Ruijie Reyee RG-SPL2016-SC/RG-SPL2032-SC Passive Optical Splitters

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

- The official website of Ruijie Reyee: https://reyee.ruijie.com
- Technical Support Website: https://reyee.ruijie.com/en-global/support
- Case Portal: https://www.ruijienetworks.com/support/caseportal
- Community: https://community.ruijienetworks.com
- Technical Support Email: service_rj@ruijienetworks.com
- Online Robot/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 operation instructions that if not understood or followed when operating the device can result in physical 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.

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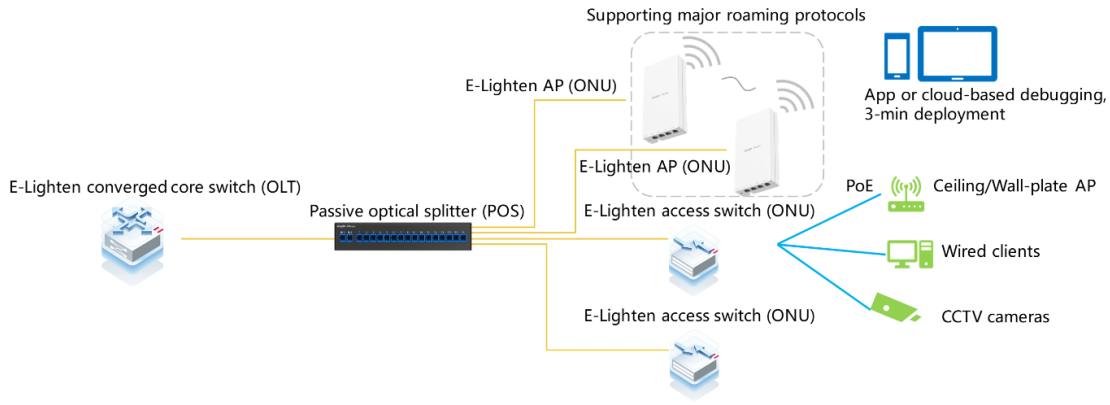
1 Overview

1.1 About the RG-SPL2016-SC/RG-SPL2032-SC

The Reyee e-Lighten Solution is a network product solution based on existing Ethernet technology integrating PON technology and passive optical splitting features. The components include:

- e-Lighten core switch (OLT): As a core switch, it has the Layer 3 data forwarding capability. It provides PON ports which can be connected to e-Lighten access switches and e-Lighten access points (APs) to achieve data interconnection.
- e-Lighten access switch (ONU): As an access device, the e-Lighten access switch is connected to the PON port at the uplink. It can send data to the core switch through the splitter.
- e-Lighten AP (ONU): An e-Lighten AP is connected to the PON port at the uplink, and can send wireless users' Internet access data to the core switch through the splitter.
- Passive optical distribution network (ODN): The ODN, consisting of splitters, is connected to the core switch at the uplink and to e-Lighten access switches or APs at the downlink.

Figure 1-1 Topology Diagram of Reyee e-Lighten Solution



The RG-SPL2016-SC and the RG-SPL2032-SC are e-Lighten passive optical splitters launched by Ruijie Reyee for passive all-optical local area networks. They are applicable for diverse applications in small and medium-sized business environments, and can effectively cater to the needs of ELV campus networks, office spaces, hotels, residences, and small to medium-sized enterprises.

Model	Number of SC Input Ports	Number of SC Output Ports
RG-SPL2016-SC	2	16
RG-SPL2032-SC	2	32

1.2 Package Contents

Note

The package contents are subject to the purchase contract, and actual delivery may vary. Please check the items carefully against the package contents or purchase contract. If you have any questions, please contact your distributor.

1.2.1 Package Contents of the RG-SPL2016-SC

Table 1-1 Package Contents of the RG-SPL2016-SC

No.	Item	Quantity
1	RG-SPL2016-SC splitter	1
2	Accessory bag (10 x mounting bracket screws)	1
3	Mounting brackets	2
4	User Manual	1

1.2.2 Package Contents of the RG-SPL2032-SC

Table 1-2 Package Contents of the RG-SPL2032-SC

No.	Item	Quantity
1	RG-SPL2016-SC splitter	1
2	Accessory bag (10 x mounting bracket screws)	1
3	Mounting brackets	2
4	User Manual	1

1.3 Product Appearance

1.3.1 Appearance of the RG-SPL2016-SC

Figure 1-2 Front Panel of the RG-SPL2016-SC

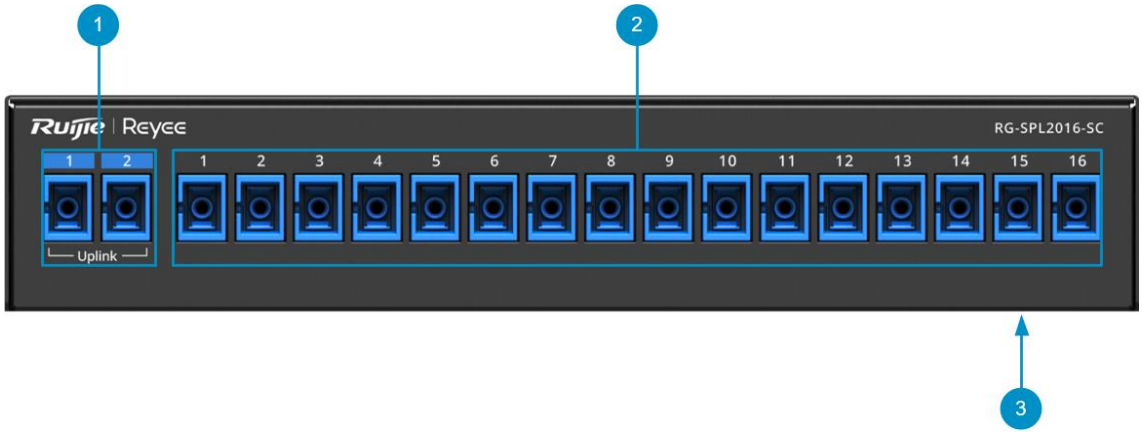


Table 1-3 Components on the Front Panel of the RG-SPL2016

No.	Component	Description
1	Uplink ports	PON ports connected to the OLT. **Caution** Only one uplink optical port should be connected. Do not connect the OLT to both uplink optical ports at the same time. Otherwise, the device may not work properly or even be damaged.
2	SC output ports	Connected to ONUs.
3	Label	Located at the bottom of the device.

1.3.2 Appearance of the RG-SPL2032-SC

Figure 1-3 Front Panel of the RG-SPL2032-SC

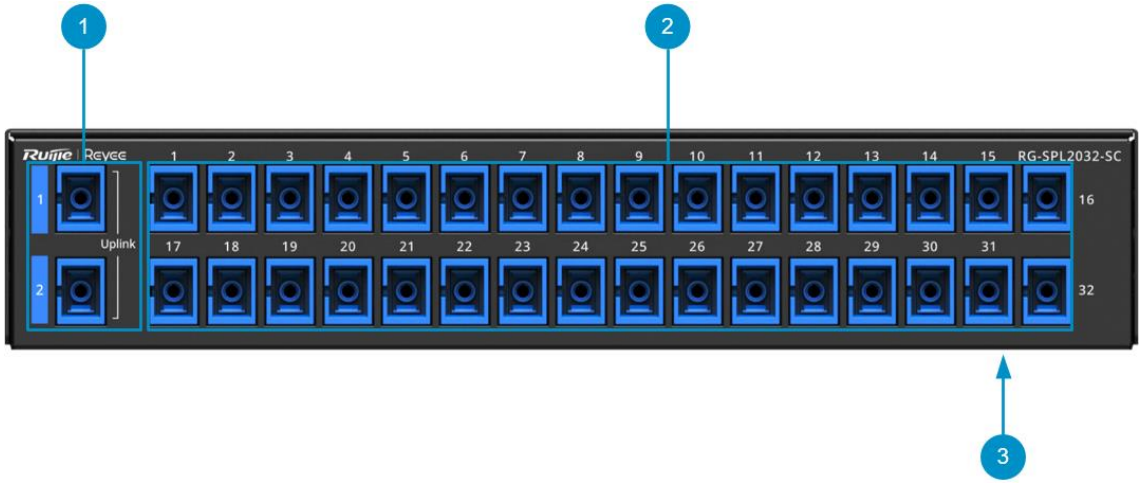


Table 1-4 Components on the Front Panel of the RG-SPL2032-SC

No.	Component	Description
1	Uplink ports	PON ports connected to the OLT. **Caution** Only one uplink optical port should be connected. Do not connect the OLT to both uplink optical ports at the same time. Otherwise, the device may not work properly or even be damaged.
2	SC output ports	Connected to ONUs.
3	Label	Located at the bottom of the device.

1.4 Hardware Specifications

1.4.1 Hardware Specifications of the RG-SPL2016-SC

Table 1-5 Hardware Specifications of the RG-SPL2016-SC

Model	RG-SPL2016-SC
Operating Wavelength	1260 nm to 1650 nm
Insertion Loss	≤ 14.3 dB
Wavelength-Dependent Loss	0.4 dB (1310 + 40) 0.4 dB (1550 + 40)

Temperature-Dependent Loss	≤ 0.3 dB
Uniformity	≤ 1.0 dB
Return Loss	≥ 50 dB
Polarization-Dependent Loss	≤ 0.25 dB
Directivity	≥ 55 dB
Operating Temperature	–40ºC to +85ºC (–40ºF to + 185ºF)
Dimensions (W x D x H)	220 mm x 130 mm x 42 mm (8.66 in. x 5.12 in. x 1.65 in.)
Net Weight	0.88 kg (1.94 lbs.)

1.4.2 Hardware Specifications of the RG-SPL2032-SC

Table 1-6 Hardware Specifications of the RG-SPL2032-SC

Model	RG-SPL2032-SC
Operating Wavelength	1260 nm to 1650 nm
Insertion Loss	≤ 17.6 dB
Wavelength-Dependent Loss	0.4 dB (1310 + 40) 0.4 dB (1550 + 40)
Temperature-Dependent Loss	≤ 0.3 dB
Uniformity	≤ 1.0 dB
Return Loss	≥ 50 dB
Polarization-Dependent loss	≤ 0.25 dB
Directivity	≥ 55 dB
Operating temperature	–40ºC to +85ºC (–40ºF to + 185ºF)
Dimensions (W x D x H)	220 mm x 130 mm x 42 mm (8.66 in. x 5.12 in. x 1.65 in.)
Net Weight	0.98 kg (2.16 lbs.)

2 Preparing for Installation

2.1 Safety Guidelines

Note

- 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.

2.1.1 General Precautions

- Do not place the equipment in a wet area, and keep it away from liquid. Keep the chassis clean and dust-free.
- Keep the equipment away from heat sources.
- For the equipment that is installed in a cabinet, ensure that the cabinet and power distribution system are properly grounded.
- Do not place the equipment in walking areas.
- During installation and maintenance, do not wear loose clothing, jewelry, or any other objects that may hook onto the chassis.
- Do not place tools and accessories in walking areas.

2.1.2 Chassis-Lifting Guidelines

- Avoid moving the equipment frequently.
- Turn off all power supplies and disconnect all power cords before lifting or moving the equipment.
- Two or more people are required to lift the chassis. Keep balance and prevent personal injuries when lifting or moving the equipment.

2.1.3 Electricity Safety

CAUTION：DOUBLE POLE/NEUTRAL FUSING

Electric shock hazard！The fuse may be in the neutral, and that the mains shall be disconnected to de-energize the phase conductors.

- Observe local regulations and specifications when performing electrical operations. Only qualified personnel should handle these tasks.
- Any improper electrical operation can lead to accidents such as fires or electric shocks, causing severe, or even fatal damage to the human body and the equipment.
- Carefully check the work area for potential hazards, including ungrounded power system, insufficient grounding, and damp or wet ground.
- Direct or indirect touch through a wet object on high-voltage and mains supply can bring a fatal danger.

- Locate the emergency power supply switch in the room before installation. In the case of an accident, cut off the power supply immediately.
- Carefully inspect the equipment and the environment before powering on or off the equipment.
- 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 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, 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.

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 products. For the leakage current value of each product model, see the product technical specifications.

2.1.4 Preventing ESD Damage

- Properly ground both the equipment and the installation site.
- Keep the site as dust free as possible.
- Maintain appropriate humidity conditions.
- Before installing or maintaining the equipment, wear an anti-ESD wrist strap and make sure that it is properly grounded.

  Avoid contact between the printed circuit boards and clothing. The anti-ESD wrist strap only protects the printed circuit boards from ESD voltages on the body. ESD voltages on clothing can still cause damage.

2.1.5 Laser Safety

An equipment with an optical port usually supports multiple types of optical transceivers, all of which are Class I laser products. Pay attention to the following during the use of optical transceivers:

- When an optical transceiver is in operation, ensure that its port is connected to 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 in operation, do not look into its port after removing the optical fiber. Doing so may result in eye injury.

Caution

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

Figure 2-1 Laser Product Warning



2.1.6 Cleanliness

Dust poses a major threat to the running of the equipment. The buildup of dust on the equipment can result in static electricity, causing poor contact between the metallic joints. Dust buildup is more likely to occur in environments with low relative humidity, which not only impacts the service life of the equipment but also increases the likelihood of communication failure. The following table shows the specifications for dust concentration and particle size in the equipment room.

Table 2-1 Requirements for Dust

Particle Size	Unit	Concentration
≥ 0.5 μm	Particles/m^3	≤ 3.5×10^6
≥ 5 μm	Particles/m^3	≤ 3.5×10^4

Apart from dust, the salt, acid, and sulfide in the air of the machine room must also meet strict requirements. These harmful substances will accelerate metal corrosion and component aging. Therefore, the machine room should be properly protected against the intrusion of harmful gases, such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, and chlorine gas. The following table lists limits for 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 (Cl_2)	0.1	0.3

Note

"Average" indicates the typical level of exposure over a one-week period. "Maximum" refers to the highest allowable exposure level within a week, with this level being sustainable for no more than 30 minutes per day.

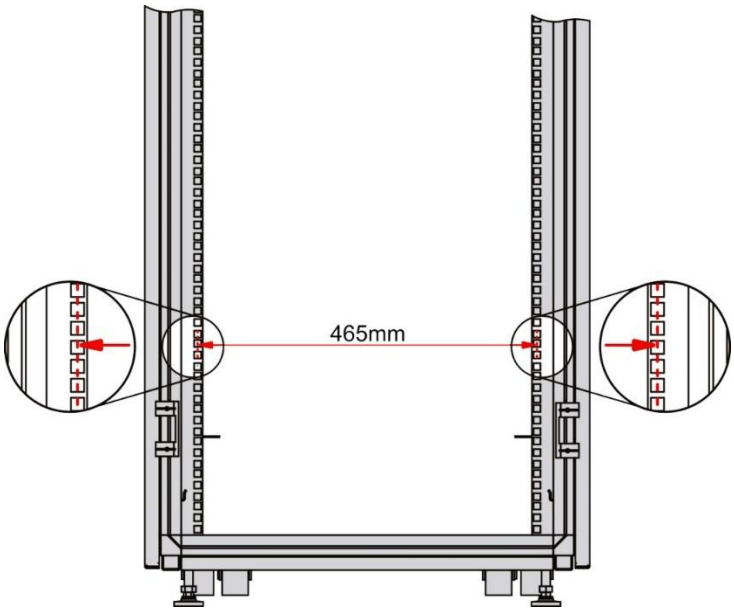
2.2 Rack Requirements

If you plan to install the equipment in a rack, ensure that the rack meets the following conditions.

(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 2-2 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 can bear the weight of the equipment and its accessories.

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

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

2.3 Tools

Table 2-3 Tools

Common Tools	Phillips screwdriver, power cords, Ethernet cables, cage nuts, diagonal pliers, and cable ties
Special Tools	Anti-ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, and wire cutter
Meters	Multimeter

Note

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

3 Installing the Device

Caution

Before installing the device, ensure that guidelines and requirements in Chapter 2 have been met.

3.1 Precautions

To ensure normal operation and to prolong the service life of the device, observe the following precautions:

- Place the device in a well-ventilated environment.
- Do not expose the device to high temperatures.
- Install the device indoors.
- Keep the device clean and dust-free.
- Do not wipe the device with a damp cloth.
- Do not wash the device with liquid.
- Do not open the enclosure when the device is working.
- Secure the device properly.

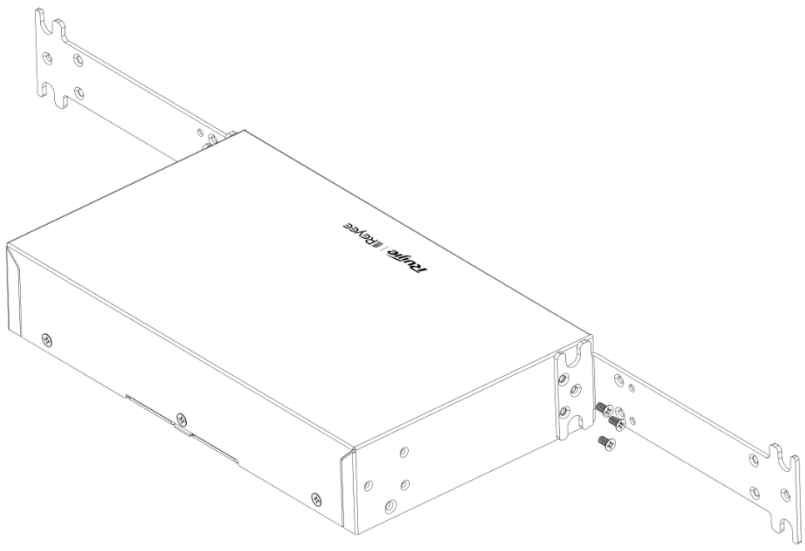
3.2 Installing the Device

3.2.1 Installing the Device in a Cabinet

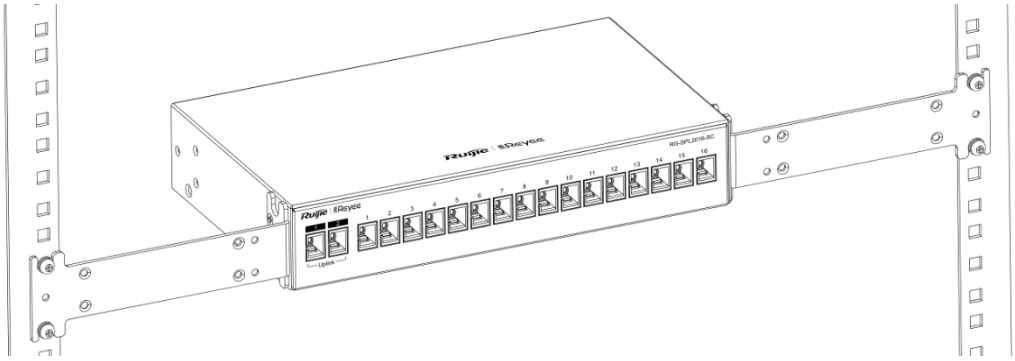
The RG-SPL2016-SC and the RG-SPL2032-SC optical splitters meet the EIA standard, and can be installed in a 19-inch rack.

1. Installing a Single Unit in a Rack

(1) Use the supplied screws to secure the mounting brackets to the device.

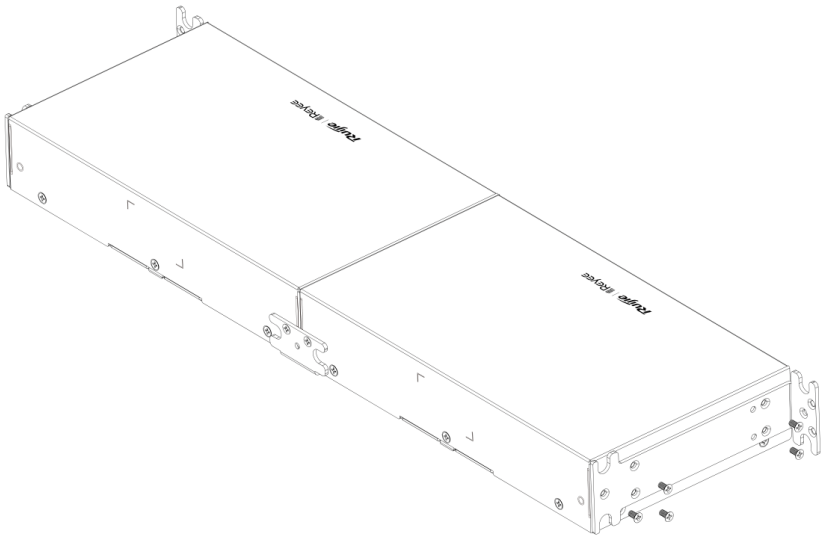


(2) Place the device horizontally in the rack, and secure it to the rack using the customer-supplied M6 screws and matching cage nuts.

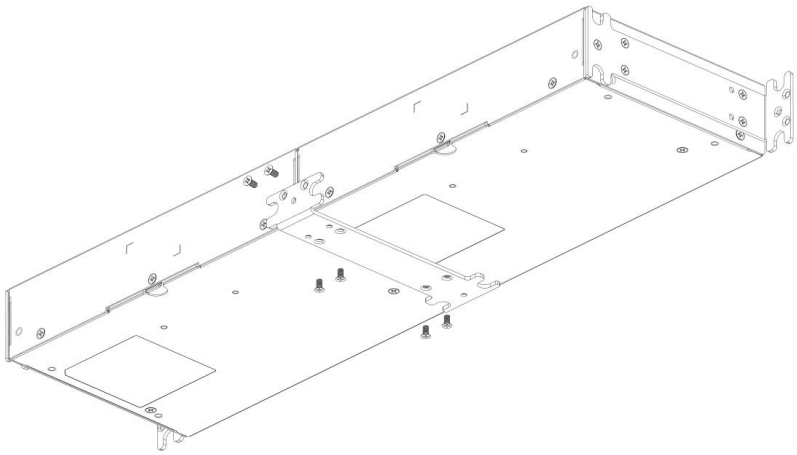


2. Installing Two Units in a Rack

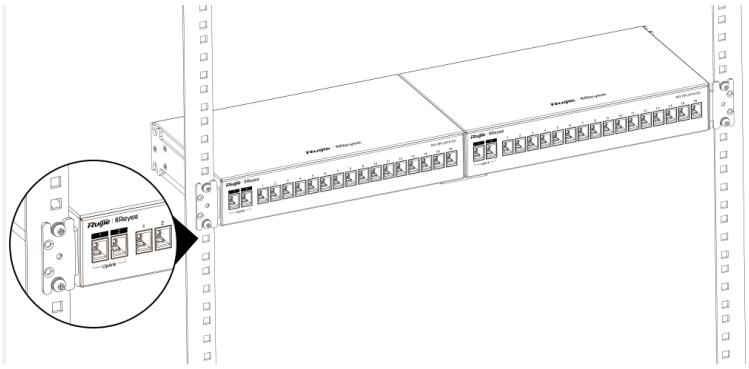
(1) Use the supplied screws to secure one mounting bracket to each side of the device.



Secure the two devices together using the screws and mounting brackets provided.

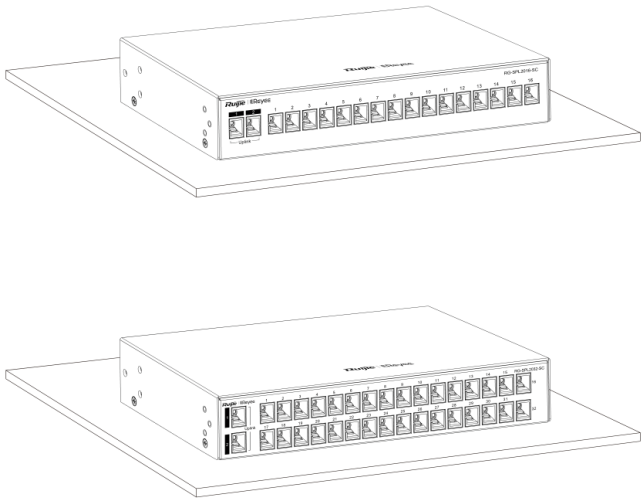


(2) Place the device horizontally in the rack, and secure it to the rack using the customer-supplied M6 screws and matching cage nuts.



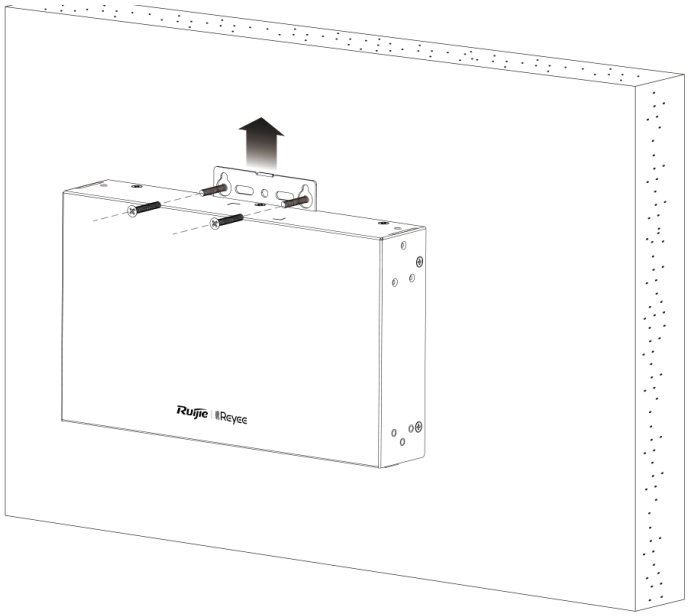
3.2.2 Installing the Device on a Desktop

The device can be installed on a desktop when a 19-inch rack is unavailable. Place the device on a clean workbench, ensuring that it is securely fastened.



3.2.3 Installing the Device on a Wall

Pull out the mounting plate on the back of the device, and use the supplied M4 screws to secure the device to the wall.



3.3 Connecting the Cables

Connect the PON port of the OLT to the uplink port of the device using an optical cable.

Connect the SC port of the ONU to the downlink SC port of the device using an optical cable.

3.4 Equipment Room Site Selection

- The equipment 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 equipment 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 equipment 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 equipment room should be located on the windward side of the pollution source perennially with advanced protection.
- The equipment room should be at least 3.7 km (2.30 miles) away from the sea or salt lake. Otherwise, the equipment 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 equipment room in the proximity of livestock farms. Otherwise, the equipment 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 equipment room.
- The equipment 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 equipment room should be away from the residential area. Otherwise, the equipment room should meet the construction standard in terms of noise.
- Make sure the air vent of the equipment room is away from the sewage pipe, septic tank, and sewage treatment tank. Keep the equipment room under positive pressure to prevent corrosive gas from entering the

equipment room to corrode components and circuit boards.

- Keep the equipment room away from industrial boiler and heating boiler.
- The equipment room should be on the second floor. Otherwise, the equipment 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 equipment 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.

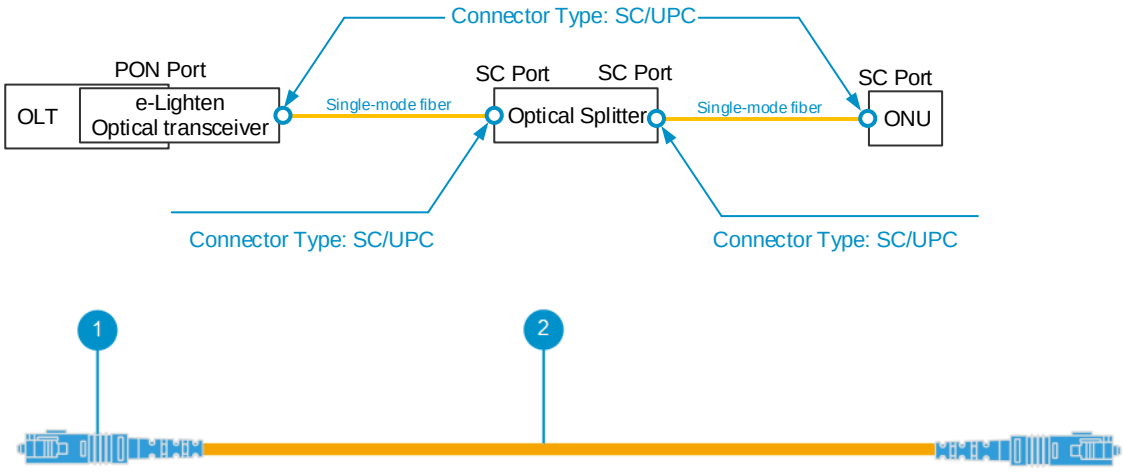
4 Appendix

4.1 PON Ports and SC Ports

Figure 4-1 shows the PON ports and SC ports on equipment in Ruijie Reyee e-Lighten Optical Solution.

- PON ports on the OLT require e-Lighten optical transceivers with SC/UPC connectors, which are connected to an optical splitter using single-mode fiber.
- SC ports on optical splitters and ONUs use SC/UPC connectors, and are interconnected using single-mode fiber.

Figure 4-1 PON Port and SC Port Connections



No	Description
1	SC/UPC connector
2	Single-mode fiber

4.2 Recommended Cabling

When the device is installed in a standard 19-inch rack, route the cables through the cable management brackets. Top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All conversion connectors should be placed at the bottom of the rack instead of outside the rack that is easily accessible. 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 locations of the DC power distribution box, AC power socket, or surge protection box.

4.2.1 Requirements for the Minimum Bend Radius of an Ethernet Cable

- The bend radius of a fixed power cord, Ethernet 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.

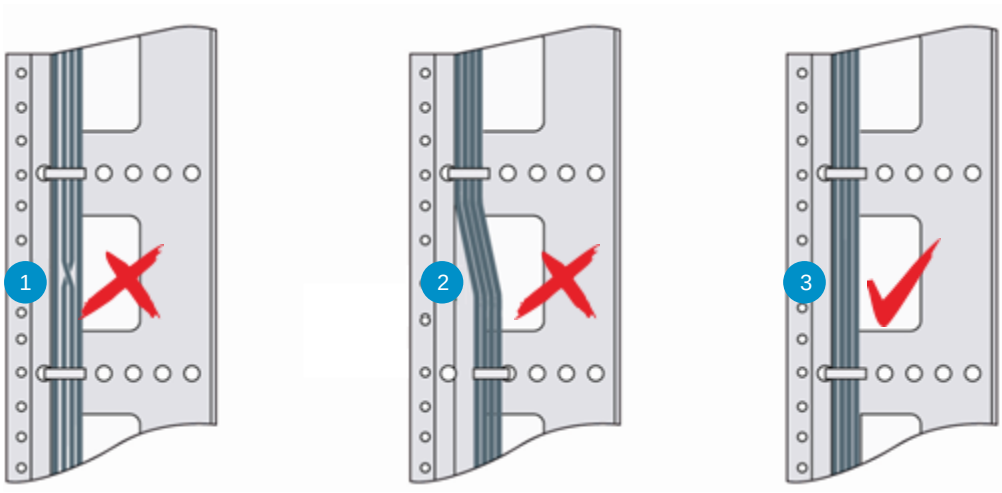
4.2.2 Requirement for the Minimum Bend Radius of an Optical Cable

- When an optical cable is coiled, the diameter of a fiber tray should be over 25 times greater than the diameter of the optical cable.
- When an optical cable is moved, the bend radius of the optical cable should be over 20 times greater than the diameter of the optical cable.
- When an optical cable is laid, the bend radius of the optical cable should be over 10 times greater than the diameter of the optical cable.

4.2.3 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 rack without twisting or bending, as shown in Figure 4-2.

Figure 4-2 Binding Cables (I)



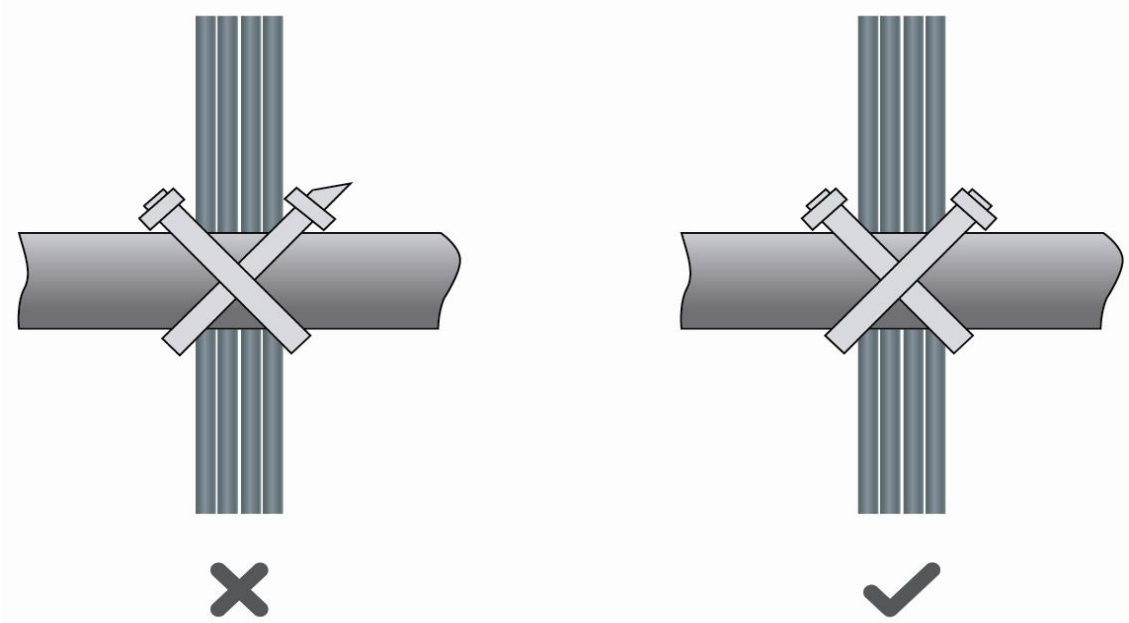
No.	Description
1	In the rack, cables should not be wound up after being bundled.
2	In the rack, cables should not bend after being bundled.
3	In the rack, cables should be neatly and straightly bundled.

- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in

cabling and bundling. Mixed bundling is disallowed. When they are close to each other, you are advised 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.

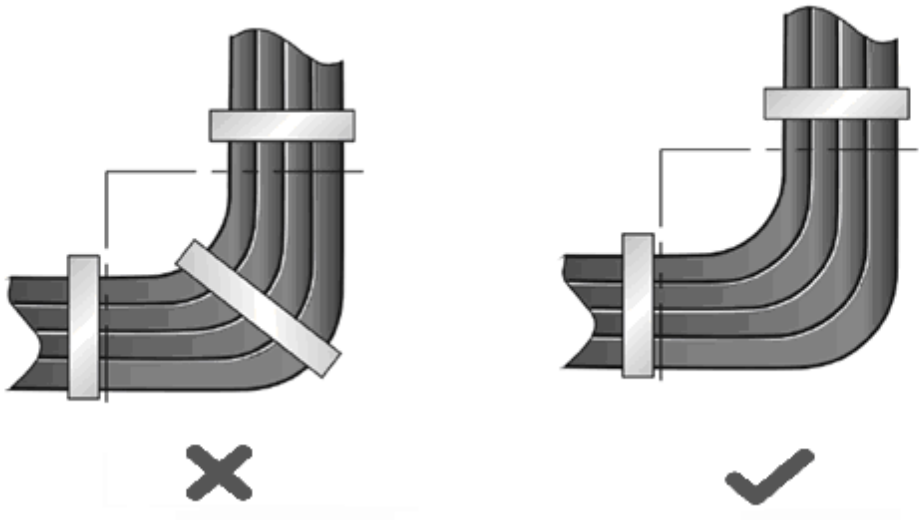
- The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.
- The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
- Use cable ties to bundle up cables properly. Please do not connect two 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 Figure 4-3.

Figure 4-3 Binding Cables (II)



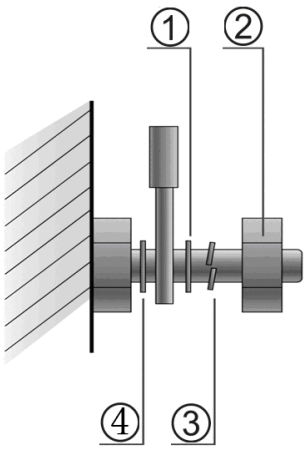
- When cables need to be bent, please bundle them up but do not tie them where the cables will be bent, as shown in Figure 4-4.

Figure 4-4 Binding Cables (III)



- Cables not to be assembled or remaining parts of cables should be folded and placed in a proper position of the rack or cable trough. The proper position refers to a position that does not affect device running or damage the device or cable.
- Do not bind power cords to the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding cables should be reserved with a margin after being assembled to avoid suffering tension or stress. When 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.
- When screw threads are used to fasten cable terminals, the anchor or screw must be tightly fastened, as shown in Figure 4-5.

Figure 4-5 Cable Fastening



① Flat washer ③ Spring washer

② Screw nut 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.

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 mm to 300 mm (7.87 in. to 11.81 in.)

- Do not tie cables or bundles in a knot.
- For wiring terminal sockets (such as circuit breakers) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal socket when assembled.

4.3 Site Selection

- The equipment 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 equipment 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 equipment 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 equipment room should be located on the windward side of the pollution source perennially with advanced protection.
- The equipment room should be at least 3.7 km (2.30 miles) away from the sea or salt lake. Otherwise, the equipment 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 equipment room in the proximity of livestock farms. Otherwise, the equipment 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 equipment room.
- The equipment 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 equipment room should be away from the residential area. Otherwise, the equipment room should meet the construction standard in terms of noise.
- Make sure the air vent of the equipment room is away from the sewage pipe, septic tank, and sewage treatment tank. Keep the equipment room under positive pressure to prevent corrosive gas from entering the equipment room to corrode components and circuit boards.
- Keep the equipment room away from industrial boiler and heating boiler.
- The equipment room should be on the second floor. Otherwise, the equipment 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 equipment 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.

4.4 Cleaning the Connectors and End Faces of Optical Cables

To ensure a good connection between a patch cable and an optical cable coupler, the cleanliness of the end face is a quite important factor, as it directly affects the communication quality of the optical network. In the daily construction of optical networks, however, improper operations or other reasons can easily contaminate the end face. When the end face accumulates dust, oil stains, and other dirt, if it is not detected and cleaned before connection, it will cause increased optical attenuation, leading to optical network failures. What's worse, it may even result in the collapse of the entire optical signal system. The following are common methods for cleaning connectors and end faces:

- Using fiber-optic cleaning pens

  Fiber-optic cleaning pens, also known as one-click fiber-optic cleaners, typically use anti-static resin materials, lint-free cleaning tip, and cleaning solution to ensure the product remains free from dust contamination. Available in 1.25 mm and 2.5 mm sizes, these pens are suitable for cleaning SC, FC, LC connectors, and more. Select an appropriate cleaning pen for the connector to be cleaned, and gently insert the pen into the connector. To prevent ferrule damage, avoid excessive pressure when you insert the cleaning pen. Press inward gently until you hear a "click", indicating the end face has been cleaned. If necessary, repeat the process 2 to 3 times for thorough cleaning. Finally, remove the pen to complete the cleaning process.

- Using fiber-optic cleaning boxes or lint-free cloths
  - Made from high-density textile fibers, fiber-optic cleaning boxes do not need alcohol, do not produce static electricity, and are lint-free. In addition, fiber-optic cleaning boxes offer a convenient way for cleaning various optical cable connectors, including SC, FC, LC, and ST connectors.
  - To use the cleaning box, grip it with one hand and press it to reveal the clean cleaning belt core. Gently swipe the optical cable ferrule to be cleaned across the cleaning belt several times to remove dirt from the end face. To prevent ferrule damage, avoid excessive pressure when you swipe the optical cable ferrule.