

Ruijie RG-ES1 Series Switches

Hardware Installation and Reference 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 RuijieReyee: <https://www.ruijienetworks.com/products/reyee>
- TechnicalSupportWebsite: <https://www.ruijienetworks.com/support>
- Case Portal: <https://caseportal.ruijienetworks.com>
- Community: <https://community.ruijienetworks.com>
- Technical Support Email: service_rj@ruijienetworks.com


Conventions


1. Signs

This document also uses signs to indicate some important points during the operation. The meanings of these signs are as follows:

 **Caution**
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.

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

 **Instruction**
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.

1 Overview

1.1 Introduction

Video surveillance has been widely popularized, and more and higher requirements are raised for surveillance security switches that are indispensable for video data transmission. Ruijie launches the Reyee RG-ES1 Series to provide customers with next-generation unmanaged surveillance security switches that feature diversified specifications, stable quality, and high-costperformance.

The RG-ES1 series switches include the following models:

Model	10/100Base-TX Auto-sensing Ethernet Port	10/100/1000Base-T Auto-sensing Ethernet Port	1000Base-X SFP Port	Console Port
RG-ES106D-P	6 (Ports 1-4 support PoE/PoE+)	N/A	N/A	N/A
RG-ES110D-P	8 (Ports 1-8 support PoE/PoE+)	2	N/A	N/A
RG-ES110GDS-P	N/A	8 (Ports 1-8 support PoE/PoE+)	2	N/A
RG-ES116G	N/A	16	N/A	N/A
RG-ES124GD	N/A	24	N/A	N/A
RG-ES118S-LP	16 (Ports 1-16support PoE/PoE+)	2	2(Combo)	N/A
RG-ES118GS-P	N/A	16 (Ports 1-16support PoE/PoE+)	2	N/A
RG-ES126S-LP	24 (Ports 1-24 support PoE/PoE+)	2	1(Combo)	N/A

1.2 RG-ES106D-P

1.2.1 Package Contents

Table 1-1 Package Contents

Item	Quantity
RG-ES106D-P Host	1
Power Adapter	1
Power Cord	1
Quick Start Guide	1
Warranty Card	1

Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.2.2 Product Appearance

RG-ES106D-P provides 6 10/100Base-TX auto-sensing Ethernet ports on the front panel, and a port mode switch-over button, a system status LED, a power socket and a grounding pole on the back panel.

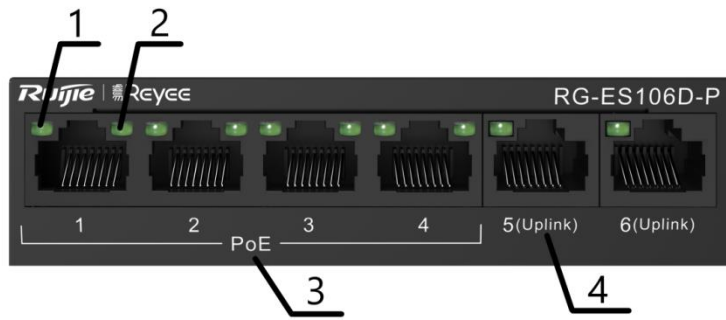
Figure 1-1 Appearance of RG-ES106D-P



1.2.3 Ports - Front Panel

Figure 1-2 shows the front panel of an RG-ES106D-P switch. For the detailed meanings of numbers 1 to 4, see the following table.

Figure 1-2 Front Panel of RG-ES106D-P

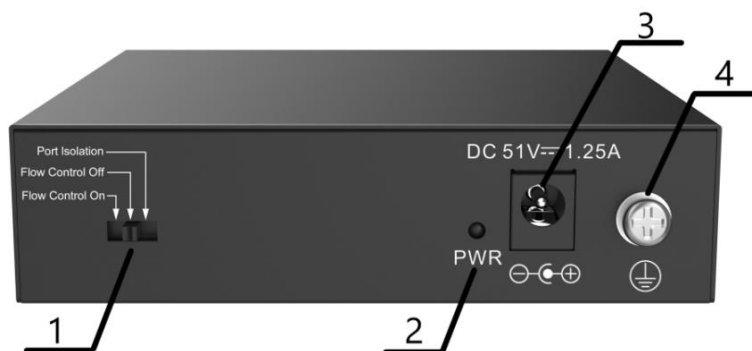


Item	Description
Copper port status indicator	Copper port status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The port is connected at 10/100 Mbps. ● Blinking green: The port is receiving or sending traffic at 10/100 Mbps. ● Off: The port is not connected.
PoE status indicator	PoE status indicator for ports 1-4. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: PoE is operational. ● Off: PoE does not supply power.
RJ-45 10/100Base-TX PoE port	10/100Base-TX adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.
RJ-45 10/100Base-TX auto-sensing Ethernet port	10/100Base-TX adaptive Ethernet port. The copper port uses an RJ45 connector.

1.2.4 Ports - Rear Panel

Figure 1-3 shows the rear panel of an RG-ES106D-P switch. For detailed meanings of numbers 1 to 4, see the following table.

Figure 1-3 Back Panel of RG-ES106D-P




Item	Description
Port mode switch-over button	Support switchover in three modes: <ul style="list-style-type: none"> ● Left: Flow Control On ● Middle: Flow Control Off ● Right: Port Isolation. When this mode is enabled, ports 1-4 are isolated from each other, but can communicate with ports 5-6.
System status indicator (PWR)	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is not powered on.
DC power socket	Used to Connect the DC power adapter (51 VDC/1.25 A)
Grounding pole	Used to fasten the ground cable.

1.2.5 Technical Specifications

Table 1-2 Technical Specifications of an RG-ES106D-P Switch

Product Model	RG-ES106D-P
Ports	6 10/100Base-TX auto-sensing Ethernet ports, ports 1-4 support PoE/PoE+.
Power Supply	<ul style="list-style-type: none"> ● AC input Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 1.5 A ● Adapter output Rated voltage range: 51 VDC Rated current range: 1.25 A
PoE	Support PoE and PoE+. Ports 1-4 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 5-6 do not support PoE or PoE+. The overall maximum output power of PoE/PoE+ is 58W.
Power Consumption	Less than 7W with no PoE load Less than 67W with PoE full load
Operating Temperature	0°C to 45°C(32°F to 113°F)

Storage Temperature	-40°C to 70°C(-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in three modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-4 are isolated from each other, but can communicate with ports 5-6.
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	100 mm x 100 mm x 26 mm (3.94 in. x 3.94 in. x 1.02 in.)
Weight (With Package)	0.66 kg (1.46 lbs)

 **Caution**

- The RG-ES106D-P switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES106D-P switch in places where children may appear.

1.2.6 Heat Dissipation Solution

The RG-ES106D-PA adopts natural heat dissipation, thereby ensuring normal function of the device. Maintain a minimum clearance of 100 mm (3.94 in.) around the device. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.3 RG-ES110D-P

1.3.1 Package Contents

Table 1-3 Package Contents

Item	Quantity
RG-ES110D-P Host	1
Power Adapter	1
Power Cord	1
Quick Start Guide	1
Warranty Card	1

i Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.3.2 Product Appearance

RG-ES110D-P provides 8 10/100Base-TX auto-sensing Ethernet ports, 2 10/100/1000Base-T auto-sensing Ethernet ports, and LED indicators on the front panel, and a power socket, a port mode switch-over button and a grounding pole on the back panel.

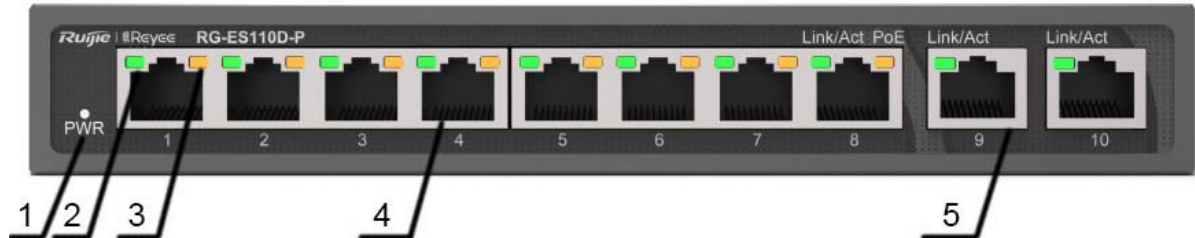
Figure 1-4 Appearance of RG-ES110D-P



1.3.3 Ports - Front Panel

Figure 1-5 shows the front panel of an RG-ES110D-P switch. For the detailed meanings of numbers 1 to 5, see the following table.

Figure 1-5 Front Panel of RG-ES110D-P

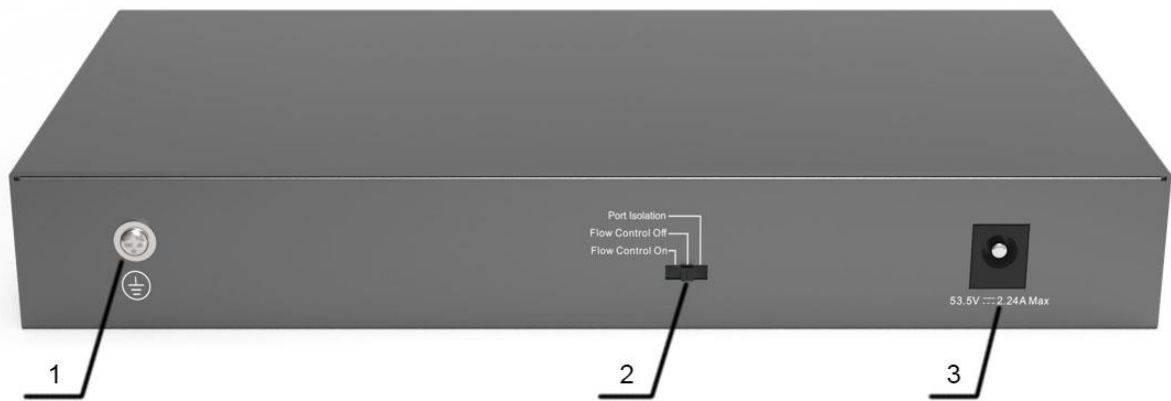


Item	Description
System status indicator (PWR)	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.
Copper port status indicator	Copper port status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The port is connected at 10/100/1000 Mbps. ● Blinking green: The port is receiving or sending traffic at 10/100/1000 Mbps. ● Off: The port is not connected.
PoE status indicator	PoE status indicator for ports 1-8. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: PoE is operational. ● Blinking green: PoE is overloaded. ● Off: PoE does not supply power.
RJ-45 10/100Base-TX PoE port	10/100Base-TX adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.
RJ-45 10/100/1000Base-T auto-sensing Ethernet port	10/100/1000Base-T adaptive Ethernet port. The copper port uses an RJ45 connector.

1.3.4 Ports - Rear Panel

Figure 1-6 shows the rear panel of an RG-ES110D-P switch. For detailed meanings of numbers 1 to 3, see the following table.

Figure 1-6 Back Panel of RG-ES110D-P



Item	Description
Grounding pole	Used to fasten the ground cable.
Port mode switch-over button	Support switchover in three modes: <ul style="list-style-type: none"> ● Left: Flow Control On ● Middle: Flow Control Off ● Right: Port Isolation. When this mode is enabled, ports 1-8 are isolated from each other, but can communicate with ports 9 and 10.
DC power socket	Used to Connect the DC power adapter (53.5 VDC/2.24 A)

1.3.5 Technical Specifications

Table 1-4 Technical Specifications of an RG-ES110D-P Switch

Model	RG-ES110D-P
Ports	8 10/100Base-TX auto-sensing Ethernet ports (Auto MDI/MDIX), and support PoE/PoE+ 2 10/100/1000Base-T auto-sensing Ethernet ports (Auto MDI/MDIX)
Power Supply	<ul style="list-style-type: none"> ● AC input Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 1.6 A ● Adapter output Rated voltage range: 53.5 VDC Rated current range: 2.24 A

EEE	Port1-8: Supported Port9-10: Not Supported
PoE	Support PoE and PoE+. Ports 1-8 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 9-10 do not support PoE or PoE+. The overall maximum output power of PoE/PoE+ is 110W.
Power Consumption	Less than 8W with no PoE load Less than 129W with PoE full load
Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in three modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-8 are isolated from each other, but can communicate with ports 9 and 10.
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1

Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	190 mm x 100 mm x 28 mm (7.48 in. x 3.94 in. x 1.1 in.)
Weight (With Package)	1.3 kg (2.87 lbs)

⚡ Caution

- The RG-ES110D-P switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES110D-P switch in places where children may appear.

1.3.6 Heat Dissipation Solution

The RG-ES110D-Padopts natural heat dissipation, thereby ensuring normal function of the device. Maintain a minimum clearance of 100 mm (3.94 in.) around the device. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.4 RG-ES110GDS-P

1.4.1 Package Contents

Table 1-5 Package Contents

Item	Quantity
RG-ES110GDS-P Host	1
Mounting bracket	2
Foot pad	4
Screw (M4X8)	8
Power cord	1
User Manual	1
Warranty Card	1

i Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.4.2 Product Appearance

RG-ES110GDS-P provides 8 10/100/1000Base-T auto-sensing Ethernet ports, 2 1000Base-X SFP ports, a port mode switch-over button and LED indicators on the front panel, and a power socket and a grounding pole on the back panel.

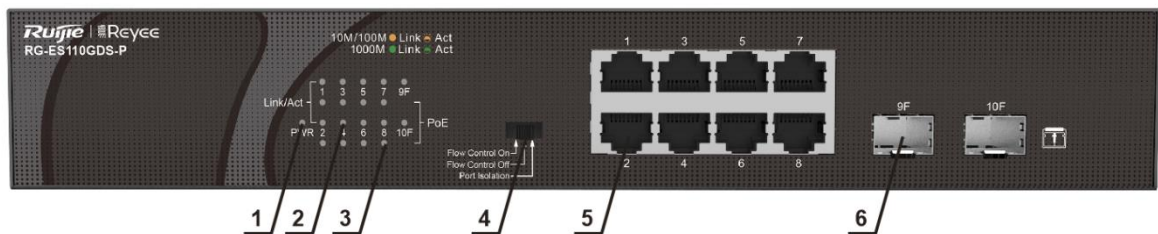
Figure 1-7 Appearance of RG-ES110GDS-P



1.4.3 Ports - Front Panel

Figure 1-8 shows the front panel of an RG-ES110GDS-P switch. For the detailed meanings of numbers 1 to 6, see the following table.

Figure 1-8 Front Panel of RG-ES110GDS-P



Item	Description
System status indicator (PWR)	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.

Item	Description
Port status indicator	<ul style="list-style-type: none"> ● RJ-45 port status: <ul style="list-style-type: none"> ○ Solid green: The port is connected at 10/100 Mbps. ○ Blinking green: The port is receiving or sending traffic at 10/100 Mbps. ○ Off: The port is not connected. ● SFP port status: <ul style="list-style-type: none"> ○ Off: The port is not connected. ○ Solid orange: The port is connected at 100 Mbps. ○ Blinking orange: The port is receiving or sending traffic at 100 Mbps. ○ Solid green: The port is connected at 1000 Mbps. ○ Blinking green: The port is receiving or sending traffic at 1000 Mbps.
PoE status indicator	<p>PoE status indicator for ports 1-8. The statuses are as follows:</p> <ul style="list-style-type: none"> ● Solid green: PoE is operational. ● Blinking green: PoE is overloaded. ● Off: PoE does not supply power.
Port mode switch-over button	<p>Support switchover in three modes:</p> <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-8 are isolated from each other, but can communicate with ports 9 and 10.
RJ-45 10/100/1000Base-T auto-sensing Ethernet port	<p>10/100/1000Base-T adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.</p>
100/1000Base-T SFP port	<p>SFP port. For details about applicable transceiver modules, see Transceiver Modules.</p>

1.4.4 Ports - Rear Panel

Figure 1-9 shows the rear panel of an RG-ES110GDS-P switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-9 Back Panel of RG-ES110GDS-P




Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables

1.4.5 Technical Specifications

Table 1-6 Technical Specifications of an RG-ES110GDS-P Switch

Model	RG-ES110GDS-P
Ports	8 10/100/1000Base-T auto-sensing Ethernet ports (Auto MDI/MDIX), and support PoE/PoE+ 2 1000Base-X SFP ports
Power Supply	AC input: Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 2.5 A
EEE	Not Supported
PoE	Support PoE and PoE+. Ports 1-8 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 9-10 do not support PoE or PoE+. The overall maximum output power of PoE/PoE+ is 120W.
Power Consumption	Less than 8W with no PoE load Less than 142W with PoE full load
Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)

Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in three modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-8 are isolated from each other, but can communicate with ports 9 and 10.
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	280 mm x 180 mm x 44 mm (11.02 in. x 7.09 in. x 1.73 in.)
Weight (With Package)	2.26 kg (4.98lbs)

 **Caution**

- The RG-ES110GDS-P switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES110GDS-P switch in places where children may appear.

1.4.6 Heat Dissipation Solution

The RG-ES110GDS-P adopts natural heat dissipation, thereby ensuring normal function of the device. Maintain a minimum clearance of 100 mm (3.94 in.) around the device. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.5 RG-ES116G

1.5.1 Package Contents

Table 1-7 Package Contents

Item	Quantity
RG-ES116G Host	1
Foot pad	4
Screw (M3X4)	8
Mounting bracket	2
Power cord	1
User Manual	1
Warranty Card	1

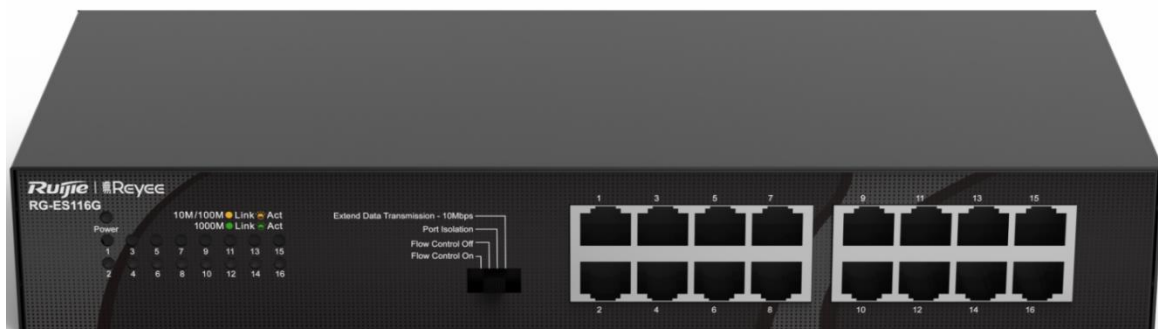
Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.5.2 Product Appearance

RG-ES116G provides 16 10/100/1000Base-T auto-sensing Ethernet ports, a port mode switch-over button and LED indicators on the front panel, and a power socket and a grounding pole on the back panel.

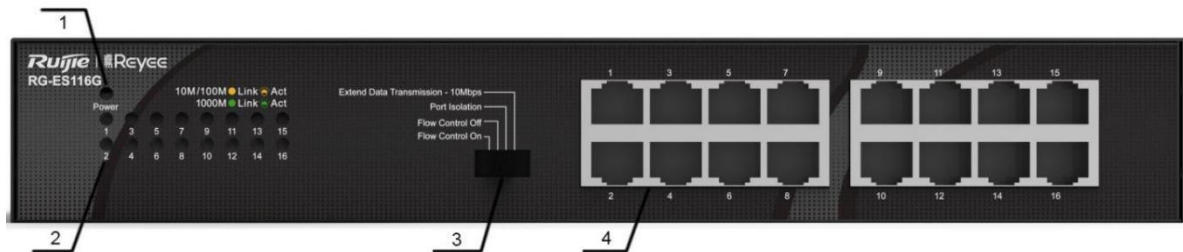
Figure 1-10 Appearance of RG-ES116G



1.5.3 Ports - Front Panel

Figure 1-11 shows the front panel of an RG-ES116G switch. For the detailed meanings of numbers 1 to 4, see the following table.

Figure 1-11 Front Panel of RG-ES116G

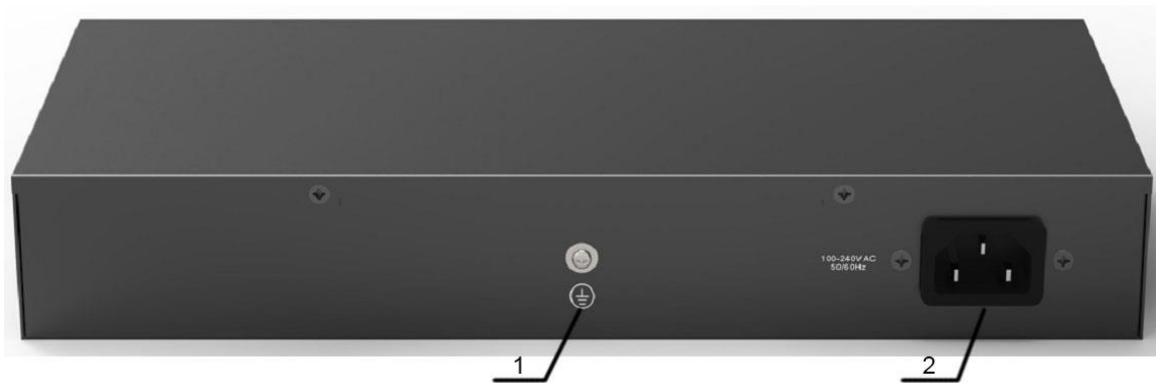


Item	Description
System status indicator	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.
Port status indicator	RJ-45 port status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid orange: The port is connected at 10/100 Mbps. ● Blinking orange: The port is receiving or sending traffic at 10/100 Mbps. ● Solid green: The port is connected at 1000 Mbps. ● Blinking green: The port is receiving or sending traffic at 1000 Mbps. ● Off: The port is not connected.
Port mode switch-over button	Support switchover in four modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-14 are isolated from each other, and can communicate with ports 15-16. ● Extend Data Transmission-10Mbps. When this mode is enabled, ports 1-8 have a reduced speed of 10 Mbps, with a transmission distance of up to 250 m. (Note: If compatibility is considered, some ports may not may not deliver such a transmission distance.)
RJ-45 10/100/1000Base-T auto-sensing Ethernet port	10/100/1000Base-T adaptive Ethernet port. The copper port uses an RJ45 connector.

1.5.4 Ports - Rear Panel

Figure 1-12 shows the rear panel of an RG-ES116G switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-12 Back Panel of RG-ES116G




Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables

1.5.5 Technical Specifications

Table 1-8 Technical Specifications of an RG-ES116G Switch

Model	RG-ES116G
Ports	16 10/100/1000Base-T auto-sensing Ethernet ports
Power Supply	AC input: Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 0.5 A
EEE	Not supported
PoE	Not supported
Power Consumption	11 W
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)

Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in four modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-14 are isolated from each other, and can communicate with ports 15-16. ● Extend DataTransmission-10Mbps. When this mode is enabled, ports 1-8 have a reduced speed of 10 Mbps, with a transmission distance of up to 250 m. (Note: If compatibility is considered, some ports may not may not deliver such a transmission distance.)
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	280 mm x 126 mm x 44 mm (11.02 in. x 4.96 in. x 1.73 in.)
Weight (With Package)	1.75 kg (3.86 lbs)

 **Caution**

- The RG-ES116G switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES116G switch in places where children may appear.

1.5.6 Heat Dissipation Solution

The RG-ES116Gadopts natural heat dissipation, thereby ensuring normal function of the device. Maintain a minimum clearance of 100 mm (3.94 in.) around the device. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.6 RG-ES124GD

1.6.1 Package Contents

Table 1-9 Package Contents

Item	Quantity
RG-ES124GD Host	1
Foot pad	4
Screw (M3X4)	8
Mounting bracket	2
Power cord	1
User Manual	1
Warranty Card	1

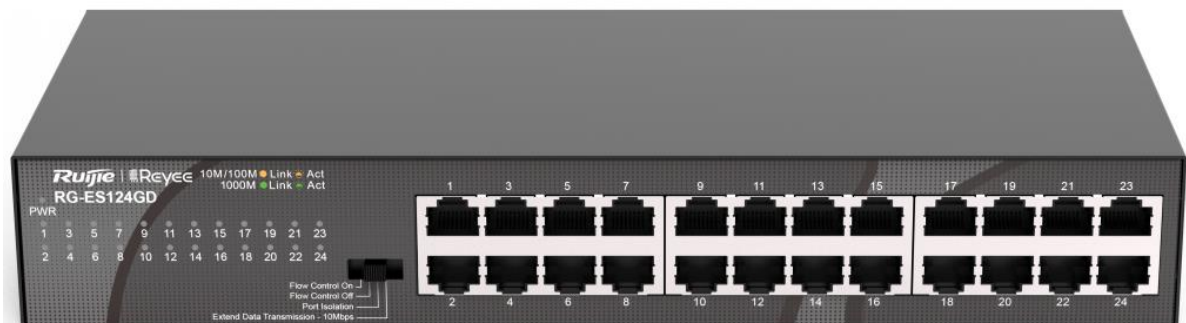
Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.6.2 Product Appearance

RG-ES124GD provides 24 10/100/1000Base-T auto-sensing Ethernet ports, a port mode switch-over button and LED indicators on the front panel, and a power socket and a grounding pole on the back panel.

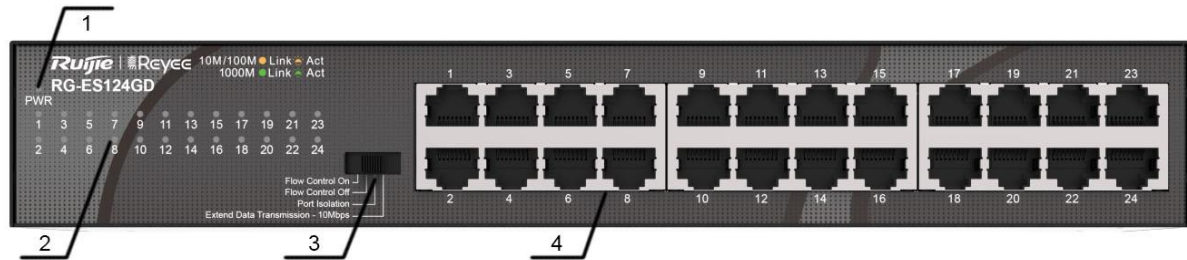
Figure 1-13 Appearance of RG-ES124GD



1.6.3 Ports - Front Panel

Figure 1-14 shows the front panel of an RG-ES124GD switch. For the detailed meanings of numbers 1 to 4, see the following table.

Figure 1-14 Front Panel of RG-ES124GD



Item	Description
System status indicator	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.
Port status indicator	RJ-45 port status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid orange: The port is connected at 10/100 Mbps. ● Blinking orange: The port is receiving or sending traffic at 10/100 Mbps. ● Solid green: The port is connected at 1000 Mbps. ● Blinking green: The port is receiving or sending traffic at 1000 Mbps. ● Off: The port is not connected.
Port mode switch-over button	Support switchover in four modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-22 are isolated from each other, and can communicate with ports 23-24. ● Extend Data Transmission-10Mbps. When this mode is enabled, ports 1-8 have a reduced speed of 10 Mbps, with a transmission distance of up to 250 m. (Note: If compatibility is considered, some ports may not may not deliver such a transmission distance.)
RJ-45 10/100/1000Base-T auto-sensing Ethernet port	10/100/1000Base-T adaptive Ethernet port. The copper port uses an RJ45 connector.

1.6.4 Ports - Rear Panel

Figure 1-15 shows the rear panel of an RG-ES124GD switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-15 Back Panel of RG-ES124GD




Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables

1.6.5 Technical Specifications

Table 1-10 Technical Specifications of an RG-ES124GD Switch

Model	RG-ES124GD
Ports	24 10/100/1000Base-T auto-sensing Ethernet ports
Power Supply	AC input: Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 0.5 A
EEE	Not supported
PoE	Not supported
Power Consumption	16 W
Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)

Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in four modes: <ul style="list-style-type: none"> • Flow Control On • Flow Control Off • Port Isolation. When this mode is enabled, ports 1-22 are isolated from each other, and can communicate with ports 23-24. • Extend DataTransmission-10Mbps. When this mode is enabled, ports 1-8 have a reduced speed of 10 Mbps, with a transmission distance of up to 250 m. (Note: If compatibility is considered, some ports may not may not deliver such a transmission distance.)
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	280 mm x 126 mm x 44 mm (11.02 in. x 4.96 in. x 1.73 in.)
Weight (With Package)	1.76 kg (3.88 lbs)

 **Caution**

- The RG-ES124GD switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES124GD switch in places where children may appear.

1.6.6 Heat Dissipation Solution

The RG-ES124GD adopts natural heat dissipation, thereby ensuring normal function of the device. Maintain a minimum clearance of 100 mm (3.94 in.) around the device. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.7 RG-ES118S-LP

1.7.1 Package Contents

Table 1-11 Package Contents

Item	Quantity
RG-ES118S-LP Host	1
Foot pad	4
Screw (M3X6)	8
Mounting bracket	2
Dust plug	2
Power cord	1
User Manual	1
Warranty Card	1

Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.7.2 Product Appearance

RG-ES118S-LP provides 16 10/100Base-TX auto-sensing Ethernet ports, 2 1000Base-X SFP combo ports, a port mode switch-over button and LED indicators on the front panel, and a power socket and a grounding pole on the back panel.

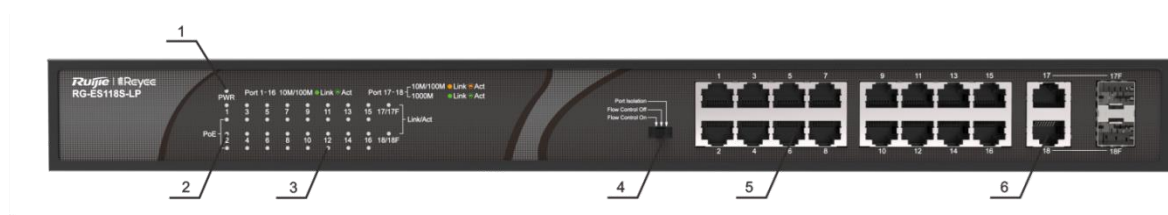
Figure 1-16 Appearance of RG-ES118S-LP



1.7.3 Ports - Front Panel

Figure 1-17 shows the front panel of an RG-ES118S-LP switch. For the detailed meanings of numbers 1 to 6, see the following table.

Figure 1-17 Front Panel of RG-ES118S-LP



Item	Description
System status indicator	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.

Item	Description
Port status indicator	<ul style="list-style-type: none"> ● RJ-45 port status: <ul style="list-style-type: none"> ○ Solid green: The port is connected at 10/100 Mbps. ○ Blinking green: The port is receiving or sending traffic at 10/100 Mbps. ○ Off: The port is not connected. ● Combo port status: <ul style="list-style-type: none"> ○ Off: The port is not connected. ○ Solid orange: The port is connected at 100 Mbps. ○ Blinking orange: The port is receiving or sending traffic at 100 Mbps. ○ Solid green: The port is connected at 1000 Mbps. ○ Blinking green: The port is receiving or sending traffic at 1000 Mbps.
PoE status indicator	<p>PoE status indicator for ports 1-16. The statuses are as follows:</p> <ul style="list-style-type: none"> ● Solid green: PoE is operational. ● Blinking green: PoE is overloaded. ● Off: PoE does not supply power.
Port mode switch-over button	<p>Support switchover in three modes:</p> <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-16 are isolated from each other, but can communicate with ports 17 and 18.
RJ-45 10/100Base-TX auto-sensing Ethernet port	<p>10/100Base-TX adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.</p>
10/100/1000Base-T combo port	<p>10/100/1000Base-T combo port is an interface that can be used as an electrical or optical interface, but they cannot work at the same time.</p>

1.7.4 Ports - Rear Panel

Figure 1-18 shows the rear panel of an RG-ES118S-LP switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-18 Back Panel of RG-ES118S-LP




Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables

1.7.5 Technical Specifications

Table 1-12 Technical Specifications of an RG-ES118S-LP Switch

Model	RG-ES118S-LP
Ports	16 10/100Base-TX auto-sensing Ethernet ports (Auto MDI/MDIX), and support PoE/PoE+ 2 1000Base-X SFP combo ports
Power Supply	AC input: Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 2.5 A
EEE	Port1-16: Supported Port17-18: Not Supported
PoE	Support PoE and PoE+. Ports 1-16 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 17-18 do not support PoE or PoE+. The overall maximum output power of PoE/PoE+ is 120W.
Power Consumption	Less than 13W with no PoE load Less than 148W with PoE full load

Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in three modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-16 are isolated from each other, but can communicate with ports 17 and 18.
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	440 mm x 208 mm x 44 mm (17.32 in. x 8.19 in. x 1.73 in.)
Weight (With Package)	3.40 kg (7.50 lbs)

 **Caution**

- The RG-ES118S-LP switch may cause radio interference in the living environment.

- It is not recommended to deploy RG-ES118S-LP switch in places where children may appear.

1.7.6 Heat Dissipation Solution

The RG-ES118S-LP adopts fans for heat dissipation, thereby ensuring normal function of the device in the specified environment. 10 cm distance space should be reserved at both sides and the back plane of the cabinet to allow air circulation. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.8 RG-ES118GS-P

1.8.1 Package Contents

Table 1-13 Package Contents

Item	Quantity
RG-ES118GS-P Host	1
Mounting bracket	2
Foot pad	4
Screw (M4X8)	8
Power cord	1
Quick Start Guide	1
Warranty card	1

Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.8.2 Product Appearance

RG-ES118GS-P provides 16 10/100/1000Base-TX auto-sensing Ethernet ports, 2 1000Base-X SFP combo ports, a port mode switch-over button and LED indicators on the front panel, and a power socket and a grounding pole on the back panel.

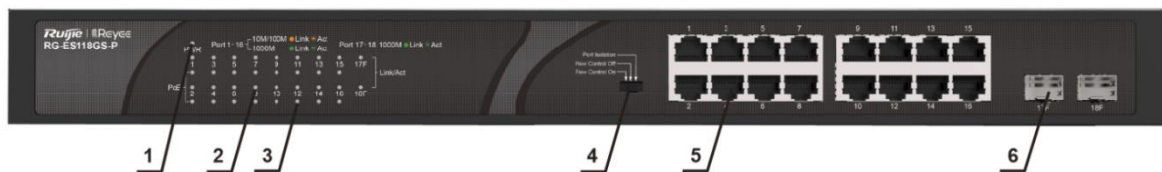
Figure 1-19 Appearance of RG-ES118GS-P



1.8.3 Ports - Front Panel

Figure 1-20 shows the front panel of an RG-ES118GS-P switch. For the detailed meanings of numbers 1 to 6, see the following table.

Figure 1-20 Front Panel of RG-ES118GS-P



Item	Description
System status indicator	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> ● Solid green: The system is operational. ● Off: The switch is powered off.

Item	Description
Port status indicator	<ul style="list-style-type: none"> ● RJ-45 port status: <ul style="list-style-type: none"> ○ Solid green: The port is connected at 10/100/1000 Mbps. ○ Blinking green: The port is receiving or sending traffic at 10/100/1000 Mbps. ○ Off: The port is not connected. ● SFP port status: <ul style="list-style-type: none"> ○ Off: The port is not connected. ○ Solid orange: The port is connected at 100 Mbps. ○ Blinking orange: The port is receiving or sending traffic at 100 Mbps. ○ Solid green: The port is connected at 1000 Mbps. ○ Blinking green: The port is receiving or sending traffic at 1000 Mbps.
PoE status indicator	<p>PoE status indicator for ports 1-16. The statuses are as follows:</p> <ul style="list-style-type: none"> ● Solid green: PoE is operational. ● Blinking green: PoE is overloaded. ● Off: PoE does not supply power.
Port mode switch-over button	<p>Support switchover in three modes:</p> <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-16 are isolated from each other, but can communicate with ports 17 and 18.
RJ-45 10/100/1000Base-T auto-sensing Ethernet port	<p>10/100/1000Base-T adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.</p>
100/1000Base-T SFP port	<p>SFP port. For details about applicable transceiver modules, see Transceiver Modules.</p>

1.8.4 Ports - Rear Panel

Figure 1-21 shows the rear panel of an RG-ES118GS-P switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-21 Back Panel of RG-ES118GS-P




Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables

1.8.5 Technical Specifications

Table 1-14 Technical Specifications of an RG-ES118GS-P Switch

Model	RG-ES118GS-P
Ports	16 10/100/1000Base-T auto-sensing Ethernet ports (Auto MDI/MDIX), and support PoE/PoE+ 2 1000Base-X SFP ports
Power Supply	AC input: Rated voltage range: 100 VAC to 240 VAC Maximum voltage range: 90 VAC to 264 VAC Frequency: 50/60Hz Rated current: 5A
EEE	Not Supported
PoE	Support PoE and PoE+. Ports 1-16 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 17-18 do not support PoE or PoE+. The overall maximum output power of PoE/PoE+ is 247W.
Power Consumption	Less than 30W with no PoE load Less than 297W with PoE full load
Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)

Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	Support switchover in three modes: <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-16 are isolated from each other, but can communicate with ports 17 and 18.
Fan	Not supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported
EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	440 mm x 240 mm x 44 mm (17.32 in. x 9.45 in. x 1.73 in.)
Weight (With Package)	4.00 kg (8.82lbs)

 **Caution**

- The RG-ES118GS-P switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES118GS-P switch in places where children may appear.

1.8.6 Heat Dissipation Solution

The RG-ES118GS-P adopts fans for heat dissipation, thereby ensuring normal function of the device in the specified environment. 10 cm distance space should be reserved at both sides and the back plane of the cabinet to allow air circulation. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.9 RG-ES126S-LP

1.9.1 Package Contents

Table 1-15 Package Contents

Item	Quantity
RG-ES126S-LP Host	1
Mounting bracket	2
Foot pad	4
Screw (KM3*8mm)	8
Power cord	1
Quick Start Guide	1
Warranty Card	1

Instruction

The preceding table lists items delivered in normal cases. The actually delivered items may vary with the contract. Carefully check your goods against the package contents or contract. Contact the seller if you have any questions or find any errors.

1.9.2 Product Appearance

RG-ES126S-LP provides 24 10/100Base-TX auto-sensing Ethernet ports, 2 10/100/1000Base-T auto-sensing Ethernet ports, a 1000Base-X SFP port, system status LEDs and a port mode switch-over button on the front panel, and a power socket and a grounding pole on the back panel.

Figure 1-22 Appearance of RG-ES126S-LP



1.9.3 Ports - Front Panel

Figure 1-23 shows the front panel of an RG-ES126S-LP switch. For the detailed meanings of numbers 1 to 8, see the following table.

Figure 1-23 Front Panel of RG-ES126S-LP



Item	Description
PoE overload indicator	<ul style="list-style-type: none"> Off: The overall PoE output does not reach the maximum power. Solid green: The overall PoE output reaches the maximum power.
System status indicator	System status indicator. The statuses are as follows: <ul style="list-style-type: none"> Solid green: The system is operational. Off: The switch is powered off.
Port status indicator	<ul style="list-style-type: none"> Solid green: The port is connected at 10/100/1000 Mbps. Blinking green: The port is receiving or sending traffic at 10/100/1000 Mbps. Off: The port is not connected.
PoE status indicator	PoE status indicator for ports 1-24. The statuses are as follows: <ul style="list-style-type: none"> Solid green: PoE is operational. Off: PoE does not supply power.

Item	Description
Port mode switch-over button	Support switchover in three modes: <ul style="list-style-type: none"> • Flow Control On • Flow Control Off • Port Isolation. When this mode is enabled, ports 1-24 are isolated from each other, but can communicate with ports 25, 26 and 26F.
RJ-45 10/100Base-TX auto-sensing Ethernet port	10/100Base-TX adaptive Ethernet port that supports PoE power supply. The copper port uses an RJ45 connector.
10/100/1000Base-T auto-sensing Ethernet port	10/100/1000Base-T adaptive Ethernet port. The copper port uses an RJ45 connector.
10/100/1000Base-T combo port	10/100/1000Base-T combo port is an interface that can be used as an electrical or optical interface, but they cannot work at the same time.

1.9.4 Ports - Rear Panel

Figure 1-24 shows the rear panel of an RG-ES126S-LP switch. For detailed meanings of numbers 1 to 2, see the following table.

Figure 1-24 Back Panel of RG-ES126S-LP



Item	Description
Grounding pole	Used to fasten the ground cable.
AC power port	Connect to AC power cables


1.9.5 Technical Specifications

Table 1-16 Technical Specifications of an RG-ES126S-LP Switch

Model	RG-ES126S-LP
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Ports	<p>Ports 1-24 are 10/100Base-TX auto-sensing Ethernet ports, and support PoE/PoE+</p> <p>Ports 25 and 26 are 10/100/1000Base-T auto-sensing Ethernet ports, and do not support PoE/PoE+</p> <p>Port 26F is a 1000Base-X SFP port multiplexed with Port 26 as a combo port, and the SFP port takes priority</p>
Power Supply	<p>AC input:</p> <p>Rated voltage range: 100 VAC to 240 VAC</p> <p>Maximum voltage range: 90 VAC to 264 VAC</p> <p>Frequency: 50/60Hz</p> <p>Rated current: 4 A Max</p>
EEE	Not supported
PoE	<p>Support PoE and PoE+.</p> <p>Ports 1-24 are PoE/PoE+-capable with the maximum power output of 30W per port. Ports 25-26 do not support PoE or PoE+.</p> <p>The overall maximum output power of PoE/PoE+ is 180W.</p>
Power Consumption	<p>Less than 10W with no PoE load</p> <p>Less than 220W with PoE full load</p>
Operating Temperature	0°C to 45°C(32°F to 113°F)
Storage Temperature	-40°C to 70°C(-40°F to 158°F)
Operating Humidity	10% to 90% RH (non-condensing)
Storage Humidity	5% to 95% RH (non-condensing)
Port Mode	<p>Support switchover in three modes:</p> <ul style="list-style-type: none"> ● Flow Control On ● Flow Control Off ● Port Isolation. When this mode is enabled, ports 1-24 are isolated from each other, but can communicate with ports 25, 26 and 26F.
Fan	Supported
Temperature Warning	Not supported
Accessing Optical Module Information	Not supported

EMC Standards	GB/T 9254.1-2021 EN 55032:2015 EN 55035:2017 EN IEC61000-3-2:2019 EN 61000-3-3:2013 Draft ETSI EN 300 386 V2.2.0 (2020-10)
Security Standards	GB 4943.1-2011 EN 62638-1
Earth Leakage Current	≤1.5mA
Dimensions (W x D x H)	440 mm x 208 mm x 44 mm (17.32 in. x 8.19 in. x 1.73 in.)
Weight (With Package)	3 kg (6.61 lbs)

 **Caution**

- The RG-ES126S-LP switch may cause radio interference in the living environment.
- It is not recommended to deploy RG-ES126S-LP switch in places where children may appear.

1.9.6 Heat Dissipation Solution

The RG-ES126S-LP adopts fans for heat dissipation, thereby ensuring normal function of the device in the specified environment. 10 cm distance space should be reserved at both sides and the back plane of the cabinet to allow air circulation. It is recommended to clean the device once every 3 months to avoid dust from blocking vents.

1.10 Transceiver Modules

Based on the port types, Ruijie provides corresponding SFP modules (Mini-GBIC modules) and 10G SFP+ modules. You can select modules based on usage requirements. In addition to the following modules, the O/E conversion 1000M SFP module (Mini-GBIC-GT) is supported. This document provides models and technical parameters of some 1000M SFP modules and 10G SFP+ modules for reference. For details about the technical specifications, see the *Ruijie Transceiver Installation and Reference Guide*.

1.10.1 1000M SFP Transceiver Modules

Table 1-17 1000M SFP Transceiver Module Technical Specifications

Model	Wavelength (nm)	Fiber Type	Support Digital Diagnostic Monitoring (DDM) (Yes/No)	TX Power (dBm)		RX Power (dBm)	
				Min	Max	Min	Max
MINI-GBIC-SX-MM850	850	Multi-mode	No	-9.5	-3	-17	0
MINI-GBIC-LX-SM1310	1310	Single-mode	No	-9.5	-3	-20	-3
MINI-GBIC-LH40-SM1310	1310	Single-mode	Yes	-2	3	-22	-3
GE-SFP-LX20-SM1310-BIDI	1310 TX/1550 RX	Single-mode	Yes	-9	-3	-20	-3
GE-SFP-LX20-SM1550-BIDI	1550 TX/1310 RX	Single-mode	Yes	-9	-3	-20	-3
GE-SFP-LH40-SM1310-BIDI	1310 TX/1550 RX	Single-mode	Yes	-5	0	-24	-1
GE-SFP-LH40-SM1550-BIDI	1550 TX/1310 RX	Single-mode	Yes	-5	0	-24	-1
MINI-GBIC-ZX80-SM1550	1550	Single-mode	Yes	0	4.7	-22	-3
MINI-GBIC-ZX100-SM1550	1550	Single-mode	Yes	0	5	-30	-9
SFP-MM850	850	Multi-mode	No	-9.5	-3	-17	0
SFP-SM1310	1310	Single-mode	No	-9.5	-3	-20	-3
GE-SFP-ZX	850	Multi-mode	Yes	-9.5	-3	-17	0
GE-SX-MM850	850	Multi-mode	Yes	-9.5	-3	-17	0

Model	Wavelength (nm)	Fiber Type	Support Digital Diagnostic Monitoring (DDM) (Yes/No)	TX Power (dBm)		RX Power (dBm)	
				Min	Max	Min	Max
GE-LX-SM1310	1310	Single-mode	Yes	-9	-3	-20	-3
SFP-S4-R1000P1 v1	1310	Single-mode	Yes	-9	-3	-20	-3

Table 1-18 1000M SFP Transceiver Module Technical Specifications

Standard	1000Base-T SFP Product Model	Support DDM (Yes/No)
1000Base-T	Mini-GBIC-GT	No

Table 1-19 SFP Transceiver Module Cabling Specifications

SFP Model	Port Type	Fiber Type	Core Specifications (µm)	Maximum Cabling Distance
MINI-GBIC-SX-MM850	LC	Multi-mode	62.5/125	275 m
			50/125	550 m
MINI-GBIC-LX-SM1310	LC	Single-mode	9/125	10 km
MINI-GBIC-LH40-SM1310	LC	Single-mode	9/125	40 km
GE-SFP-SX-SM1310-BIDI	LC	Multi-mode	50/125	500 m
GE-SFP-SX-SM1550-BIDI	LC	Multi-mode	50/125	500 m
GE-SFP-LX20-SM1310-BIDI	LC	Single-mode	9/125	20 km
GE-SFP-LX20-SM1550-BIDI	LC	Single-mode	9/125	20 km
GE-SFP-LH40-SM1310-BIDI	LC	Single-mode	9/125	40 km
GE-SFP-LH40-SM1550-BIDI	LC	Single-mode	9/125	40 km
MINI-GBIC-ZX80-SM1550	LC	Single-mode	9/125	80 km
MINI-GBIC-ZX100-SM1550	LC	Single-mode	9/125	100 km
SFP-MM850	LC	Multi-mode	50/125	500 m

SFP Model	Port Type	Fiber Type	Core Specifications (μm)	Maximum Cabling Distance
SFP-SM1310	LC	Single-mode	9/125	10 km
GE-SFP-ZX	LC	Multi-mode	50/125	550 m
GE-SX-MM850	LC	Multi-mode	50/125	550 m
GE-LX-SM1310	LC	Single-mode	9/125	10 km
SFP-S4-R1000P1 v1	LC	Single-mode	9/125	10 km
Mini-GBIC-GT	RJ-45 network cable	Unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cables of CAT5 or higher		100 m
GE-SFP-GT	RJ-45 network cable	UTP or STP cables of CAT5 or higher		100 m
SFP-GT	RJ-45 network cable	UTP or STP cables of CAT5 or higher		100 m

Instruction

- When a transceiver module supporting a deployment distance of 40 km or longer is connected with a single-mode optical fiber for short-range transmission, an online light attenuator must be installed to prevent the optical receiver from being overloaded.
- To ensure that the transceiver module is clean, put on a dust cap when you do not connect an optical fiber to the transceiver module.

Caution

A transceiver module is a laser transmitter. Do not stare at any light source to prevent it from burning your eyes.

Table 1-20 Pairing Description of BIDI Transceiver Module

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

Rate/Distance	PairingModel
1000M/40 km	GE-SFP-LH40-SM1310-BIDI GE-SFP-LH40-SM1550-BIDI
10G/10 km	XG-SFP-LR-SM1270-BIDI XG-SFP-LR-SM1330-BIDI

i Instruction

- The BIDI transceiver modules at both ends must be paired for use. For example, if GE-SFP-LX20-SM1310-BIDI is used at one end, GE-SFP-LX20-SM1550-BIDI must be used at the other end.

1.10.2 10G SFP+ Transceiver Modules

Table 1-21 10G SFP+ Transceiver Module Technical Specifications

Model	Wavelength (nm)	Support DDM (Yes/No)	Fiber Type	TX Power (dBm)		RX Power (dBm)	
				Min	Max	Min	Max
XG-SFP-SR-MM850	850	Yes	Multi-mode	-7.3	-1	-9.9	-1
XG-SR-MM850	850	Yes	Multi-mode	-7.3	-1	-9.9	-1
SFP+MM850	850	Yes	Multi-mode	-7.3	-1	-9.9	-1
XG-SFP-LR-SM1270-BIDI	1270	No	Single-mode	-6.5	0.5	-14.4	0.5
XG-SFP-LR-SM1330-BIDI	1330	No	Single-mode	-6.5	0.5	-14.4	0.5
XG-LR-SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
SFP+SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
XG-SFP-LR-SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
XG-eSFP-LR-SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
XG-SFP-ER-SM1550	1550	Yes	Single-mode	-4.7	4	-11.3	-1
XG-SFP-ZR-SM1550	1550	Yes	Single-mode	0	4	-24	-7
SFP-S4-R1000P1 v2	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
SFP-S1-R1000P1	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5

Model	Wavelength (nm)	Support DDM (Yes/No)	Fiber Type	TX Power (dBm)		RX Power (dBm)	
				Min	Max	Min	Max
SFP+1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
SFP-M3-R1000P1	850	Yes	Multi-mode	-7.3	-1	-11.1	-1
XG-LR-SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
HSFP-XG-SFP-LR-SM1310	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5
XG-SFP-SR-MM850-I	850	Yes	Multi-mode	-7.3	-1	-9.9	-1
XG-SFP-LR-SM1310-I	1310	Yes	Single-mode	-8.2	0.5	-14.4	0.5

Table 1-22 10G Active SFP+ Transceiver Module Technical Specifications

Model	Module Type	Connector Type	Copper Cable Length (m)	Conduct or Wire Diameter (AWG)	Data Rate (Gb/s)	Support DDM (Yes/No)
XG-SFP-AOC1M	Active	SFP+	1	N/A	10.3125	Yes
XG-SFP-AOC3M	Active	SFP+	3	N/A	10.3125	Yes
XG-SFP-AOC5M	Active	SFP+	5	N/A	10.3125	Yes
XG-SFP-AOC10M	Active	SFP+	10	N/A	10.3125	Yes

Instruction

- Types/models of SFP+ series modules are being updated. To obtain more accurate module models, contact Ruijie's marketing personnel or technical support personnel.
- The DDM function of the active optical cables (AOCs) does not have TX power report. The TX power can be displayed as N/A.
- To ensure that the transceiver module is clean, put on a dust cap when you do not connect an optical fiber to the transceiver module.

Caution

A transceiver module is a laser transmitter. Do not stare at any light source to prevent it from burning your eyes.

Table 1-23 SFP+ Module Cabling Specifications

Model	Port Type	Fiber Type	Core Specifications (μm)	Modal Bandwidth (MHz km)	Maximum Cabling Distance
XG-SFP-SR-MM850	LC	Multi-mode	50/125	2000 (OM3)	300 m
XG-SR-MM850	LC	Multi-mode	50/125	2000 (OM3)	300 m
SFP+MM850	LC	Multi-mode	50/125	2000 (OM3)	300 m
XG-SFP-LR-SM1270-BIDI	LC	Single-mode	9/125	N/A	10 km
XG-SFP-LR-SM1330-BIDI	LC	Single-mode	9/125	N/A	10 km
XG-SFP-LR-SM1310	LC	Single-mode	9/125	N/A	10 km
SFP+SM1310	LC	Single-mode	9/125	N/A	10 km
XG-SFP-ER-SM1550	LC	Single-mode	9/125	N/A	40 km
XG-SFP-ZR-SM1550	LC	Single-mode	9/125	N/A	80 km
SFP-S4-R1000P1 v2	LC	Single-mode	9/125	N/A	10 km
SFP-S1-R1000P1	LC	Single-mode	9/125	N/A	10 km
SFP+1310	LC	Single-mode	9/125	N/A	10 km
SFP-M3-R1000P1	LC	Multi-mode	50/125	2000 (OM3)	300 m
XG-LR-SM1310	LC	Single-mode	9/125	N/A	10 km
HSFP-XG-SFP-LR-SM1310	LC	Single-mode	9/125	N/A	10 km
XG-SFP-SR-MM850-I	LC	Multi-mode	50/125	2000 (OM3)	300 m
XG-SFP-LR-SM1310-I	LC	Single-mode	9/125	N/A	10 km

1.11 Cable

1.11.1 Ethernet Cables

- 1000BASE-T: Use 100-ohm CAT5E UTP or STP cables with the maximum transmission distance of 100 m.
- 100BASE-TX: Use 100-ohm CAT5 or CAT5E UTP or STP cables with the maximum transmission distance of 100 m.
- 10BASE-T: Use 100-ohm CAT3, CAT4, CAT5, or CAT5E UTP or STP cables with the maximum transmission distance of 100 m.
- When device ports support MDI/MDI-X adaption, both straight-through and crossover network cables are supported. RG-ES110D-P, RG-ES110GDS-P, RG-ES118S-LP and RG-ES118GS-P support MDI/MID-X.

i Instruction

For details about the connection methods and signals of twisted-pair cables, see *Connection Modes of Cables Prepared by Users*.

1.11.2 Optical Fibers

Table 1-24 Features of Optional Transmission Media

Model	Description
1000BASE-SX	<p>Wavelength: 850 nm</p> <p>The maximum transmission distance of a 62.5/125 μm multi-mode optical fiber is 220 m.</p> <p>The maximum transmission distance of a 50/125 μm multi-mode optical fiber is 500 m.</p>
1000BASE-LX	<p>Wavelength: 1310 nm</p> <p>The maximum transmission distance of a 62.5/125 μm multi-mode optical fiber is 550 m.</p> <p>The maximum transmission distance of a 50/125 μm multi-mode optical fiber is 550 m.</p> <p>The maximum transmission distance of a 9/125 μm single-mode optical fiber is 10 km.</p>
1000BASE-LH	<p>Wavelength: 1310 nm</p> <p>The maximum transmission distance of a 9/125 μm single-mode optical fiber is 40 km.</p>
1000BASE-ZX	<p>Wavelength: 1550 nm</p> <p>The maximum transmission distance of a 9/125 μm single-mode optical fiber is 50 km or 80 km.</p>
FE-SFP-LX-MM1310	<p>Wavelength: 1310 nm</p> <p>The maximum transmission distance of a 50/125 μm multi-mode optical fiber is 2 km.</p>
FE-SFP-LH15-SM1310	<p>Wavelength: 1310 nm</p> <p>The maximum transmission distance of a 9/125 μm single-mode optical fiber is 15 km.</p>

Table 1-25 SFP+ Transmission Media and Distance

Specifications	XG-SFP-SR-MM850		XG-SFP-LR-SM1310	XG-SFP-ER-SM1550	XG-SFP-ZR-SM1550
Wavelength (nm)	850		1310	1550	1550
Fiber Type	Multi-mode optical fiber-LC connector		Single-mode optical fiber-LC connector	Single-mode optical fiber-LC connector	Single-mode optical fiber-LC connector
Core Specifications (μm)	62.5/125	50/125	9/125	9/125	9/125
Modal Bandwidth (MHz, km)	200 160	2000 500 400	N/A	N/A	N/A
Maximum Cabling Distance	33 m 26 m	300 m 82 m 66 m	10 km	40 km	80 km
TX Power (dBm)	-5 to -1		-4.8 to +0.5	-1 to +2	0 to 4
RX Power (dBm)	-7.5 to +0.5		-10.3 to +0.5	-11.3 to -1	-24 to -7

2 Preparing for Installation

2.1 Safety Precautions

Instruction

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

2.1.1 General Safety Precautions

- Install the switch inside a standard 19-inch cabinet.
- Do not place the switch in a wet position, and keep the switch away from liquid. Keep the chassis clean and dust-free.
- Install the switch in a position far away from heat sources.
- Ensure that the cabinet and power distribution system are properly grounded.
- Do not place the device in walking areas.
- During the installation and maintenance, do not wear loose clothes, ornaments, or any other things that may be hooked by the chassis.
- Keep tools and components away from walking areas.

2.1.2 Handling Safety

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

2.1.3 Electric Safety

Warning

- Improper or incorrect electric operations may cause a fire, electric shock, and other accidents, and lead to severe and fatal personal injury and device damage.
 - Direct or indirect contact with high voltage or mains power supply via wet objects may cause fatal dangers.
-
- Observe local regulations and specifications during electric operations. Only personnel with relevant qualifications can perform such operations.
 - Check whether there are potential risks in the work area. For example, check whether the power supply is grounded, whether the grounding is reliable, and whether the ground is wet.
 - Learn about the position of the indoor emergency power switch before installation. Cut off the power switch in case of accidents.

- Check the switch carefully before shutting down the power supply.
- If a power supply system is equipped with a leakage protector (also referred to as "leakage current switch" or "leakage current breaker"), 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 twenty identical power supplies, the leakage current of each power supply is equal to or less than 1.5mA, and the leakage current of the system totals 30mA. A leakage protector with 30mA rated action current supports less than ten power supplies (that is, Action current of the leakage protector/2/Maximum leakage current of each power supply = $30/2/1.5=10$). In other words, the leakage protector with 30mA rated action current supports no more than ten power supplies. In this case, the twenty power supplies in the system require at least two leakage protectors with 30mA rated action current and each leakage protector supports ten power supplies. If power supplies in a system differ in models, the rated leakage action current of each leakage protector divided by two is greater than the sum of maximum leakage current of all the power supplies. The rated leakage non-action current of a leakage protector shall be 50% of the leakage action current. Take a leakage protector with 30mA rated leakage action current as an example. The rated leakage non-action current shall be 15mA. When the leakage current is below 15mA, the protector shall not act. Otherwise, misoperation may easily occur due to high sensitivity and thus the leakage protector trips, devices are powered off, and services are interrupted.

 **Note**

- To guarantee personal safety, the rated leakage action current of each leakage protector in the system must be equal to or less than 30mA (human body safety current is 30mA). When twice of the total leakage current of the system is greater than 30mA, the system must be equipped with two or more leakage protectors.
 - For the leakage current value of each power supply model, see the power supply model parameter table in Chapter 1.
-

2.1.4 Electrostatic Discharge Safety

- Properly ground the device and floor.
- Keep the indoor installation environment clean and free of dust.
- Maintain appropriate humidity conditions.
- When installing different types of transceiver modules, wear an antistatic wrist strap and ensure that it is reliably grounded.
- Do not use bare hands to touch the components and the printed circuit boards (PCBs).
- Use an ESD shielding bag to properly store the boards.
- Do not let any clothes touch PCBs. An antistatic wrist strap can only prevent human static electricity from damaging the PCBs but cannot prevent static electricity on clothes.


2.1.5 Laser Safety

The RG-ES126S-LP and RG-ES118S-LP switches support varying models of optical modules sold on the market which are Class I laser products. Improper use of optical modules may cause damage.

Precautions:

- When a fiber transceiver works, ensure that the port has been connected with a fiber or covered by a dust cap to keep out dust and prevent it from burning your eyes.

- Do not stare at any optical port.

 Caution

Do not approach or stare at any fiber port under any circumstances, as this may cause permanent damage to your eyes.

2.2 Installation Environment Requirements

Install the switch indoors to ensure its normal operation and prolonged service life.

The installation site must meet the following requirements.

2.2.1 Bearing Requirements

Evaluate the weight of the switch and its accessories (for example, the cabinet, chassis, and power supply modules), and ensure that the ground of the installation site meets the requirements.

2.2.2 Ventilation Requirements

Reserve sufficient space in front of the air vents to ensure normal heat dissipation. After various cables are connected, bundle the cables or place them in the cable management bracket to avoid blocking air inlets.

2.2.3 Space Requirements

To dissipate heat and maintain the switch, do not install it against walls. Maintain a minimum clearance of 10 cm (3.94 in.) around the chassis to facilitate heat dissipation.

2.2.4 Temperature/Humidity Requirements

To ensure the normal operation and prolonged service life of the RG-ES1 series switches, maintain an appropriate temperature and humidity in the equipment room.

The equipment room with too high or too low temperature and humidity for a long period may damage the switch.

- In an environment with high relative humidity, the insulating material may have poor insulation or even leak electricity.
- In an environment with low relative humidity, the insulating strip may dry and shrink, loosening screws.
- In a dry environment, static electricity is prone to occur and damage the internal circuits of the switch.
- Too high temperatures can accelerate the aging of insulation materials, greatly reducing the reliability of the switch and severely affecting its service life.

For details about the operating temperature and humidity requirements of the switch, see section [1.2.5 Technical Specifications](#).

 Instruction

The ambient temperature and humidity of the switch are measured at the point that is 1.5 m (59.06 in.) above the floor and 0.4 m (15.75 in.) before the switch rack when there is no protective plate in front or at the back of the rack.

2.2.5 Cleanliness Requirements

Dust poses a major threat to the switch. The indoor dust takes on a positive or negative static electric charge when falling on the switch, causing poor contact of the metallic joint. Such electrostatic adhesion may occur more easily when the relative humidity is low, not only affecting the service life of the switch, but also causing communication faults. Table 2-1 describes the requirements for the dust content and granularity in the equipment room.

Table 2-1 Requirements for Dust

Dust	Unit	Content
Dust particles (diameter $\geq 0.5 \mu\text{m}$)	Particles/ m^3	$\leq 3.5 \times 10^6$
Dust particles (diameter $\geq 5 \mu\text{m}$)	Particles/ m^3	$\leq 3.5 \times 10^4$

Apart from dust, the salt, acid, and sulfide in the air in the equipment room must meet strict requirements. These harmful substances will accelerate metal corrosion and component aging. Therefore, the equipment room should be properly protected against the intrusion of harmful gases, such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide and chlorine gas. Table 2-2 lists limit values 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 (HS)	0.1	0.5
Nitrogen dioxide (NO_2)	0.5	1.0
Chlorine gas (Cl_2)	0.1	0.3

Instruction

Average refers to the average value of harmful gases measured in one week. Maximum refers to the upper limit of harmful gases measured in one week, and the maximum value lasts up to 30 minutes every day.

2.2.6 Grounding Requirements

A proper grounding system is the basis for stable and reliable running and is indispensable for preventing lightning strikes and interference. Carefully check the grounding conditions at the installation site according to the grounding specifications, and complete grounding properly based on the actual situation.

- Safe Grounding

Ensure that the cabinet and power distribution device are securely grounded when the switch uses the AC power supply. Otherwise, electric shock may occur when the insulation resistance between the power supply inside the switch and the chassis becomes small.

Note

Please adopt protection grounding connections in buildings so that the switch can be connected to the protection ground.

- **Lightning Grounding**

The lightning protection system of facilities is standalone, and is composed of a lightning rod, a lower conductor, and a connector connected to the grounding system. The grounding system is usually used for power reference grounding and safety grounding of the cabinet. Lightning grounding is required only for facilities and is not required for the switch.

- **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, and the ground terminals of the cabinet should be grounded before the running of the switch.

2.2.7 Anti-interference Requirements

- Take interference prevention measures for the power supply system.
- Keep the switch away from the grounding equipment or lightning and grounding equipment of the power device as much as possible.
- Keep the switch far away from high-frequency current devices such as high-power radio transmitting station and radar launcher.
- Take electromagnetic shielding measures when necessary.

2.2.8 Lightning Protection Requirements

The RG-ES1 series switches can guard against lightning strikes. As an electric device, it may still be damaged by strong lightning strikes. Take the following lightning protection measures:

- Ensure that the ground cable of the cabinet is in good contact with the ground.
- Ensure that the neutral point of the AC power socket is in good contact with the ground.
- It is recommended to install a power lightning arrester in front of the power input end to enhance the lightning prevention for the power supply.
- When the AC power cable is imported outdoors and directly connected to the power port of the RG-ES1 series switches, lightning line bank should be adopted to prevent the switch from being hit by lightning shocks. Usage of the lightning line bank: Connect the mains supply AC cable to the lightning line bank. Then, connect the switch to the lightning line bank. This can help to prevent the current of high-voltage lightning from passing the switch directly through the mains supply cable to a certain extent.

2.2.9 Inspection of the Installation Unit

Regardless of whether the switch is installed inside a cabinet or on a workbench, the following conditions must be met:

- The switch is equipped with fans. Therefore, maintain a minimum clearance of 15 cm (5.91 in.) around the air vents for heat dissipation. It is recommended to install the switch inside a standard 19-inch cabinet. The

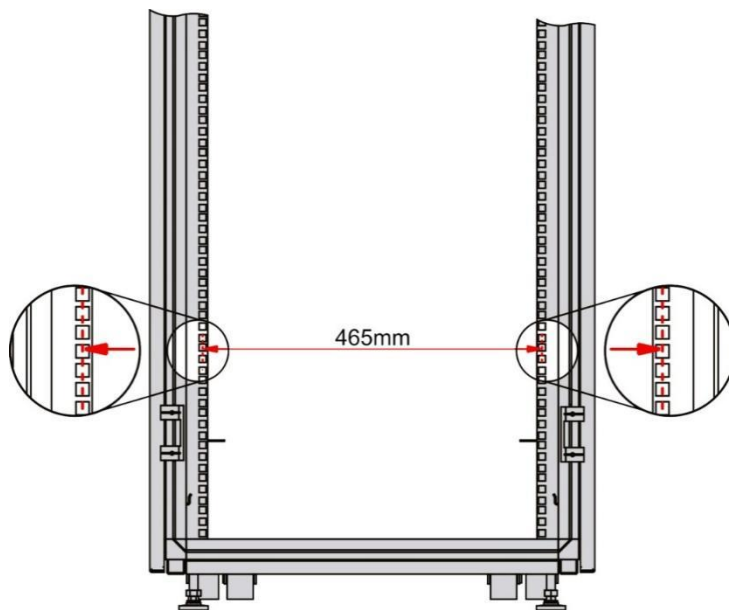
switch can be horizontally placed on a clean plane if conditions are not met. It is recommended to install air conditioners if you want to use the switch in hot areas.

- The cabinet and workbench has proper ventilation and heat dissipation.
- The cabinet and workbench are strong enough to support the weight of the switch and its accessories.
- The cabinet and workbench are properly grounded.

2.3 Cabinet Installation Requirements

If you want to install the switch inside a cabinet, confirm that the cabinet meets the following conditions:

Figure 2-1 Standard 19-inch Cabinet



- (1) A 19-inch standard cabinet is used.
- (2) The distance between square hole strips on the left and right sides of the 19-inch standard cabinet is 465 mm.
- (3) The distance between the square hole strip on the rack column and the outer side of the front cabinet door is greater than 180 mm and the thickness of the front cabinet door is smaller than 25 mm. Therefore, the available space is greater than 155 mm. The cabinet depth (distance between the front and rear doors) is greater than 1000 mm.
- (4) The slide rails (or trays) of the cabinet meets the requirements of the switch and support its weight.
- (5) A ground terminal is installed reliably on the cabinet to ensure that the switch is fully grounded.
- (6) The cabinet is well ventilated and the porosity of the front and rear panels is greater than 50%.

2.4 Tools

Table 2-3 Tools

Common Tools	Phillips screwdrivers, wires, network cables, fastening bolts, diagonal pliers, and binding straps
Special Tools	Antistatic gloves or Antistatic wrist strap, wire stripper, crimping pliers, crystal connector crimping pliers, and wire cutter
Meter	Multimeter
Relevant Devices	PC, display, and keyboard

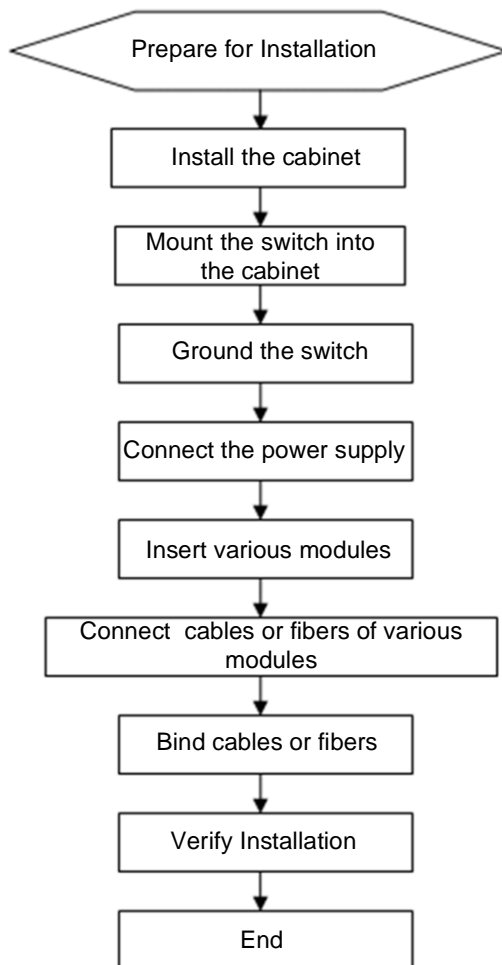
 Instruction

The RG-ES1 series switches are delivered without a tool kit. Please prepare a tool kit yourself.

3 Installing the Switch

Ensure that requirements in Chapter 2 are all met.

3.1 Installation Procedure



- (1) Preparing
- (2) Mounting the Switch
- (3) Installing and Removing the Power Supply
- (4) Verifying Installation
- (5) Adding Unmanaged Device in Topology

3.2 Preparing

The RG-ES1 series switch is a complex device. Carefully plan and arrange the installation position, networking mode, power supply, and cabling before installation. Confirm the following requirements before installation:

- The installation position provides sufficient space for heat dissipation.
- The installation position meets the temperature and humidity requirements of the switch.
- The power supply and required current are available in the installation position.
- The network cables have been deployed in the installation position.
- The selected power supply modules meet the system power requirements.
- The position of the indoor emergency power switch is learned before installation. The power switch is cut off in case of accidents.

3.3 Mounting the Switch

Typically, the switch is mounted to the following places:

- Cabinet
- Wall
- Workbench

3.3.1 Mounting the Switch into a Cabinet

The RG-ES106D-P and RG-ES110D-P series switches do not support rack mounting.

The RG-ES126S-LP, RG-ES118S-LP, RG-ES110GDS-P, RG-ES118GS-P, RG-ES116G and RG-ES124GD series switches follow the EIA standard dimensions and can be installed in 19-inch standard cabinet. Use fixing accessories delivered with the switch to install the switch into the cabinet based on the cabinet situation.

Notes

When mounting the switch inside a cabinet, note the following:

- All expansion bolts for fastening the cabinet base to the ground should be installed and tightened in sequence from bottom to up (large flat washer, spring washer, and nut), and the installation holes on the base and the expansion bolts are properly aligned.
- The installed cabinet should be stable and still.
- The installed cabinet should be vertical to the ground.
- When multiple cabinets are placed side by side in the equipment room, they should be aligned with each other, leaving an error less than 5 mm.
- The front/rear doors of the cabinet should be installed to allow you open and close them smoothly. The locks should work normally, and all keys should be complete.
- There should be no unnecessary and informal labels inside the cabinet and on service modules.
- Filler panels are installed on vacant slots.
- Fastening screws of the switch in the cabinet should be ready, tightened, and of the same model.
- Service modules of the switch are securely installed, and the fastening screws on the panel are tightened.
- All wiring outlets at the top and bottom of the cabinet should be installed with rodent-resistant nets with

seams no more than 1.5 cm (0.59 in.) in diameter to prevent rodents and other small animals from entering the cabinet.

- Antistatic wrist straps should be provided in the cabinet.

Simple Installation Steps for Cabinet

- (1) Plan the available space before installing the cabinet. Reserve sufficient space for the front and rear doors for maintenance.
- (2) Install and fasten the cabinet in the designed position as planned.
- (3) Install the appropriate cable troughs and cables.
- (4) Install the tray and cable management brackets on the cabinet according to the number of switches installed inside the cabinet.

Preparing

Before mounting an RG-ES1 switch into a cabinet, verify that the front and rear brackets of the cabinet are in the right positions. If the brackets are too far forward, the front door of the switch may be too close to the front door of the cabinet. As a result, the front door of the cabinet cannot be closed when the switch is connected with network cables and fibers. Maintain a minimum clearance of 10 cm (3.94 in.) between the front panel of the switch and the front door of the cabinet. Before mounting the switch into a cabinet, ensure that the following conditions are met:

- The cabinet is fixed.
- All the internal units have been installed properly in the cabinet.
- No obstacles to installation exist inside or around the cabinet.
- The switch is prepared and moved to a place near the cabinet where you can handle it easily.

Installation Steps

- (1) Attach the mounting brackets to the switch with the supplied screws, as shown in Figure 3-1.

Figure 3-1 Attaching the Mounting Bracket to RG-ES126S-LP/RG-ES118S-LP/RG-ES118GS-P

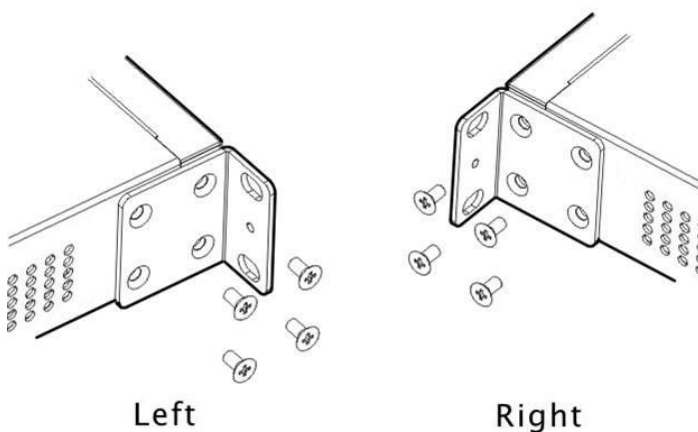
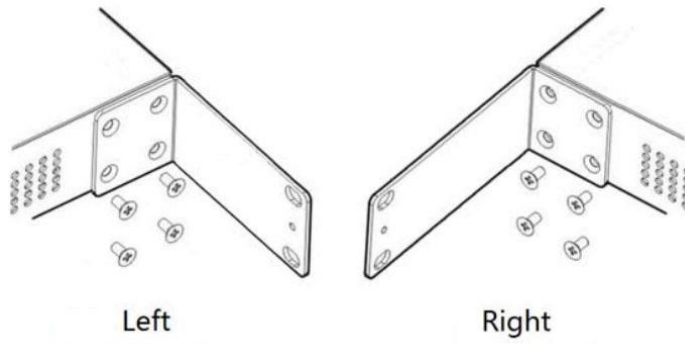
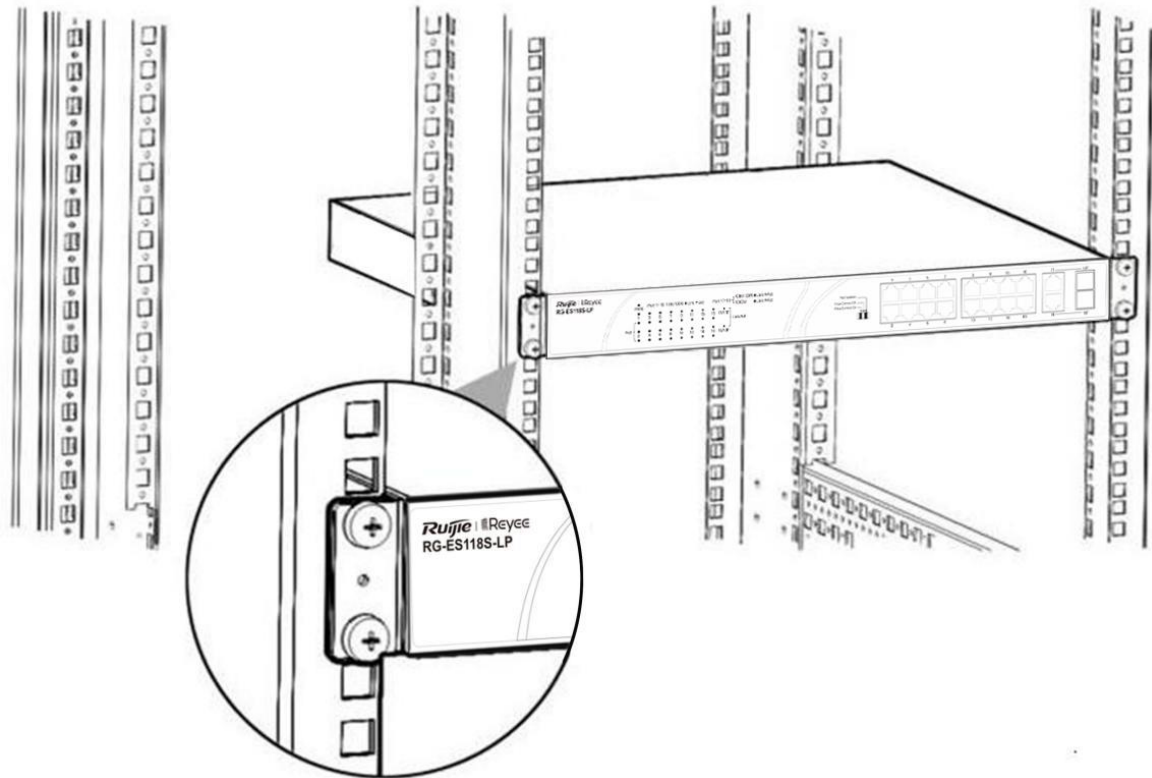


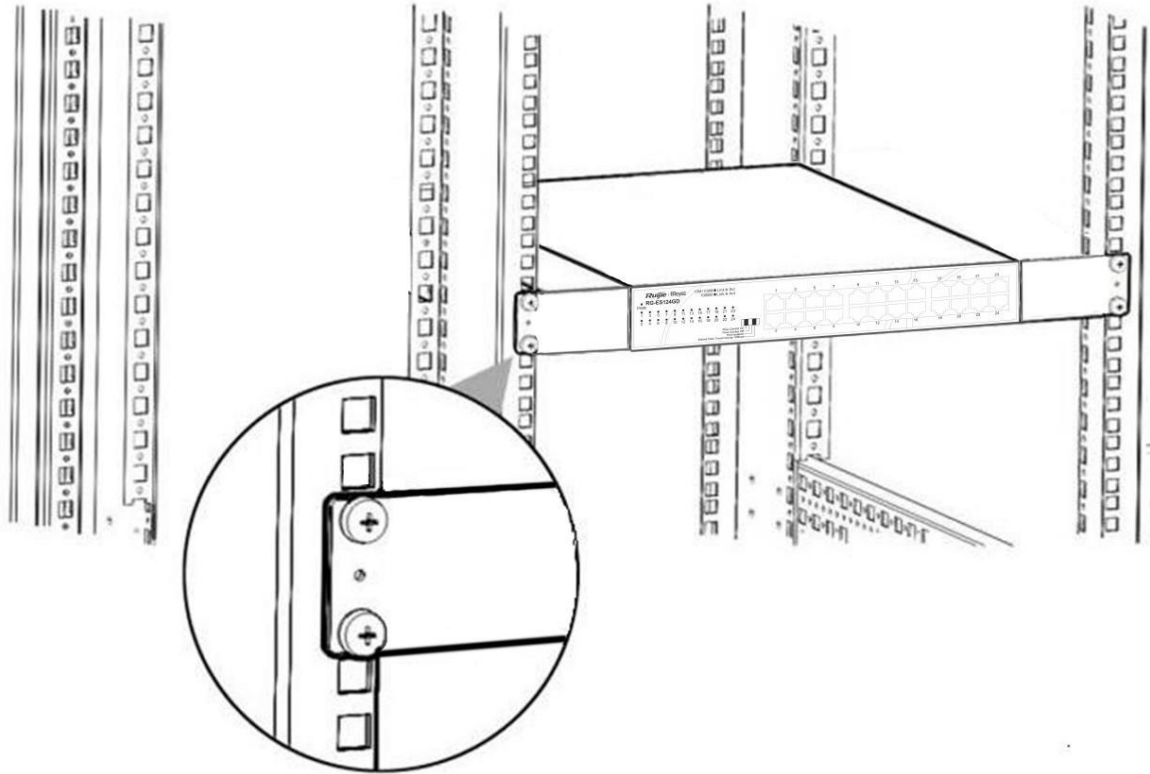
Figure 3-2 Attaching the Mounting Bracket to RG-ES116G/RG-ES124GD/RG-ES110GDS-P



(2) Use the supplied screws and cage nuts to securely attach the mounting brackets to the cabinet, as shown in Figure 3-3.

Figure 3-3 Attaching the Brackets to the Rack





3.3.2 Mounting the Switch on the Wall

RG-ES106D-P and RG-ES110D-P can be mounted on the wall. (Mounting screws and wall anchors are customer supplied.)

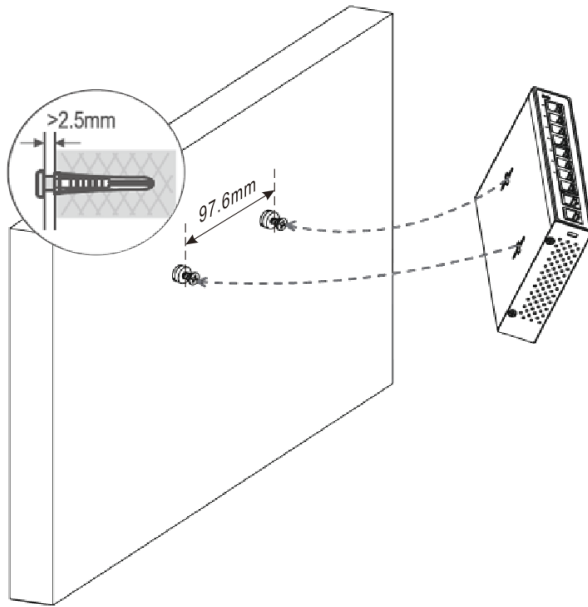
In actual installation, users need to determine the size and depth of the two mounting holes on the wall based on the sizes of wall anchors and screws. Ensure that the wall anchors can be inserted into the holes, only the outer edges of the wall anchors are left outside the wall, and screws can be tightly fastened to the wall.

Installation Steps

The following process takes RG-ES110D-P as an example. The steps of mounting the switch on the wall are as follows:

- (1) As shown in Figure 3-4, drill two holes 97.6 mm (3.84 in.) far away from each other, and the line of connecting the two holes is horizontal.
- (2) Insert wall anchors into the holes and ensure that the outer edges of the wall anchors are aligned with the wall.
- (3) Put screws (ST4.2x20 recommended) into the wall anchors and ensure that the distance between the inner side of the screw head and the outer edge of the wall anchors not be smaller than 2.5 mm (0.10 in.) so that the device can be securely mounted on the screws.
- (4) Align the two mounting holes on the bottom of the chassis of the device with the screws, and then fasten the device on the screws.

Figure 3-4 Mounting the Switch on the Wall



Note

Suitable for mounting on concrete or other non-combustible surface only.

3.3.3 Mounting the Switch on a Workbench

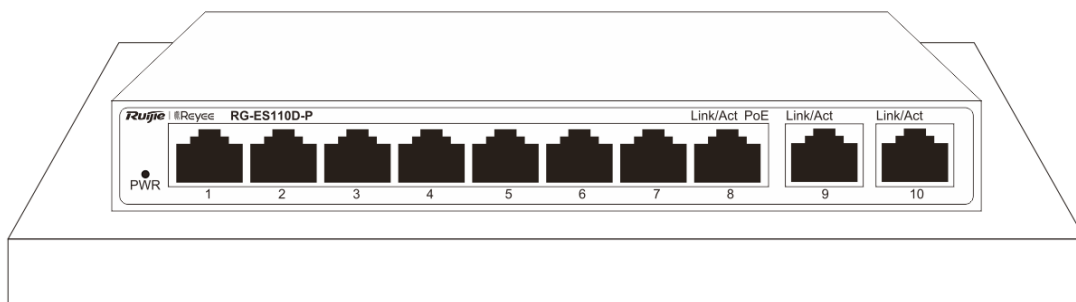
When mounting the switch onto a workbench, note the following:

- Ensure that the workbench is stable and properly grounded.
- Attach the foot pads delivered with the switch to small holes at the bottom of the switch and maintain a minimum clearance of 10 cm (3.94 in.) around the chassis for heat dissipation.
- Do not place heavy objects on the switch.

Installation Steps

The following process takes RG-ES110D-P as an example. Place the switch on a workbench, as shown in Figure 3-5.

Figure 3-5 Placing the Switch on a Workbench



Note

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

3.4 Installing and Removing the Power Supply

3.4.1 Connecting the Power Cord and Ground Cable

Ensure that the power cord and ground cable meet specification requirement.

- For details about the requirements for AC power supply modules, see Technical Specifications of the switch.
 - The switch uses three-wire power cords. It is recommended to use a single-phase three-wire power socket with a neutral-point connector. The neutral point must be securely grounded in buildings. Ensure that power supplies in this building are properly grounded.
- (1) Open the circuit breaker of the power supply. Insert one end of the power cord delivered with the switch into the power socket on the rear panel of the switch and the other end into an AC power socket.
 - (2) Close the circuit breaker of the power supply.
 - (3) Check whether the power supply indicator on the front panel is on. If yes, it means that the power supply is properly connected.

Warning

- Please use the power cord delivered with the switch.
-

Connecting the Ground Cable of the Switch

A proper grounding system is the basis for stable and reliable running and is indispensable for preventing lightning strikes and interference.

- The cross-sectional area of the ground cable should be determined according to the possible maximum current. Cables with good conductor should be used.
- Do not use bare wire.
- To ensure human safety and device security, the switch must be properly grounded. The resistance between the chassis and ground should be less than 1 ohm.

Simple Grounding Steps

- (1) Remove ground screws on the back panel of the switch.
- (2) Use the removed ground screws to fix one end of the ground cable to the switch. Use the same method to connect the other end of the ground cable to the cabinet ground cable or ground bar in the equipment room.

Warning

- To ensure human safety and device security, the switch must be properly grounded. The resistance between the switch and ground should be less than 1 ohm.
- Please check whether the AC socket of the switch is reliably connected to the protection ground of the building. If not, please use a protection ground wire to connect the protection ground terminal of the AC socket to the protection ground of the building.
- The power socket should be installed in an easily operable position near the switch.

- During the device installation, always make the ground cable connected first and disconnected last.
 - The cross-sectional area of the protection ground cable should be at least 2.5 mm² (12 AWG).
-

3.4.2 Removing the Power Cord and Ground Cable

- (1) Open the circuit breaker of the power supply.
 - (2) Unplug the power cord.
 - (3) Check whether the power indicator on the front panel is off. If yes, the power cord is removed.
 - (4) Use a screwdriver to remove the ground cable of the switch.
-

Warning

- Before unplugging a power cord, ensure that the circuit breaker of the power supply is open.
 - Before maintenance, ensure that all power cords are disconnected.
-

3.5 Verifying Installation

- If the switch is installed inside a cabinet, verify that the cabinet and mounting brackets are secured. If the switch is placed on a workbench, maintain sufficient space around the device for heat dissipation.
- Verify that the power cord meets the specification requirement.
- Verify that the cabinet is securely grounded.
- Verify that the switch is properly connected to other devices, such as the configuration terminal.
- Verify that the power cord is long enough to avoid overstretching.

3.6 Adding Unmanaged Device in Topology

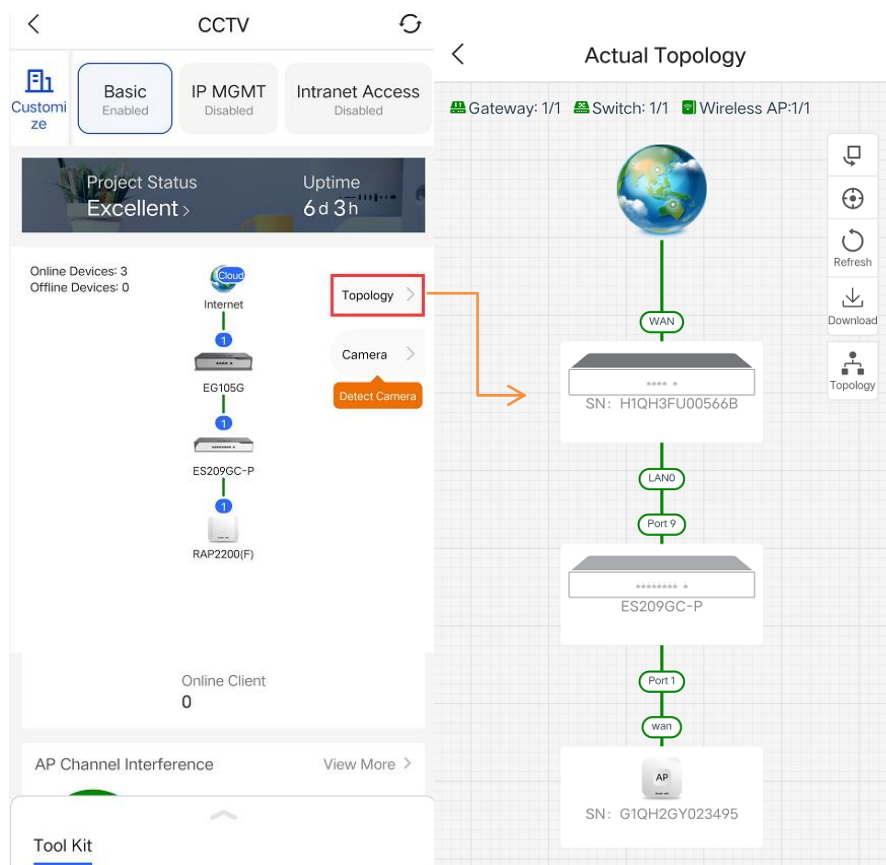
Premise: There must be devices that can be managed in the network, including Reyeeg EG or ES2/NBS Switch

Adding scenarios:

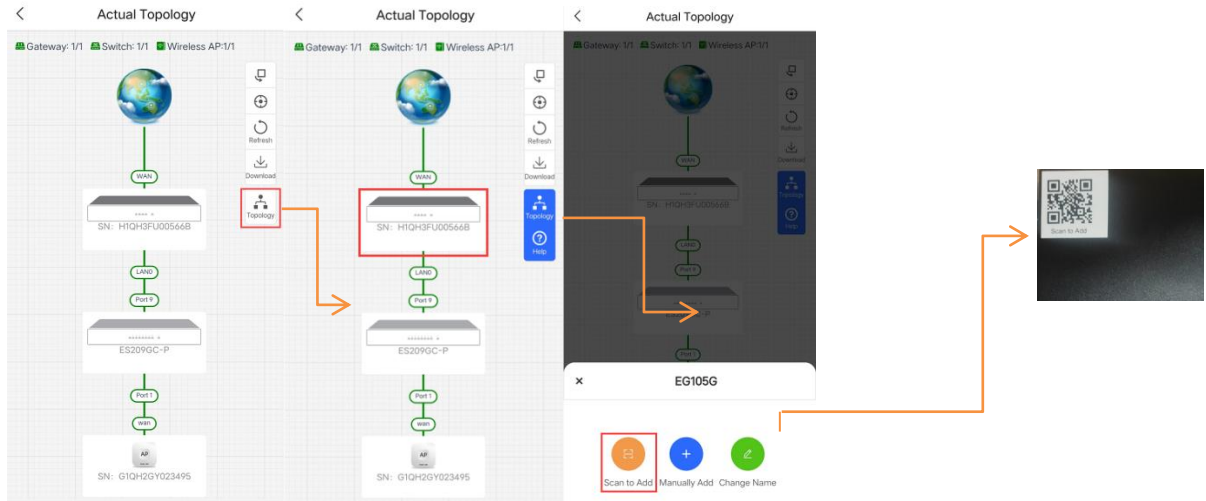
- Select up link device, scan the QR code or manually add the unmanaged device into the topology.
- There is a virtual device in topology. Select the virtual device and scan the QR code or manually add unmanaged device information into the topology.

3.6.1 Scan QR Code of Unmanaged Device

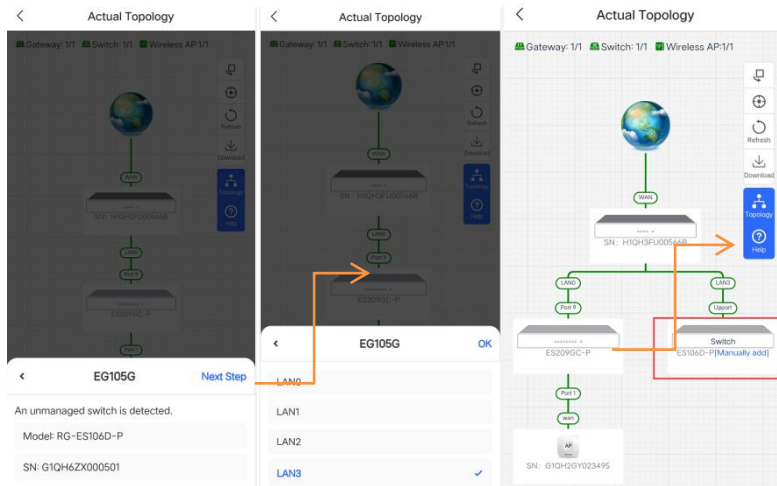
(1) Click 'Topology' into the topology page.



(2) Click 'Topology' bottom to edit and click on saved devices. To add an unmanaged downlink switch, select 'Scan to Add' by scanning the QR code.

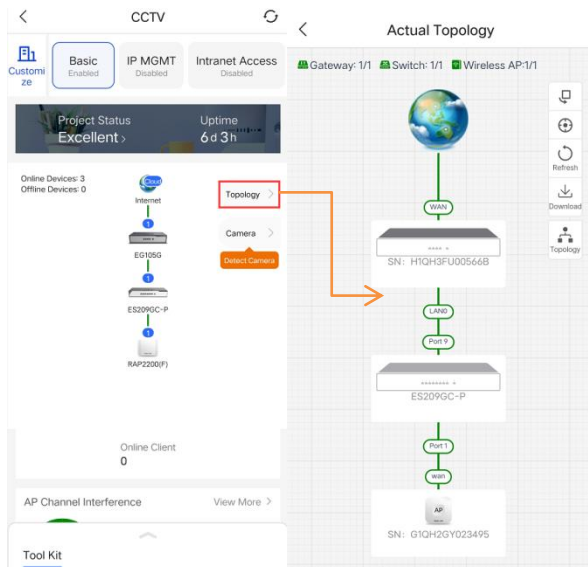


(3) The device is automatically added by scanning the QR code. Select the upper link port from the list. Then the device is added successfully.

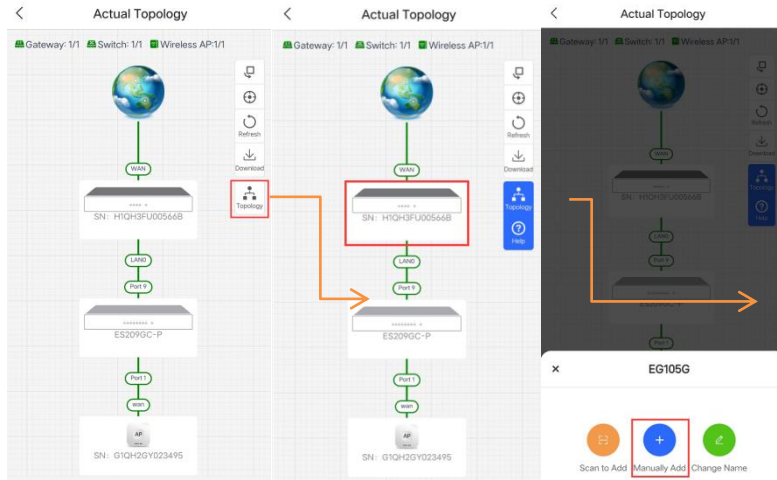


3.6.2 Manually Select Unmanaged Device Model

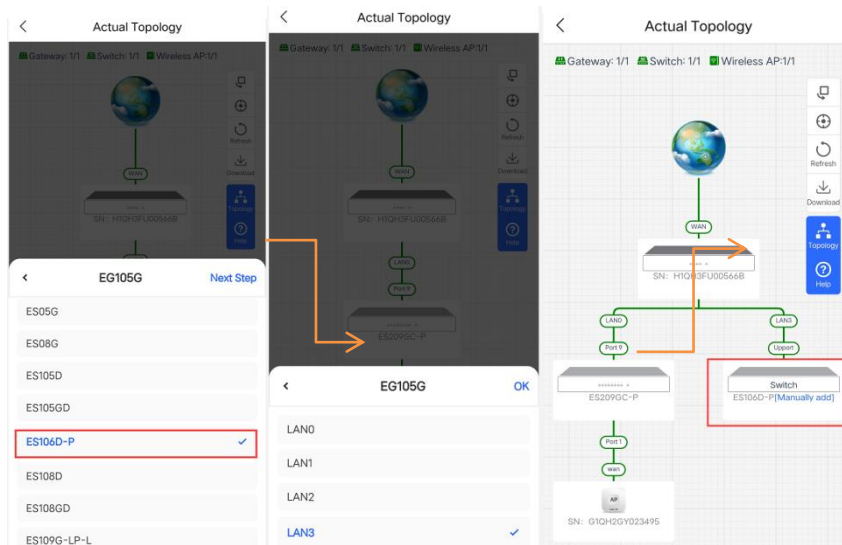
(1) Click 'Topology' into the topology page.



(2) Click 'Topology' bottom to edit and click on saved devices. To add an unmanaged downlink switch, select 'Manually add'.



(3) Select the corresponding model from the list and the upper link port. Then the device is added successfully.



4 System Debugging

4.1 Startup Check

4.1.1 Checking Environment Before Power-on

- (1) Check whether the switch is properly grounded.
- (2) Check whether the power cord is properly connected.
- (3) Check whether the power supply voltage meets the requirement.
- (4) Check whether the network cable is properly connected, whether the terminal (may be PC) is started, and whether configuration parameters are configured.

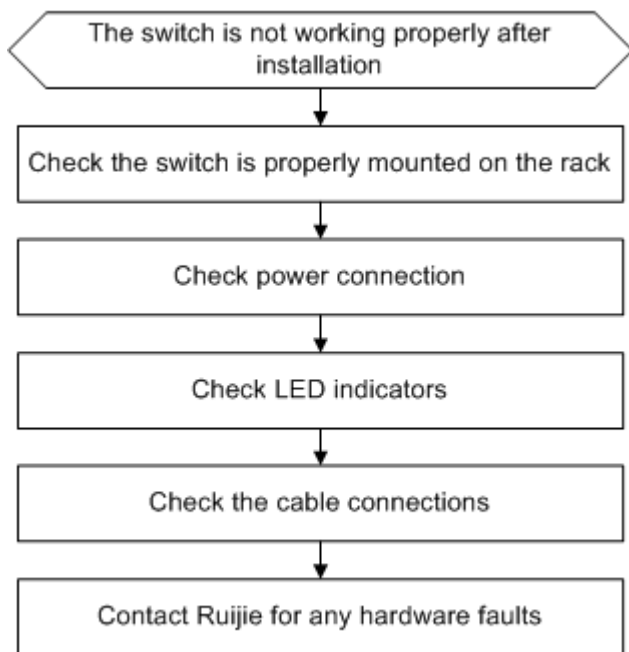
4.1.2 Checking Environment After Power-on (Recommended)

After power-on, check the following item:

- Check the switch indicator status.

5 Maintenance and Troubleshooting

5.1 General Troubleshooting Procedure



5.2 Troubleshooting Common Faults

Symptom	Possible Causes	Solution
The status indicator is not on after the switch is started.	<ul style="list-style-type: none"> The power module does not work. The power cable is in loose contact. 	<ul style="list-style-type: none"> Check whether the power socket at the equipment room is normal and whether the power cable is plugged in.
The RJ45 port is not in connectivity or it is erroneous in receiving/transmitting frames.	<ul style="list-style-type: none"> The connected twisted pair cable is faulty. The length of the cable exceeds 100 m. The port has special configuration that has no common working mode with the connected switch. 	<ul style="list-style-type: none"> Replace the twisted pair cable. Check that the port configuration has the common working mode with the connected switch.

Symptom	Possible Causes	Solution
The fiber port cannot be connected.	<ul style="list-style-type: none">● The Rx and Tx ends are connected reversely.● The interconnected optical module type does not match.● The fiber type is not correct.● The length of the optical fiber exceeds that rated of the optical module.	<ul style="list-style-type: none">● Switch the Rx and Tx ends of the optical fiber.● Replace the optical module with one of the matched type.● Replace the optical fiber with one of the appropriate type.● Replace the optical fiber with one of the appropriate length.

6 Appendix

6.1 Connection Modes of Cables Prepared by Users

The following describes the connection modes and signals of cables prepared by users. When you hold the RJ-45 connector facing yourself, the signal wires from left to right are numbered 1 to 8.

Figure 6-1 Cable Connection and Signals

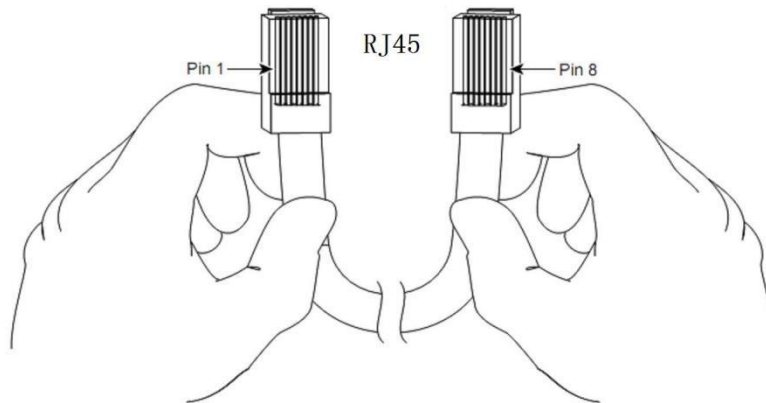


Table 6-1 Definition of Pin Signal Concerning the 1000BASE-T Port

Pin	MDI Mode	MDI-X Mode
1	Media Dependent Interface A+	Media Dependent Interface B+
2	Media Dependent Interface A-	Media Dependent Interface B-
3	Media Dependent Interface B+	Media Dependent Interface A+
4	Media Dependent Interface C+	Media Dependent Interface D+
5	Media Dependent Interface C-	Media Dependent Interface D-
6	Media Dependent Interface B-	Media Dependent Interface A-
7	Media Dependent Interface D+	Media Dependent Interface C+
8	Media Dependent Interface D-	Media Dependent Interface C-

The preceding table describes the definition of pin signal concerning the 1000BASE-T port. A 1000BASE-T port uses four pairs of wires for data transmission, and all of the four pairs of wires must be connected. Figure 7-2 shows the connection of twisted-pair cables used by a 1000BASE-T port.

Figure 6-2 Four Pairs of Twisted-pair Cables Used by a 1000BASE-T Port

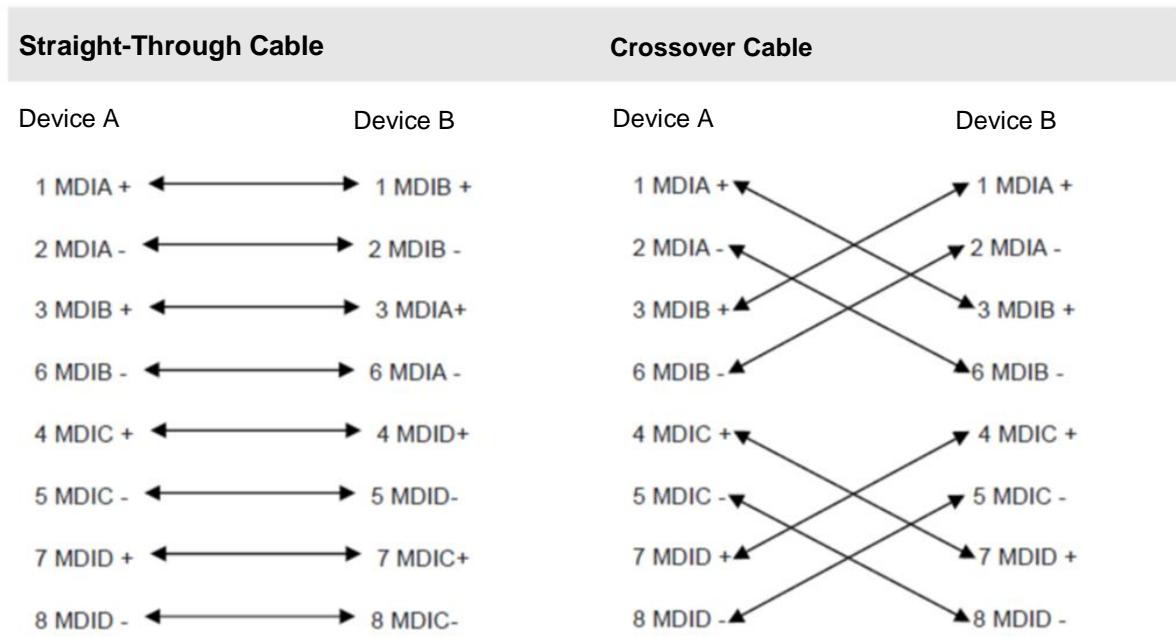
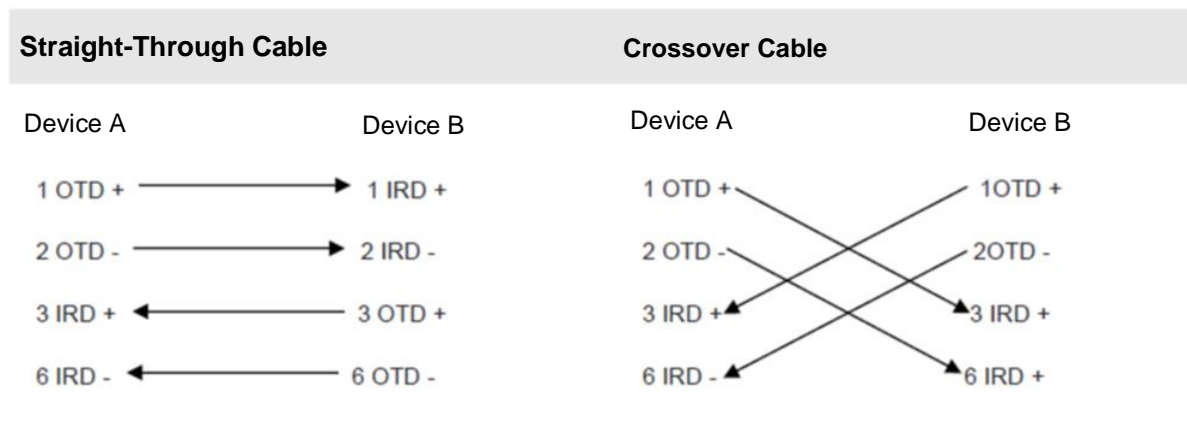


Table 6-2 Definition of Pin Signal Concerning the 100BASE-TX/10BASE-T Port

Pin	MDI Mode	MDI-X Mode
1	Output Transmit Data+	Input Receive Data+
2	Output Transmit Data-	Input Receive Data-
3	Input Receive Data+	Output Transmit Data+
6	Input Receive Data-	Output Transmit Data-
4, 5, 7, 8	Not used	Not used

[Figure 6-3](#) shows feasible connections of the straight-through and crossover twisted pairs of a 100BASE-TX/10BASE-T port.

Figure 6-3 Connection Modes of 100BASE-TX/10BASE-T Twisted-pair Cables

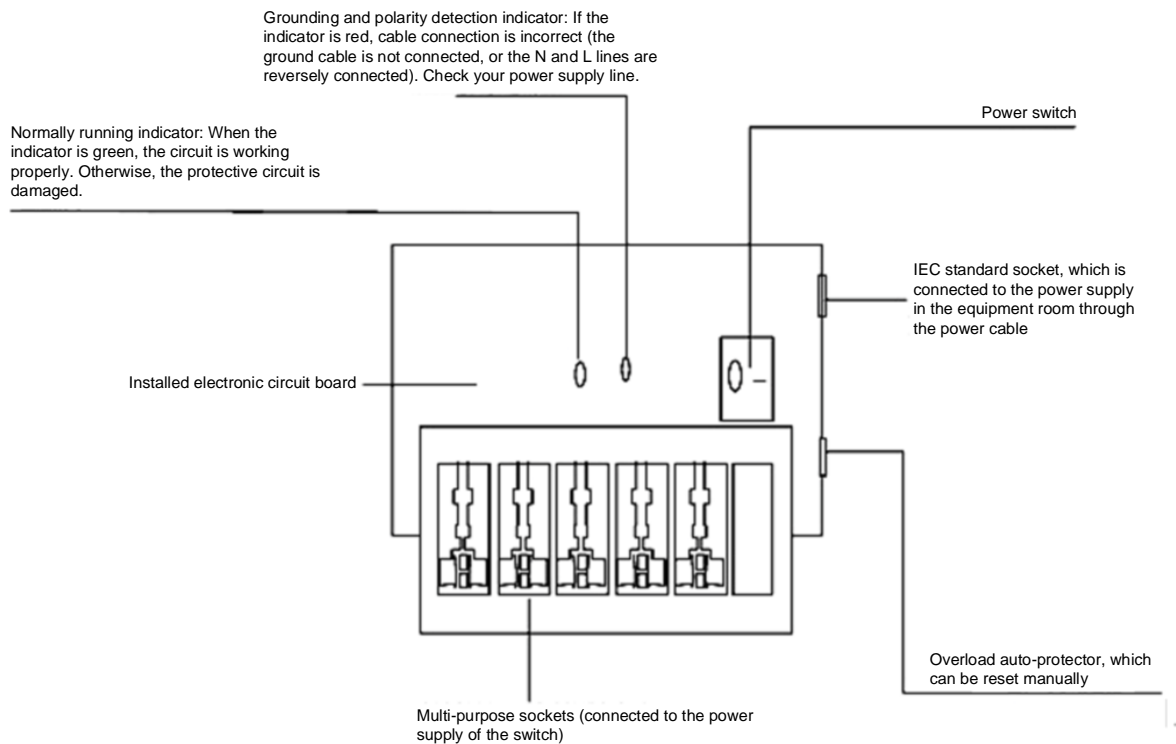


6.2 Lightning Protection

Installing AC Power Arrester (Lightning Protection Power Strip)

The AC power port must be connected to an external lightning protection power strip to prevent the switch from being struck by lightning when the AC power cord is introduced from the outdoor and directly connected to the power port of the switch. The lightning protection power strip can be fixed on the cabinet, workbench, or wall in the equipment room by using cable ties and screws. AC power enters the lightning protection power strip and then gets to the switch.

Figure 6-4 Power Arrester



Note

- The power arrester is not delivered with the switch. Please purchase it based on actual requirements.
 - 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 protection power strip), 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 has not been grounded.
-

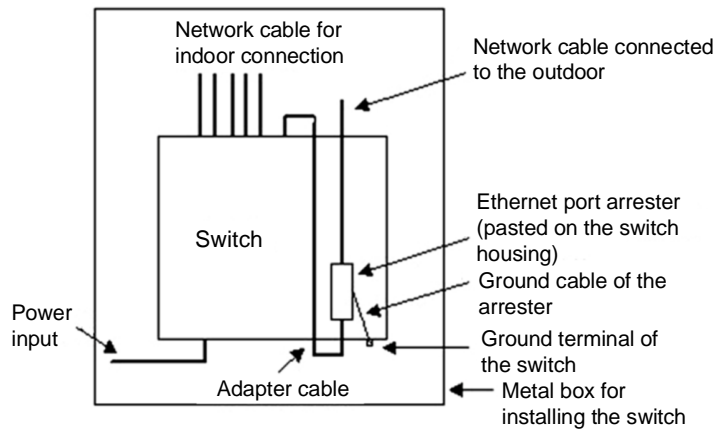
Installing the Ethernet Port Arrester

Please 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 housing of the Ethernet port arrester. Tear the other side of the protective paper for the double-sided adhesive tape and paste the Ethernet port arrester to the switch housing. The paste position for the Ethernet port arrester should be as close to the ground terminal of the switch as possible.
- (2) Based on the distance between the switch ground terminal and the Ethernet port arrester, cut the ground cable for the Ethernet port arrester and firmly tighten the ground cable to the ground terminal of the switch.
- (3) Use a multimeter to check whether the ground cable for the arrester is in good contact with the ground terminal and the housing of the switch.
- (4) 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 indicator is normal.
- (5) Use a nylon cable tie to bundle the power cords.

Figure 6-5 Ethernet Port Arrester Installation

⚠ Note

- The Ethernet port arrester is only for the 10M/100M copper ports with an RJ-45 connector.
 - The Ethernet port arrester is not delivered with the switch. Please purchase it based on actual requirements.
-

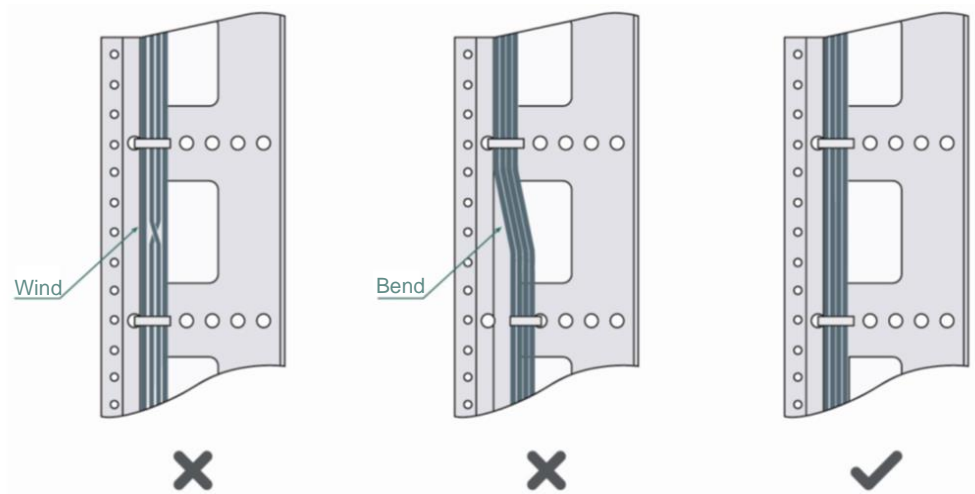
Pay attention to the following conditions during the actual installation to avoid affecting the performance of the Ethernet port arrester:

- Reversed installation direction of the arrester. Connect the external network cable to the "IN" end and connect the Ethernet port of the switch to the "OUT" end.
- Poor grounding of the arrester. The ground cable of the arrester should be as short as possible to ensure that it is in good contact with the ground terminal of the switch. Use a multimeter to confirm the contact condition after the grounding.
- Incomplete arrester installation. If there is more than one port connected to the peer device on the switch, arresters need to be installed on all connection ports for the purpose of lightning protection.

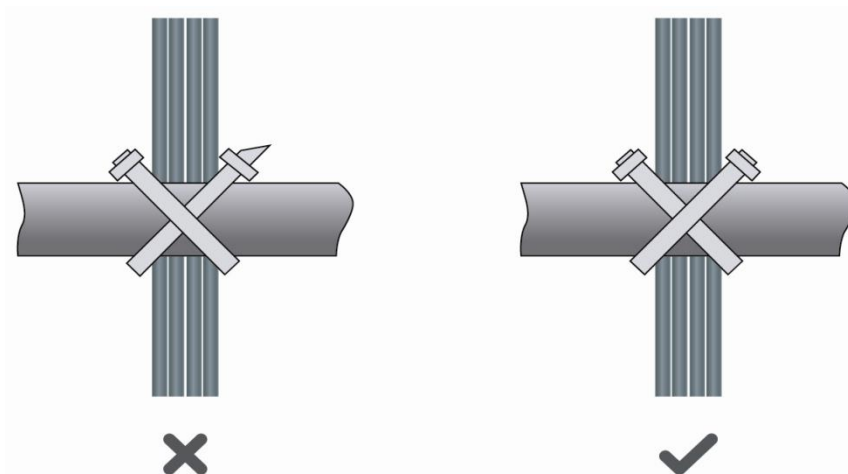
6.3 Cabling

When the RG-ES1 series switches are installed in a standard 19-inch cabinet, secure the cables around the cable management brackets. Top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All transferred cable connectors should be placed at the bottom of the cabinet in an orderly manner instead of outside the cabinet that is easy to touch. Power cables 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.

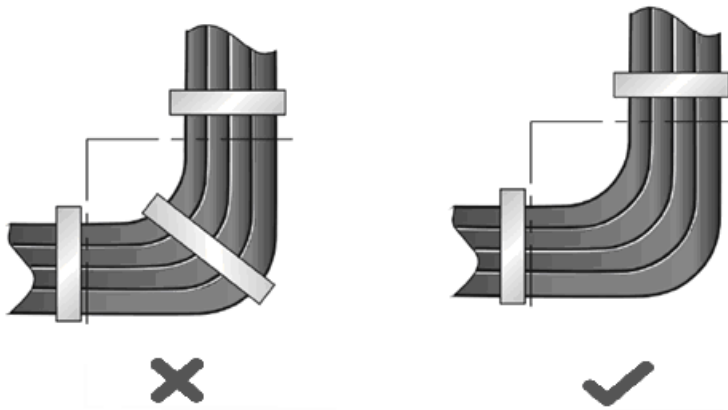
- Requirement for the Minimum Cable Bend Radius
 - The bend radius of a fixed power cord, network cable, or flat cable should be over five times greater than their respective diameters. The bend radius of these cables that are often bent or plugged should be over seven times greater than their respective 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.
- Requirement for the Minimum Fiber Bend Radius
 - 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.
- 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 [Figure 6-6](#).

Figure 6-6 Binding Cables (1)

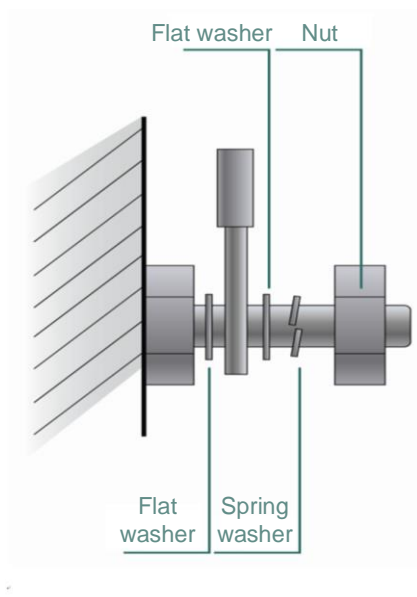
- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in cabling and bundling. Mixed bundling is disallowed. When they are close to each other, it is recommended to adopt crossover cabling. In the case of parallel cabling, maintain a minimum distance 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 [Figure 6-7](#).

Figure 6-7 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 Figure 7-8.

Figure 6-8 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.
- 220 V and –48 V power cords must not be bundled on 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.
- 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 [Figure 6-9](#).

Figure 6-9 Cable Fastening

- 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 cables 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 [Table 6-3](#).

Table 6-3 Bundle up Cables Using Cable Ties

Cable Bunch Diameter	Distance between Every Binding Spot
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.)

- 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.

6.4 Site Selection

- The equipment room should be at least 5 km 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 away from medium pollution sources, such as the chemical factory, rubber factory, and electroplating factory. The equipment room should be at least 2 km away from light pollution sources, such as the food factory and leather plant. If these pollution sources are unavoidable, the equipment room should be located on the windward side of the pollution sources perennially with advanced protection.
- The equipment room should be at least 3.7 km 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 environments.
- 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. The equipment room should be away from the dusty road or quarry. 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 that the air vents of the equipment room are 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 PCBs.
- Keep the equipment room away from industrial boilers and heating boilers.
- The equipment room had better be on the second floor or above. Otherwise, the equipment room floor should be 600 mm higher than the highest flood level ever recorded.
- Make sure there are no cracks or holes on the wall and floor. If there are cable entries on 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 switch.



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