Ruijie Reyee
RG-NBS3100-24GT4SFP-P-V2 Switch

Installation Guide

Document Version: V1.4

Date: November 6, 2025

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Preface

Intended Audience

This document is intended for:

- Network engineers
- Technical support and servicing engineers
- Network administrators

Technical Support

- Ruijie Reyee website: https://reyee.ruijie.com
- Online support center: https://reyee.ruijie.com/en-global/support
- Case Portal: https://www.ruijie.com/support/caseportal
- Community: https://community.ruijie.com
- Email support: service_rj@ruijie.coms
- Live chat: https://reyee.ruijie.com/en-global/rita

Conventions

1. Signs

The signs used in this document are described as below:

Danger

An alert that calls attention to safety instruction that if not understood or followed can result in personal injury.

Warning

An alert that calls attention to important rules and information that if not understood or followed can result in data loss or equipment damage.

Caution

An alert that calls attention to essential information that if not understood or followed can result in function failure or performance degradation.

Note

An alert that contains additional or supplementary information that if not understood or followed will not lead to serious consequences.

Specification

An alert that contains a description of product or version support.

2. Note

This manual provides installation steps, troubleshooting, technical specifications, and usage guidelines for cables and connectors. It is intended for users who want to understand the above and have extensive experience in network deployment and management, and assume that users are familiar with related terms and concepts.

Contents

1 Product Overview

RG-NBS3100-24GT4SFP-P V2 is a new generation Ethernet switch developed by Ruijie Networks. The switch provides GE Ethernet ports and GE SFP ports and features high performance, high reliability and multi-service integration. It adopts an efficient hardware architecture design for larger MAC address table capacity, higher hardware performance and more convenient experience.

The switch has 24 10/100/1000Base-T PoE/PoE+ ports and four 1000Base-X SFP ports with a PoE consumption of 370 W. It supports App and cloud-based management.

Model	10/100/1000BASE-T port	1000Base-X SFP Port	Console Port	Fan	Power unit
RG-NBS3100-24GT4SFP-P V2	24 (PoE+/PoE-capable)	4	/	1 x fixed fan	Fixed single power supply

Note

- SFP port is downward compatible with 100Base-FX.
- 1000Base-T is downward compatible with 100Base-TX and 10Base-T.

1.1 Package Contents

Table 1-1 Package Contents

Item	Quantity
RG-NBS3100-24GT4SFP-P V2 Switch	1
Rubber pad	4
M4 x 8 mm cross recessed countersunk head screws	6
Power cord	1 x 1.5 m (4.92 ft.)
Power cord retention clip	1
Grounding cable	1 x 1 m (3.28 ft.)
Rack-mount bracket	2
Warranty Card	1
User Manual	1

Note

The above is the general Packet Contents. The actual delivery is subject to the order contract. And please check your goods carefully against the order contract. If you have any questions, please contact the distributor.

1.2 Appearance

The RG-NBS3100-24GT4SFP-P V2 provides 24 10/100/1000BASE-T RJ45 Ethernet ports with auto negotiation and four SFP ports on the front panel, and an AC power input plug on the rear panel.

Figure 1-1 Front Panel

1.2.1 Front Panel

Figure 1-2 Front Panel

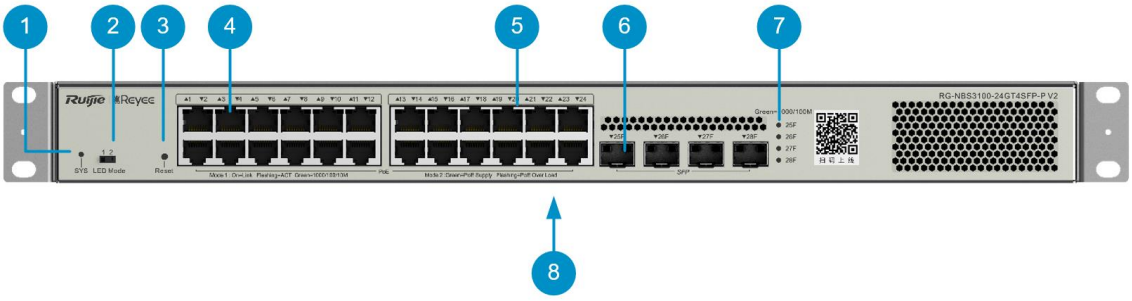


Table 1-2 Ports and Buttons on the Front Panel

ID	Item	Description
1	System Status LED (SYS)	Off: The switch is not powered on. Slow blinking (0.5 Hz): The switch is operating properly but not connected to Ruijie Cloud, or PoE power is insufficient. Fast blinking (10 Hz): The switch is upgrading or restarting. Solid green: The switch is operating properly and connected to Ruijie Cloud.
2	LED Mode Switchover Button	Toggle the switch to the left (Mode 1): The port status LED indicates the operating status of the switch. If the LED is solid green, the port is not sending and receiving data. If LED is blinking green, the port is connected and sending and receiving data. Toggle the switch to the right (Mode 2): The port status LED indicates the PoE status. If the LED is solid green, the port is supplying power. If LED is blinking green, power overload occurs on the port.
3	Reset Button	Press and hold the button for less than two seconds: Restart the switch. Press and hold the button for two to five seconds: No action. Press and hold the button for over five seconds: Restore the switch to factory settings.
4	Ethernet Port	10/100/1000Base-T Ethernet port with auto-negotiation
5	Port Status LED	PoE status: Off: The PoE port is not supplying power. Solid green: The PoE port is supplying power. Blinking green: PoE overload occurs on the port. Port status: Off: The port is not connected. Solid green: The port has made a successful 10/100/1000 Mbps link, but it is not receiving or sending data. Blinking green: The port is receiving or sending data at 10/100/1000 Mbps.
6	SFP Port	1000Base-X SFP Port
7	SFP Port Status LED	Off: The port is not connected. Solid green: The port has made a successful 1000 Mbps link, but it is not receiving or sending data. Blinking green: The port is receiving or sending data at 1000 Mbps.
8	Nameplate	The nameplate is on the bottom of the switch.

1.2.2 Rear Panel

Figure 1-3 Rear Panel

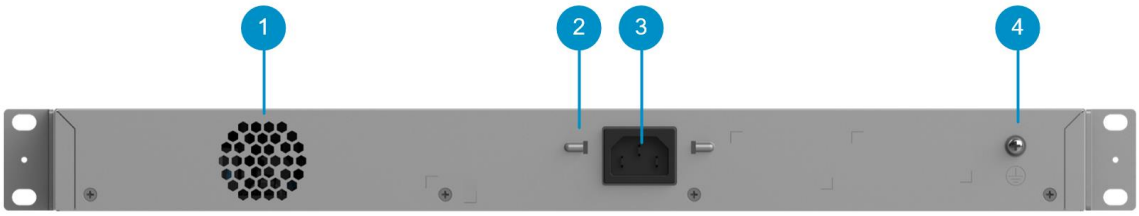


Table 1-3 Ports and Buttons on the Rear Panel

ID	Item	Description
1	Ventilation Openings	Used for ventilation.
2	Power Cord Retention Clip	Secure the power cord.
3	AC Power Input Plug	Connected to an external AC power supply.
4	Grounding Screw	Secure the grounding lug to ensure connection between the chassis and earth ground.

1.3 Technical Specifications

Table 1-4 Specifications

Parameter Type	Parameter Name	RG-NBS3100-24GT4SFP-P V2
Product Information	Warranty	5 years
System Specifications	RAM	256 MB
	Flash memory	16 MB
Port Specifications	Total number of RJ45 ports	24
	Total number of optical ports	4
	Number of 1GE SFP ports	4
	Number of 10/100/1000BASE-T ports	24
	Ethernet cable type	CAT5e
	LEDs	1 x system status LED 24 x Ethernet port LEDs 4 x SFP port LEDs

Power Supply and Consumption	PoE Out standard	PoE/PoE+ (IEEE 802.3af/at)
	Number of PoE Out ports	24
	Number of PoE/PoE+ Out ports	24
	PoE power pins	1–2 (+), 3–6 (-)
	PoE budget per port	30 W
	PoE budget	370 W
	Power supply	Fixed power supply
	Power input	220 V AC power supply: Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz Maximum input current: 6 A
	Power supply to external devices	The Ethernet interface provides a PoE budget of 54 V/30 W.
	Maximum power consumption	21 W (with no PoE load) 443 W (with full PoE load)
	EEE	Yes
	Leakage Current to Ground	≤ 3.5 mA
Dimensions and Weight	Casing	Metal
	Product dimensions (W x D x H)	440 mm x 215 mm x 44 mm (17.32 in. x 8.46 in. x 1.73 in.)
	Weight	3 kg (6.61 lbs) (without packaging materials)
	Shipping weight	3.53 kg (7.78 lbs)
	Rack space	Rack requirement: 19-inch rack
Environment and Reliability	Fan	1 x fixed fan
	Cooling	Air cooling, front-to-rear airflow + left-to-rear airflow
	Mounting options	Rack
	MTBF	400,000 hours
	Operating temperature	0°C to +50°C (32°F to 122°F)

	Storage temperature	–40°C to +70°C (–40°F to +158°F)
	Operating humidity	10% RH to 90% RH (non-condensing)
	Storage humidity	5% RH to 95% RH (non-condensing)
	Altitude	Operating altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.) Storage altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.)
	Surge protection	Service port: ±6 kV for common mode Power connector: ±6 kV for both common mode and differential mode
Certification and Regulatory Compliance	Certification	CE, FCC

Warning

In a domestic environment, this product may cause radio interference.

1.4 Ventilation

The RG-NBS3100-24GT4SFP-P V2 switch adopts the front-to-rear airflow + left-to-rear airflow design to ensure that the switch works properly in the specified environment. Maintain a minimum clearance of 100 mm (3.94 in.) around the switch to ensure proper ventilation. You are advised to dust the switch at an interval of three months to avoid blocking the ventilation openings.

Figure 1-4 Airflow Direction

2 Preparing for Installation

2.1 Safety Precautions

Note

- To avoid personal injury and device damage, carefully read the safety precautions before you install the switch.
- The following safety precautions may not cover all possible dangers.

2.1.1 Installation Safety

- Keep the chassis clean and free from dust.
- Do not place the switch in walking areas.
- Do not wear loose clothes, ornaments, or any other things that may be hooked by the chassis during installation and maintenance.
- Cut off all power supplies and unplug all power cords before mounting the switch in a rack or removing the switch from a rack.

2.1.2 Handling Safety

- Prevent the switch from being frequently handled.
- Cut off all power supplies and unplug all power cords before moving or handling the device.
- Keep balance and prevent personal injuries when handling the switch.

2.1.3 Electric Safety

Warning

- Any nonstandard and inaccurate operation can cause an accident such as fire or electrical attack, thus causing severe damages to human bodies and the switch.
- Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

- Observe local regulations and specifications during electric operations. Only personnel with qualifications can perform such operations.
- Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.
- Find out the position of the indoor emergency power switch before installation. Cut off the power switch in the case of accidents.
- Make sure that the switch is powered off when you cut off the power supply.
- Equip the power supply system with a leakage protector (also referred to as “leakage current switch” or “leakage current breaker”) to automate the power cut-off in the case of power leakage or shock. When selecting the leakage protector, observe the following rule:
  - The rated leakage action current of each leakage protector is greater than twice of the theoretical maximum leakage current of all the power supplies in the system.

For example, if a system is equipped with 16 identical power supplies, the leakage current of each power supply is at most 3.5 mA, and the leakage current of the system totals 56 mA (maximum theoretical value). A leakage protector with 30 mA rated action current supports less than nine power supplies (that is, Action current of the leakage protector/2/Maximum leakage current of each power supply = 30/2/3.5 ≈ 4.28). In other words, the leakage protector with a rated action current of 30 mA supports up to four power supplies. In this case, the 16 power supplies in the system require at least four leakage protectors with a rated action current of 30 mA and each leakage protector supports four power supplies.

If power supplies in a system differ in models, the rated leakage action current of each leakage protector divided by two is greater than the sum of maximum leakage currents of all the power supplies.

- The rated leakage non-action current of a leakage protector shall be 50% of the leakage action current. If the non-action current value is too small, the high sensitivity level may cause the circuit to break, causing power cut-off and service interruption even if the leakage current value is normal.

  Take a leakage protector with a rated action current of 30 mA as an example. The rated leakage non-action current shall be 15 mA. When the leakage current is less than 15mA, the protector shall not act.

Caution

- To guarantee personal safety, the rated leakage action current of each leakage protector in the system must be equal to or less than 30 mA (human body safety current is 30 mA). When twice of the total leakage current of the system is greater than 30 mA, the system must be equipped with two or more leakage protectors.
- The leakage current values vary with products. For the leakage current value of each product model, see the technical specifications in Section 1.3 Technical Specifications.

2.1.4 Electronic Static Discharge

To prevent Electronic Static Discharge (ESD), pay attention to the following:

- Ensure that the grounding screw on the rear panel of the device is tightened. Ensure that the AC power socket is a single-phase three-core power socket with protective earthing conductors (PE).
- Keep the indoor installation environment clean and free of dust.
- Maintain appropriate humidity conditions.

2.1.5 Laser Safety

The RG-NBS3100 switch supports various types of optical transceivers available in the market, and these optical transceiver are Class I laser products. Improper use of an optical transceiver may cause damage. Therefore, pay attention to the following:

- When an optical transceiver is working, ensure that its port has been connected with an optical fiber or covered by a dust cap to keep out dust and prevent it from burning your eyes.
- When an optical transceiver is working, do not look into its port after removing the optical fiber. Otherwise, your eyes may be hurt.

Warning

Do not approach or look into any optical port under any circumstances. This may cause permanent damage to your eyes.

2.2 Installation Site Requirements

To ensure the normal working and a prolonged durable life of the equipment, the installation site must meet the following requirements.

2.2.1 Ventilation

For the RG-NBS3100 series, a sufficient space (at least 10 cm distances from both sides and the back plane of the cabinet) should be reserved at the ventilation openings to ensure the normal ventilation. After various cables have been connected, they should be arranged into bundles or placed on the cabling rack to avoid blocking the air inlets. It is recommended to clean the switch at regular intervals (like once every 3 months). Especially, avoid dust from blocking the screen mesh on the back of the cabinet.

2.2.2 Temperature and Humidity

To ensure the normal operation and prolong the service life of RG-NBS3100 series switch, you should keep proper temperature and humidity in the equipment room.

If the equipment room has temperature and humidity that do not meet the requirements for a long time, the equipment may be damaged.

- In an environment with high relative humidity, the insulating material may have bad insulation or even leak electricity. Sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.
- In an environment with low relative humidity, however, the insulating strip may dry and shrink. Static electricity may occur easily and endanger the circuit on the equipment.
- In an environment with high temperature, the equipment is subject to even greater harm, as its performance may degrade significantly and various hardware faults may occur.

Therefore, the ambient temperature and humidity of the RG-NBS3100 series must meet the requirements listed in Table 2-1:

Table 2-1 Temperature and Humidity Requirements of the RG-NBS3100 Series Switch

Temperature	Relative Humidity
0 ºC to 50ºC	10% to 90%

The requirements for the sampling site of the temperature and humidity in the operating environment of the device are as follows:

Note

- There is no protective plate at the front or back of the equipment rack.
- The vertical height is 1.5 m above the floor.
- The distance from the front panel of the equipment is 0.4 m.

2.2.3 Cleanness

Dust poses a severe threat to the running of the equipment. The indoor dust falling on the equipment may be adhered by the static electricity, causing bad contact of the metallic joint. Such electrostatic adherence may occur more easily when the relative humidity is low, not only affecting the useful life of the equipment, but also causing

communication faults. Table 2-2 shows the requirements for the dust content and granularity in the equipment room.

Table 2-2 Requirements for the Dust Content and Granularity in the Equipment Room

Dust	Unit	Density
Diameter≥0.5μm	Particles/ m^3	≤3.5×10^6
Diameter≥5μm	Particles/ m^3	≤3×10^4

Apart from dust, the salt, acid and sulfide in the air in the equipment room must also meet strict requirements, as such poisonous substances may accelerate the corrosion of the metal and the aging of some parts. The equipment room should be protected from the intrusion of harmful gases such as sulfur dioxide, sulfured hydrogen, nitrogen dioxide, and chlorine), whose requirements are listed in Table 2-3.

Table 2-3 Requirements for Harmful Gases in the Equipment Room

Gas	Average (mg/m3)	Maximum (mg/m3)
SO_2	0.3	1.0
H_2S	0.1	0.5
NO_2	0.5	1.0
Cl_2	0.1	0.3

Note

Both average and maximum value are measured for a week. The switch cannot be placed in the environment with the maximum density for over 30 minutes every day. ..

2.2.4 Interference Resistance

The switch is vulnerable to external interface caused by capacity coupling, inductance coupling, electromagnetic wave radiation, common impedance (including grounding system) coupling and conducting wires (including power cords, signal and output wires). Therefore, the following points should be noted:

- The AC power supplying system is the TN system. The single-phase three-wire socket with protecting grounding must be used as the socket for the power supply to enable the device's upper filter circuit to effective filter the power interface.
- The switch should be far from high-power radio transmitting stations, radar stations and high-frequency and large-current devices.
- Electromagnetic shielding methods should be applied when necessary, such as using the shielded cable as the interface cable.
- Cables must be connected to interfaces inside the room to prevent damage to the device's signal ports caused by over-voltage and over-current generated by thunder and lightning.

2.2.5 Grounding

A good grounding system is the basis for the stable and reliable operation of the RG-NBS3100 series switches. It is the chief condition to prevent lightning stroke and resist interference. Please carefully check the grounding conditions on the installation site according to the grounding requirements, and perform grounding operations properly as required.

Caution

Effective grounding of the switch is an important guarantee for lightning protection and interference resistance. Therefore, connect the grounding line of the switch properly.

Safety Grounding

The equipment using AC power supply must be grounded by using the yellow/green safety grounding cable. Otherwise, when the insulating resistance decreases the power supply and the enclosure in the equipment, electric shock may occur.

Caution

- The building must provide protective grounding connection to ensure that the device is connected to the protection location.
- The installation and maintenance personnel must check whether the A.C. socket is well connected to the protection location of the building, if not, they should use a protective grounding wire to connect the grounding end of the A.C. socket to the building's protection location.
- The power supply socket must be installed in a place that is near to the device and where users can operate the device easily.
- Before the installation of the device, make sure that ground connection is connected at first and disconnected finally.
- The sectional area of the protective grounding wire should be at least 0.75 mm^2 (18 AWG).
- Use the 3-core power supply line. The sectional area of each pin should be at least 0.75 mm^2 or 18 AWG.

2.2.6 Lightning Grounding

The lightning protection system of a facility is an independent system that consists of the lightning rod, download conductor and the connector to the grounding system, which usually shares the power reference ground and yellow/green safety cable ground. The lightning discharge ground is for the facility only, irrelevant to the equipment.

2.2.7 EMC Grounding

The grounding required for EMC design includes shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The resistance of earth wires should be less than 1 ohm. The RG-NBS3100 series switch back plane is reserved with one grounding pole, as shown in Figure 2-1.

Figure 2-1 Grounding of RG-NBS3100

2.2.8 Lightning Resistance

When the AC power cable is imported outdoors and directly connected to the power port of the RG-NBS3100 series switch, lightning line bank should be adopted to prevent the switch from being hit by lightning shocks. Usage of the lightning line bank: Connect the mains supply AC cable to the lightning line bank. Then, connect the switch to the lightning line bank. This can help to prevent the current of high-voltage lightning from passing the switch directly through the mains supply cable to a certain extent.

Note

The lightning line banks are not provided and should be purchased by users as required.
For the usage of lightning line banks, refer to their related manuals.

2.2.9 EMI

Electro-Magnetic Interference (EMI), from either outside or inside the equipment or application system, affects the system in the conductive ways such as capacitive coupling, inductive coupling, and electromagnetic radiation.

There are two types of electromagnetic interference: radiated interference and conducted interference, depending on the type of the transmission path.

When the energy, often RF energy, from a component arrives at a sensitive component via the space, the energy is known as radiated interference. The interference source can be either a part of the interfered system or a completely electrically isolated unit. Conducted interference results from the electromagnetic wire or signal cable connection between the source and the sensitive component, along which cable the interference conducts from one unit to another. Conducted interference often affects the power supply of the equipment, but can be controlled by a filter. Radiated interference may affect any signal path in the equipment and is difficult to shield.

- For the AC power supply system TN, single-phase three-core power socket with protective earthing conductors (PE) should be adopted to effectively filter out interference from the power grid through the filtering circuit.
- The grounding device of the switch must not be used as the grounding device of the electrical equipment or anti-lightning grounding device. In addition, the grounding device of the switch must be deployed far away from the grounding device of the electrical equipment and anti-lightning grounding device.
- Keep the equipment away from high-power radio transmitter, radar transmitting station, and high-frequency large-current device.
- Measures must be taken to shield static electricity.

Interface cables should be laid inside the equipment room. Outdoor cabling is prohibited, avoiding damages to device signal interfaces caused by over-voltage or over-current of lightning.

2.2.10 Installation Tools

Table 2-4 List of Installation Tools

Common Tools	Phillips screwdriver, flathead screwdriver, related electric cables and optical cables, bolts, diagonal pliers, straps
Special Tools	Anti-static tools

Meters	Multimeter

Note

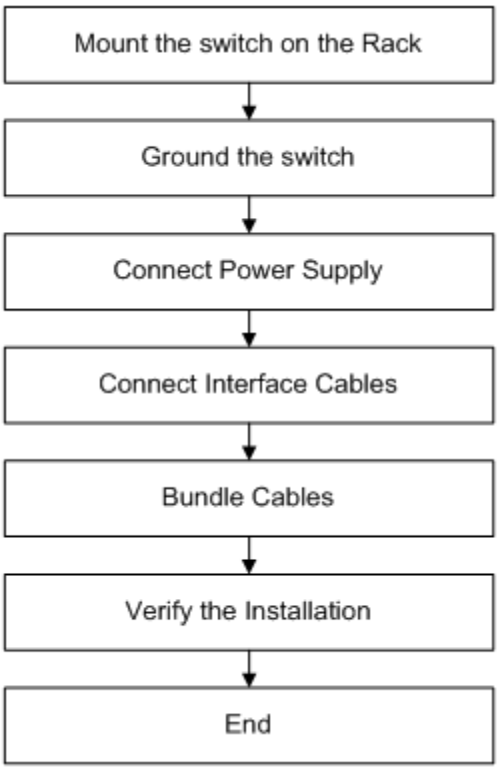
The tool kit is customer-supplied.

3 Product Installation

Note

Please ensure that you have carefully read Chapter 2.
Make sure that the requirements set forth in Chapter 2 have been met.

3.1 Installation Flowchart



3.2 Confirmations before Installation

Before installation, please confirm the following points:

- Whether ventilation requirements are met for the switch
- Whether the requirements of temperature and humidity are met for the switch
- Whether power cables are already laid out and whether the requirements of electrical current are met
- Whether related network adaption lines are already laid out

3.3 Installing the RG-NBS3100

3.3.1 Precautions

During installation, note the following points:

- Connect the power cables of different colors to the corresponding grounding posts.
- Ensure that the interface of the power supply cable is well connected to the power interface of the device.

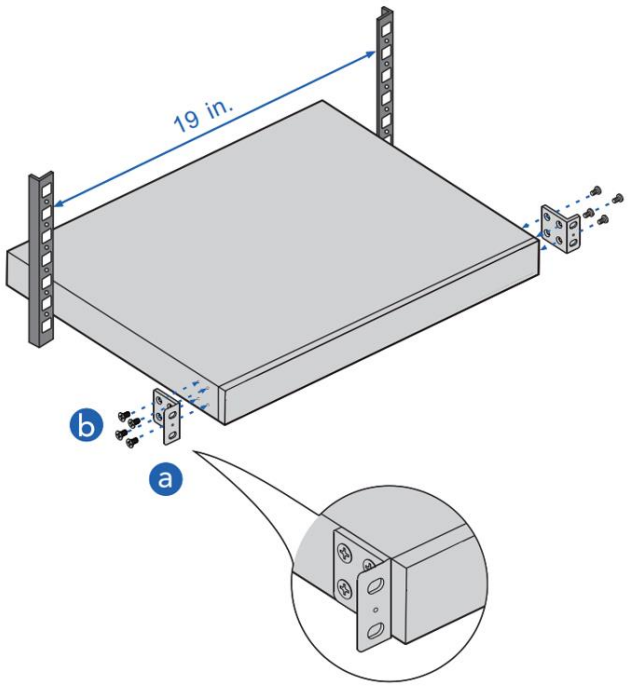
The power cables must be protected using power cable retention clips after they are connected to the device.

- Do not place any articles on the RG-NBS3100 series switch.
- Reserve a spacing of at least 10 cm around the chassis for good ventilation. Do not stack the devices.
- The switch should be located at places free from the large power radio launch pad, radar launch pad, and high-frequency large-current devices. If necessary, electromagnetic shielding should be adopted. For example, use interface cables to shield cables.
- 100-meter network cables should be laid inside the equipment room and outdoor cabling of such cables is prohibited. If outdoor cabling is necessary, take relevant measures for lightning protection.

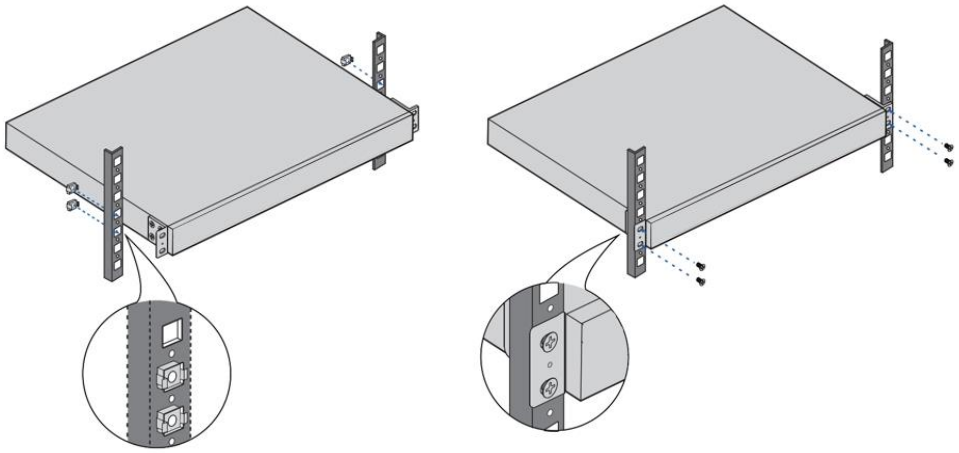
3.3.2 Mounting the Switch to a Standard 19-inch Rack

The RG-NBS3100 series switches follow the EIA standard dimensions and can be installed in 19-inch rack.

Step 1: Attach the mounting brackets to the switch with the supplied screws



Step 2: Use the supplied M6 screws and cage nuts to securely attach the mounting brackets to the rack.



3.3.3 Mounting the Switch on a Table

Attach the four rubber pads to the recessed areas on the bottom of the switch.

Warning

The device must be installed and operated in the place that can restrict its movement.

3.3.4 Grounding the Switch

RG-NBS3100 has a PGND on the back panel. First connect the PGND to the grounding lug of the rack and then connect the grounding lug to the grounding bar of the equipment room.

Precautions

The sectional area of the grounding wire should be determined according to the possible maximum current. Cables of good conductor should be used.

Do not use bare wire.

The grounding electric resistance should be less than 1Ω.

Caution

- To guarantee the security of the body and the device, the switch must be well-grounded. The grounding resistance for combined grounding should be less than 1Ω.
- The maintenance personnel shall check whether or not the AC socket powering the switch is well connected to the building protective earth (PE). If not, the personnel shall connect the grounding lug of the AC socket with the PE by using a grounding connector.
- The AC socket shall be installed near the equipment and shall be easily used.
- When installing the switch, make sure the grounding is connected first and disconnected last.
- The cross-sectional area of PE conductor shall be at least 2.5 mm^2 (12AWG).

3.4 Connecting the External Cables

3.4.1 Precautions

Correctly distinguish single-mode and multi-mode fibers and ports.

Avoid bends of small radius at the connector.

3.4.2 Steps

Step 1: Connect one end of the Ethernet cable to the MGMT port of the device, and the other end to the NMS or a control terminal.

Step 2: Insert the single-mode or multi-mode fiber into the appropriate port according to the identification on the panel of the module.

Step 3: Insert the twisted pair with the RJ45 connector into the appropriate port according to the identification on the panel of the module. Distinguish the crossover cable and straight-through cable.

3.5 Bundling the Cables

3.5.1 Precautions

The power cables and other cables should be bundled in a pleasing way.

When you bundle fibers, make sure that the fibers at the connectors have natural bends or bends of large radius.

Do not bundle fibers and twisted pairs too tightly, as this may press hard the fibers and affect their service time and transmission performance.

3.5.2 Steps

Bind the drooping part of the fibers and twisted pairs of each board, and lead them to both sides of the chassis for convenience.

On the both sides of the chassis, fasten the fibers and twisted pairs to the cabinet cable management ring or cabling chute.

For the power cables, you should bundle them closely along the bottom of the chassis, in a straight line wherever possible.

3.5.3 Checking after Installation

⚠ Caution

Before checking the installation, switch off the power supply to avoid any personal injury or damage to the component due to connection errors.

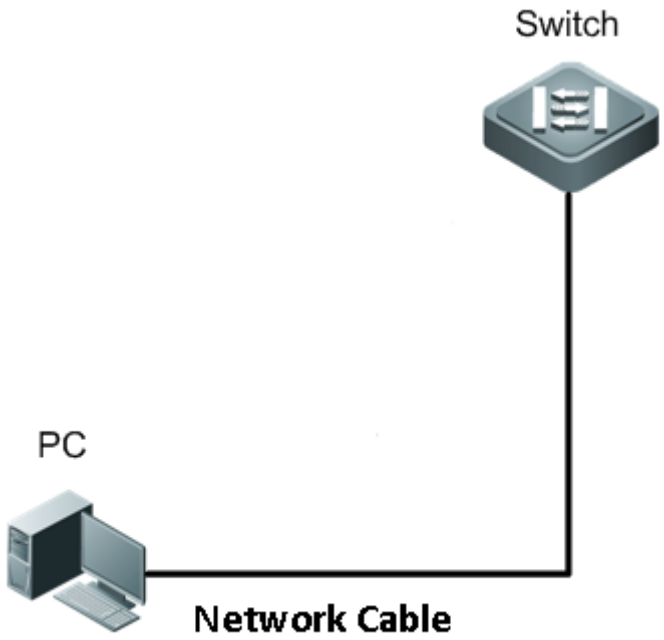
- Check that the ground line is connected.
- Check that the cables and power input cables are correctly connected.
- Check that all interface cables are laid out inside the equipment room. In the case of external cabling, check that the lightning resistance socket or network interface lightning protector is connected.
- Check that sufficient airflow is available around the device (over 10 cm).

4 System Commissioning

4.1 Establishing the Configuration Environment

Use the network cable to connect the PC to the switch.

Figure 4-1 Configuration Environment



4.2 Configuring the Device

Step 1: Start the PC and configure the IP address of the PC as 10.44.77.*XXX*. (10.44.77.*XXX* indicates the IP address which is in the same network as the switch. *XXX* is in the range of 1 to 254, excluding 200.)

Step 2: Log in to the switch by accessing the IP address of 10.44.77.200 on a browser. The default password is admin.

5 Power-on Startup

5.1 Checking before Power-on

The switch is fully grounded.

The power cable is correctly connected.

The power cable is buckled after connected.

The power supply voltage complies with the requirement of the switch.

The console cable is correctly connected; the PC is already started; the parameters are already configured.

5.2 Checking after Power-on (Recommended)

After power-on, you are recommended to perform the following checks to ensure the normal operation of follow-up configurations.

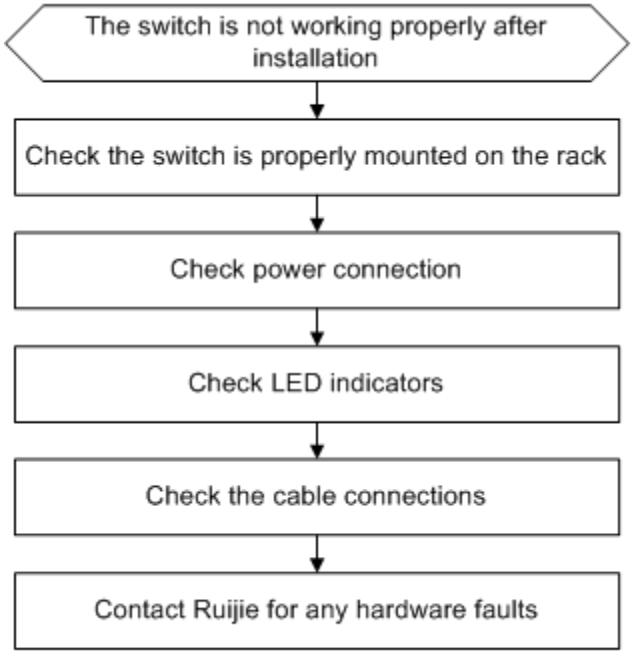
Check whether the status of the switch indicator is normal.

Check whether the main program is loaded normally.

Check whether the service interface forwards data normally.

6 Troubleshooting

6.1 General Troubleshooting Flowchart



6.2 Troubleshooting Common Faults

Symptom	Possible Causes	Solution
Forgetting the management interface login password	A password is manually configured but it is forgotten.	Press the reset button to restore the default settings.
The Status LED is off after power-on.	The power supply is not enabled, or the power cable is loosened.	Check whether the power socket is normal. Check whether the power cable is correctly connected.
The RJ45 port is not in connectivity or it is erroneous in receiving/transmitting frames.	The connected twisted pair cable is faulty. The length of the cable exceeds 100 m. The port has special configuration that has no common working mode with the connected switch.	Replace the twisted pair cable. Check that the port configuration has the common working mode with the connected switch.

The fiber port cannot be connected.	The Rx and Tx ends are connected reversely. The interconnected optical module type does not match. The fiber type is not correct. The length of the optical fiber exceeds that rated of the optical module.	Switch the Rx and Tx ends of the optical fiber. Replace the optical module with one of the matched type. Replace the optical fiber with one of the appropriate type. Replace the optical fiber with one of the appropriate length.

7 Appendix A Connectors and Connection Media

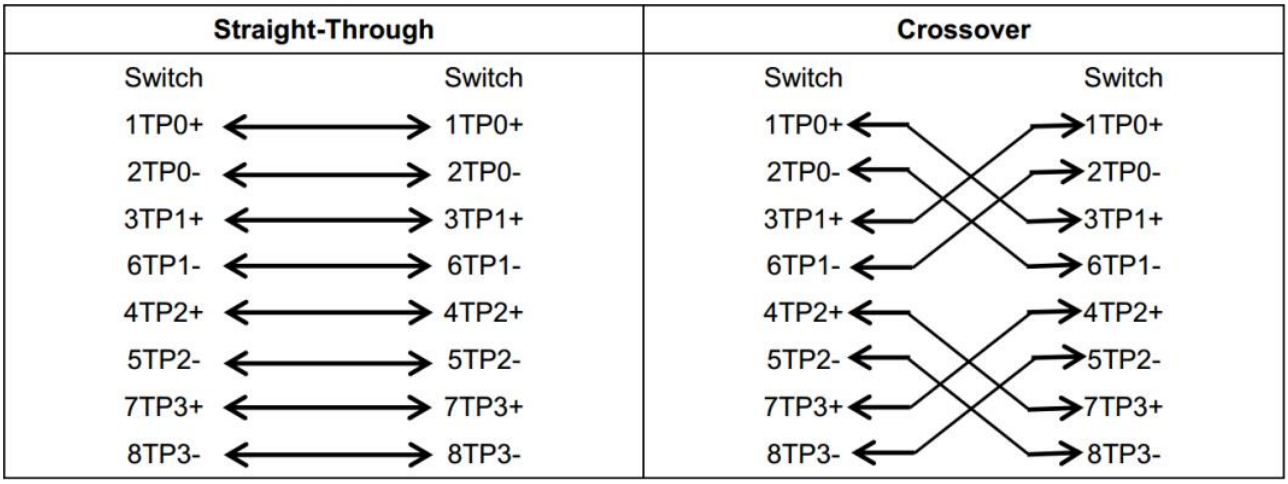
1000BASE-T/100BASE-TX/10BASE-T Ports

The 1000BASE-T/100BASE-TX/10BASE-T is a port that supports adaptation of three rates, and automatic MDI/MDIX Crossover at these three rates.

The 1000BASE-T complies with IEEE 802.3ab, and uses the cable of 100-ohm Category-5 or Supper Category-5 UTP or STP, which can be up to 100 m.

The 1000BASE-T port uses four pairs of wires for transmission, all of which must be connected. Figure A-1 shows the connections of the twisted pairs used by the 1000BASE-T port.

Figure A-1 Schematic Diagram for the Four Twisted Pairs of the 1000BASE-T



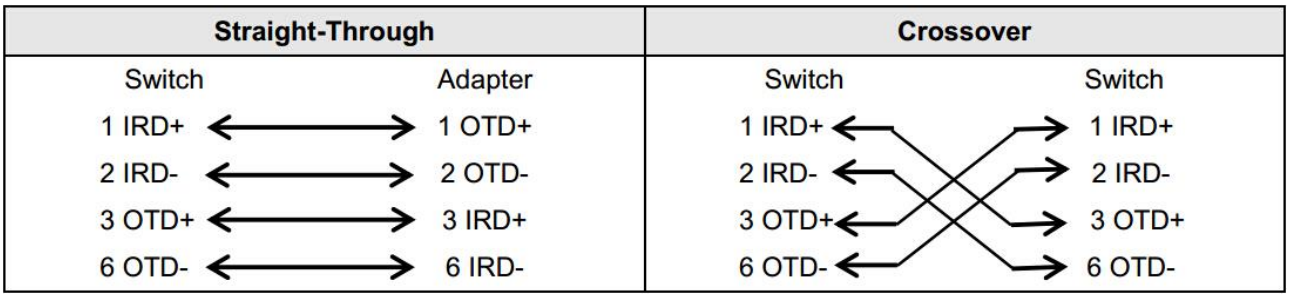
In addition to the above cables, the 100BASE-TX/10BASE-T can also use 100-ohm Category-3, 4, 5 cables for 10 Mbps, and 100-ohm Category-5 cables for 100 Mbps, both of which can be up to 100 m. 0 shows the pinouts of the 100BASE-TX/10BASE-T.

Figure A-2 Pinouts of the 100BASE-TX/10BASE-T

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4,5,7,8	Not used	Not used

Figure A-3 shows the straight-through and crossover cable connections for the 100BASE-TX/10BASE-T.

Figure A-3 Connections of the Twisted Pairs of the 100BASE-TX/10BASE-T



Optical Fiber Connection

For the optical fiber ports, select single-mode or multiple-mode optical fibers for connection according to the fiber module connected. The connection schematic diagram is shown in Figure A-4:

Figure A-4 Schematic Diagram for optical fiber connection

8 Appendix B Mini-GBIC and SPF Module

SFP modules (Mini-GBIC module) are available to address the requirements of interface types of switch modules. You can select the Mini-GBIC or SFP+ module to suit your specific needs. The models and technical specifications of some Mini-GBIC and SFP modules are listed below for your reference.

Table B-1 Models and Technical Specifications of the 1000M Mini-GBIC Module

Model	Wave Length (nm)	Media Type	DDM (Yes/No)	Intensity of Transmitted Light (dBm)		Intensity of Received Light (dBm)	
				Min	Max	Min	Max
MINI-GBIC-SX-MM850	850	MMF	No	-9.5	-3	-17	0
MINI-GBIC-LX-SM1310	1310	SMF	No	-9.5	-3	-20	-3
GE-eSFP-SX-MM850	850	MMF	Yes	-9.5	-3	-17	0
GE-eSFP-LX-SM1310	1310	SMF	Yes	-9.5	-3	-20	-3
GE-SFP-LX-SM1310	1310	SMF	No	-9.5	-3	-20	-3
MINI-GBIC-LH40-SM1310	1310	SMF	Yes	-2	3	-22	-3
GE-SFP-SX-SM1310-BIDI	1310	MMF	No	-10	-5	-17	-3
GE-SFP-SX-SM1550-BIDI	1550	MMF	No	-10	-5	-17	-3
GE-SFP-LX20-SM1310-BIDI	1310TX/1550RX	SMF	Yes	-9	-3	-20	-3
GE-SFP-LX20-SM1550-BIDI	1550TX/1310RX	SMF	Yes	-9	-3	-20	-3
GE-SFP-LH40-SM1310-BIDI	1310TX/1550RX	SMF	Yes	-5	0	-24	-1

GE-SFP-LH40-SM1550-BIDI	1550TX/1310RX	SMF	Yes	-5	0	-24	-1
MINI-GBIC-ZX50-SM1550	1550	SMF	Yes	-5	0	-22	-3
MINI-GBIC-ZX80-SM1550	1550	SMF	Yes	0	4.7	-22	-3
MINI-GBIC-ZX100-SM1550	1550	SMF	Yes	0	5	-30	-9
GE-SFP-SX	850	MMF	No	-9.5	-3	-17	0
GE-SFP-LX	1310	SMF	No	-9.5	-3	-20	-3
SFP-MM850	850	MMF	No	-9.5	-3	-17	0
SFP-SM1310	1310	SMF	No	-9.5	-3	-20	-3

Table B-2 Models and Technical Specifications of the Mini-GBIC-GT Module

Standard	1000Base-T SFP Type	DDM (Yes/No)
1000Base-T	Mini-GBIC-GT	No

Table B-3 Cabling Specifications of SFP Modules

Model	Optical Fiber Type	Media Type	Core Size (μm)	Maximum Cabling Distance
MINI-GBIC-SX-MM850	LC	MMF	62.5/125	275m
			50/125	550m
MINI-GBIC-LX-SM1310	LC	SMF	9/125	10km
GE-eSFP-SX-MM850	LC	MMF	62.5/125	275m
			50/125	550m
GE-eSFP-LX-SM1310	LC	SMF	9/125	10km
GE-SFP-LX-SM1310	LC	SMF	9/125	10km
MINI-GBIC-LH40-SM1310	LC	SMF	9/125	40km
GE-SFP-SX-SM1310-BIDI	LC	MMF	50/125	500m

GE-SFP-SX-SM1550-BIDI	LC	MMF	50/125	500m
GE-SFP-LX20-SM1310-BIDI	LC	SMF	9/125	20km
GE-SFP-LX20-SM1550-BIDI	LC	SMF	9/125	20km
GE-SFP-LH40-SM1310-BIDI	LC	SMF	9/125	40km
GE-SFP-LH40-SM1550-BIDI	LC	SMF	9/125	40km
MINI-GBIC-ZX50-SM1550	LC	SMF	9/125	50km
MINI-GBIC-ZX80-SM1550	LC	SMF	9/125	80km
MINI-GBIC-ZX100-SM1550	LC	SMF	9/125	100km
GE-SFP-SX	LC	MMF	62.5/125	275m
			50/125	550m
GE-SFP-LX	LC	SMF	9/125	10km
Mini-GBIC-GT	RJ45 cable	Category 5 (or above) UTP/STP		100m

Note

- For the optical module with transmission distance exceeding 40 km and more, one on-line optical attenuator should be added on the link to avoid the overload of the optical receiver when short single-mode optical fibers are used.
- The optical module is a laser device. Please take care of your eyes and do not look into the laser beam directly.
- To keep the optical module clean, please make sure that the dust cap is mounted when it is not connected to cables.

Table B-4 Specifications of SFP BIDI Optical Module Pairs

Rate/Distance	Module Pairs
1000M/500m	GE-SFP-SX-SM1310-BIDI GE-SFP-SX-SM1550-BIDI
1000M/20km	GE-SFP-LX20-SM1310-BIDI GE-SFP-LX20-SM1550-BIDI

1000M /40km	GE-SFP-LH40-SM1310-BIDI GE-SFP-LH40-SM1550-BIDI

Caution

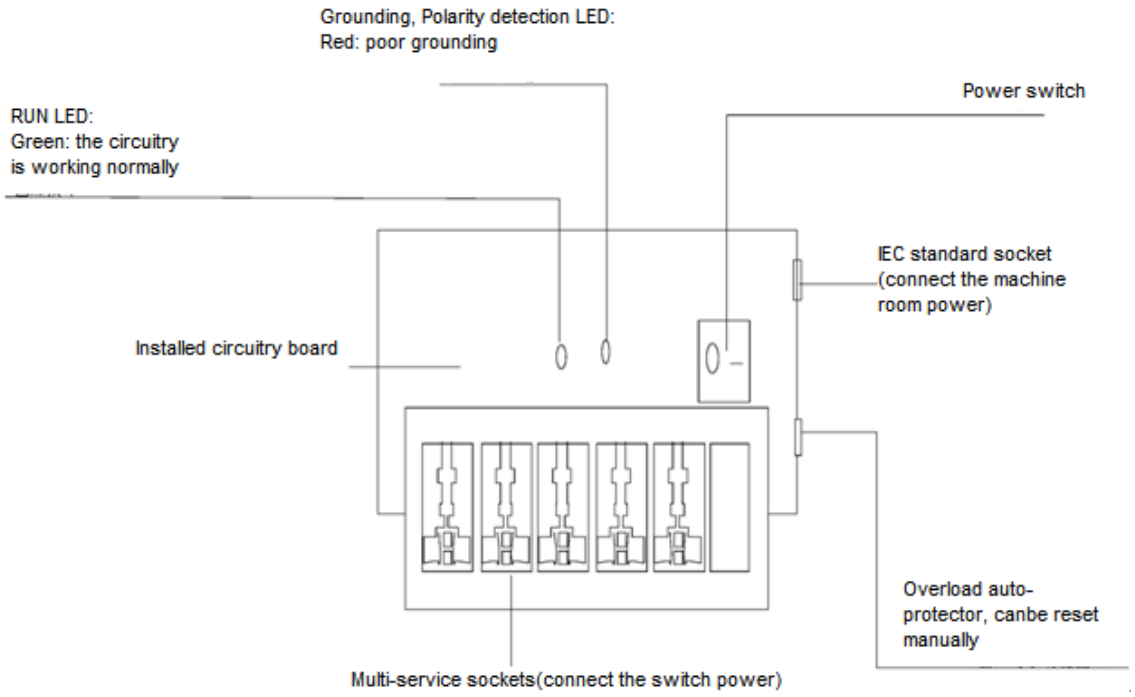
The BIDI modules must be used in pairs (e.g., GE-SFP-LX20-SM1310-BIDI and GE-SFP-LX20-SM1550-BIDI).

9 Appendix C Lightning Protection

Installing AC Power Arrester (lightning protection cable row)

The external lightning protection cable row shall be used on the AC power port to prevent the switch from being struck by lightning when the AC power cable is introduced from the outdoor and directly connected to the power port of the switch. The lightning protection cable row is fixed on the cabinet, operating table or the wall in the machine room using the line buttons and screws.

Figure C-1 Schematic Diagram for the Power Arrester



Caution

The power arrester is not provided and the user shall purchase it to address the practical requirement.

Precautions for installation:

- Make sure that the PE terminal of the power arrester has been well-grounded;
- After connecting the switch AC power plug to the socket of the power arrester (lightning protection socket), lightning protection function implements if the RUN LED is Green and the ALARM LED is OFF.
- If the ALARM LED on the power arrester is Red, you shall check what the reason is, poor grounding connection or the reversed connection of the Null and Live lines: Use the multimeter to check the polarity of the power socket for the arrester when the LED is Red, if the N line is on the left and the L line is on the right, the arrester PE terminal is not grounded; if the L line is on the left and the N line is on the right, the polarity of the arrester power cable shall be reversed; if the LED is still Red, it is confirmed that the arrester PE terminal has not been grounded.

Installing the Ethernet Port Arrester

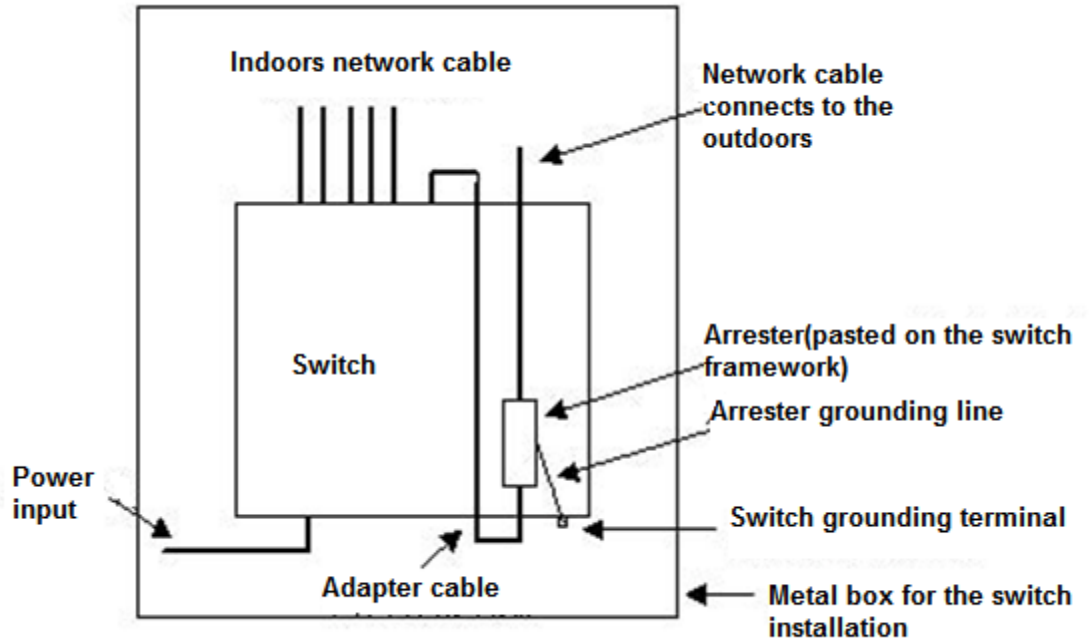
During the switch usage, the Ethernet port arrester shall be connected to the switch to prevent the switch damage by lightning before the outdoor network cable connects to the switch.

Tools: Cross or straight screwdriver, Multimeter, Diagonal pliers

Installation Steps:

- Tear one side of the protection paper for the double-sided adhesive tape and paste the tape to the framework of the Ethernet port arrester. Tear the other side of the protection paper for the double-sided adhesive tape and paste the Ethernet port arrester to the switch framework. The paste location for the Ethernet port arrester shall be as close to the grounding terminal of the switch.
- Based on the distance of the switch grounding terminal, cut the grounding line for the Ethernet port arrester and firmly tighten the grounding line to the grounding terminal of the switch.
- Use the multimeter to check whether the grounding line for the arrester is in good contact with the switch grounding terminal and the framework.
- According to the description on the Ethernet Port Arrester Hardware Installation Guide, connect the arrester using the adapter cable(note that the external network cable is connected to the end of IN, while the adapter cable connected to the switch is connected to the end of OUT) and observe whether the LED on the borad is normal or not.
- Use the nylon button to bundle the power cables.

Figure C-2 Schematic Diagram for the Ethernet port Arrester Installation



Caution

- The Ethernet port arrester is only for the 10M/100M copper Ethernet ports with the RJ-45 connector;
- The Ethernet port arrester is not provided, the user can purchase them to address their own practical requirements. For the detailed information during the arrester installation, please refer to Ethernet Port

Arrester Hardware Installation Guide, which contains the technical specification and the maintenance and installation of the arrester.

- You may pay attention to the following conditions during the actual installation to avoid influencing the performance of the Ethernet port arrester:
- Reversed direction of the arrester installation. You shall connect the external network cable to the “IN” end and connect the switch Ethernet port to the “OUT” end.
- Poor arrester grounding. The length of the grounding line should be as short as possible to ensure that it is in good contact with the switch grounding terminal. Use the multimeter to confirm the contact condition after the grounding.
- Incomplete arrester installation. If there is more than one port connected to the peer device on the switch, it needs to install the arresters on all connection ports for the purpose of the lightning protection.

10 Appendix D Cabling Recommendations

When RG-NBS3100 series switches are installed in standard 19-inch racks, route cable bundles upward or downward along the sides of the rack depends on the actual situation in the equipment room. All cable connectors should be placed at the bottom of the rack rather than be exposed outside of the cabinet. Power cords should be routed upward or downward beside the rack close to the location of the DC power distribution cabinet, AC power outlet, or lightning protection box.

Required Minimum Cable Bend Radius

- The minimum bend radius of a power, communication or flat cable should be 5 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 7 times the overall diameter.
- The minimum bend radius of a coaxial cable should be 7 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 10 times the overall diameter.
- The minimum bend radius of a high-speed cable, such as an SFP+ cable should be 5 times the overall diameter of the cable. If the cable is constantly bent, plugged or unplugged, the bend radius should be 10 times the overall diameter.

Required Minimum Fiber Bend Radius

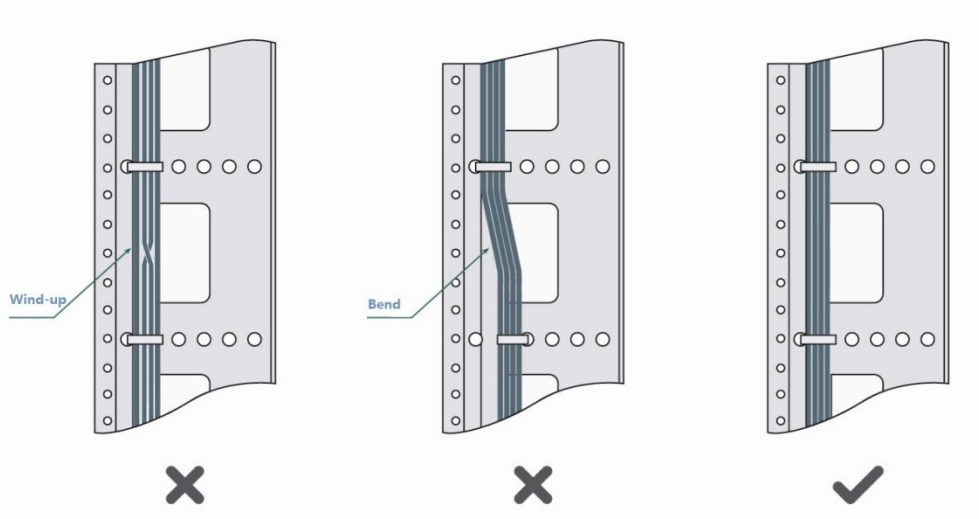
- The diameter of a fiber tray to hold fibers cannot be less than 25 times the diameter of the fiber.
- When moving an optical fiber, the bend radius of the fiber should be equal to or greater than 20 times the diameter of the fiber.
- During cabling of an optical fiber, the bend radius of the fiber should be equal to or greater than 10 times the diameter of the fiber.

Precautions for Cable Bundling

Before bundling cables, correctly mark labels and stick the labels to cables where appropriate.

Cables should be neatly and properly bundled, as shown in Figure D-1.

Figure D-1 Bundling Cables

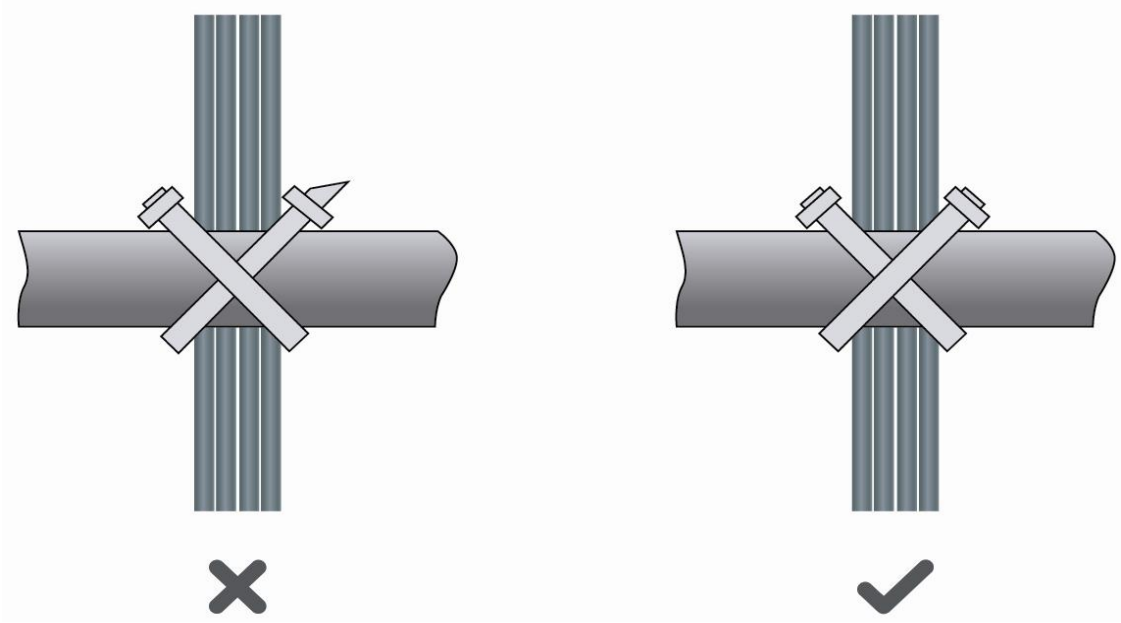


- Route and bundle power, signal, ground cables separately. When the cables are close to each other, cross

them. When power cables run parallel to signal cables, the distance between them must b

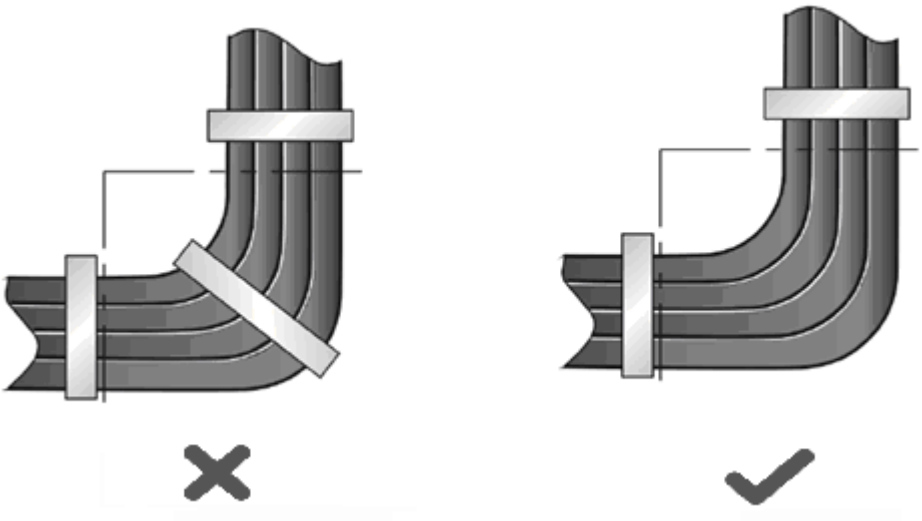
- All cable trays and their accessories shall be smooth and free from sharp edges.
- Holes in metal, through which cables pass shall have smooth, well-rounded surfaces or be protected with insulating bushings.
- Use proper cable ties to bind cables together. Do not tie two or more cable ties to bind cables.
- Cut off excess cable tie cleanly with no sharp edges after bundling cables, as shown in Figure D-2.

Figure D-2 Cutting off Excess Cable Tie



- If cables are to be bent, bind them first but do not tie cable ties within the bend to avoid stress on the cables, which may otherwise cause the wires inside to break, as shown in Figure D-3.

Figure D-3 Do Not Tie Cable Ties within the Bend

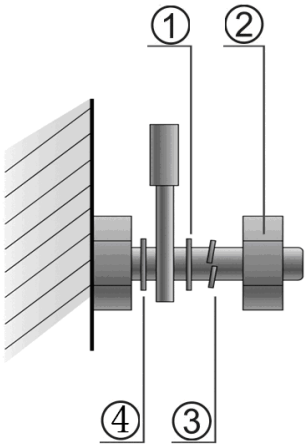


- Wrap up unnecessary or excess cables and bind them to the appropriate rack position, where device operation is not affected and no damages occur to the device and cables during debugging.
- Do not bind power cords to the rails for moving parts.
- Leave a certain length of the cable connecting moving parts, such as the ground wire of the cabinet door, to

avoid stress on the cable; when moving parts are in place, ensure the excess cable length shall not contact heat sources, sharp corners or edges. If heat sources are unavoidable, use high-temperature cables instead.

- When using screws to fasten cable lugs, the bolts or nuts shall be tightened and prevented from loosening, as shown in Figure D-4.

Figure D-4 Fastening Cable Lugs



Note	Flat washer Nut	Spring washer Flat washer

- When using a stiff cable, fix it near the cable lug to avoid stress on the lug and cable.
- Do not use self-tapping screws to fasten terminals.
- Bundle cables of the same type and running in the same direction into groups. Keep cables clean and straight.
- Cables shall be tied according to the following table.

Diameter of Cable Bundle (mm)	Space between Bundles (mm)
10	80 to 150
10 to 30	150 to 200
30	200 to 300

- Do not tie knots for cables or cable bundles.
- The metal parts of the cold-pressed terminal blocks, such as air circuit breakers, shall not be exposed outside of the blocks.

11 Appendix E Site Selection

- The machine room should be at least 5km away from the heavy pollution source such as the smelter, coal mine and thermal power plant, 3.7km away from the medium pollution source such as the chemical industry, rubber industry and electroplating industry, and 2km away from the light pollution source such as the food manufacturer and leather plant. If the pollution source is unavoidable, the machine room should be located on the windward side of the pollution source perennially with advanced protection.
- The machine room should be at least 3.7km away from the sea or salt lake. Otherwise, the machine room must be sealed, with air conditioner installed for temperature control. Saline soil cannot be used for construction. Otherwise, you should select devices with advanced protection against severe environment.
- Do not build the machine room in the proximity of livestock farms. Otherwise, the machine room should be located on the windward side of the pollution source perennially. The previous livestock house or fertilizer warehouse cannot be used as the machine room.
- The machine room should be firm enough to withstand severe weather conditions such as windstorm and heavy rain as well as away from dust. If the dust is unavoidable, keep the door and window away from the pollution source.
- The machine room should be away from the residential area. Otherwise, the machine room should meet the construction standard in terms of noise.
- Make sure the air vent of the machine room is away from the sewage pipe, septic tank, and sewage treatment tank. Keep the machine room under positive pressure to prevent corrosive gas from entering the machine room to corrode components and circuit boards. Keep the machine room away from industrial boiler and heating boiler.
- The machine room had better be on the second floor or above. Otherwise, the machine room floor should be 600mm higher than the highest flood level ever recorded.
- Make sure there are no cracks or holes in the wall and floor. If there are cable entries in the wall or window, take proper sealing measures. Ensure that the wall is flat, wear-resistant, and dust-free, which should be up to the standard for flame retarding, soundproofing, heat absorption, dust reduction, and electromagnetic shielding.
- Keep the door and the window closed to make the machine room sealed.
- The steel door is recommended for soundproofing.
- Sulfur-containing materials are forbidden.
- Pay attention to the location of the air conditioner. Keep the air conditioner from blowing wind straight toward the device or blowing water drops from the window or air vent toward the device.