

PureFlow WSX

Unified Network Controller NF7600 series Operation Manual TCP Acceleration Edition

Seventh Edition

For safety and warning information, please read this manual before attempting to install and use the equipment.

Keep this manual with the equipment.

ANRITSU CORPORATION

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu Corporation equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual



DANGER

This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.



WARNING

This indicates a hazardous procedure that could result in serious injury or death if not performed properly.



CAUTION

This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.

PureFlow WSX
Unified Network Controller NF7600 series
Operation Manual

9 March 2016 (First Edition)
19 December 2020 (Seventh Edition)

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Printed in Japan

For Safety



WARNING



- 1 ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached. If the advice in the operation manual is not followed there is a risk of personal injury or reduced equipment performance. The alert mark shown on the left may also be used with other marks and descriptions to indicate other dangers.
- 2 Laser radiation warning
NEVER look directly into the opening of the optical modules or the optical fiber cable connectors. The optical modules emit laser beams, so there is a risk of injury if laser radiation enters the eye.
- 3 To avoid electric shock or failure, do not insert objects in the openings or connectors.
- 4 To avoid electric shock, disconnect all power cords before maintenance.
- 5 For safety, use the specified 3-pin power cord and the outlet with earth terminal. When using a conversion adapter instead of the 3-pin power cord, be sure to earth the terminal of green ground wire attached to the conversion adapter. If power is supplied without earthing the equipment, there is a risk of receiving a severe or fatal electric.
- 6 To prevent electric shock, be sure to ground the devices connected to this equipment.
- 7 An unintended high voltage might be applied to the LAN cable due to lightning or an accident in the power circuitry. Be careful when handling the metal parts of this equipment and the LAN cables.



or



For Safety



WARNING

Disassembly



- 8 To avoid fire or electric shock, do not disassemble or modify this device. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

Falling Over

- 9 This equipment should always be installed in the correct manner. If the equipment is installed incorrectly so that it is unstable, the equipment might fall down or drop from the rack, resulting in injury.

Cleaning

- 10 Keep the power supply and cooling fan free of dust.
- Clean the power plug regularly. If dust accumulates around the power pins, there is a risk of fire.
 - Keep the cooling fan clean so that the ventilation holes are not obstructed. If the ventilation holes are obstructed, the equipment inside becomes hot and might catch fire.

For Safety



CAUTION

Power Supply

The power of the equipment is turned off by removing the power plug. Be sure to connect the power cable to an accessible outlet near the equipment so that the power cable plug can be removed easily.

Repair

This equipment cannot be repaired by the customer. If the equipment fails, contact your dealer.

External Storage Media

This equipment can use a CompactFlash card or USB flash drive as external data storage media.

The contents of the CompactFlash card or USB flash drive might be corrupted due to incorrect usage or device failure.

It is recommended to back up the contents as a precaution.

Anritsu Corporation is not liable for the loss of stored memory.

Lifetime of Parts

The life span of certain parts used in this equipment is limited. Such parts are recommended to be replaced periodically. If these parts are to operate continuously for a long time, it is recommended to design a parts operation plan taking into account the replacement timing.

For details about parts with limited life spans, see B.4 Environment.

Use in Corrosive Atmospheres

Exposure to corrosive gases such as hydrogen sulfide, sulfurous acid, and hydrogen chloride will cause faults and failures.

Note that some organic solvents release corrosive gases.

For Safety

Laser Safety

The laser in this equipment is classified as Class 1 according to the IEC 60825-1 standards, or as Class I according to the 21 CFR 1040.10 standard. The laser safety label "Class 1" is attached to the front panel of the equipment.

Class 1 indicates the level of danger of the laser radiation. This is specified in IEC 60825-1 as described below.

Class 1: Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments to view the beams.

Class I indicates the level of danger of the laser radiation. This is specified in 21 CFR 1040.10 as described below.

Class I: Class I levels of laser radiation are not considered to be hazardous.



CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The use of optical instruments with this product will increase eye hazard.

Regulatory Compliance Statements

1 About FCC

FCC Class A Notice (For U.S.A.)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

2 About ICES

CAN ICES-3 (A)/NMB-3(A)

This equipment has been tested and found to comply with Canadian ICES-003.

3 About VCCI

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

4 About JIS C 61000-3-2

This equipment has been tested and found to comply with the current JIS C 61000-3-2 harmonic standard.

5 About UL 60950-1

This equipment has been tested and found to comply with the UL 60950-1 safety standard.

Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within one year after shipment due to a manufacturing fault.

The warranty for software shall be based on the separate "Software End-User License Agreement". However, Anritsu Corporation will deem this warranty void when:

- The fault is outside the scope of the warranty conditions separately described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster, including fire, wind, flooding, earthquake, lightning strike, or volcanic ash, etc.
- The fault is due to damage caused by acts of destruction, including civil disturbance, riot, or war, etc.
- The fault is due to explosion, accident, or breakdown of any other machinery, facility, or plant, etc.
- The fault is due to use of non-specified peripheral or applied equipment or parts, or consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.
- The fault is due to use in unusual environments^(Note).
- The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for damage or financial loss of the customer due to the use of or a failure to use this equipment, unless the damage or loss is caused due to Anritsu Corporation's intentional or gross negligence.

Note:

For the purpose of this Warranty, "unusual environments" means use:

- In places of direct sunlight
- In dusty places
- Outdoors
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in place chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen dioxide, or hydrogen chloride etc.) are present
- In places where high-intensity static electric charges or electromagnetic fields are present

- In places where abnormal power voltages (high or low) or instantaneous power failures occur
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places at an altitude of more than 2,000 m
- In the presence of frequent vibration or mechanical shock such as in cars, ships, or airplanes

Anritsu Corporation Contact

For Information on this equipment, contact an Anritsu Corporation Service and Sales office. Contact information can be found on the safety manual.

Maintenance Contract

Anritsu Corporation can provide a range of optional services under a maintenance contract. For details, contact your dealer.

Software End-User License Agreement (EULA)

This license agreement (“the License”) constitutes a legally binding contract between you and Anritsu Corporation (“Anritsu”) concerning the use of Anritsu NF7600 series software NF7600-S001A (“the Software”). Please carefully read and accept the terms of this Software End-User License Agreement (hereafter EULA) before using (includes executing, copying, installing, registering, etc.). By using this Software, you shall be deemed to have agreed to be bound by the terms of this EULA, and Anritsu hereby grants you the right to use this Software with the Anritsu-specified equipment (hereafter Equipment) for the purposes set out in this EULA.

The Software is protected by all relevant laws and treaties pertaining to copyrights and intellectual property rights, including but not limited to the Copyright Act. Anritsu grants you the right to use the Software as per the License.

This software includes open source software. For open source software, see "Appendix C Third-Party Software License" in this document. If there is the difference between our license and open source software license statement, the open source software license statement takes precedence.

1. License Grant

Anritsu grants you the following usage:

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2. You may use the Software only for the purposes of carrying out operations in your company.

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4. You may not modify, correct, or otherwise change the right indication on the third-party software bundled with the Software.

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3. If the License is canceled or terminated, you must cease using the Software and dispose of the Software and all its component parts, all related documents, and all copies of the Software and its related documents, and erase the software completely from the storage media on your computer.
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1. You understand the risks involved in using the Software and agree to take full responsibility for any direct or indirect damage or loss that may occur as the result of using the Software, including but not limited to loss of data, server stoppages, interruptions to work, and claims made by third parties.
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You also agree that you will not use or otherwise export or re-export this Software for any purposes prohibited by the Japanese and US laws and regulations, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction, and conventional weapons.

7. Change of Terms

Anritsu may change without your approval the terms of this EULA if the changes are for the benefit of general customers, or are reasonable in light to the purpose of this EULA and circumstances of the changes. At the time of change, Anritsu will inform you of those changes and its effective date, as a general rule 45 days, in advance on its website, or in writing or by e-mail.

8. Damages

If Anritsu suffers any damage or loss, financial or otherwise, due to your violation of the terms of this EULA, Anritsu shall have the right to seek proportional damages from you.

9. Negotiation for Dispute Resolution

If matters of interpretational dispute or items not covered under this EULA arise, they shall be resolved by negotiations in good faith between you and Anritsu.

10. Governing Law and Court of Jurisdiction

This EULA shall be governed by and interpreted in accordance with the laws of Japan without regard to the principles of the conflict of laws thereof, and any disputes arising from or in relation to this EULA that cannot be resolved by negotiation described in Article 9 shall be subject to and be settled by the exclusive agreed jurisdiction of the Tokyo District Court of Japan.

Revision History

December 19, 2020

Notes On Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

Trademark and Registered Trademark

OpenFlow is a trademark or registered trademark of the Open Networking Foundation.

Disposal Procedure

This product incorporates a lithium battery and compound semiconductors that contain arsenic. Be sure to follow national and local laws when disposing of this product.

About This Manual

This operation manual describes how to install and handle the PureFlow WSX Unified Network Controller (hereafter referred to as “this device”).

This manual is applicable to the following models of this equipment:

- NF7601A
- NF7602A
- NF7605A

The operation manual of this device consists of the following four manuals. This document is <1>.

<1> Operation Manual TCP Acceleration Edition (NF7600-W011E)

Describes the basic operation, maintenance procedures, common features, and common remote control operations.

<2> Command Reference TCP Acceleration Edition (NF7600-W012E)

Describes in detail the commands used in this device.

<3> Configuration Guide TCP Acceleration Edition (NF7600-W013E)

Describes the basic features of this device and provides specific examples of the settings required to build a network using these features.

<4> WebGUI Operation Manual TCP Acceleration Edition (NF7600–W014E)

Describes the operation for setting and display of this device using a Web browser.

If the following documents related to this device or other documents related to the features of this device are issued, be sure to read them:

Release notes

(For details of the issuance of release notes, contact your dealer.)

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1.1 Overview

This device is installed on a network distribution path to control traffic and accelerate based on the user's network policy. This device can be placed on a table or installed in a rack. To enhance reliability, the fan unit and power supply unit have a redundancy configuration.

(1) Fan redundancy system

Using two fan units enables this device to continue operating even if one of the fan units fails. Fan units can be replaced by the user.

(2) Power supply redundancy system

A power supply redundancy system can be constructed. This system enables this device to continue operating even if one of the power supply units fails. The operating power supply unit does not have to be disconnected when replacing the malfunctioning unit, enabling this device to continue operating during power supply unit replacement. The power supply unit required for the redundancy system is an optional unit. Power supply units can be replaced by the user.

(3) Network bypass function (NF7605A)

If the power is not supplied to this equipment due to a power failure, etc. or an error in this equipment occurs, the direct connection between Network port 1 and Network port 2 has been established inside the equipment to enable the devices connected to this equipment to continuously communicate with each other.

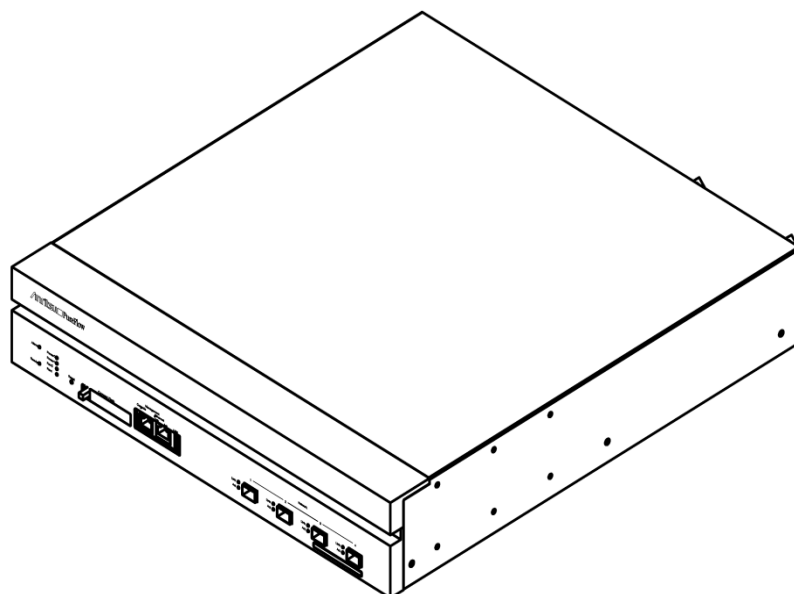
Figure 1.1-1 shows an external view from the top, looking at the front of this device.

Figure 1.1-2 shows an external view from the top, looking at the rear of this device.

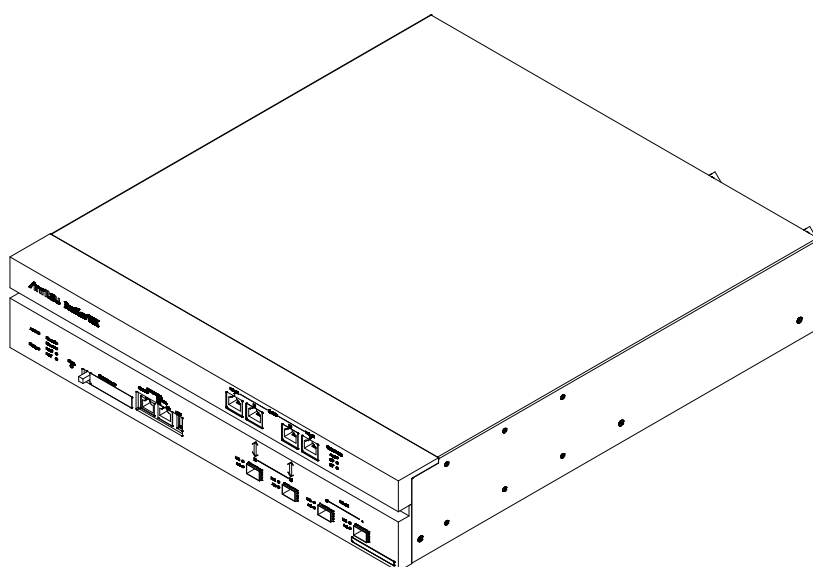
Figure 1.1-3 shows a front view of this device.

Figure 1.1-4 shows a rear view of this device.

For details about the parts of this device, see Section 1.3 "Part names and functions".

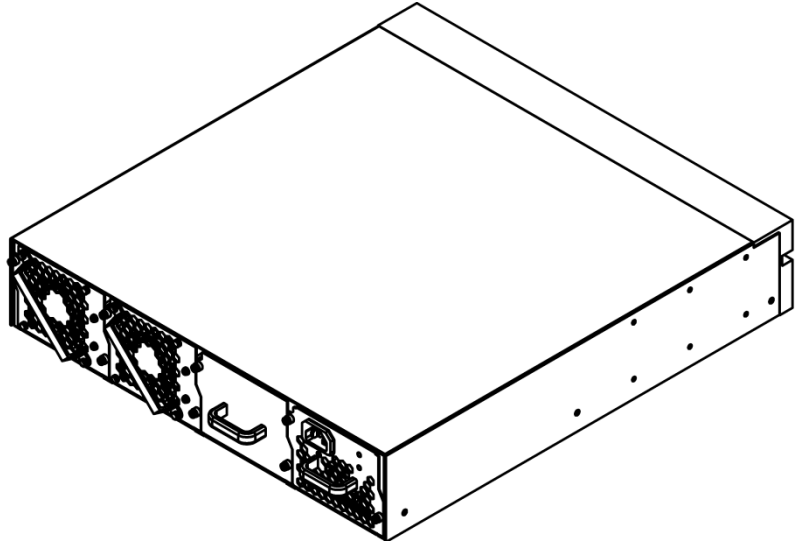


NF7601A, NF7602A



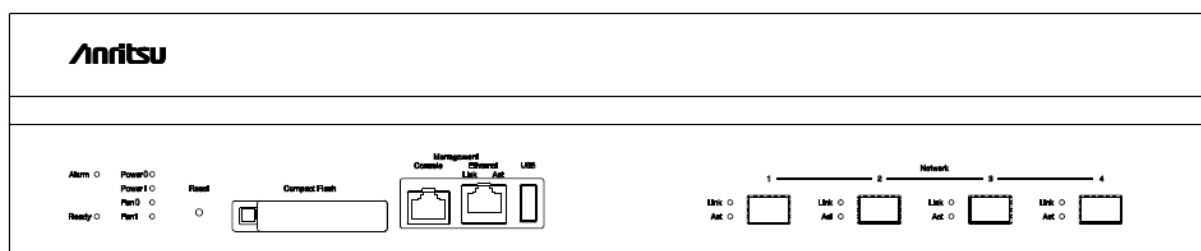
NF7605A

Figure 1.1-1 Top view from the front

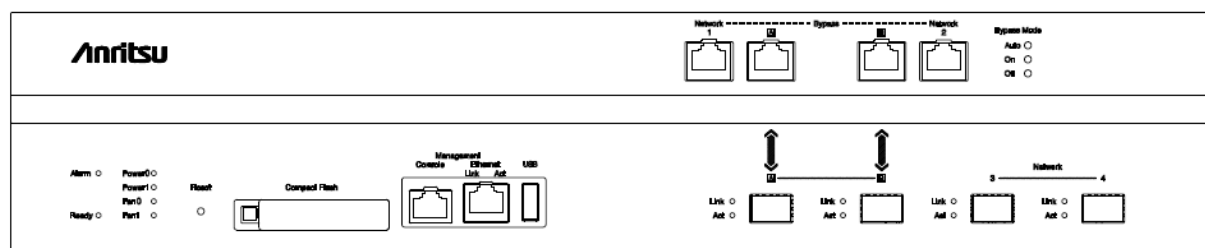


NF7601A, NF7602A, NF7605A

Figure 1.1-2 Top view from the rear

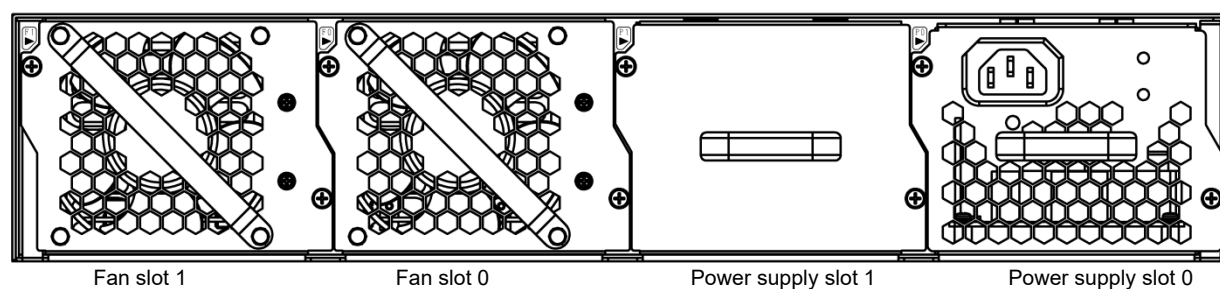


NF7601A, NF7602A



NF7605A

Figure 1.1-3 Front view



NF7601A, NF7602A, NF7605A

Figure 1.1-4 Rear view

1.2 Device configuration

1.2.1 Main unit configuration

This device is configured as shown below.

Table 1.2.1-1 Main unit

Model name	Item name	Remark
NF7601A	Unified Network Controller	PureFlow WSX 10 Gbit/s maximum transfer bandwidth
NF7602A	Unified Network Controller	PureFlow WSX Lite 1 Gbit/s maximum transfer bandwidth
NF7605A	Unified Network Controller	PureFlow WSX Lite Maximum transfer bandwidth: 1 Gbit/s The network bypass function (UTP) is available.

Table 1.2.1-2 Standard accessories

Model name	Item name	Qty.	Remark
NF7000-U001A	150W AC Input Power Supply Unit	1	Pre-installed
—	AC Power Cord Clamp	1	
NF7000-U002A	FAN Unit	2	Pre-installed
NF7000-M001A	Power Unit Blank Panel	1	Pre-installed
PJ012	Console cable	1	
NF7600-W002A	Safety Manual	1	Booklet
PB001	CF cap	1	For CF card slot Pre-installed
NF7000-M002A	Rack Mount Kit	1 set	Two rack mount angles Eight flat head screws (M4) Four pan head screws (M5)
—	Rubber pad	4	
—	SFP cage plug	4	Pre-installed
—	USB cap	1	Pre-installed
NY06011A	UTP cable	2	1 m Comes only with NF7605A.

Model name	Item name	Qty.	Remark
—	Getting Started Guide	1	Paper
—	Unpacking instructions	1	Paper
—	Export announcement card	1	Paper

Table 1.2.1-3 Software

Model name	Item name	Remark
NF7600-S001A	NF7600 series software	Included in the main unit

Note:

The SFP+ module, SFP module, and AC power cord are not supplied as standard. Purchase them separately by referring to Table 1.2.3-1 “Option list”.

**WARNING**

Be sure to purchase an AC power cord in the country in which you are using this device. If you use a cord purchased in another country, it may emit smoke or catch fire, causing a serious accident. Cords purchased in other countries may also violate the laws and/or regulations of the country in which this device is being used.

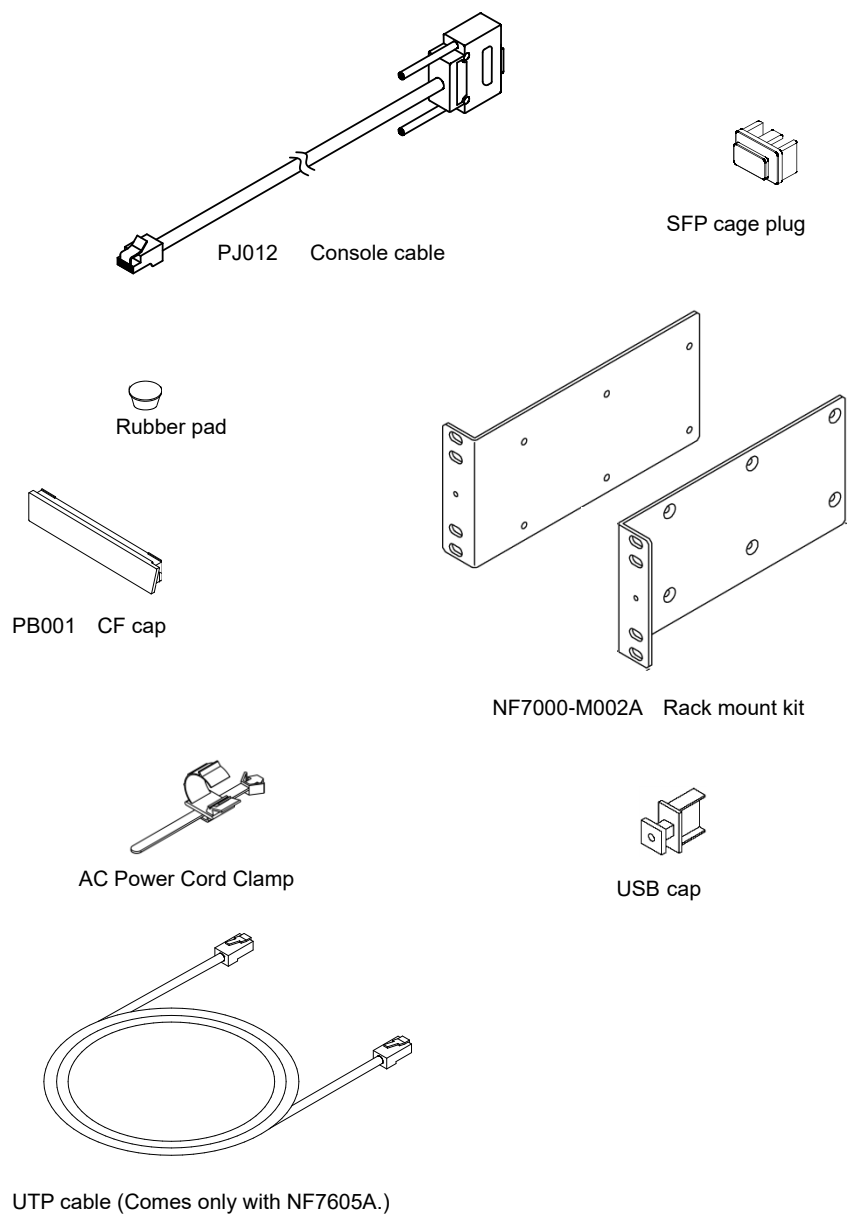


Figure 1.2.1-1 Appearance of standard accessories

1.2.2 Main unit overview

(1) NF7601A

This is a Unified Network Controller equipped with an SFP+ compliant Network port.

An SFP+ module and SFP module can be connected to the Network port. PureFlow WSX provides a transfer bandwidth of 1 Gbit/s as standard. The transfer bandwidth can be expanded to 10 Gbit/s by using the license key options.

(2) NF7602A

This is a Unified Network Controller equipped with an SFP compliant Network port.

An SFP module can be connected to the Network port. PureFlow WSX Lite provides a transfer bandwidth of 100 Mbit/s as standard. The transfer bandwidth can be expanded to 1 Gbit/s by using the license key options.

(3) NF7605A

This is a Unified Network Controller equipped with an SFP compliant Network port.

An SFP module can be connected to the Network port. NF7605A provides a transfer bandwidth of 100 Mbit/s as standard. The transfer bandwidth can be expanded to 1 Gbit/s by using the license key options.

10BASE-T, 100BASE-TX, 1000BASE-T network bypass function is available.

(4) 150W AC Input Power Supply Unit

This is a power supply unit used to supply power from an AC power supply to this device.

This power supply unit supports hot swapping, and up to two units can be installed in the main unit. A power supply redundancy system is available when two power supply units are installed. One power supply unit is supplied as standard.

(5) FAN unit

This fan unit is used to cooling for dissipating heat inside this device. This fan unit supports hot swapping, and two units are installed as standard. This device can therefore continue operating even if one of the units fails.

1.2.3 Option list

The following option parts and license key options are provided for this device.

Table 1.2.3-1 shows the optional parts, Table 1.2.3-2 shows the license key options for NF7601A and Table 1.2.3-3 shows the license key options for NF7602A, and NF7605A.

Table 1.2.3-1 Option list

Model name	Item name	Remark
NF7000-U001A	150W AC Input Power Supply Unit	An AC power cord is not supplied. Purchase the AC power cord shown below separately. AC Power Cord Clamp is supplied as standard.
NF7000-U002A	FAN Unit	For replacement in case of a failure of the fan unit.
NY02001A	SFP+ Module (10GBASE-SR)	An optical module for 10 Gbit/s MMF* ¹ compliant with IEEE Std 802.3-2012. Not available in NF7602A, and NF7605A PureFlow WSX Lite.
NY02002A	SFP+ Module (10GBASE-LR)	An optical module for 10 Gbit/s SMF* ² compliant with IEEE Std 802.3-2012. Not available in NF7602A, and NF7605A PureFlow WSX Lite.
NY02003A	SFP Module (10/100/1000BASE-T)	A module for 1 Gbit/s twisted pair cable compliant with IEEE Std 802.3-2012.
NY02004A	SFP Module (1000BASE-SX)	An optical module for 1 Gbit/s MMF compliant with IEEE Std 802.3-2012.
NY02005A	SFP Module (1000BASE-LX)	An optical module for 1 Gbit/s SMF compliant with IEEE Std 802.3-2012.
NY98001A	CF card (1GB)	A CF card whose operation is guaranteed by Anritsu.
NY06011A	UTP cable	Length 1.0 m
NY01001A	AC Power Cord for USA	Length 2.5 m* ³
NY01004A	AC Power Cord for Japan	Length 3.0 m* ³

*1: Multimode Fiber

*2: Single-mode Fiber

*3: Purchase the AC power cord separately when purchasing the main unit or power supply unit.

Table 1.2.3-2 License key options for NF7601A

Model name	Item name	Remark
NF7600-L211A	2G Bandwidth License	Expands the transfer bandwidth per port from 1 Gbit/s to 2 Gbit/s.
NF7600-L212A	4G Bandwidth License	Expands the transfer bandwidth per port from 1 Gbit/s to 4 Gbit/s.
NF7600-L213A	7G Bandwidth License	Expands the transfer bandwidth per port from 1 Gbit/s to 7 Gbit/s.
NF7600-L214A	10G Bandwidth License	Expands the transfer bandwidth per port from 1 Gbit/s to 10 Gbit/s.
NF7600-L215A	2G to 4G Bandwidth License	Expands the transfer bandwidth per port from 2 Gbit/s to 4 Gbit/s.
NF7600-L216A	4G to 7G Bandwidth License	Expands the transfer bandwidth per port from 4 Gbit/s to 7 Gbit/s.
NF7600-L217A	7G to 10G Bandwidth License	Expands the transfer bandwidth per port from 7 Gbit/s to 10 Gbit/s.
NF7600-L231A	FEC function License	FEC function is usable.
NF7600-L232A	OpenFlow function License	OpenFlow function is usable.

The following specifications apply if no license options are used:

Bandwidth: 1 Gbit/s

FEC function: Unavailable

OpenFlow function: Unavailable

Table 1.2.3-2 of the license key options applies to NF7601A only. These licenses are not available in NF7602A, and NF7605A.

For details about how to use the license key, read “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

Table 1.2.3-3 License key options for NF7602A, and NF7605A

Model name	Item name	Remark
NF7600-L111A	200M Bandwidth License	Expands the transfer bandwidth per port from 100 Mbit/s to 200 Mbit/s.
NF7600-L112A	400M Bandwidth License	Expands the transfer bandwidth per port from 100 Mbit/s to 400 Mbit/s.
NF7600-L113A	700M Bandwidth License	Expands the transfer bandwidth per port from 100 Mbit/s to 700 Mbit/s.
NF7600-L114A	1G Bandwidth License	Expands the transfer bandwidth per port from 100 Mbit/s to 1 Gbit/s.
NF7600-L115A	200M to 400M Bandwidth License	Expands the transfer bandwidth per port from 200 Mbit/s to 400 Mbit/s.
NF7600-L116A	400M to 700M Bandwidth License	Expands the transfer bandwidth per port from 400 Mbit/s to 700 Mbit/s.
NF7600-L117A	700M to 1G Bandwidth License	Expands the transfer bandwidth per port from 700 Mbit/s to 1 Gbit/s.
NF7600-L131A	FEC function License	FEC function is usable.
NF7600-L132A	OpenFlow function License	OpenFlow function is usable.

The following specifications apply if no license options are used:

Bandwidth: 100 Mbit/s

FEC function: Unavailable

OpenFlow function: Unavailable

Table 1.2.3-3 of the license key options applies to NF7602A, and NF7605A only. These licenses are not available in NF7601A.

For details about how to use the license key, read “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

1.2.4 Overview of options

(1) NF7000-U001A 150W AC Input Power Supply Unit

This is an AC input power supply unit with a capacity of 150 W. This unit can be installed in this device. Purchase this option when configuring a power supply redundancy system, or if the power supply unit fails.

(2) NF7000-U002A FAN Unit

This is a fan unit for cooling this device. This unit can be installed in this device. If the fan unit fails, replace it with this option.

(3) NY02001A SFP+ module (10GBASE-SR)

This is a 10GBASE-SR SFP+ module that can be connected to the Network port of the NF7601A. This module complies with IEEE Std 802.3-2012 and allows up to 10 Gbit/s communication. (The actual transfer bandwidth of the NF7601A depends on the installed Bandwidth License. If a Bandwidth License is not installed, the maximum communication speed is 1 Gbit/s even if an SFP+ module is used.) This module is not available in NF7602A, and NF7605A. Model name "NY02001A" is printed on the back surface label of the SFP+ module.

(4) NY02002A SFP+ module (10GBASE-LR)

This is a 10GBASE-LR SFP+ module that can be connected to the Network port of the NF7601A. This module complies with IEEE Std 802.3-2012 and allows up to 10 Gbit/s communication. (The actual transfer bandwidth of the NF7601A depends on the installed Bandwidth License. If a Bandwidth License is not installed, the maximum communication speed is 1 Gbit/s even if an SFP+ module is used.) This module is not available in NF7602A, and NF7605A. Model name "NY02002A" is printed on the back surface label of the SFP+ module.

(5) NY02003A SFP module (10/100/1000BASE-T)

This is a 10BASE-T/100BASE-TX/1000BASE-T SFP module that can be connected to the Network port of this device. This module complies with IEEE Std 802.3-2008 and allows up to 1 Gbit/s communication. Model name "NY02003A" is printed on the back surface label of the SFP module.

(6) NY02004A SFP module (1000BASE-SX)

This is a 1000BASE-SX SFP module that can be connected to the Network port of this device. This module complies with IEEE Std 802.3-2012 and allows up to 1 Gbit/s communication. Model name "NY02004A" is printed on the back surface label of the SFP module.

Notes:

1. When using this SFP module for NF7605A, the network bypass function is not available.

(7) NY02005A SFP module (1000BASE-LX)

This is a 1000BASE-LX SFP module that can be connected to the Network port of this device. This module complies with IEEE Std 802.3-2012 and allows up to 1 Gbit/s communication. Model name "NY02005A" is printed on the back surface label of the SFP module.

Notes:

1. When using this SFP module for NF7605A, the network bypass function is not available.

(8) NY98001A CF card (1GB)

This is a compact flash drive that can be inserted in the CF card slot of this device. It can be used to update this device firmware and upload and download the configuration settings. Model name "NY98001A" is printed on the back surface label of the CF card.

(9) NF7600-L211A 2G Bandwidth License

This expands the transfer bandwidth per Network port from 1 Gbit/s to 2 Gbit/s. This license applies to NF7601A. License certificate will be provided with the purchase.

(10) NF7600-L212A 4G Bandwidth License

This expands the transfer bandwidth per Network port from 1 Gbit/s to 4 Gbit/s. This license applies to NF7601A. License certificate will be provided with the purchase.

(11) NF7600-L213A 7G Bandwidth License

This expands the transfer bandwidth per Network port from 1 Gbit/s to 7 Gbit/s. This license applies to NF7601A. License certificate will be provided with the purchase.

(12) NF7600-L214A 10G Bandwidth License

This expands the transfer bandwidth per Network port from 1 Gbit/s to 10 Gbit/s. This license applies to NF7601A. License certificate will be provided with the purchase.

(13) NF7600-L215A 2G to 4G Bandwidth License

This expands the transfer bandwidth per Network port from 2 Gbit/s to 4 Gbit/s. NF7600-L211A 2G Bandwidth License must be installed in advance. This license applies to NF7601A. License certificate will be provided with the purchase.

(14) NF7600-L216A 4G to 7G Bandwidth License

This expands the transfer bandwidth per Network port from 4 Gbit/s to 7 Gbit/s. NF7600-L212A 4G Bandwidth License, or NF7600-L211A 2G Bandwidth License and NF7600-L215A 2G to 4G Bandwidth License must be installed in advance. This license applies to NF7601A. License certificate will be provided with the purchase.

(15) NF7600-L217A 7G to 10G Bandwidth License

This expands the transfer bandwidth per Network port from 7 Gbit/s to 10 Gbit/s. NF7600-L213A 7G Bandwidth License, or NF7600-L212A 4G

Bandwidth License and NF7600-L216A 4G to 7G Bandwidth License, or NF7600-L211A 2G Bandwidth License and NF7600-L215A 2G to 4G Bandwidth License and NF7600-L216A 4G to 7G Bandwidth License must be installed in advance. This license applies to NF7601A. License certificate will be provided with the purchase.

(16) NF7600-L231A FEC function License

FEC function is usable. This license applies to NF7601A. License certificate will be provided with the purchase.

(17) NF7600-L232A OpenFlow Function License

This enables you to use the OpenFlow function. This license applies to NF7601A. License certificate will be provided with the purchase.

(18) NF7600-L111A 200M Bandwidth License

This expands the transfer bandwidth per Network port from 100 Mbit/s to 200 Mbit/s. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(19) NF7600-L112A 400M Bandwidth License

This expands the transfer bandwidth per Network port from 100 Mbit/s to 400 Mbit/s. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(20) NF7600-L113A 700M Bandwidth License

This expands the transfer bandwidth per Network port from 100 Mbit/s to 700 Mbit/s. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(21) NF7600-L114A 1G Bandwidth License

This expands the transfer bandwidth per Network port from 100 Mbit/s to 1 Gbit/s. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(22) NF7600-L115A 200M to 400M Bandwidth License

This expands the transfer bandwidth per Network port from 200M bit/s to 400 Mbit/s. NF7600-L111A 200M Bandwidth License must be installed in advance. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(23) NF7600-L116A 400M to 700M Bandwidth License

This expands the transfer bandwidth per Network port from 400 Mbit/s to 700 Mbit/s. NF7600-L112A 400M Bandwidth License, or NF7600-L111A 200M Bandwidth License and NF7600-L115A 200M to 400M Bandwidth License must be installed in advance. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(24) NF7600-L117A 700M to 1G Bandwidth License

This expands the transfer bandwidth per Network port from 700 Mbit/s to 1 Gbit/s. NF7600-L113A 700M Bandwidth License, or NF7600-L112A 400M Bandwidth License and NF7600-L116A 400M

to 700M Bandwidth License, or NF7600-L111A 200M Bandwidth License and NF7600-L115A 200M to 400M Bandwidth License and NF7600-L116A 400M to 700M Bandwidth License must be installed in advance. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(25) NF7600-L131A FEC function License

FEC function is usable. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

(26) NF7600-L132A OpenFlow Function License

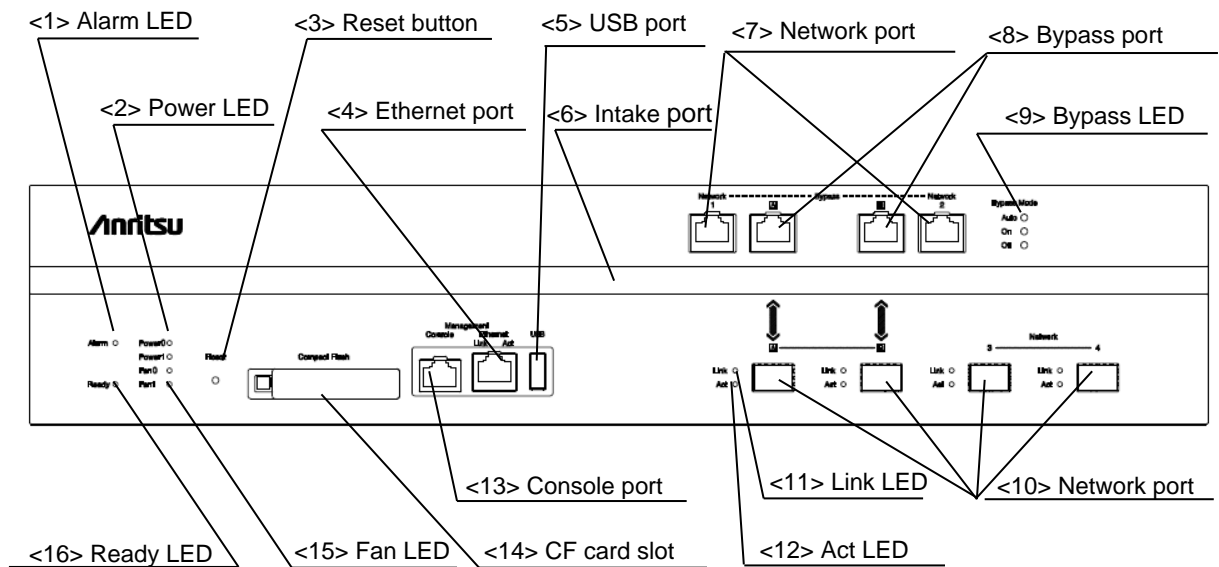
This enables you to use the OpenFlow function. This license applies to NF7602A and NF7605A. License certificate will be provided with the purchase.

1.3 Part names and functions

Figure 1.3-1 shows a front view of NF7605A indicating the part names as an example.

Figure 1.3-2 shows a rear view of this device indicating the part names.

Figure 1.3-2 shows this device with the power supply unit installed in power supply slot 0, a power supply blank panel covering power supply slot 1, and fan units installed in fan slots 0 and 1.



Note: NF7601A and NF7602A are not equipped with the interfaces <7>, <8>, and <9>.

Figure 1.3-1 Front view of NF7605A device with part names

<1> Alarm LED

This LED indicates that an error has occurred in this device.

Indication	Meaning
Red (on)	A device error has occurred.
Off	This device is operating normally.

<2> Power LEDs

These LEDs indicate the status of the power supply unit.

Power0 indicates the state of the power supply unit installed in power slot 0, and Power1 indicates the state of the power supply unit installed in power slot 1.

Indication	Meaning
Green (on)	Power is being supplied to the power supply unit and this device is operating normally.
Green (blinking)	A power supply unit error has occurred. This includes cases where a Power Supply Unit is installed in the corresponding slot but AC power is not being supplied.
Off	A power supply unit is not installed in the corresponding slot.

<3> Reset button

Press the reset button to reboot this device.

Use the tip of a ballpoint pen to press the reset button. Do not use a pencil or mechanical pencil because the lead might remain inside this device and cause fails.

<4> Ethernet port

This port is used as an interface for managing this device.

This port is an Auto-MDIX port and supports 10BASE-T, 100BASE-TX, and 1000BASE-T.

It is a local port of this device and is separate from the Network port.

Link LED: Indicates the link status of the Ethernet port.

Indication	Meaning
Green (on)	The port is linked at 1000BASE-T.
Orange (on)	The port is linked at 100BASE-TX or 10BASE-T.
Off	The port is not linked to the network device connected to the port.

Act LED: Indicates the packet transmission/reception status of the Ethernet port.

Indication	Meaning
Green (blinking)	The port is transmitting or receiving packets.
Off	The port is not transmitting or receiving packets.



CAUTION

Do not connect the Ethernet port to a telecommunications network such as a Public Switched Telephone Network. Incorrect connection may result in failure of the communication line or device.

<5> USB port

This port is used for maintenance work such as configuration settings and downloading, uploading and executing software. For details about operation procedure, read “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”. It is recommended to use a USB memory whose operation is confirmed by Anritsu. For details, see Section 2.10 “Connecting and removing the USB memory”.

<6> Intake port

This is used for intaking air to cool down this device. For details about the open space around this device required for cooling this device, see Section 2.3 “Open space”.

<7> Network port (for bypass)

This port is used for connecting the lines subject to the traffic control when the network bypass function is used. NF7601A and NF7602A are not equipped with this interface. For NF7605A, this port is used to connect the UTP cable. For how to connect the cable, see Section 2.5 “Network Connection Procedure”.

<8> Bypass port

This port is connected with <10> Network port via the UTP cable that comes with this equipment or via the optical fiber. NF7601A and NF7602A are not equipped with this interface. This port is used for connecting with the UTP cable for NF7605A. For how to connect the cable, see Section 2.5 “Network Connection Procedure”.

<9> Bypass LED

This LED indicates the network bypass conditions and settings.
NF7601A and NF7602A are not equipped with this interface.

Auto LED

Display	Function
Green (on)	The bypass is set to Auto.
Off	The bypass is not set to Auto.

On LED

Display	Function
Green (on)	The equipment is in the bypass condition.
Off	The equipment is not in the bypass condition.

Off LED

Display	Function
Green (on)	The equipment is not in the bypass condition.
Off	The equipment is in the bypass condition.

Either of On LED or Off LED is always on.

<10> Network port

The Network port is used to connect the line whose traffic is to be controlled.
This port complies with SFP+ and SFP at NF7601A, and complies only with SFP at NF7602A and NF7605A, and supports the following:

- SFP+ module
10GBASE-SR (NY02001A)
10GBASE-LR (NY02002A)
- SFP module
10/100/1000BASE-T (NY02003A)
1000BASE-SX (NY02004A)
1000BASE-LX (NY02005A)

When using the network bypass function for NF7605A, NY02003A is available.

**CAUTION**

Do not connect the Network port to a telecommunications network such as a Public Switched Telephone Network. Incorrect connection may result in failure of the communication line or device.

<11> Link LED

Indicates the link status of the Network port.

Display	Function
Green (on)	Link status of the Network port
Green (blinking in synchronized with Act LED)	Reboot* is required.
Off	The port is not linked to the network device connected to the port.

*: When the module used for the Network port is changed from SFP to SFP+ and vice versa, the NF7601A must be restarted.

<12> Act LED

Indicates the packet transmission/reception status of the Network port.

Indication	Meaning
Green (blinking)	The port is transmitting or receiving packets.
Green (blinking in synchronized with Link LED)	Reboot* is required.
Off	The port is not transmitting or receiving packets.

*: When the module used for the Network port is changed from SFP to SFP+ and vice versa, the NF7601A must be rebooted.

<13> Console port

This port is used as an interface for managing this device.

This is used for displaying and setting the operation parameters of this device.

For details, see Section 3.3 “Settings”.



CAUTION

Do not connect the Console port to a telecommunications network such as a Public Switched Telephone Network. Incorrect connection may result in failure of the communication line or device.

<14> CF card slot

This port is used for configuration settings and downloading, uploading software or maintenance work. For details about operation procedure, read “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”. Use the CF card supplied by Anritsu as an option.

For details, see Section 2.9 “Inserting and removing the CF card”.

<15> Fan LED

These LEDs indicate the status of the fans in this device.

Fan 0 indicates the status of the fan unit connected to Fan slot 0, and Fan1 indicates the status of the fan unit connected to Fan slot 1.

Indication	Meaning
Green (on)	The fan of the FAN Unit is operating normally.
Green (blinking)	An error has occurred in the fan of the FAN Unit.
Off	No power is being supplied to this device. Or, the corresponding FAN Unit is not installed.

<16> Ready LED

Indicates the operational status of the entire device.

Indication	Meaning
Green (blinking)	This device is starting up or is undergoing self diagnosis.
Green (on)	This device is operating normally.
Off	No power is being supplied to this device or an error has been detected in this device.

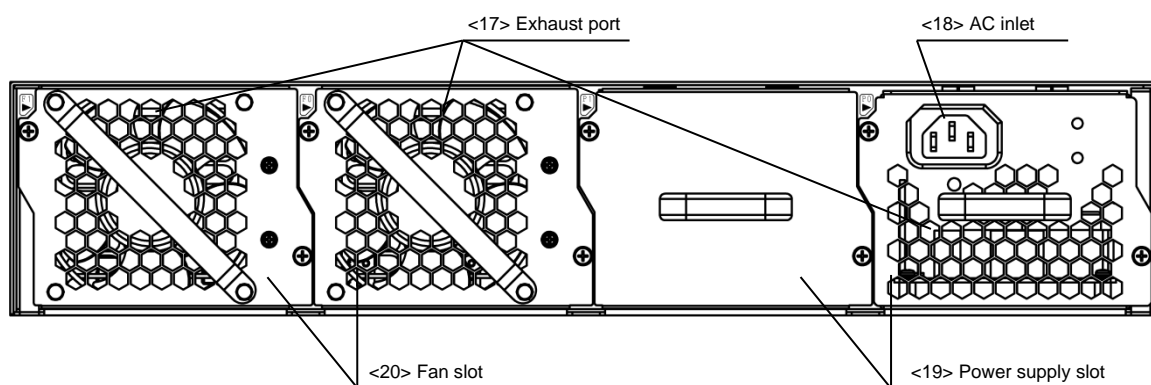


Figure 1.3-2 Rear view of device with part names

<17> Exhaust port

This is used fan exhausting air to cool this device.

For details about the open space around this device required for cooling this device, see Section 2.3 “Open space”.



CAUTION

Do not block the exhaust port. Otherwise, this device may overheat, stop, or fail.

<18> AC inlet

This is used for connecting the AC power cord.



WARNING

Use the dedicated AC power cord. Use of other types of AC power cord may result in electric shock, heat generation, smoke, or ignition, leading to fire, injury, or death.

<19>Power supply slot

Install the power supply unit and power unit blank panel in power supply slots 0 and 1. Before shipment, a power supply unit is installed in power supply slot 0, and power supply slot 1 is covered by a power unit blank panel.

Use the power unit blank panel when not installing a power supply unit in a power supply slot. Remove this panel when adding a power supply unit. Store the removed power unit blank panel for future use.

Model name	Item name
NF7000-U001A	150 W AC Input Power Supply Unit
NF7000-M001A	Power Unit Blank Panel

<20>Fan slot

Install the following fan unit in fan slots 0 and 1. In shipment, fan units are installed in both fan slots 0 and 1.

Model name	Item name
NF7000-U002A	FAN Unit

Chapter 2 Unpacking and Installation

This chapter describes how to unpack and install this device.

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2.1 Unpacking

2.1.1 How to unpack this device

- (1) Open the packing box.
- (2) Pull out the top box from the packing box.
- (3) Insert your hands in the area indicated by **A** and securely support this device by holding both the side surfaces and the bottom.
- (4) Pull out this device from the top.

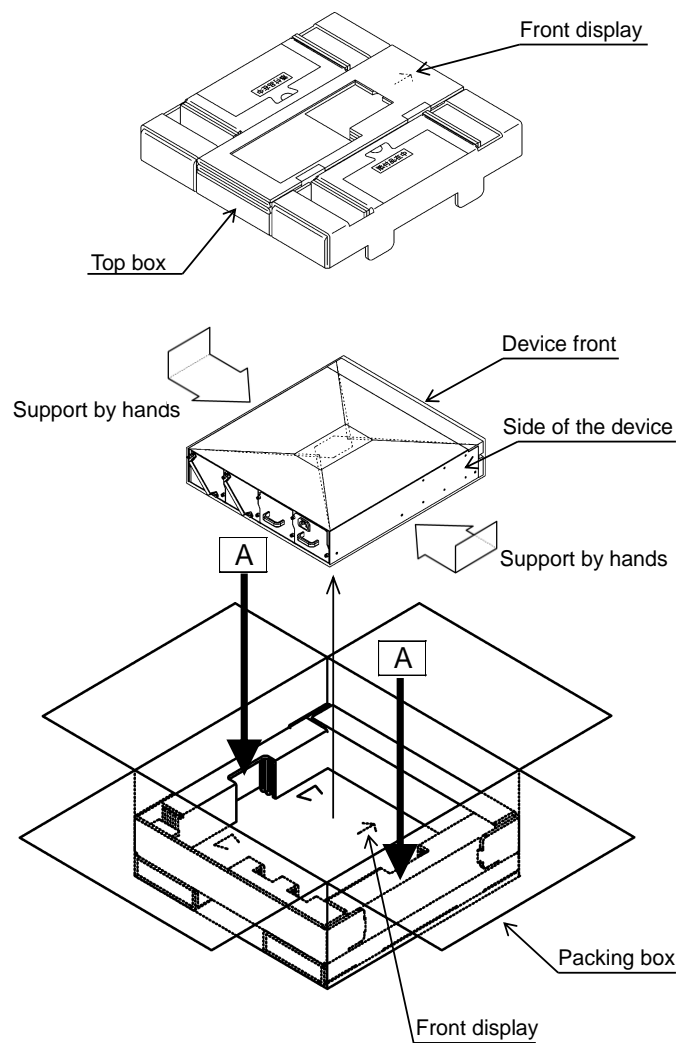


Figure 2.1.1-1 How to unpack this device



CAUTION

Hold on the both sides of this device. Do not hold protrusions or grooves. They are slippery and you might drop this device, causing injury or damaging the device.

2.1.2 Checking the contents of the box

Remove the contents from the packing box, and check that the following items are included. If any item is missing or has been damaged during transportation, contact your dealer immediately.

Keep the packing materials such as the packaging box for future transportation.

Table 2.1.2-1 Contents list

Model name	Item name	Qty.	Remark
NF7601A NF7602A NF7605A	Unified Network Controller (device main unit)	1	Either one unit
NF7000-U001A	150W AC Input Power Supply Unit	1	(Pre-installed)
NF7000-M001A	Power Unit Blank Panel	1	(Pre-installed)
NF7000-U002A	FAN Unit	2	(Pre-installed)
—	SFP cage plug	4	(Pre-installed)
PB001	CF cap	1	For CF card slot (Pre-installed)
—	USB cap	1	For USB port (Pre-installed)
NF7000-M002A	Rack Mount Kit	1 set	Rack mount angle: 2 pieces Flat head screw (M4): 8 pieces Pan head screw (M5): 4 pieces
NF7600-W002A	Safety Manual	1	Booklet
PJ012	Console cable	1	
—	Rubber pad	4	
—	AC Power Cord Clamp	1	
—	Getting Started Guide	1	Paper
—	Unpacking instructions	1	Paper
—	Export announcement card	1	Paper
NY06011A	UTP cable	2	Comes only with NF7605A.

2.2 Selecting an installation location

Avoid the following places when installing this device:

- In places of direct sunlight
- In dusty places
- Outdoors
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in place chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen dioxide, or hydrogen chloride etc.) are present
- In places where high-intensity static electric charges or electromagnetic fields are present
- In places where abnormal power voltages (high or low) or instantaneous power failures occur
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places at an altitude of more than 2,000 m
- In the presence of frequent vibration or mechanical shock



WARNING

Installing this device in a place such as those above might cause the device to fall over or fall, or cause an electric shock, fire, or failure.



CAUTION

When carrying this device, hold the bottom firmly in your hands. Holding anywhere other than the bottom might damage the device, cause the injury.

2.3 Open space

Allow space of 90 mm at the front and rear of this device to ensure that the inside this device is cool and to space for the cables as shown in Figure 2.3-1. This device has a cooling fan in the back. The fan takes air in from the front and exhausted air from the rear of this device.

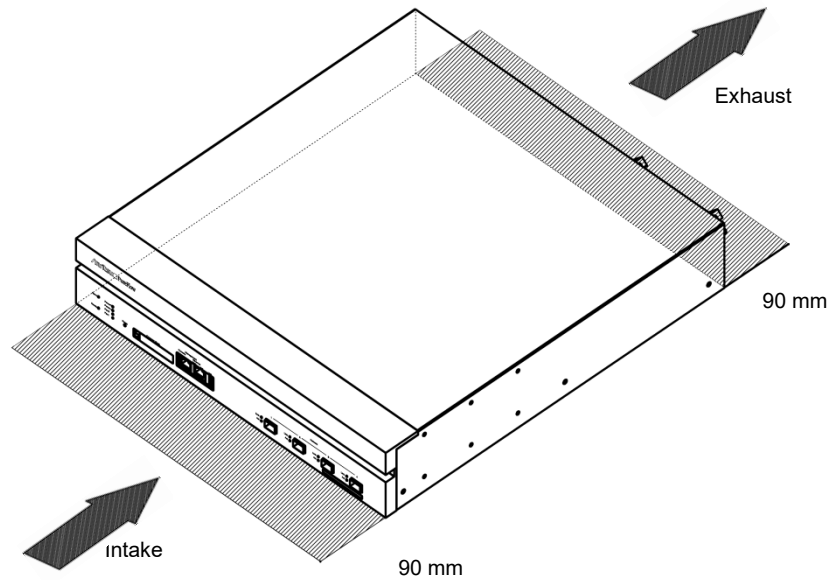


Figure 2.3-1 Open space



CAUTION

Do not block the intake port and exhaust port. Allow space shown in Figure 2.3-1. If the space around this device is not sufficient, this device will overheat, causing failure.

2.4 Installing the main unit

2.4.1 Placing this device on a table

Do not place any object on this device. Also avoid stacking devices (other devices, including the same model, can be mounted directly on or under this device when using rack mounting).

To improve operability when using this device on a table, you can attach the supplied rubber pad. Attach the rubber pad as follows:

- (1) Wipe off any dirt on the rubber pad areas on the bottom of this device (the punch marks in Figure 2.4.1-1) with a cloth.
- (2) Remove the adhesive protection seal on the supplied rubber pad, and affix the pad (the punch marks in Figure 2.4.1-1).

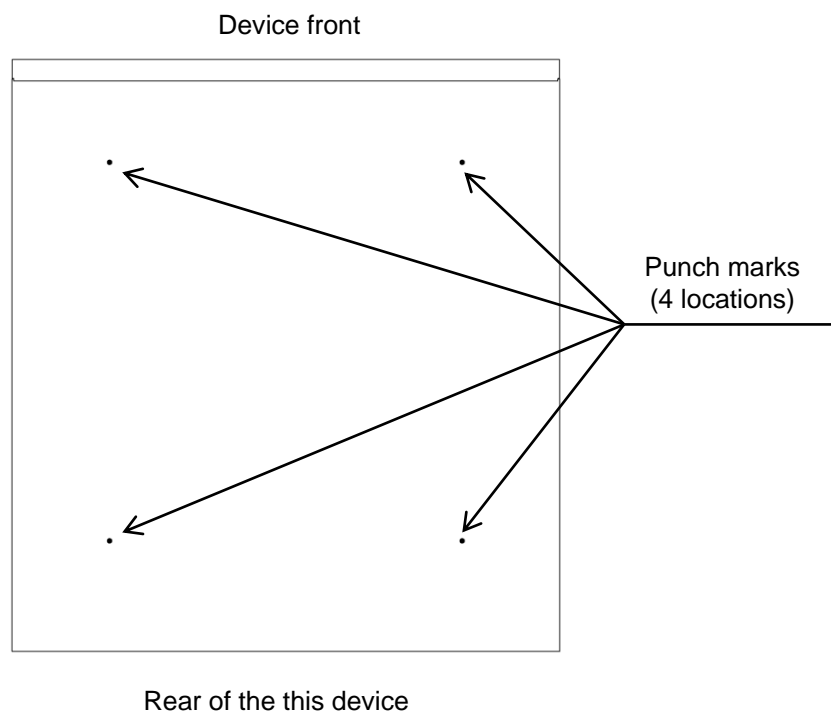


Figure 2.4.1-1 Punch marks for rubber pad



CAUTION

Do not use this device in a vertical position. This device will overheat, causing failure. Always use it in a horizontal position.

2.4.2 Mounting this device in a 19-inch rack

When mounting this device in a 19-inch rack, use the rack mount kit. The installation holes of the rack mount kit comply with the IEC and EIA (only for wide pitch).



WARNING

Use the dedicated AC power cord when installing this device. Use of other types of AC power cord may result in heat generation, leading to fire.

When connecting this device to a power circuit, always provide proper protective grounding. Provide unbroken and secure protective grounding from the main power supply to the AC power cord of this device. Otherwise, electric shock may occur.



CAUTION

1. Do not install this device in a place where the operating ambient temperature exceeds 40°C. Otherwise, the device may fail.
2. Be careful not to block the air flow from the front to the back of this device (see Figure 2.3-1 “Open space”). Otherwise, this device may fail.
3. If anything other than the specified rack mount hardware or screws are used, or if the installation procedure shown below is not followed, this device might fall off the rack, causing injury or device failure.
4. When installing multiple units of this device on a rack with other devices, make sure that the total current capacity does not exceed the capacity of the power circuit, lines, and overcurrent protective device provided on the rack. Add up all the current rating values listed on the nameplates of all the devices connected to the power circuit, and determine the current capacity of the power circuit so that it will not result in an overload. The rated current value of one unit of this device is 1.8 A at 100 V. The power circuit breaker may trip and system failure may occur due to lack of power capacity.

Mount this device in a rack according to the following procedure:

- (1) Mounting this device on the rack mount kit

Attach the rack mount angles to this device. Use the supplied flat head screws M4 (four on each side). Figure 2.4.2-1 shows how to attach the angles.

Note:

Use the mounting screws that total of 8 by 4 on each side.

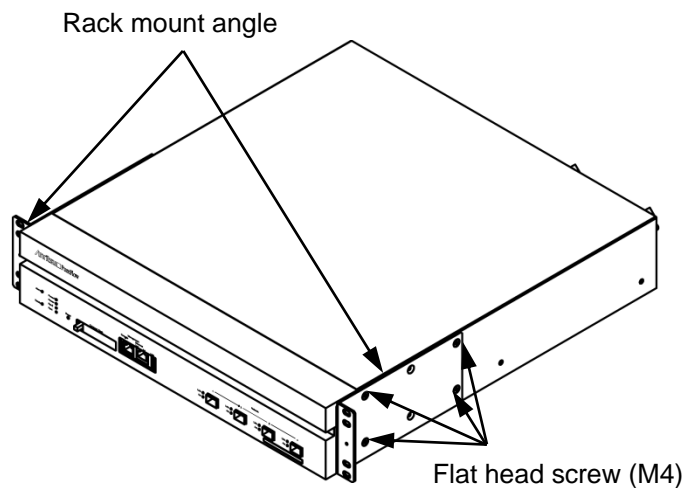


Figure 2.4.2-1 Attaching the rack mount angles

The rack mount angles are possible to adjust by selecting the screw hole the mounting position in the front-to-rear direction.

Choose the installation holes that match your environment.

- <1> Standard position of flush against the mounting surface (Figure 2.4.2-2)
- <2> 65 mm rearward from the standard position (Figure 2.4.2-3)
- <3> 65 mm forward from the standard position (Figure 2.4.2-4)

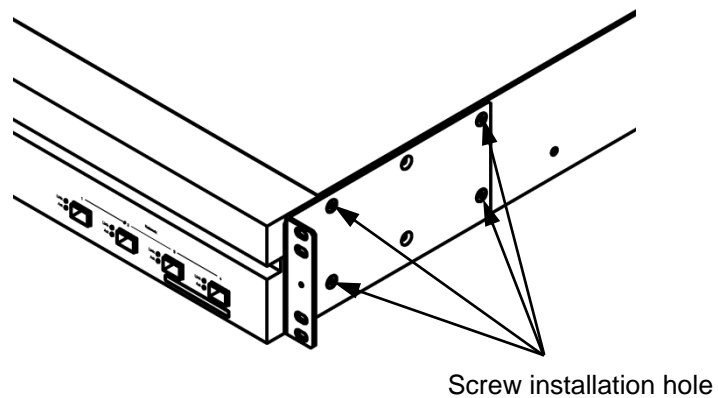


Figure 2.4.2-2 Installation hole position (standard position)

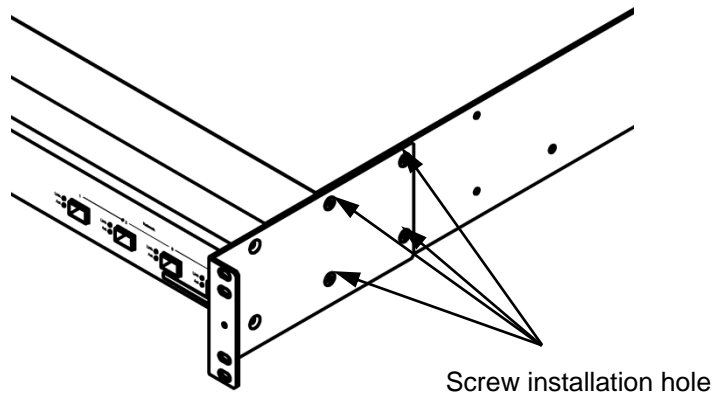


Figure 2.4.2-3 Installation hole position (rear position)

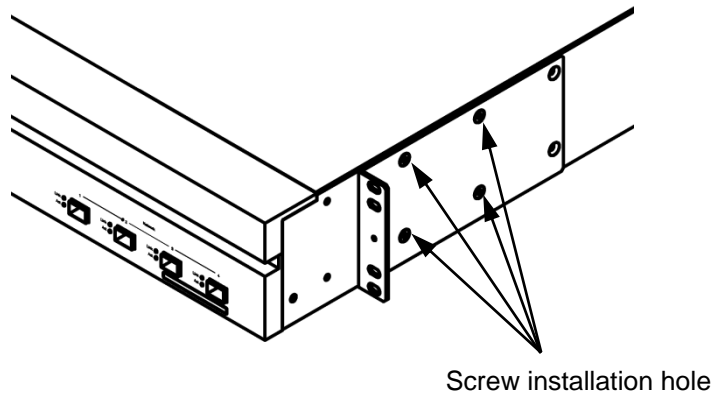


Figure 2.4.2-4 Installation hole position (front position)



CAUTION

Use the supplied screws. Using incorrect screws may cause the device to fall off, cause failure.

Use four supplied installation screws on each side.
The installation holes vary depending on the installation position. Choose the appropriate position.

(2) Mounting and securing this device

Mount this device on the rack. Pan head screws (M5) are attached for installation to the rack. If the rack is not compatible with the M5 screws, please use appropriate screws. Figure 2.4.2-5 shows an example of mounting this device on the rack.

Note:

Screwed the mounting screws that total of four by two on each side.

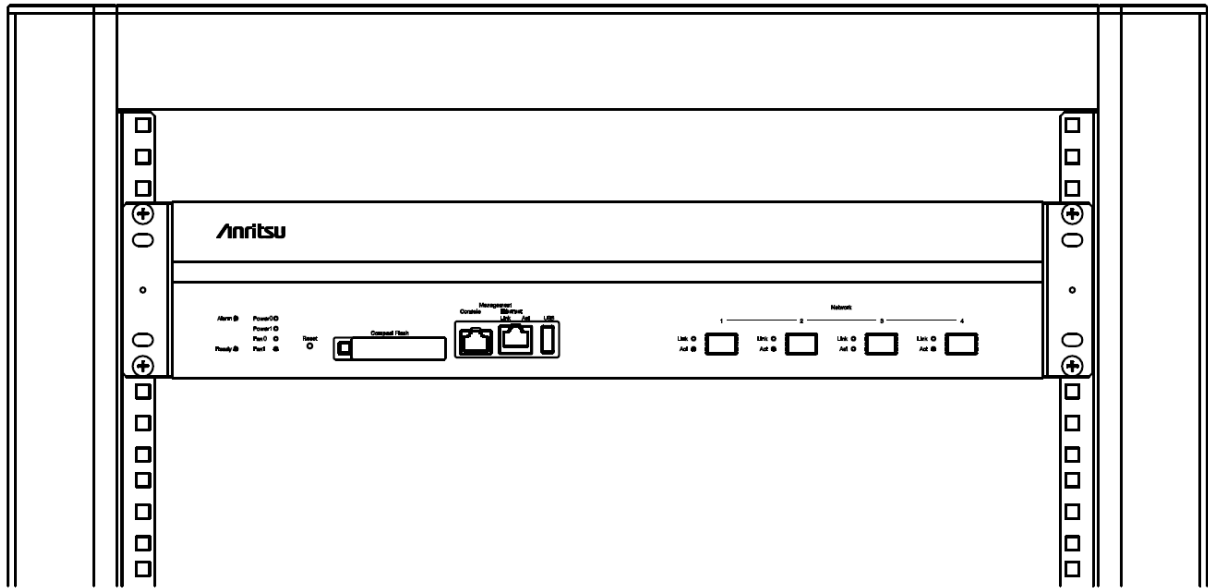


Figure 2.4.2-5 Mounting this device on the rack



CAUTION

Do not hold the protrusions or grooves on the front and rear sides of this device. They are slippery and you might drop the device, causing injury.

2.5 Network Connection Procedure

2.5.1 For NF7601A and NF7602A

1. Mount the SFP+ or SFP module (option of this equipment) to the Network port of this equipment. For how to mount, see Section 2.6. "Connecting and removing the SFP module".
2. Connect the network line cable to the SFP+ or SFP module. For the cable connection method, see Section 2.7. "Connecting and removing the optical fiber cable" or 2.8 "Connecting and removing the UTP cable".

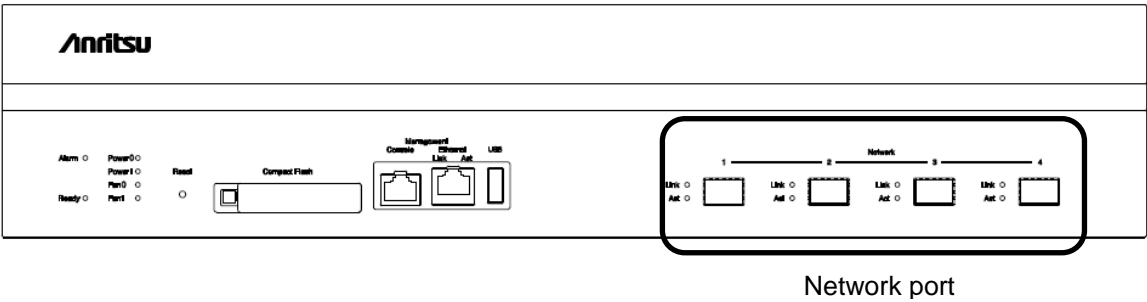


Figure 2.5.1-1 Front view of this equipment (NF7601A and NF7602A)

2.5.2 For NF7605A

This section describes how to connect the network using the network bypass function of NF7605A.

NF7605A is equipped with the network bypass function.

In the case of abnormal operation of NF7605A or by the command, this network changes to the bypass status. For the conditions for shifting to the bypass status, refer to the Configuration Guide TCP: TCP Acceleration Edition (NF7600-W013E).

The solid line in the following figure indicates the communication path of the network bypass function.

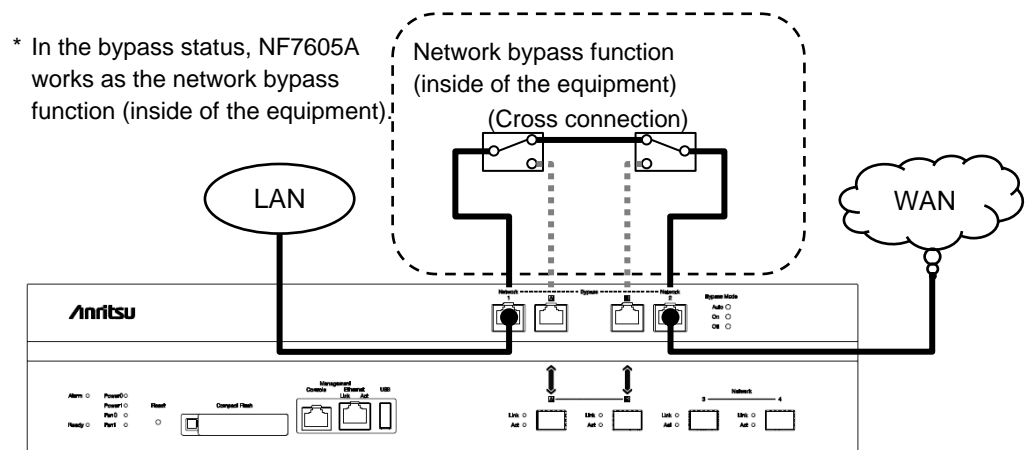


Figure 2.5.2-1 Communication path in the bypass status

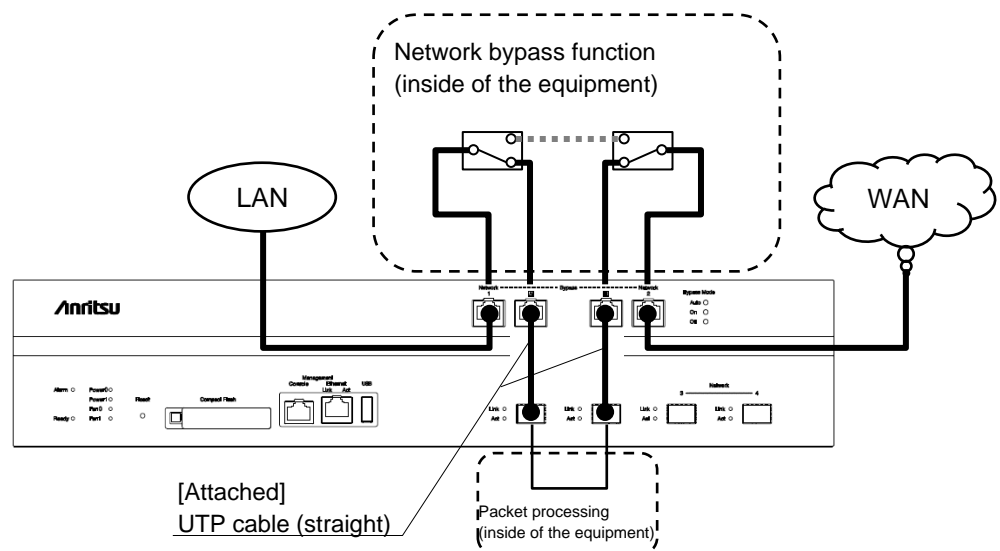


Figure 2.5.2-2 Communication path in the non-bypass status

The detailed cable connection procedure is described below.

1. Mount NY02003A 1000BASE-T SFP to the network port A and B to use the bypass function. For how to mount, see Section 2.6 "Connecting and removing the SFP module".
2. Connect the UTP cable of the line that is subject to the traffic control to the Network port 1 or 2. For how to connect the UTP cable, see Section 2.8 "Connecting and removing the UTP cable".

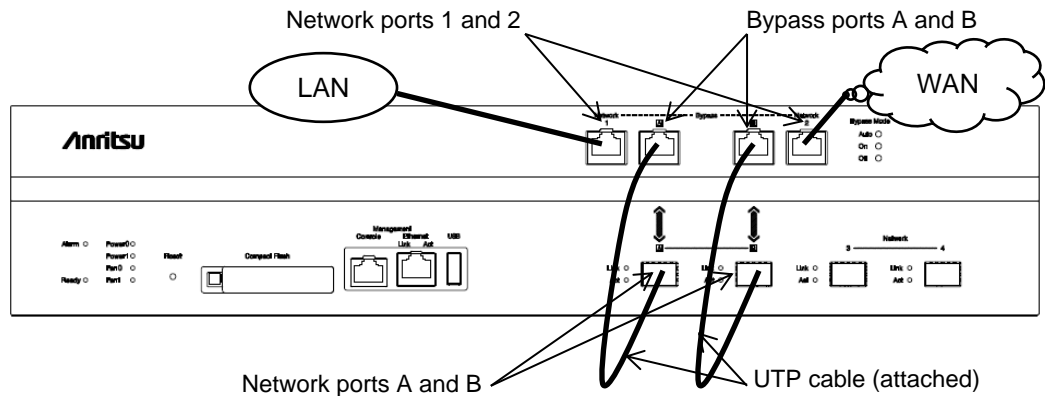


Figure 2.5.3-3 Front view of this equipment (NF7605A)

3. Use the NY06011A UTP cable that comes with NF7605A to connect the bypass port A/B and Network port A/B, respectively. For how to connect the UTP cable, see Section 2.8 "Connecting and removing the UTP cable".
4. When using the Network port 3 and 4, mount the SFP module. For how to mount, see Section 2.6. "Connecting and removing the SFP module".
5. Connect the cable of the line that is subject to the traffic control to the SFP module. For the cable connection method, see Section 2.8 "Connecting and removing the UTP cable".

If the network bypass function is not used, mount the desired SFP module to Network port A and B and connect the line cable that is subject to the traffic control to use this equipment. In this case, set the bypass setting to "off" before use.

Replace Network port A with Network port 1, and Network port B with Network port 2 to set the equipment.

Notes:

1. Be sure to use the cable that comes with NF7605A for connection of the bypass port A/B and Network port A/B.
2. NF7605A has the built-in mechanic relay. Click sound is heard at switching, but this is not abnormal status.
3. If the cable of the line that is subject to the traffic control is connected directly to Network port A, B, 3 or 4, the network bypass function is not available.

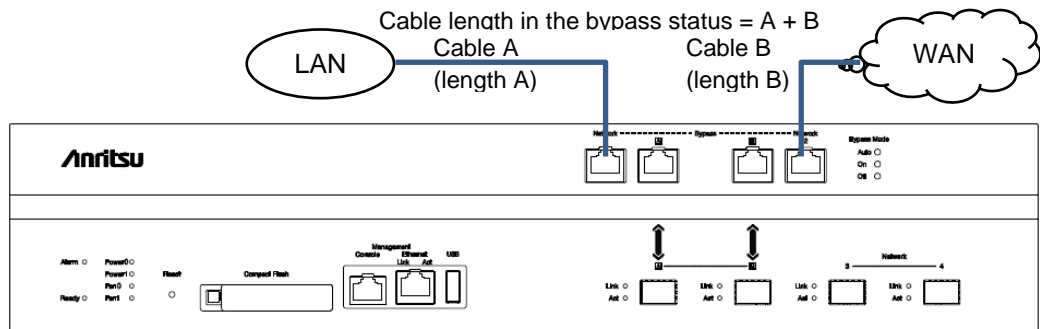
2.5.3 Precautions for network design

If NF7605A is in the bypass status, the opposed machines are directly connected via NF7605A. Therefore, the communication cable length increases.

Even in the bypass status, be careful to prevent the communication cable length between the opposed machines from exceeding the communication standard value.

Considering a loss inside due to the bypass function and communication in the bypass status, it is recommended to adjust the length of the cables to connect Network ports 1 and 2 to the following value in total.

Check the length in the communication environment to be actually used.



- Total length of cable A and cable B
1000BASE-T: 60 m or less

If the Network port is in the bypass status, NF7605A is disconnected from the network, and the traffic control does not work.

2.6 Connecting and removing the SFP module

The Network port of this device is compatible with SFP+/SFP.

NF7601A is compatible with both the SFP+ and SFP. NF7602A and NF7605A are compatible with the SFP only.

The SFP+/SFP (described as SFP hereafter) module is a transceiver module that enables hot swapping. The external view of the SFP module is shown below:

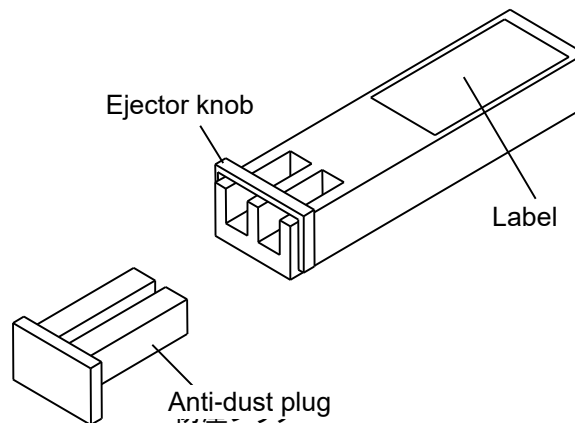


Figure 2.6-1 External view of SFP module (for LC connector)



CAUTION

Use the optional SFP module. Using the incorrect optional SFP module is out of warranty. In addition, may cause failure.

Use the adapted SFP module to the communication standard of the opposing device and cable. Using the incorrect adapted SFP module is out of warranty. In addition, may cause failure.

Note:

Please refer to the Appendix A “I/O Interface Specifications” for details such as the communication standard and the type of cable and SFP module.

2.6.1 Cleaning SFP module and the optical fiber cable

Using an optical fiber cable with dust or dirt attached to the ferrule end surface may deteriorate the performance. Before using this device, sufficiently clean the optical fiber cable to be connected and the ferrule end surface of the SFP module.

2.6.1.1 Cleaning SFP module

Before installing the SFP module in the Network port, clean the optical cable fitting surfaces of SFP module and the ferrule end surfaces. For cleaning the ferrule end surface inside SFP module, use a commercially-available stick cleaner.

An example of a commercially-available stick cleaner is shown below:

<Procedure>

- (1) Insert the stick cleaner (for a $\phi 1.25$ LC connector) in straight as shown in the figure below:
- (2) Lightly push the stick cleaner until the stick touch the end lightly and rotate it 4 to 5 times clockwise.
* Holding the support part allows the load to be transmitted easily.
- (3) Pull out the stick while rotating it clockwise.

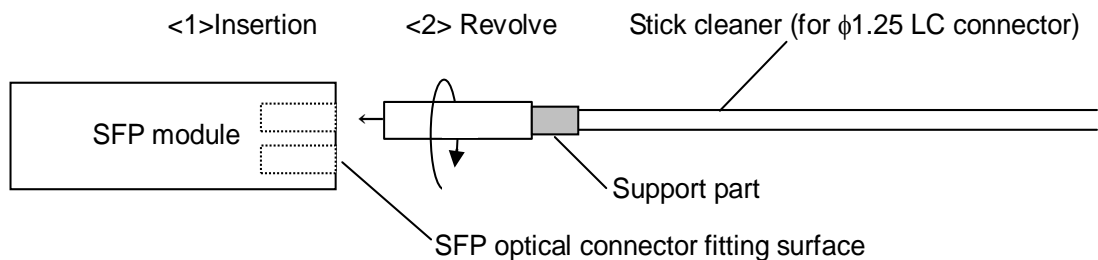


Figure 2.6.1.1-1 Example of the use of stick cleaner



CAUTION

When cleaning and checking the ferrule end surface of the SFP module, remove it from this device. Laser light may enter your eyes, causing eye injury.

2.6.1.2 Cleaning the optical fiber cable

Before connecting the optical fiber cable, clean the ferrule end surface. For cleaning the ferrule of the optical fiber cable, use a commercially-available ferrule cleaner.

An example of a commercially-available ferrule cleaner is shown below:

<Procedure>

- (1) Pull the ferrule cleaner lever to pull out the cleaning surface.

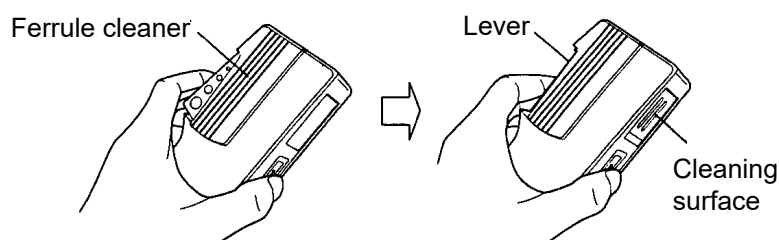


Figure 2.6.1.2-1 Example of the ferrule cleaner (1)

- (2) Hold the lever, push the ferrule end surface of the optical connector toward the cleaning surface, and scrub it in one direction.

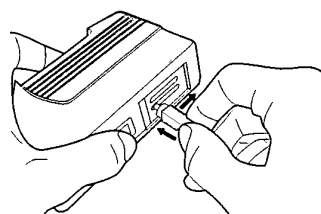


Figure 2.6.1.2-2 Example of the ferrule cleaner (2)

Precautions when cleaning

1. Do not use already-used cleaning surface.
2. Do not use a cotton-tipped stick since fibers might become attached to the ferrule.
3. Put a cap on the unused connector.

For details, see the manual of ferrule cleaner.



CAUTION

Do not look into the connector portion of the optical fiber cable. Laser light may be emitted from the connected device, which might enter your eyes, causing eye injury.

2.6.2 Installing and removing SFP module

2.6.2.1 Installing SFP module

The SFP module can be inserted and removed without turning off this device. At this time, handle the SFP module with the SFP dust-proof plug.

<Procedure>

- (1) Remove the SFP cage plug of the Network port to which the SFP module will be inserted.

Note:

Keep SFP cage plug for future use.

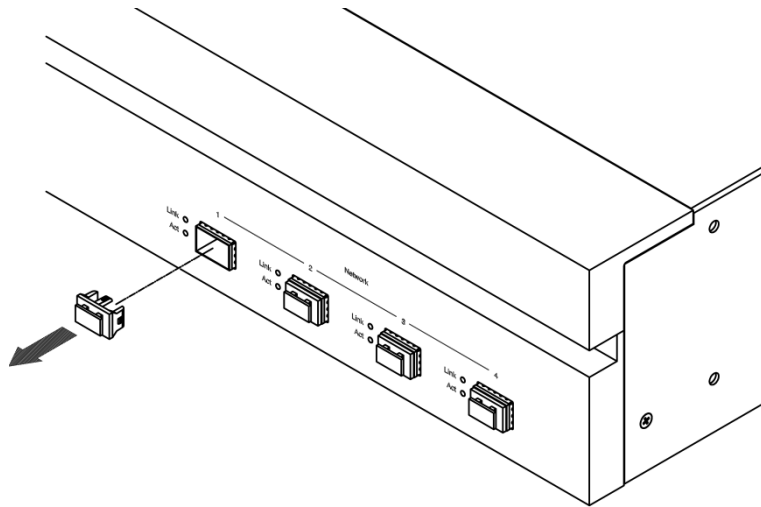


Figure 2.6.2.1-1 Removing the SFP cage plug



CAUTION

When the SFP module is not installed to the Network port, do not remove the SFP cage plug to the Network port. Dust might enter the Network port. This may cause failure.

- (2) Install the SFP module into the Network port with the latch downward and the "ejector knob" fold in the SFP module. Insert the SFP module securely.

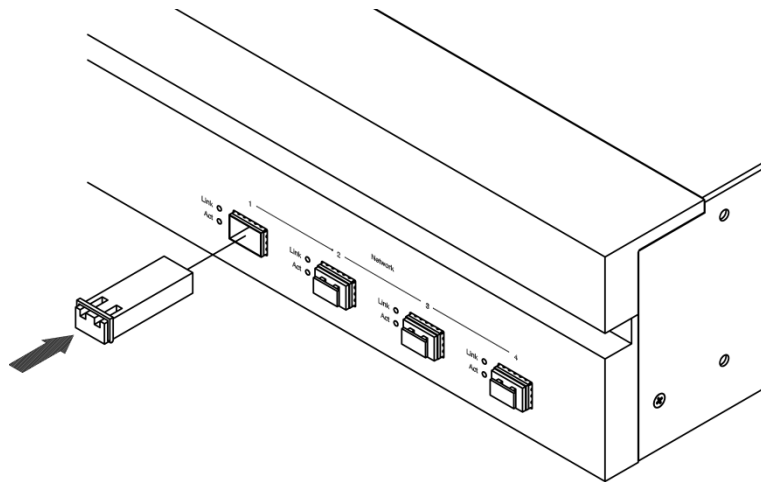


Figure. 2.6.2.1-2 Inserting SFP module



CAUTION

Keep the SFP module ejector knob folded when inserting the SFP module. If the SFP module is inserted while the ejector knob not folded, the module may not be inserted securely.

2.6.2.2 Removing SFP module

<Procedure>

- (1) Tilt the SFP module ejector knob forward, and pinch the ejector knob to pull out the SFP module.

At this time, pull out the knob straight toward the SFP module. If it is pulled out at an angle, the SFP module lock will not be removed and SFP module may be damaged.

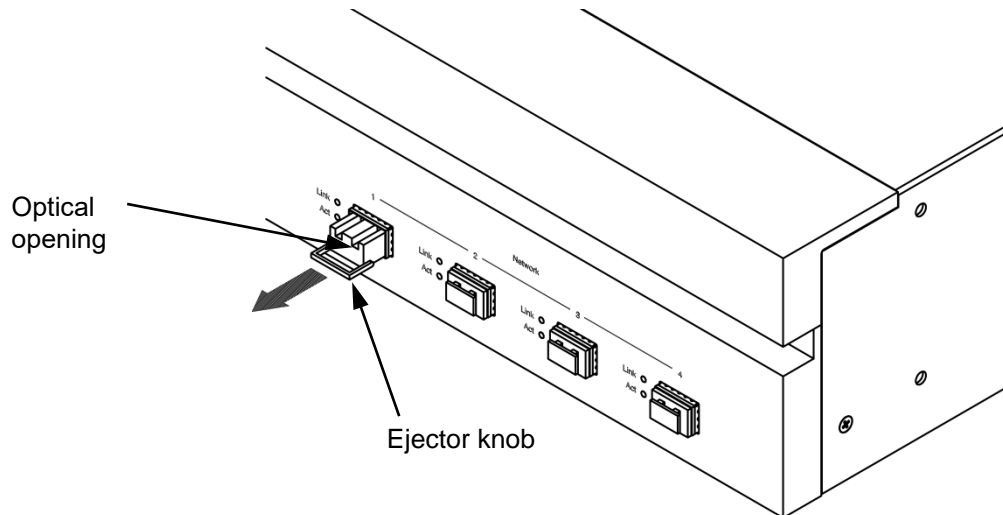


Figure 2.6.2.2-1 Removing SFP module

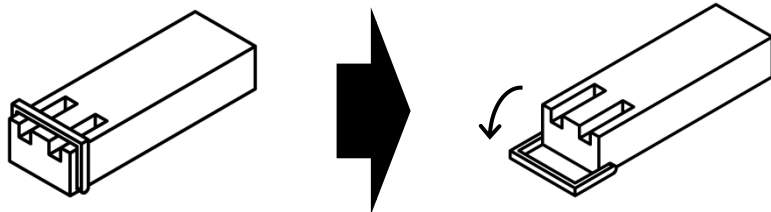


Figure 2.6.2.2-2 Operation of SFP module ejector knob forward



CAUTION

1. Do not look into the SFP module optical opening. Laser light may enter your eyes, causing eye injury. When inserting and removing the SFP module, laser light may be emitted from the optical opening.
 2. Do not insert and remove the SFP module with the optical fiber cable connected. Insertion and removal with the optical fiber cable connected may damage the SFP module and optical fiber cable.
 3. When an optical fiber cable is not connected to the SFP module, attach the dust-proof plug to the SFP module. Dust might enter the SFP module. This may cause failure.
 4. Do not touch the electrical connector of the SFP module. Touching the connector may cause failure.
-

2.7 Connecting and removing the optical fiber cable

2.7.1 Connecting the optical fiber cable

<Procedure>

- (1) Remove the dust-proof plug of the SFP module to be connected to the optical fiber cable.

Note:

Keep dust-proof plug for future use.

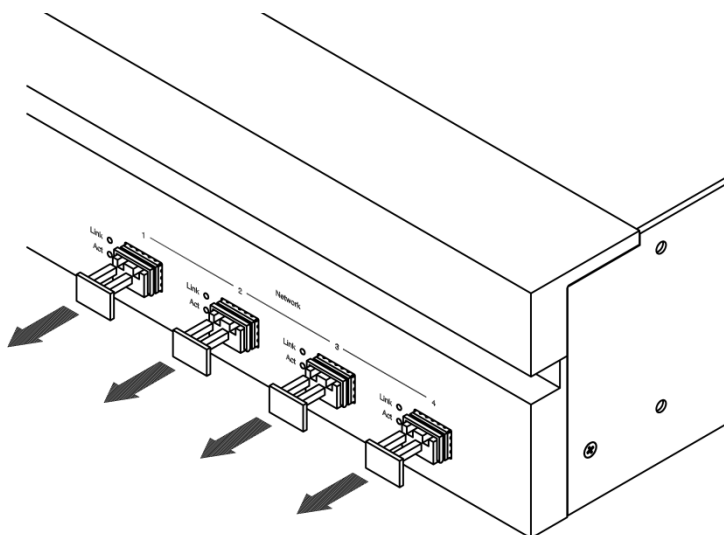


Figure 2.7.1-1 Removing the dust-proof plug



CAUTION

When the optical fiber cable is not connected to the SFP module, attach the dust-proof plug to the SFP module. Dust might enter the SFP module. This may cause failure.

- (2) Remove the ferrule dust caps of the optical fiber cable LC connector.

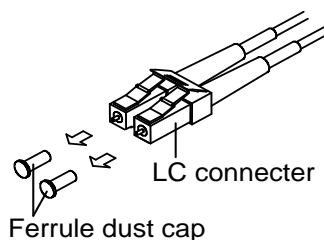


Figure 2.7.1-2 Removing the ferrule dust cap

- (3) Connect the optical fiber cable into the SFP module. Push it until engage the latch.

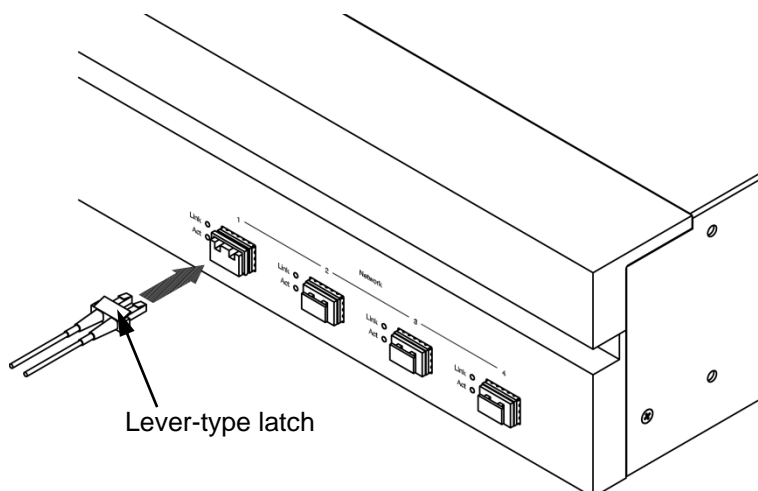


Figure 2.7.1-3 Connect the optical fiber cable

2.7.2 Removing the optical fiber cable

<Procedure>

- (1) Push the lever-type latch of the optical fiber cable with your fingers to disengage the latch, and gently remove the cable.

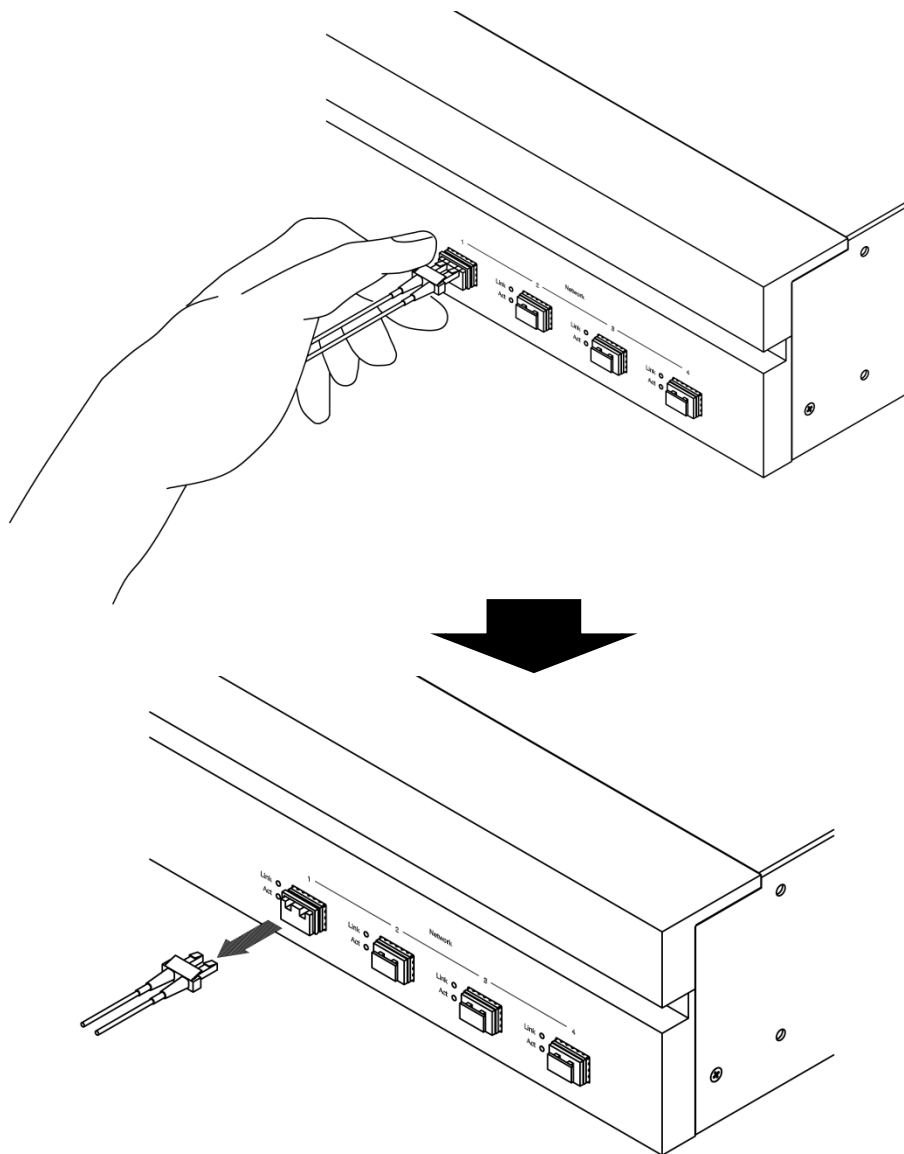


Figure 2.7.2-1 Removing the optical fiber cable

- (2) Attach the dust-proof plug of the SFP module.

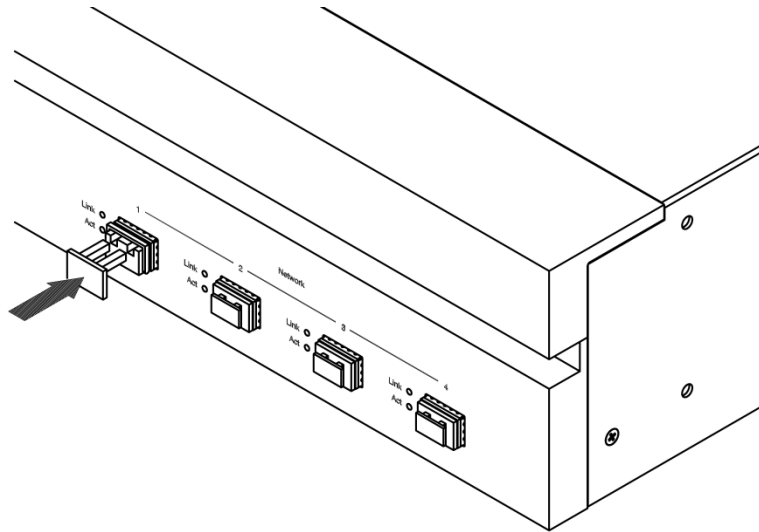


Figure 2.7.2-2 Attaching the dust-proof plug



CAUTION

When the optical fiber cable is not connected to the SFP module, attach the dust-proof plug to the SFP module. Dust might enter the SFP module. This may cause failure.

2.8 Connecting and removing the UTP cable

2.8.1 Connect the UTP cable

Insert the UTP cable into the Ethernet port for management.
Push in the cable until it latches.

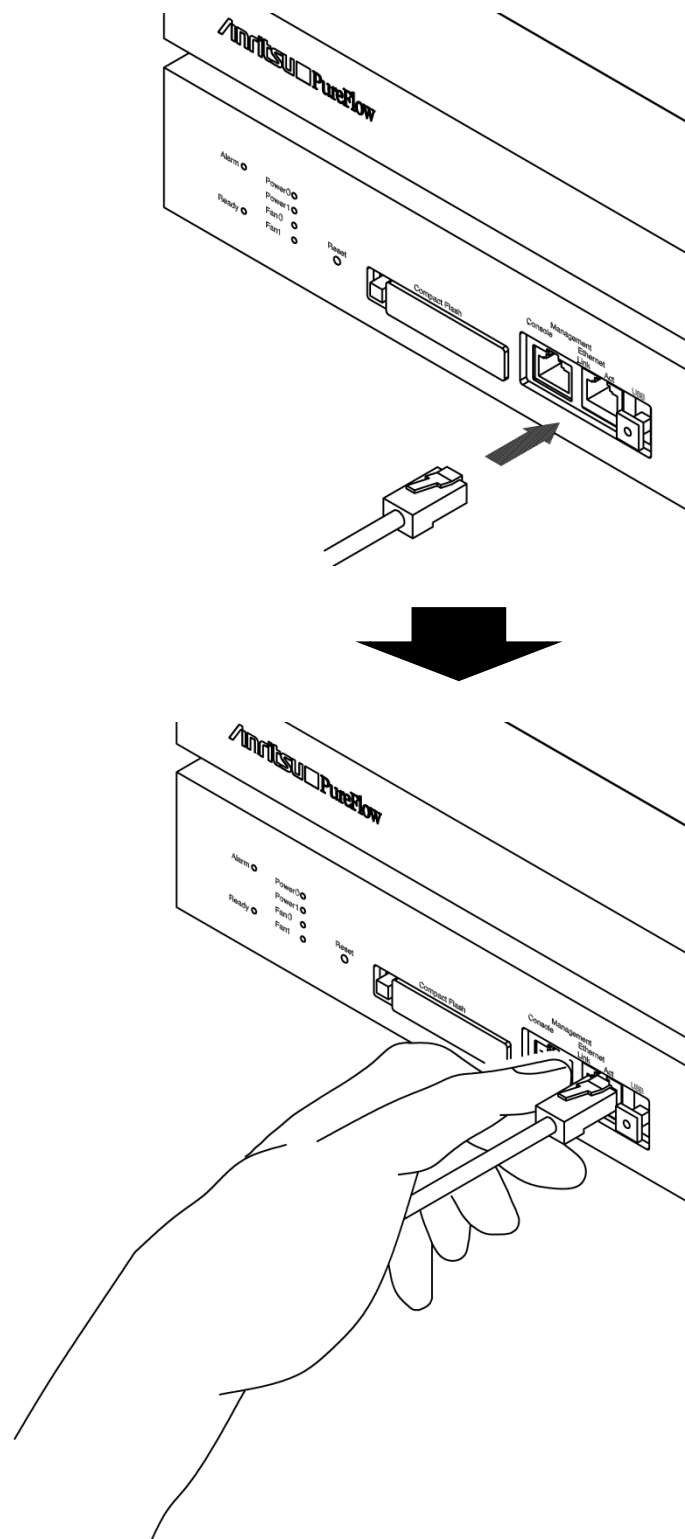


Figure 2.8.1-1 Inserting the UTP cable

2.8.2 Removing the UTP cable

Push the latch of the UTP cable with your fingers to disengage the latch, and gently remove the cable.

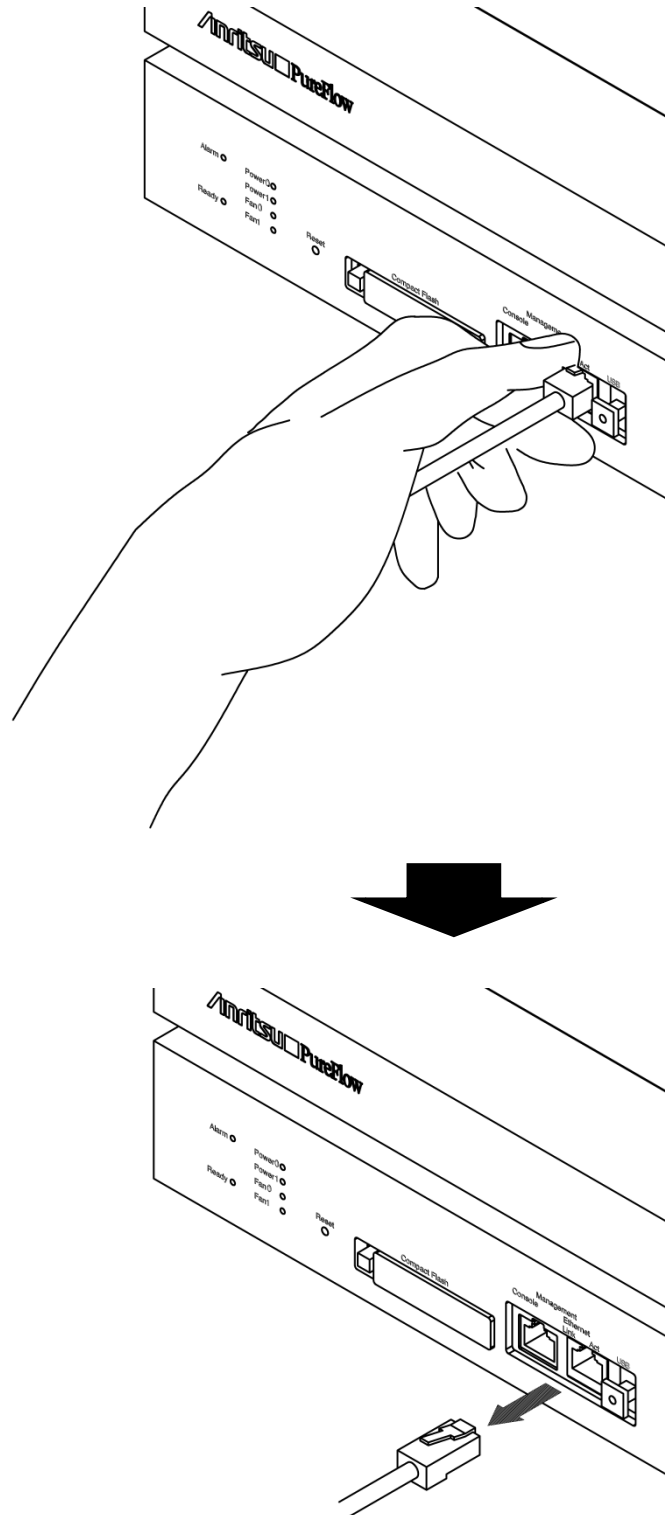


Figure 2.8.2-1 Removing the UTP cable

2.9 Inserting and removing the CF card

The CF card is used for setting parameters and downloading, uploading and executing software. For details, read the attached “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

Use the optional CF card. Use of incorrect CF card may cause failure. Format the CF card in FAT16 or FAT32 format.

<Procedure for inserting CF card>

- (1) Remove the CF cap.

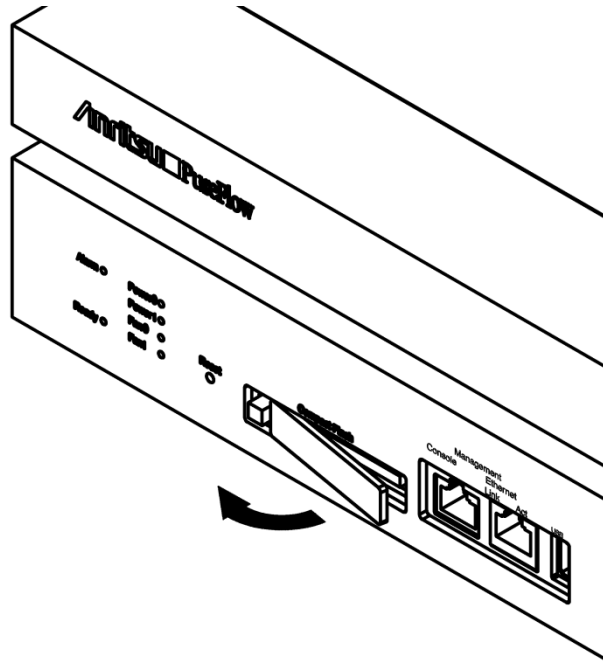


Figure 2.9-1 Removing the CF cap

- (2) Push the CF card until the ejector pops out.

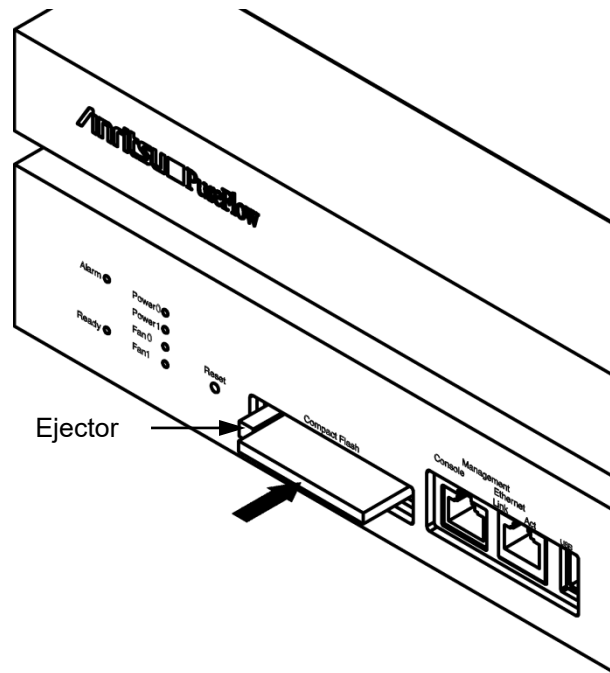


Figure 2.9-2 Inserting the CF card

<Procedure for removing the CF card>

- (1) Push the ejector to remove the CF card.

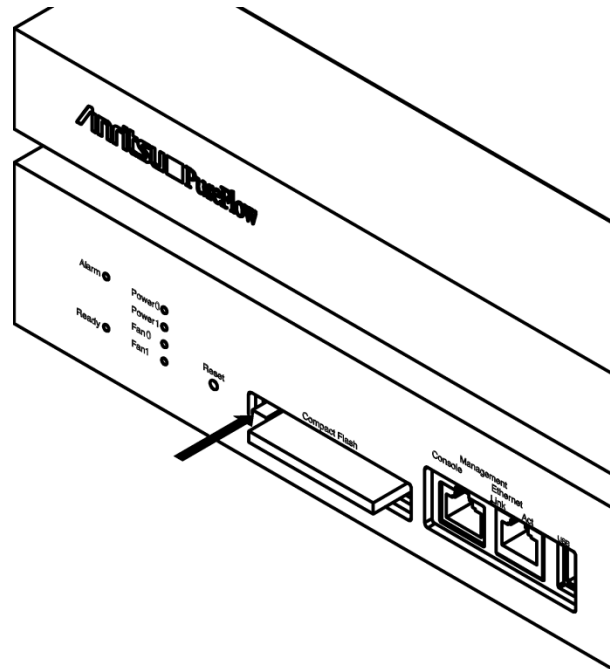


Figure 2.9-3 Removing the CF card

- (2) Attach the CF cap.

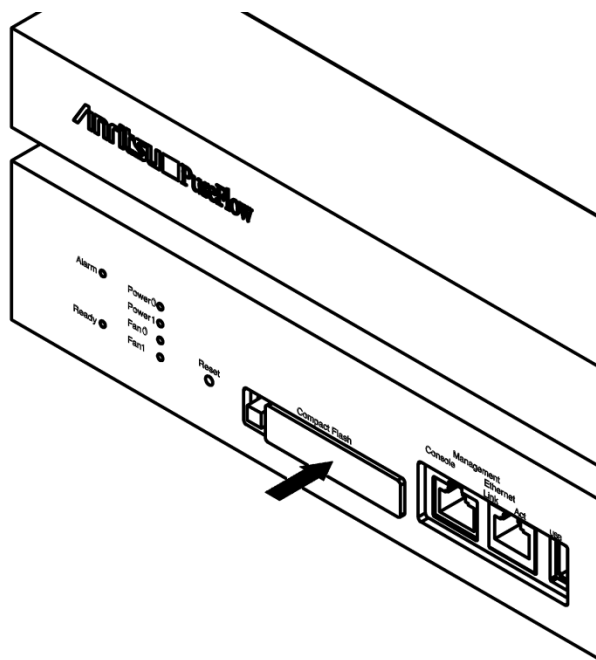


Figure 2.9-4 Attaching the CF cap

For details about how to use the CF card, read “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

2.10 Connecting and removing the USB memory

The USB memory is used for setting parameters and downloading, uploading and executing software. For details, read the attached “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

Table 2.10-1 shows the USB memory whose operation is confirmed. To save important information in the USB memory, it is recommended to verify the USB memory. Format the USB memory in FAT16 or FAT32 format.

Table 2.10-1 USB memory whose operation is confirmed

Item number	Manufacturer	Model name
1	Transcend Information, Inc.	TS4GJF300

<Procedure for connecting the USB memory>

- (1) Remove the USB cap.

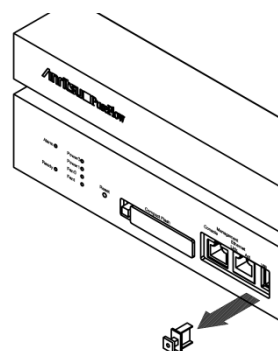


Figure 2.10-1 Removing the USB cap

- (2) Paying attention to the connector direction, insert the USB memory right to the back.

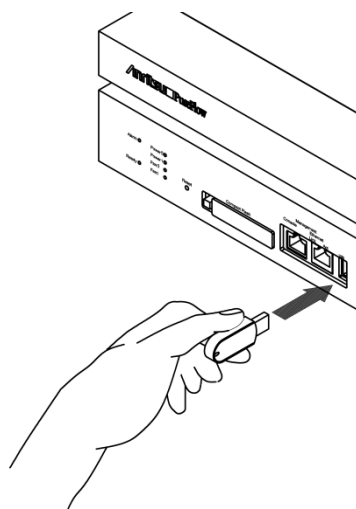


Figure 2.10-2 Connecting the USB memory

<Procedure for removing the USB memory>

- (1) Pinch the USB memory and gently remove it.

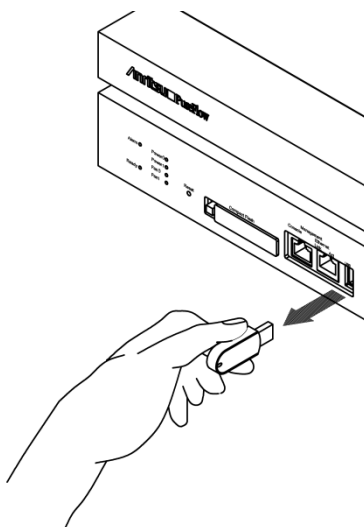


Figure 2.10-3 Removing the USB memory

- (2) Attach the USB cap.

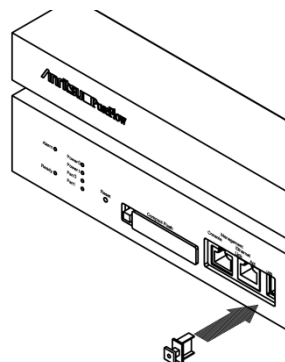


Figure 2.10-4 Attaching the USB cap

For details about how to use the USB memory, read “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

2.11 Daily inspection

- (1) Check the Alarm LED for device errors.
If the Alarm LED lights in red, check the Power LED and Fan LED.
If these LEDs are blinking, check the units.
If these units have failed, replace it.
For detail, see chapter 5 “Troubleshooting”.



CAUTION

If the Alarm LED does turn off even after the units are replaced, or if the cause is unknown, turn off the power immediately, and contact your dealer.

- (2) Clean dust from around this device.
Regularly clean dust accumulated on the power plug.



WARNING

-
- **Dust accumulated on the power plug may cause a fire.**
 - **Do not block the air intake port and exhaust port. Blocking the air holes will increase the internal temperature of the device, possibly causing a failure.**
-

- (3) NF7605A has the built-in mechanical relay. This function works only in the case of an abnormality. Therefore, it is recommended to turn on or off the network bypass function nearly once per year and check how the bypass function works.
By the command or turning the power off, the bypass function operation can be checked. For the procedures for shifting to the bypass status, refer to the Configuration Guide: TCP Acceleration Edition (NF7600-W013E).

2.12 Packing

2.12.1 How to pack this device

Place it in the packing materials used for delivery.

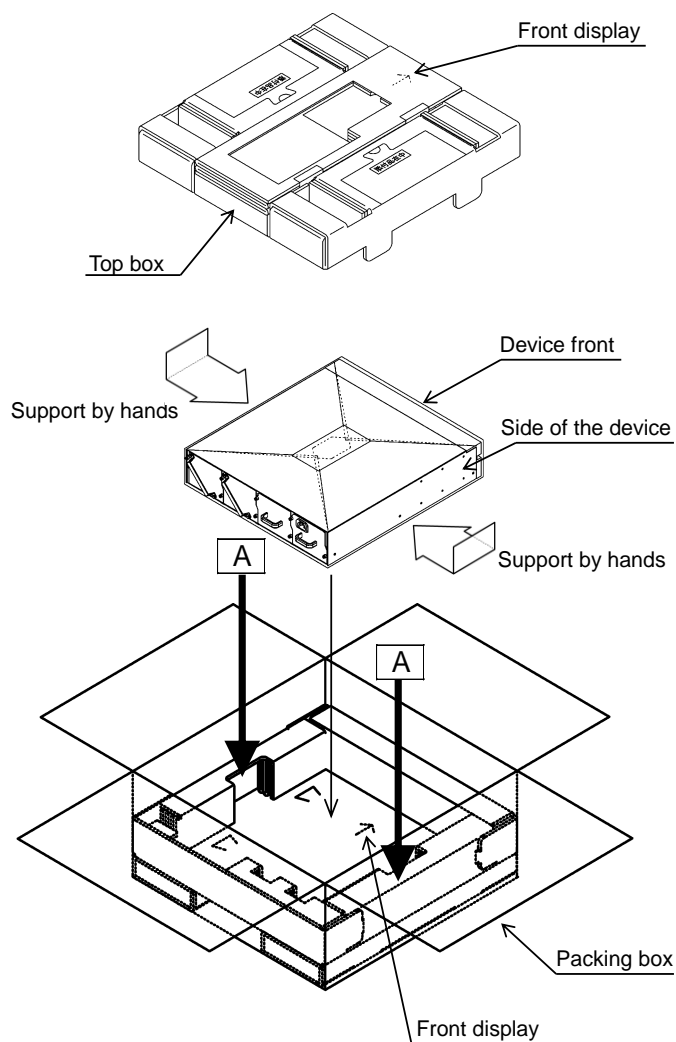


Figure 2.12.1-1 How to pack this device

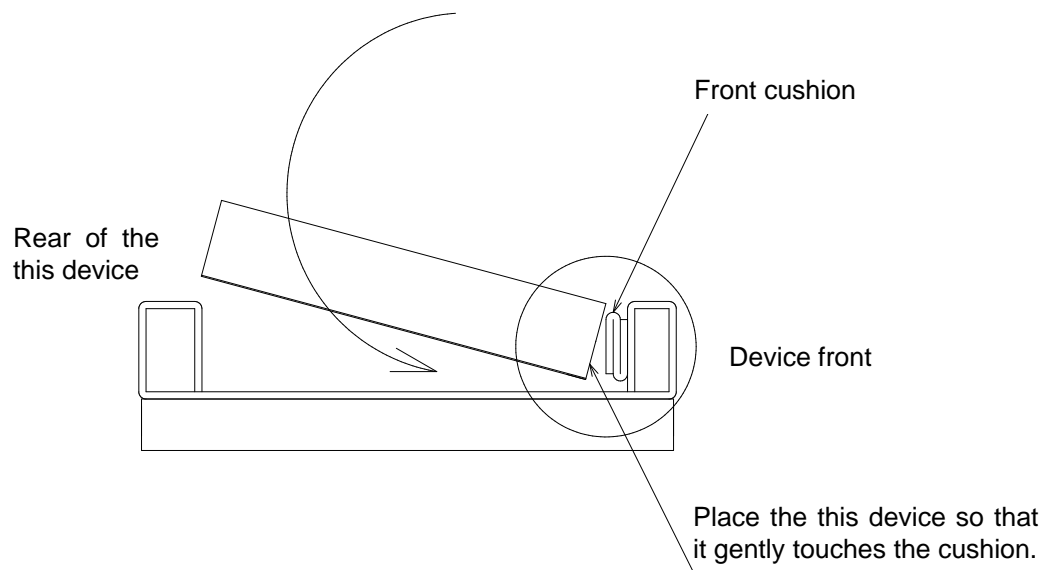


Figure 2.12.1-2 Side view of packing box

- (1) Support this device by holding both the side surfaces and the bottom.
- (2) Place this device into the packing box so that your hands holding as described in step (1) can enter the area indicated by A, and it so that this device front gently hits the cushion at the front of the packing box.
- (3) Align the direction with the packing box front indication and gently set the top box into the packing box.
- (4) Close the packing box.



CAUTION

- 1. Do not pack this device with the SFP/SFP+ module or cable connected. Otherwise, the SFP/SFP+ module, cable and this device may cause failure.**
- 2. Insert the SFP cage plug in the Network port. If not dust might enter the SFP cage connector. This may cause failure.**
- 3. Hold on the both sides of this device. Do not hold protrusions or grooves. They are slippery and you might drop this device, causing injury or damaging the device.**

2.12.2 Re-transportation

For re-transport of this device, contain the packing material in the packing box.

Keep the packing materials such as the packing box for future re-transportation.



CAUTION

Re-transporting the device without using the packing materials used for delivery may cause failure.

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Chapter 3 Startup and Shutdown

This chapter describes how to start up and set the power supply of this device.

3.1	Supplying power	3-2
3.2	Power supply redundancy	3-6
3.3	Settings	3-7
	3.3.1 Connecting the console	3-7
	3.3.2 Setting the software license.....	3-9
3.4	Turn off the AC power	3-10

3.1 Supplying power

(1) Checking the power supply and power cord

Check the rating of the power supply for this device and of the AC power cord to be used. Be sure to observe the rating of this device and AC power cord for use.

For the rating of the power supply for this device and of the AC power cord, refer to "Appendix B.3 Power".

WARNING

Be sure to use the dedicated AC power cord within the rating when installing this device. Supply of power that exceeds the rating may result in insulation breakdown or heat generation, leading to fire.

(2) Connecting the AC power cord

Insert the AC power cord into the AC inlet of the power supply unit at the back of this device.

To construct a power supply redundancy system, install two power supply units and insert AC power cords into both AC inlets.

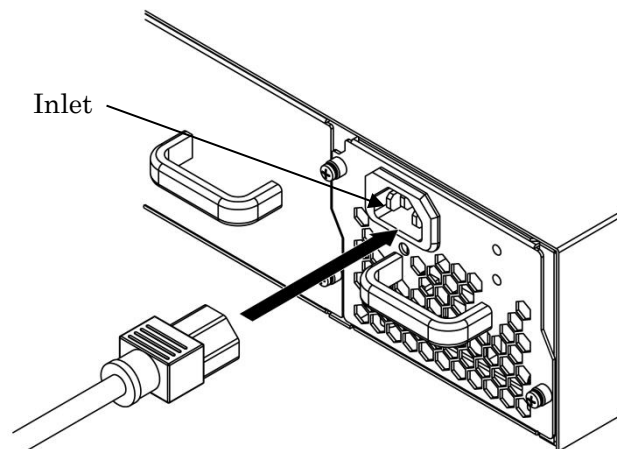


Figure 3.1-1 Connecting the AC power cord (inlet)

(3) Turning on the power

When the AC power cord is plugged into the power outlet, power is supplied to this device. Figure 3.1-2 shows an example of using the AC power cord (NY01004A).

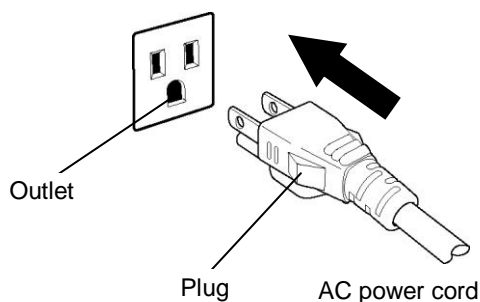


Figure 3.1-2 Connecting the AC power cord (outlet)



WARNING

The power of this device is turned off when the AC power cord is disconnected.

Pay attention to the installation location of this device and to the AC power cord layout so that the power cable can be disconnected from the power outlet easily.

Difficulty in turning the power off may result in leading to fire, or death.

(4) Install the AC Power Cord Clamp

The supplied AC Power Cord Clamp (hereafter referred to as “Cord Clamp”) prevents the AC power cord disconnected by accident. Push the protrusion of the Cord Clamp into the circular hole at the bottom of the AC inlet of the power supply unit, and secure the Cord Clamp to the power supply unit.

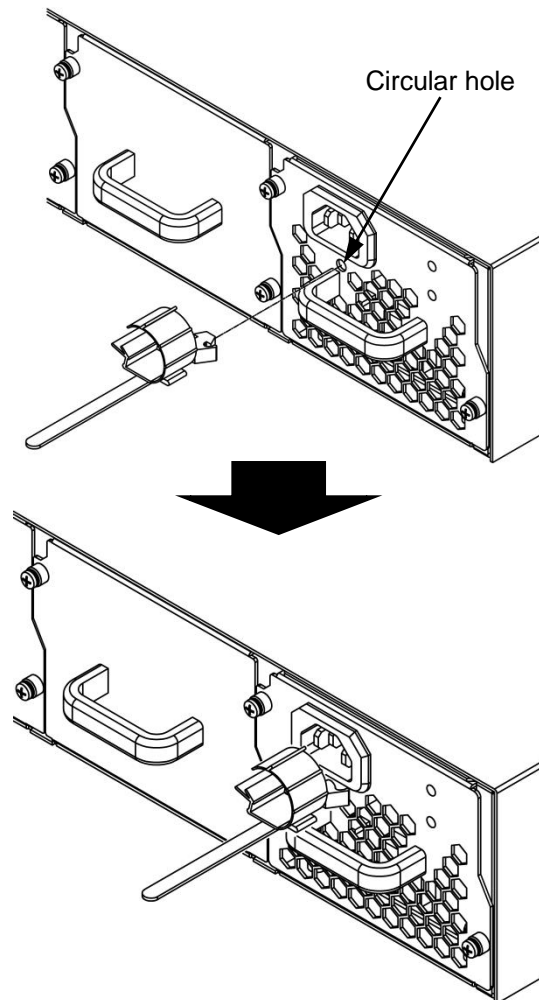


Figure 3.1-3 Clamping the AC power cord



WARNING

The power of this device is turned off when the AC power cord is disconnected.

Install a circuit breaker or switch that can turn the power off when using the AC Power Cord Clamp. Difficulty in turning the power off may result in leading to fire, or death.

(5) Clamping the AC power cord

The AC power cord can be clamped by using the Cord Clamp that was installed as described in step (4).

To clamp the cable, install the clamp head on the base of the AC power cord connector. Install the AC power cord connector on the power supply inlet while sliding the clamp head on the slide portion.

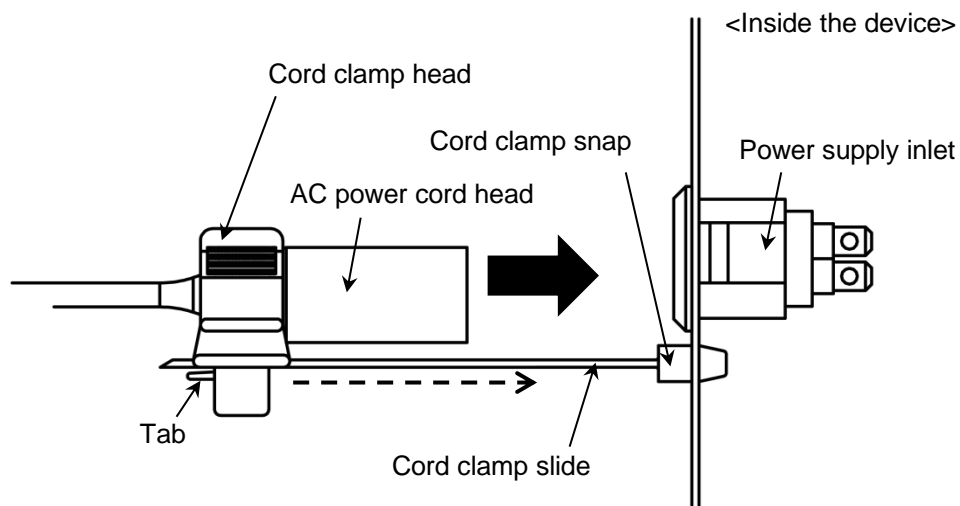


Figure 3.1-4 AC power cord clamp

3.2 Power supply redundancy

This device operates on one power supply unit. However, power supply redundancy can be constructed by using two power supply units. If one power supply unit fails (power is cut off), this construct enables this device to operate on the other power supply unit.

Note:

Power LEDs Indicate error when the Power Supply Unit is installed in the slot but AC power is not being supplied.



WARNING

Do not disassemble the power supply unit. Otherwise, an electric shock may occur, causing injury or death.

3.3 Settings

This device has two management ports: one is the (serial) console port and another is the Ethernet port (10/100/1000BASE-T) for remote access. These are used to display and set the operation parameters of this device.

3.3.1 Connecting the console

You can connect a console to this device to display and set the operation parameters of this device. When connecting a console to the console port, use the supplied console cable PJ012 (RJ-45/DB-9 adapter cable). When using a PC as the console, it must support VT100 terminal emulation.

The console must satisfy the following communication conditions:

Communication method	: Asynchronous
Communication speed	: 9,600 bit/s (factory default setting)
Character length	: 8 bits
Parity	: None
Stop length	: 1 bit
Flow control	: None

The communication speed can be changed by the command **set console baudrate**. Specify the communication speed of the terminal emulation software according to the set communication speed.

For details about related commands, read “Command Reference TCP Acceleration Edition (NF7600-W012E)”.



CAUTION

The connector type of the console port and Ethernet port is the same. Be careful not to connect a network cable to the console port by mistake. Incorrect connection may cause failure.

<Procedure>

- (1) Connect the RJ-45 side of the supplied console cable to the console port.

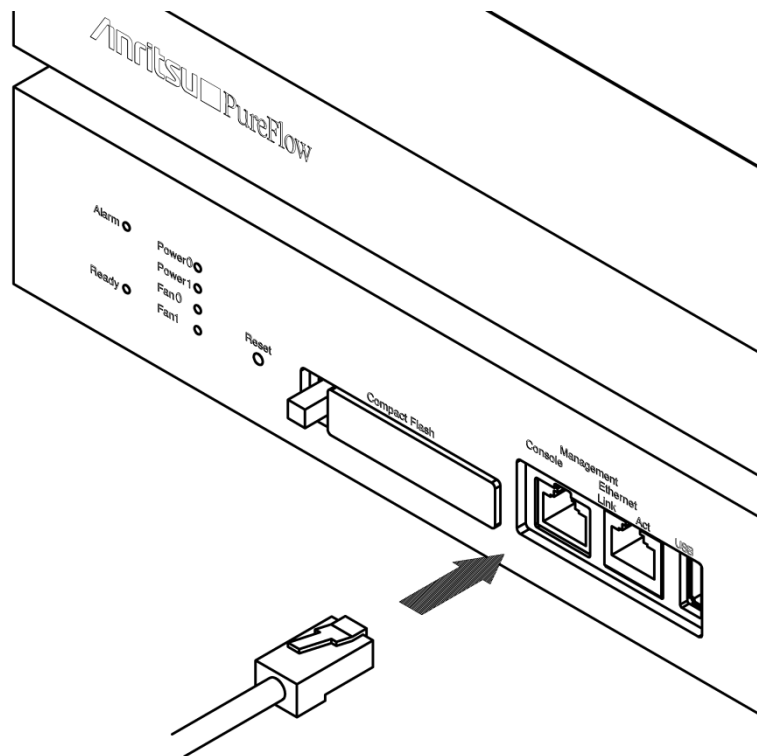


Figure 3.3.1-1 Connecting the console cable (device side)

- (2) Connect the D-sub9 side of the console cable to the console.

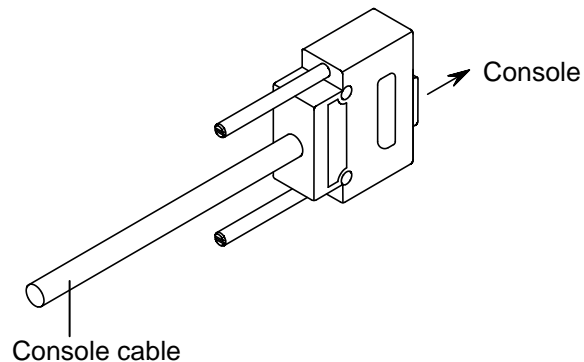


Figure 3.3.1-2 Connecting the console cable (console side)

- (3) Use the console to start the terminal emulation program.

For details about starting up and setting this device and related commands, read “Command Reference TCP Acceleration Edition (NF7600-W012E)” and “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

3.3.2 Setting the software license

When using TCP acceleration function in NF7601A, the optional TCP acceleration software license must be applied to this device. For details of how to apply the license, read "Getting Started Guide", which comes with this device.

After applying this license, startup of this device is completed with the license applied.

For NF7602A and NF7605A, it is not required to set the software license.

3.4 Turn off the AC power

Disconnect the AC power cords from the power outlet for all power supply units to turn off the power supply of this device completely. Figure 3.4-1 shows an example of using the AC power cord (NY01004A).

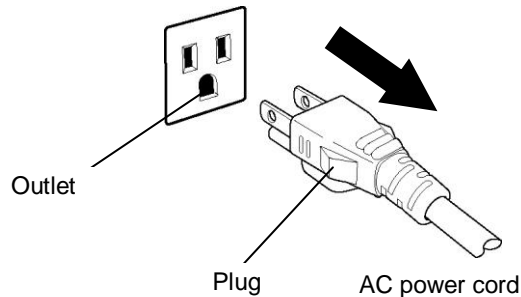


Figure 3.4-1 Turn off the AC power (outlet)

To remove an AC power cord clamped by the AC Power Cord Clamp on the inlet side, disconnect the cable while pulling down the cord clamp head tab.

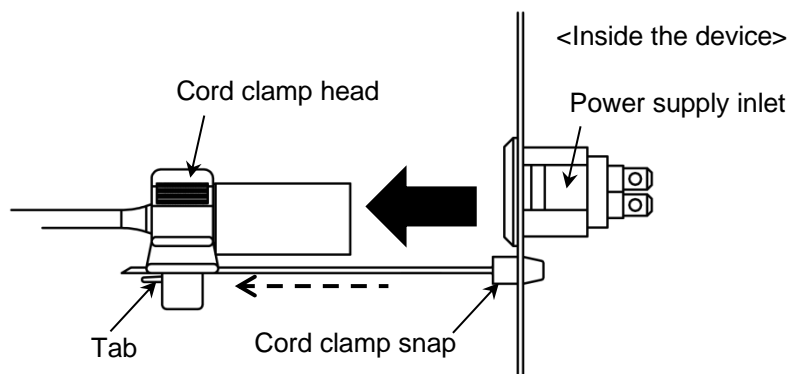


Figure 3.4-2 Unclamping the AC power cord

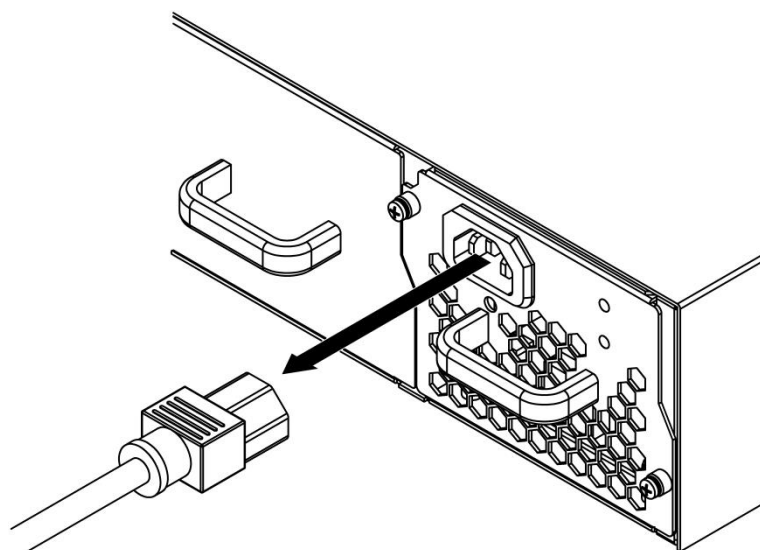


Figure 3.4-3 Disconnected the AC power (inlet)

Note:

After disconnecting the AC power cord, the AC Power Cord Clamp can be removed from the power supply unit. When removing the clamp, hold the snap part to release the latch, and pull out the cord clamp from the unit.



DANGER

Install this device in a location where the operator can easily access the power outlet. The power of this device is turned off when the AC power cord is disconnected from the power outlet.

If using the AC Power Cord Clamp, the AC power cord cannot be removed from the AC inlet immediately. Install a circuit breaker or switch that can turn off the power.

Difficulty in turning off the power may result in leading to fire, or death.

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Chapter 4 Unit Replacement

This chapter describes the procedure for replacing units in this device.

4.1	Procedure for replacing a fan unit.....	4-2
4.1.1	Removing the fan unit	4-2
4.1.2	Attaching the fan unit.....	4-4
4.2	Procedure for replacing a power supply unit.....	4-5
4.2.1	Removing the power supply unit.....	4-5
4.2.2	Attaching the power supply unit.....	4-7
4.3	Procedure for adding a power supply unit.....	4-9
4.3.1	Removing the power unit blank panel	4-9
4.3.2	Attaching the power supply unit.....	4-10

4.1 Procedure for replacing a fan unit

Replace a fan unit according to the following procedure when it indicates an error.

Always be installed both fan unit. Except when replacing the fan unit.

Fan units can be replaced separately without turning off the power.

Prepare the new fan unit (NF7000-U002A) before starting replacement.

4.1.1 Removing the fan unit

<Procedure>

- (1) Loosen the two retaining screws on the fan unit until they can be loosely rotated. Because the screws have a retaining structure, they will not fall off from the fan unit.
- (2) Hold the handle, pull out the fan unit, and then remove the unit from this device. When a fan unit is removed, the fan of the other unit rotates faster.
- (3) Do not touch the removed fan unit until the fan stops rotating completely.
- (4) To dispose of the removed fan unit, follow the regulations in your local area.

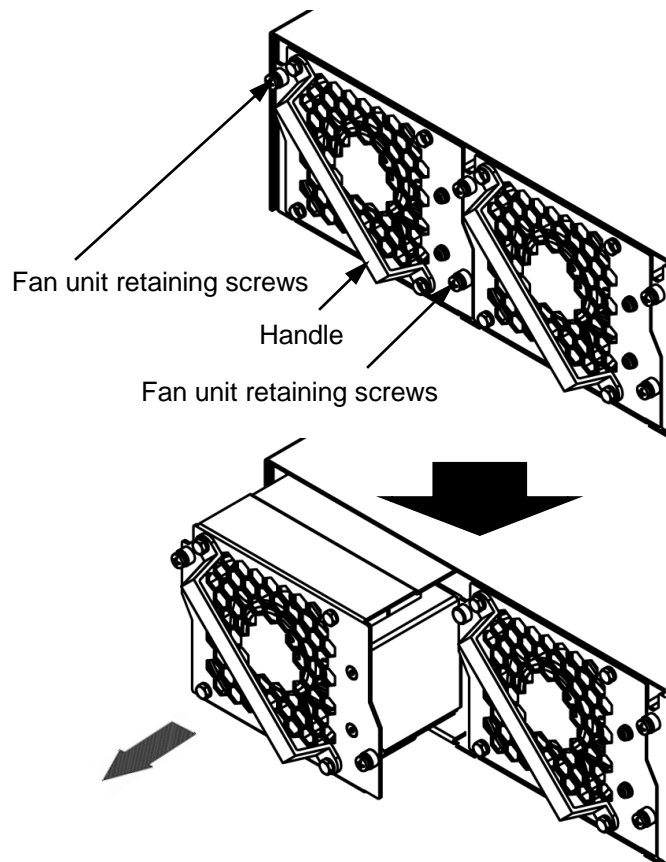


Figure 4.1.1-1 Removing the fan unit



CAUTION

- Do not insert your finger or a stick into the fan while it is rotating. There is a risk of injury.
 - Do not insert your hand or any object into the opening of the fan slot. There is a risk of damaging the internal circuits of this device or of device failure.
 - Replace the fan units one by one. If the both fan units are removed without turning off the power, this device may not fully cool down, causing malfunction or failure.
 - When removing the fan unit, install the new unit according to Section 4.1.2 “Attaching the fan unit”. If the new unit is not reinstalled, this device may not fully cool down, causing malfunction or failure.
-

4.1.2 Attaching the fan unit

<Procedure>

- (1) Prepare the new fan unit (NF7000-U002A).
- (2) Hold the fan unit so that the label faces upwards.
- (3) Insert the fan unit into this device. If the device is operating normally, the fan rotates as soon as it contacts the connector. Do not insert your finger into the fan unit. There is a risk of injury.
- (4) Tighten the two retaining screws on the fan unit.
- (5) Check that the Fan LED corresponding to the attached fan unit lights green.

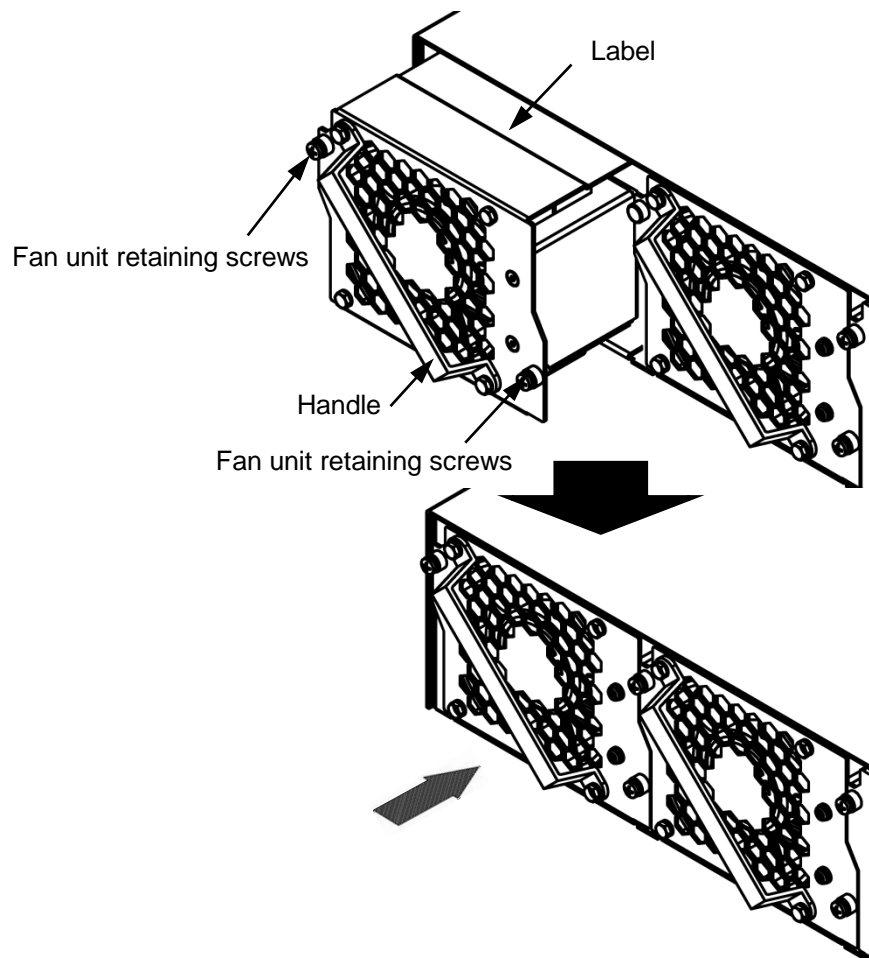


Figure 4.1.2-1 Attaching the fan unit



CAUTION

Do not insert your finger or a stick into the fan while it is rotating. There is a risk of injury.

4.2 Procedure for replacing a power supply unit

4.2.1 Removing the power supply unit

<Procedure>

- (1) Disconnect the AC power cord from the power supply unit, see Section 3.4 “Turn off the AC power”.
- (2) Loosen the two retaining screws on the power supply unit until they can be loosely rotated. Because the screws have a retaining structure, they will not fall off the power supply unit.
- (3) Hold the handle, slide out the power supply unit, and then remove the unit from this device.
- (4) To dispose the removed power supply unit, follow the regulations of your local area.

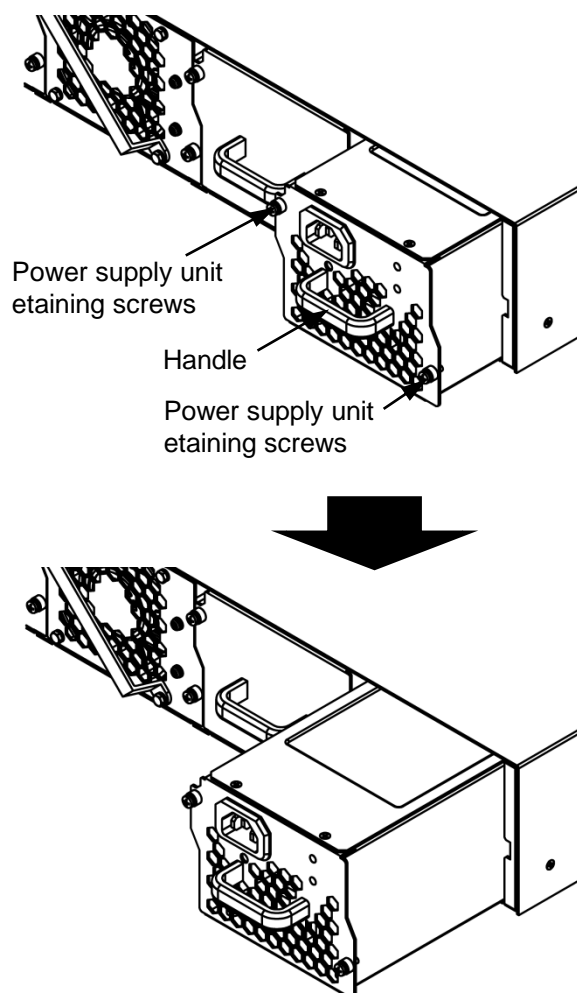


Figure 4.2.1-1 Removing the power supply unit



WARNING

Do not disassemble the power supply unit. The unit has some live parts. Therefore, there is a risk of receiving a severe or fatal electric shock.



CAUTION

The power supply unit is heavy. When pulling it out, pull out the unit half way, and then hold the unit with the other hand. If the unit is not supported, it might fall and cause injury.

When removing the power supply unit, be sure to install the new unit. If the new unit or blank panel is not installed this device may not fully cool down, causing malfunction or failure.

4.2.2 Attaching the power supply unit

<Procedure>

- (1) Prepare the new power supply unit (NF7000-U001A).
Until the (5) step, the AC power cord must not be connected to the power supply unit.
- (2) Hold the power supply unit so that the label faces upwards.
- (3) Hold the entire power supply unit with the hand not holding the handle, and insert the unit into the power slot of this device.
When attaching the power supply unit while the device is operating normally, the fan rotates as the unit contacts the connector of this device.
- (4) Tighten the two retaining screws on the power supply unit.
- (5) Fully insert the AC power cord, see Section 3.1 “Supplying power”.
- (6) Supply AC power to this device.
- (7) Check that the Power LED on the front panel lights green.

Note:

If a redundant configuration is used for the power supply units and AC power is not supplied to either of them, the LED indicates a power slot error. (The Power LED blinks green and the Alarm LED lights.) As long as AC power is supplied to the both power supply units, the LED indicates the normal state. (The Power LED lights green and the Alarm LED is OFF.)

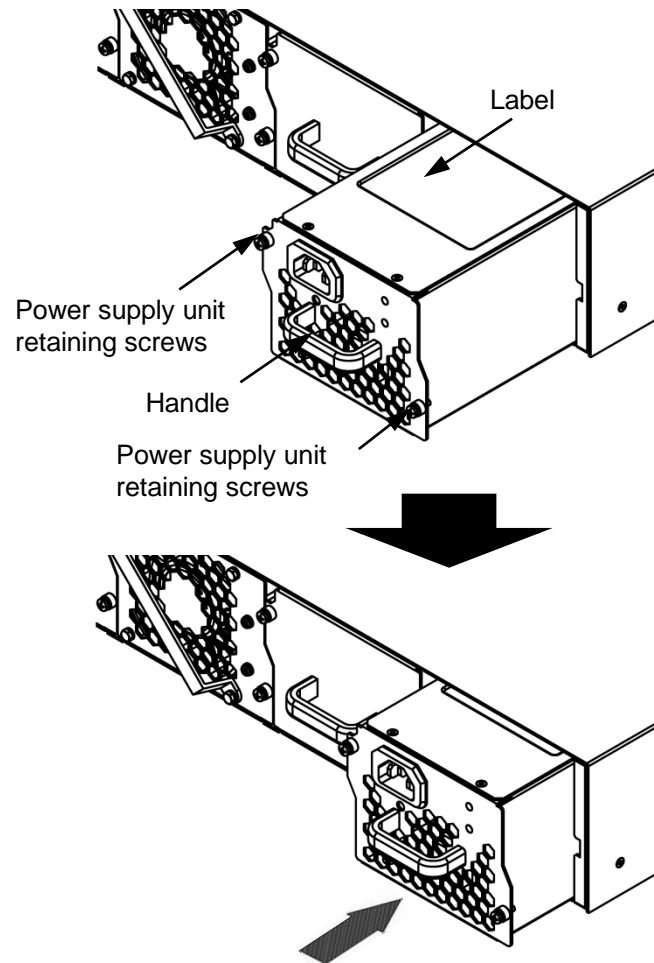


Figure 4.2.2-1 Attaching the power supply unit



CAUTION

Do not install the power supply unit in this device while the AC power cord is connected. There is a risk of device failure.

4.3 Procedure for adding a power supply unit

4.3.1 Removing the power unit blank panel

<Procedure>

- (1) Loosen the two retaining screws on the power unit blank panel until they can be loosely rotated. Because the screws have a retaining structure, they will not fall off the power unit blank panel.
- (2) Hold the handle, pull out the power unit blank panel, and then remove the panel from this device.
- (3) Keep the removed power unit blank panel for future use.

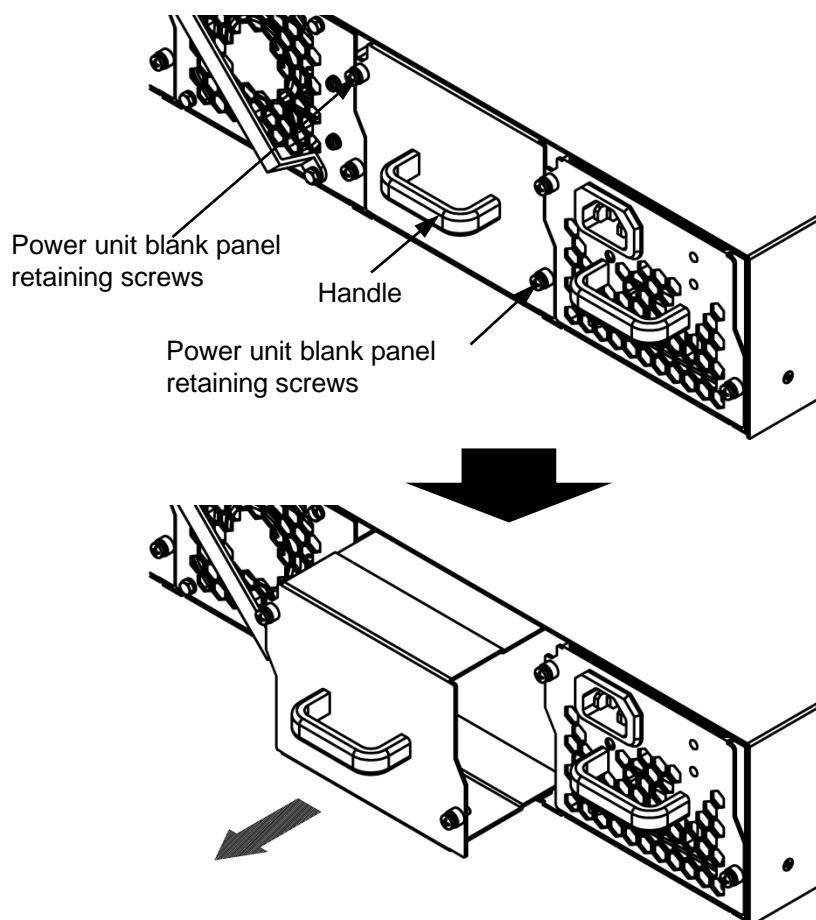


Figure 4.3.1-1 Removing the power unit blank panel



CAUTION

After removing the power unit blank panel, be sure to reattach either a power supply unit or the power unit blank panel. If this is not done, this device may not fully cool down, causing malfunction or failure.

4.3.2 Attaching the power supply unit

Attach the power supply unit to this device according to Section 4.2.2.
“Attaching the power supply unit”.

Chapter 5 Troubleshooting

This chapter describes the procedure for troubleshooting this device.

5.1	LED indicator confirmation	5-2
5.2	Troubleshooting errors	5-3
5.2.1	Power LED is blinking	5-3
5.2.2	Fan LED is blinking	5-4
5.2.3	Other errors	5-5
5.2.4	Requesting restart of the device	5-6
5.3	Order the repair	5-7

5.1 LED indicator confirmation

This device uses LED indicators to indicate the operating status. LEDs on the front panel show the status of this device.

The following shows how to confirm the error from LED indications and troubleshoot the error.

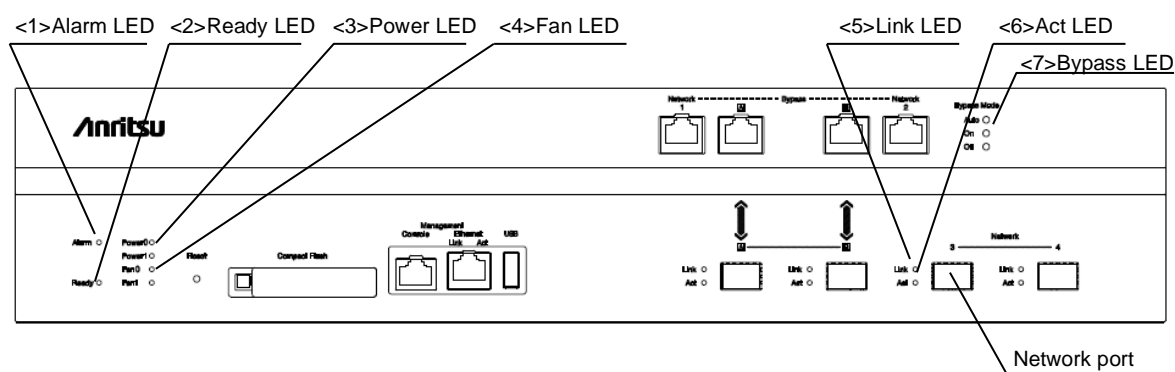


Figure 5.1-1 Names of LEDs

Table 5.1-1 LED indication (when further troubleshooting is required)

● = Lit ○ = OFF ▲ = Blinking – = Indefinite

No.	LED indication									Assumed error
	<1>Alarm (Red)	<2>Ready (Green)	<3>Power (Green)* ¹	<4>Fan (Green)	Network port		<7>Bypass			
					<5>Link	<6>Act	Auto	On	Off	
1	●	○	▲	●	—	—	—	—	—	Power supply unit error
2	●	○	●	▲/○	—	—	—	—	—	Fan unit error or not installed
3	●	○	●	●	—	—	—	—	—	Other Errors
4	—	—	—	—	▲	▲	—	—	—	Requesting reboot of device
5	●	—	—	—	—	—	●	●	—	Error related to the traffic control* ²

***1:** Power0 indicates the state of the power supply unit installed in power slot 0, and Power1 indicates the state of the power supply unit installed in power slot 1. If the power supply unit is not installed, the Power LED for that slot is not lit.

***2:** For errors related to the traffic control, refer to “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

5.2 Troubleshooting errors

5.2.1 Power LED is blinking

<Troubleshooting flow when the Alarm LED is on and Power LED is blinking>

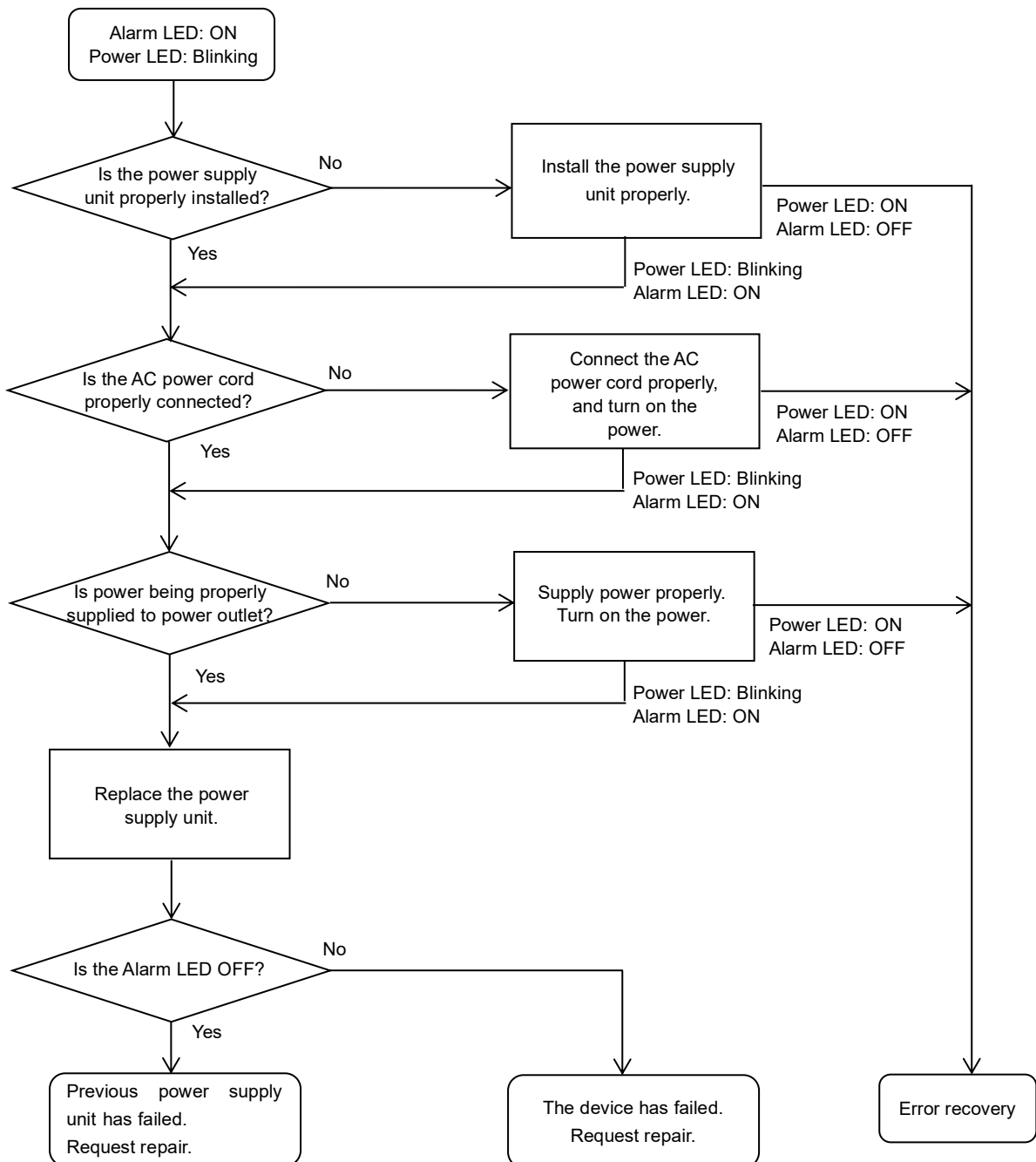


Figure 5.2.1-1 Error investigation flow when the Power LED is blinking

5.2.2 Fan LED is blinking or off

<Troubleshooting flow when Alarm LED is on and Fan LED is blinking or off>

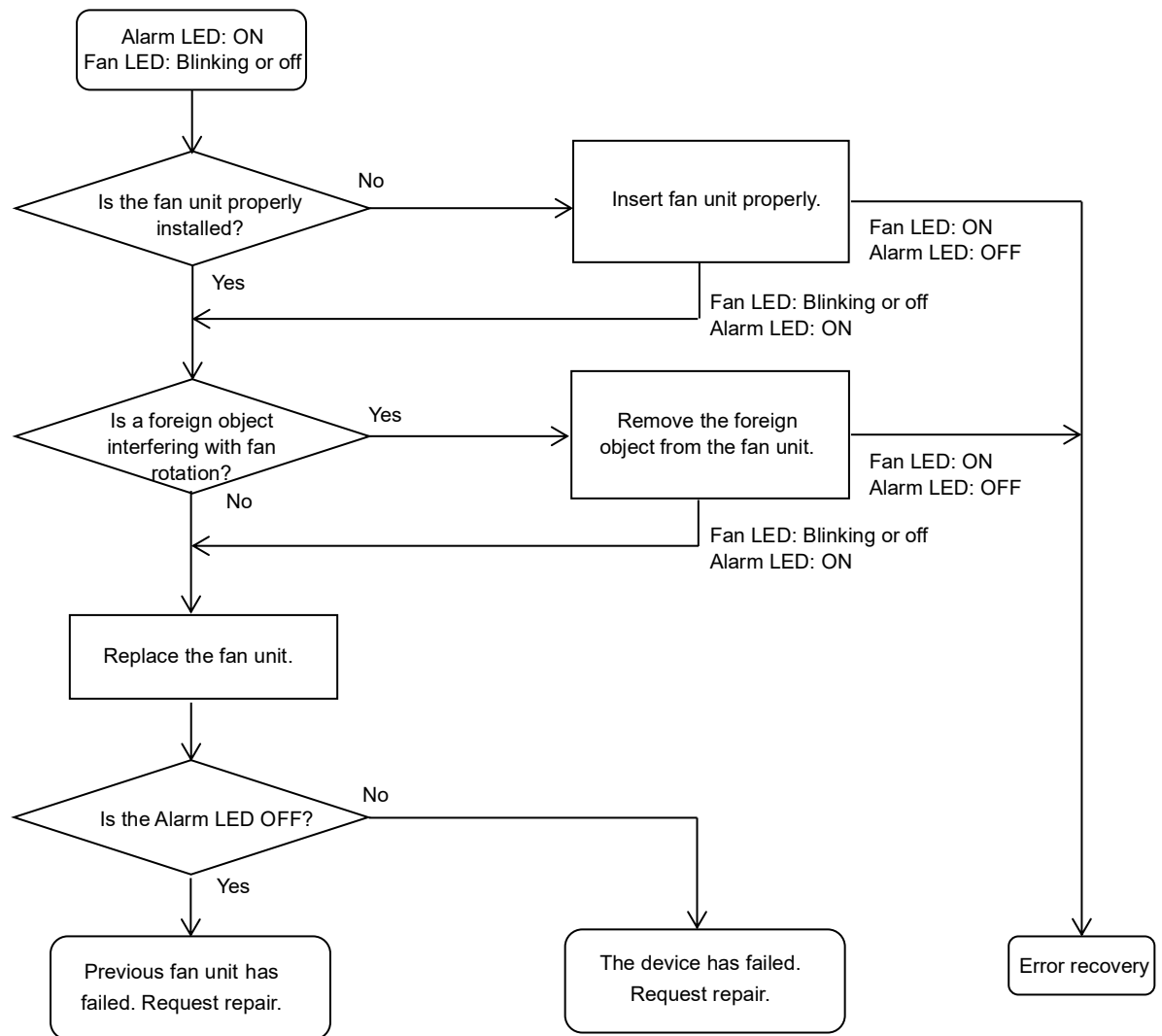


Figure 5.2.2-1 Error investigation flow when the Fan LED is blinking

5.2.3 Other errors

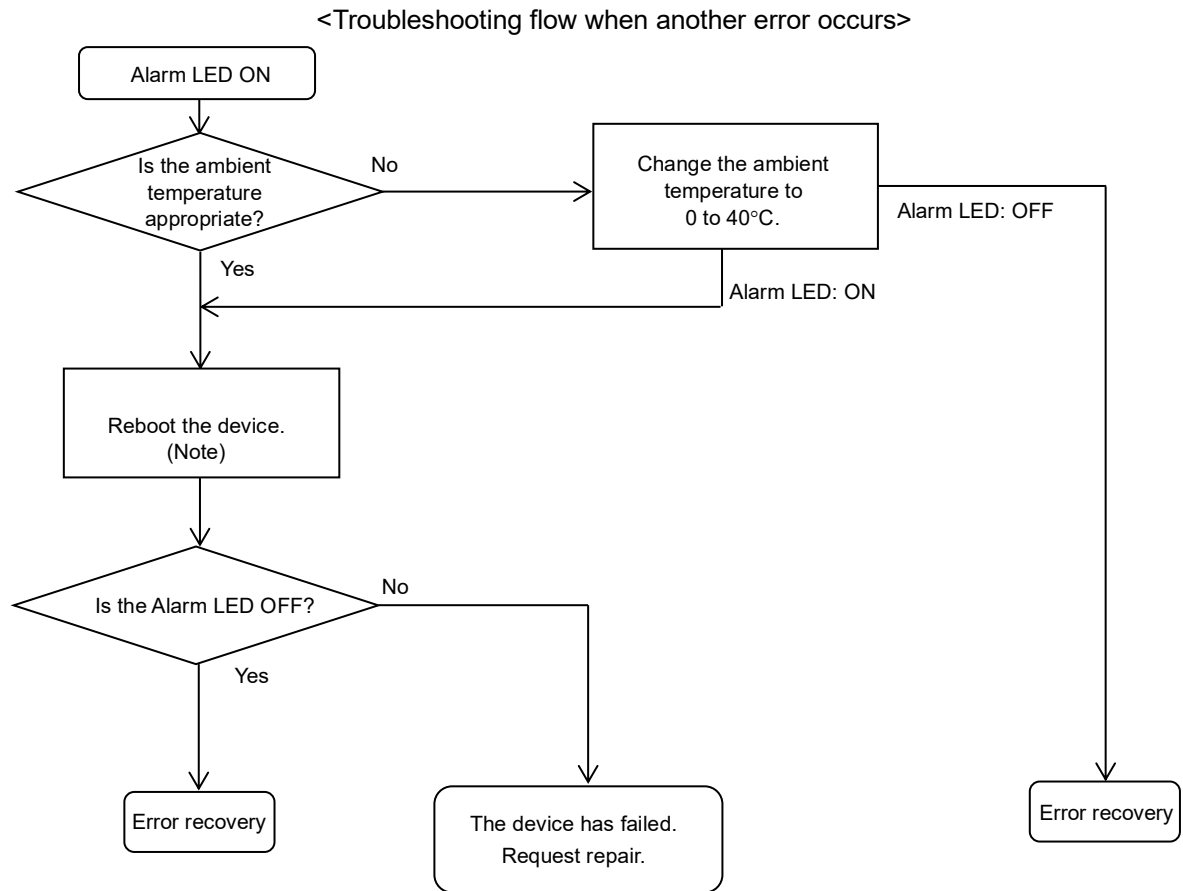


Figure 5.2.3-1 Error investigation flow when another error occurs

Note:

Error events that occur in this device can be recorded in multiple ways. The “log data” saved in the internal memory is lost when the power is turned off.

For details about how to displays the log data, read “Configuration Guide TCP Acceleration Edition (NF7600-W013E)”.

5.2.4 Requesting restart of the device

In case of NF7601A, reboot the device when Act LED and Link LED are blinking simultaneously. Because the NF7601A distinguishes SFP+/SFP module that connected to Network port during device starting up, the device needs to be rebooted when:

- (1) No module was connected to the Network port when this device was started but an SFP module was connected while this device was operating.
- (2) An SFP module was connected to the Network port when this device was started but the module was converted to an SFP+ module while this device was operating.
- (3) An SFP+ module was connected to the Network port when this device was started but the module was converted to an SFP module while this device was operating.

5.3 Order the repair

Please order for repair if the device fails. Please send us, the entire device set. So, please use the packing set.

This device cannot be repaired by the customer.

Contact your dealer if the device fails.



WARNING

Do not disassemble this device. There is a risk of receiving a severe or fatal electric shock.

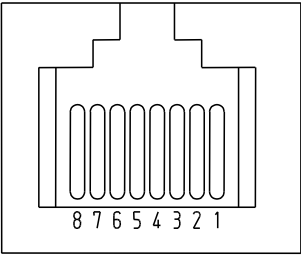
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Appendix A I/O Interface Specifications

A.1	Console port for management	A-2
A.2	Ethernet port for management.....	A-3
A.3	USB port	A-4
A.4	Network port (10GBASE-SR SFP+)	A-5
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A.6	Network port (1000BASE-SX SFP)	A-7
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A.8	Network port (10/100/1000BASE-T SFP)	A-9
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A.1 Console port for management

(1) Connector: 8pin modular connector



* Viewed from the mating face of the front console port

Figure A.1-1 Pin arrangement

(2) Console cable (Dsub9 side)

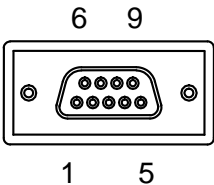


Figure A.1-2 Console cable

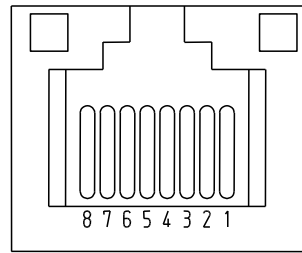
Table A.1-1 Pin assignment and console cable connection

RJ-45	Signal name	Connection	Dsub9 side
1	Reserved		8
2	Reserved		6
3	SD (sent data)		2
4	GND		5
5	GND		
6	RD (received data)		3
7	Reserved		4
8	Reserved		7

* On the female side of Dsub9, the 1st and 9th pins cannot be used.

A.2 Ethernet port for management

(1) Connector



* Viewed from the mating face

Figure A.2-1 Pin arrangement

Table A.2-1 Pin assignment

Pin No.	Signal name	
	1000BASE-T	100BASE-TX 10BASE-T
1	TP1+	TX+/RX+
2	TP1-	TX-/RX-
3	TP0+	RX+/TX+
4	TP3+	—
5	TP3-	—
6	TP0-	RX-/TX-
7	TP2+	—
8	TP2-	—

(2) Network cable

Use a network cable and connector that satisfy the following specifications

- Category: CAT5E or CAT6 recommended
(Maximum cable length: 100 m)
- Connector: 8-pin modular connector

Notes:

1. If a Cat 5 network cable is used in 1000BASE-T traffic, the maximum cable length might be too short due to the cable quality, causing communication failure.
2. Enable auto negotiation for 1000 Mbit/s communication in 1000BASE-T traffic.
3. If the speed and duplex settings are fixed, use the same settings in the communicating device.

A.3 USB port

(1) Connector

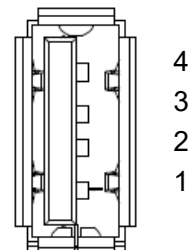


Figure A.3-1 Pin arrangement

Table A.3-1 Pin assignment

Pin No.	Signal name
1	+5V
2	D-
3	D+
4	GND

(2) Functions

Table A.3-2 Function list

	Function	Contents
1	Specification	USB 2.0
2	Connector type	Standard A
3	Maximum data transfer rate	480 Mbit/s (High-Speed)
4	Maximum output current	0.5 A

A.4 Network port (10GBASE-SR SFP+)

(1) Optical connector

- LC connector (SFP+ module)

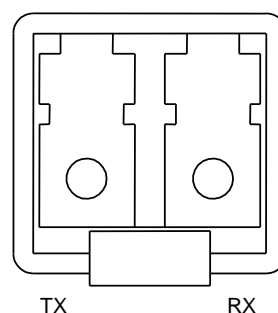


Figure A.4-1 10GBASE-SR module front view

Notes:

1. The figure above shows the connector view when installing 10GBASE-SR SFP+ module to the Network port.
2. Connect the transmitter (TX) of the device to the receiver (RX) of the other side, and the receiver (RX) of the device to the transmitter (TX) of the other side.

(2) Network cable

Use a network cable and connector that satisfy the following specifications.

- Cable type:
 - 62.5 μm /125 μm (Core/Clad) Multimode optical fiber cable
 - 50 μm /125 μm (Core/Clad) Multimode optical fiber cable
- Cable standards: 850 nm wavelength
- Connector: LC connector
- Operating range: See below

Fiber type	Modal bandwidth @850 nm (MHz-km)	Range (m)	
		MIN.	MAX.
62.5 μm MMF	160	2	26
62.5 μm MMF	200	2	33
50 μm MMF	400	2	66
50 μm MMF	500	2	82
50 μm MMF	2000	2	300
50 μm MMF	4700	2	400

* For details, see Chapter 52 in Section 4 of IEEE Std 802.3-2012.

Note:

This module is not available in NF7602A, NF7605A PureFlow WSX Lite.

A.5 Network port (10GBASE-LR SFP+)

- (1) Optical connector
- LC connector (SFP+ module)

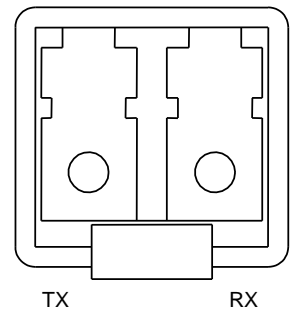


Figure A.5-1 10GBASE-LR module front view

Notes:

1. The figure above shows the connector view when installing 10GBASE-LR SFP+ module to the Network port.
2. Connect the transmitter (TX) of the device to the receiver (RX) of the other side, and the receiver (RX) of the device to the transmitter (TX) of the other side.

- (2) Network cable

Use a network cable and connector that satisfy the following specifications.

- Cable type:
10 μ m/125 μ m (Core/Clad) Single-mode optical fiber cable
- Cable standards: 1310 nm wavelength
- Connector: LC connector
- Operating range: See below

Fiber type	Modal bandwidth @1300 nm (MHz-km)	Range (m)	
		MIN.	MAX.
10 μ m SMF	N/A	2	10000

* For details, see Chapter 52 in Section 4 of IEEE Std 802.3-2012.

Note:

This module is not available in NF7602A, NF7605A PureFlow WSX Lite.

A.6 Network port (1000BASE-SX SFP)

- (1) Optical connector
- LC connector (SFP module)

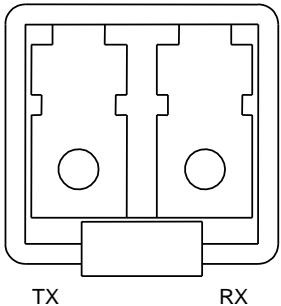


Figure A.6-1 1000BASE-SX module front view

Notes:

1. The figure above shows the connector view when installing 1000BASE-SX SFP module to the Network port.
2. Connect the transmitter (TX) of the device to the receiver (RX) of the other side, and the receiver (RX) of the device to the transmitter (TX) of the other side.

- (2) Network cable

Use a network cable and connector that satisfy the following specifications.

- Cable type:
 - 62.5 μm /125 μm (Core/Clad) Multimode optical fiber cable
 - 50 μm /125 μm (Core/Clad) Multimode optical fiber cable
- Cable standards: 850 nm wavelength
- Connector: LC connector
- Operating range: See below

Fiber type	Modal bandwidth @850 nm (MHz-km)	Range (m)	
		MIN.	MAX.
62.5 μm MMF	160	2	220
62.5 μm MMF	200	2	275
50 μm MMF	400	2	500
50 μm MMF	500	2	550

* For details, see Chapter 38 in Section 3 of IEEE Std 802.3-2012.

A.7 Network port (1000BASE-LX SFP)

(1) Optical connector

- LC connector (SFP module)

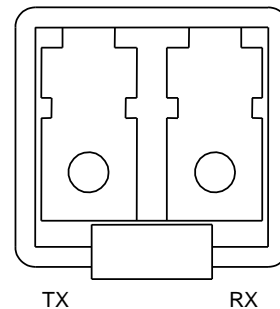


Figure A.7-1 1000BASE-LX module front view

Notes:

1. The figure above shows the connector view when installing 1000BASE-LX SFP module to the Network port.
2. Connect the transmitter (TX) of the device to the receiver (RX) of the other side, and the receiver (RX) of the device to the transmitter (TX) of the other side.

(2) Network cable

Use a network cable and connector that satisfy the following specifications.

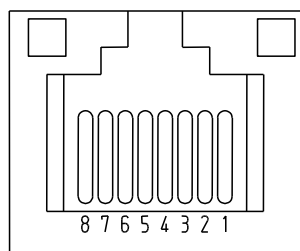
- Cable type
 - 62.5 μm /125 μm (Core/Clad) Multimode optical fiber cable
 - 50 μm /125 μm (Core/Clad) Multimode optical fiber cable
 - 10 μm /125 μm (Core/Clad) Single-mode optical fiber cable
- Cable standards: 1310 nm wavelength
- Connector: LC connector
- Operating range: See below

Fiber type	Modal bandwidth @1300 nm (MHz-km)	Range (m)	
		MIN.	MAX.
62.5 μm MMF	500	2	550
50 μm MMF	400	2	550
50 μm MMF	500	2	550
10 μm SMF	N/A	2	5000

* For details, see Chapter 38 in Section 3 of IEEE Std 802.3-2012.

A.8 Network port (10/100/1000BASE-T SFP)

(1) Connector



* Viewed from the mating face

Figure A.8-1 Pin arrangement

Table A.8-1 Pin assignment

Pin No.	Signal name	
	1000BASE-T	100BASE-TX 10BASE-T
1	TP1+	TX+/RX+
2	TP1-	TX-/RX-
3	TP0+	RX+/TX+
4	TP3+	—
5	TP3-	—
6	TP0-	RX-/TX-
7	TP2+	—
8	TP2-	—

(2) Network cable

Use a network cable and connector that satisfy the following specifications

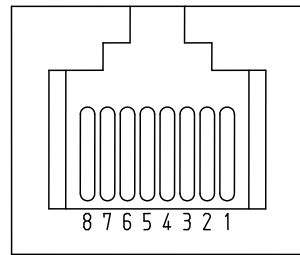
- Category: CAT5E or CAT6 recommended
(Maximum cable length: 100 m)
- Connector: 8pin modular connector

Notes:

1. If a Cat 5 network cable is used in 1000BASE-T traffic, the maximum cable length might be too short due to the cable quality, causing communication failure.
2. Enable auto negotiation for 1000 Mbit/s communication in 1000BASE-T traffic.
3. If the speed and duplex settings are fixed, use the same settings in the communicating device.

A.9 Network port (for NF7605A bypass)

(1) Connector



* Viewed from the mating face

Figure A.11-1 Pin arrangement

Table A.11-1 Pin assignment

Pin No.	Signal name	
	1000BASE-T	100BASE-TX 10BASE-T
1	TP1+	TX+/RX+
2	TP1-	TX-/RX-
3	TP0+	RX+/TX+
4	TP3+	—
5	TP3-	—
6	TP0-	RX-/TX-
7	TP2+	—
8	TP2-	—

(2) Network cable

Use a network cable and connector that satisfy the following specifications.

- Category: CAT5E or CAT6 recommended
- Connector: 8pin Modular Connector

Notes:

1. In the non-bypass status, connections between Network port 1 and bypass port A, and between Network port 2 and bypass port B are established internally.
2. In the bypass status, connection between Network port 1 and Network port 2 is established internally.
3. For the length of the network cable used for connection between Network port 1 and Network port 2, 60 m or less in total is recommended considering a loss inside this equipment and communication in the bypass status.

Appendix B Device Specifications

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B.1 Functions

Table B.1-1 Function list

	Function		PureFlow WSX	PureFlow WSX Lite	
			NF7601A	NF7602A	NF7605A
1	Controllable bandwidth ^{Note1}		10 kbit/s to 10 Gbit/s	10 kbit/s to 1 Gbit/s	
2	Scenario	Max. number of scenarios	4,096		
		Max. number of scenario hierarchies	8		
		Scenario type	Acceleration mode, Aggregate mode, individual mode, discard mode		
3	Filter	Max. number of filters	40,000		
4	Rule list	Max. number of Groups	1,024		
		Max. number of Entrys	512 (Group × Entry total: 64,000)		
5	Flow	Max. number of flows	1,280,000		
6	Interface	Network port	SFP/SFP+ × 4 10GBASE-SR 10GBASE-LR 1000BASE-SX 1000BASE-LX 10/100/1000BASE-T	SFP × 4 ^{Note2} 1000BASE-SX 1000BASE-LX 10/100/1000BASE-T	
		Ethernet port	10/100/1000BASE-T × 1		
		Console port	RS-232C (RJ-45)		
		USB port	USB 2.0 × 1		
		CF card slot	CompactFlash Specification Revision 4.1 compatible × 1 slot		
7	Traffic acceleration	Max. number of TCP session	100,000		
		Target protocol	TCP (IPv4/IPv6)		
		Data compression	ZIP format		
		Network connection	In-Path, Out-Of-Path		
		FEC Function ^{Note3}	Max. number of TCP-FEC session	1,000	
		Bypass	Bypass transfer (RTT measurement, TCP connection error, KeepAlive error, Force)		
		Redundancy	Secondary Peer transfer		
		Congestion control	Fast recovery control		

	Function		PureFlow WSX	PureFlow WSX Lite	
			NF7601A	NF7602A	NF7605A
8	VLAN		VLAN Tag (IEEE802.1Q), QinQ (IEEE802.1ad)		
9	Max. frame length	Network port	2,048 bytes or 10,240 bytes		
		Ethernet port	1,518 bytes		
10	SMB protocol acceleration	Version	SMB2.0.2, SMB2.1		
		Max. SMB session count	10,000		
11	QoS setting		8 priority levels, maximum/minimum rate (10 kbit/s to 10 Gbit/s)	8 priority levels, maximum/minimum rate (10 kbit/s to 1 Gbit/s)	
12	Network management	System Interface (via Ethernet port)	Ping (IPv4/IPv6), Telnet (IPv4/IPv6), SSH (IPv4/IPv6), RADIUS (IPv4/IPv6), SNTP (IPv4/IPv6), SYSLOG (IPv4/IPv6), SNMP (IPv4 only), WebAPI (IPv4/IPv6), WebGUI (IPv4/IPv6), OpenFlow <i>Note4</i> (IPv4/IPv6), probe agent protocol (IPv4 only)		
		Channel Interface (via Network port)	Ping (IPv4/IPv6), Traceroute (IPv4/IPv6)		
13	Failure		Link path through		
14	Network bypass function		No	No	Yes (UTP)

Note 1: If the required data transmission rate per port is more than 1 Gbit/s at NF7601A please order a band expansion license. Also, if the required data transmission rate per port is more than 100 Mbit/s at NF7602A and NF7605A, please order a band expansion license.

Note 2: Use 10/100/1000BASE-T SFP (NY02003A) to use the bypass function in NF7605A.

Note 3: If you want to use the FEC function, please order a FEC function license.

Note 4: If you want to use the OpenFlow function, please order a OpenFlow function license.

B.2 Dimensions and weight

- Dimensions: 88 (H), 436 (W), 471 (D) mm (excluding protrusions)
- Weight: 8.0 kg or less (installed one power supply unit)
9.5 kg or less (installed two power supply units)

B.3 Power

- Voltage: AC 100 - 127 V,
AC 200 - 240 V
- Current: 1.8 A (at 100 V)
0.9 A (at 200 V)
- Current consumption: 180 VA or less, 140 W or less
- Frequency: 48 - 52 Hz
58 - 62 Hz
- Power receiving system: Single-phase two-wire, 1 ground line
- Instantaneous interruption: 100%, 1 cycle
- Inrush current: 14 A or less (at 100 V)
28 A or less (at 200 V)
(per power supply unit)
- Leakage current: 0.5 mA or less (per power supply unit)
- Quantity of heat: 140 W•sec, 504 kJ/hr, 120 kcal/hr

The values without special notes indicate the values for the entire equipment.

Table B.3-1 AC power cord rating

Model	Rated voltage	Rated current	Remarks
NY01001A	AC125 V	10 A	For the U.S.
NY01004A	AC125 V	7 A	For Japan

B.4 Environment

- Operable temperature: 0 to 40°C
- Operable humidity: 20 to 80% (no condensation)
- Storage temperature: -20 to 60°C
- Operable height: 2,000 m or lower
- MTBF: 128,000 H (Only for NF7601A and NF7602A main unit)*
117,000 H (Only for NF7605A main unit)*
200,000 H (Only 150 W AC Input Power Supply Unit)
2,820,000 H (only FAN Unit)
- Life limited parts:

150 W AC Input Power Supply Unit	4.5 years
FAN Unit	4.5 years

*: Except for 150 W AC Input Power Supply Unit and FAN Unit.

B.5 Interference standards

- VCCI: Class A
- FCC: Class A
- EN55032: Class A
- Harmonic current: JIS C 61000-3-2

B.6 Safety standards

- UL: 60950-1
- CSA: C22.2 No.60950-1-07
- EN: 60950-1

Appendix C Third Party Software License

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C.1 Third Party Software

The following table lists the third-party libraries, applications, and other software used by this device.

Table C.1-1 List of Libraries, Applications, and Licenses

Item name	Contents	License
linux	Linux kernel	GPLv2
libgcc	Gcc library	GPLv2
libpthread	POSIX thread library	LGPL
glibc	GNU C standard library	LGPL
busybox	Command line application	GPLv2
net-tools	NET-3 network tool This tool is used to control the network subsystems (arp, ifconfig, route, etc.)	GPLv2
iputils	Tool used to test the network host reachability (ping)	Original
module-init-tools	Driver module installation tool	GPLv2
ntpd	NTP client	Original
rsyslog	Syslog daemon	GPLv3
libee	String operation library	GPLv2
libestr	String operation library	GPLv2
libuuid	Identifier generation library	Original
sudo	Program that assigns restricted super-user privileges to designated users	ISC-style
udev	Device manager that provides a persistent device naming system	GPLv2
iptables	Packet filtering application	GPLv2
openssh	SSH server	Original
openssl	Cryptographic library	Original
zlib	Data compression library	Original
radiusclient-ng	RADIUS client	Original
apache	HTTP server	Original
json-c	JSON data analysis package	Original
u-boot	Boot loader	GPLv2
jquery	JavaScript library	Original
jqplot	jQuery plug-in for graph drawing	Original
openvswitch	OpenFlow protocol processing	apache

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C.2 GPLv2

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C.4 LGPLv2.1

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C.6 ntpd

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C.9 openssh

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@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>
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C.10 openssl

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C.12 radiusclient-ng

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C.16jqplot

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