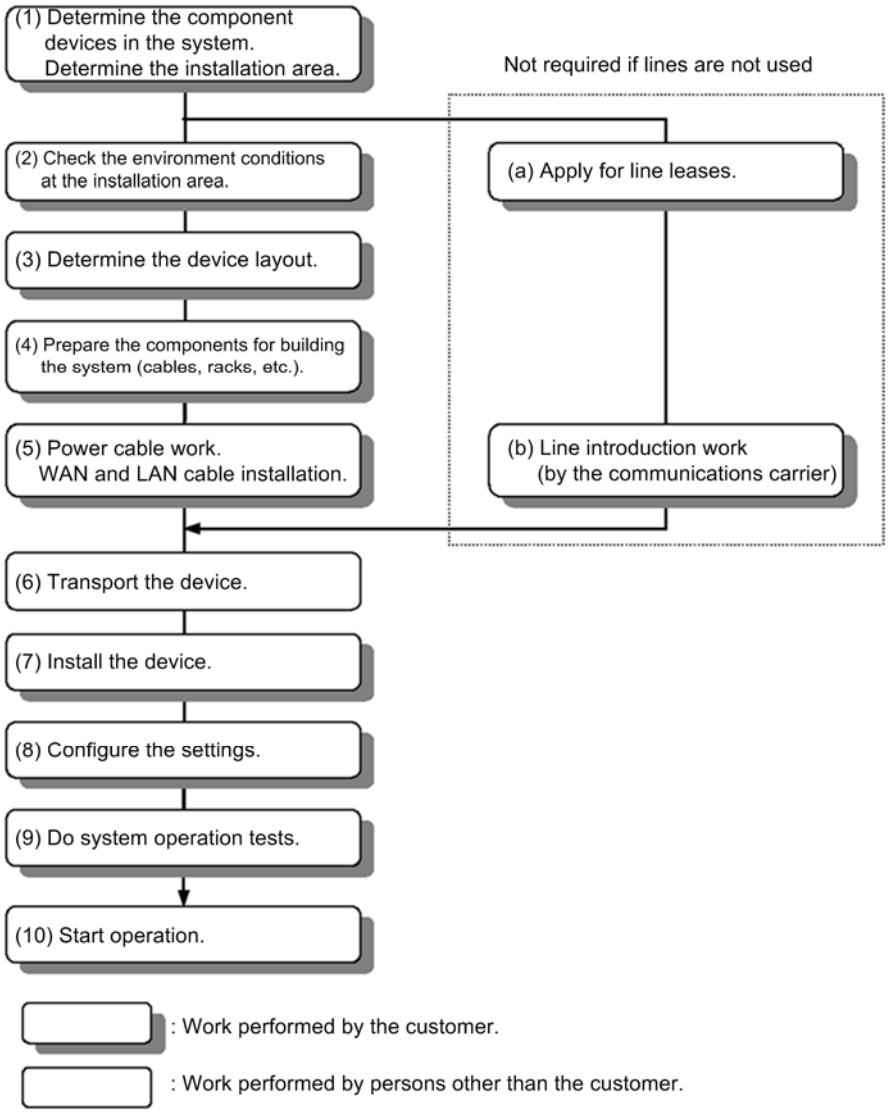
This chapter describes the environment conditions and preparations required for installation of the Switch. Before preparing for the installation, read this chapter carefully and be sure that you understand all instructions and notes within.

2.1 Preparation workflow

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

Be sure to schedule enough time to complete the following work before installing the Switch: power supply work, communications equipment work, and laying down LAN cables.

Figure 2-1 Flowchart of preparation for installation



2.2 Installation conditions

The general installation requirements for the Switch are described below. The installation environment must meet these requirements.

Table 2-1 Switch installation conditions

Item		Specifications			
		AX6304S		AX6308S	
		When an AC power supply unit is installed	When a DC power supply unit is installed	When an AC power supply unit is installed	When a DC power supply unit is installed
Dimensions (Width[#1] x Depth[#2] x Height)		443 x 544 x 211 mm	443 x 573 x 211 mm	443 x 544 x 303 mm	443 x 573 x 303 mm
Weight (with maximum number installed)		45 kg		64 kg	
Input voltage[#3]	Rated breaker capacity	Single phase 100 to 120 V AC Single phase 200 to 240 V AC	−48 V DC	Single phase 100 to 120 V AC Single phase 200 to 240 V AC	−48 V DC
	Variation range	90 to 132 V AC 180 to 264 V AC	−40.5 to -57V	90 to 132 V AC 180 to 264 V AC	−40.5 to −57V
Frequency		50/60 ± 3Hz	--	50/60 ± 3Hz	--
Maximum input current		16A @ 100 V AC, 8A @ 200 V AC	32A @ −48 V DC	25 A @ 100 V AC, 12.5 A @ 200 V AC	50 A @ −48 V DC
Maximum power consumption		1,500 W		2,400 W	
Maximum heat dissipation		5,400k J/h		8,640 kJ/h	
Noise[#4]	Intake temperature 25°C	55 dB or less			
	Intake temperature 40°C	60 dB or less			
Vibration		2.45 m/s^2 or less			
Dust[#5]		0.15 mg/m^3 or less			
Temperature	Operating	0 to 40°C (23 to 28°C is recommended)			
	Not operating	−10 to 43°C			
	During storage and transportation	−25 to 65°C			
Humidity[#6]	Operating	10 to 85% (45 to 55 % is recommended)			
	Not operating	8 to 85 %			
	During storage and transportation	5 to 85 %			

#1: Dimensions of the rack fixture are not included.

#2: Dimensions for the handles of the Switch, fan unit, and power supply unit are included.

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

#4: The value is measured at 1 m from the side of the Switch. The number of rotations of the fan varies according to the intake temperature. Because of this, the value of the noise changes.

#5: According to *JIS Z 8813 Measuring Methods for Suspended Particulate Matter Concentration in Air*.

#6: No condensation

2.3 Carrying a Switch

(1) Number of people

The weight of the Switch is shown in the table below. The Switch must be installed and carried by at least three people.

Table 2-2 Number of people required to carry a Switch:

Model	Weight	Number of people
AX6304S	45 kg	Three or more
AX6308S	64 kg	

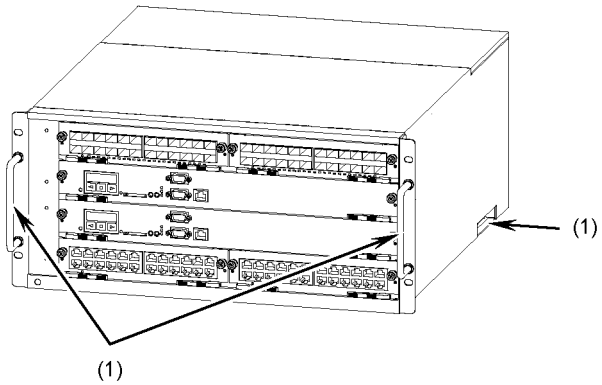
⚠WARNING

The Switch must be carried by at least three people. Installing or carrying a Switch with too few people could result in the Switch being dropped or falling, possibly leading to injury.

(2) How to carry

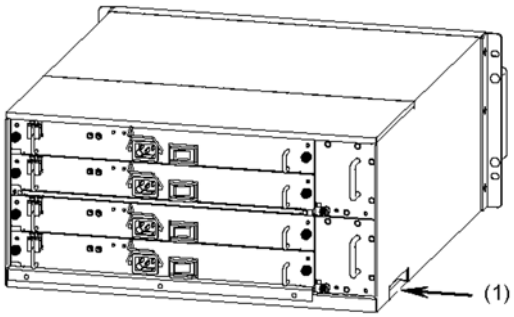
When moving a Switch, hold the handles shown in the following figure and the bottom of the Switch.

Figure 2-2 Location of handles for the AX6304S (front)



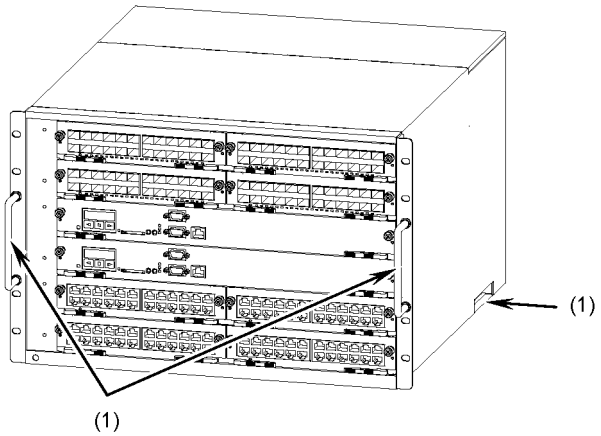
(1) Handles

Figure 2-3 Location of handles for the AX6304S (rear)



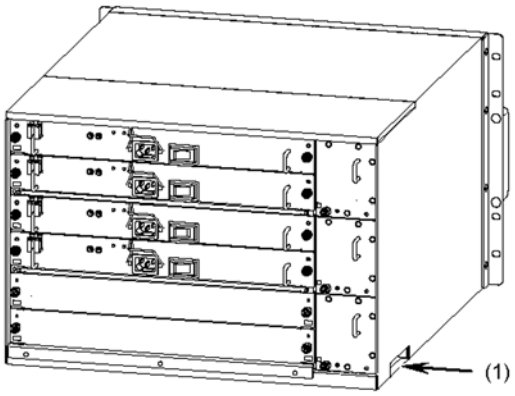
(1) Handles

Figure 2-4 Location of handles for the AX6308S (front)



(1) Handles

Figure 2-5 Location of handles for the AX6308S (rear)



(1) Handles

⚠CAUTION	When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

NOTE	To install a Switch in an elevated location, ALAXALA Networks Corporation recommends that you use a hand lifter or equivalent device.

2.4 Power supply facility

2.4.1 Power supply facility for 100 V AC

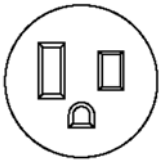
(1) Outlet

Use an outlet shown below, that conforms to the JIS and NEMA standards. This type of electrical outlet is available from electrical equipment suppliers.

Table 2-3 Electrical outlet standards

Standards		Specifications
JIS	C-8303	15A 125V, two-pin grounded outlet
NEMA	5-15R	

Figure 2-6 Two-pin grounded outlet (125V 15A)



⚠WARNING

Always use a grounded power outlet. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

(2) Distribution board

Use circuit breakers on the branch circuit supplying power to the Switch. See the following table for the rated breaker capacity, and the required number of circuit breakers and outlets.

Table 2-4 Rated breaker capacity and required quantity

Rated breaker capacity	Power supply redundancy	Number of required circuit breakers	Number of required outlets
15 AT with single phase 100 V AC (for a 15 A circuit)	None	2	2
	Required	4	4

NOTE

For easy operation, the distribution board should be installed in the same room as the Switch or in an adjacent room.

NOTE

For a redundant power supply, the power from different power supply systems can be supplied to each power supply unit.

(3) Requirements for the incoming current to the distribution board

The capacity of the incoming current to the distribution board must be greater than that of the breaker operating current described in the above *(2) Distribution board*.

⚠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 fire.

NOTE

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

In addition, when a Switch is turned on, inrush current shown in the figure below flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current.

Table 2-5 Inrush current

Current	Time
30 A	150 ms

CAUTION

When a Switch is turned on, inrush current flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same power supply facility.

NOTE

The inrush current described above is the value for a single power supply unit.

2.4.2 Power supply facility 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 *1.9 Power cable*.

NOTE

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

Table 2-6 AC power cable specifications

Item	Connector (Switch side)	Cable	Plug (outlet side)
Rated breaker capacity	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 fire or electric shock.

(2) Outlet

Use an outlet shown below, that conforms to the JIS and NEMA standards. This type of electrical outlet is available from electrical equipment suppliers.

Table 2-7 Electrical outlet standards

Standards		Specifications
JIS	C-8303	20 A 250 V, Two-pin grounded twist-lock outlet
NEMA	L6-20R	

Figure 2-7 Two-pin grounded twist-lock outlet (250 V, 20 A)

⚠WARNING

Always use a grounded power outlet. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

NOTE

The above outlet supports the ALAXALA 200 V AC optional power cable. If you do not want to use the ALAXALA optional power cable, use the outlet below. This type of electrical outlet is available from electrical equipment suppliers.

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

(3) Distribution board

Use circuit breakers on the branch circuit supplying power to the Switch. See the following table for the rated breaker capacity, and the required number of circuit breakers and outlets.

Table 2-8 Rated breaker capacity and required quantity

Rated breaker capacity	Power supply redundancy	Number of required circuit breakers	Number of required outlets
10 AT with single phase 200 V AC (for a 10 A circuit)	None	2	2
	Required	4	4

NOTE

For easy operation, the distribution board should be installed in the same room as the Switch or in an adjacent room.

NOTE

For a redundant power supply, the power from different power supply systems can be supplied to each power supply unit.

(4) Requirements for the incoming current to the distribution board

The capacity of the incoming current to the distribution board must be greater than that of the breaker operating current described in the above *(3) Distribution board*.

⚠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 fire.

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

In addition, when a Switch is turned on, inrush current shown in the figure below flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current.

Table 2-9 Inrush current

Current	Time
30 A	150 ms

CAUTION	When a Switch is turned on, inrush current flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same power supply facility.

NOTE	The inrush current described above is the value for a single power supply unit.

2.4.3 Power supply facility for −48 V DC

(1) DC power cable

When using a Switch in a −48 V DC environment, use only the power cable described in *Table 2-10 DC power cable specifications*.

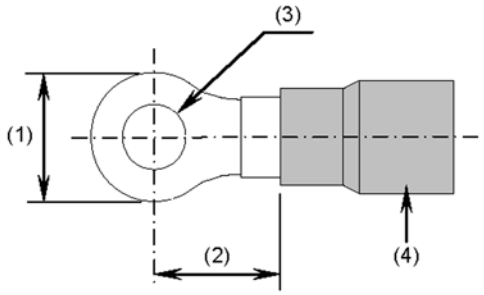
Use the terminals described in *Figure 2-8 0 V and −48 V terminals* as the 0 V and −48 V terminals of a DC power cable, and use either terminal described in *Figure 2-9 Ground terminal* as the ground terminal.

For information about the distances from the cable clamp to the 0 V terminal, the −48 V terminal, and the ground terminal, see *Figure 2-10 Terminal board of the DC power supply unit*.

Table 2-10 DC power cable specifications

Power supply unit	Cable specifications		
	Number of cores	AWG No.	External diameter of the cable
PS-D11	Three cores	4	30 to 32 mm

Figure 2-8 0 V and −48 V terminals



(1) 17.8 mm (max)

(2) 17.5 mm (max)

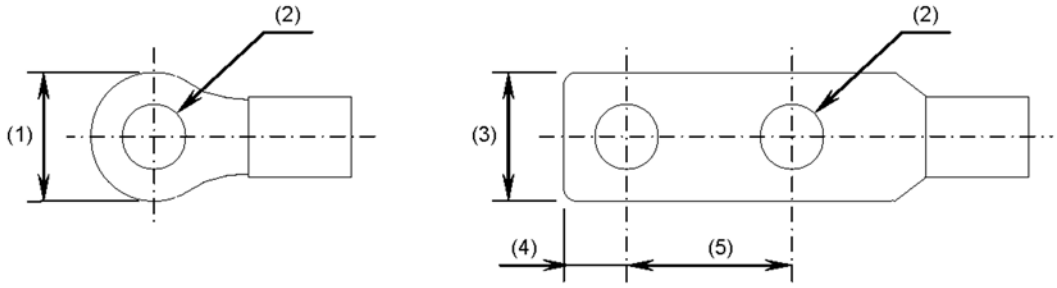
(3) 6.3 to 6.9 mm

(4) Insulation cover

⚠WARNING

Place an insulation cover over the 0 V and -48 V terminals. Using the terminals without an insulation cover could result in fire or electric shock. Place the insulation cover so that the distance from the hole of the terminal to the insulation cover is 17.5 mm or less (half of the width of the terminal board for the power supply unit). Be careful that the exposed core of the cable does not extend out of the terminal board.

Figure 2-9 Ground terminal



(1) 17.8 mm (max)

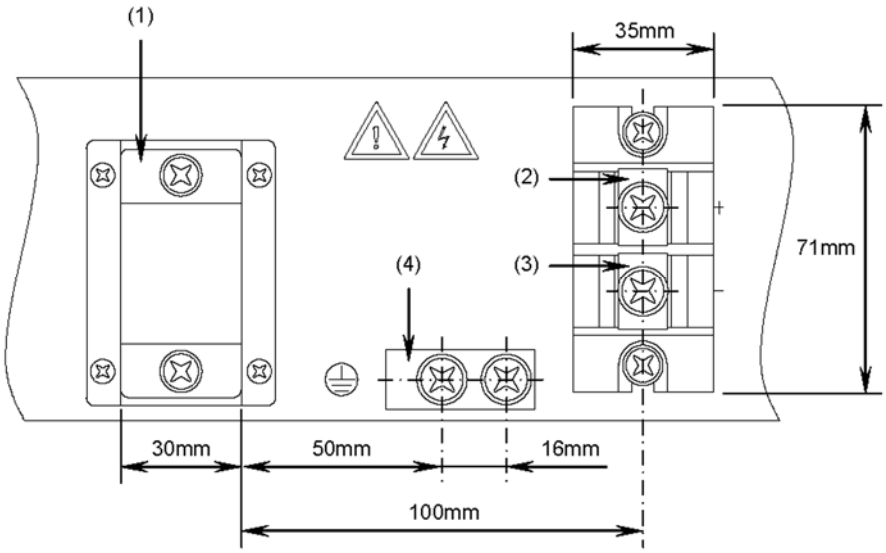
(2) 6.3 to 6.9 mm

(3) 19 mm (max)

(4) 8 mm (max)

(5) 16 mm

Figure 2-10 Terminal board of the DC power supply unit



(1) Cable clamp

(2) 0V terminal (screw: M6)

(3) −48V terminal (screw: M6)

(4) Ground terminal (screw: M6)

(2) Distribution board

Use circuit breakers on the branch circuit supplying power to the Switch. See the following table for the rated breaker capacity and the required quantity.

Table 2-11 Rated breaker capacity and required quantity

Rated breaker capacity	Power supply redundancy	Required number
60 A	None	1
	Required	2

NOTE

For easy operation, the distribution board should be installed in the same room as the Switch or in an adjacent room.

NOTE

For a redundant power supply, the power from different power supply systems can be supplied to each power supply unit.

(3) Requirements for the incoming current to the distribution board

The capacity of the incoming current to the distribution board must be greater than that of the breaker operating current described in the above *(2) Distribution board*.

⚠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 fire.

NOTE

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

In addition, if a Switch is turned on, the inrush current described in *Table 2-12 Inrush current* flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current. Be especially careful, when using a UPS or CVCF.

Table 2-12 Inrush current

Current	Time
80 A	40 ms

CAUTION

When a Switch is turned on, inrush current flows. Consider measures for avoiding a voltage drop in the power supply facility caused by the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same power supply facility.

NOTE

The inrush current described above is the value for a single power supply unit.

2.5 Notes on electric noise

Electric noise emitted by other devices can cause failures.

Note the following points when designing a plan for the power supply facility:

- The branch circuit of the power supply to the Switch should not be connected to devices that use a relay, micro-switches, or other means to power them on and off repeatedly, such as air conditioners.
- The service ground terminal of the Switch (Type D grounding) should be directly connected to the ground plate or, if possible, to a dedicated ground system for the Switch.
- Embed a circuit to prevent noise generation into devices that emit electrical noise.
- The cables connected to the Switch can be broadly categorized into power supply cables and signal cables, which have different electrical characteristics. Avoid bundling or twisting the two types of cables together when laying the cables.
- Do not route communication lines along the power supply cables.

2.6 Leakage current

The Switch is equipped with a noise filter to prevent failure due to electric noise. As a result, a maximum leakage current of 3.5 mA flows through the protective ground line (Type D grounding).

Be sure to consider whether the installation of a residual current circuit breaker is required for compliance with the Fire Service Act or other legislation.

2.7 Environment conditions

(1) Dust

Because cooling fan units are mounted in a Switch, do not install them in a humid or dusty place. Dust requirements for the Switch are as follows:

- Airborne dust concentration: 0.15 mg/m^3 or less (according to JIS Z 8813 Measuring Methods for Suspended Particulate Matter Concentration in Air: General Requirements)

NOTE

Generally, areas around printers or with large numbers of people passing by contain high levels of toner or dust. Do not install the Switch in such places.

(2) Corrosive and flammable gases

Install the Switch in a place free of corrosive or flammable gases. If the Switch is installed where it is exposed to corrosive gases, the Switch will deteriorate and become unreliable.

(3) Floor surface material

The Switch can be installed in an ordinary office room. However, the floor surface should have the following properties:

- Fireproof
- Dust-resistant

(4) Direct sunlight

Do not expose the Switch to direct sunlight.

(5) Water

When cleaning the floor, do not allow the Switch to be exposed to water.

(6) Electromagnetic interference

Please note that when using high-frequency devices near the Switch, waves emitted by such devices might interfere with normal operation of the Switch.

The Switch generates weak high-frequency radio waves that might affect indoor antennas for television, radio, and transceivers within 30 m of the Switch.

(7) Cable protection

Route the cables through ducts or cover them for protection.

If cables are unprotected, mice or other animals might bite or chew them, leading to cable disconnection.

Fiber-optic cables require special handling; lay the cables with a bend radius of 100 mm or more along the major axis and 50 mm or more along the minor axis, and protect them with metal covers.

For fiber-optic cables with the required number of cores, ensure that they are protected against repeated mechanical stress due to bending, stretching, compression, and straightening when laying the cables, and ensure that they are protected against environmental stress after installation.

(8) Spraying

When spraying pesticide or disinfectant in the room where the Switch is installed, cover the Switch beforehand to prevent direct exposure to chemicals.

(9) Earthquake countermeasures

Earthquakes can cause Switches to shift, fall over, or fall out of windows, possibly resulting in bodily injury or death. Take sufficient precautions to prevent the Switch from shifting or falling over.

NOTE

The actual vibration affecting a Switch is different from the vibrations at ground level and varies depending on the amplification factor determined by the structure of the building and the floor level of the room containing the Switch. Generally, the fifth floor and above of a nine-story, medium-rise building experiences two to three times the amount of shaking than that at ground level.

Examples of effects observed in past earthquakes:

- The position of a switch shifted from 10 to 30 cm.
- Racks fell over.
- Objects on higher furnishings in the room fell on a switch.

2.8 Installation location

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

(1) On a desktop

When installing the Switch on a desktop, use a level, stable, and flat surface. When installing the Switch on a desktop, consider the requirements described in the following table.

Table 2-13 Requirements for installing on a desktop

Item	Conditions
Air intake and exhaust space	Ensure at least 70 mm of space around all air vents of the Switch. (For details, see 2.10 *Cooling requirements*.)
Cable space	Ensure 100 mm of space in front of the Switch and 50 mm of space behind the Switch for the routing of cables.#1
Device noise	For details about noise, see *2.11 Device noise*.

#1: When using the Switch in a 200 V AC environment, ensure 100 mm of space behind the Switch.

⚠WARNING When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in injury.

(2) 19-inch cabinet rack

When mounting the Switch on a rack, be sure to satisfy the rack requirements described in *Table 2-14 Rack requirements*.

In addition, prepare a bracket described in *Table 2-15 Required brackets* and screws described in *Table 2-16 Number of required screws*.

Table 2-14 Rack requirements

Item	Conditions
Rack standard	19-inch cabinet rack conforming to the EIA standard#1
Air intake and exhaust space	Ensure 70 mm or more of space between all air vents of the Switch and the rack pillars and side walls. (For details, see 2.10 *Cooling requirements*.)
Cable space	Ensure 100 mm of space in front of the Switch and 50 mm of space behind the Switch for the routing of cables.#2#3

#1: A rack fixture attached to a Switch supports a 19-inch cabinet rack conforming to the EIA standard. To use a 19-inch cabinet rack conforming to the JIS standard, contact an ALAXALA Networks Corporation sales representative.

#2: When using the Switch in a 200 V AC environment, ensure 100 mm of space behind the Switch.

#3: A rack fixture attached to a Switch is used to secure the rack pillars and the front of the Switch so that they are flat when the Switch is installed in a rack. If 100 mm of space cannot be maintained between the rack door and the front of the Switch, you

can use an optional fixture that secures the Switch so that it is recessed 50 mm from the rack pillar. For information about this separately sold fixture, see *1.10 Rack fixture*.

Table 2-15 Required brackets

Bracket	AX6304S	AX6308S	Specifications
Guide rail	Y	Y	Supplied with the rack. The width must be 56 mm or less.#1 #2
Shelf	Y	Y	Supplied with the rack.#1
Support bracket	Y	--	Sold separately. Only for the AX6304S.

Legend

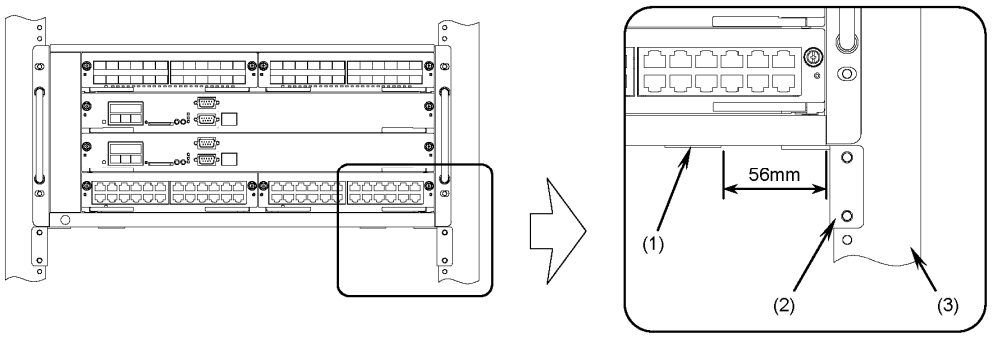
Y: Can be used.

--: Cannot be used.

#1: Install the guide rail in the location described in *4.5 Mounting in a rack*.

#2: Rubber pads for the Switch are attached 56 mm inward from the side of the Switch. Use a guide rail with a width of 56 mm or less so that it does not touch the rubber pads (see *Figure 2-11 Guide rail details*).

Figure 2-11 Guide rail details



(1) Rubber pad

(2) Guide rail

(3) Rack pillar

⚠CAUTION

It is not possible for the provided rack fixture alone to support the weight of a Switch. Its purpose is merely to hold a Switch on the rack. Accordingly, use the following fixtures:

- AX6304S : Guide rails, shelves, and support brackets
- AX6308S : Guide rails and shelves

You must use the guide rails and shelves provided with the rack, and these must be able to support the weight of a Switch (with the maximum number of optional modules installed).

Table 2-16 Number of required screws

Purpose		AX6304S	AX6308S	Specifications
When a guide rail or shelf is used	For securing guide rails and shelves	(Note 1)	(Note 1)	Supplied with the rack. M5 or M6 screws.

Purpose		AX6304S	AX6308S	Specifications
	For securing a Switch	4	8	
When a support bracket is used	For securing the support bracket	4	--	
	For securing a Switch	4	--	

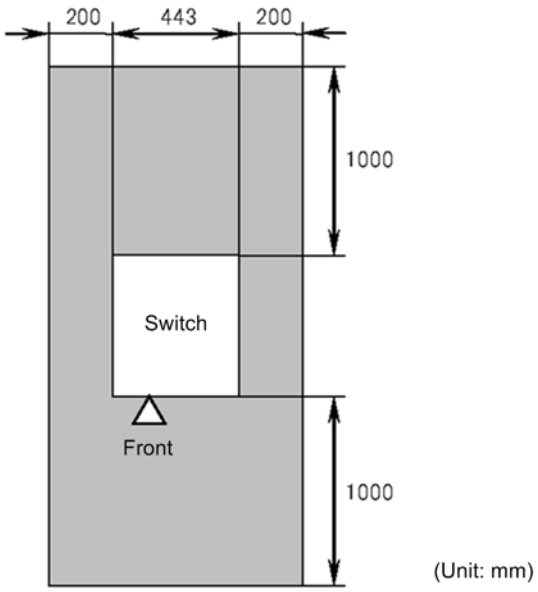
Note 1: For the number of screws used to secure a guide rail or a shelf, see the documentation supplied with your rack.

2.9 Maintenance area

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

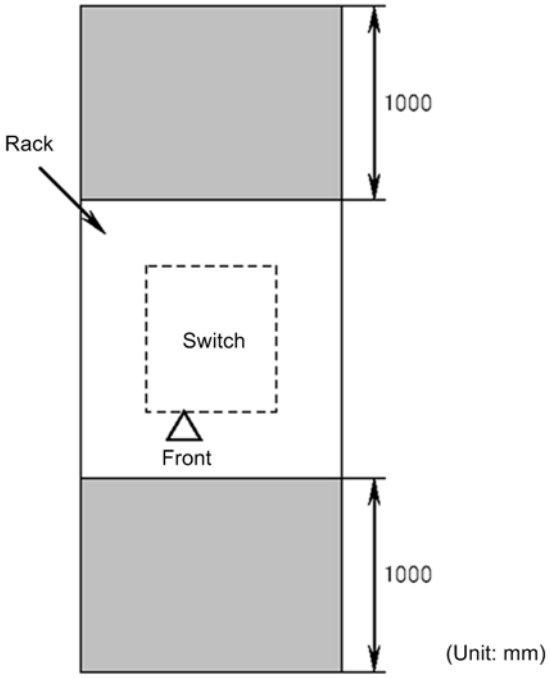
(1) Maintenance area for a desktop installation

Figure 2-12 Maintenance area for a desktop installation



(2) Maintenance area for a rack installation

Figure 2-13 Maintenance area for a rack installation



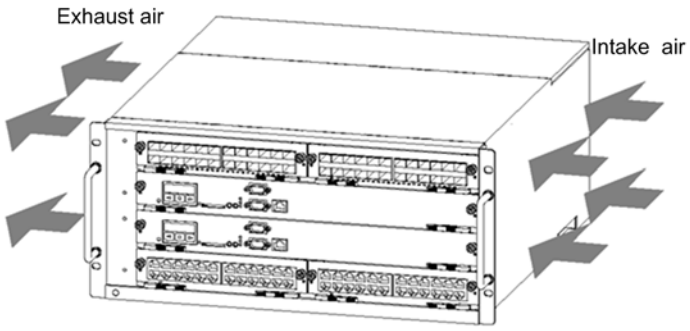
2.10 Cooling requirements

2.10.1 Airflow

The following describes the airflow of the Switch.

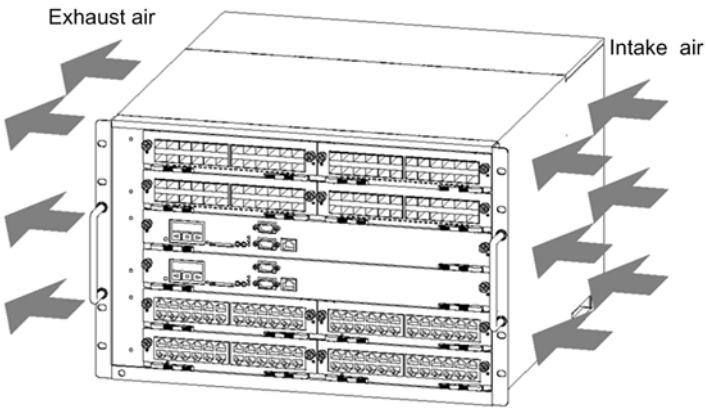
(1) AX6304S

Figure 2-14 AX6304S



(2) AX6308S

Figure 2-15 AX6308S



2.10.2 Cooling requirements for a desktop installation

Ensure at least 70 mm of space for airflow on all sides of the Switch.

⚠CAUTION	Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in fire. Maintain a space of at least 70 mm around the ventilation slots.

NOTE

When equipment with forced air cooling systems is installed near the Switch, interference due to the airflow from multiple devices can adversely affect the cooling of the Switch, which might result in a malfunction.

- 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.

Maintain enough space or place a partition between equipment to prevent airflow interference.

Note that if a partition is installed, it must be at least 70 mm away from the side panel of the Switch.

2.10.3 Cooling requirements for a rack installation

Ensure at least 70 mm of space between the Switch and all structural components of the rack, including the side walls, pillars, guide rails, and front and rear doors.

⚠CAUTION

Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in fire. Maintain a space of at least 70 mm around the ventilation slots.

NOTE

Be sure that the temperature inside the rack is within the operating temperature specified for the Switch. Otherwise, the Switch might malfunction or fail. To bring the temperature inside the rack within the temperature requirements of the Switch, consider the following methods:

- Install fans inside the rack for sufficient ventilation.
- To allow good ventilation, replace the front and rear door panels with panels that have punched holes for cooling, or remove the doors.
- If necessary, reduce the number of devices in the rack or mount the Switch under other equipment that emits heat.

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.

- The exhaust airflow from nearby equipment might be drawn into the Switch, and the Switch air intake temperature might exceed the environment requirements.
- Maintain enough space between equipment installed in the rack to prevent airflow interference.

Maintain enough space between equipment installed in the rack to prevent airflow interference.

2.11 Device noise

Switches contain cooling fans that generate noise. Consider this noise when planning the layout for the installation of devices.

For details about the noise emitted by the Switch, see *2.2 Installation conditions*.

NOTE

Some examples of a layout that takes noise into account are given below.

- 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.

3. Preparation of Interface Cables and Terminals

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

3.1 List of interface cables

This section describes the interface cables used for the Switch. The customer is responsible for obtaining these cables.

Table 3-1 Interface cables

Port	Transceiver	Interface	Cable	Connector
10/100/1000BASE-T port	--	10BASE-T	UTP cable (Category 3 or higher)	RJ-45 connector
	--	100BASE-TX	UTP cable (Category 5 or higher)	
	--	1000BASE-T	UTP cable (Enhanced category 5 or higher)	
1000BASE-X port	SFP-SX	1000BASE-SX	Multimode fiber optic cable (core/cladding diameter = 50 μm/125 μm)	LC duplex connector
			Multimode fiber optic cable (core/cladding diameter = 62.5 μm/125 μm)	
	SFP-SX2	1000BASE-SX2	Multimode fiber optic cable (core/cladding diameter = 50 μm/125 μm)	
			Multimode fiber optic cable (core/cladding diameter = 62.5 μm/125 μm)	
	SFP-LX	1000BASE-LX	Multimode fiber optic cable[#1] (core/cladding diameter = 50 μm/125 μm)	
			Multimode fiber optic cable[#1] (core/cladding diameter = 62.5 μm/125 μm)	
			Single-mode fiber optic cable (core/cladding diameter = 10 μm/125 μm)	
	SFP-LH	1000BASE-LH	Single-mode fiber optic cable (core/cladding diameter = 10 μm/125 μm)	
			Single-mode (DSF) fiber optic cable (core/cladding diameter = 8 μm/125 μm)	
	SFP-LHB	1000BASE-LHB	Single-mode fiber optic cable (core/cladding diameter = 10 μm/125 μm)	
			Single-mode (DSF) fiber optic cable (core/cladding diameter = 8 μm/125 μm)	
	SFP-BX1U	1000BASE-BX10-U	Single-mode fiber optic cable (core/cladding diameter = 10 μm/125 μm)	LC simplex connector
	SFP-BX1D	1000BASE-BX10-D		
	SFP-BX4U	1000BASE-BX40-U		

Port	Transceiver	Interface	Cable	Connector
	SFP-BX4D	1000BASE-BX40-D		
10GBASE-R port	XFP-SR	10GBASE-SR	Multimode fiber optic cable (core/cladding diameter = 50 μm/125 μm)	LC duplex connector
			Multimode fiber optic cable (core/cladding diameter = 62.5 μm/125 μm)	
	XFP-LR	10GBASE-LR	Single-mode fiber optic cable (core/cladding diameter = 10 μm/125 μm)	
	XFP-ER	10GBASE-ER		
	XFP-ZR	10GBASE-ZR		
AUX port[#2]	--	RS-232C	RS-232C straight-through cable	D-SUB 9-pin connector
CONSOLE port	--	RS-232C	RS-232C crossover cable	D-SUB 9-pin connector
MANAGEMENT port	--	10BASE-T	UTP cable (Category 3 or higher)	RJ-45 connector
		100BASE-TX	UTP cable (Category 5 or higher)	

#1: Some kinds of multimode fiber optic might increase the BER (bit error rate) when used with 1000BASE-LX. In this case, proper communication can be established by using the mode-conditioning patch code.

#2: In the MSU-1A and MSU-1B, the AUX port is supported by software version 10.3 and later.

NOTE

For details about the interface cables to be connected to the 10/100/1000BASE-T port, 1000BASE-X port, or 10GBASE-R port, see *3.2 Details about interface cables*.

NOTE

For details about the terminals and interface cables to be connected to the AUX port, the CONSOLE port, and the MANAGEMENT port, see *3.3 Terminals and connection cables*.

3.2 Details about interface cables

NOTE

To allow for Switch maintenance, fiber optic cables should be the necessary length (3 m), and the excess cabling should be bundled near the Switch. When fiber optic cables and other interface cables are used together, be sure to avoid applying excessive stress on the fiber optic cables.

NOTE

Always have extra fiber optic cables ready in addition to the ones in use.

3.2.1 UTP cables (10/100/1000BASE-T)

For information about UTP cables, see the following table.

Table 3-2 Physical specifications for 10/100/1000BASE-T

Item	Physical specifications		
	10BASE-T	100BASE-TX	1000BASE-T
Category	Category 3 and higher	Category 5 and higher	Enhanced category 5 and higher
Transmission distance (max.)	100 m	100 m	100 m

NOTE

The 10BASE-T, 100BASE-TX, or 1000BASE-T port on a Switch supports Auto MDI/MDI-X functionality. If the Auto MDI/MDI-X functionality is enabled, either a straight-through cable or a crossover cable can be connected, regardless of the connection target.

NOTE

The Auto MDI/MDI-X functionality is enabled only when auto-negotiation is specified for a 10/100/1000BASE-T port.

The factory default setting is auto-negotiation.

NOTE

If the Auto MDI/MDI-X functionality is disabled, the 10/100/1000BASE-T port of the Switch is fixed to MDI-X.

Use a straight-through cable if the port at the connection target is MDI, and use a crossover cable if the port is MDI-X.

For information about the pin configuration of the 10/100/1000BASE-T port when the Auto MDI/MDI-X functionality is disabled, see the following table.

Table 3-3 Pin configuration of the 10/100/1000BASE-T port

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)

RJ45 Pin number	Physical specifications		
	10BASE-T	100BASE-TX	1000BASE-T
3	Send (+) (B)	Send (+) (B)	Send/receive (+) (B)
4	Not used[#1] (C)	Not used[#1] (C)	Send/receive C (+) (C)
5	Not used[#1] (c)	Not used[#1] (c)	Send/receive C (-) (c)
6	Send (-) (b)	Send (-) (b)	Send/receive (-) (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: Connect to the pin if you are using a 4-pair, 8-core cable.

#2: Twisted pair line. Use (A) and (a), (B) and (b), (C) and (c), (D) and (d) in pairs for a 4-pair, 8-core cable. Use (A) and (a) and (B) and (b) in pairs for a 2-pair, 4-core cable.

3.2.2 Fiber optic cables (1000BASE-X)

For details about the fiber optic cables used for 1000BASE-SX, 1000BASE-SX2, 1000BASE-LX, 1000BASE-LH, 1000BASE-LHB, and 1000BASE-BX, see the following tables.

Table 3-4 Physical specifications for 1000BASE-SX

Item	Physical specifications			
Cable type	Multi-mode			
Core/cladding diameter	50 μm/125 μm		62.5 μm/125 μm	
Transmission band	400 MHz x km	500 MHz x km	160 MHz x km	200 MHz x km
Center emission wavelength	0.770 to 0.860 μm			
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 3-5 Physical specifications for 1000BASE-SX2

Item	Physical specifications	
Cable type	Multi-mode	
Core/cladding diameter	50 μm/125 μm	62.5 μm/125 μm
Transmission band	500 MHz x km	500 MHz x km
Center emission wavelength	1.270 to 1.355 μm	
Optical transmission power (mean)	-9.0 to -3.0 dBm	

Item	Physical specifications	
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: The transmission distance can be increased by using the mode conditioning patch code. However, the maximum distance for transmission is 2 km, and that distance depends on transmission loss. For 2 km transmission, the transmission loss must be no more than 10 dB.

Table 3-6 Physical specifications for 1000BASE-LX

Item	Physical specifications			
Cable type	Multi-mode[#1]			Single-mode
Core/cladding diameter	50 μm/125 μm		62.5 μm/125 μm	10 μm/125 μm
Transmission band	400 MHz x km	500 MHz x km	500 MHz x km	--
Center emission 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			
Optical transmission loss (max)	7.5 dB			8.0 dB
Transmission distance	2 to 550 m			2 m to 5 km

#1: Some kinds of multimode fiber optic might increase the BER (bit error rate) when used with 1000BASE-LX. In this case, proper communication can be established by using the mode-conditioning patch code.

Table 3-7 Physical specifications for 1000BASE-LH

Item	Physical specifications	
Cable type	Single-mode	Single-mode (DSF)
Core/cladding diameter	10 μm/125 μm	8 μm/125 μm
Center emission 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)	22.0 dB[#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 3-8 Physical specifications for 1000BASE-LHB

Item	Physical specifications	
Cable type	Single-mode	Single-mode (DSF)
Core/cladding diameter	10 μm/125 μm	8 μm/125 μm
Center emission wavelength	1.480 to 1.580 μm	
Optical transmission power (mean)	+2.0 to +7.0 dBm	
Optical reception power (mean)	-34.0 to -9.0 dBm	
Optical transmission loss (max)	36.0 dB#1	
Transmission distance	2 m to 100 km#2	2 m to 100 km

#1: When optical transmission loss is 16.0 dB or less, use an optical attenuator to adjust the loss.

#2: For transmission over a 100 km distance, use a fiber optic with dispersion of 20 ps/nm/km or less.

Table 3-9 Physical specifications for 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 μm/125 μm			
Center emission 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	
Optical transmission loss (max)	10.0 dB		20.0 dB#3	
Transmission distance	0.5 m to 10 km		0.5 m to 40 km	

#1: 1000BASE-BX10-U and 1000BASE-BX10-D are used in pairs.

#2: 1000BASE-BX40-U and 1000BASE-BX40-D are used in pairs.

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

3.2.3 Fiber optic cables (10GBASE-R)

For details about the fiber optic cables used for 10GBASE-SR, 10GBASE-LR, 10GBASE-ER, and 10GBASE-ZR, see the following tables.

Table 3-10 Physical specifications for 10GBASE-SR

Item	Physical specifications				
Cable type	Multi-mode				
Core/cladding diameter	50 μm/125 μm			62.5 μm/125 μm	
Transmission band	400 MHz x km	500 MHz x km	2,000 MHz x km	160 MHz x km	200 MHz x km
Center emission wavelength	0.840 to 0.860 μm				
Optical transmission power (mean)	-7.3 to -1.0 dBm				
Optical reception power (mean)	-9.9 to -1.0 dBm				
Optical transmission loss (max)	2.6 dB				
Transmission distance	2 m to 66 m	2 m to 82 m	2 m to 300 m	2 m to 26 m	2 m to 33 m

Table 3-11 Physical specifications for 10GBASE-LR

Item	Physical specifications
Cable type	Single-mode
Core/cladding diameter	10 μm/125 μm
Center emission wavelength	1.260 to 1.355 μm
Optical transmission power (mean)	-8.2 to +0.5 dBm
Optical reception power (mean)	-14.4 to +0.5 dBm
Optical transmission loss (max)	6.2 dB
Transmission distance	2 m to 10 km

Table 3-12 Physical specifications for 10GBASE-ER

Item	Physical specifications
Cable type	Single-mode
Core/cladding diameter	10 μm/125 μm
Center emission wavelength	1.530 to 1.565 μm
Optical transmission power (mean)	-4.7 to +4.0 dBm
Optical reception power (mean)	-15.8 to -1.0 dBm
Optical transmission loss (max)	11.1 dB[#1]
Transmission distance	2 m to 40 km

#1: When optical transmission loss is 5 dB or less, use an optical attenuator to adjust the loss.

Table 3-13 Physical specifications for 10GBASE-ZR

Item	Physical specifications
Cable type	Single-mode
Core/cladding diameter	10 μm/125 μm

Item	Physical specifications
Center emission wavelength	1.530 to 1.565 μm
Optical transmission power (mean)	+0.5 to +4.0 dBm
Optical reception power (mean)	-24.0 to -7.0 dBm
Optical transmission loss (max)	24.5 dB[#1]
Transmission distance	2 m to 80 km

#1: When optical transmission loss is 15 dB or less, use an optical attenuator to adjust the loss.

3.3 Terminals and connection cables

3.3.1 When connecting an operation terminal to the CONSOLE port

(1) Operation terminal

To connect an operation terminal to the CONSOLE port of the Switch, prepare a personal computer or a workstation that meets the specifications in the following table.

Table 3-14 Operation terminal (when connecting to the CONSOLE port)

Item		Specifications
Communication port		RS-232C port
Communication software		Tera Term Pro (Version 2.3) or communication software that meets the communication settings below.
Communication settings	Communication parameters	8 bits, 1 stop bit, no parity
	Communication speed#1	19,200 bps, 9,600 bps, 4,800 bps, 2,400 bps, 1,200 bps

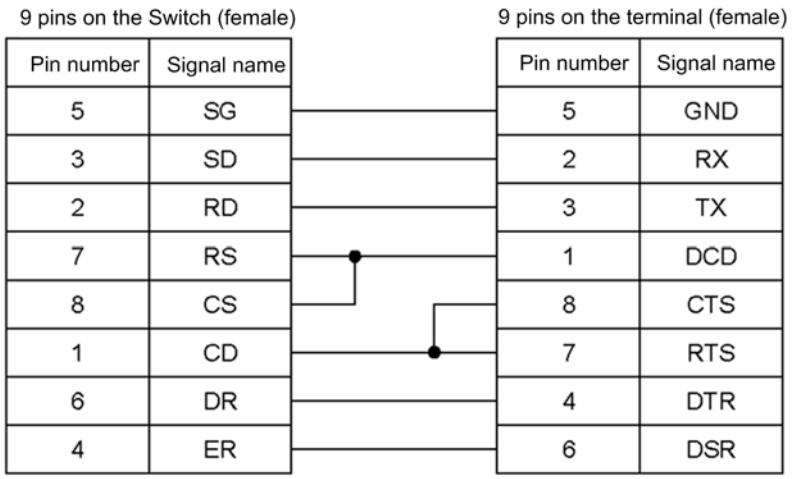
#1: The communication speed of the Switch is set to 9,600 bps when shipped from the factory.

(2) RS-232C crossover cable

To connect an operation terminal to the CONSOLE port of the Switch, use a RS-232C crossover cable with a 9-pin (female) D-sub connector on both ends, and use #4-40 inch-screws.

The following figure shows the pin arrangement of an RS-232C crossover cable.

Figure 3-1 Connection cable for the operation terminal



3.3.2 When connecting an operation terminal to the MANAGEMENT port

(1) Operation terminal

To connect an operation terminal to the MANAGEMENT port of the Switch, prepare a personal computer or a workstation that meets the specifications in the following table.

Table 3-15 Operation terminal (when connecting to the MANAGEMENT port)

Item	Specifications
Communication port	10BASE-T/100BASE-TX port
Communication software	Tera Term Pro (Version 2.3) or another Telnet client
	FTP client#1
Communication procedure	Telnet, FTP

#1: Used for transferring software and dump files.

(2) UTP cable (10BASE-T/100BASE-TX)

To connect an operation terminal to the MANAGEMENT port of the Switch, prepare a UTP cable that supports the specifications in *Table 3-16 Physical specifications of the MANAGEMENT port* below.

Table 3-16 Physical specifications of the MANAGEMENT port

Item	Physical specifications	
	10BASE-T	100BASE-TX
Category	Category 3 and higher	Category 5 and higher
Transmission distance (max.)	100 m	100 m

NOTE

The MANAGEMENT port of the Switch supports the Auto MDI/MDI-X functionality. If the Auto MDI/MDI-X functionality is enabled, either a straight-through cable or a crossover cable can be connected, regardless of the connection target.

NOTE

The Auto MDI/MDI-X functionality is enabled only when auto-negotiation is specified for the MANAGEMENT port.

The factory default setting is auto-negotiation.

NOTE

When the Auto MDI/MDI-X functionality is disabled, the MANAGEMENT port of the Switch is fixed to MDI.

Use a crossover cable if the port at the connection target is MDI, and use a straight-through cable if the port is MDI-X.

For information about the pin configuration of the MANAGEMENT port when the Auto MDI/MDI-X functionality is disabled, see the following table.

Table 3-17 Pin arrangement of the MANAGEMENT port

RJ 45 pin number	Physical specifications	
	10BASE-T	100BASE-TX
1	Send (+) (A)	Send (+) (A)
2	Send (-) (a)	Send (-) (a)
3	Receive (+) (B)	Receive (+) (B)
4	Not used#1 (C)	Not used#1 (C)
5	Not used#1 (c)	Not used#1 (c)
6	Receive (-) (b)	Receive (-) (b)
7	Not used#1 (D)	Not used#1 (D)

RJ 45 pin number	Physical specifications	
	10BASE-T	100BASE-TX
8	Not used[#1] (d)	Not used[#1] (d)

#1: Connect to the pin if you are using a 4-pair, 8-core cable.

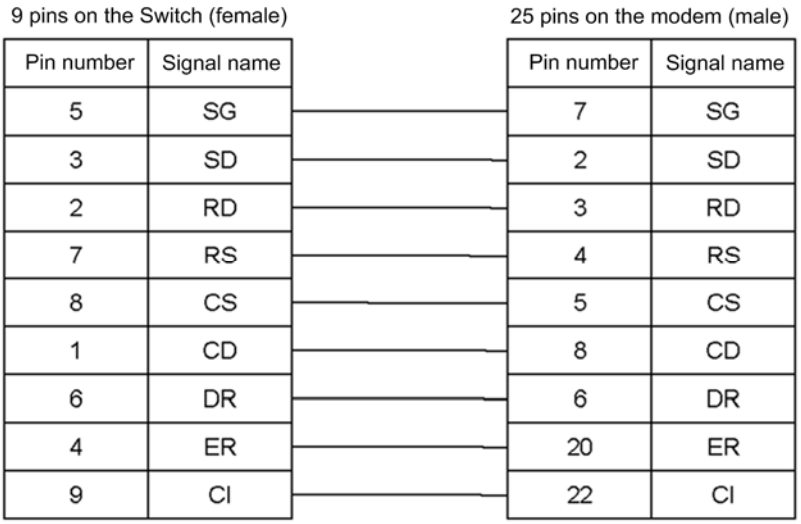
#2: Twisted pair line. Use (A) and (a), (B) and (b), (C) and (c), (D) and (d) in pairs for a 4-pair, 8-core cable. Use (A) and (a) and (B) and (b) in pairs for a 2-pair, 4-core cable.

3.3.3 Connecting a modem to the AUX port

To connect a modem to the AUX port of the Switch, use an RS-232C straight-through cable with a 9-pin (female) D-SUB connector and a 25-pin (male) D-SUB connector, and use #4-40 inch screws.

The following figure shows the pin arrangement of an RS-232C straight-through cable.

Figure 3-2 Modem connection cable



4. Installing a Switch

This chapter describes the procedure for installing a Switch.

4.1 Required tools

The following tools are necessary to install a Switch:

No. 2 Phillips screwdriver

Required when using M5 screws to replace a rack fixture or mount a Switch on a rack. This screwdriver is also required when connecting or disconnecting a DC power cable.

No. 3 Phillips screwdriver

Required when using M6 screws to mount a Switch on a rack. This screwdriver is also required when connecting or disconnecting a DC power cable.

Antistatic wrist strap

Used to protect the equipment from electrostatic discharge.

Hand lifter:

Used to install a Switch.

4.2 Read prior to operation

⚠WARNING	When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in injury.
⚠CAUTION	Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in fire. Maintain a space of at least 70 mm around the ventilation slots.
⚠CAUTION	Do not place any objects on the Switch. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.
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	Place the Switch where the LEDs can be easily seen.
NOTE	Route the cables through ducts or cover them for protection. Fiber optic cables require special handling; lay the cables with a bend radius of 100 mm or more along the major axis and 50 mm or more along the minor axis, and protect them with metal covers.
NOTE	To allow for Switch maintenance, fiber optic cables should be the necessary length (3 m), and the excess cabling should be bundled near the Switch. When fiber optic cables and other interface cables are used together, be sure to avoid applying excessive stress on the fiber optic cables.

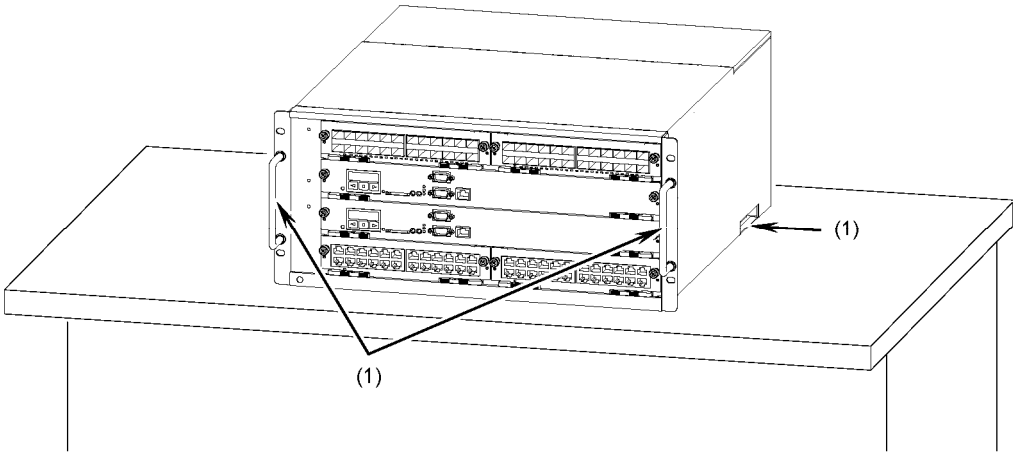
4.3 Installing a Switch on a desktop

A Switch can be placed on a stable, flat surface.

Rubber pads are attached to the bottom of the Switch when it is shipped from the factory. When installing a Switch on a desktop, do so without removing the rubber pads.

When installing the Switch, hold it by the bottom and the handles.

Figure 4-1 Installing a Switch on a desktop



(1) Handles

⚠WARNING When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in injury.

⚠WARNING The weight of the Switch is shown in the table below. A Switch must be installed and carried by the number of people shown in the table below. Using too few people to install or carry the Switch could result in the Switch being dropped or falling, possibly leading to injury.

Model	Weight	Number of people
AX6304S	Up to 45 kg	Three or more
AX6308S	Up to 64 kg	

⚠CAUTION When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

4.4 Replacing the rack fixture

A rack fixture attached to a Switch is used to secure the rack pillars and the front of the Switch so that they are flat when the Switch is installed in a rack.

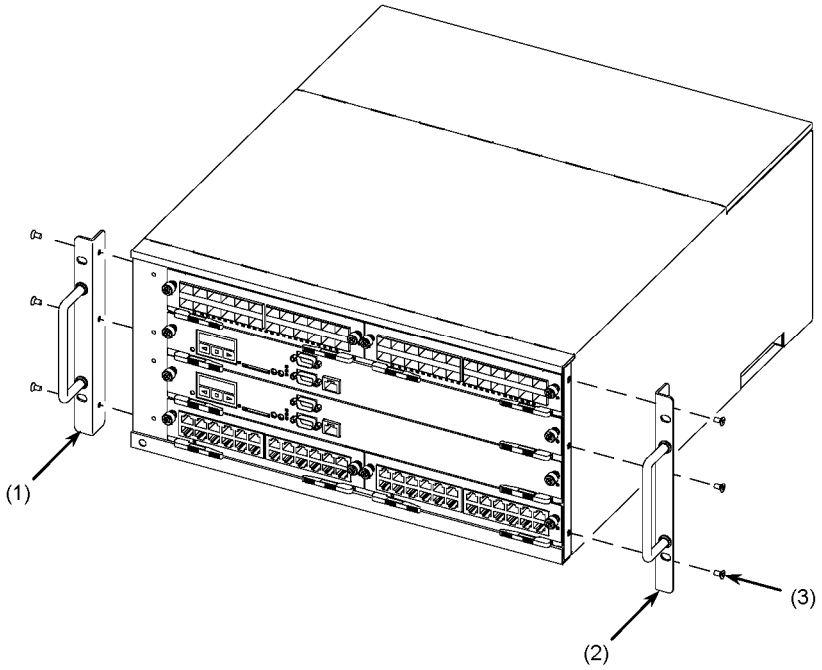
If you purchased an optional fixture, which secures the Switch so that it is recessed 50 mm, use the following procedure to replace the rack fixture.

4.4.1 AX6304S

Step 1

Remove the rack fixture that was attached to the Switch when it was shipped from the factory.

Figure 4-2 Removing the rack fixture



(1) Left: L

(2) Right: R

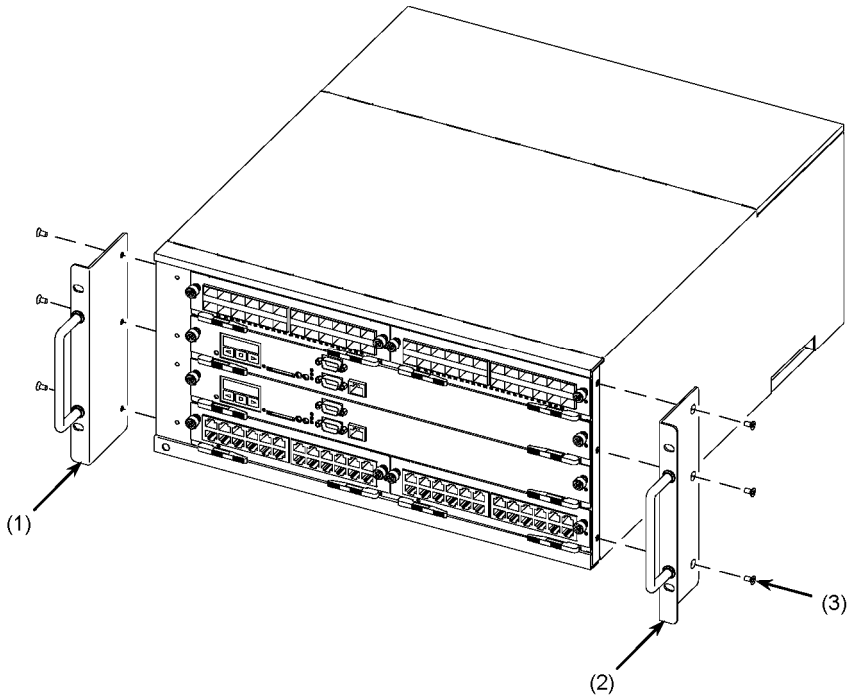
(3) Screws

NOTE | Make sure you keep the rack fixture and screws you remove.

Step 2

Attach the optional rack fixture.

Figure 4-3 Attaching the rack fixture



(1) Left: L

(2) Right: R

(3) Screws

NOTE

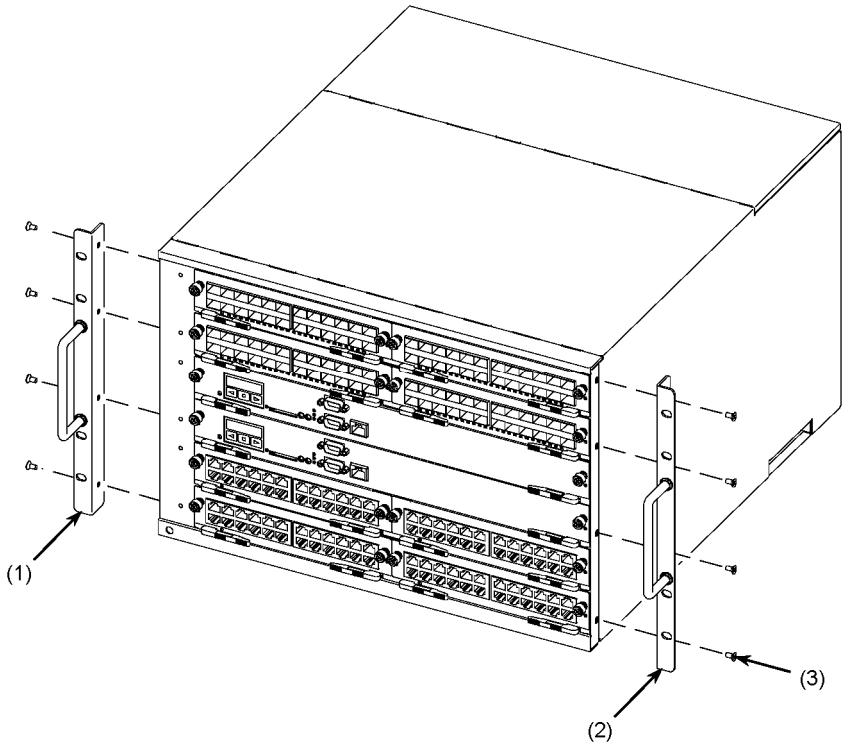
Use the screws supplied with the optional rack fixture to secure it to the Switch.

4.4.2 AX6308S

Step 1

Remove the rack fixture that was attached to the Switch when it was shipped from the factory.

Figure 4-4 Removing the rack fixture



(1) Left: L

(2) Right: R

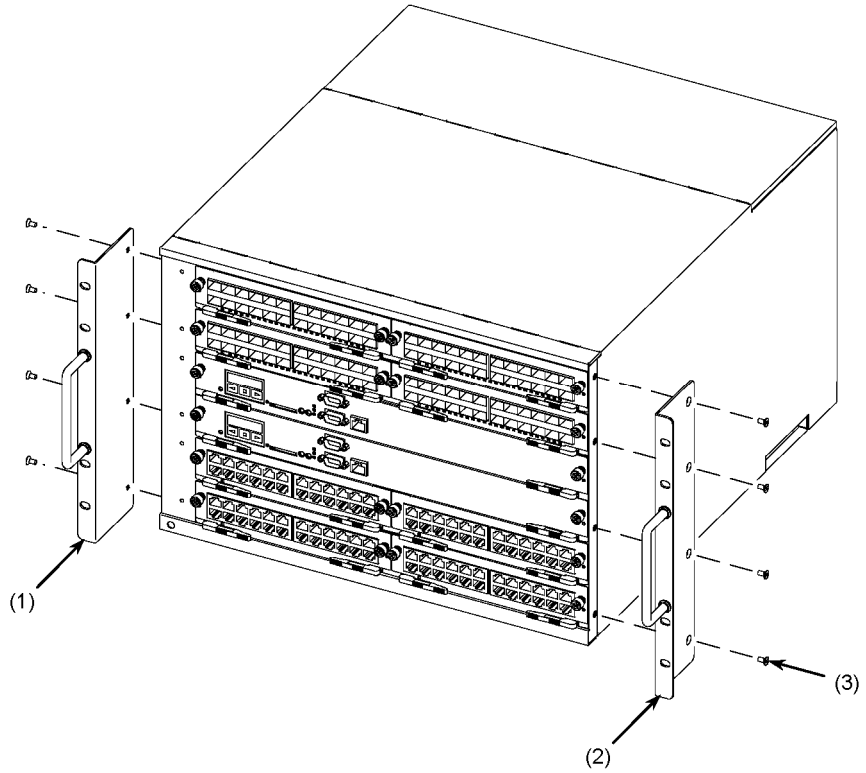
(3) Screws

NOTE | Make sure you keep the rack fixture and screws you remove.

Step 2

Attach the optional rack fixture.

Figure 4-5 Attaching the rack fixture



(1) Left: L

(2) Right: R

(3) Screws

NOTE

Use the screws supplied with the optional rack fixture to secure it to the Switch.

4.5 Mounting in a rack

The Switch can be mounted in to a 19-inch cabinet rack that conforms to the EIA standard.

The procedure for mounting in a rack is described below.

⚠CAUTION

It is not possible for the provided rack fixture alone to support the weight of a Switch. Its purpose is merely to hold a Switch on the rack. Accordingly, use the following fixtures:

- AX6304S: Guide rails, shelves, and support brackets
- AX6308S: Guide rails and shelves

You must use the guide rails and shelves provided with the rack, and these must be able to support the weight of a Switch (with the maximum number of optional modules installed).

NOTE

Use a rack facility that satisfies the conditions described in *(2) 19-inch cabinet rack* in *2.8 Installation location*.

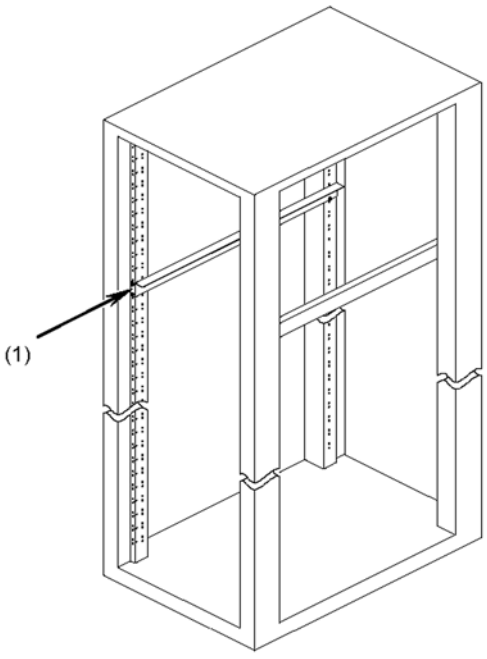
4.5.1 AX6304S (when a guide rail or a shelf is used)

Step 1

Attach a guide rail or a shelf to the rack.

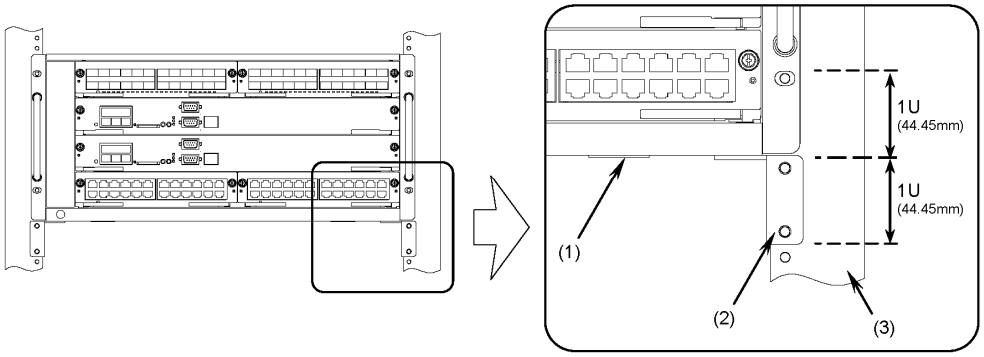
For the installation location of the guide rail, see *Figure 4-7 Installation location of the guide rail*.

Figure 4-6 Installing a guide rail



(1) Guide rail

Figure 4-7 Installation location of the guide rail



(1) Rubber pad

(2) Guide rail

(3) Rack pillar

NOTE

Dotted lines (- - -) in the Figure indicate the boundary between units (U). When attaching a guide rail, align the top of the guide rail with the boundary (U).

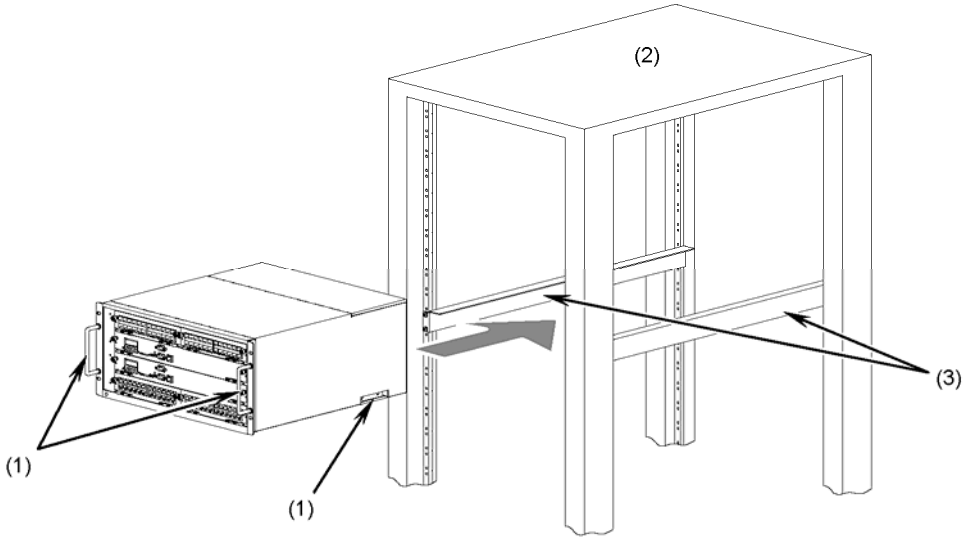
NOTE

Rubber pads are attached to the bottom of a Switch when it is shipped from the factory. The height of a rubber pad is 0.7 mm. When using a shelf, adjust it so that it is 0.7 mm below the boundary (U).

Step 2

Mount the Switch on the guide rails or the shelf. Hold the bottom and the handles of the Switch when mounting the Switch.

Figure 4-8 Mounting a Switch on the rack



(1) Handles

(2) Rack

(3) Guide rail

⚠WARNING The maximum weight of the AX6304S is 45 kg. The Switch must be installed and carried by at least three people. Installing or carrying a Switch with too few people could result in the Switch being dropped or falling, possibly leading to injury.

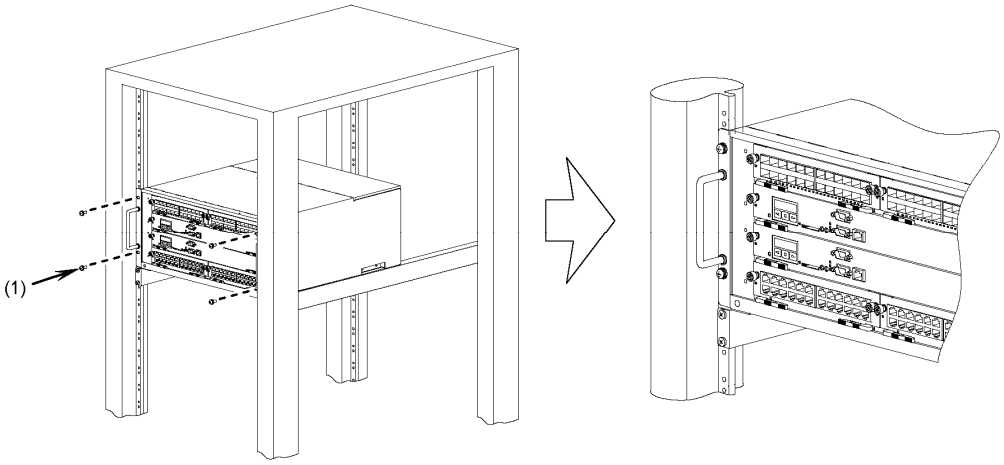
⚠CAUTION When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

NOTE To install a Switch in an elevated location, ALAXALA Networks Corporation recommend that you use a hand lifter or equivalent device.

Step 3

Secure the Switch to the rack.

Figure 4-9 Mounting a Switch on the rack



(1) Screws (M5 or M6 x 4)

NOTE To secure a Switch to the rack, use the M5 or M6 screws supplied with the rack.

4.5.2 AX6304S (when support brackets are used)

⚠CAUTION The support bracket supports the AX6304S only. Do not use the bracket with another Switch. Using a bracket with another Switch might cause the Switch to drop or fall, resulting in injury.

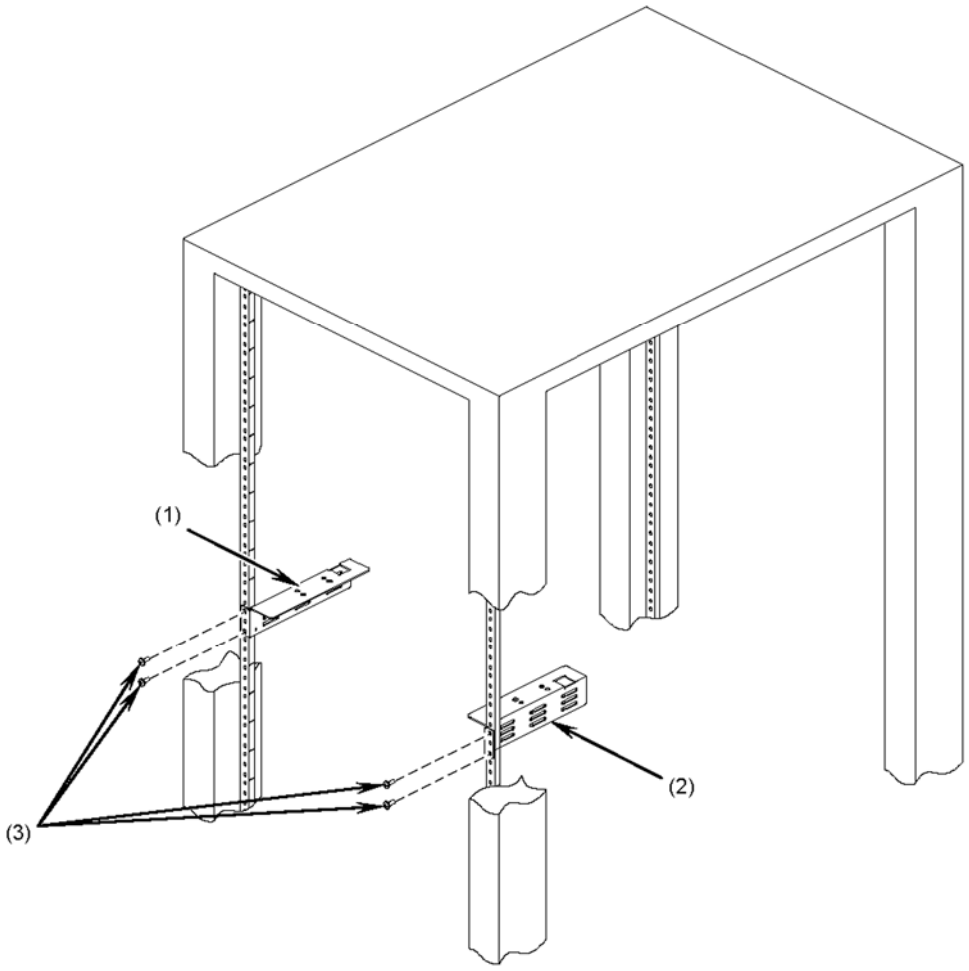
⚠CAUTION When support brackets are used to mount a Switch on a rack, the weight of the Switch is borne by the rack fixture and the support brackets only. Securely tighten the screws on the rack fixtures and the support brackets.

Step 1

Install brackets L and R in the rack.

For the installation location of the brackets, see *Figure 4-11 Installation location of the support brackets*.

Figure 4-10 Installing support brackets



(1) Bracket L

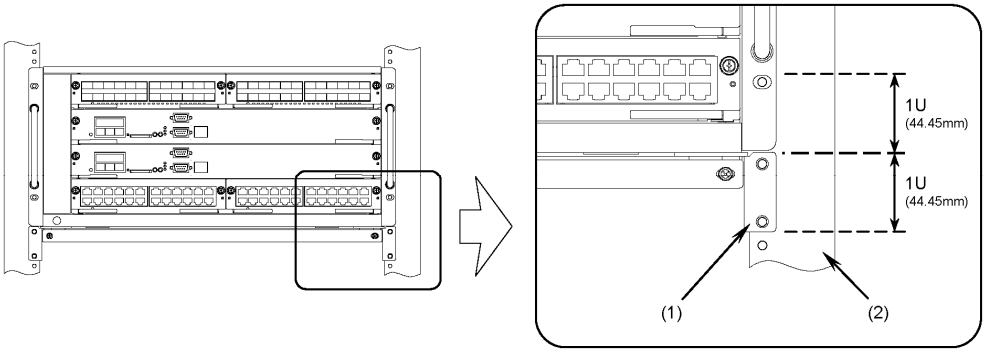
(2) Bracket R

(3) Screws (M5 or M6 x 4) supplied with the rack

NOTE

To attach the brackets, use the M5 or M6 screws supplied with the rack.

Figure 4-11 Installation location of the support brackets



(1) Support bracket

(2) Rack pillar

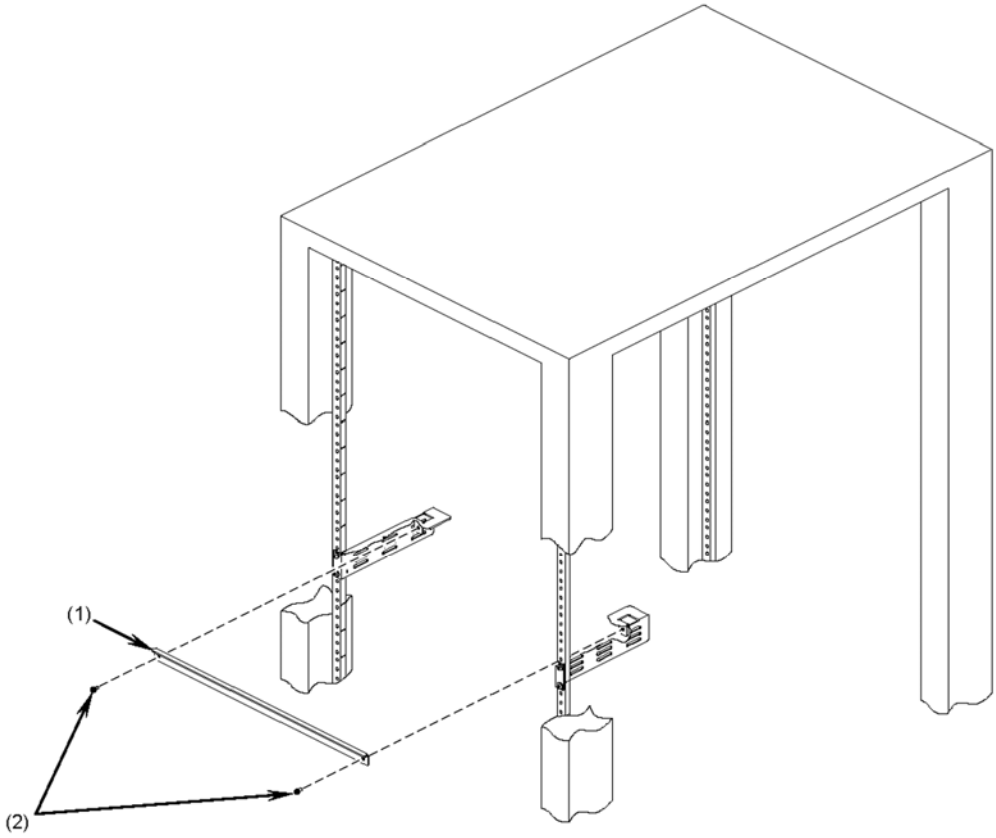
NOTE

Dotted lines (- - -) in the Figure indicate the boundary between units (U).
Align the top of a support bracket with the boundary.

Step 2

Attach crossbar A to brackets L and R.

Figure 4-12 Attaching crossbar A



(1) Cross bar A

(2) Screws supplied with the support bracket (Two M4 x 10 screws)

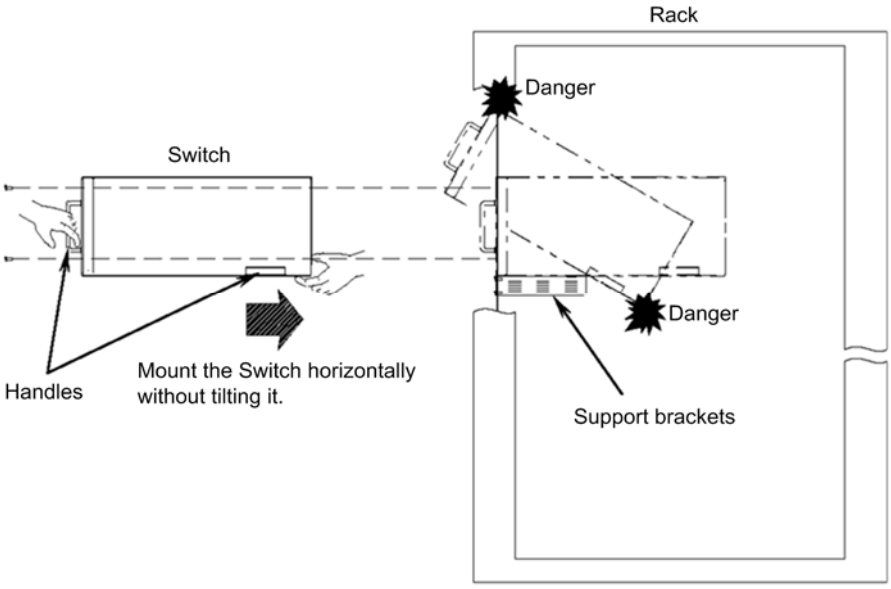
NOTE

To attach crossbar A, use the M4 screws supplied with the support bracket.

Step 3

Mount the Switch on the rack. Hold the handles and the bottom of the Switch, and then mount the Switch horizontally on the support brackets.

Figure 4-13 Mounting a Switch on the rack



⚠WARNING

The maximum weight of the AX6304S is 45 kg. The Switch must be installed and carried by at least three people. Installing or carrying a Switch with too few people could result in the Switch being dropped or falling, possibly leading to injury.

⚠CAUTION

While supporting the front and the back of the Switch, mount it horizontally. If the Switch tilts, it could drop or fall, resulting in injury. In addition, other devices mounted in the same rack might be damaged.

⚠CAUTION

When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

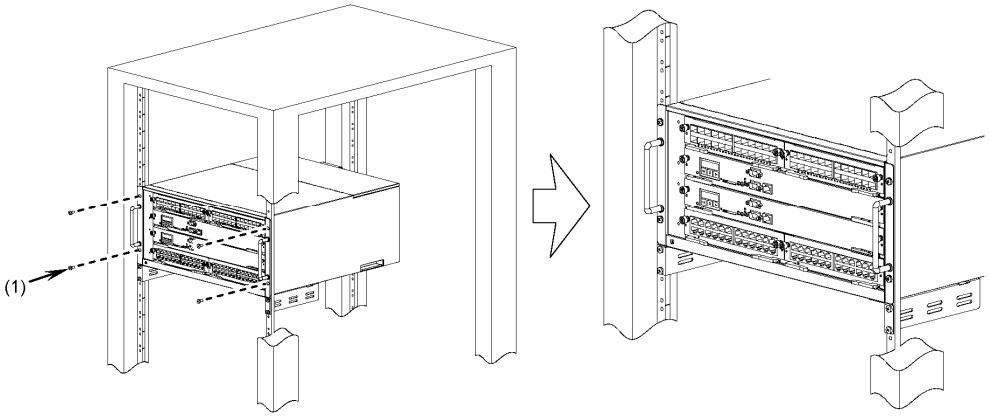
NOTE

To install a Switch in an elevated location, ALAXALA Networks Corporation recommend that you use a hand lifter or equivalent device.

Step 4

Secure the Switch to the rack. Use the screws to secure the Switch to the rack pillar.

Figure 4-14 Securing the Switch



(1) Screws (M5 or M6 x 4) supplied with the rack

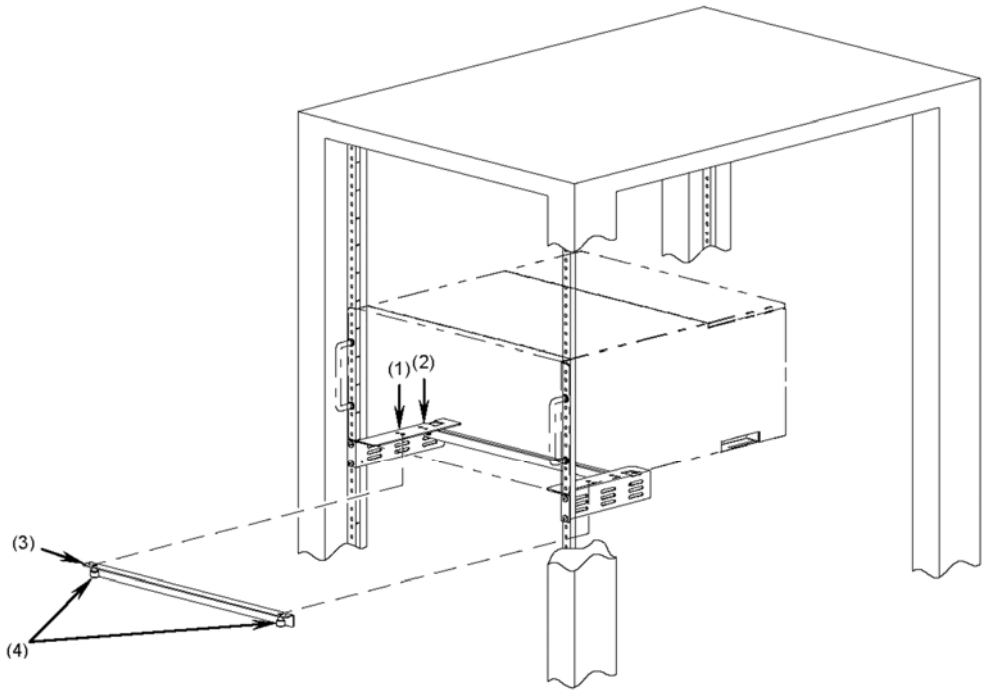
⚠CAUTION	Support the front and the back of the Switch until the screws have been tightened. If the Switch tilts, it could drop or fall, resulting in injury. In addition, other devices mounted in the same rack might be damaged.

NOTE	To secure a Switch to the rack, use the M5 or M6 screws supplied with the rack.

Step 5

Use thumb screws to secure crossbar B to the bottom of the Switch. Use mounting hole 1 if a rack fixture attached when the Switch was shipped from the factory is used, and use mounting hole 2 if the BRK-11 is used.

Figure 4-15 Attaching crossbar B



(1) Mounting hole 1

(2) Mounting hole 2

(3) Cross bar B

(4) Thumb screw

NOTE

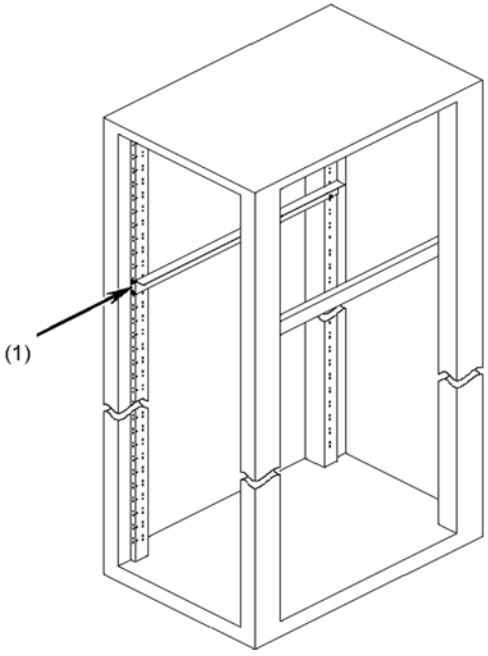
Securely tighten the thumb screws with your hand.

4.5.3 AX6308S

Step 1

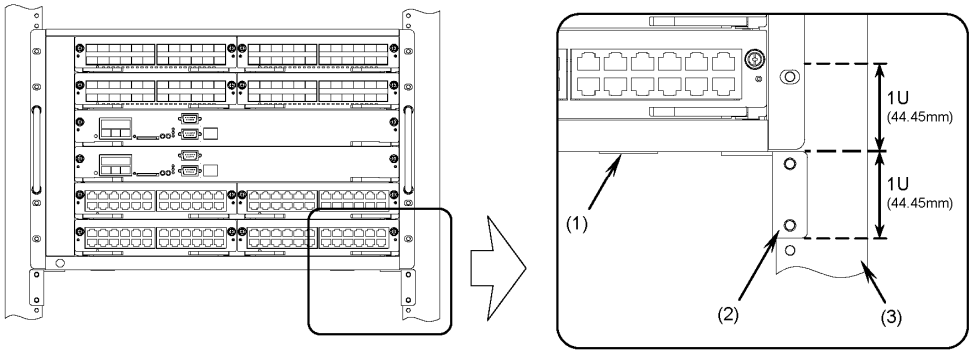
Attach a guide rail or a shelf to the rack. For the installation location of the guide rail, see *Figure 4-17 Installation location of the guide rail*.

Figure 4-16 Installing a guide rail



(1) Guide rail

Figure 4-17 Installation location of the guide rail



(1) Rubber pad

(2) Guide rail

(3) Rack pillar

NOTE

Dotted lines (- - -) in the Figure indicate the boundary between units (U). When attaching a guide rail, align the top of the guide rail with the boundary (U).

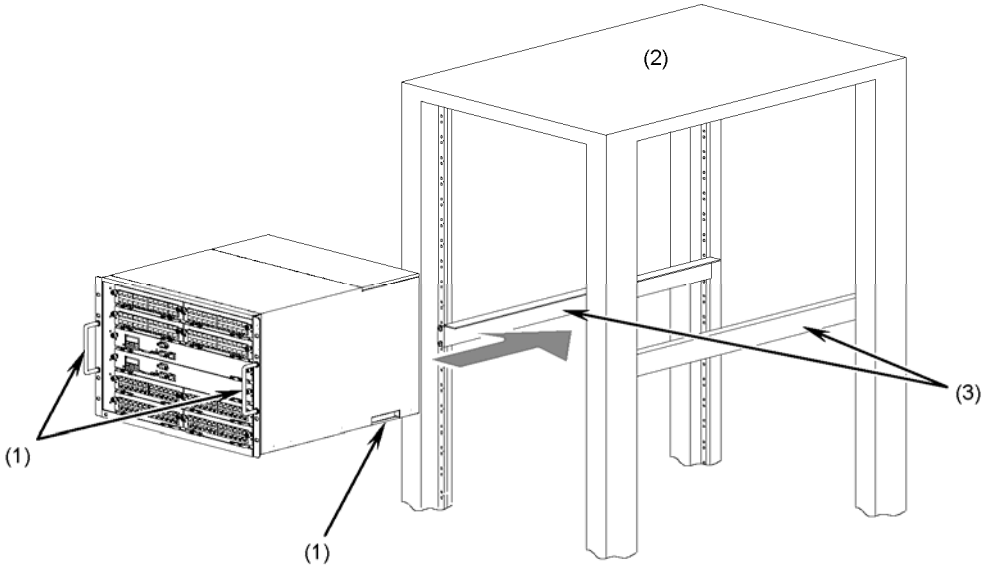
NOTE

Rubber pads are attached to the bottom of a Switch when it is shipped from the factory. The height of a rubber pad is 0.7 mm. When using a shelf, adjust it so that it is 0.7 mm below the boundary (U).

Step 2

Mount the Switch on the guide rails or the shelf. Hold the bottom and the handles of the Switch when mounting the Switch.

Figure 4-18 Mounting a Switch on the rack



(1) Handles

(2) Rack

(3) Guide rail

⚠WARNING	The maximum weight of the AX6308S is 64 kg. The Switch must be installed and carried by at least three people. Installing or carrying a Switch with too few people could result in the Switch being dropped or falling, possibly leading to injury.

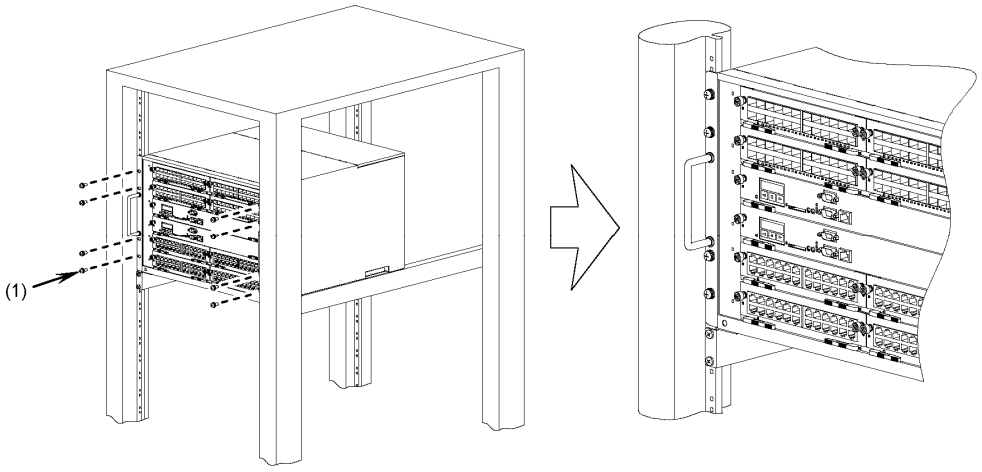
⚠CAUTION	When moving a Switch, do not hold the handle of the fan unit or power supply unit. The handle might come off, resulting in the Switch falling and possibly causing injury. Also, the fan unit or power supply unit might become deformed, resulting in fire or electric shock.

NOTE	To install a Switch in an elevated location, ALAXALA Networks Corporation recommend that you use a hand lifter or equivalent device.

Step 3

Secure the Switch to the rack.

Figure 4-19 Mounting a Switch on the rack



(1) Screws (M5 or M6 x 8)

NOTE

To secure a Switch to the rack, use the M5 or M6 screws supplied with the rack.

4.6 Connecting and disconnecting the power cable

4.6.1 Replacing the bracket preventing disconnection of the power cable (when a 200 V AC power cable is used)

The bracket attached when a Switch is shipped from the factory supports only the supplied power cable.

To connect the optional 200 V AC power cable to a Switch, use the bracket supplied with the power cable.

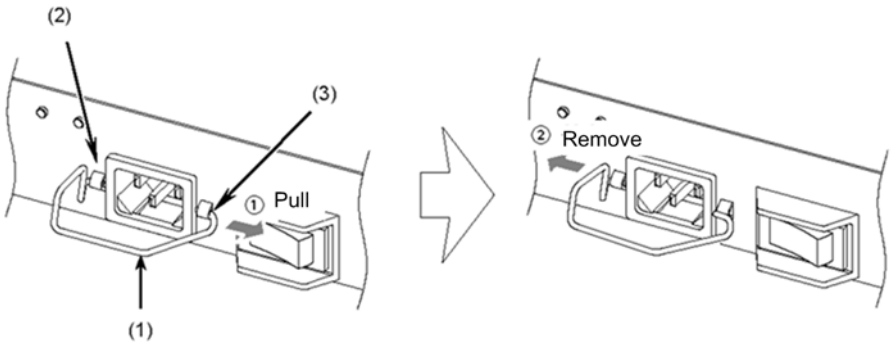
NOTE

If you have obtained your own 200 V AC power cable, do not use the bracket.

(1) Removing the bracket preventing disconnection of the power cable

Pull the bracket outward from support B to remove it, and then pull the support A side.

Figure 4-20 Removing the bracket



(1) Bracket preventing disconnection of the power cable

(2) Support A

(3) Support B

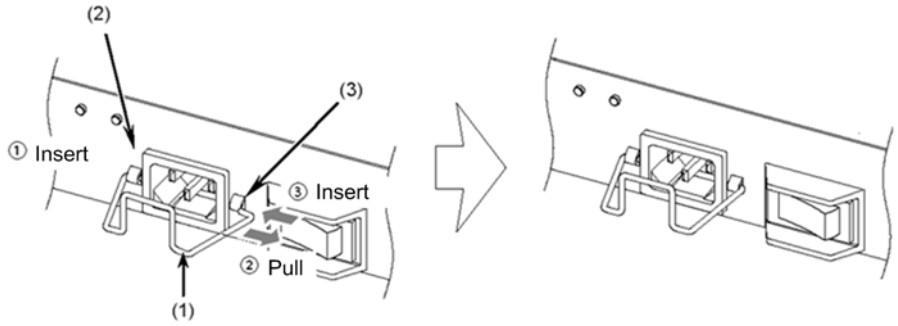
NOTE

Keep the removed bracket with the power cable.

(2) Attaching the bracket

Insert the bracket into support A, and then pull the bracket of the other side away from support B and insert it.

Figure 4-21 Attaching the bracket



(1) Bracket preventing disconnection of the power cable

(2) Support A

(3) Support B

4.6.2 Connecting and disconnecting the AC power cable

(1) Connecting the AC power cable

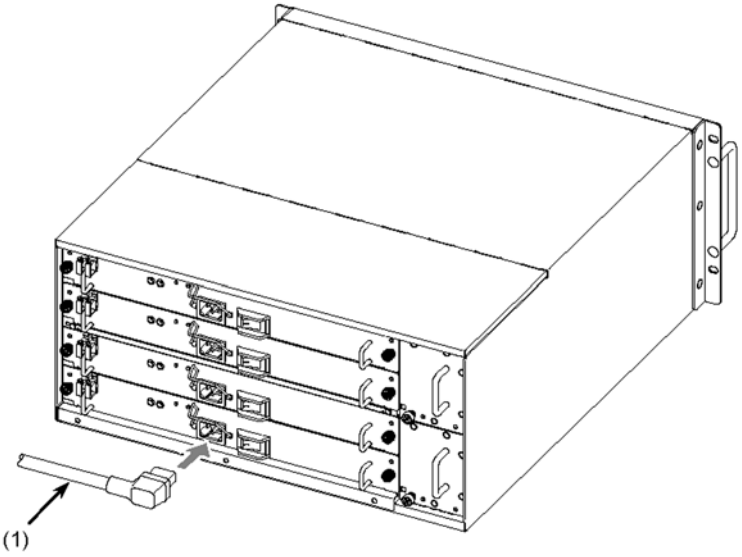
NOTE

The figure below shows an example of connecting the 100 V AC power cable supplied with a Switch. Use the same procedure to connect a 200 V AC power cable.

Step 1

Connect a power cable to the power connector.

Figure 4-22 Connecting the power cable



(1) Power cable

⚠WARNING

Always use a grounded power outlet. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

⚠WARNING	When using a Switch at 100 V AC, use the supplied power cable. 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 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 the supplied power cable with another switch. Doing so could result in fire or electric shock.

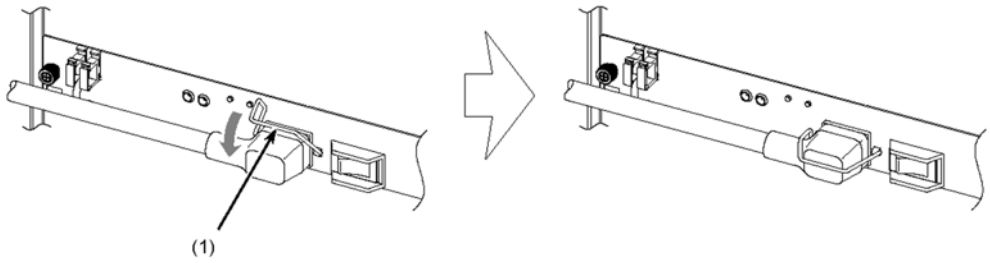
CAUTION	Before connecting or disconnecting a power cable, turn off the power to the device to be installed or removed.

NOTE	For the specifications defined by ALAXALA for power cables, see *2.4.2 Power supply facility for 200 V AC*.

Step 2

Clamp the power connector with the bracket.

Figure 4-23 Clamping the power connecter



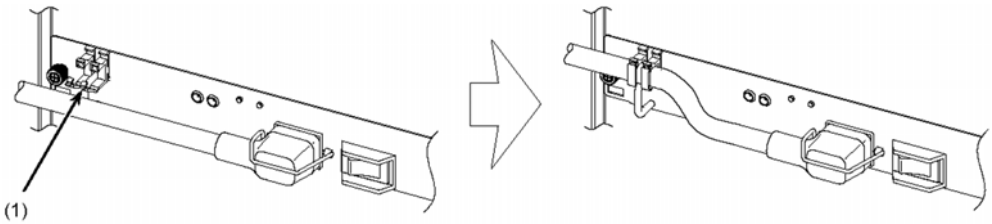
(1) Bracket preventing disconnection of the power cable

NOTE	If the bracket is removed, do not perform this step.

Step 3

Clamp the power cable by using the cable clamp.

Figure 4-24 Clamping the power cable



(1) Cable clamp

(2) Disconnecting the AC power cable

Reverse the steps described in *(1) Connecting the AC power cable* to disconnect

the power cable.

CAUTION

To disconnect the power cable, set the switch of the power supply unit to be removed to OFF.

4.6.3 Connecting and disconnecting the DC power cable

(1) Connecting the DC power cable

⚠WARNING

Use the specified DC power cable. Using another cable could result in fire or electric shock.

⚠WARNING

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. The DC power cable is connected to the terminal board. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

⚠WARNING

Make sure the circuit breaker of the power supply facility is set to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker of the power supply facility set to ON could result in fire or electric shock.

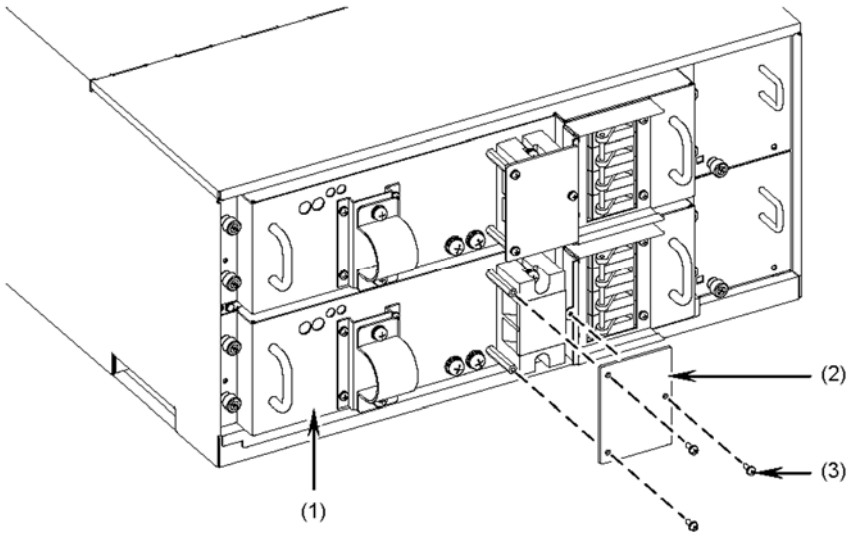
NOTE

For the specifications defined by ALAXALA for power cables, see *2.4.3 Power supply facility for −48 V DC*.

Step 1

Remove the terminal board cover.

Figure 4-25 Removing the terminal board cover



(1) Power supply unit

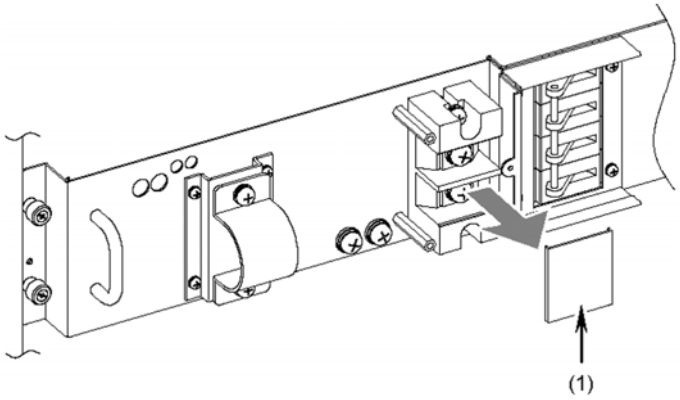
(2) Terminal board cover

(3) Screw (M3)

Step 2

Remove the terminal board cover from the terminal board.

Figure 4-26 Removing the terminal cover

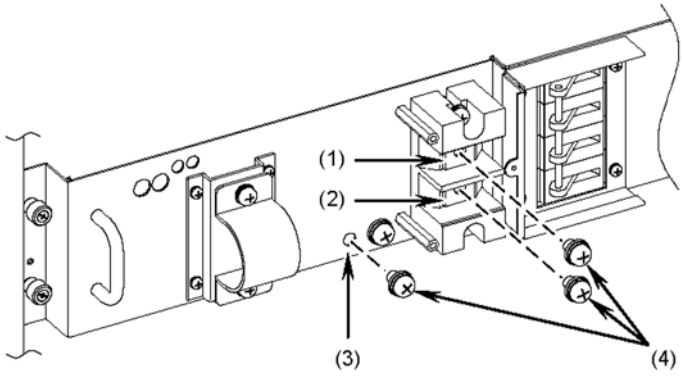


(1) Terminal cover

Step 3

Remove the 0 V terminal, −48 V terminal, and ground terminal screws.

Figure 4-27 Removing the screws



(1) 0V terminal

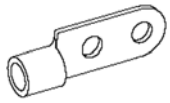
(2) −48 V terminal

(3) Ground terminal

(4) Screws (M6)

NOTE

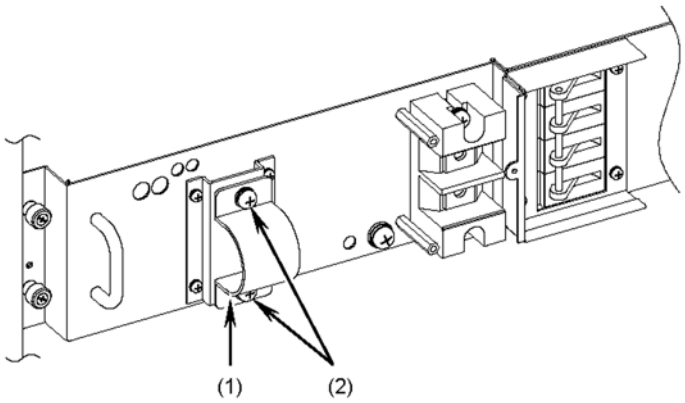
If a two-hole type bracket (shown in the following figure) is used for the ground terminal, remove both screws of the ground terminal.



Step 4

Loosen the cable clamp screws.

Figure 4-28 Releasing the cable clamp



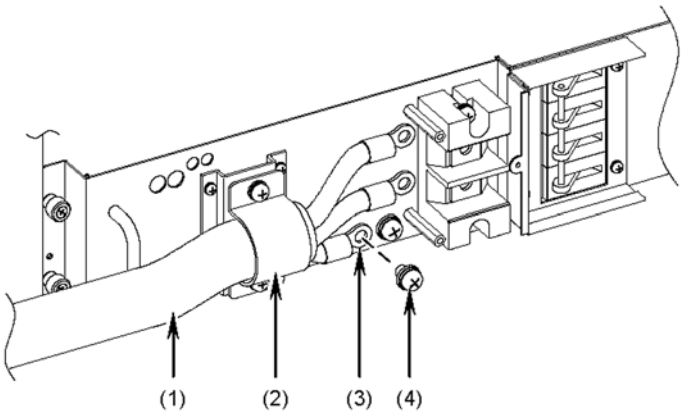
(1) Cable clamp

(2) Screws (M5)

Step 5

Pass the DC power cable through the cable clamp, and then tighten the screws of the ground terminals.

Figure 4-29 Securing the ground terminals



(1) DC power cable

(2) Cable clamp

(3) Ground terminal

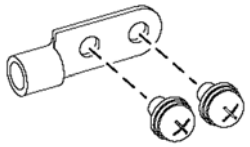
(4) Screws (M6)

⚠WARNING

If you use a DC power supply, always connect the ground terminals. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

NOTE

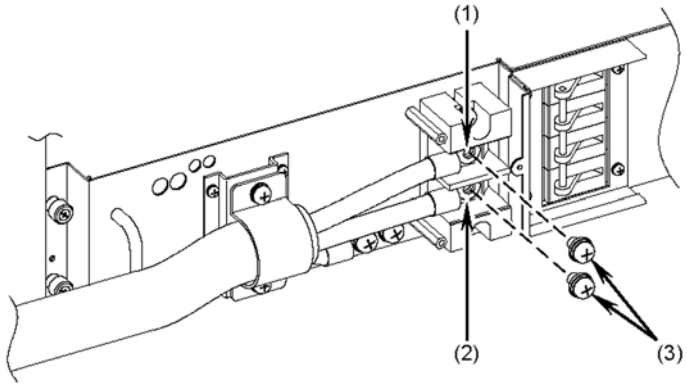
If a two-hole type bracket (shown in the figure below) is used for the ground terminal, use two screws to secure the ground terminal.



Step 6

Tighten the 0 V terminal and −48 V terminal screws in that order.

Figure 4-30 Securing the 0 V terminal and the -48 V terminal



(1) 0V terminal

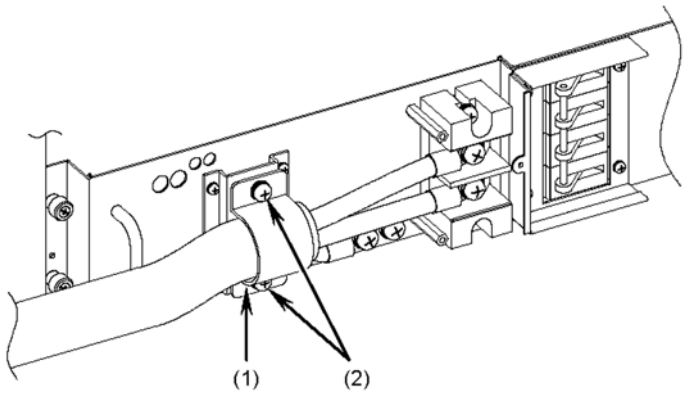
(2) −48 V terminal

(3) Screws (M6)

Step 7

Secure the DC power cable with the cable clamp. (Tighten the cable clamp screws.)

Figure 4-31 Securing the DC power cable



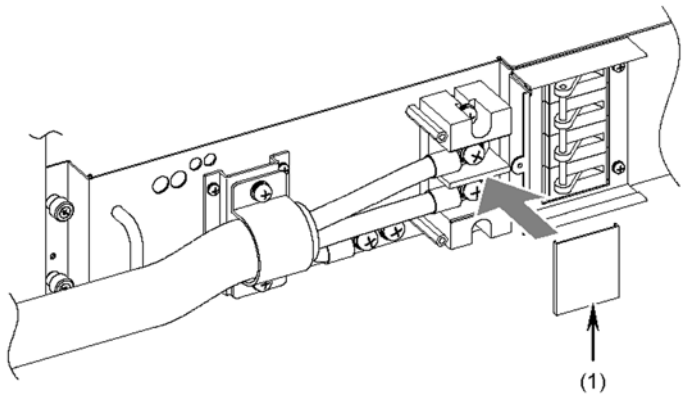
(1) Cable clamp

(2) Screws (M5)

Step 8

Attach the terminal cover.

Figure 4-32 Attaching the terminal cover

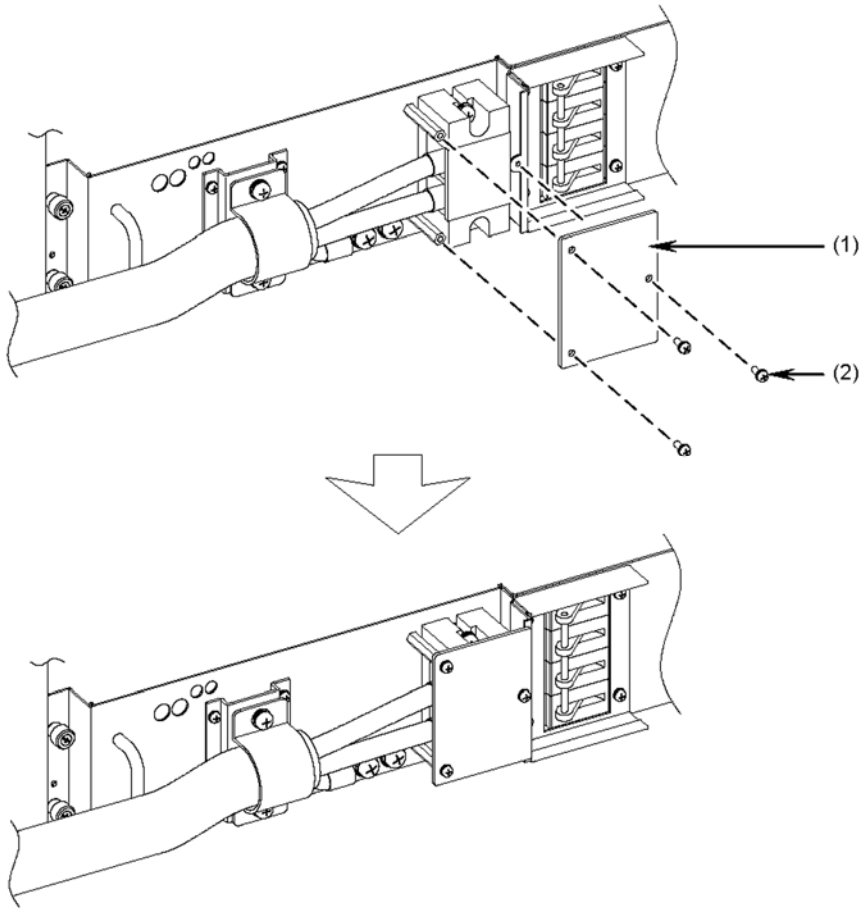


(1) Terminal cover

Step 9

Attach the terminal board cover.

Figure 4-33 Attaching the terminal board cover



(1) Terminal board cover

(2) Screw (M3)

⚠WARNING	After connecting the DC power cable, attach the terminal board cover. Using the power supply unit without the cover could result in electric shock.

(2) Disconnecting the DC power cable

Reverse the steps described in *(1) Connecting the DC power cable* to remove the power cable.

⚠WARNING	Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. The DC power cable is connected to the terminal board. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

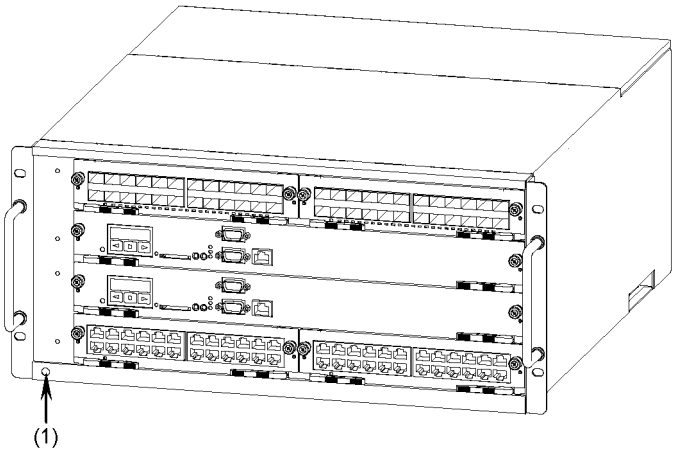
⚠WARNING	Make sure the circuit breaker of the power supply facility is set to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker of the power supply facility set to ON could result in fire or electric shock.

4.7 Attaching a wrist strap

A Switch has a terminal for an antistatic wrist strap.

The terminal supports 4 mm banana plugs. Use a 4 mm banana plug for the wrist strap terminal.

Figure 4-34 Location of the wrist strap terminal



(1) Wrist strap terminal

4.8 Inserting and removing memory cards

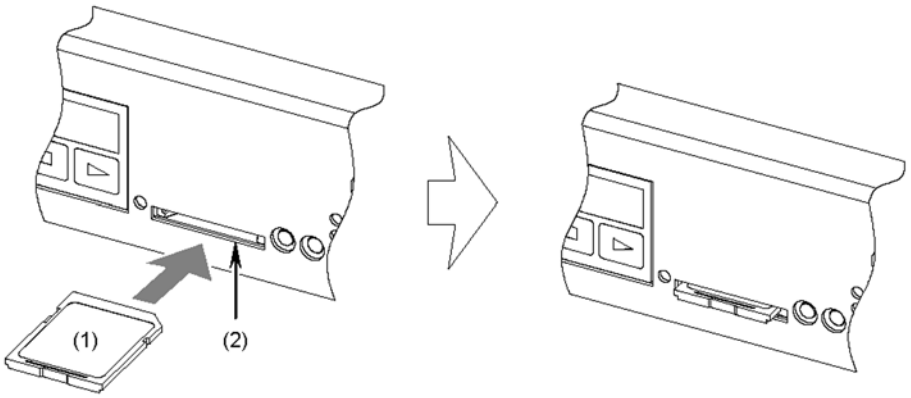
To use a memory card, insert it in the management and switching unit.

CAUTION	Remove the memory card before moving the Switch. If a card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

(1) Inserting a memory card

Insert a memory card into the slot until you hear a click, and then remove your fingers slowly. (Hold the memory card with the cut-off corner to the right.)

Figure 4-35 Inserting a 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 prevent deleting or writing of data, slide the protection switch to the Lock position before inserting it.

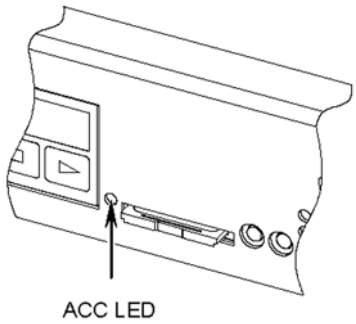
NOTE	If the memory card slot is dusty, clean the slot with a dry cloth before inserting a memory card.

(2) Removing a memory card

Step 1

Make sure the ACC LED is off (the memory card is not being accessed).

Figure 4-36 Checking the ACC LED



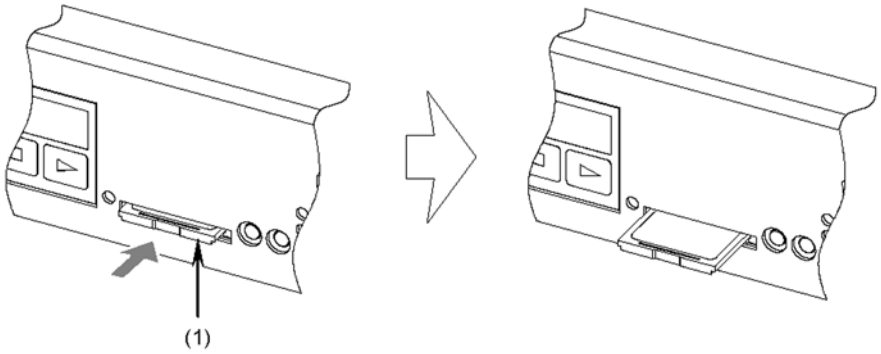
CAUTION

If the ACC LED is lit, the memory card is being accessed. 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. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Step 2

Push the memory card in until you hear a click (the memory card is ejected slightly).

Figure 4-37 Ejecting a memory card

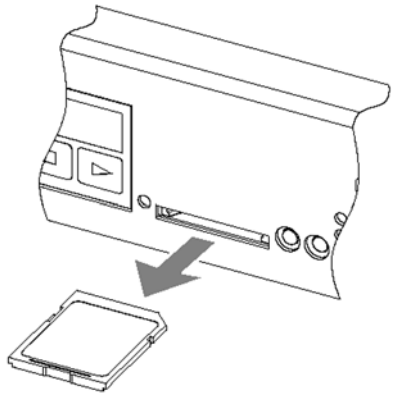


(1) Memory card

Step 3

Remove the memory card.

Figure 4-38 Removing a memory card



CAUTION	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.

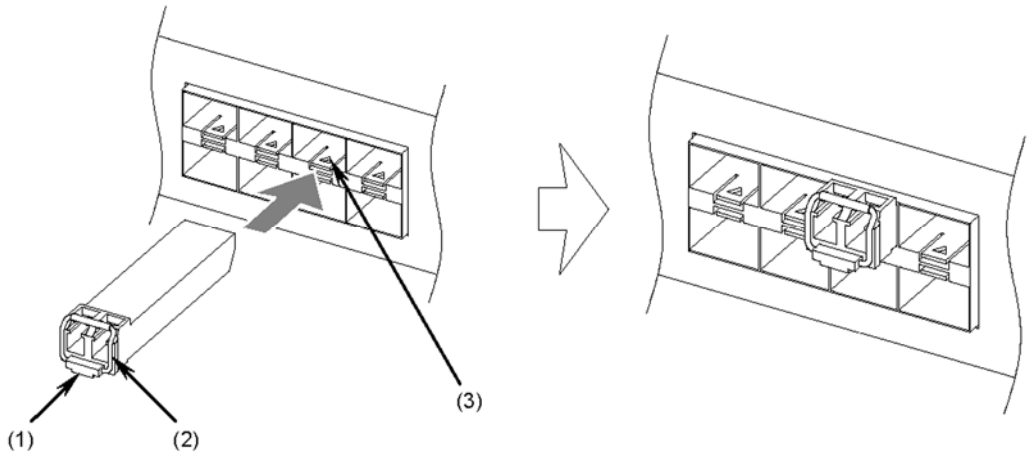
4.9 Inserting and removing SFP transceivers

SFP transceivers with a network interface unit attached can be inserted and removed while the Switch is on.

(1) Inserting an SFP transceiver

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

Figure 4-39 Inserting an SFP transceiver (upper port)



(1) SFP transceiver

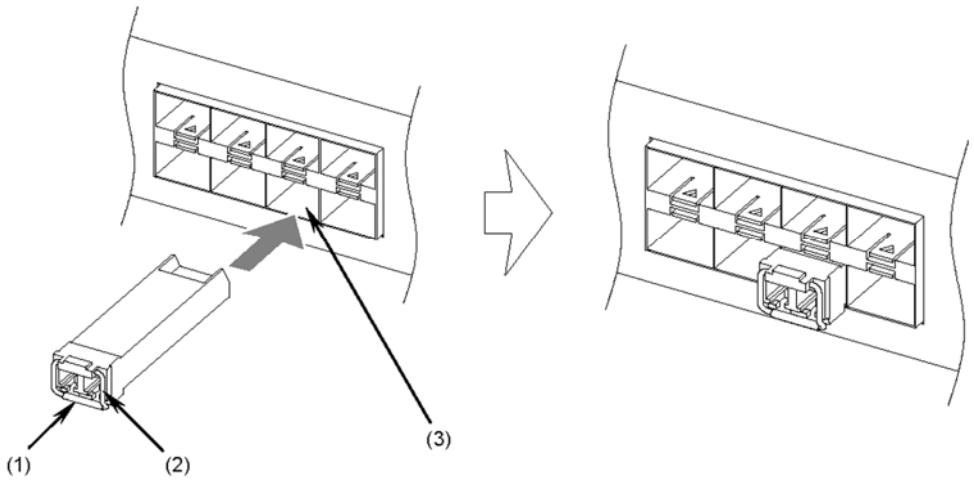
(2) Lever

(3) Ethernet port

NOTE

The above figure shows an example for inserting an SFP transceiver in the upper Ethernet port of the network interface unit. If you want to insert an SFP transceiver in the lower Ethernet port, turn the SFP transceiver upside down and install it as shown in the figure below.

Figure 4-40 Inserting an SFP transceiver (lower port)



(1) Lever

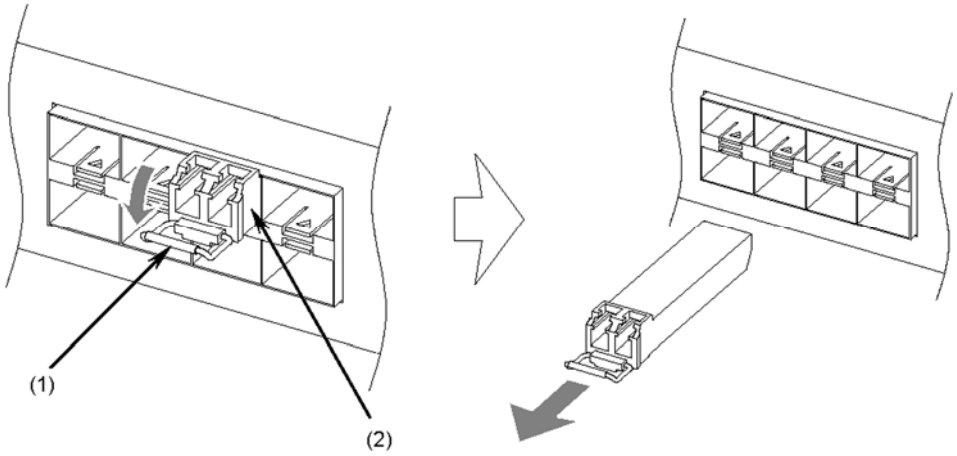
(2) SFP transceiver

(3) Ethernet port

(2) Removing an SFP transceiver

Press the lever down in the direction of the arrow. While holding down the lever, pull out the SFP transceiver.

Figure 4-41 Removing an SFP transceiver



(1) Lever

(2) SFP transceiver

4.10 Inserting and removing XFP transceivers

XFP transceivers with a network interface unit attached can be inserted and removed while the Switch is on.

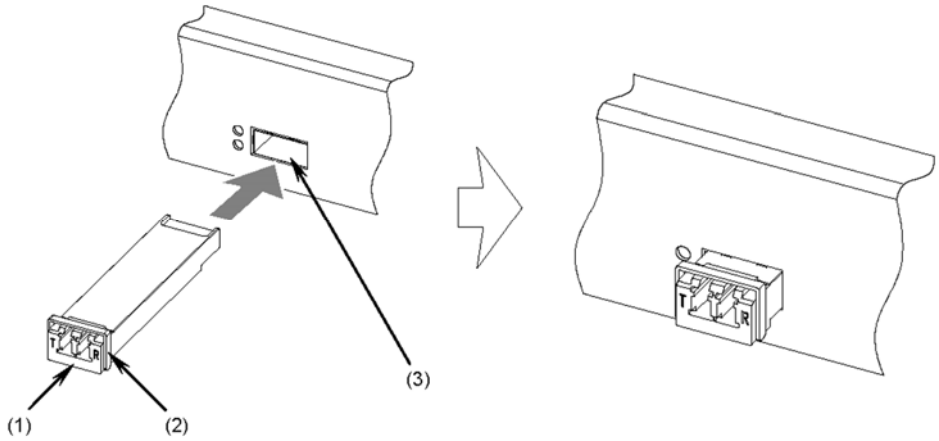
NOTE

The following procedures describe how to insert and remove a type-A module. The same procedures apply to a type-B module.

(1) Installing an XFP transceiver

Keep the lever upright as shown in the figure, and insert the XFP transceiver until you hear a click.

Figure 4-42 XFP transceiver



(1) XFP transceiver

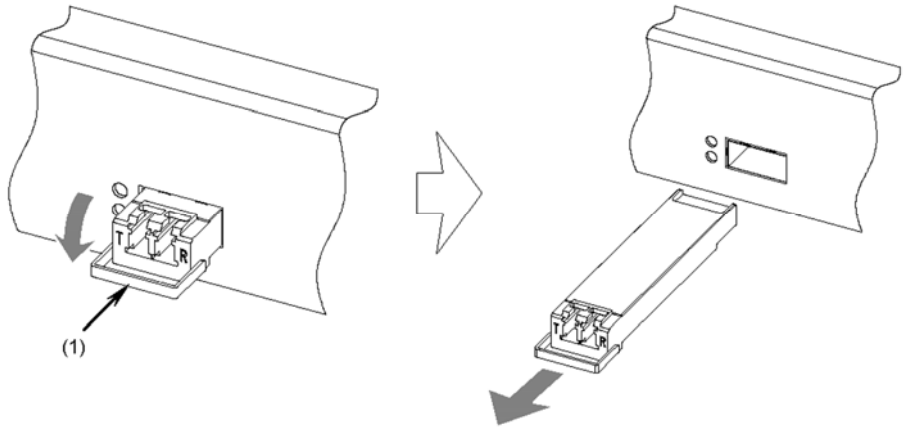
(2) Lever

(3) Ethernet port

(2) Removing an XFP transceiver

Press the lever down in the direction of the arrow. While holding down the lever, pull out the XFP transceiver.

Figure 4-43 Removing an XFP transceiver



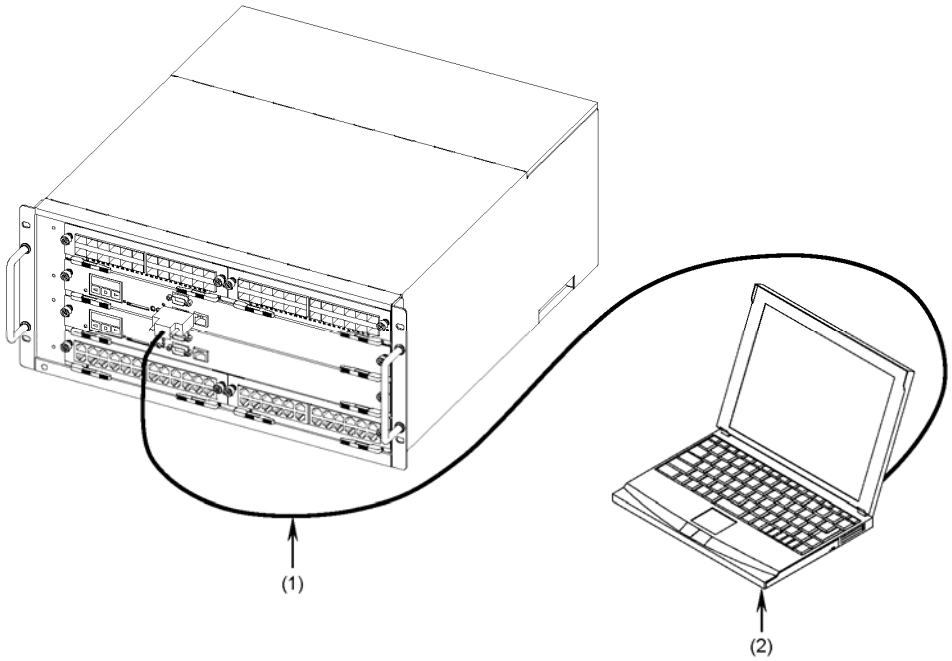
(1) Lever

4.11 Connecting operation terminals

Connect an operation terminal to the CONSOLE port of the Switch.

To do so, use an RS-232C crossover cable with 9-pin (female) D-sub connectors on both ends, and use #4-40 screws.

Figure 4-44 Connecting the operation terminal



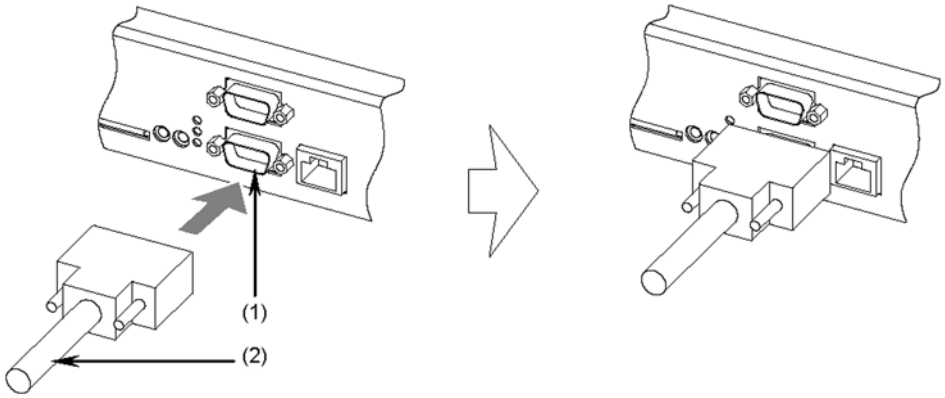
(1) RS-232C cable

(2) Operation terminal

Step 1

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

Figure 4-45 Connecting the RS-232C cable



(1) CONSOLE port

(2) RS-232C cable

NOTE

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

Step 2

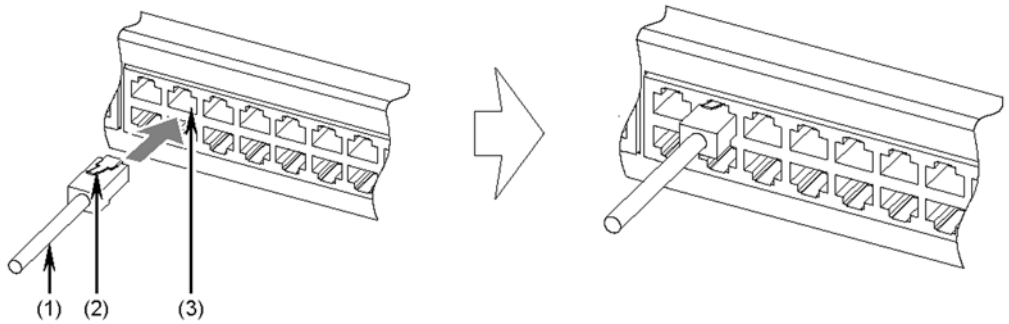
In the same way, connect the RS-232C cable to the operation terminal.

4.12 Connecting interface cables

(1) UTP cable

Push the connector until you hear a click.

Figure 4-46 Connecting a UTP cable



(1) UTP cable

(2) Tab

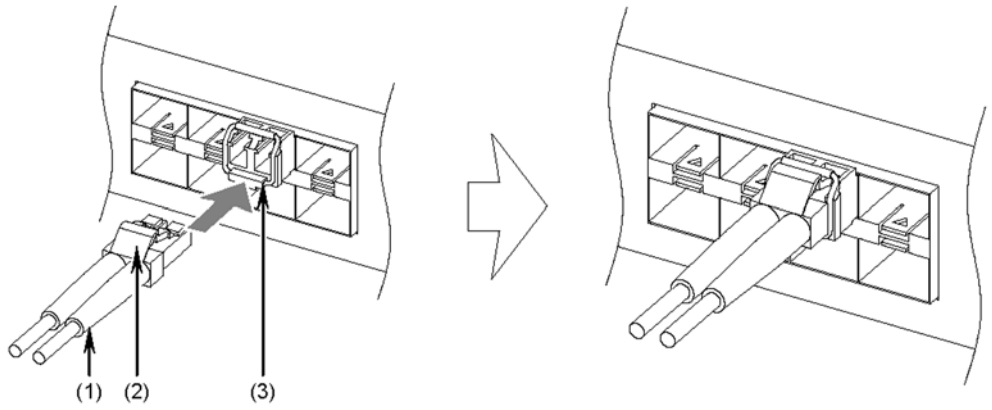
(3) Ethernet port

NOTE To detach the cable, hold the tab down and pull out the connector.

(2) Fiber optic cable (LC duplex connector)

Push the connector until you hear a click.

Figure 4-47 Fiber optic cable (LC duplex connector)



(1) Fiber optic cable (LC duplex connector)

(2) Tab

(3) Transceiver

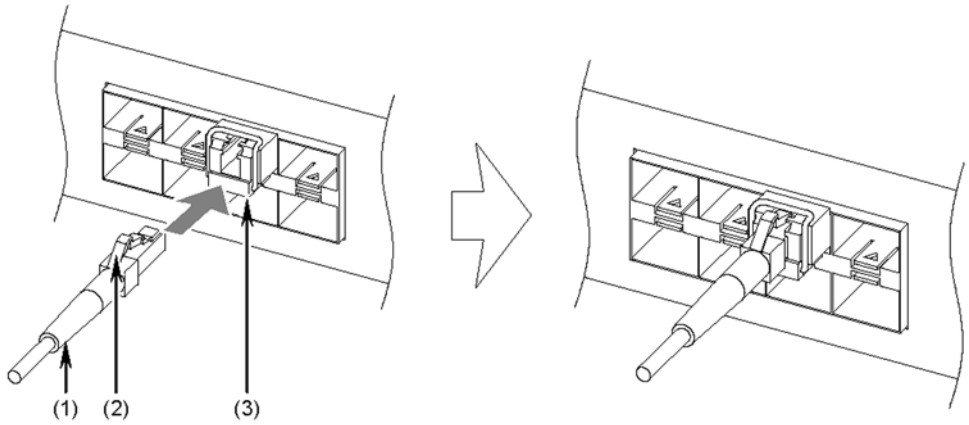
NOTE To detach the cable, hold the tab down and pull out the connector.

NOTE | For details about cleaning optical connectors, see *A Cleaning Optical Connectors*.

(3) Fiber optic cable (LC simplex connector)

Push the connector until you hear a click.

Figure 4-48 Fiber optic cable (LC simplex connector)



(1) Fiber optic cable (LC simplex connector)

(2) Tab

(3) Transceiver

NOTE | To detach the cable, hold the tab down and pull out the connector.

NOTE | For details about cleaning optical connectors, see *A Cleaning Optical Connectors*.

4.13 Turning the Switch on and off

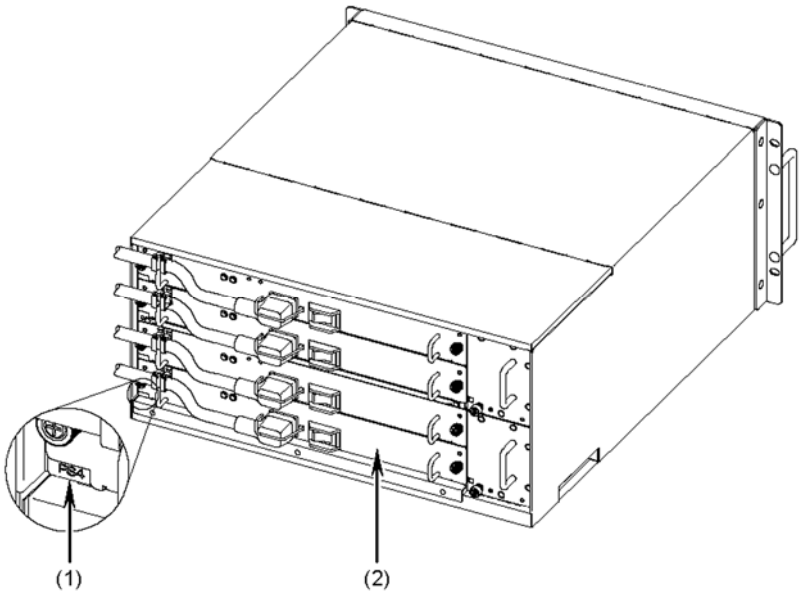
4.13.1 AX6304S (AC power supply unit installed)

(1) Turning the Switch on

Step 1

Make sure the power supply unit is installed correctly.

Figure 4-49 Checking the installation location of the power supply unit



(1) Slot number

(2) Power supply unit

NOTE

If you do not want a redundant power supply, install power supply units in PS1 and PS2. For a redundant power supply, install power supply units in all slots from PS1 to PS4.

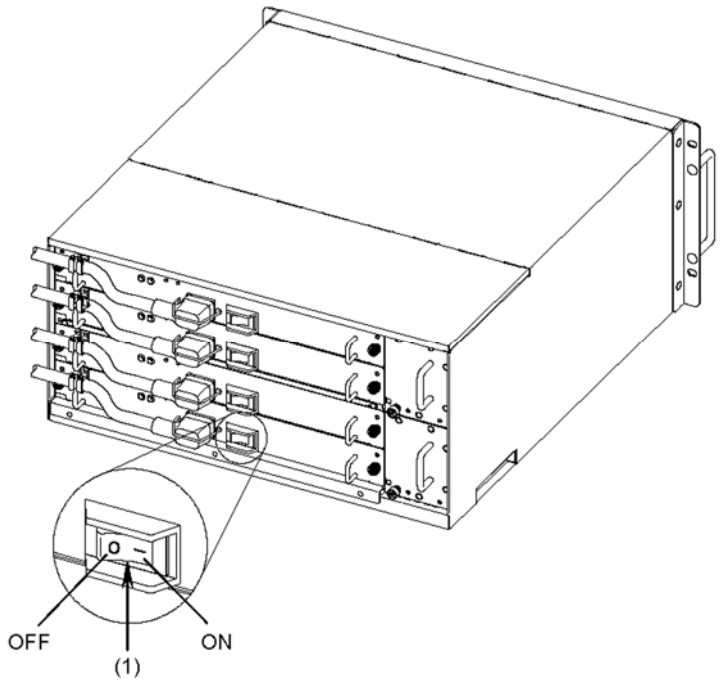
NOTE

The slot number of a power supply unit is located on the Switch. You can find the number at the bottom left of each power supply unit.

Step 2

Set all the circuit breakers of the Switch to ON.

Figure 4-50 Turning on the power



(1) Power switch

NOTE

Set all power switches to ON within five seconds of turning the first switch on. If you take longer than five seconds, the management and switching unit detects a power failure, and the failure information is displayed on the LCD.

If this happens, take action as described in the following table.

Display on the LCD	Action
E8 PS Msg=00000001	The Switch is ready. Set all power switches to ON. (When the power failure is resolved, the display on the LCD disappears.)
[MD] FAULT 2200 220000*aa*00*bb*	The Switch is unable to start operation because the power supply capacity is insufficient. Set all power switches to OFF, and then set them to ON again.

The values for *<aa>* and *<bb>* above vary depending on the installation status of the power supply unit and the status of the power supply.

NOTE

When you set the power switch to OFF and then ON again, wait at least two seconds between the OFF and ON operations.

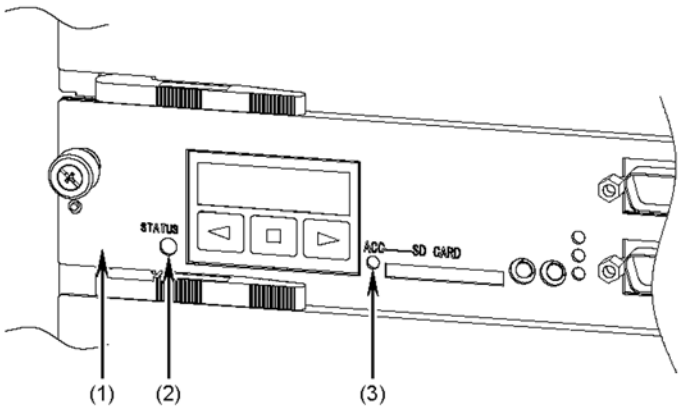
(2) Turning off the power

Step 1

Make sure the software is not being updated (the `ppupdate` command is not being

executed) and the memory card is not being accessed.

Figure 4-51 Checking the LED



(1) Management and switching unit

(2) STATUS LED

(3) ACC LED

CAUTION

When the `ppupdate` command is executed, the Switch restarts automatically. Do not turn off the Switch until it is restarted (until the STATUS LED on the management and switching unit changes from blinking green to constant green). Failure to do so could result in a Switch failure.

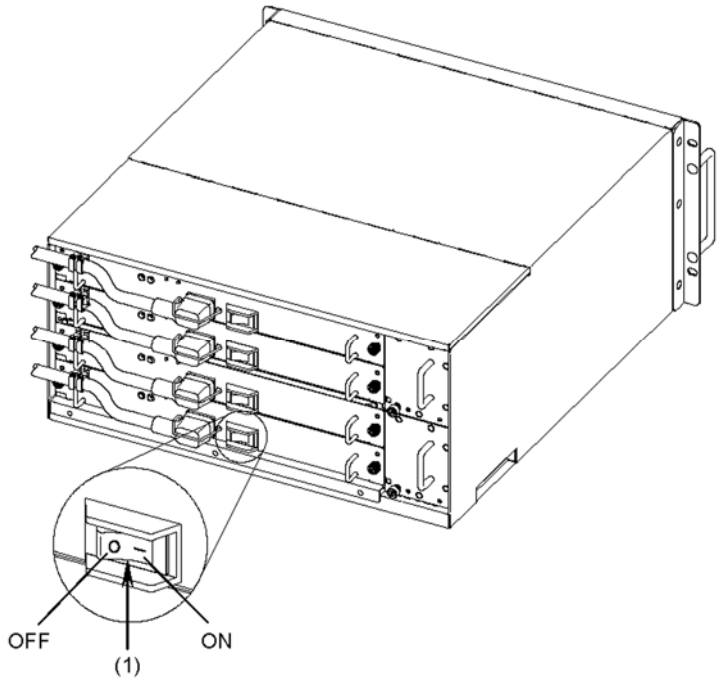
CAUTION

If the ACC LED is lit, the memory card is being accessed. 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. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Step 2

Set all power switches on the Switch to OFF.

Figure 4-52 Turning off the power



(1) Power switch

⚠WARNING A Switch has multiple input power supplies. Before turning off the power, set all power switches of the Switch to OFF.

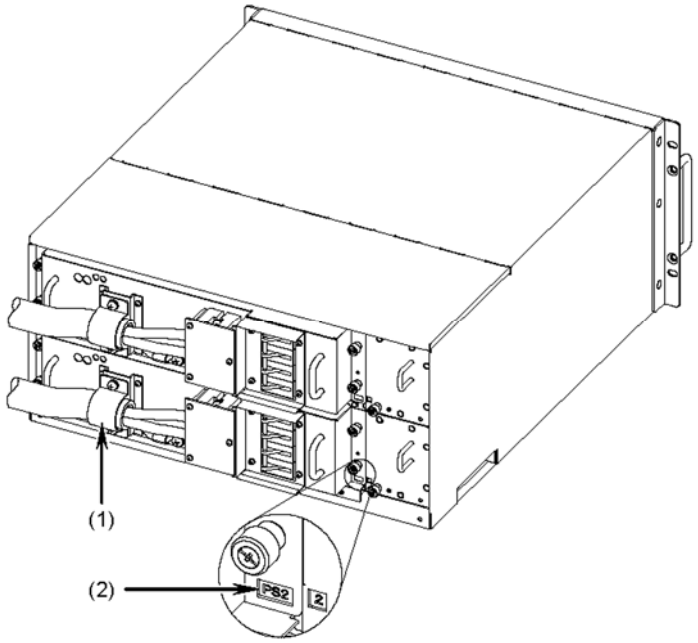
4.13.2 AX6304S (DC power supply unit installed)

(1) Turning the Switch on

Step 1

Make sure the power supply unit is installed correctly.

Figure 4-53 Checking the installation location of the power supply unit



(1) Power supply unit

(2) Slot number

NOTE

If you do not want a redundant power supply, install the power supply unit in PS1. For a redundant power supply, install power supply units in both the PS1 and PS2 slots.

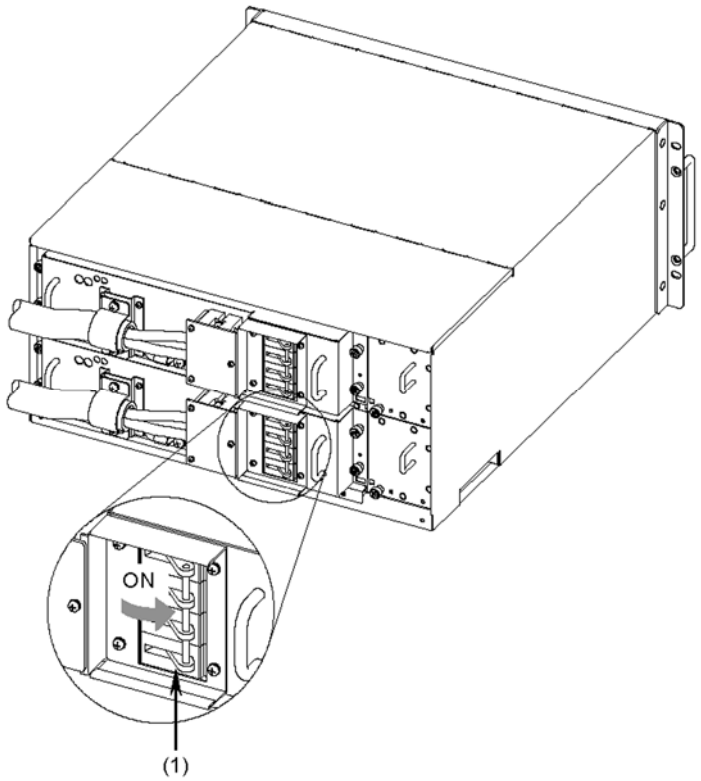
NOTE

The slot number of a power supply unit is located on the Switch. You can find the number at the bottom right of each power supply unit.

Step 2

Set all the circuit breakers of the Switch to ON.

Figure 4-54 Turning on the power



(1) Circuit breaker

NOTE

Set all power switches to ON within five seconds of turning the first switch on. If you take longer than five seconds, the management and switching unit detects a power failure, and the failure information is displayed on the LCD.

If this happens, take action as described in the following table.

Display on the LCD	Action
E8 PS Msg=00000001	The Switch is ready. Set all circuit breakers to ON. (When the power failure is resolved, the display on the LCD disappears.)
[MD] FAULT 2200 220000*aa*00*bb*	The Switch is unable to start operation because the power supply capacity is insufficient. Set all circuit breakers to OFF, and then set them to ON again.

The values for *<aa>* and *<bb>* above vary depending on the installation status of the power supply unit and the status of the power supply.

NOTE

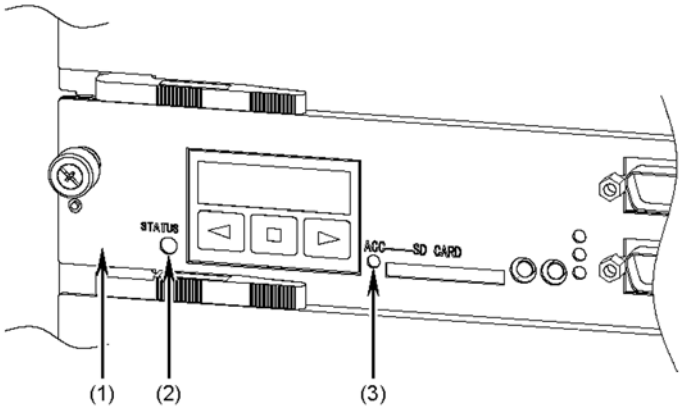
When you set the circuit breaker to OFF and then ON again, wait at least two seconds between the OFF and ON operations.

(2) Turning off the power

Step 1

Make sure the software is not being updated (the `ppupdate` command is not being executed) and the memory card is not being accessed.

Figure 4-55 Checking the LED



(1) Management and switching unit

(2) STATUS LED

(3) ACC LED

CAUTION

When the `ppupdate` command is executed, the Switch restarts automatically.
Do not turn off the Switch until it is restarted (until the STATUS LED on the management and switching unit changes from blinking green to constant green). Failure to do so could result in a Switch failure.

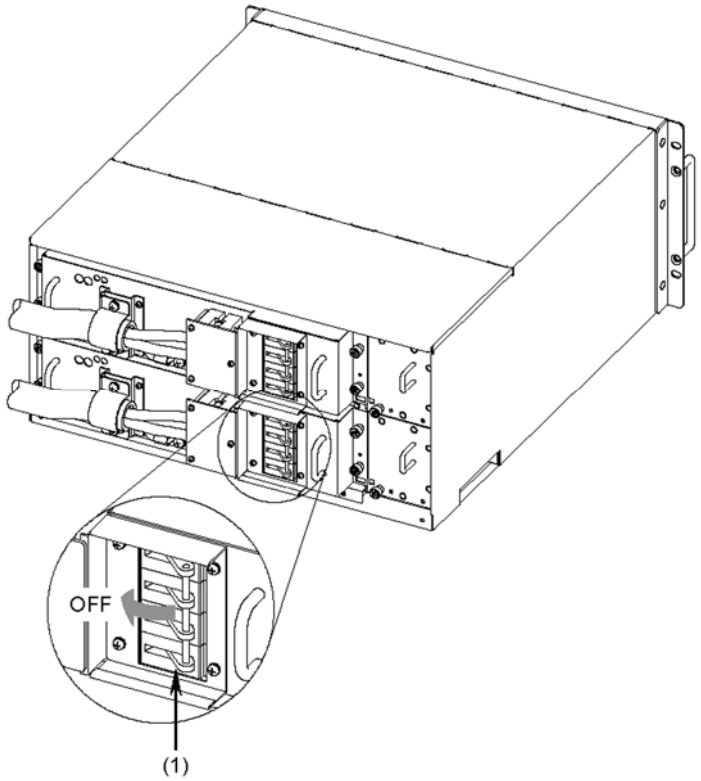
CAUTION

If the ACC LED is lit, the memory card is being accessed. 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. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Step 2

Set all power switches of the Switch to ON.

Figure 4-56 Turning off the power



(1) Circuit breaker

⚠WARNING A Switch has multiple input power supplies. Before turning off the power, set all circuit breakers of the Switch to OFF.

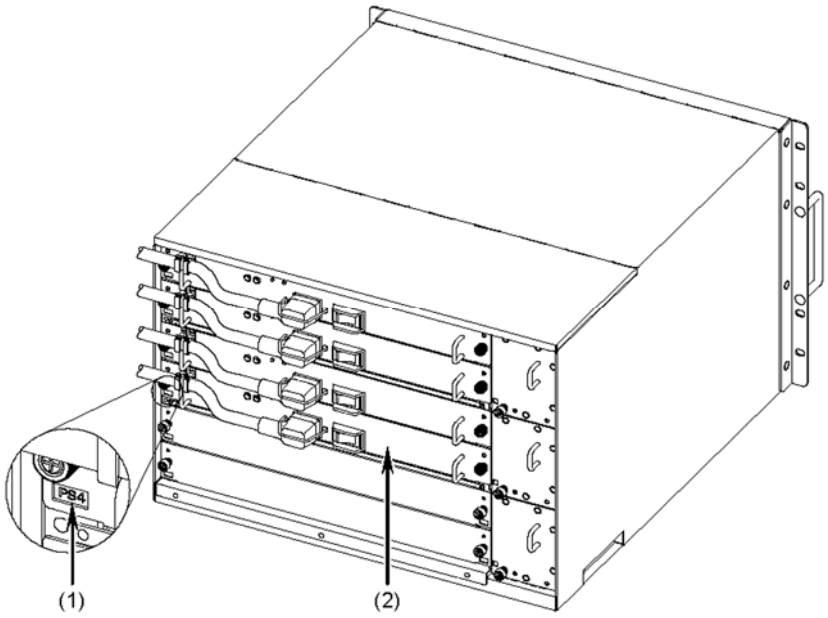
4.13.3 AX6308S (AC power supply unit installed)

(1) Turning the Switch on

Step 1

Make sure the power supply unit is installed correctly.

Figure 4-57 Checking the installation location of the power supply unit



(1) Slot number

(2) Power supply unit

NOTE

If you do not want a redundant power supply, install the power supply units in PS1 and PS2. For a redundant power supply, install power supply units in the PS1 to PS4 slots.

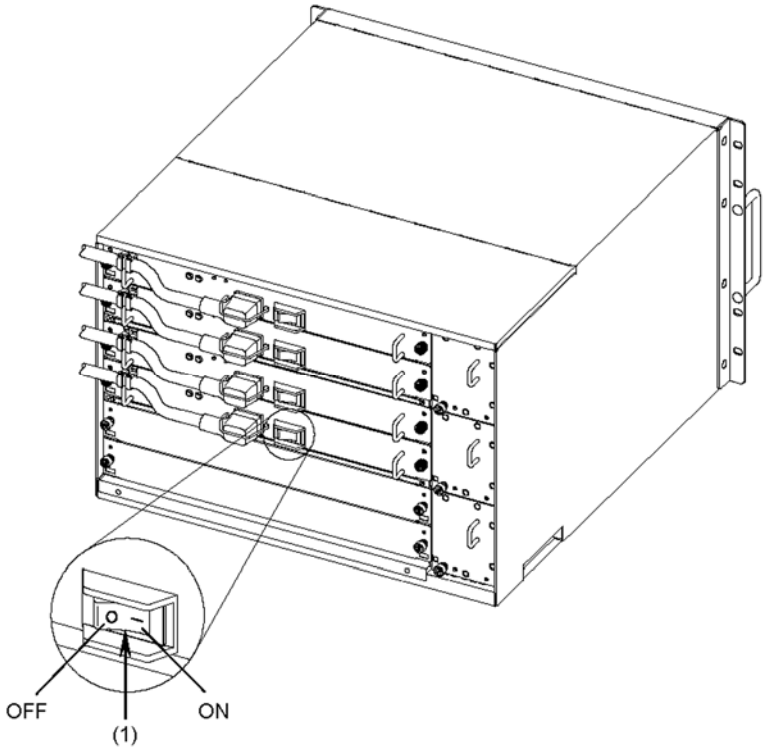
NOTE

The slot number of a power supply unit is located on the Switch. You can find the number at the bottom left of each power supply unit.

Step 2

Set all the circuit breakers of the Switch to ON.

Figure 4-58 Turning on the power



(1) Power switch

NOTE

Set all power switches to ON within five seconds of turning the first switch on. If you take longer than five seconds, the management and switching unit detects a power failure, and the failure information is displayed on the LCD.

If this happens, take action as described in the following table.

Display on the LCD	Action
E8 PS Msg=00000001	The Switch is ready. Set all power switches to ON. (When the power failure is resolved, the display on the LCD disappears.)
[MD] FAULT 2200 220000*aa*00*bb*	The Switch is unable to start operation because the power supply capacity is insufficient. Set all power switches to OFF, and then set them to ON again.

The values for <*aa*> and <*bb*> above vary depending on the installation status of the power supply unit and the status of the power supply.

NOTE

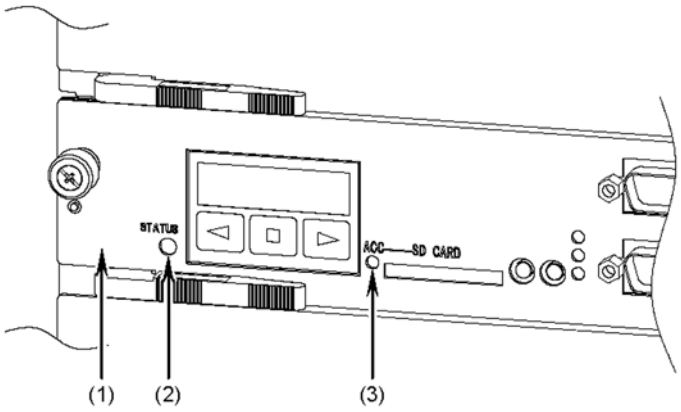
When you set the power switch to OFF and then ON again, wait at least two seconds between the OFF and ON operations.

(2) Turning off the power

Step 1

Make sure the software is not being updated (the `ppupdate` command is not being executed) and the memory card is not being accessed.

Figure 4-59 Checking the LED



(1) Management and switching unit

(2) STATUS LED

(3) ACC LED

CAUTION

When the `ppupdate` command is executed, the Switch restarts automatically.

Do not turn off the Switch until it is restarted (until the STATUS LED on the management and switching unit changes from blinking green to constant green). Failure to do so could result in a Switch failure.

CAUTION

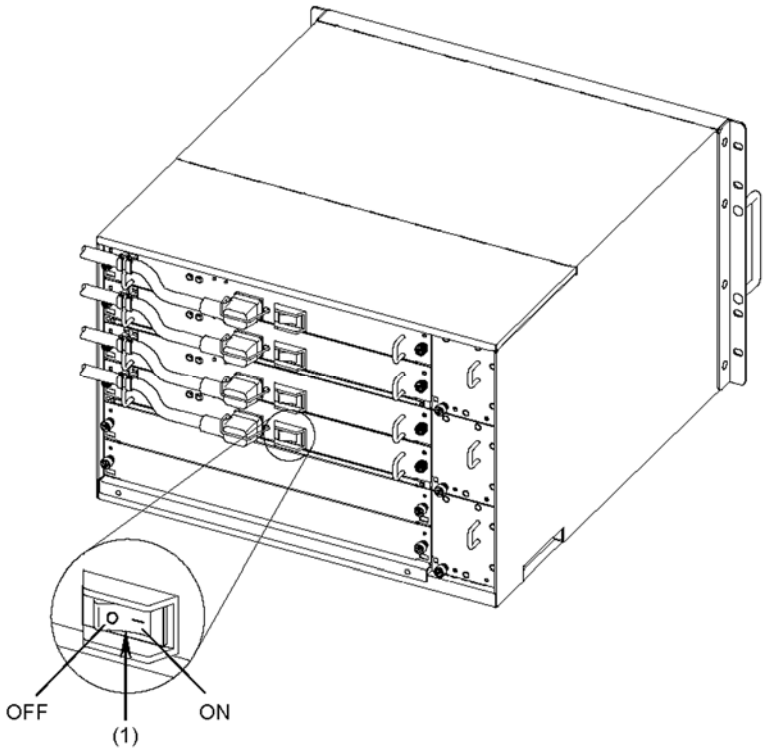
If the ACC LED is lit, the memory card is being accessed. While a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card.

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

Step 2

Set all power switches on the Switch to OFF.

Figure 4-60 Turning off the power



(1) Power switch

⚠WARNING A Switch has multiple input power supplies. Before turning off the power, set all power switches of the Switch to OFF.

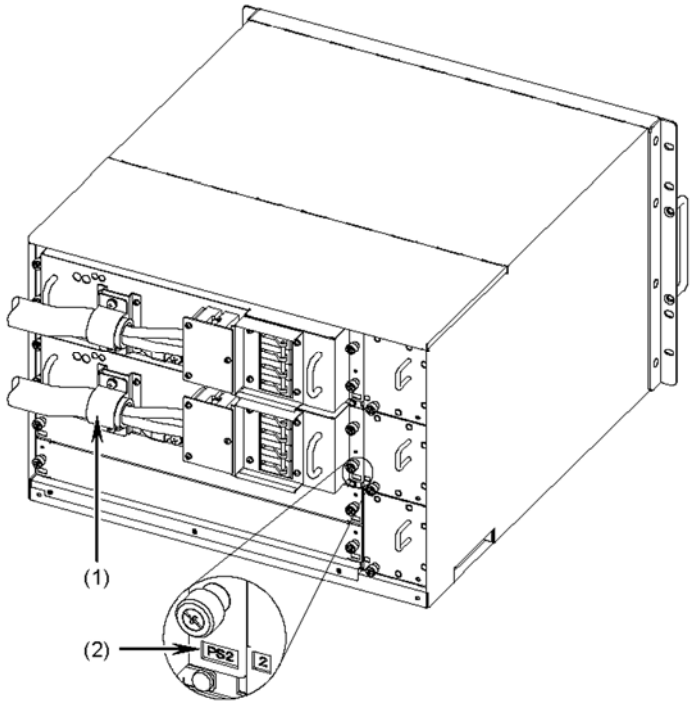
4.13.4 AX6308S (DC power supply unit installed)

(1) Turning the Switch on

Step 1

Make sure the power supply unit is installed correctly.

Figure 4-61 Checking the installation location of the power supply unit



(1) Power supply unit

(2) Slot number

NOTE

If you do not want a redundant power supply, install the power supply unit in PS1. For a redundant power supply, install power supply units in both the PS1 and PS2 slots.

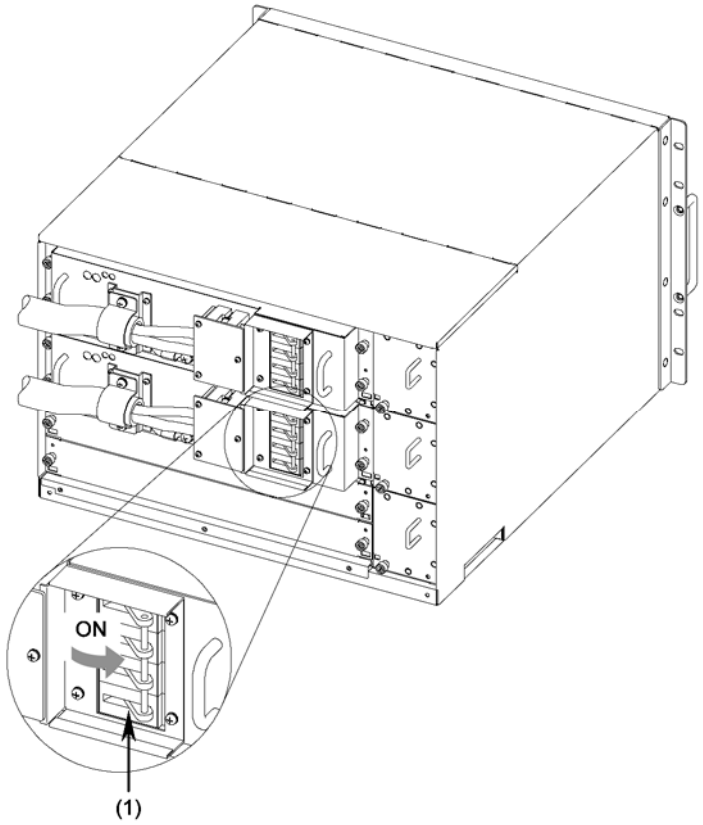
NOTE

The slot number of a power supply unit is located on the Switch. You can find the number at the bottom right of each power supply unit.

Step 2

Set all the circuit breakers of the Switch to ON.

Figure 4-62 Turning on the power



(1) Circuit breaker

NOTE

Set all power switches to ON within five seconds of turning the first switch on. If you take longer than five seconds, the management and switching unit detects a power failure, and the failure information is displayed on the LCD.

If this happens, take action as described in the following table.

Display on the LCD	Action
E8 PS Msg=00000001	The Switch is ready. Set all circuit breakers to ON. (When the power failure is resolved, the display on the LCD disappears.)
[MD] FAULT 2200 220000*aa*00*bb*	The Switch is unable to start operation because the power supply capacity is insufficient. Set all circuit breakers to OFF, and then set them to ON again.

The values for <*aa*> and <*bb*> above vary depending on the installation status of the power supply unit and the status of the power supply.

NOTE

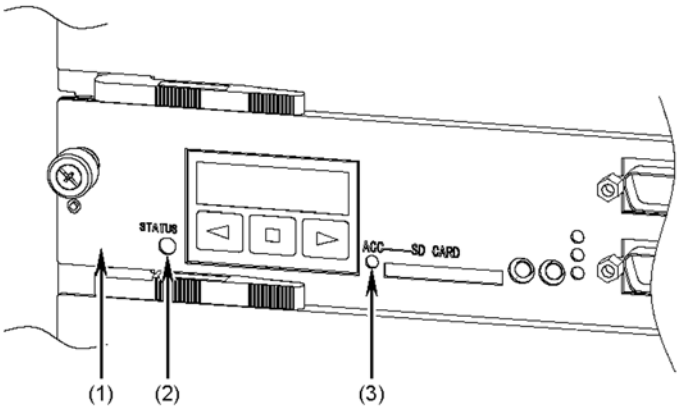
When you set the circuit breaker to OFF and then ON again, wait at least two seconds between the OFF and ON operations.

(2) Turning off the power

Step 1

Make sure the software is not being updated (the `ppupdate` command is not being executed) and the memory card is not being accessed.

Figure 4-63 Checking the LED



(1) Management and switching unit

(2) STATUS LED

(3) ACC LED

CAUTION

When the `ppupdate` command is executed, the Switch restarts automatically.

Do not turn off the Switch until it is restarted (until the STATUS LED on the management and switching unit changes from blinking green to constant green). Failure to do so could result in a Switch failure.

CAUTION

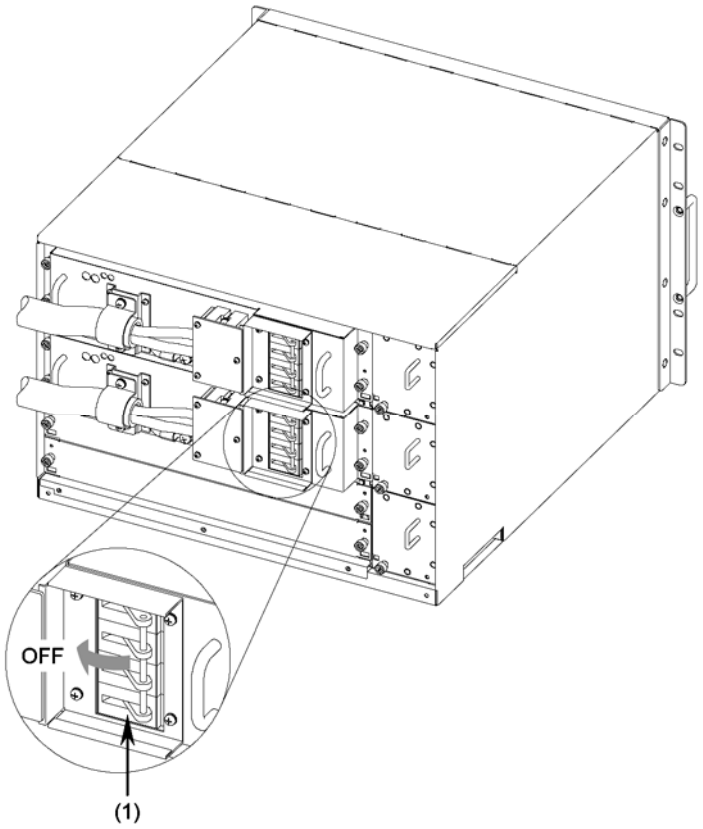
If the ACC LED is lit, the memory card is being accessed. While a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card.

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

Step 2

Set all power switches of the Switch to ON.

Figure 4-64 Turning off the power



(1) Circuit breaker

⚠WARNING	A Switch has multiple input power supplies. Before turning off the power, set all circuit breakers of the Switch to OFF.

4.14 Other operations

(1) Operation management and configuration settings

For details about the operation management and configuration settings, see the following manuals, as appropriate. (The number in the parentheses is the manual number.)

- Manuals for operation management and configuration settings:
  - *Software Manual Configuration Guide Vol. 1 (AX63S-S001X)*
  - *Software Manual Configuration Guide Vol. 2 (AX63S-S002X)*
  - *Software Manual Configuration Guide Vol. 3 (AX63S-S003X)*
- Manuals for detailed configuration commands:
  - *Software Manual Configuration Command Reference Vol. 1 (AX63S-S004X)*
  - *Software Manual Configuration Command Reference Vol. 2 (AX63S-S005X)*
- Manuals for detailed operation commands:
  - *Software Manual Operation Command Reference Vol. 1 (AX63S-S006X)*
  - *Software Manual Operation Command Reference Vol. 2 (AX63S-S007X)*

NOTE

After setting a configuration, back up the operation information to simplify restoration if a failure occurs or if a management and switching unit is replaced.

For details about backup operations, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

(2) System interoperation test

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

(3) Troubleshooting

See the following manual for corrective actions to problems. (The number in the parentheses is the manual number.

- *Troubleshooting Guide (AX36S-T001)*

NOTE

The *Troubleshooting Guide* is common to the AX2400S, AX3600S, AX6300S, AX6600S, and AX6700S series.

5. Adding and Replacing Optional Modules

This chapter describes how to add and replace a fan unit, power supply unit, management and switching unit, and network interface unit.

5.1 Required tools

The following tools are necessary to add, replace, or remove devices:

No. 1 Phillips screwdriver

Used to install or remove an optional module.

No. 2 Phillips screwdriver

Used to connect or disconnect a DC power cable, and to install or remove a single guide rail.

No. 3 Phillips screwdriver

Used to connect or disconnect a DC power cable.

Antistatic wrist strap

Used to protect the equipment from electrostatic discharge.

5.2 Read prior to operation

⚠WARNING	Adding or replacing optional modules must be performed by a trained technician or maintenance personnel. Adding or replacing a power supply unit requires connecting or disconnecting the power cable. If an untrained person performs the operation and mishandles the power cable, fire or electric shock could result. Also, mishandling other optional modules could result in injury or damage.
⚠CAUTION	Handle an optional module carefully so that you do not drop it. Dropping it could result in injury.
⚠CAUTION	Do not carelessly put your hands inside the Switch. The frame and components might cause injury.
⚠CAUTION	The components in a management and switching unit and a network interface unit might be very hot. Do not touch any components with your hands. Doing so could result in burns.
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.
CAUTION	Do not touch any components or soldered surfaces of an optional module with your hands. Also, when storing it, use an antistatic bag.

5.3 Replacing a fan unit

A fan unit can be replaced while the Switch is on.

⚠WARNING	Replacing a fan unit must be performed by a trained technician or maintenance personnel. If another person performs the above and mishandles the fan unit, injury or damage could result.

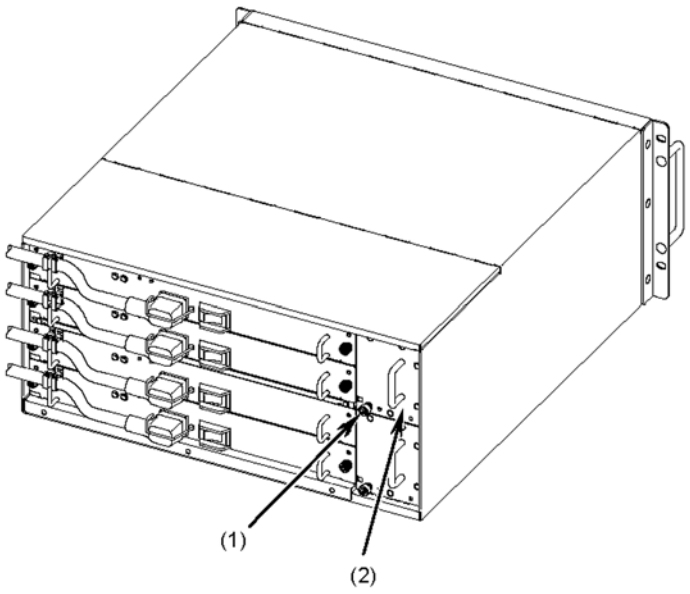
CAUTION	When replacing a fan unit with the Switch on, you must remove and replace the unit within one minute. If the operation takes longer than one minute, the temperature inside the Switch will rise and possibly cause a failure.

(1) Removing a fan unit

Step 1

Loosen the screws of the fan unit.

Figure 5-1 Removing a fan unit (1)



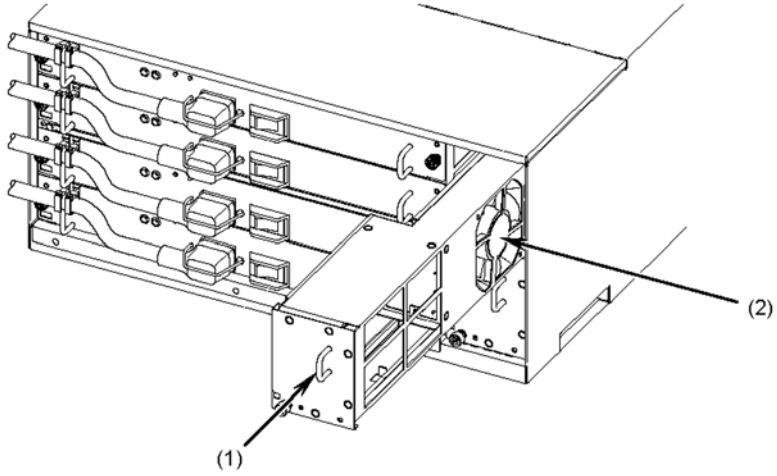
(1) Screws

(2) Fan unit

Step 2

Hold the handle of the fan unit and pull it a little way toward you, and then wait for the fan to stop.

Figure 5-2 Removing a fan unit (2)



(1) Handle

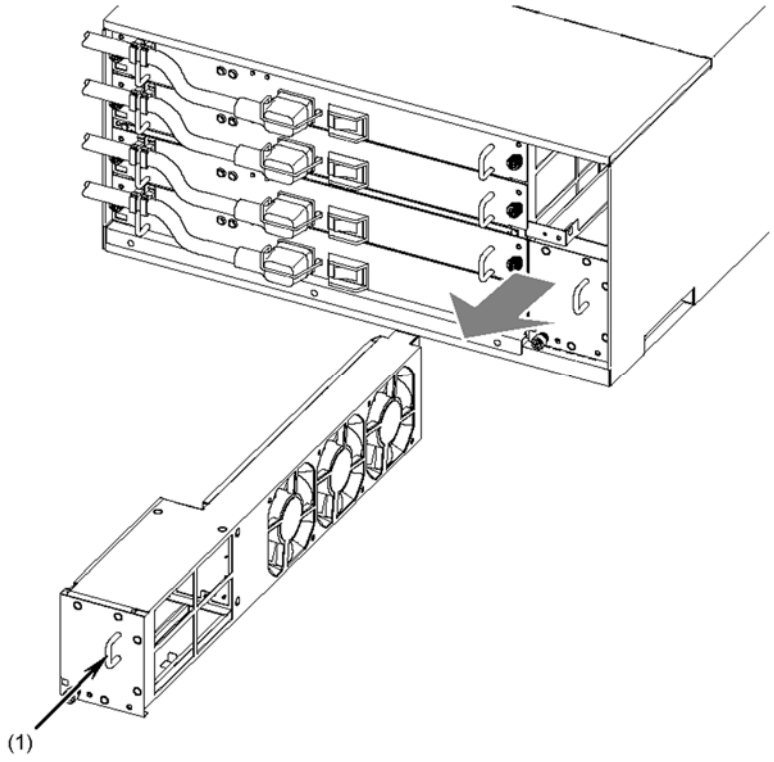
(2) Fan

⚠CAUTION	Immediately after you have moved the fan unit, the fan might be still rotating. While the fan blades are rotating, do no place your hands near them. Doing so might result in injury.

Step 3

When the fan stops, remove the fan unit (remove it by holding the handle and supporting the bottom of the fan unit).

Figure 5-3 Removing a fan unit (3)



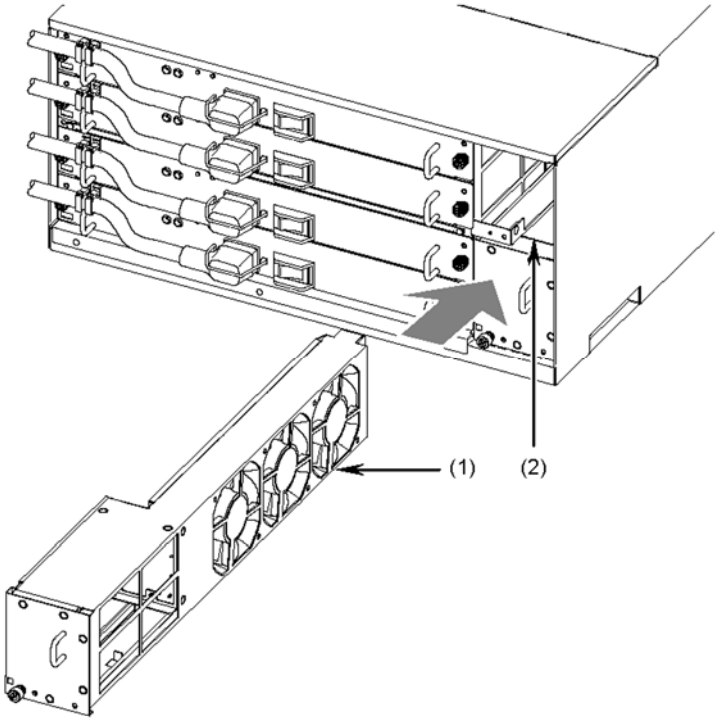
(1) Handle

(2) Installing a fan unit

Step 1

Insert a fan unit in a fan unit slot.

Figure 5-4 Installing a fan unit (1)



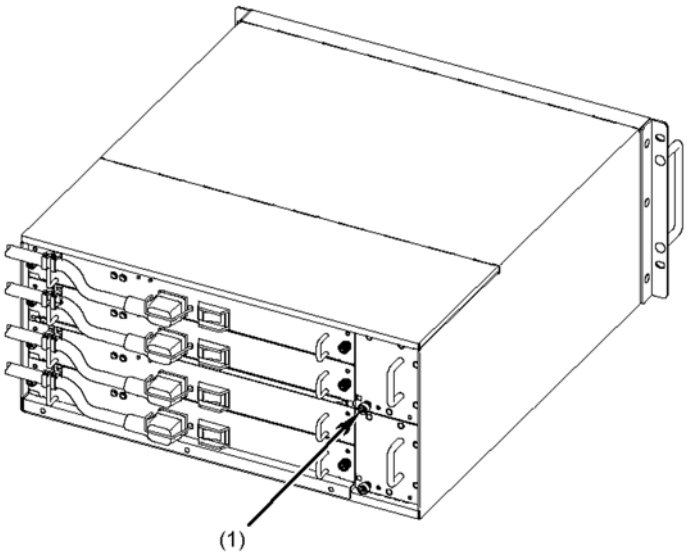
(1) Fan unit

(2) Fan unit slot

Step 2

Push the fan unit in as far as it will go, and then tighten the fan unit screw.

Figure 5-5 Installing a fan unit (2)



(1) Screws

NOTE

Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

5.4 Adding or replacing a power supply unit

A power supply unit can be added while the Switch is on.

If the power supply is redundant, a power supply unit can be replaced while the Switch is on.

⚠WARNING

Replacing a power supply unit must be performed by a trained technician or maintenance personnel. Adding or replacing a power supply unit requires connecting or disconnecting the power cable.

If another person performs the above and mishandles the power supply unit, fire or electric shock could result.

NOTE

Power supply units come in an AC model and a DC model.

Do not install both an AC power supply unit and DC power supply unit on a single Switch.

If you install both units, they will not operate properly.

When replacing different types of power supply units, such as replacing an AC power supply unit with a DC power supply unit, turn off the Switch first.

NOTE

When adding a power supply unit, remove the blank panel. Make sure you keep the blank panel you remove.

5.4.1 Adding or replacing an AC power supply unit

(1) Removing an AC power supply unit

NOTE

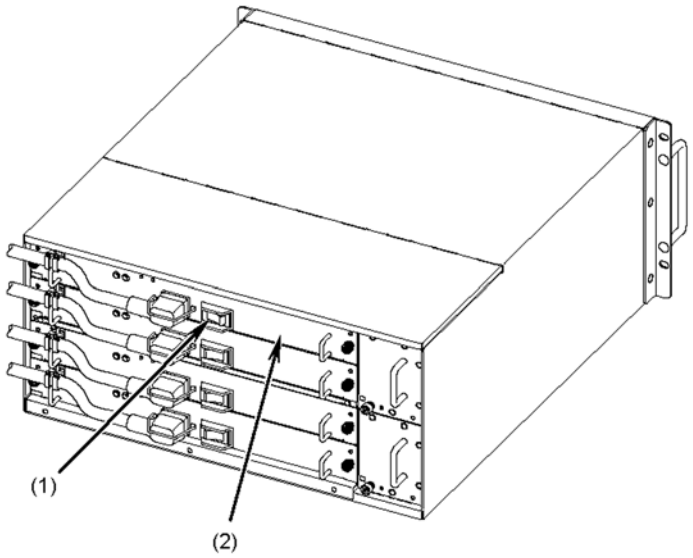
If the power supply is redundant, an AC power supply unit can be removed while the Switch is on.

If the power supply is not redundant, turn off the Switch before removing the DC power supply unit.

Step 1

Set the power switch of the power supply unit you are replacing to OFF.

Figure 5-6 Turning off the power



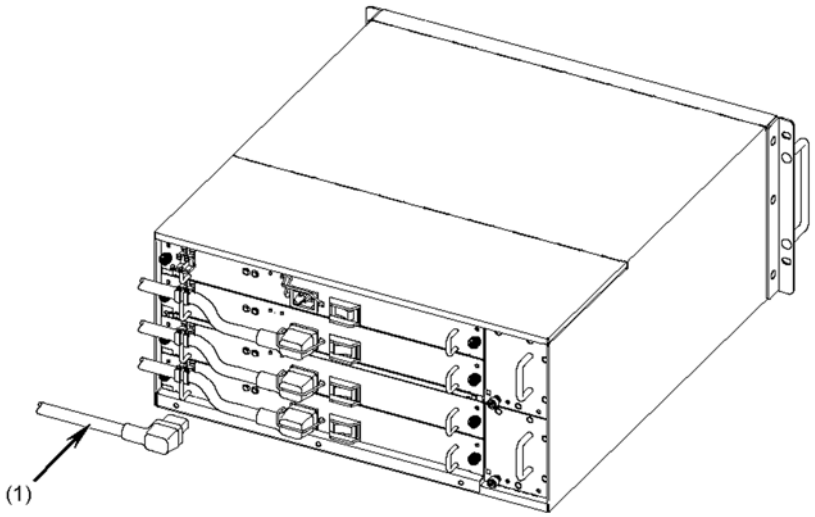
(1) Power switch

(2) Power supply unit

Step 2

Disconnect the power cable from the power supply unit you are replacing. (For details about how to disconnect the power cable, see *4.6 Connecting and disconnecting the power cable.*)

Figure 5-7 Disconnecting the power cable



(1) Power cable

⚠WARNING

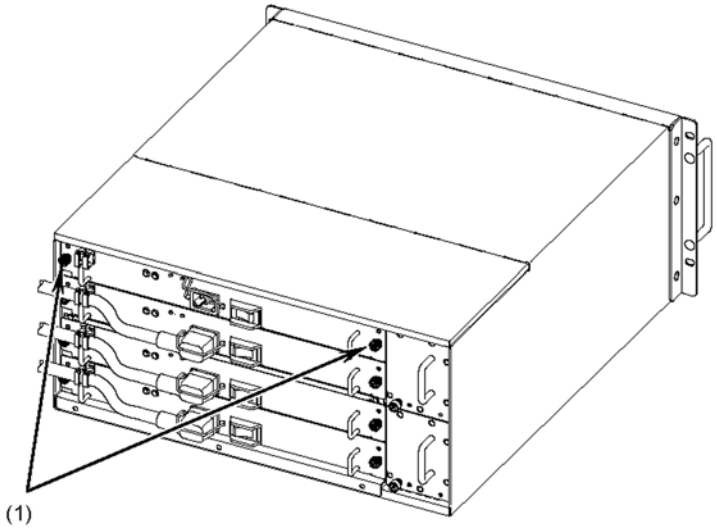
When adding or replacing a power supply unit, disconnect the power cable from the power supply unit that will be replaced.

If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. For this reason, adding or replacing a power supply unit with the power cable connected could result in fire or electric shock.

Step 3

Loosen the screws of the power supply unit.

Figure 5-8 Removing a power supply unit (1)

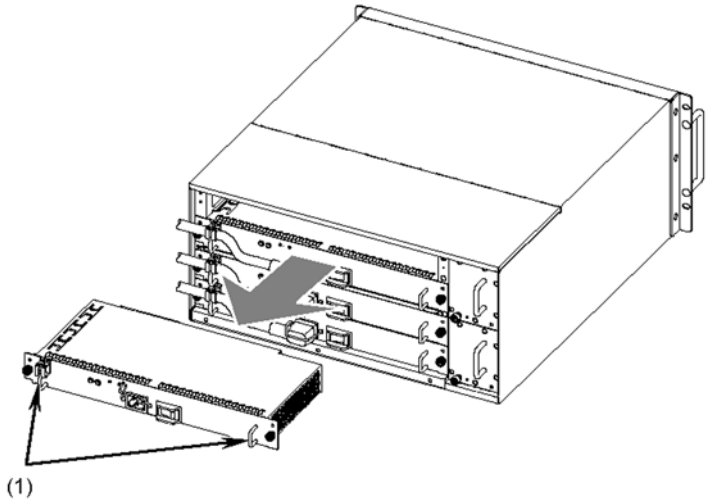


(1) Screws

Step 4

Remove the power supply unit. (Pull the unit a little way toward you while holding the handles and supporting the bottom of the unit.)

Figure 5-9 Removing a power supply unit (2)



(1) Handles

CAUTION

When removing a power supply unit, install a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure.

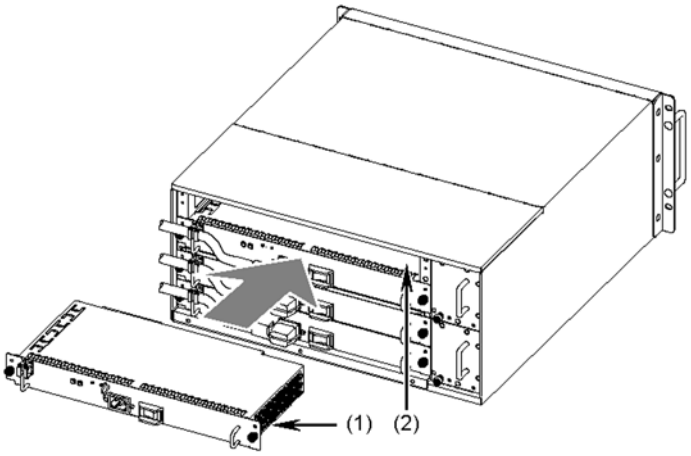
In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

(2) Installing a power supply unit

Step 1

Install a power supply unit in a power supply unit slot.

Figure 5-10 Installing a power supply unit (1)



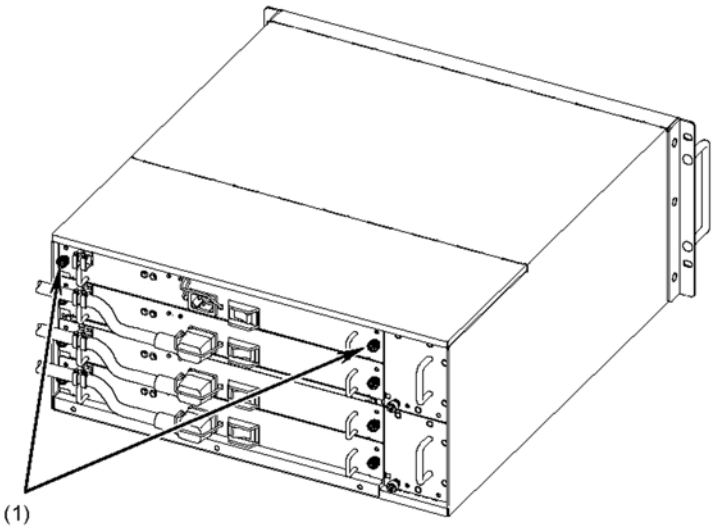
(1) Power supply unit

(2) Power supply unit slot

Step 2

Push the power supply unit in as far as it will go, and then tighten the power supply unit screws.

Figure 5-11 Installing a power supply unit (2)



(1) Screws

NOTE

Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

Step 3

Connect a power cable to the power supply unit. (For details about how to connect a power cable, see *4.6 Connecting and disconnecting the power cable*.)

5.4.2 Adding or replacing a DC power supply unit

(1) Removing a DC power supply unit

NOTE

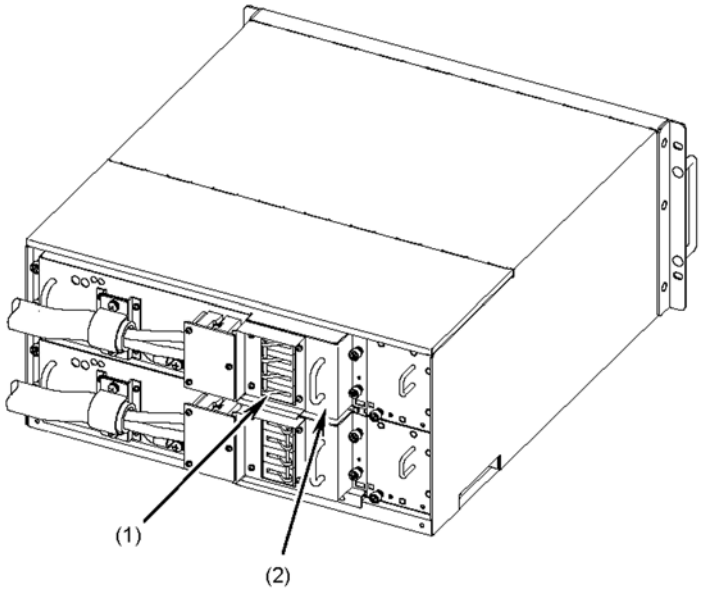
If the power supply is redundant, a DC power supply unit can be removed while the Switch is on.

If the power supply is not redundant, turn off the Switch before removing the DC power supply unit.

Step 1

Set the circuit breaker of the power supply unit you are replacing to OFF.

Figure 5-12 Turning off the power



(1) Circuit breaker

(2) Power supply unit

Step 2

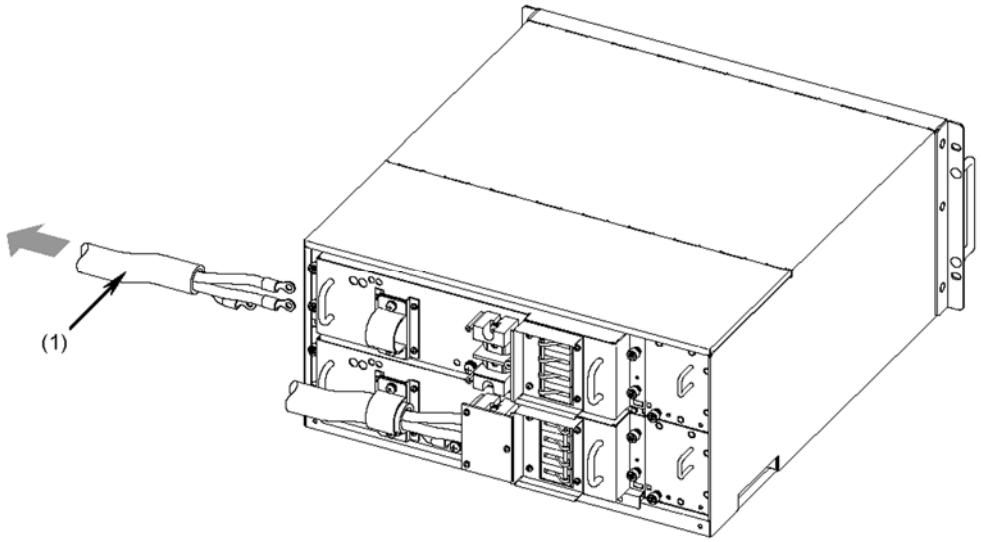
Set the circuit breaker of the power supply facility to OFF to turn off the power.

⚠WARNING	The circuit breaker of the power supply facility must be set to OFF. Adding or replacing a DC power supply unit with the circuit breaker set to ON could result in fire or electric shock.

Step 3

Disconnect the power cable from the power supply unit you are replacing. (For details about how to disconnect the power cable, see *4.6 Connecting and disconnecting the power cable.*)

Figure 5-13 Disconnecting the power cable

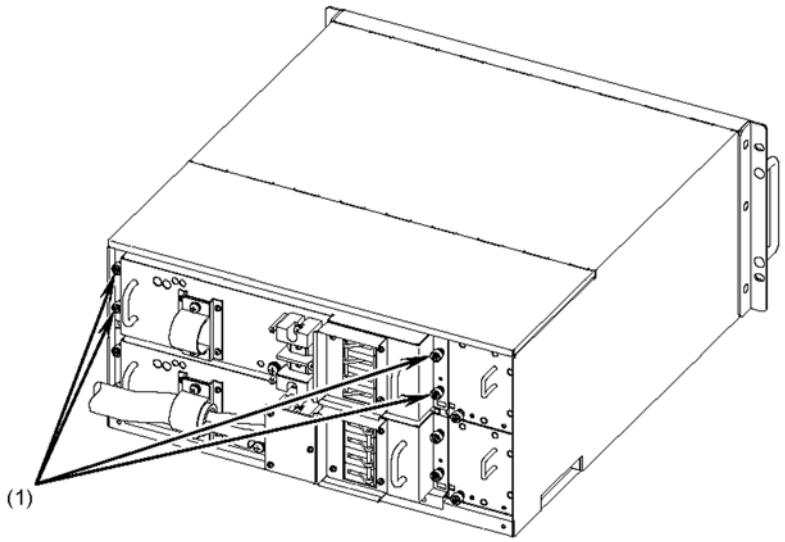


(1) Power cable

Step 4

Loosen the screws of the power supply unit.

Figure 5-14 Removing a power supply unit (1)

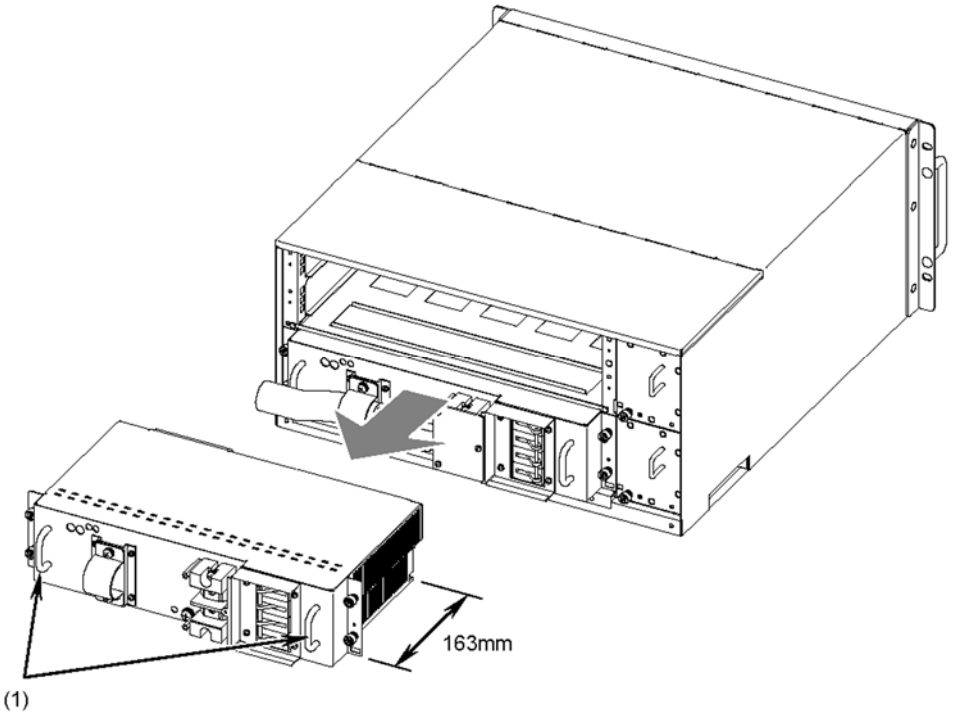


(1) Screws

Step 5

Remove the power supply unit. (Pull the unit a little way toward you while holding the handles and supporting the bottom of the unit.)

Figure 5-15 Removing a power supply unit (2)



(1) Handles

⚠WARNING	The weight of a DC power supply unit is 5.6 kg and the front-to-back measurement is 163 mm. When removing a DC power supply unit from a Switch, support the DC power supply unit itself. If you pull the unit carelessly, it might fall, possibly resulting in injury.

CAUTION	When removing a power supply unit, install a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure. In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

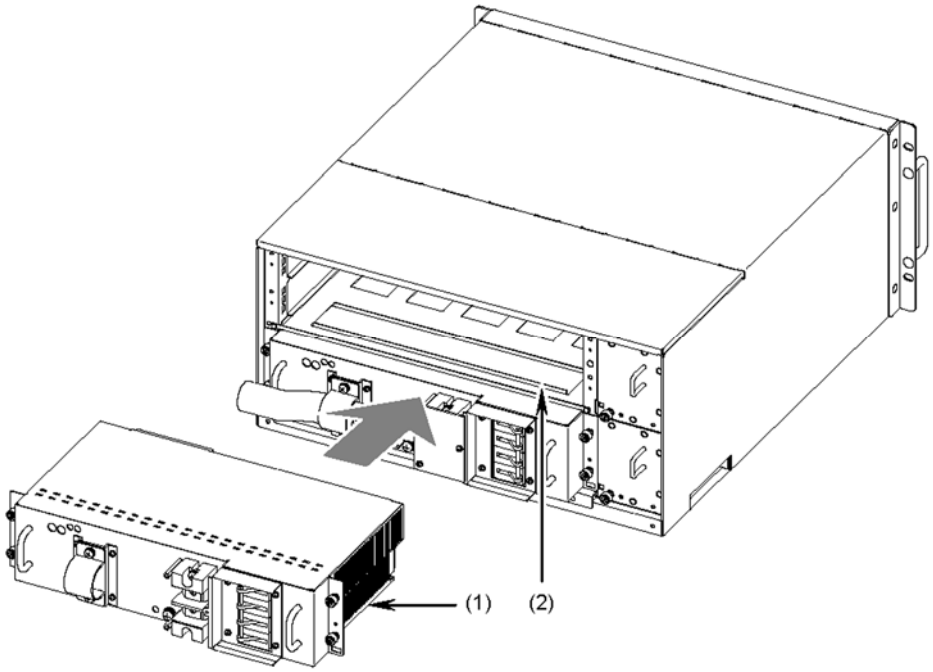
NOTE	Make sure you reattach the screws and cover you removed from the power supply unit to the power supply unit after you have replaced it.

(2) Installing a power supply unit

Step 1

Install a power supply unit in a power supply unit slot.

Figure 5-16 Installing a power supply unit (1)



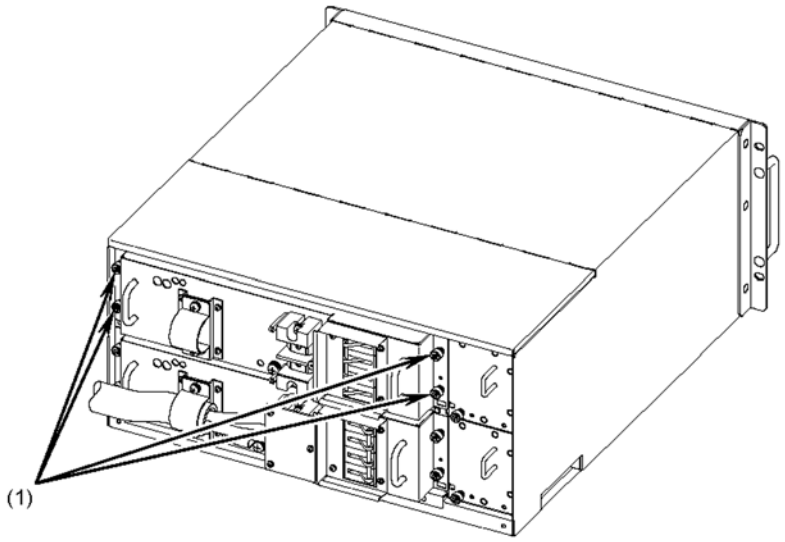
(1) Power supply unit

(2) Power supply unit slot

Step 2

Push the power supply unit in as far as it will go, and then tighten the power supply unit screws.

Figure 5-17 Installing a power supply unit (2)



(1) Screws

NOTE

Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

Step 3

Connect a power cable to the power supply unit. (For details about how to connect a power cable, see *4.6 Connecting and disconnecting the power cable.*)

⚠WARNING	Make sure the circuit breaker of the power supply facility is set to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker of the power supply facility set to ON could result in fire or electric shock.

⚠WARNING	After connecting the DC power cable, attach the terminal board cover. Using the power supply unit without the cover could result in electric shock.

5.5 Adding or replacing a management and switching unit

⚠WARNING

Adding or replacing a management and switching unit must be performed by a trained technician or maintenance personnel.
If another person performs the above and mishandles the management and switching unit, injury or damage could result.

NOTE

When adding a network interface unit, remove the blank panel. Make sure you keep the blank panel you remove.

(1) Removing a management and switching unit

A management and switching unit can be removed while the Switch is on.

Note, however, that the procedure varies depending on whether the Switch is on or off.

Remove the unit while referring to the following figure.

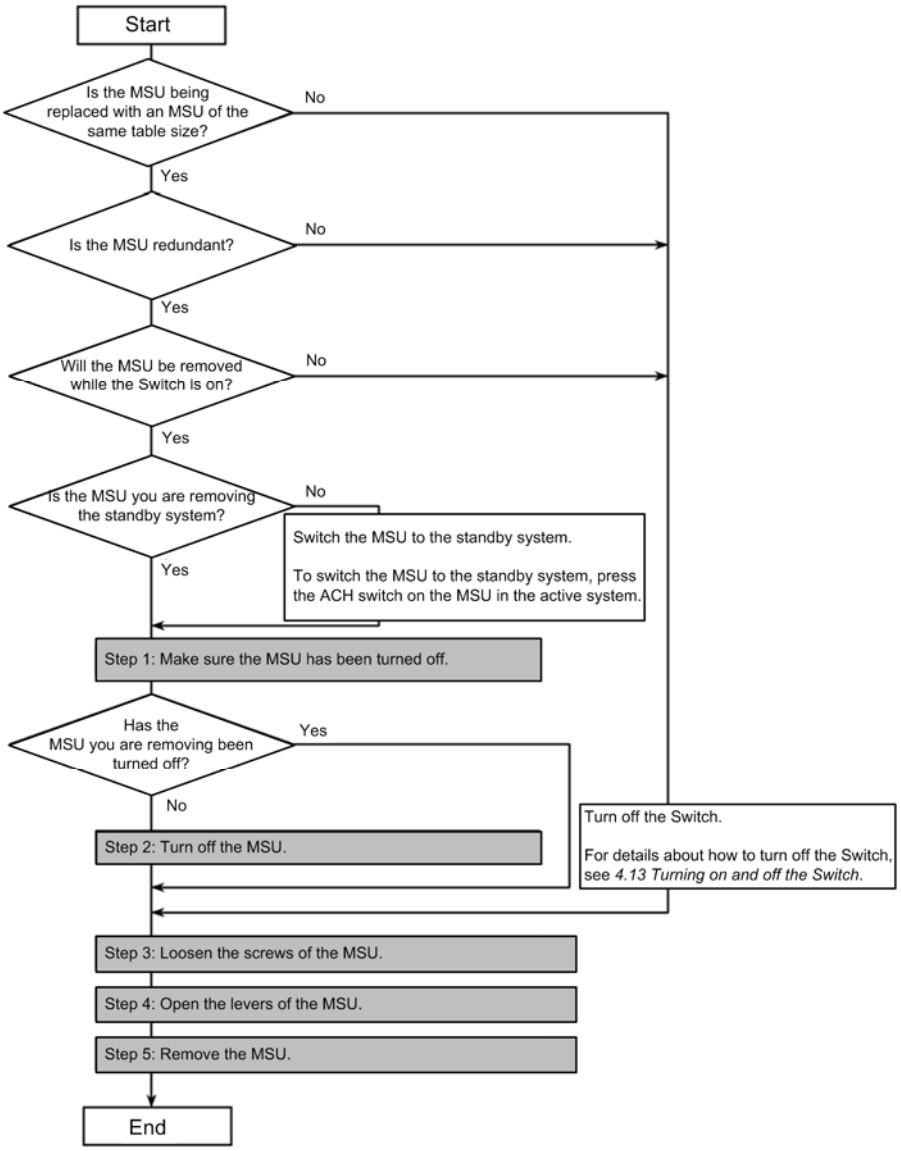
NOTE

Management and switching units of different table sizes, such as the MSU-1A and the MSU-1B, cannot be replaced while the Switch is on. You must turn off the Switch before replacing these units.

NOTE

For details about steps 1 to 5 in the figure, see the description of the steps that follow *Figure 5-18 Overview of removing a management and switching unit*.

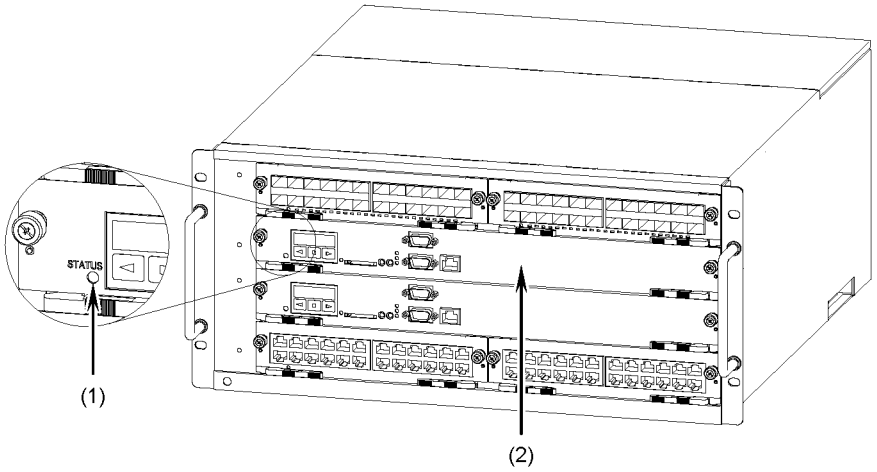
Figure 5-18 Overview of removing a management and switching unit



Step 1

Make sure the management and switching unit you are removing has been turned off (when the STATUS LED is on, the unit is turned on; when it is off, the unit is off).

Figure 5-19 Checking the STATUS LED



(1) STATUS LED

(2) Management and switching unit

Step 2

Turn off the management and switching unit if the power is being supplied (execute the Inactivate operation).

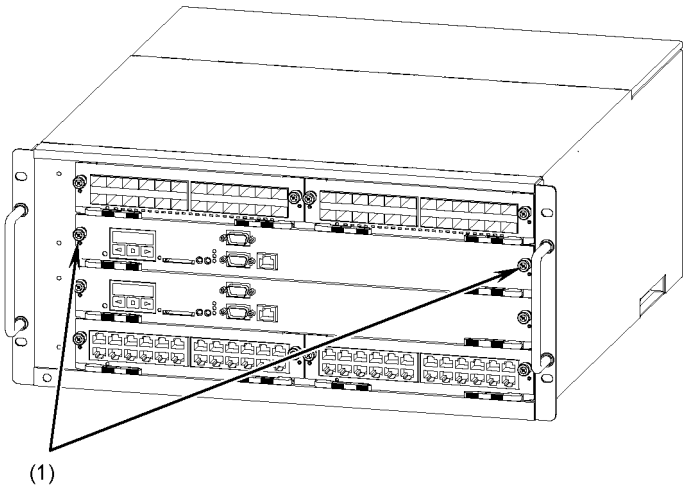
NOTE

For details about the Inactivate operation, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

Step 3

Loosen the screws of the management and switching unit.

Figure 5-20 Removing a management and switching unit (1)



(1) Screws

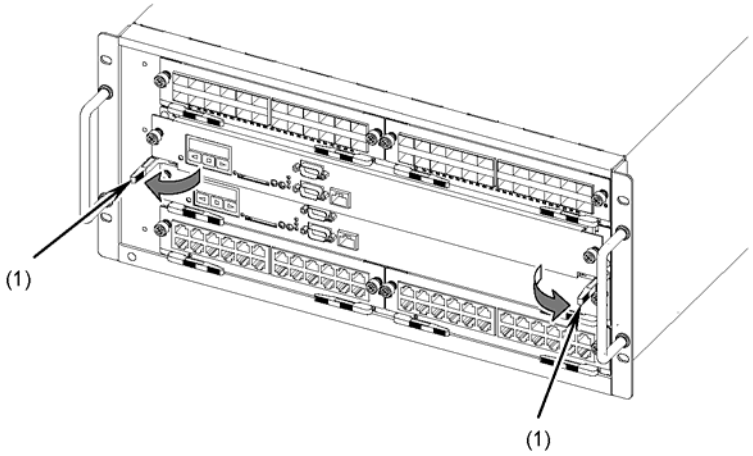
CAUTION

Loosen the screws completely. If the screws are not loose enough, the management and switching unit might be damaged when the levers are opened.

Step 4

Open the right and left levers of the management and switching unit at the same time (the unit comes out toward you about 15 mm).

Figure 5-21 Removing a management and switching unit (2)



(1) Lever

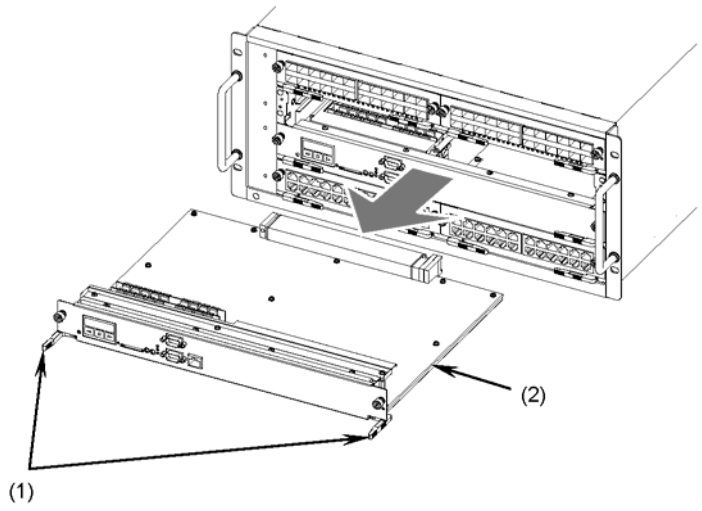
NOTE

Use the levers so that the connectors on the optional module and the Switch can be disengaged correctly. When moving a lever, move the right and left levers slowly and at the same time without exerting excessive force.

Step 5

Remove the management and switching unit. (Use the levers to remove the unit partway, and then hold the sides to remove the unit the rest of the way.)

Figure 5-22 Removing a management and switching unit (3)



(1) Lever

(2) Side

⚠CAUTION	Components in a management and switching unit might be very hot. Do not touch any components with your hands. Doing so could result in burns.

CAUTION	When removing a management and switching unit, install a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure. In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

(2) Installing a management and switching unit

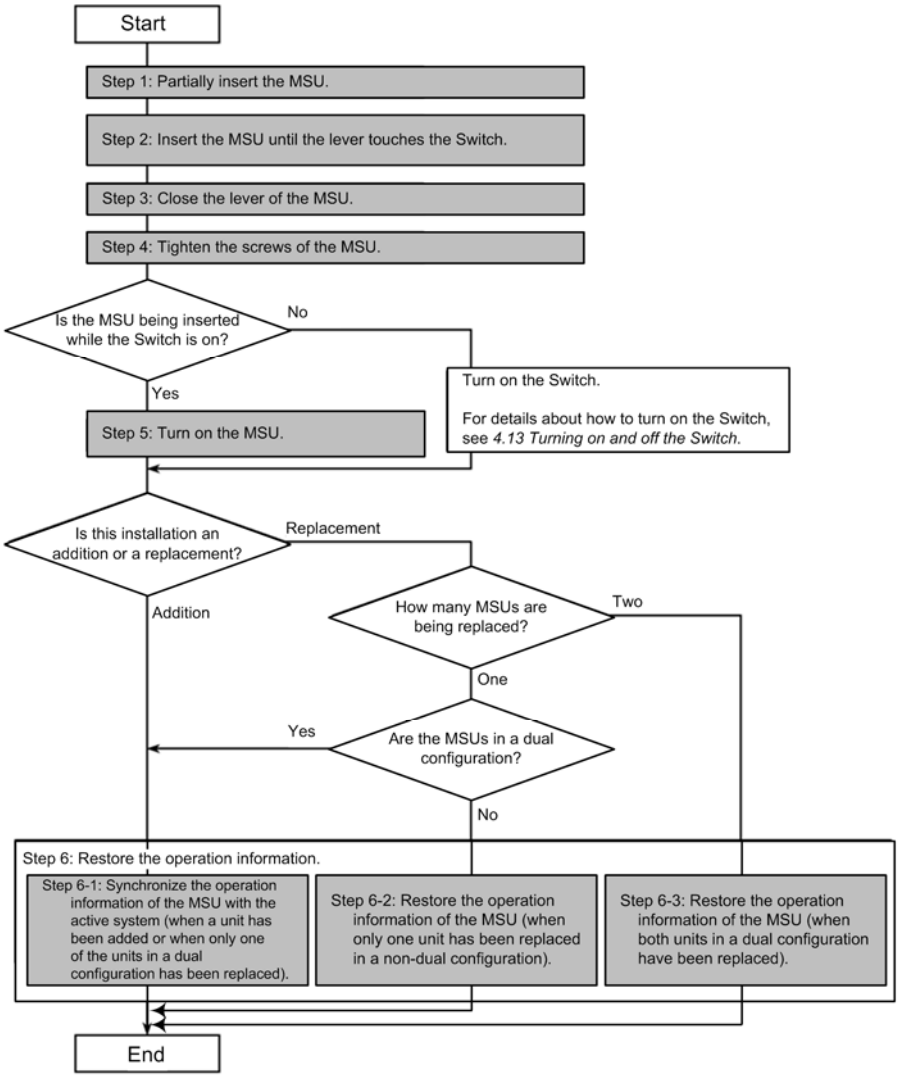
A management and switching unit can be installed while the Switch is on.

Note, however, that the procedure varies depending on whether the Switch is on or off.

In addition, the procedure also varies according to the installation conditions. Install the unit while referring to the following figure.

NOTE	For details about steps 1 to 6 in the figure, see the description of the steps that follow *Figure 5-23 Installation overview*.

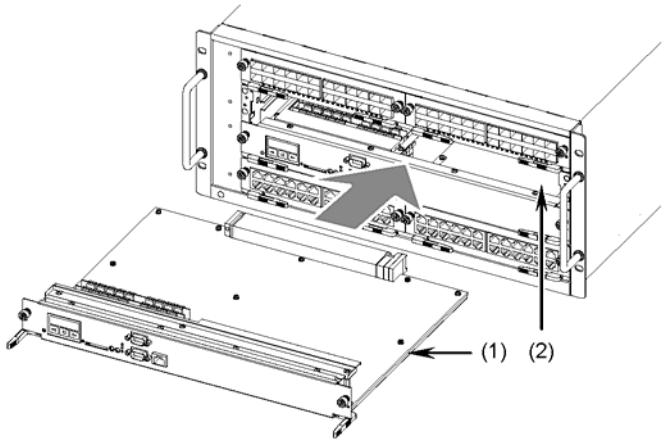
Figure 5-23 Installation overview



Step 1

Insert a management and switching unit halfway into the slot for it. (Do this while holding the sides of the unit.)

Figure 5-24 Installing a management and switching unit (1)



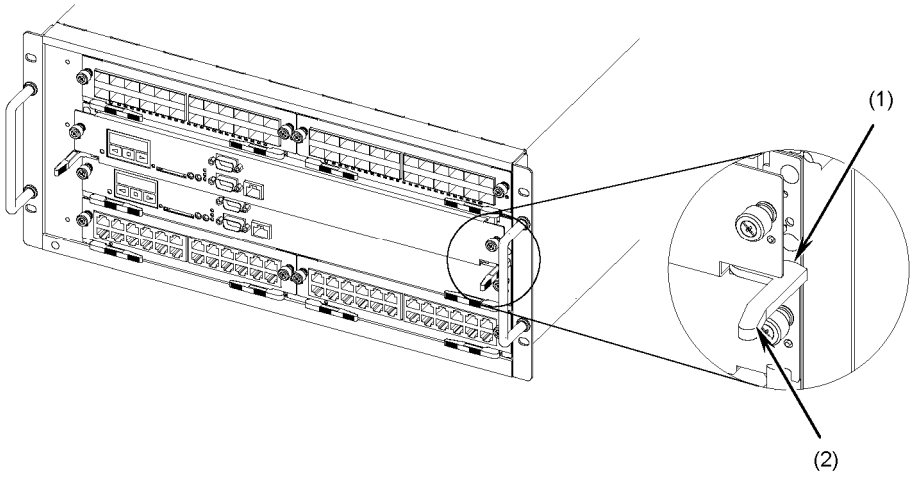
(1) Management and switching unit

(2) Management and switching unit slot

Step 2

While holding the levers, push the unit carefully until the levers touch the Switch. The levers must be opened parallel to the direction of insertion.

Figure 5-25 Installing a management and switching unit (2)



(1) Contact point

(2) Lever

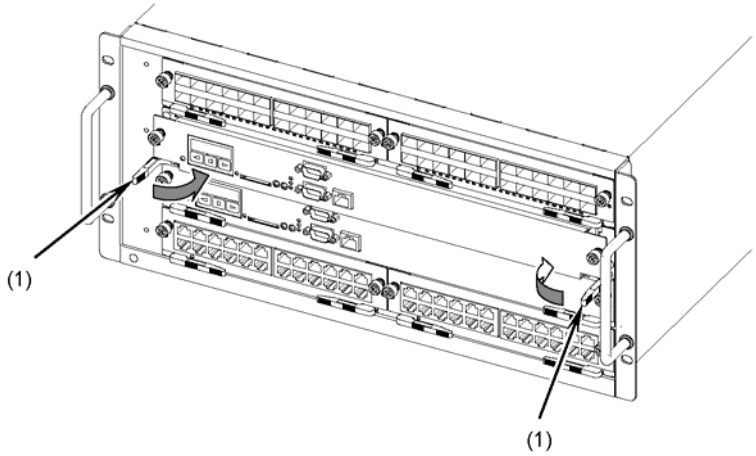
CAUTION	While holding the levers, push the management and switching unit carefully until the levers touch the Switch. Failure to do this could result in a Switch malfunction or fault.

CAUTION	When you install a management and switching unit, open the levers as shown in the figure. If the levers are closed or opened too much, they might be damaged when you install the unit.

Step 3

Close the levers of the management and switching unit. (The unit is inserted completely.)

Figure 5-26 Installing a management and switching unit (3)



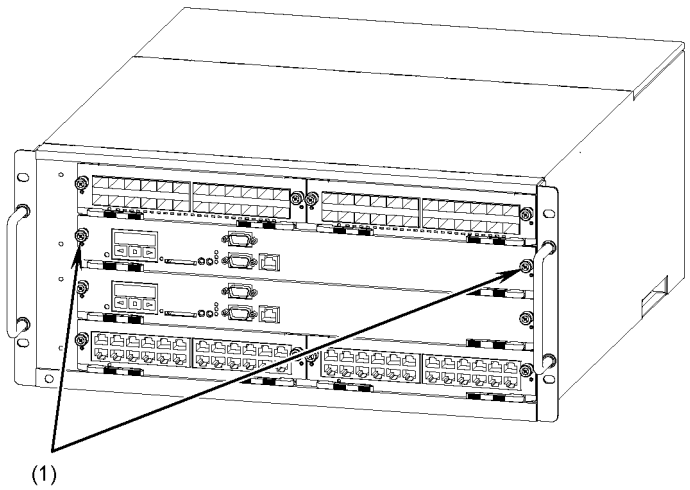
(1) Lever

CAUTION	
	Use the levers so that the connectors on the optional module and the Switch will be engaged correctly. When moving the levers, move them slowly (one second or longer) without exerting any force. Failure to do this could result in a Switch malfunction or fault.

Step 4

Tighten the screws of the management and switching unit.

Figure 5-27 Installing a management and switching unit (4)



(1) Screws

NOTE

Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

Step 5

Turn on the management and switching unit. (Execute the Activate operation.)

NOTE

For details about the Activate operation, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

NOTE

Executing the Activate operation starts loading of the software. If the following conditions exist, the SYSTEM1 LED of the management and switching unit lights in orange when the software has been loaded.

- When the software is version 11.0 or later
- When the license keys of the active system and the standby system do not match (when an optional license is set in a dual configuration)

When the operation information is restored by the following step, the SYSTEM1 LED turns off.

Step 6

Restore the operation information. The restoration procedure varies according to the case. Perform the appropriate procedure.

6-1 Synchronize the operation information of the management and switching unit with the active system (when a unit has been added or when only one of the units in a dual configuration has been replaced).

1. Match the software version with the version used in the active system (use the `ppupdate` command).
2. Synchronize the configuration, user account, password, license key, and other settings with the settings used in the active system (use the `synchronize` command).
3. When an optional license has been installed, restart the management and switching unit of the standby system in order to reflect the license key information (use the `reload` command).

6-2 Restore the operation information of the management and switching unit (when only one unit has been replaced in a non-dual configuration).

1. Restore the operation information from the file you have backed up (use the `restore` command). To do this, use the backup file stored on a memory card or an FTP server.

6-3 Restore the operation information of the management and switching unit (when both units in a dual configuration have been replaced).

1. Turn off the management and switching unit in the standby system so that the system is not switched during restoration of the operation information (execute the `Inactivate` operation).
2. Restore the operation information from the file you have backed up (use the `restore` command). To do this, use the backup file stored on a memory card or an FTP server.
3. Turn on the management and switching unit in the standby system (execute

the `Activate` operation).

4. Match the software version used in the standby system with the version used in the active system (use the `ppupdate` command).
5. Synchronize the configuration, user account, password, and license key settings of the standby system with the settings of the active system (use the `synchronize` command).
6. When an optional license has been installed, restart the management and switching unit of the standby system in order to reflect the license key information (use the `reload` command).

NOTE

For details about the Activate and Inactivate operations, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

NOTE

For details about the commands to use, see the following manuals:

`restore` command: *9. Checking the Software Version and Switch Status* in the *Software Manual Operation Command Reference Vol. 1*

`ppupdate` command: *13. Software update* in the *Software Manual Operation Command Reference Vol. 1*

`synchronize` command: *29. Making Devices Redundant* in the *Software Manual Operation Command Reference Vol. 1*

`reload` command: *9. Checking the Software Version and Switch Status* in the *Software Manual Operation Command Reference Vol. 1*

5.6 Adding or replacing a network interface unit

⚠WARNING

Adding or replacing a network interface unit must be performed by a trained technician or maintenance personnel.

If another person performs the above and mishandles the network interface unit, injury or damage could result.

NOTE

When adding a network interface unit, remove the blank panel. Make sure you keep the blank panel you remove.

5.6.1 Single-size network interface unit

(1) Removing a single-size network interface unit

A network interface unit can be removed while the Switch is on.

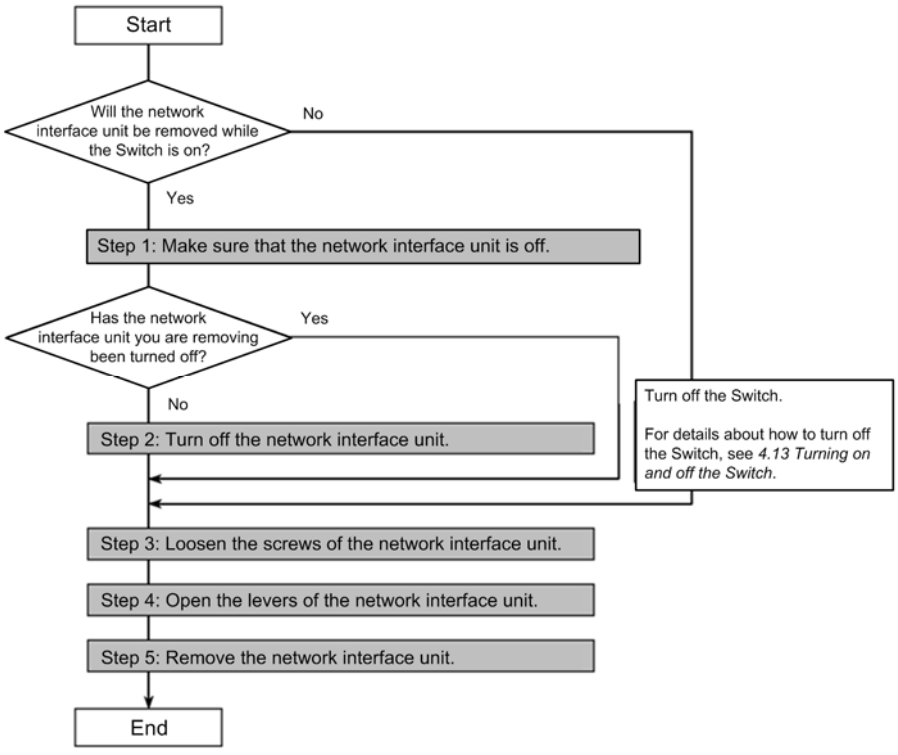
Note, however, that the procedure varies depending on whether the Switch is on or off.

Remove the unit while referring to the following figure.

NOTE

For details about steps 1 to 5 in the figure, see the description of the steps that follow *Figure 5-28 Overview of removing a network interface unit*.

Figure 5-28 Overview of removing a network interface unit

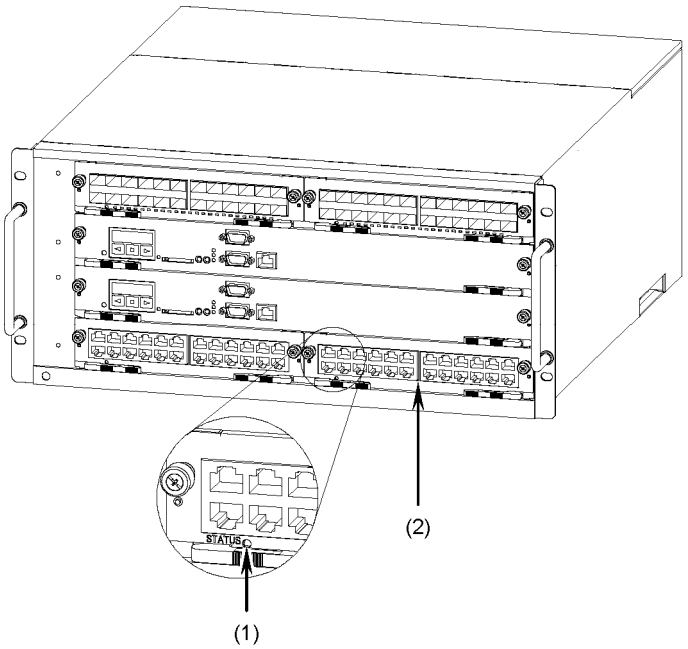


Step 1

Make sure the network interface unit you are removing has been turned off (when

the STATUS LED is on, the unit is on; when it is off, the unit is off).

Figure 5-29 Checking the STATUS LED



(1) STATUS LED

(2) Network interface unit

Step 2

Turn off the network interface unit if power is being supplied (execute the Inactivate operation).

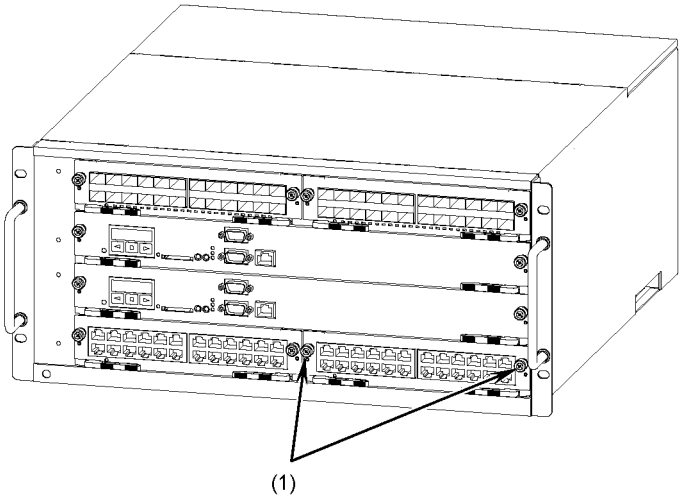
NOTE

For details about the Inactivate operation, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

Step 3

Loosen the screws of the network interface unit.

Figure 5-30 Removing a network interface unit (1)



(1) Screws

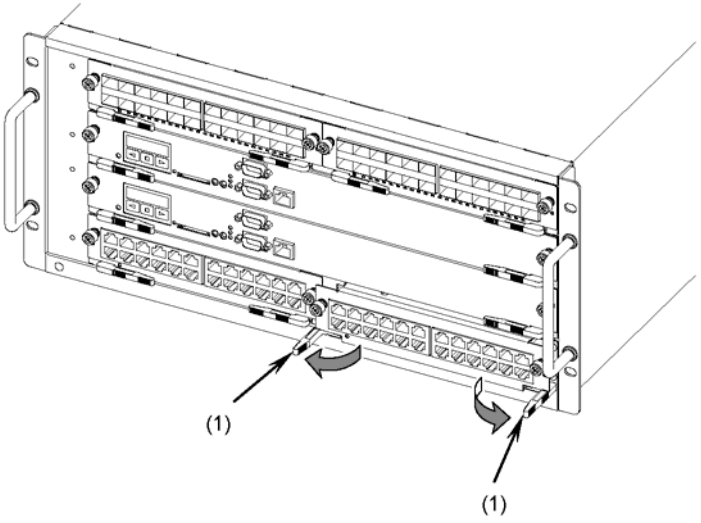
CAUTION

Loosen the screws completely. If the screws are not loose enough, the network interface unit might be damaged when the levers are opened.

Step 4

Open the right and left levers of the network interface unit at the same time (the unit comes out toward you about 15 mm).

Figure 5-31 Removing a network interface unit (2)



(1) Lever

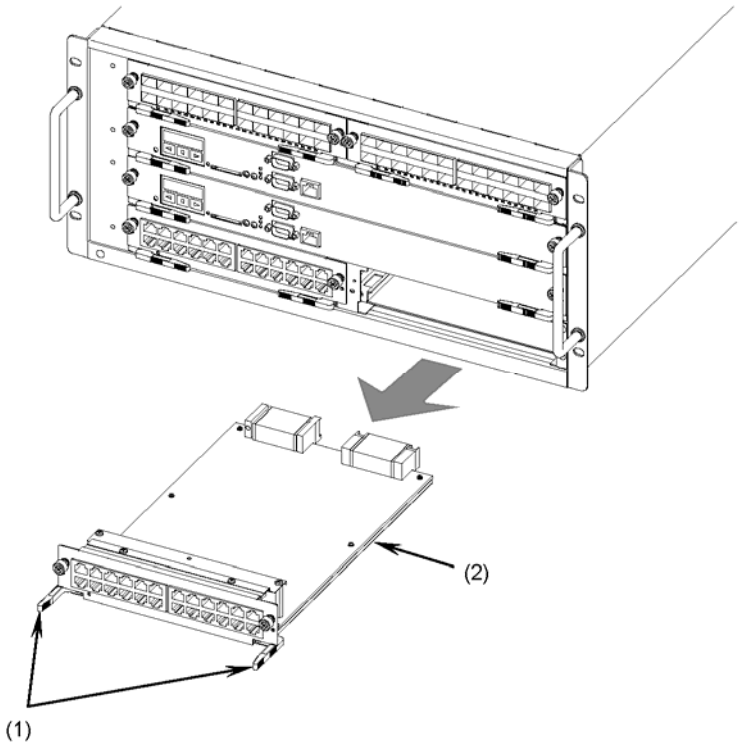
NOTE

Use the levers so that the connectors on the optional module and the Switch can be disengaged correctly. When moving a lever, move the right and left levers slowly and at the same time without exerting excessive force.

Step 5

Remove the network interface unit. (Pull the unit a little way toward you while holding the levers and supporting the sides.)

Figure 5-32 Removing a network interface unit (3)



(1) Lever

(2) Side

⚠CAUTION	The components in a network interface unit might be very hot. Do not touch any components with your hands. Doing so could result in burns.

CAUTION	When removing a network interface unit, install a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure. In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

(2) Installing a network interface unit

A network interface unit can be installed while the Switch is on.

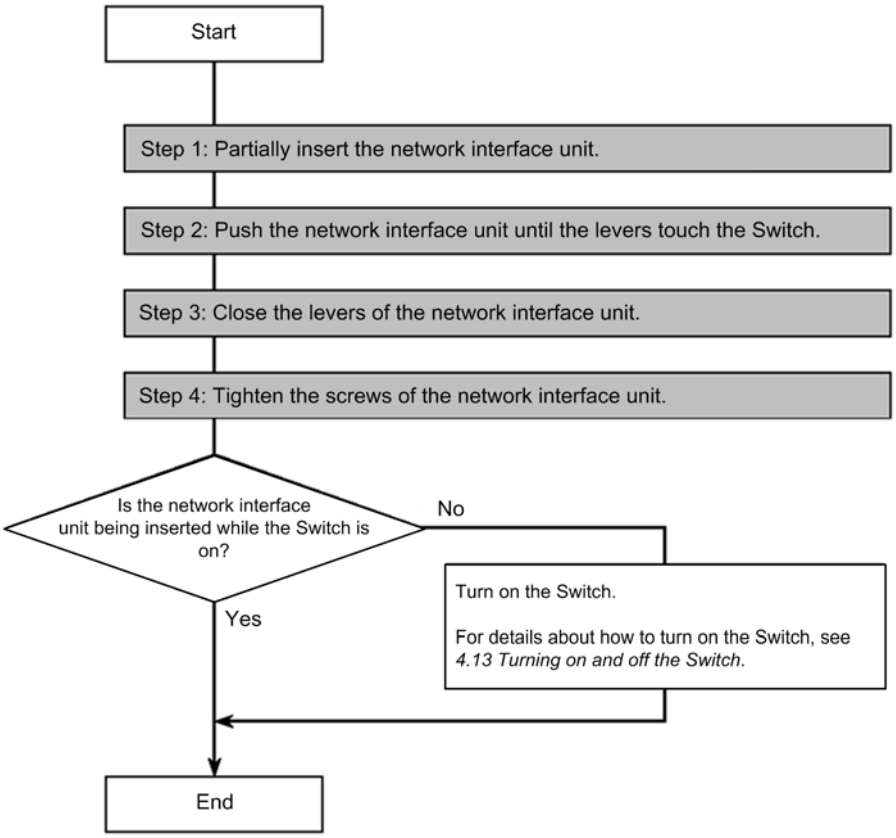
Note, however, that the procedure varies depending on whether the Switch is on or off.

Remove the unit while referring to the following figure.

NOTE

For details about steps 1 to 5 in the figure, see the description of the steps that follow *Figure 5-33 Installation overview*.

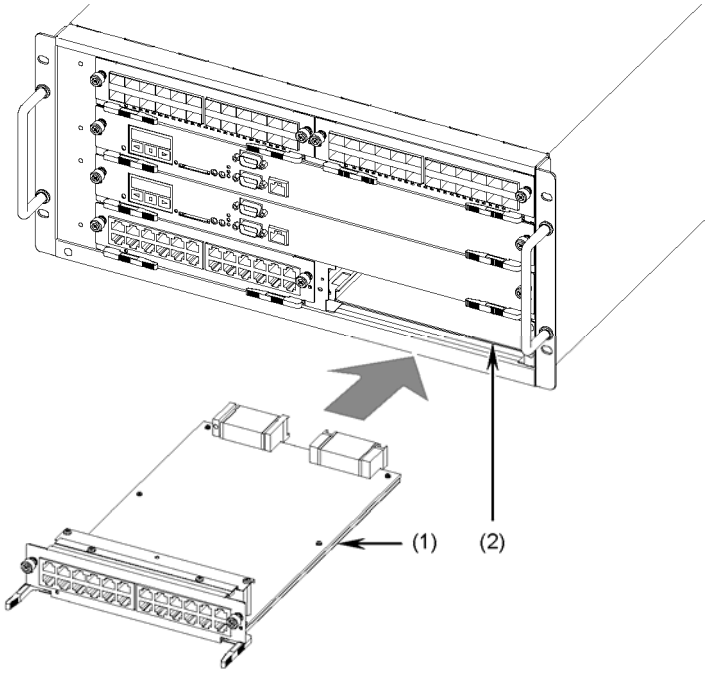
Figure 5-33 Installation overview



Step 1

Insert a network interface unit halfway into the slot for it. (Do this while holding the sides of the unit.)

Figure 5-34 Installing a network interface unit (1)



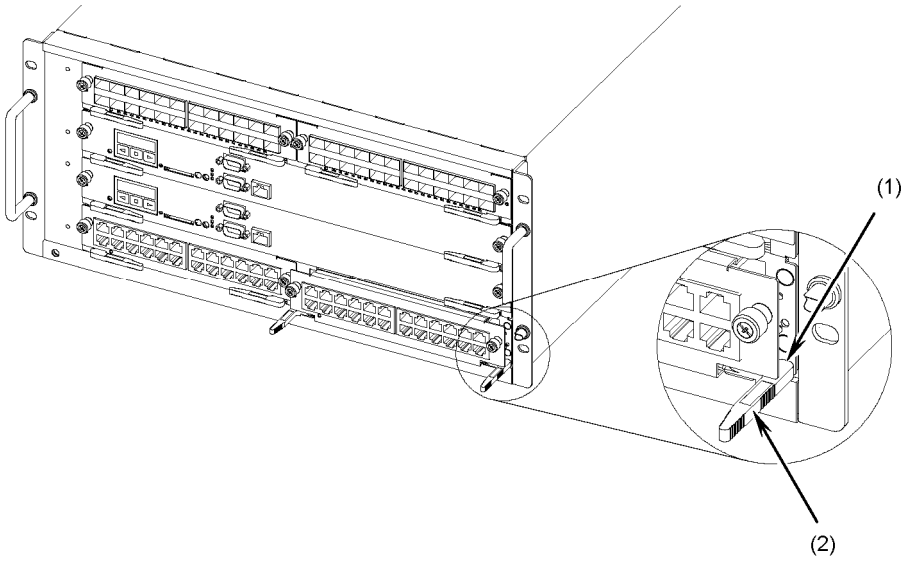
(1) Network interface unit

(2) Network interface unit slot

Step 2

While holding the levers, push the unit carefully until the levers touch the Switch. The levers must be opened parallel to the direction of insertion.

Figure 5-35 Installing a network interface unit (2)



(1) Contact point

(2) Lever

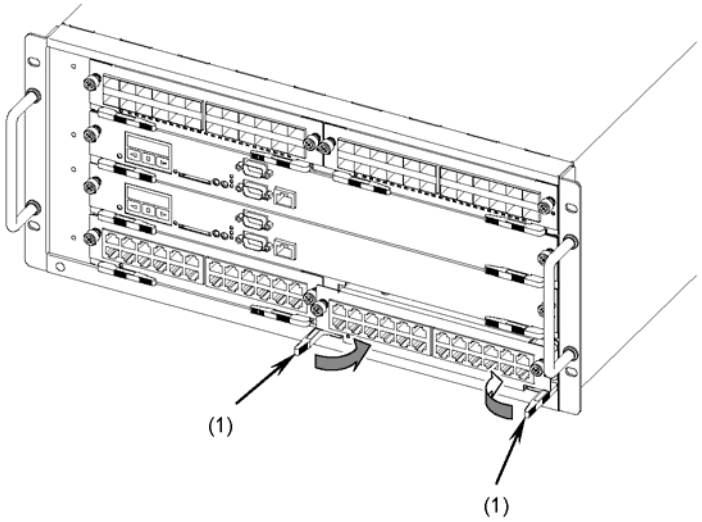
CAUTION	While holding the levers, push the network interface unit carefully until the levers touch the Switch. Failure to do this could result in a Switch malfunction or fault.

CAUTION	Open the levers as shown in the figure when you install a network interface unit. If the levers are closed or opened too much, they might be damaged when you install the unit.

Step 3

Close the levers of the network interface unit. (The unit is inserted completely.)

Figure 5-36 Installing a network interface unit (3)



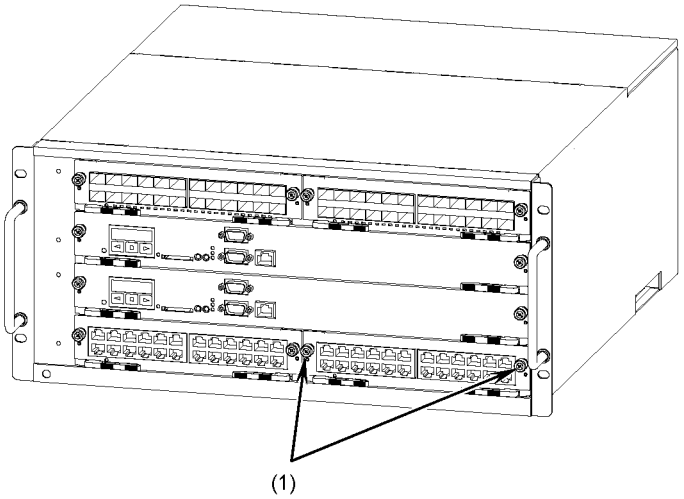
(1) Lever

CAUTION	Use the levers so that the connectors on the optional module and the Switch will be engaged correctly. When moving the levers, move them slowly (one second or longer) without exerting any force. Failure to do this could result in a Switch malfunction or fault.

Step 4

Tighten the screws of the network interface unit.

Figure 5-37 Installing a network interface unit (4)



(1) Screws

NOTE

Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

NOTE

If you install a network interface unit (NIF) while the Switch is on, the NIF is turned on automatically when the NIF is installed.

Note, however, that if no power enable is set in the configuration, the NIF is not turned on automatically. Set power enable, and then turn on the power.

For details about the `power enable` command, see *12. Management of BSU/NIF* in the *Software Manual Configuration Guide Vol. 1*.

5.6.2 Double-size network interface unit

(1) Removing a double-size network interface unit

A network interface unit can be removed while the Switch is on.

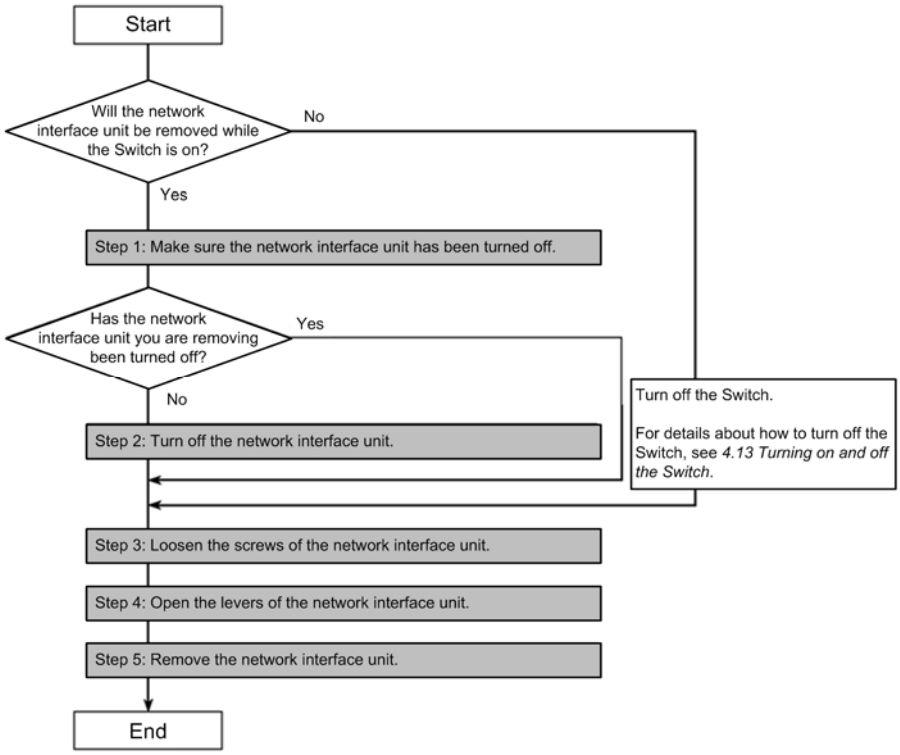
Note, however, that the procedure varies depending on whether the Switch is on or off.

Install the unit while referring to the following figure.

NOTE

For details about steps 1 to 5 in the figure, see the description of the steps that follow *Figure 5-38 Overview of removing a network interface unit*.

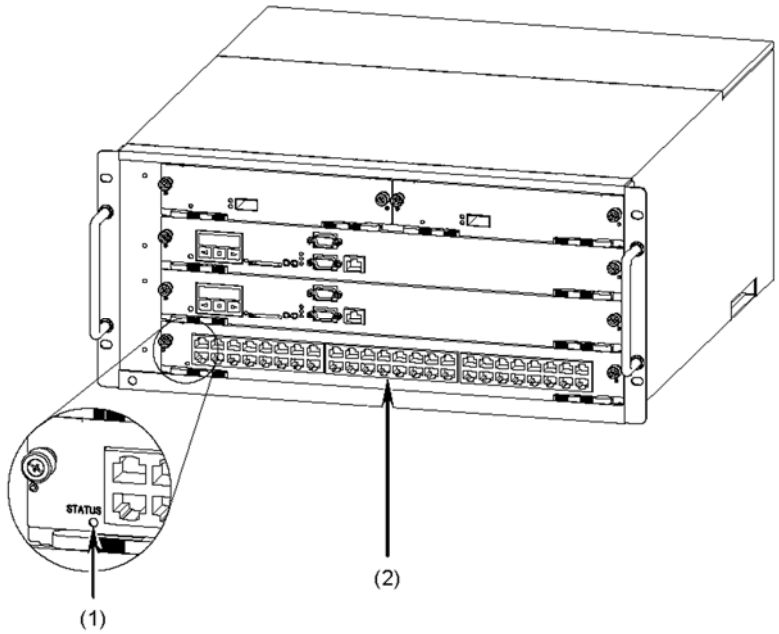
Figure 5-38 Overview of removing a network interface unit



Step 1

Make sure the network interface unit you are removing has been turned off (when the STATUS LED is on, the unit is on; when it is off, the unit is off).

Figure 5-39 Checking the STATUS LED



(1) STATUS LED

(2) Network interface unit

Step 2

Turn off the network interface unit if power is being supplied (execute the Inactivate operation).

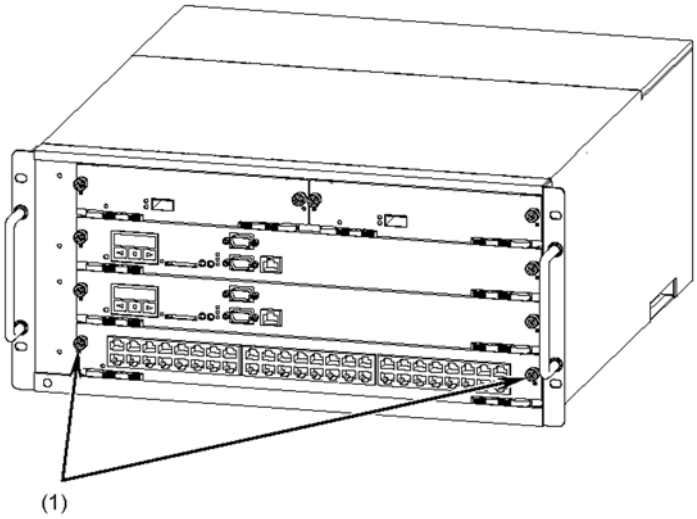
NOTE

For details about the Inactivate operation, see *11 Switch Management* in the *Software Manual Configuration Guide Vol. 1*.

Step 3

Loosen the screws of the network interface unit.

Figure 5-40 Removing a network interface unit (1)



(1) Screws

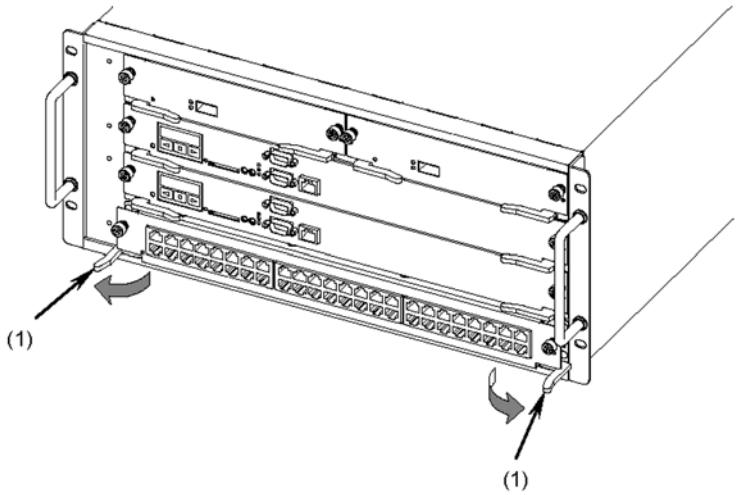
CAUTION

Loosen the screws completely. If the screws are not loose enough, the network interface unit might be damaged when the levers are opened.

Step 4

Open the right and left levers of the network interface unit at the same time (the unit comes out toward you about 15 mm).

Figure 5-41 Removing a network interface unit (2)



(1) Lever

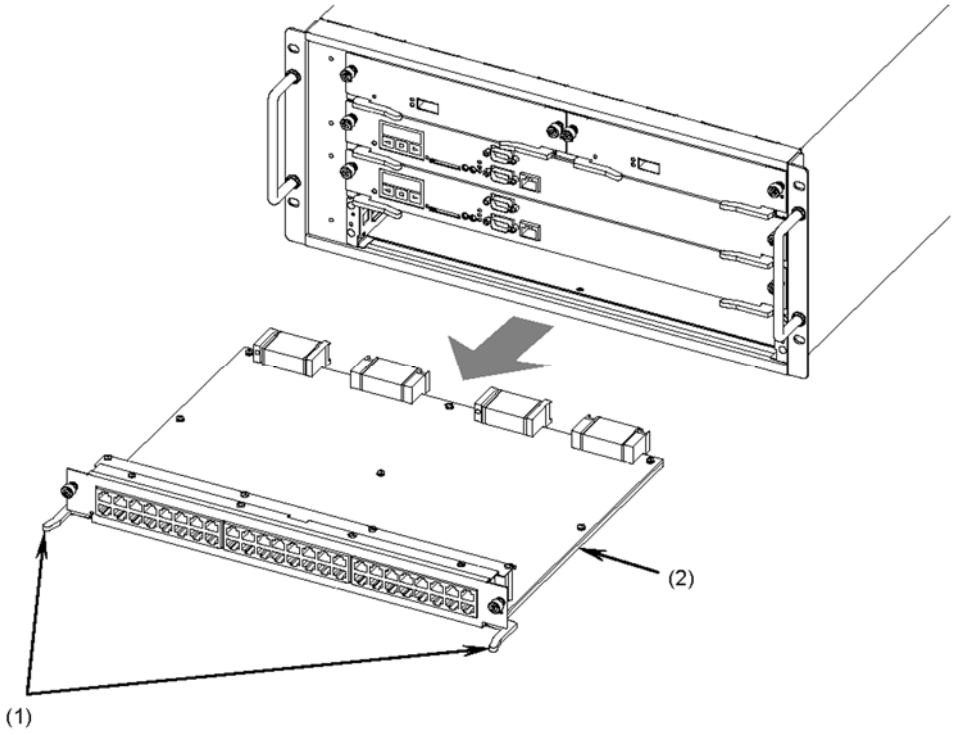
NOTE

Use the levers so that the connectors on the optional module and the Switch can be disengaged correctly. When moving a lever, move the right and left levers slowly and at the same time without exerting excessive force.

Step 5

Remove the network interface unit. (Pull the unit a little way toward you while holding the levers and supporting the sides.)

Figure 5-42 Removing a network interface unit (3)



(1) Lever

(2) Side

⚠CAUTION	The components in a network interface unit might be very hot. Do not touch any components with your hands. Doing so could result in burns.

CAUTION	When removing a network interface unit, install a blank panel. If you continue using the Switch without attaching a blank panel, the airflow in the Switch cannot be maintained. As a result, the temperature inside the Switch will rise, possibly resulting in a failure. In addition, the radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

(2) Installing a double-size network interface unit

A network interface unit can be installed while the Switch is on.

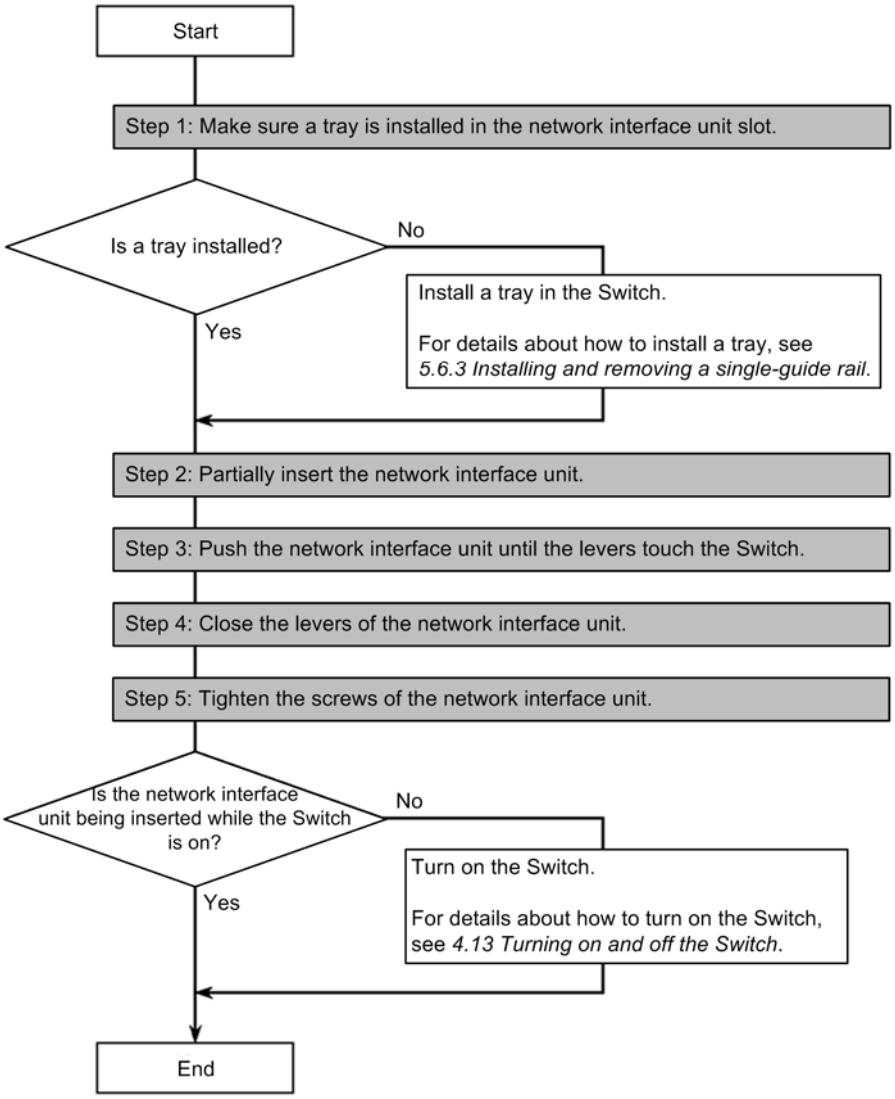
Note, however, that the procedure varies depending on whether the Switch is on or off.

Install the unit while referring to the following figure.

NOTE	For details about steps 1 to 5 in the figure, see the description of the steps that follow *Figure 5-43 Installation overview*.

NOTE	Before installing a double-size network interface unit, a single-guide rail must be removed from the network interface unit slot. For details about how to remove the single-guide rail, see *5.6.3 Installing and removing a single-guide rail*.

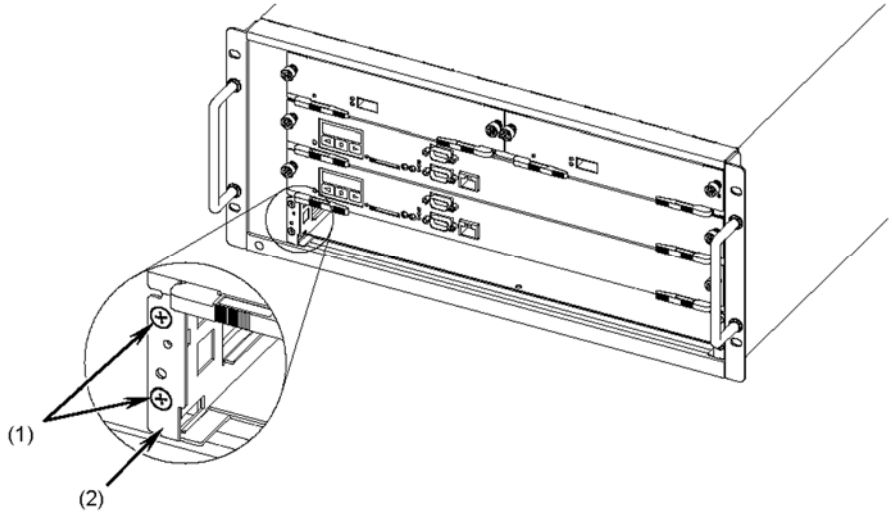
Figure 5-43 Installation overview



Step 1

Make sure a tray is installed in the network interface unit slot (the tray is secured with screws).

Figure 5-44 Checking a tray



(1) Screws

(2) Tray

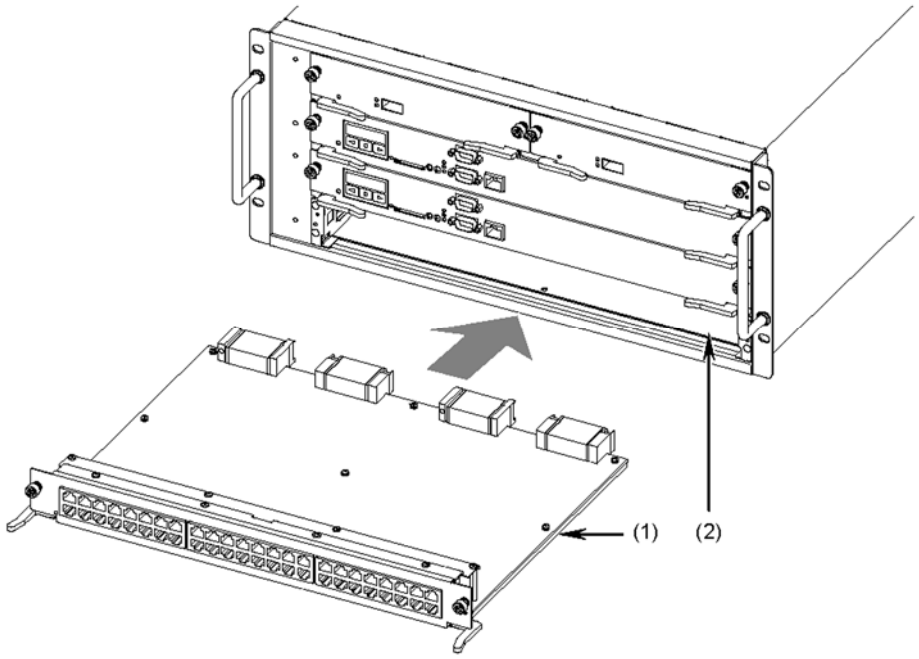
NOTE

For details about how to install a tray, see *5.6.3 Installing and removing a single-guide rail*.

Step 2

Insert a network interface unit halfway into the slot for it. (Do this while holding the sides of the unit.)

Figure 5-45 Installing a network interface unit (1)



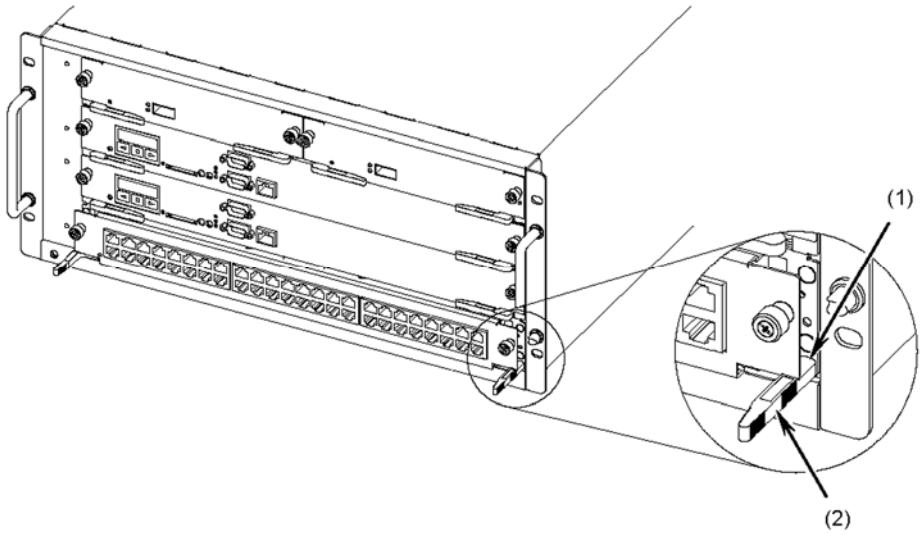
(1) Network interface unit

(2) Network interface unit slot

Step 3

While holding the levers, push the unit carefully until the levers touch the Switch. The levers must be opened parallel to the direction of insertion.

Figure 5-46 Installing a network interface unit (2)



(1) Contact point

(2) Lever

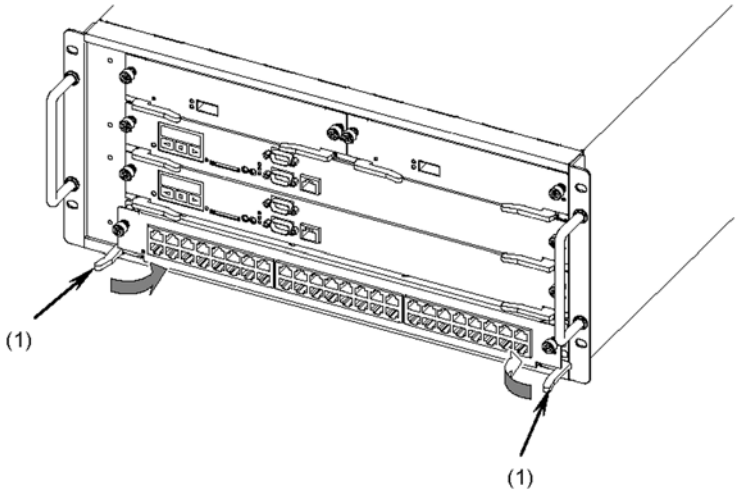
CAUTION	While holding the levers, push the network interface unit carefully until the levers touch the Switch. Failure to do this could result in a Switch malfunction or fault.

CAUTION	Open the levers as shown in the figure when you install a network interface unit. If the levers are closed or opened too much, they might be damaged when you install the unit.

Step 4

Close the levers of the network interface unit. (The unit is inserted completely.)

Figure 5-47 Installing a network interface unit (3)



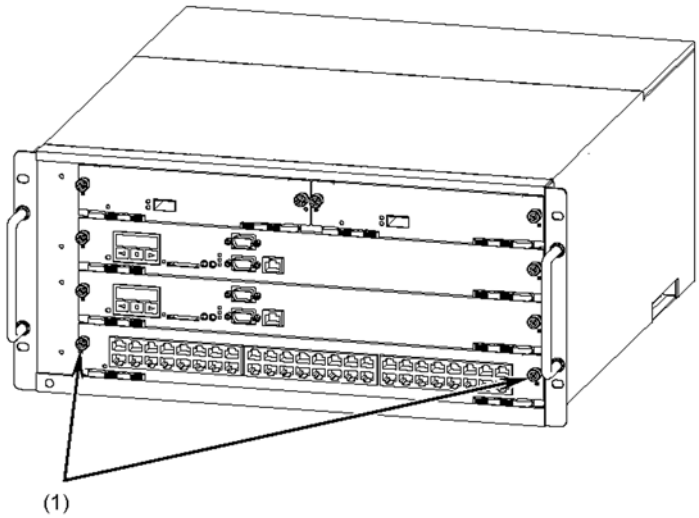
(1) Lever

CAUTION	Use the levers so that the connectors on the optional module and the Switch will be engaged correctly. When moving the levers, move them slowly (one second or longer) without exerting any force. Failure to do this could result in a Switch malfunction or fault.

Step 5

Tighten the screws of the network interface unit.

Figure 5-48 Installing a network interface unit (4)



(1) Screws

NOTE	Use a screwdriver to tighten the screws. Make sure the screws are firmly tightened.

NOTE

If you install a network interface unit (NIF) while the Switch is on, the NIF is turned on automatically when the NIF is installed.

Note, however, that if no power enable is set in the configuration, the NIF is not turned on automatically. Set power enable, and then turn on the power.

For details about the `power enable` command, see *12. Management of BSU/NIF* in the *Software Manual Configuration Guide Vol. 1*.

5.6.3 Installing and removing a single-guide rail

Before installing a single-size network interface unit in a Switch, install a single-guide rail in the tray.

Before installing a double-size network interface unit in a Switch, remove the single-guide rail from the tray.

⚠WARNING

Installing and removing a single-guide rail must be performed by a trained technician or maintenance personnel.

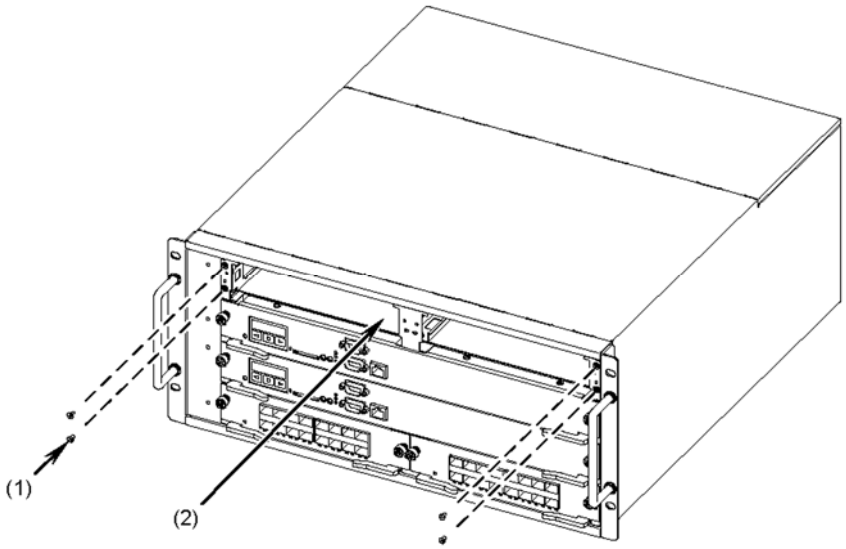
If another person performs the above and mishandles the single-guide rail, injury or damage could result.

(1) Removing a single-guide rail

Step 1

Remove the four screws securing the tray.

Figure 5-49 Removing a tray (1)



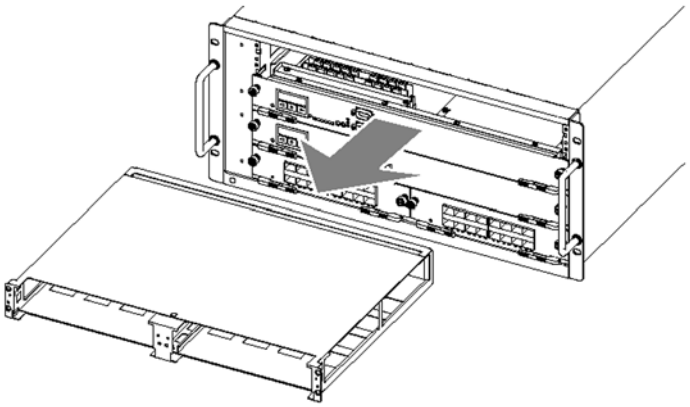
(1) Screws

(2) Tray

Step 2

Remove the tray. (Hold inside the tray and pull it a little way toward you, and then remove it while supporting the bottom of the tray.)

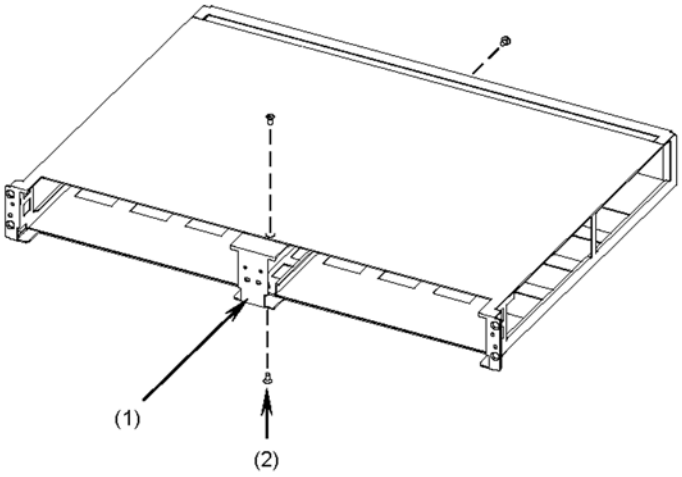
Figure 5-50 Removing a tray (2)



Step 3

Remove the three screws securing the single-guide rail.

Figure 5-51 Removing a single-guide rail (1)



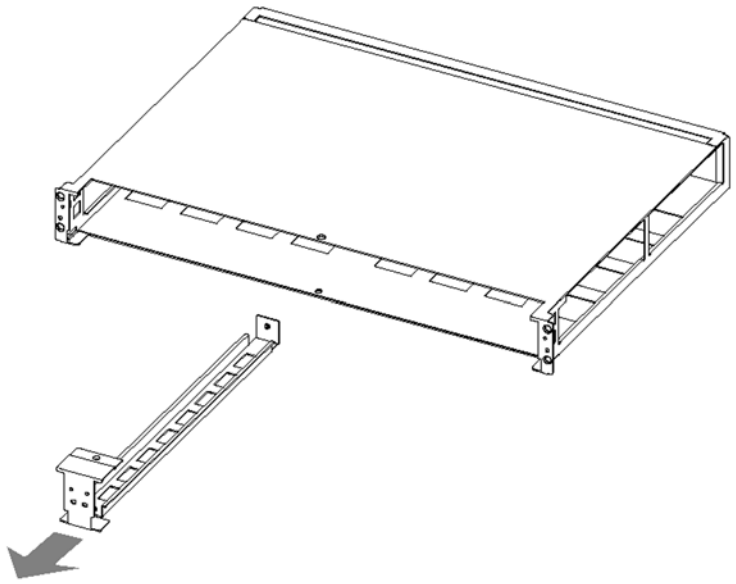
(1) Single-guide rail

(2) Screws

Step 4

Remove the single-guide rail from the tray.

Figure 5-52 Removing a single-guide rail (2)



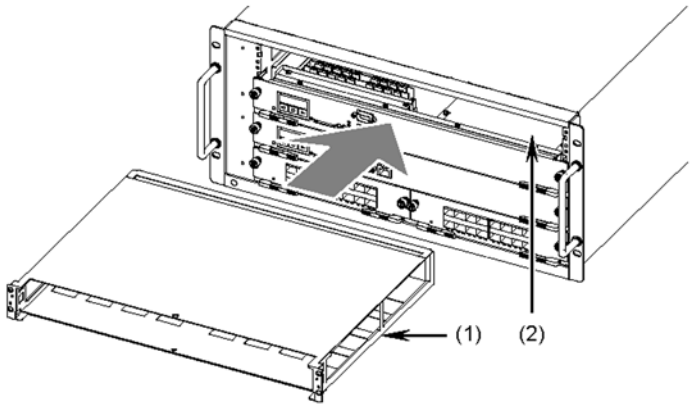
NOTE

Make sure you keep the single-guide rail and the screws you remove.

Step 5

Install the tray in the network interface unit slot.

Figure 5-53 Installing a tray (1)



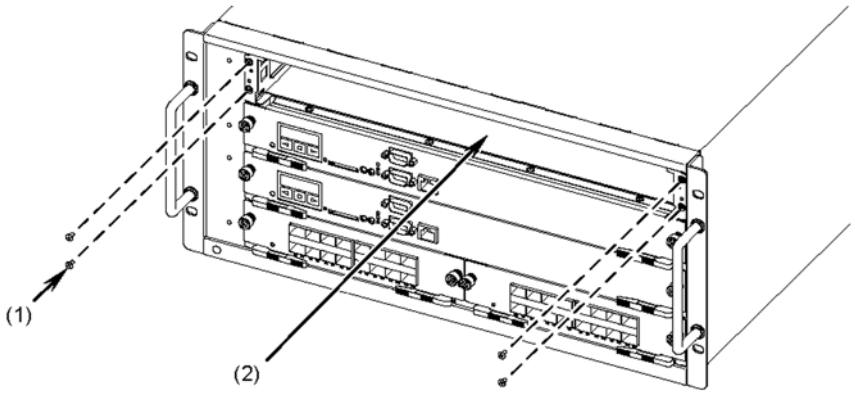
(1) Tray

(2) Network interface unit slot

Step 6

Tighten the screws of the tray.

Figure 5-54 Installing a tray (2)



(1) Screws

(2) Tray

(2) Installing a single-guide rail

To install the single-guide rail, reverse the steps described in *(1) Removing a single-guide rail*.

Appendix

A. Cleaning Optical Connectors

A.1 Cleaning the optical connectors of transceivers

To clean the optical connector for the transceiver, follow the procedure below.

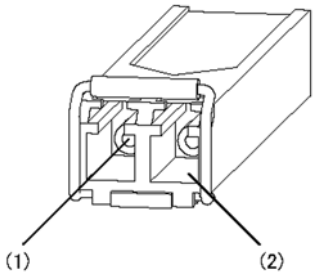
⚠CAUTION	The fiber optic cable uses a laser beam that is colorless and transparent, and invisible to the eye. Never look directly into the optical transceiver.

NOTE	The following is an example of cleaning the optical connector of an SFP transceiver. Use the same procedure to clean the optical connector of an XFP transceiver.

Step 1

Use an air duster to remove dirt and dust from the optical connector.

Figure A-1 Optical connector and ferrule tip



(1) Ferrule tip (at the back)

(2) Connector for supplying standby power

⚠WARNING	Do not use an air duster that contains flammable gas near a flame. Doing so could result in 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.

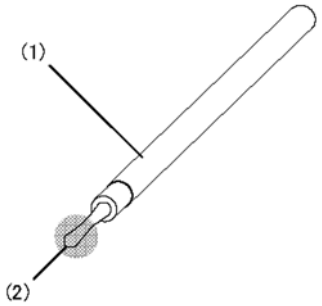
CAUTION	Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

NOTE	For instructions on how to use the air duster, see the documentation for the air duster.

Step 2

Check the tip of the optical connector cleaner (stick-type) for irregularities, such as lint, dirt, or other foreign matter.

Figure A-2 Checking the optical connector cleaner



(1) Optical connector cleaner (stick-type)

(2) Part to check

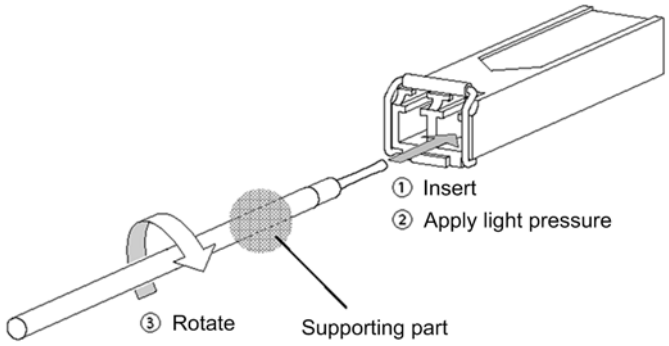
CAUTION	Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.

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 optical connector cleaner (stick-type) to clean any dirt from the ferrule tip.

Figure A-3 Cleaning the ferrule tip



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

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

NOTE

For instructions on how to use the optical connector cleaner, see the documentation for the optical connector cleaner.

A.2 Cleaning fiber optic cables

To clean fiber optic cables, follow the procedure below.

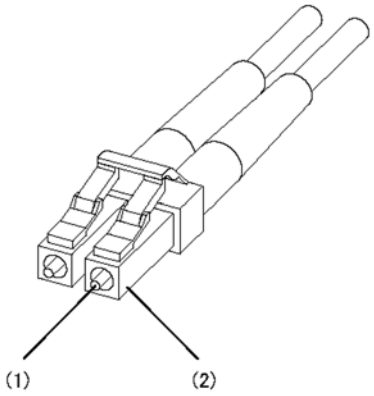
⚠CAUTION

The fiber optic cable uses a laser beam. (Laser beams are colorless and transparent, and invisible to the eye.) Never look directly into the optical transceiver.

Step 1

Use an air duster to remove dirt and dust from the tip of the connector.

Figure A-4 Optical connector and ferrule tip



(1) Ferrule tip

(2) Connector for supplying standby power

⚠WARNING

Do not use an air duster that contains flammable gas near a flame. Doing so could result in 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

For instructions on how to use the air duster, see the documentation for the air duster.

Step 2

Use an optical connector cleaner (reel-type) to clean any dirt from the ferrule tip.

Figure A-5 Cleaning the ferrule tip

CAUTION	Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might be damaged.

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

NOTE	For instructions on how to use the optical connector cleaner, see the documentation for the optical connector cleaner.