# Lysora LS2-24GT4SFP-P Switch

## Installation Guide

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# Preface

## Intended Audience

This document is intended for:

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

## Technical Support

- Official website: https://help.lysoratech.com/
- Technical support email: support@lysoratech.com

## Conventions

### 1. Signs

The signs used in this document are described as follows:

**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. Notes

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

The LS2-24GT4SFP-P switch is a new generation Ethernet switch developed by Lysora. 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.

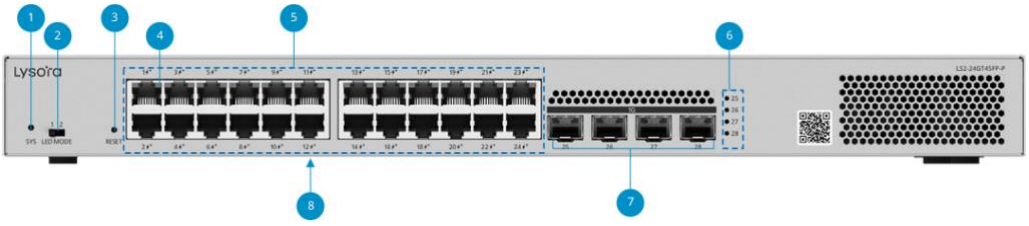
| Model | 10/100/1000BASE-T Port | 1000Base-X SFP Port | Console Port | Power Unit | Fan |
|---|---|---|---|---|---|
| LS2-24GT4SFP-P | 24 (support for PoE/PoE+) | 4 | / | Fixed single power supply | 1 x fixed fan |

## 1.1 Product Appearance

**Figure 1-1 Appearance of LS2-24GT4SFP-P**

## 1.1.2 Front Panel

**Figure 1-1 Front Panel of LS2-24GT4SFP-P**




**Note**

indicates PoE+ port, which is compliant with IEEE 802.3af and IEEE 802.3at.

**Table 1-1 Front Panel Description of LS2-24GT4SFP-P**

| No. | Silkscreen | Component | Description |
|---|---|---|---|
| 1 | SYS | System status LED | For details about the LED status, see 1.1.3 LED. |
| 2 | LED MODE | Port LED switch | ● LED switch toggled to left (Mode 1): the port LED status indicates the status of traffic transmission.<br>● LED switch toggled to right (Mode 2): The port LED status indicates the PoE status. |
| 3 | RESET | Reset button | ● Press and hold the button for less than 2s: Restart the switch.<br>● Press and hold the button for more than 5s: Press and hold the button for more than 5s until the |

| No. | Silkscreen | Component | Description |
|---|---|---|---|
| | | | system status LED starts blinking to restore factory settings and restart the switch.<br>● Press and hold for 2s to 5s: No action is triggered. |
| 4 | 1-24 | 10/100/1000Base-T Ethernet port status LED | For details about the LED status, see 1.1.3 LED. |
| 5 | 1-24 | 10/100/1000Base-T Ethernet port | 24 x 10/100/1000BASE-T ports, with ports 1-24 supporting PoE/PoE+. |
| 6 | 25-28 | SFP port status LED | For details about the LED status, see 1.1.3 LED. |
| 7 | 25-28 (1G) | 1GE SFP port | 4 x 1GE SFP Port |
| 8 | / | Nameplate | The nameplate is located at the bottom of the device. |

## 1.1.3 Rear Panel

**Figure 1-1 Rear Panel of LS2-24GT4SFP-P**

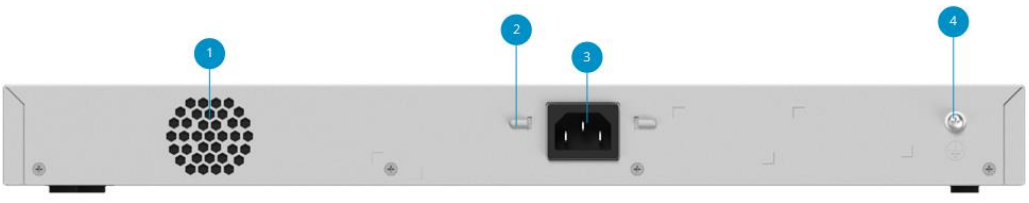


**Table 1-1 Rear Panel Description of LS2-24GT4SFP-P**

| No. | Name | Description |
|---|---|---|
| 1 | Ventilation openings | Used for heat dissipation. |
| 2 | Power cord retention clips holes | You can secure the power cord retention clip to the holes. |
| 3 | Three-hole AC power receptacle | Connected to an external AC power supply. |
| 4 | Grounding stud | You can secure the terminal of a grounding wire to the grounding stud to connect the chassis to earth ground. |

### 1.1.4 LED

**Table 1-1 LED**

| LED | Silkscreen | Status | Description |
|---|---|---|---|
| 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 Lysora 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. |

| LED | Silkscreen | Status | Description |
|---|---|---|---|
| 10/100/1000Base-T Ethernet port status LED (ports status) | 1-24 | 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. |
| 10/100/1000Base-T Ethernet port status LED (PoE status) | 1-24 | Off | The PoE port is not supplying power. |
| | | Solid green | The PoE port is supplying power. |
| | | Blinking green | PoE overload occurs on the port. |
| SFP port status LED | 25-28 | 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 transmitting traffic at 1000 Mbps. |

# 1.2 Technical Specifications

**Table 1-1 Technical Specifications**

| Parameter Type | Parameter Name | LS2-24GT4SFP-P |
|---|---|---|
| **Product Information** | Warranty | 3 years |
| **System Specifications** | RAM | 512 MB |
| | Flash memory | 16 MB |
| **Port Specifications** | Total number of RJ45 ports | 24 |
| | Total number of optical ports | 4 |
| | Number of 10/100/1000BASE-T ports | 24 |
| | Number of 1GE SFP ports | 4 |
| | Ethernet cable type | CAT5e |
| | LEDs | 1 x system status LED<br>24 x Ethernet port LEDs<br>4 x SFP port LED |
| **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 |

| Parameter Type | Parameter Name | LS2-24GT4SFP-P |
|---|---|---|
| | Power supply | Fixed power supply |
| | Power input | 220 V AC power supply:<br>● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz<br>● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz<br>● Maximum input current: 6 A |
| | Power supply to external devices | The Ethernet interface provides aPoEbudget of 54 V/30 W. |
| | Maximum power consumption | 21 W (with no PoE load)<br>443 W (with full PoE load) |
| | Maximum heat dissipation | No PoE load: 71.82 BTU/hr(220V/50Hz)<br>Full PoE load: 1,515.06 BTU/hr(220V/50Hz) |
| | EEE | Yes |
| | Max. Ground Leakage Current | ≤ 3.5 mA |
| **Dimensions and Weight** | Enclosure Material | 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.) |

| Parameter Type | Parameter Name | LS2-24GT4SFP-P |
|---|---|---|
| | Package dimensions (W x D x H) | 554 mm × 310 mm × 93 mm (21.81 in. x 12.2 in. x 3.66 in.) |
| | Weight | 3 kg (6.61lbs) (without packaging materials) |
| | Shipping weight | 3.53 kg (7.78lbs) |
| | Rack space | Rack requirement: 19-inch rack |
| **Environment and Reliability** | Mounting options | Rack/Desk |
| | Fan | 1 x fixed fan |
| | Cooling | Air cooling, front-to-rear airflow + left-to-rear airflow |
| | 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) |
| | Surge protection | Service port: ±6 kV for common mode<br>Power connector: ±6 kV for both common mode and differential mode |
| | MTBF | 400,000 hours |

| Parameter Type | Parameter Name | LS2-24GT4SFP-P |
|---|---|---|
| **Certification and Regulatory Compliance** | Certification | FCC, IC, cTUVus |

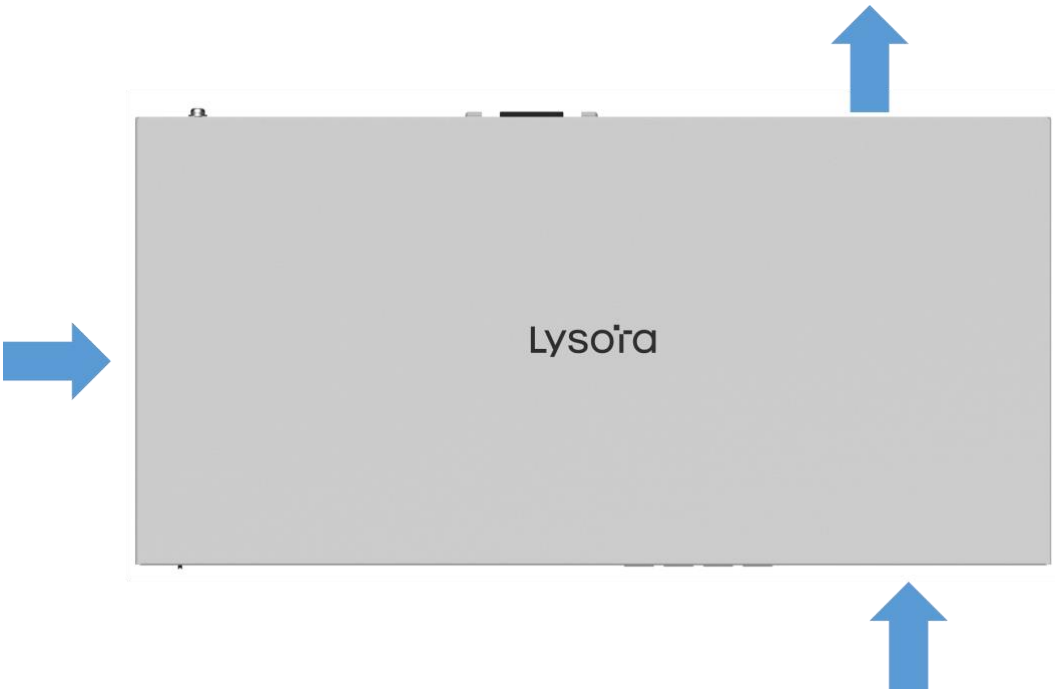
**⚠ Caution**

Operation of this equipment in a residential environment could cause radio interference.

## 1.3 Cooling

The LS2-24GT4SFP-P 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 1-1 Airflow Direction**



# 2 Preparing for Installation

## 2.1 Package Contents

**Table 2-1 Package Contents**

| Item | Quantity |
|---|---|
| Device | 1 |
| Rack-mount bracket | 2 |
| Rubber pad | 4 |
| User manual | 1 |
| M4 x 8 mm cross recessed countersunk head screw | 6 |
| Power cord | 1 x 1.8 m (5.91 ft.) |
| Power cord retention clip | 1 |
| Grounding cable | 1 x 1 m (3.28 ft.) |
| Warranty Card | 1 |

**Note**

The package contents above are intended to provide a general overview, and are subject to the terms of the order contract. Please check your goods carefully against the package contents or order contract. If you have any questions, please contact the distributor.

## 2.2 Safety Guidelines

**Caution**

- To avoid personal injury or equipment damage, review the safety guidelines in this chapter before you begin the installation.

- The following safety guidelines may not include all the potentially hazardous situations.

## 2.2.1 General Precautions

- Install the equipment in a standard 19-inch rack.
- Cut off all power supplies and unplug all cables before mounting the equipment in a rack or removing it from a rack.
- Never operate the equipment in a wet environment, and avoid any liquids inside it. Keep the chassis clean and dust-free.
- Keep the equipment away from heat sources.
- Ensure that the rack and power distribution system are properly grounded.
- Keep the equipment away from walk areas.
- During installation and maintenance, do not wear loose clothing or ornament that may get caught in the chassis.
- Keep tools and accessories away from walk areas.

## 2.2.2 Chassis-Lifting Guidelines

- Avoid moving the equipment frequently.
- Turn off all power supplies and disconnect all cables before lifting or moving the equipment.
- Keep balance and prevent personal injuries when lifting or moving the equipment.

## 2.2.3 Electricity Safety

**Warning**

- Any deviation from standard or improper electrical operations can result in accidents such as fires or electric shocks, potentially causing severe or even fatal harm to both individuals and equipment.
- Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

- Always observe the local regulations and standards. Only qualified personnel should be allowed to operate the equipment.

- Carefully check the work area for potential hazards, including ungrounded power system, absent safety grounds, and damp floors.
- Locate the emergency power-off switch in the room before installation. In the case of an accident, cut off the power supply immediately.
- Never assume that power is disconnected from a circuit. Always check.
- Select the right leakage protector (also called “leakage current switch” or “leakage current breaker”) for the power supply system. This equipment automatically disconnects the power supply in the event of leakage and the risk of electric shock. A leakage protector should meet the following requirements:
  - The rated leakage action current of each leakage protector is greater than twice 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, and the leakage current of each power supply is equal to or less than 3.5 mA, then the leakage current of the system totals 56 mA. A leakage protector with a rated leakage action current of 30 mA supports no more than four 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 this case, 16 power supplies in the system require at least four leakage protectors with a rated action current of 30 mA, with each leakage protector supporting four power supplies.
  - Although the number of power supplies in a system differs in models, the rated leakage action current of each leakage protector divided by two must be greater than the sum of the maximum leakage current of all the power supplies.
  - The rated leakage non-action current of a leakage protector should be 50% of the leakage action current. If the non-action current value is too small, the high sensitivity level can cause the circuit to break, leading to power cutoff and service interruption, even if the leakage current value is normal.
  - For example, if a leakage protector has a rated leakage action current of 30 mA, the rated leakage non-action current should be 15 mA. The leakage protector will not activate unless the leakage current exceeds 15 mA.

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**⚠ Caution**

- To ensure personal safety, each leakage protector in the system must have a rated leakage action current equal to or below 30 mA, which is the recognized safety threshold for human body current. If the total leakage current of the system

exceeds twice the 30 mA limit, the system must be equipped with two or more leakage protectors to maintain safety.

- The leakage current values vary with equipment. For the leakage current value of each equipment model, see the technical specifications in section "Technical Specifications".

## 2.2.4 Preventing ESD Damage

- Ensure that the grounding stud on the rear panel of the equipment is grounded.
- Ensure that the AC power socket is a single-phase three-core power socket with protective earthing conductors (PE).
- Keep the site as dust free as possible.
- Maintain appropriate humidity conditions.
- Before installing any pluggable modules, wear an anti-ESD wrist strap and make sure that it is properly grounded.

## 2.2.5 Laser Safety

The equipment with optical ports supports various types of optical transceivers, which are Class I laser products. Pay attention to the following:

- When an optical transceiver is working, ensure that its port is connected to an optical cable 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 stare into its port after removing the optical cable. Otherwise, your eyes may be hurt.

**Figure 2-1 Laser Product ID**


**Warning**

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

# 2.3 Site Requirements

The equipment must be installed indoors for normal operation and prolonged service life. The installation site must meet the following requirements.

## 2.3.1 Floor Loading

Assess the combined weight of the equipment and its accessories, such as the rack and cables, and verify that the floor under the rack can bear the weight.

## 2.3.2 Airflow

Maintain a minimum clearance of 100 mm (3.94 in.) around the switch for air circulation and ventilation. After various cables are connected, bundle the cables or place them in the patch panel to avoid blocking air inlets. Dust the device every three months to avoid blocking the ventilation openings on the housing.

## 2.3.3 Temperature and Humidity

To ensure normal operation and prolonged service life of the equipment, maintain appropriate temperature and humidity conditions in the equipment room. Prolonged exposure to inappropriate temperature and humidity conditions can cause damage to the equipment.

- In an environment with high relative humidity, insulating materials are prone to poor insulation or even electricity leakage. Sometimes, high humidity may cause changes in the mechanical properties and cause rusting of metal parts.
- In an environment with low relative humidity, insulating gaskets may shrink, resulting in screw loosening.
- A high temperature can accelerate the aging process of insulation materials, greatly reducing the availability of the equipment and severely affecting its service life.

**Table 2-1 Operating Temperature and Humidity Requirements**

| Operating Temperature | Operating Humidity |
| --- | --- |
| 0°C to +50°C(32°F to +122°F) | 10% RH to 90% RH (non-condensing) |

**Note**

The operating temperature and humidity are measured at 1.5 m (4.92 ft.) above the floor and 0.4 m (1.31 ft.) before the rack when there is no protective plate in front or on the rear of the rack.

## 2.3.4 Cleanliness

Dust poses a significant hazard to the equipment. Dust on the enclosure causes electrostatic adhesion, leading to poor contact of the metallic joints. Electrostatic adhesion is more likely to occur in an indoor environment with relatively low humidity, not only affecting the service life of the equipment, but also causing communication faults. The following table lists the requirements for dust concentration and particle size in the equipment room.

**Table 2-1 Requirements for Dust**

| Particle Diameter | Unit | Concentration |
|---|---|---|
| ≥ 0.5 μm | Particles/$m^3$ | ≤ 3.5 x $10^6$ |
| ≥ 5 μm | Particles/$m^3$ | ≤ 3 x $10^4$ |

Apart from dust, there are also requirements on the salt, acid, and sulfide in the air of the equipment room. These harmful substances will accelerate metal corrosion and component aging. Therefore, the equipment room should be properly protected against harmful gases, such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine gas, and so on. The following table lists the limits on harmful gases.

**Table 2-2 Requirements for Gases**

| Gas | Average (mg/$m^3$) | Maximum (mg/$m^3$) |
|---|---|---|
| Sulfur dioxide ($SO_2$) | 0.3 | 1.0 |
| Hydrogen sulfide ($H_2S$) | 0.1 | 0.5 |
| Nitrogen dioxide ($NO_2$) | 0.5 | 1.0 |
| Chlorine gas ($CI_2$) | 0.1 | 0.3 |

**Note**

**Average** refers to the average value of harmful gases measured in a week. **Maximum** refers to the upper limit of harmful gases measured in a week for up to 30 minutes every day.

### 2.3.5 Preventing Electromagnetic Interference

All interference sources, either from outside or inside of the equipment or application system, affect the equipment by capacitive coupling, inductive coupling, or electromagnetic waves. Electromagnetic interference (EMI) occurs due to radiated interference or conducted interference, depending on the transmission path. When the energy, often RF energy, from a component arrives at a sensitive component through 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 occurs when interference is transferred from one unit to another unit through cables, which are usually electromagnetic wires or signal cables connected between the source and the sensor. 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.

The anti-interference requirements for the equipment are as follows:

- Take interference prevention measures for the power supply system.
- Keep the switch away from the grounding system or surge protection grounding system of the power facility.
- Keep the equipment far away from high-frequency current equipment such as high-power radio transmitting stations and radar stations.
- Take electromagnetic shielding measures when necessary.

### 2.3.6 Grounding

A proper grounding system is crucial for ensuring stable and reliable operation, as well as preventing lightning strikes and interference. Carefully check the grounding conditions at the installation site according to the grounding requirements, and complete grounding properly based on the site situation.

- Safety Grounding

Ensure that the equipment is securely grounded using grounding wires if the equipment uses the AC power supply. Otherwise, electric shocks may occur when the insulation resistance between the power module and the chassis decreases.

**Caution**

- The building should provide a protective ground connection to ensure that the equipment is connected to a protective ground.
- The O&M personnel should verify whether the AC socket is reliably connected to the protective ground of the building. If not, the O&M personnel should use a protective grounding wire to connect the protective grounding lug of the AC socket to the protective ground of the building.
- The power socket should be installed near the equipment and easily accessible.
- During the equipment installation, connect the grounding wire first and disconnect it last.
- The cross-sectional area of the protective grounding cable should be at least 0.75 $mm^2$ (18 AWG).
- Install the equipment by using 3-core power cords, with a minimum cross-sectional area of 0.75 $mm^2$ or 18 AWG per pin.

- Lightning Grounding

  The lightning protection system is an independent system composed of a lightning rod, a downlead conductor, and a connector connected to the grounding system. The grounding system is typically used for power reference grounding and safety grounding of the rack. Lightning grounding is required only for facilities, and is not required for the equipment.

**Note**

For surge protection, see 6.3 Surge Protection.

- EMC Grounding

  Grounding required for electromagnetic compatibility includes shielded grounding, filter grounding, noise and interference suppression, and level reference, which contribute to the overall grounding requirements.

  The grounding resistance should be smaller than 1 ohm. The switch provides one grounding stud on the back panel.

### 2.3.7 Surge Protection

- Ensure that the neutral point of the AC power socket is in good contact with the ground.
- Install a power arrester in front of the power input end to enhance surge protection for the power supply.
- When an AC power cord is introduced from outdoors and directly connected to the power port of the switch, the AC power port must be connected to an external power strip with surge protection to protect the switch against lightning strikes. Connect the mains AC power cord to the power strip with surge protection, and then connect the equipment to the power strip with surge protection. This prevents the current of high-voltage lightning from directly passing through the switch along the mains cable.

**Note**

- Power strips with surge protection are customer-supplied.
- For details on how to use a power strip with surge protection, see the related user guide.

### 2.3.8 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.

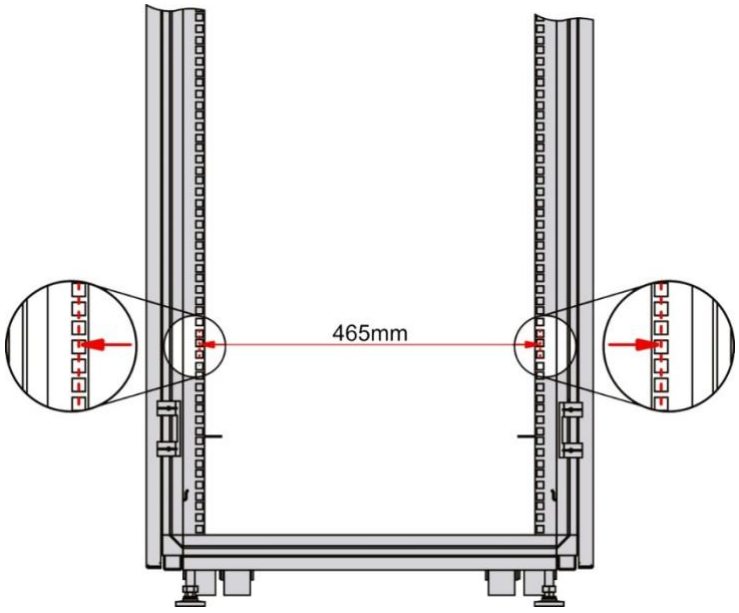
## 2.4 Rack Requirements

The equipment meets the EIA standard and can be installed in a 19-inch rack. If you want to install the switch in a rack, make sure that the rack observes the following requirements:

(1) Use a four-post 19-inch cabinet.

(2) The left and right square-hole rack posts are 465 mm (18.31 in.) apart.

**Figure 2-1 19-Inch Rack**



(3) The square-hole rack post is at least 180 mm (7.09 in.) from the front door, and the front door is at most 25 mm (0.98 in.) thick. This ensures an available clearance of at least 155 mm (6.10 in.). The rack depth (distance between front and rear doors) is at least 1000 mm (39.37 in.).

(4) The guide rails or tray can bear the weight of the equipment and its accessories.

(5) The rack has a reliable grounding lug for the chassis to connect to earth ground.

(6) The rack has a reliable ventilation system. The open area of front and rear doors is greater than 50%.

## 2.5 Tools

**Table 2-1 Tools**

| | |
|---|---|
| **Common Tools** | Phillips screwdriver, slotted screwdriver, related copper and fiber-optic cables, bolts, diagonal pliers, cable ties |
| **Special Tools** | ESD tools |
| **Meters** | Multimeter |
| **Relevant Equipment** | PC, display, and keyboard |

**Note**

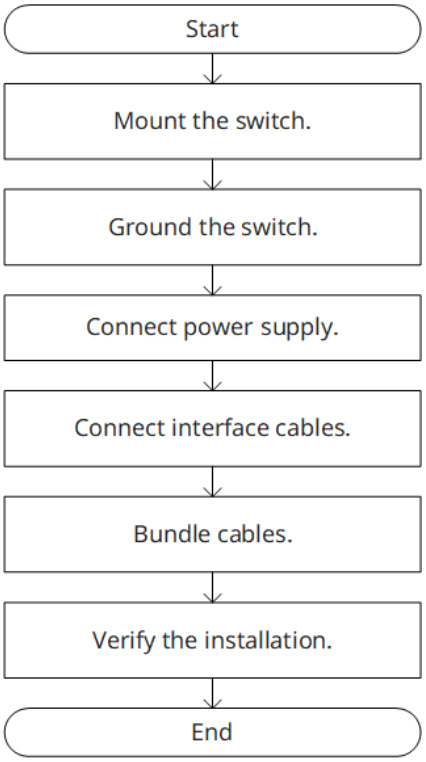
The equipment is delivered without a toolkit. Prepare the preceding tools by yourself.

# 3 Installing the switch

**Note**

- Before reading chapter 3 "Installing the switch", ensure that you have read chapter 2 carefully.
- Verify that requirements described in chapter 2 have been met.

## 3.1 Installation Procedure




## 3.2 Before You Begin

Confirm the following requirements before installation:

- The installation environment meets heat dissipation requirements.
- The installation environment meets the temperature and humidity requirements.
- The power supply and required current are available in the installation site.
- Ethernet cables have been deployed at the installation site.

# 3.3 Installing the Switch

**Precautions**

Pay attention to the following:

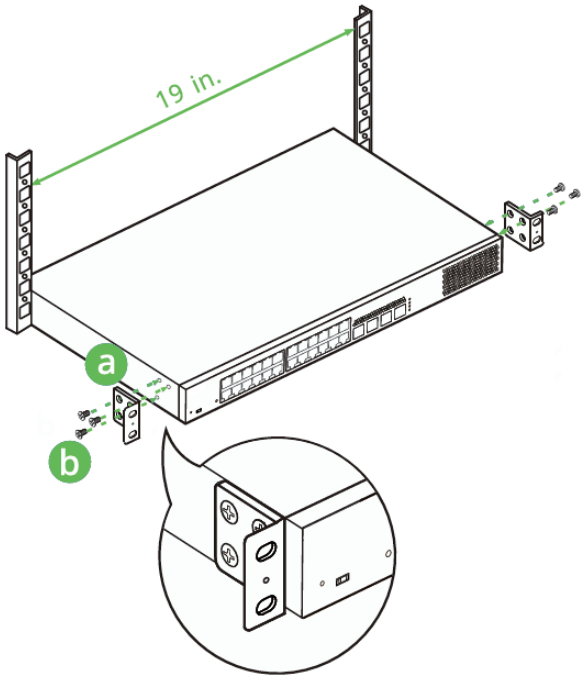
- Connect the power cords of different colors to the corresponding cable terminals.
- Ensure that the connector of the power cord is properly seated in the power port of the switch. After the power cord is securely inserted into the device, fasten the power cord with
- power cord retention clips.
- Do not place anything on the top of the switch.
- Maintain a minimum clearance of 100 mm (3.94 in.) around the device to ensure proper airflow. Do not stack switches.
- Keep the switch away from high-power radio launch pads, radar launch pads, and high-frequency large-current devices. Take electromagnetic shielding measures to minimize interference when necessary, for example, use shielded interface cables.
- Manage Ethernet cables with a distance of 100 meters (328.08 feet) indoors. Take lightning protection measures if they need to be routed outdoors.

## 3.3.1 Installing the Switch in a Rack

The switch follows the EIA standard dimensions and can be installed in the 19-inch rack.

(1) Attach the mounting brackets to the switch with the supplied screws.

**Figure 3-1 Securing Rack-Mount Brackets**




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

**Figure 3-1 Securing Rack-Mount Brackets to the Rack (1)**

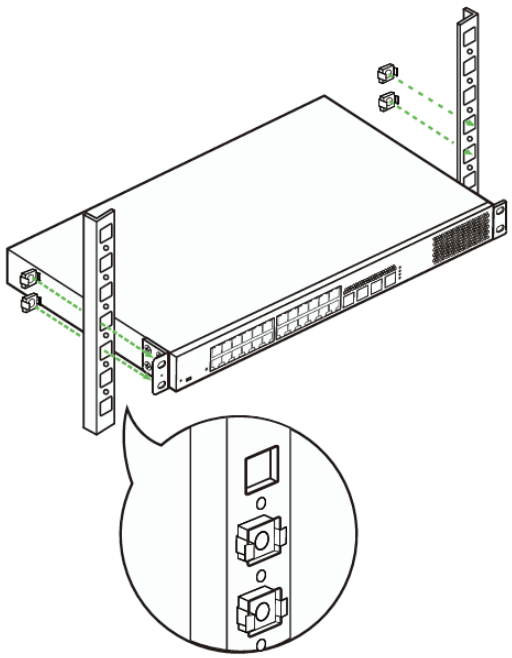
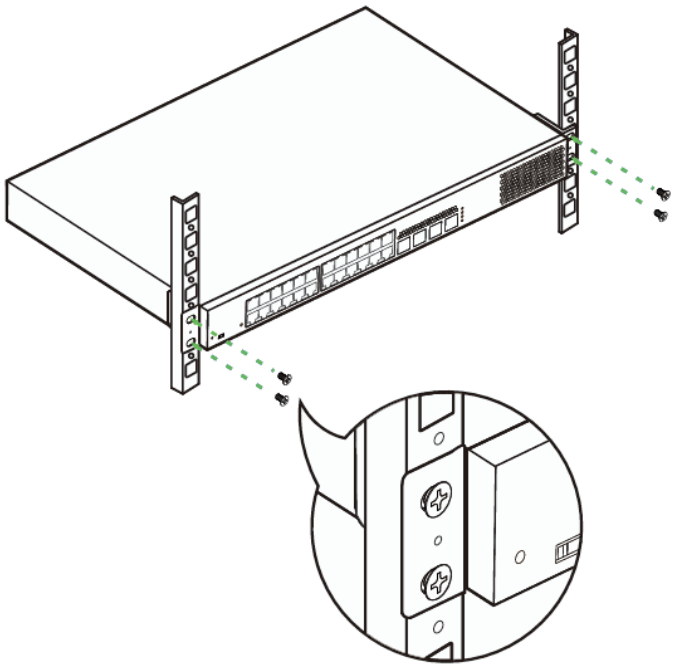


**Figure 3-2 Securing Rack-Mount Brackets to the Rack (2)**



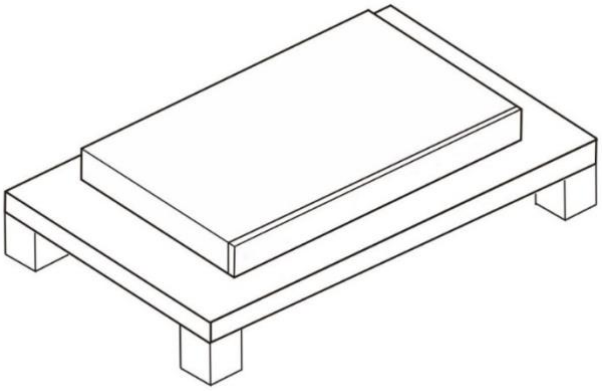
## 3.3.2 Installing the Switch on a Workbench

In some cases, if a standard 19-inch rack is unavailable, the switch can be mounted on a clean workbench, as shown in following figure. The location where the switch is installed must be subject to movement restrictions.

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

(2) Place the switch on the workbench.

**Figure 3-1 Installing the Switch on the Workbench**



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

(4) Place the switch on the table.

**⚠ Caution**

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

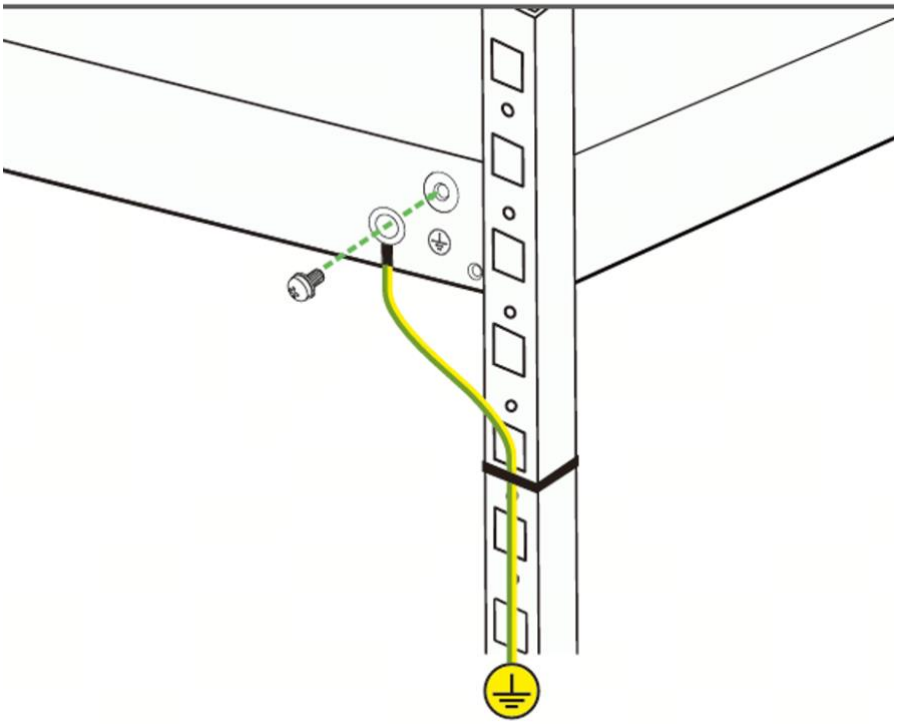
## 3.4 Grounding the Equipment

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.

(1) **Precautions**

- Determine the sectional area of the grounding wire according to the possible maximum current, and use cables of the good conductor.
- Do not use bare wires.
- The grounding electric resistance should be less than 1 Ω.

**Figure 3-1 Grounding Installation**



**⚠ 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 1 Ω.
- The maintenance personnel must check whether the AC socket powering the switch is well connected to the building protective earth (PE). If not, the personnel must connect the grounding lug of the AC socket to the PE with a grounding connector.
- building protective earth (PE). If not, the personnel must connect the grounding lug of the AC socket to the PE with a grounding connector.
- The AC socket must be installed near the device and easily used.
- When installing the switch, ensure that the grounding is connected first and then disconnected.
- The cross-sectional area of the PE conductor must be at least 2.5 $mm^2$ (12 AWG).

## 3.5 Connecting Cables

### Precautions

- Make sure that the models of optical transceivers and optical cables match with SFP

ports. The transmitting port on the local device should be connected to the receiving port on the peer device and vice versa.

- Avoid a small bend radius at the connector.

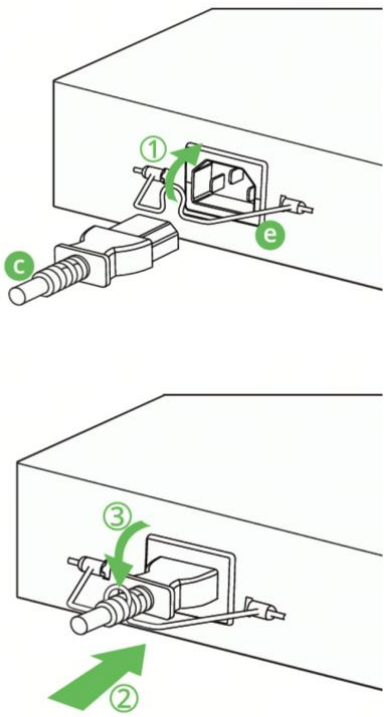
**Steps**

- Connect the power cord.

  Insert the power cord retention clip into the power cord retention clip holes, place the power cord retention clip upward, insert the power cord, and then place the power cord retention clip downward to secure the power cord.

> **Warning**
>
> Use the delivered power cords. Otherwise, security accidents may occur.

**Figure 3-1 Connecting the Power Cord**




- Connect cables.

  b. Connect the RJ45 connector of a twisted pair cable to the Ethernet port on the switch, and the other end to a managed device or PC.

c. Plug the SMF and MMF optical fibers into the corresponding ports according to the panel identification, and distinguish the transmitting and receiving ends of the optical fibers.

## 3.6 Bundling Cables

### Precautions

- The power cables and other cables must be well bundled.
- When you bundle fibers, make sure that the fibers at the connectors have natural bends or bends of the large radius.
- Do not bundle fibers and twisted pairs too tightly because this may press hard the fibers and affect their service time and transmission performance.

### Steps

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

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

(3) For power cables, bundle them closely along the bottom of the chassis, in a straight line wherever possible.

## 3.7 Verifying the Installation

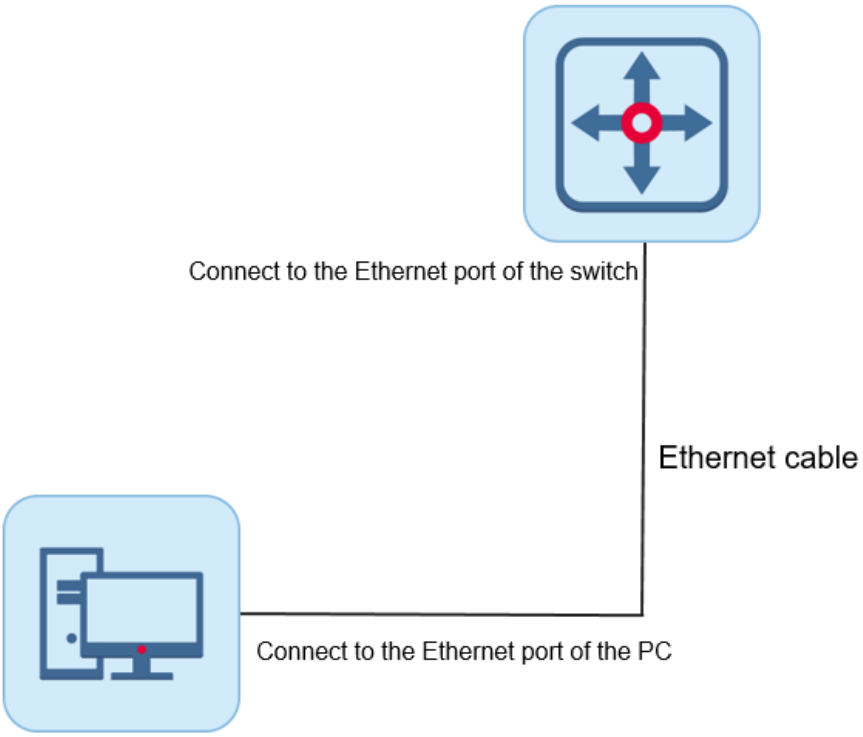
- Verify that the ground wire is connected.
- Verify that the Ethernet cables and power cords are properly connected.
- Verify that the cables with a distance of 100 meters (328.08 feet) are managed indoors. If not, check whether the power supply and interfaces are protected from lightning strikes.
- Verify that there is a minimum clearance of 100 mm (3.94 in.) around the switch.

# 4 Networking Configuration

## 4.1 Setting Up the Configuration Environment

Connect a PC to the switch's Ethernet port using an Ethernet cable.

**Figure 4-1 Configuring Environment**




**Connecting the Console Cable**

- Connect the one end (RJ45 port) of the network cable to the network port of the PC.
- Connect the other end (RJ45 port) of the network cable to any Ethernet port of the switch.

## 4.2 Power-on

(1) Check the items before power-on.

- The equipment is properly grounded.
- The power cord is reliably connected.
- The input voltage meets the requirement.
- The Ethernet cable is properly connected, and the client such as a PC used for

configuration is already turned on.

(2) Power on the equipment.

(3) Check the items after power-on.

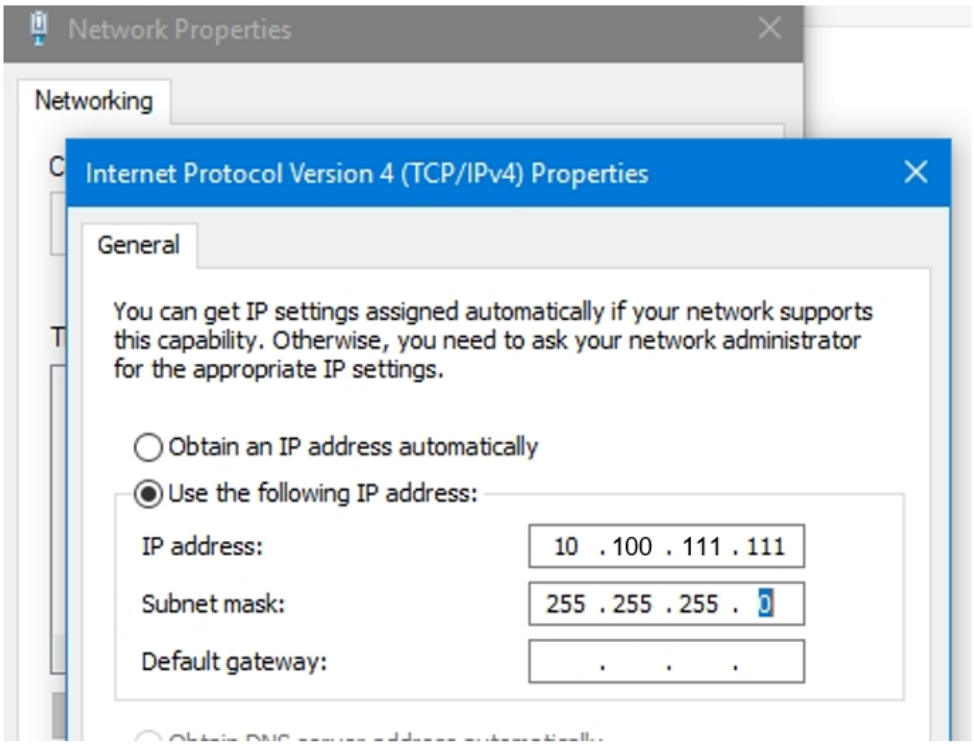
After the equipment is powered on, check the following items:

- The system status LED works properly.
- Service ports can forward data properly.

## 4.3 Configuring the Switch through Web Login

(1) Set the IP address of the PC to 10.100.111.XXX (Range: 1–254, excluding 200).

**Figure 4-1 Changing the PC's IP Address**




(2) Open your browser, enter 10.100.111.200 in the address bar, and log in to the management system after setting a password.

(3) Perform device commissioning and configuration based on service requirements.

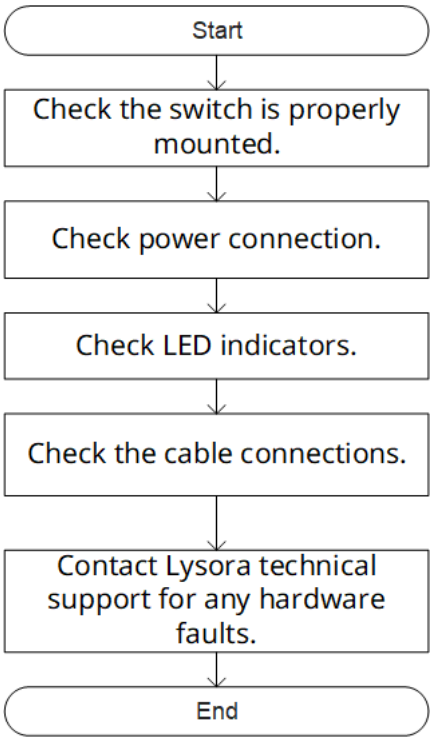
**Note**

For security purposes, you are advised to change the password regularly.

# 5 Troubleshooting

## 5.1 Troubleshooting Flowchart

If the switch is not working properly after installation, you can refer to the following flowchart for troubleshooting.




## 5.2 Common Troubleshooting

| Fault Symptom | Possible Cause | Suggested Action |
|---|---|---|
| The status indicator is off after the device is powered on. | No power is supplied to the switch or the power cord is loose. | Check whether the power socket in the equipment room is normal and whether the power cable connected to the switch is loose. |
| An RJ45 port is disconnected or a frame | The connected twisted pair cable is faulty. | ● Replace the twisted pair cable. |

| Fault Symptom | Possible Cause | Suggested Action |
| --- | --- | --- |
| sending/receiving error occurs. | The cable length exceeds 100 m.<br>The port is specially configured and does not use the same work mode as the interconnected switch. | Check port configurations and whether they work in the same mode as the interconnected switch. |
| An optical port cannot be connected. | Rx and Tx ends are connected incorrectly.<br>The types of the interconnected optical modules do not match.<br>Fiber type does not meet requirements.<br>The optical fiber length is beyond the allowed length marked on the optical module. | ● Connect the Rx and Tx ends of the fiber correctly.<br>● Replace optical modules with those of the same type.<br>● Replace the fiber with a qualified one.<br>● Use an optical fiber with the required length. |

# 6 Appendix

## 6.1 Connectors and Media

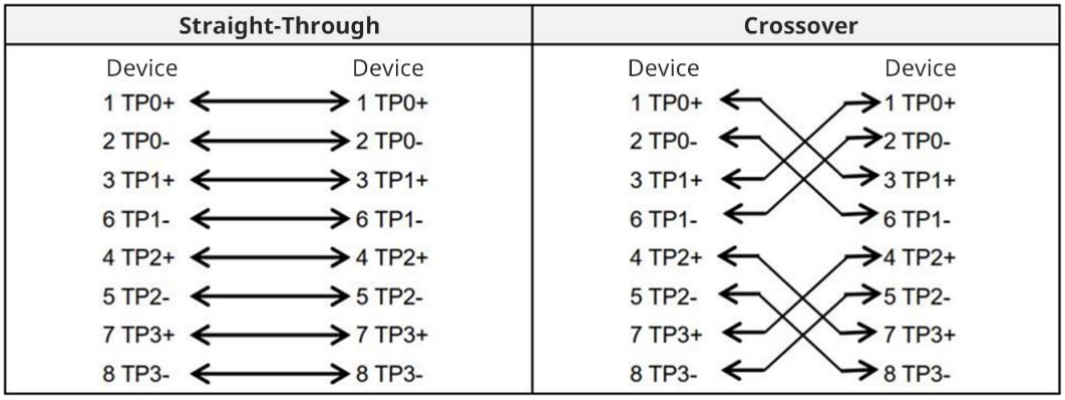
### 6.1.1 1000BASE-T／100BASE-TX／10BASE-T Port

1000BASE-T/100BASE-TX/10BASE-T ports are Ethernet ports with auto-negotiation of three speeds: 10 Mbps, 100 Mbps, and 1000 Mbps. They support auto MDI/MDIX Crossover, and use RJ 45 connectors.

Compliant with IEEE 802.3ab, 1000BASE-T requires Category 5e 100-ohm UTP or STP (recommended) with a maximum distance of 100 meters (328 feet).

The 1000BASE-T port requires all four pairs of wires to be connected for data transmission. The following figure shows the connection of twisted pairs used by a 1000BASE-T port.

**Figure 6-1 Connections of Four Twisted Pairs for the 1000BASE-T Port**



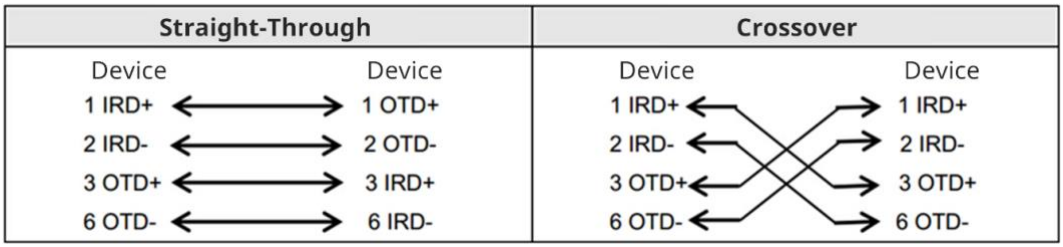

100BASE-TX/10BASE-T can be interconnected using cables of the preceding specifications. For 10 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 3, Category 4, and Category 5 cables; for 100 Mbps, the 100BASE-TX/10BASE-T port can be connected using 100-ohm Category 5 cables with a maximum connection distance of 100 meters. The following table shows 100BASE-TX/10BASE-T pin assignments.

**Table 6-1 Pin Assignments for the 100BASE-TX/10BASE-T Port**

| 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 |

The following figure shows feasible connections of straight-through and crossover twisted-pair cables for 100BASE-TX/10BASE-T.

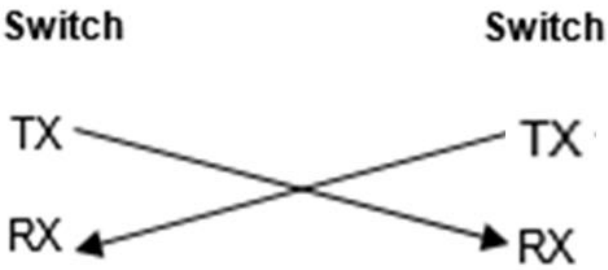
**Figure 6-2 Twisted Pair Connections for the 100BASE-TX/10BASE-T Port**




## 6.1.2 Optical Fiber Connection

Choose single mode or multi-mode fibers according to the module types.

**Figure 6-1 Optical Fiber Connection**



## 6.2 Mini-GBIC and SFP Modules

We provide appropriate SFP modules (Mini-GBIC modules) according to the port types. You can select the module to suit your specific needs. Besides, the Mini-GBIC-GT modules are also supported. The following models and technical specifications of some SFP modules are listed for your reference. For details about the technical specifications, see Lysora Transceiver Installation and Reference Guide.

**Table 6-1 Models and Specifications of 1000M Mini-GBIC (SFP) Optical Modules**

| Model | Wavelength (nm) | Cable 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- | 1310 | SMF | Yes | -2 | 3 | -22 | -3 |

| Model | Wavelength (nm) | Cable type | DDM (Yes/No) | Intensity of Transmitted Light (dBm) | | Intensity of Received Light (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min | Max |
| LH40-SM1310 | | | | | | | |
| 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 |

| Model | Wavelength (nm) | Cable type | DDM (Yes/No) | Intensity of Transmitted Light (dBm) | | Intensity of Received Light (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min | Max |
| 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 6-2 1000Base-T SFP Copper Module**

| Standard | 1000Base-T SFP Module | DDM (Yes/No) |
|---|---|---|
| 1000BASE-T | Mini-GBIC-GT | No |

**Table 6-3 Cabling Specifications of SFP Modules**

| SFP Model | Connector Type | Cable type | Core Specifications (μm) | Max. Cabling Distance |
|---|---|---|---|---|
| MINI-GBIC-SX-MM850 | L/C | MMF | 62.5/125 | 275 m |
| | | | 50/125 | 550 m |
| MINI-GBIC-LX-SM1310 | L/C | SMF | 9/125 | 10 km |
| GE-eSFP-SX-MM850 | L/C | MMF | 62.5/125 | 275 m |
| | | | 50/125 | 550 m |
| GE-eSFP-LX-SM1310 | L/C | SMF | 9/125 | 10 km |
| GE-SFP-LX-SM1310 | L/C | SMF | 9/125 | 10 km |
| MINI-GBIC-LH40-SM1310 | L/C | SMF | 9/125 | 40 km |
| GE-SFP-SX-SM1310-BIDI | L/C | MMF | 50/125 | 500 m |
| GE-SFP-SX-SM1550-BIDI | L/C | MMF | 50/125 | 500 m |
| GE-SFP-LX20-SM1310-BIDI | L/C | SMF | 9/125 | 20 km |
| GE-SFP-LX20-SM1550-BIDI | L/C | SMF | 9/125 | 20 km |
| GE-SFP-LH40-SM1310-BIDI | L/C | SMF | 9/125 | 40 km |

| SFP Model | Connector Type | Cable type | Core Specifications (μm) | Max. Cabling Distance |
|---|---|---|---|---|
| GE-SFP-LH40-SM1550-BIDI | L/C | SMF | 9/125 | 40 km |
| MINI-GBIC-ZX50-SM1550 | L/C | SMF | 9/125 | 50 km |
| MINI-GBIC-ZX80-SM1550 | L/C | SMF | 9/125 | 80 km |
| MINI-GBIC-ZX100-SM1550 | L/C | SMF | 9/125 | 100 km |
| GE-SFP-SX | L/C | MMF | 62.5/125 | 275 m |
| | | | 50/125 | 550 m |
| GE-SFP-LX | L/C | SMF | 9/125 | 10 km |
| Mini-GBIC-GT | RJ45 Ethernet cable | Cat 5 (or higher) twisted-pair cable | | 100 m |

**Note**

- For optical transceivers with a maximum cabling distance of over 40 km (including 40 km), install an optical attenuator to avoid overload when using short-distance SMFs.
- An optical module is a laser transmitter. Do not look directly into the optical module to prevent it from burning your eyes.
- To keep the optical module clean, ensure that the unused ports remain capped.
- No additional cable needs to be connected when an SFP cable is used. You need to only plug both ends of the SFP cable into the corresponding ports of the switch.

**Table 6-4 Pairing Models of the BIDI Optical Modules**

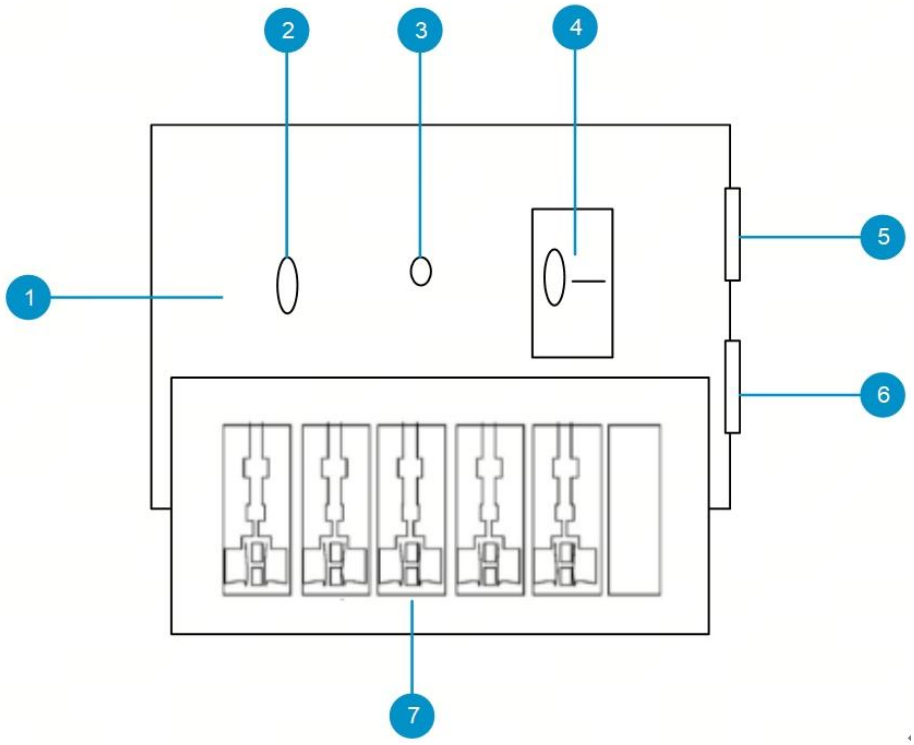
| Speed/Distance | Pairing Model |
| --- | --- |
| 1000 Mbps/500 m | GE-SFP-SX-SM1310-BIDI<br>GE-SFP-SX-SM1550-BIDI |
| 1 Gbps/20 km | GE-SFP-LX20-SM1310-BIDI<br>GE-SFP-LX20-SM1550-BIDI |
| 1 Gbps/40 km | GE-SFP-LH40-SM1310-BIDI<br>GE-SFP-LH40-SM1550-BIDI |

# 6.3 Surge Protection

## 6.3.1 Installing an AC Power Arrester (Lightning Resistance Socket)

When an AC power cord is introduced from outdoors and directly connected to the power port of the switch, the AC power port must be connected to an external lightning protection power strip to protect the switch against lightning strokes. The lightning resistance socket can be fixed on the rack, workbench, or wall in the machine room by using cable ties and screws. AC power enters the lightning protection power strip and then enters the switch.

**Figure 6-1 Power Arrester**




| No. | Description |
|---|---|
| 1 | Installed electronic circuit board |
| 2 | Normally running indicator: When the indicator is green, the circuit is working properly. Otherwise, the protective circuit is damaged. |
| 3 | Grounding and polarity detection indicator: If the indicator is red, cable connection is incorrect (the ground cable is not connected, or the N and L lines are reversely connected). Check your power supply line. |
| 4 | Power switch |
| 5 | IEC standard socket, which is connected to the power supply in the equipment room through the power cable |
| 6 | Overload auto-protector, which can be reset manually |
| 7 | Multi-purpose sockets (connected to the power supply of the switch) |

**Note**

The power arrester is not delivered with the switch. Please purchase it based on actual requirements.

**Important points**

- Make sure that the PE terminal of the power arrester is well grounded.
- After the AC power plug of the switch is connected to the socket of the power arrester (lightning resistance socket), the lightning protection function is implemented only if the RUN indicator is green and the ALARM indicator is OFF.
- If the ALARM indicator on the power arrester is red, check whether it is caused by poor grounding connection or by the reversed connection of the Null and Live lines. The detection method is as follows: Use a multimeter to measure the polarity of the power socket for the arrester when the indicator is red. If the N line is on the left and the L line is on the right (facing the socket), the arrester's PE terminal is not grounded. If not, the polarity of the arrester power cord should be reversed. In this case, you should open the power arrester and rectify the polarity of the connection. If the indicator is still red, the arrester's PE terminal is not grounded.

### 6.3.2 Installing the Ethernet Port Arrester

Connect an Ethernet port arrester to the switch to prevent the damage by lightning before connecting an outdoor network cable to the switch.

**Tools**

Phillips screwdrivers or flat-head screwdriver, multimeter, and diagonal pliers.

**Installation Steps**

(1) Tear one side of the protective paper for the double-sided adhesive tape and paste the tape to the enclosure of the Ethernet port arrester.

(2) Tear the other side of the protective paper for the double-sided adhesive tape and paste the Ethernet port arrester to the switch enclosure. The paste position for the Ethernet port arrester should be as close to the grounding terminal of the switch as possible. over any of its shares arising under its Articles of Association.

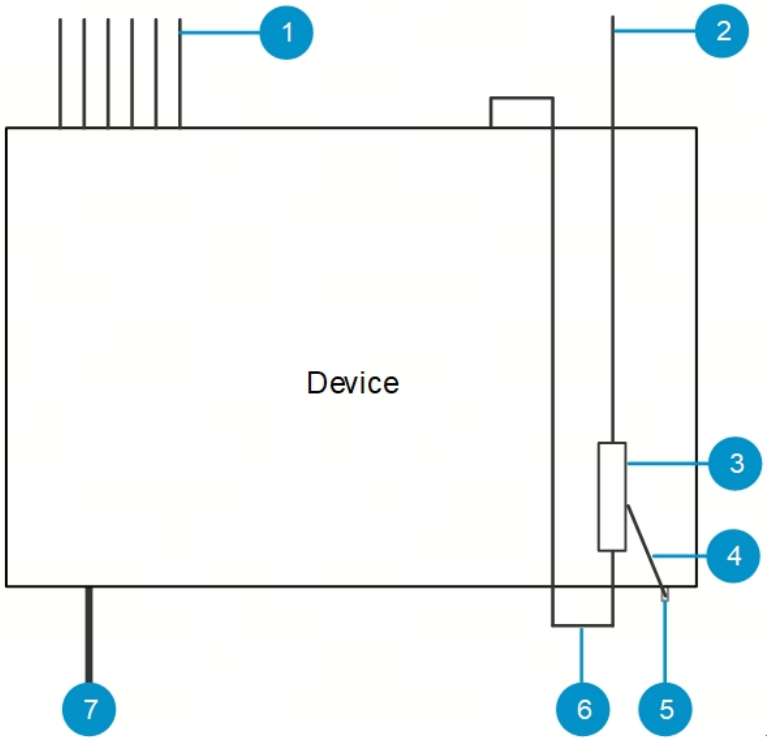
(3) According to the distance between the switch grounding terminal and the Ethernet port arrester, cut the grounding cable for the Ethernet port arrester and firmly crimp the grounding cable to the grounding terminal of the switch.

(4) Use a multimeter to check whether the grounding cable for the arrester is in good contact with the grounding terminal and the enclosure of the switch.

(5) Connect the arrester by using an adapter cable (note that the external network cable is connected to the IN end, while the adapter cable connected to the switch is connected to the OUT end) and check whether the service module LED is normal.

(6) Use a nylon cable tie to bind the power cords.

**Figure 6-1 Installing an Ethernet Port Lightning Arrester**




| No. | Description |
|---|---|
| 1 | Ethernet cable for indoor connection |
| 2 | Ethernet cable connected to the outdoor |
| 3 | RJ45 port arrester (pasted on the enclosure) |
| 4 | Ground cable of the arrester |
| 5 | Grounding lug of the equipment |
| 6 | RJ45 port adapter cable |

| No. | Description |
| --- | --- |
| 7 | Power input |

## 6.4 Cabling Recommendations

When the switch is installed in a standard 19-inch rack, secure the cables around the cable management brackets. Adopt top cabling or bottom cabling according to the actual situation in the machine room. All cable connectors used for transit should be placed at the bottom of the cabinet rather than be exposed outside of the cabinet. Power cords are routed beside the cabinet, and top cabling or bottom cabling is adopted according to the actual situation in the equipment room, such as the positions of the DC power distribution box, AC socket, or lightning protection box.

### 6.4.1 Requirements for Cable Bend Radius

- The bend radius of a fixed power cord, network cable, or flat cable should be over five times greater than their respective diameters. The bend radius of these cables that are often bent or plugged should be over seven times greater than their respective diameters.
- The bend radius of a fixed common coaxial cable should be over seven times greater than its diameter. The bend radius of the common coaxial cable that is often bent or plugged should be over 10 times greater than its diameter.
- The bend radius of a fixed high-speed cable (such as SFP+ cable) should be over five times greater than its diameter. The bend radius of the fixed high-speed cable that is often bent or plugged should be over 10 times greater than its diameter.

### 6.4.2 Requirement for the Minimum Bend Radius of an Optical Fiber

- The diameter of a fiber tray to hold fibers should be over 25 times greater than the diameter of the fiber.
- When an optical fiber is moved, the bend radius of the fiber should be over 20 times greater than the diameter of the fiber.
- During cabling of an optical fiber, the bend radius of the fiber should be over 10 times greater than the diameter of the fiber.

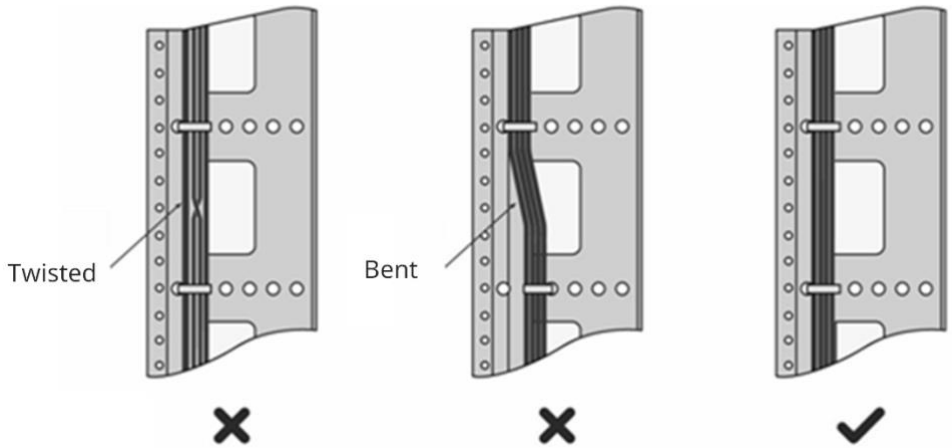
### 6.4.3 Precautions for Bundling up Cables

- Before cables are bundled, mark labels and stick the labels to cables wherever

appropriate.

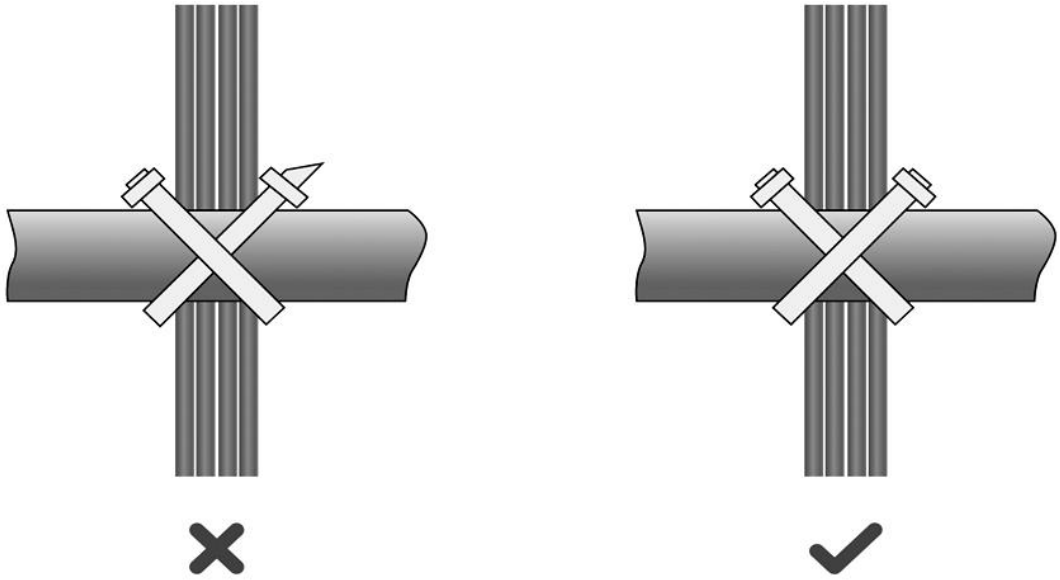
- Cables should be neatly and properly bundled in the cabinet without twisting or bending, as shown in the following figure.

**Figure 6-1 Binding Cables (1)**



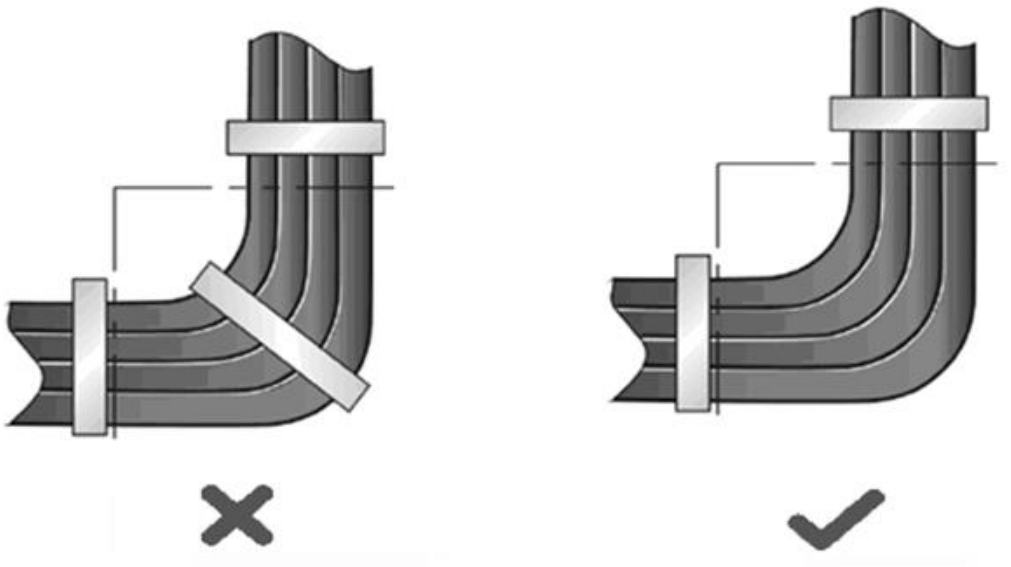

- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in cabling and bundling. Mixed bundling is not allowed. When they are close to each other, it is recommended to adopt crossover cabling. In the case of parallel cabling, maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.
- The cable management brackets and cabling troughs inside and outside the cabinet should be smooth without sharp corners.
- The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
- Use cable ties to bundle up cables properly. Please do not connect two or more cable ties to bundle up cables.
- After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim, without sharp corners, as shown in the following figure.

**Figure 6-2 Binding Cables (2)**



- When cables need to be bent, please bundle them up but do not tie them where the cables will be bent. Otherwise, considerable stress may be generated in cables, breaking cable cores, as shown in the following figure.

**Figure 6-3 Binding Cables (3)**



- Cables not to be assembled or remaining parts of cables should be folded and placed in a proper position of the cabinet or cable trough. The proper position refers to a position that does not affect device running or damage the switch or cable.
- Do not bind power cords to the guide rails of moving parts.

- The power cords connecting moving parts such as door grounding wires should be reserved with some access after being assembled to avoid suffering tension or stress. After the moving part is installed, the remaining cable part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used. If heat sources cannot be avoided, high-temperature cables should be used.
- When screw threads are used to fasten cable terminals, the bolt or screw must be tightly fastened, and anti-loosening measures should be taken, as shown in the following figure.

**Figure 6-4 Cable Fastening**

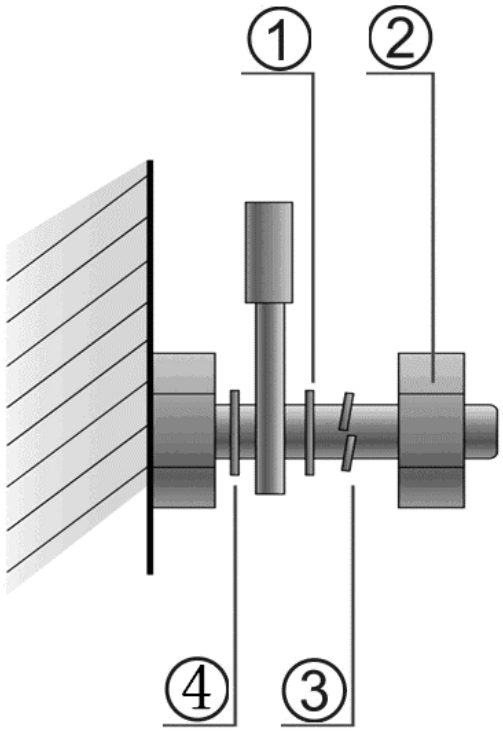



**Table 6-1 Cable Fastening Components**

| No. | Components |
|---|---|
| 1 | Flat washer |
| 2 | Nut |
| 3 | Spring washer |

| No. | Components |
|---|---|
| 4 | Flat washer |

- Hard power cords should be fastened in the terminal connection area to prevent stress on terminal connection and cable.
- Do not use self-tapping screws to fasten terminals.
- power cords of the same type and in the same cabling direction should be bundled up into cable bunches, with cables in cable bunches clean and straight.
- Bundle up cables by using cable ties based on the following table.

| Cable Bunch Diameter | Distance between Every Binding Point |
|---|---|
| 10 mm (0.39 in.) | 80 mm to 150 mm (3.15 in. to 5.91 in.) |
| 10 mm to 30 mm (0.39 in. to 1.18 in.) | 150 mm to 200 mm (5.91 in. to 7.87 in.) |
| 30 mm (1.18 in.) | 200 to 300 |

- No knot is allowed in cabling or bundling.
- For wiring terminal blocks (such as circuit breakers) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal block when assembled.

## 6.5 Machine Room Site Selection

- The machine room should be at least 5 km (3.11 miles) away from heavy pollution sources, such as the smelter works, coal mine, and thermal power plant. The machine room should be at least 3.7 km (2.30 miles) away from medium pollution sources, such as the chemical factory, rubber factory, and electroplating factory. The machine room should be at least 2 km (1.24 miles) away from light pollution sources, such as the food factory 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 3.7 km (2.30 miles) 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 should be on the second floor. Otherwise, the machine room floor should be 600 mm (23.62 in.) 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.
- Keep the air conditioner from blowing wind straight toward the device or blowing water drops from the window or air vent toward the device.