Ruijie Reyee RG-NIS3100 Series Switches

Installation Guide

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Preface

Intended Audience

This document is intended for:

- Network engineers

- Technical support and servicing engineers

- Network administrators

Technical Support

- Ruijie Reyee website: https://reyee.ruijie.com

- Online support center: https://reyee.ruijie.com/en-global/support

- Case portal: https://www.ruijie.com/support/caseportal

- Community: https://community.ruijie.com

- Email support: service_rj@ruijie.com

- Live chat: https://reyee.ruijie.com/en-global/rita

Conventions

1. Signs

The signs used in this document are described as follows:

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

🛈 **Warning**

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

⚠ **Caution**

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

🛈 **Note**

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

✅ **Specification**

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

2. Notes

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

Contents

1 Product Introduction

1.1 Overview

The RG-NIS3100 series Layer 2 industrial switch applies next-generation high-performance hardware with distinctive industrial design. It features industrial-grade operating temperature range and professional outdoor surge protection capabilities, and complies with enterprise-class dustproof and anticorrosion standards, adapting to harsh and complex outdoor cabinet scenarios. In addition, with the Ruijie's exclusive Self-Organizing Network (SON) technology and the unified management platform Ruijie Cloud, the switch facilitates easy management and O&M.

Model	10/100/1000BASE-T Ethernet ports with auto-negotiation	1000BASE-X SFP Port	Console Port	10GE SFP+ Port	Power Supply
RG-NIS3100-8GT 4SFP-HP	8	4	N/A	N/A	1+1 redundancy
RG-NIS3100-8GT 2SFP-HP	8	2	N/A	N/A	1+1 redundancy
RG-NIS3100-4GT 2SFP-HP	4	2	N/A	N/A	1+1 redundancy

> **Note**
> ● 1000BASE-T ports are downward compatible with 100BASE-T and 10BASE-T.
> ● Redundant power supply has only one power supply at the same time, and the other power supply is used as backup.

1.2 Package Contents

Table 1-1   Package Contents

Item	Quantity	Remarks
RG-NIS3100 Series Switch	1	N/A
Rack-mount bracket	2	N/A
User Manual	1	N/A
Warranty Card	1	N/A
M3 x 8 mm Cross Recessed Countersunk Head Screw	4	N/A

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

1.3 RG-NIS3100-8GT4SFP-HP

1.3.1 Technical Specifications

Product Model	Parameter Name	RG-NIS3100-8GT4SFP-HP
Product Information	Warranty	5 years
System Specifications	RAM	256 MB
	Flash memory	16 MB
Port Specifications	Total number of RJ45 ports	8
	Total number of optical ports	4
	Number of 1GE SFP ports	4
	Number of 10/100/1000BASE-T ports	8
	Ethernet cable type	CAT5e
	LEDs	1 x system status LED 8 x Ethernet port LEDs 4 x SFP port LEDs 2 x power supply LEDs
	EEE	Yes
Power Supply and Consumption	PoE Out standard	PoE/PoE+ (IEEE 802.3af/at)
	Number of PoE Out ports	8
	Number of PoE/PoE+ Out ports	8
	PoE power pins	1–2 (+), 3–6 (-)
	PoE budget per port	30 W
	PoE budget	240 W
	Power supply	DC power input Power module

	Power input	DC power input： ● Rated input voltage: 12 V DC to 56 V DC ● Maximum input current: 7 A RG-NS-PA240-48 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 3.5 A RG-NIS-PA120-48 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 85 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 1.5 A RG-NIS-PA240-54 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 3.5 A RG-NIS-PA120-54 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 4 A
	Power output	● RG-NS-PA240-48 90 V AC to 264 V AC: 54 V DC (output voltage), 4.4 A (rated output current) ● RG-NIS-PA120-48 85 V AC to 264 V AC: 48 V DC (output voltage), 2.5 A (rated output current) ● RG-NIS-PA240-54 90 V AC to 264 V AC: 54 V DC (output voltage), 4.4 A (rated output current) ● RG-NIS-PA120-54 90 V AC to 264 V AC: 54 V DC (output

		voltage), 2.2 A (rated output current)
	Power supply to external devices	The Ethernet interface provides a PoE budget of 54 V/30 W.
	Maximum power consumption	20 W (with no PoE load)
		80 W (full-load power when the input power is 12 V to 20 V)
		140 W (full-load power when the input power is 21 V to 45 V)
		260 W (full-load power when the input power is 46 V to 56 V)
	Ground-Leakage Current	≤ 3.5 mA
Dimensions and Weight	Casing	Metal
	Product dimensions (W x D x H)	85 mm x 132 mm x 165 mm (3.35 in. x 5.2 in. x 6.5 in.)
	Weight	1.47 kg (3.24 lbs) (without packaging materials)
	Shipping weight	1.93 kg (4.25 lbs)
Environment and Reliability	Fan	Fanless design
	Cooling	Natural cooling
	Mounting options	DIN rail/Wall
	MTBF	400,000 hours
	Operating temperature	-40ºC to +65ºC (-40°F to 149°F) (installed in a sealed cabinet)
		-40ºC to +70ºC (-40°F to 158°F) (installed in a fume hood with a ventilation speed of at least 80LFM (Line Feet Minute))
		-40ºC to +75ºC (-40°F to 167°F) (installed in a fume hood with a ventilation speed of at least 200LFM (Line Feet Minute))
		-40ºC to +80ºC (-40°F to 176°F) (installed in a fume hood with a ventilation speed of at least 400LFM (Line Feet Minute))
	Storage temperature	−40°C to +75°C (−40°F to +167°F)
	Operating humidity	5% RH to 95% RH (non-condensing)

	Storage humidity	5% RH to 95% RH (non-condensing)
	Altitude	Operating altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.) Storage altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.)
	Surge protection	Service port: ±6 kV for common mode Power connector: ±4 kV for common mode and ±2 kV for differential mode
Certification and Regulatory Compliance	Certification	CE;FCC

⚠ Caution

- In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.
- To ensure minimal radio interference and the compatibility with various power module models, it is necessary to use a power cord (less than 3 meters) with a magnetic ring larger than 7 Ohm at the input end of the device. This ensures electromagnetic compatibility and proper functioning of the device. Moreover, you are advised to use shielded twisted pair (STP) cables for Ethernet port connections.

🔴 Danger

This device is not suitable for use in locations where children are likely to be present.

1.3.2 Appearance
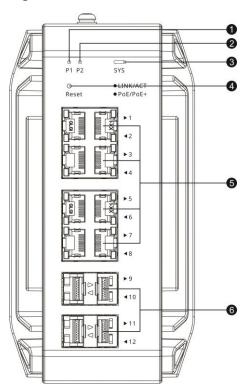
The RG-NIS3100-8GT4SFP-HP full GE switch provides eight 10/100/1000BASE-T RJ45 ports with auto-negotiation and four SFP ports on the front panel, and DC power inlets on the top panel. The following figures show the product appearance.

Figure 1-1   RG-NIS3100-8GT4SFP-HP

1.   Front Panel

Figure 1-2   Front Panel of RG-NIS3100-8GT4SFP-HP

Note	1. Power status LED P1	5. 10/100/1000BASE-T Ethernet ports with auto-negotiation
	2. Power status LED P2	
	3. System status LED	6. GE SFP ports
	4. Reset button	

ℹ️ Note

Reset button: Press and hold the button for less than 2 seconds to restart the system. Press and hold the button for over 5 seconds until the system status LED starts blinking to restore factory settings and restart the system.
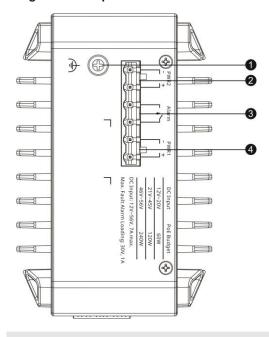
2. LEDs

LED	Silkscreen Label	Status	Description
System status LED	SYS	Off	The switch is not powered on.
		Fast blinking green (8–10 Hz)	The switch is starting.
		Solid green	The switch is running properly.
		Slow blinking green (0.5 Hz)	The switch is not connected to the cloud.
		Blinking green (2 Hz)	The switch is restoring factory settings and will be powered off or is upgrading.
		Irregular blinking green (cycle: 1s on and 1s off, 0.25s on and 0.25s off, 0.25s on and 0.25s off, 0.25s on and 1.75s off) Note: *On-Off R cycle	The main program is lost or damaged, or specific functions are abnormal.
Electrical port and optical port LEDs	LINK/ACT	Off	The port is Down.
		Solid green	The port is Up.
		Blinking green	The port is Up and is receiving or sending data.
	PoE/PoE+	Off	PoE power supply is off.
		Solid yellow	PoE power supply is on.
Power status LEDs	P1	Off	PWR1 power supply is off.
		Solid on	PWR1 power supply is on.

		Off	PWR2 power supply is off.
	P2	Solid on	PWR2 power supply is on.

3.   Top Panel

Figure 1-3   Top Panel of NIS3100-8GT4SFP-HP

Note	1. Grounding stud	2. DC power inlet PWR2
	3. Alarm port	4. DC power inlet PWR1

> **Note**
> - The alarm port contact operates in a closed state under normal conditions. When a triggering alarm event occurs (such as a power loss in one of the two power sources), the contact switches to an open state.
> - The power module for this device does not support hot swapping. Therefore, connect the power plug before powering on the device.

4.   Rear Panel

The switch supports two installation modes: DIN rail mounting and wall mounting.

Figure 1-4   Rear Panel for DIN Rail Mounting
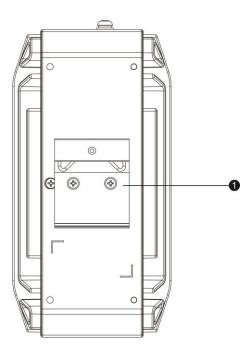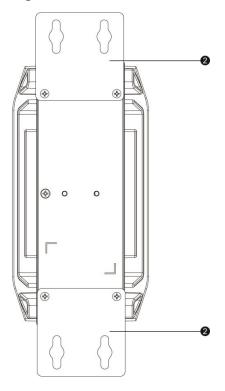
Figure 1-5   Rear Panel for Wall Mounting
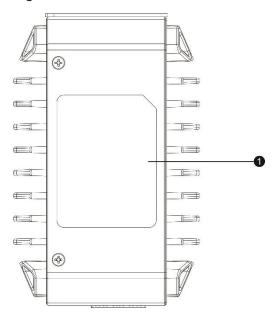
Note	1. DIN rail clamp	2. Screw holes for wall mounting

Note

To maintain the IP40 state of the device, fix the two screws back into their original positions in the DIN slot when mounting the device on a wall.

5. Bottom Panel

Figure 1-6   Bottom Panel of NIS3100-8GT4SFP-HP

Note	1. Nameplate

6. Cooling

The RG-NIS3100-8GT4SFP-HP adopts natural cooling to ensure that the device works properly under specified environment. Maintain a minimum clearance of 100 mm (3.94 in.) around the device to ensure proper ventilation.

1.4 RG-NIS3100-8GT2SFP-HP

1.4.1 Technical Specifications

Product Model	Parameter Name	RG-NIS3100-8GT2SFP-HP
Product Information	Warranty	5 years
System Specifications	RAM	256 MB
	Flash memory	16 MB
Port Specifications	Total number of RJ45 ports	8
	Total number of optical ports	2
	Number of 1GE SFP ports	2

	Number of 10/100/1000BASE-T ports	8
	Ethernet cable type	CAT5e
	LEDs	1 x system status LED 8 x Ethernet port LEDs 2 x SFP port LEDs 2 x power supply LEDs
	EEE	Yes
Power Supply and Consumption	PoE Out standard	PoE/PoE+ (IEEE 802.3af/at)
	Number of PoE Out ports	8
	Number of PoE/PoE+ Out ports	8
	PoE power pins	1–2 (+), 3–6 (-)
	PoE budget per port	30 W
	PoE budget	240 W
	Power supply	● DC power input ● Power module
	Power input	DC power input： ● Rated input voltage: 12 V DC to 56 V DC ● Maximum input current: 7 A RG-NS-PA240-48 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 3.5 A RG-NIS-PA120-48 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 85 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 1.5 A RG-NIS-PA240-54 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz

Environment and (continued top row)	Fan	• Rated input current: 3.5 A RG-NIS-PA120-54 (AC input): • Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz • Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz • Rated input current: 4 A
	Power output	• RG-NS-PA240-48 90 V AC to 264 V AC: 54V DC (output voltage), 4.4 A (rated output current) • RG-NIS-PA120-48 85 V AC to 264 V AC: 48 V DC (output voltage), 2.5 A (rated output current) • RG-NIS-PA240-54 90 V AC to 264 V AC: 54 V DC (output voltage), 4.4 A (rated output current) • RG-NIS-PA120-54 90 V AC to 264 V AC: 54 V DC (output voltage), 2.2 A (rated output current)
	Power supply to external devices	The Ethernet interface provides a PoE budget of 54 V/30 W.
	Maximum power consumption	20 W (with no PoE load) 80 W (full-load power when the input power is 12 V to 20 V) 140 W (full-load power when the input power is 21 V to 45 V) 260 W (full-load power when the input power is 46 V to 56 V)
	Ground-Leakage Current	≤ 3.5 mA
Dimensions and Weight	Casing	Metal
	Product dimensions (W x D x H)	85 mm x 132 mm x 165 mm (3.35 in. x 5.2 in. x 6.5 in.)
	Weight	1.42 kg (3.13 lbs) (without packaging materials)
	Shipping weight	1.91 kg (4.21 lbs)
Environment and	Fan	Fanless design

Reliability	Cooling	Natural cooling
	Mounting options	DIN rail/Wall
	MTBF	400,000 hours
	Operating temperature	-40ºC to +65ºC (-40°F to 149°F) (installed in a sealed cabinet) -40ºC to +70ºC (-40°F to 158°F) (installed in a fume hood with a ventilation speed of at least 80LFM (Line Feet Minute)) -40ºC to +75ºC (-40°F to 167°F) (installed in a fume hood with a ventilation speed of at least 200LFM (Line Feet Minute)) -40ºC to +80ºC (-40°F to 176°F) (installed in a fume hood with a ventilation speed of at least 400LFM (Line Feet Minute))
	Storage temperature	−40°C to +75°C (−40°F to +167°F)
	Operating humidity	5% RH to 95% RH (non-condensing)
	Storage humidity	5% RH to 95% RH (non-condensing)
	Altitude	Operating altitude: −500 m to +5,000 m (−1,640.42 ft. to +16,404.20 ft.) Storage altitude: −500 m to +5,000 m (−1,640.42 ft. to +16,404.20 ft.)
	Surge protection	Service port: ±6 kV for common mode Power connector: ±4 kV for common mode and ±2 kV for differential mode
Certification and Regulatory Compliance	Certification	CE, FCC

⚠ Caution

- In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.
- To ensure minimal radio interference and the compatibility with various power module models, it is necessary to use a power cord (less than 3 meters) with a magnetic ring larger than 7 Ohm at the input end of the device. This ensures electromagnetic compatibility and proper functioning of the device. Moreover, you are advised to use shielded twisted pair (STP) cables for Ethernet port connections.

🛑 Danger

This device is not suitable for use in locations where children are likely to be present.

1.4.2 **Appearance**
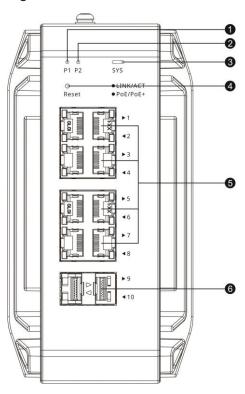
The RG-NIS3100-8GT2SFP-HP full GE switch provides eight 10/100/1000BASE-T RJ45 ports with auto-negotiation and two SFP ports on the front panel, and DC power inlets on the top panel. The following figures show the product appearance.

Figure 1-7   RG-NIS3100-8GT2SFP-HP

2.   Front Panel

Figure 1-8   Front Panel of RG-NIS3100-8GT2SFP-HP

Note	1. Power status LED P1	5. 10/100/1000BASE-T Ethernet ports with auto-negotiation
	2. Power status LED P2	
	3. System status LED	6. GE SFP ports
	4. Reset button	

> **Note**

Reset button: Press and hold the button for less than 2 seconds to restart the system. Press and hold the button for over 5 seconds until the system status LED starts blinking to restore factory settings and restart the system.

3.   LEDs

LED	Silkscreen Label	Status	Description
System status LED	SYS	Off	The switch is not powered on.
		Fast blinking green (8–10 Hz)	The switch is starting.
		Solid green	The switch is running properly.
		Slow blinking green (0.5 Hz)	The switch is not connected to the

			cloud.
		Blinking green (2 Hz)	The switch is restoring factory settings and will be powered off or is upgrading.
		Irregular blinking green (cycle: 1s on and 1s off, 0.25s on and 0.25s off, 0.25s on and 0.25s off, 0.25s on and 1.75s off)	The main program is lost or damaged, or specific functions are abnormal.
Electrical port and optical port LEDs	LINK/ACT	Off	The port is Down.
		Solid green	The port is Up.
		Blinking green	The port is Up and is receiving or sending data.
	PoE/PoE+	Off	PoE power supply is off.
		Solid yellow	PoE power supply is on.
Power status LEDs	P1	Off	PWR1 power supply is off.
		Solid on	PWR1 power supply is on.
	P2	Off	PWR2 power supply is off.
		Solid on	PWR2 power supply is on.

4. Top Panel

Figure 1-9   Top Panel of RG-NIS3100-8GT2SFP-HP

Note	1. Grounding stud	2. DC power inlet PWR2
	3. Alarm port	4. DC power inlet PWR1

ℹ️ Note
- The alarm port contact operates in a closed state under normal conditions. When a triggering alarm event occurs (such as a power loss in one of the two power sources), the contact switches to an open state.
- The power module for this device does not support hot swapping. Therefore, connect the power plug before powering on the device.

5. Rear Panel

The switch supports two installation modes: DIN rail mounting and wall mounting.

Figure 1-10 Rear Panel for DIN Rail Mounting
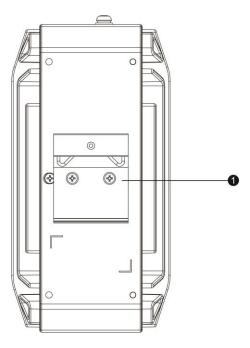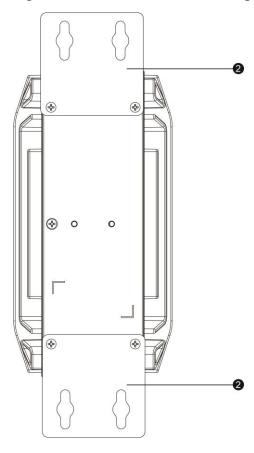
Figure 1-11 Rear Panel for Wall Mounting
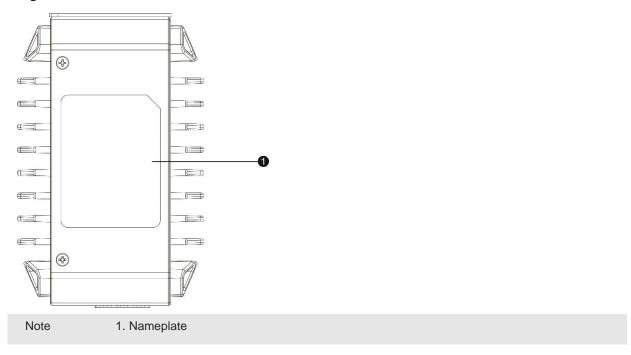
Note	1. DIN rail clamp	2. Screw holes for wall mounting

ℹ️ **Note**

To maintain the IP40 state of the device, fix the two screws back into their original positions in the DIN slot when mounting the device on a wall.

6. Bottom Panel

Figure 1-12 Bottom Panel of NIS3100-8GT2SFP-HP

| Note | 1. Nameplate |

7. Cooling

The RG-NIS3100-8GT2SFP-HP adopts natural cooling to ensure that the device works properly under specified environment. Maintain a minimum clearance of 100 mm (3.94 in.) around the device to ensure proper ventilation.

1.5 RG-NIS3100-4GT2SFP-HP

1.5.1 Technical Specifications

Product Model	Parameter Name	RG-NIS3100-4GT2SFP-HP
Product Information	Warranty	5 years
System Specifications	RAM	256 MB
	Flash memory	16 MB
Port Specifications	Total number of RJ45 ports	4
	Total number of optical ports	2
	Number of 1GE SFP ports	2
	Number of 10/100/1000BASE-T ports	4
	Ethernet cable type	CAT5e

	LEDs	1 x system status LED 4 x Ethernet port LEDs 2 x SFP port LEDs 2 x power supply LEDs
	EEE	Yes
Power Supply and Consumption	PoE Out standard	PoE/PoE+ (IEEE 802.3af/at)
	Number of PoE Out ports	4
	Number of PoE/PoE+ Out ports	4
	PoE power pins	1–2 (+), 3–6 (-)
	PoE budget per port	30 W
	PoE budget	120 W
	Power supply	● DC power input ● Power module
	Power input	DC power input： ● Rated input voltage: 12 V DC to 56 V DC ● Maximum input current: 7 A RG-NIS-PA120-48 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 85 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 1.5 A RG-NIS-PA240-54 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 3.5 A RG-NIS-PA120-54 (AC input): ● Rated input voltage: 100 V AC to 240 V AC, 50/60 Hz ● Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz ● Rated input current: 4 A
	Power output	● RG-NIS-PA120-48: 85 V AC to 264 V AC: 48 V DC (output

		voltage), 2.5 A (rated output current)
		● RG-NIS-PA240-54 90 V AC to 264 V AC: 54 V DC (output voltage), 4.4 A (rated output current) ● RG-NIS-PA120-54 90 V AC to 264 V AC: 54 V DC (output voltage), 2.2 A (rated output current)
	Power supply to external devices	The Ethernet interface provides a PoE budget of 54 V/30 W.
	Maximum power consumption	12 W (with no PoE load) 72 W (full-load power when the input power is 12 V to 20 V) 132 W (full-load power when the input power is 21 V to 56 V)
	Ground-Leakage Current	≤ 3.5 mA
Dimensions and Weight	Casing	Metal
	Product dimensions (W x D x H)	85 mm x 132 mm x 165 mm (3.35 in. x 5.2 in. x 6.5 in.)
	Weight	1.39 kg (3.06 lbs) (without packaging materials)
	Shipping weight	1.86 kg (4.1 lbs)
Environment and Reliability	Fan	Fanless design
	Cooling	Natural cooling
	Mounting options	DIN rail/Wall
	MTBF	400,000 hours
	Operating temperature	-40ºC to +65ºC (-40°F to 149°F) (installed in a sealed cabinet) -40ºC to +70ºC (-40°F to 158°F) (installed in a fume hood with a ventilation speed of at least 80LFM (Line Feet Minute)) -40ºC to +75ºC (-40°F to 167°F) (installed in a fume hood with a ventilation speed of at least 200LFM (Line Feet Minute))

		-40ºC to +80ºC (-40°F to 176°F) (installed in a fume hood with a ventilation speed of at least 400LFM (Line Feet Minute))
	Storage temperature	−40°C to +75°C (−40°F to +167°F)
	Operating humidity	5% RH to 95% RH (non-condensing)
	Storage humidity	5% RH to 95% RH (non-condensing)
	Altitude	Operating altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.) Storage altitude: –500 m to +5,000 m (–1,640.42 ft. to +16,404.20 ft.)
	Surge protection	Service port: ±6 kV for common mode Power connector: ±4 kV for common mode and ±2 kV for differential mode
Certification and Regulatory Compliance	Certification	CE, FCC

⚠ Caution

- In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.
- To ensure minimal radio interference and the compatibility with various power module models, it is necessary to use a power cord (less than 3 meters) with a magnetic ring larger than 7 Ohm at the input end of the device. This ensures electromagnetic compatibility and proper functioning of the device. Moreover, you are advised to use shielded twisted pair (STP) cables for Ethernet port connections.

🛑 Danger

This device is not suitable for use in locations where children are likely to be present.

1.5.2 Appearance
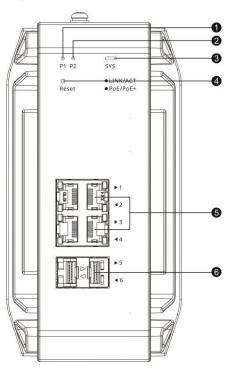
The RG-NIS3100-4GT2SFP-HP full GE switch provides four 10/100/1000BASE-T RJ45 ports with auto-negotiation and two SFP ports on the front panel, and DC power inlets on the top panel. The following figures show the product appearance.

Figure 1-13 RG-NIS3100-4GT2SFP-HP

2.   Front Panel

Figure 1-14 Front Panel of RG-NIS3100-4GT2SFP-HP

Note	1. Power status LED P1	5. 10/100/1000BASE-T Ethernet ports with auto-negotiation
	2. Power status LED P2	
	3. System status LED	6. GE SFP ports
	4. Reset button	

ℹ️ **Note**

Reset button: Press and hold the button for less than 2 seconds to restart the system. Press and hold the button for over 5 seconds until the system status LED starts blinking to restore factory settings and restart the system.

3. LEDs

LED	Silkscreen Label	Status	Description
System status LED	SYS	Off	The switch is not powered on.
		Fast blinking green (8–10 Hz)	The switch is starting.
		Solid green	The switch is running properly.
		Slow blinking green (0.5 Hz)	The switch is not connected to the cloud.
		Blinking green (2 Hz)	The switch is restoring factory settings and will be powered off or is upgrading.
		Irregular blinking green (cycle: 1s on and 1s off, 0.25s on and 0.25s off, 0.25s on and 0.25s off, 0.25s on and 1.75s off)	The main program is lost or damaged, or specific functions are abnormal.
Electrical port and optical port LEDs	LINK/ACT	Off	The port is Down.
		Solid green	The port is Up.
		Blinking green	The port is Up and is receiving or sending data.
	PoE/PoE+	Off	PoE power supply is off.
		Solid yellow	PoE power supply is on.
Power status LEDs	P1	Off	PWR1 power supply is off.
		Solid on	PWR1 power supply is on.
	P2	Off	PWR2 power supply is off.
		Solid on	PWR2 power supply is on.

4.   Top Panel

Figure 1-15 Top Panel of RG-NIS3100-4GT2SFP-HP

Note	1. Grounding stud	2. DC power inlet PWR2
	3. Alarm port	4. DC power inlet PWR1

ⓘ   Note

- The alarm port contact operates in a closed state under normal conditions. When a triggering alarm event occurs (such as a power loss in one of the two power sources), the contact switches to an open state.
- The power module for this device does not support hot swapping. Therefore, connect the power plug before powering on the device.

5.   Rear Panel

The switch supports two installation modes: DIN rail mounting and wall mounting.

Figure 1-16 Rear Panel for DIN Rail Mounting
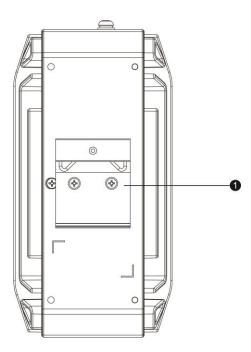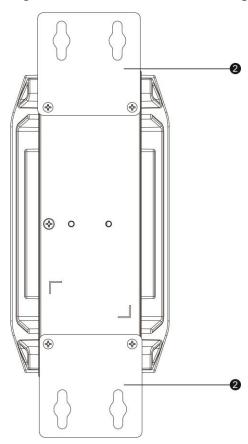
Figure 1-17 Rear Panel for Wall Mounting
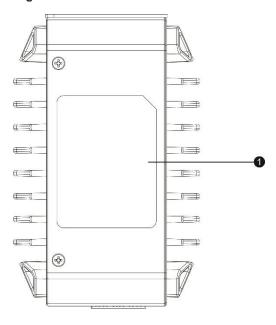
Note	1. DIN rail clamp	2. Screw holes for wall mounting

ℹ️ Note

To maintain the IP40 state of the device, fix the two screws back into their original positions in the DIN slot when mounting the device on a wall.

6. Bottom Panel

Figure 1-18 Bottom Panel of NIS3100-4GT2SFP-HP

Note	1. Nameplate

7. Cooling

The RG-NIS3100-4GT2SFP-HP adopts natural cooling to ensure that the device works properly under specified environment. Maintain a minimum clearance of 100 mm (3.94 in.) around the device to ensure proper ventilation.

2 Preparation before Installation

2.1 Safety Suggestions

To avoid personal injury and device damage, carefully read the safety suggestions before you install the RG-NIS3100 series.

⚠ Caution

The following safety suggestions may not cover all possible dangers.

2.1.1 General Safety Precautions

- Take security measures (such as wearing an anti-static wrist strap) to ensure safety.

- Keep the chassis clean and dust-free. Do not place the switch at a damp place and keep the switch away from moisture.

- Make sure the installation site is dry and flat. Take skid-proof measures.

- Do not place the switch in a walking area.

- Do not wear loose clothes or any other things that may be caught by the chassis during installation and maintenance.

- Moving or lifting the switch and its components requires team work. Be careful not to get hurt.

2.1.2 Movement

- Do not frequently move the device.

- When moving the device, note the balance and avoid hurting legs and feet or straining the back.

- Before moving the device, turn off all power supplies and dismantle all power modules.

2.1.3 Electricity

- Observe local regulations and specifications when performing electric operations. Relevant operators must be qualified.

- Before installing the device, carefully check any potential danger in the surroundings, such as ungrounded power supply, and damp or wet ground or floor.

- Before installing the device, find out the location of the emergency power supply switch in the room. First cut off the power supply in the case of an accident.

- Try to avoid maintaining the switch that is powered on alone.

- Be sure to make a careful check before you shut down the power supply.

- Do not place the device in a damp location. Do not let any liquid enter the chassis.

⚡ Danger

⚡ Any nonstandard and inaccurate electric operation may cause an accident such as fire or electrical shock, thus causing severe even fatal damages to human bodies and the device.

⚡ Direct or indirect touch through a wet object on high-voltage and mains supply may bring a fatal danger.

⚠ Caution

● If a power supply system is equipped with a leakage protector (leakage current switch or breaker), the rated leakage action current of each leakage protector is twice greater than the maximum leakage current of all the power supplies in the system. For example, if a system is equipped with 16 identical power supplies, the leakage current of each power supply is equal to or less than 3.5 mA, and the total leakage current of the system is 56 mA. A leakage protector with 30 mA 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 = 30/2/3.5 ≈ 4.28). In other words, the leakage protector with 30 mA rated action current supports no more than 4 power supplies. In this case, the 16 power supplies in the system require at least 4 leakage protectors with 30 mA rated action current and each leakage protector supports 4 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 must be 50% of the leakage action current. The leakage protector with 30 mA rated leakage action current is used as an example. The rated leakage non-action current must be 15 mA. When the leakage current falls below 15 mA, the protector should 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.

● To guarantee personal safety, the rated leakage action current of each leakage protector in the system must be equal to or less than 30 mA (human body safety current is 30 mA). When twice of the total leakage current of the system is greater than 30 mA, the system must be equipped with two or more leakage protectors.

● For details of the leakage current value of each power supply model, see Chapter 1 .

2.1.4 ESD

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

● Proper grounding of grounding screws on the back panel of the device, and three-wire single-phase socket with protective earth wire (PE) used as the AC power socket.

● Indoor dust prevention

● Proper humidity conditions

2.1.5 Laser Safety

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

● When an optical transceiver is in operation, ensure that its port is connected to an optical fiber or covered by a dust cap to keep out dust and prevent it from burning your eyes.

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

Figure 2-1   Laser Product Warning

CLASS 1 LASER PRODUCT

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

2.2 Installation Site Requirements

To ensure the normal running and prolonged service life of the device, the installation site must meet the following requirements.

2.2.1 Load Bearing Requirements

Evaluate the load bearing requirements for the ground according to the weight of the switch and its accessories (such as the cabinet, chassis, line cards and power supply modules). Make sure the installation site meet the requirements.

2.2.2 Space Requirements

- The width of the machine room corridor should be greater than 0.8 m (31.50 in.) to ensure enough space to move the chassis, and to plug and remove modules.
- Do not install the switch against the wall. Maintain proper clearance around the switch for heat dissipation and switch maintenance.

2.2.3 Anti-interference Requirements

The switch is susceptible to external interference by capacitive coupling, inductive coupling, electromagnetic waves, common impedance (grounding) coupling, or conduction over conducting wires including power cords, signal cables, and output cables. Note that:

In a TN grounding system, use a three-wire single-phase outlet that has a protective earth (PE) contact to allow the filter circuit in the device to eliminate interference from the power grid.

Keep the switch away from high-power radio transmitters, radar transmitters, and high-frequency high-current devices.

Take electromagnetic shielding measures to minimize interference when necessary, for example, use shielded interface cables.

Route interface cables only indoors to prevent signal ports from getting damaged by overvoltage or overcurrent caused by lightning strikes.

2.2.4 Ventilation

For the RG-NIS3100 series, a sufficient space (at least 10 cm distance from both sides and the back plane of the cabinet) should be reserved at the ventilation openings to ensure normal ventilation. After various cables have been connected, they should be arranged into bundles or placed on the cabling rack to avoid airflow blocking. It is recommended that you clean the switch at regular intervals (like once every three months). In particular, avoid dust from blocking the screen mesh on the back of the cabinet.

2.2.5 Temperature and Humidity

To ensure the normal operation and prolong the service life of the RG-NIS3100 series switch, keep proper temperature and humidity in the equipment room.

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

- In an environment with a high humidity, insulating materials may have bad insulation or even leaking electricity. Sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.

- In an environment with a low humidity, insulating strips may dry and shrink. Static electricity may occur easily and endanger circuits on the device.

- In an environment with a high temperature, the router is subject to more serious harm. Its performance may degrade significantly and various hardware faults may occur.

⚠ Caution

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

2.2.6 Cleanness

Dust poses a severe threat to the running of the device. The indoor dust falling on the device may be absorbed by the static electricity, causing bad contact of the metallic joint. Such electrostatic absorption may occur more easily when the relative humidity is low. This affects the device lifecycle and causes communication faults. Table 2-2 lists the requirements for the dust content and granularity in the equipment room.

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

Apart from dust, the salt, acid and sulfide in

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

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

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

Gas	Average (mg/m3)	Maximum (mg/m3)
SO$_2$	0.3	1.0

H_2S	0.1	0.5
NO_2	0.5	1.0
Cl_2	0.1	0.3

🛈 **Note**

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

2.2.7 Grounding

A good grounding system is the basis for stable and reliable operation of the device, preventing lightning strokes and resisting interference. Carefully check the grounding conditions at the installation site according to the grounding requirements, and perform grounding operations properly as required.

⚠ Caution

Effective grounding of the switch guarantees lightning protection and interference resistance. Therefore, connect the grounding line of the switch properly.

Safety Grounding

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

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

Lightning Grounding
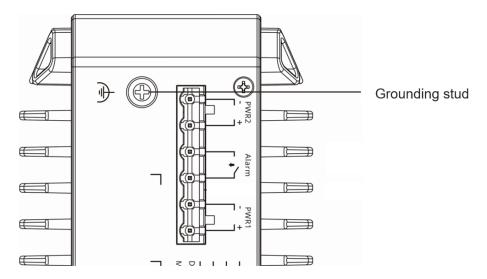
The surge protection system of a facility is an independent system that consists of the lightning rod, down conductor, and connector to the grounding system, which usually shares the power reference ground and ground cable. The lightning discharge ground is targeted for the facility.

EMC Grounding

The grounding required for EMC design includes the shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The

resistance of earth wires should be less than 1 Ω. The RG-NIS3100 series switch back plane is reserved with one grounding pole, as shown below.

Figure 2-2   Grounding of the RG-NIS3100 Series Switch

Grounding stud

2.2.8 EMI

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

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

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

● For the TN AC power supply system, the single-phase three-core power socket with protective earthing conductors (PE) should be adopted to effectively filter out interference from the power grid through filtering circuits.

● Do not use the grounding device for an electrical device or anti-lightning grounding device. In addition, the grounding device of the device must be deployed far away from the grounding device of the electrical device and anti-lightning grounding device.

● Keep the device away from the high-power radio transmitter, radar transmitting station, and high-frequency large-current device.

● Take measures to shield static electricity.

● Lay interface cables inside the equipment room. Outdoor cabling is prohibited, avoiding damages to device signal interfaces caused by over-voltage or over-current of lightning.

2.2.9 Lightning Resistance

When the AC power cable is imported outdoors and directly connected to the power port of the RG-NIS3100 series switch, use the lightning line bank to prevent the switch from being hit by lightning shocks. In this case, connect the mains supply AC cable to the lightning line bank, and connect the switch to the lightning line bank. This helps prevent the current of high-voltage lightning from passing the switch directly through the mains supply cable to a certain extent.

> **ℹ Note**
>
> The lightning line banks are not provided and should be purchased by customers as required.

2.3 Installation Tools

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

> **ℹ Note**
>
> The tool kit is customer-supplied.

3 Product Installation
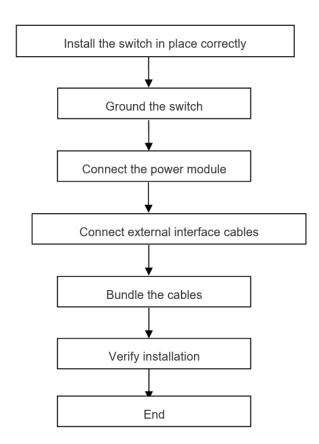
⚠ Caution

⚠ Ensure that you have read chapter 2 carefully.

⚠ Verify that the requirements described in chapter 2 have been met.

3.1 Installation Flowchart

```
┌─────────────────────────────────────┐
│   Install the switch in place correctly   │
└─────────────────────────────────────┘
                  │
                  ▼
        ┌───────────────────┐
        │   Ground the switch   │
        └───────────────────┘
                  │
                  ▼
        ┌───────────────────┐
        │ Connect the power module │
        └───────────────────┘
                  │
                  ▼
    ┌───────────────────────────┐
    │ Connect external interface cables │
    └───────────────────────────┘
                  │
                  ▼
        ┌───────────────────┐
        │   Bundle the cables   │
        └───────────────────┘
                  │
                  ▼
        ┌───────────────────┐
        │   Verify installation   │
        └───────────────────┘
                  │
                  ▼
        ┌───────────────────┐
        │         End         │
        └───────────────────┘
```

3.2 Confirmations Before Installation

Before installation, confirm the following points at the installation site:

- Cooling requirements are met.

- Temperature and humidity requirements are met.

- The power supply and required current are available.

- Network cables have been deployed.

3.3 Installing the RG-NIS3100

Precautions

During installation, note the following points:

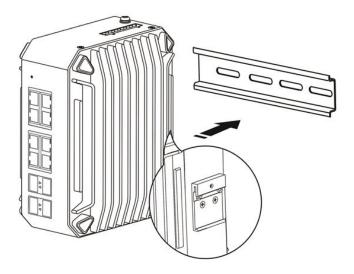- During installation, pay attention to the following points:

- Connect the power cords of different colors to the corresponding cable terminals.

- Ensure that the connector of the power cord is properly seated in the power connector of the switch. After plugging the power cord on the device, secure the power cord with a power cord retention clip.

- Do not place anything on the top of the switch.

- Maintain a minimum clearance of 100 mm (3.94 in.) around the device to ensure proper ventilation. Do not stack switches.

- Keep the switch away from high-power radio transmitters, radar transmitters, and high-frequency high-current devices. Take electromagnetic shielding measures to minimize interference when necessary, for example, use shielded interface cables.

- Keep network cables with a length within 100 m (328.08 feet) indoors. Take lightning protection measures if they need to be routed outdoors.

3.3.1 Mounting the Switch on a DIN Rail

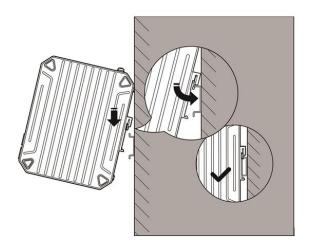The RG-NIS3100 series switch supports DIN rail mounting. The installation procedure is as follows:

Step 1: Move the device to make the network port face outward and align the DIN rail clamp with the DIN rail, as shown in Figure 3-1.

Figure 3-1   DIN Rail Mounting Step 1

Step 2: Snap the top part of the DIN rail clamp on the DIN rail, and then push the device inward until it is completely seated on the rail, as shown in Figure 3-2.

Figure 3-2   DIN Rail Mounting Step 2
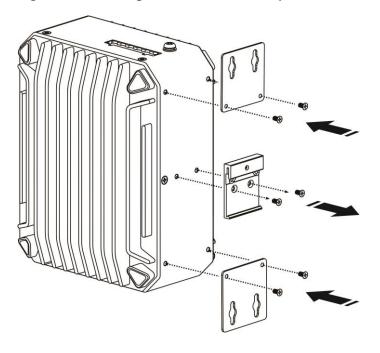
3.3.2 Mounting the Switch on a Wall

You can use the mounting brackets delivered with the RG-NIS3100 series switch to mount the switch on a wall. The installation procedure is as follows:
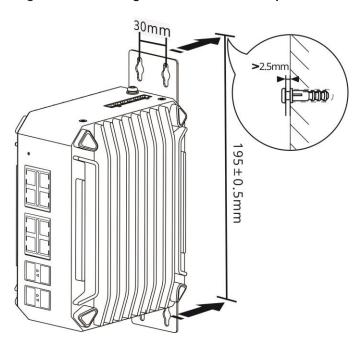
Step 1: Remove the DIN rail clamp and screws from the switch, and install the mounting brackets on the switch, as shown in Figure 3-3.

Figure 3-3   Mounting Bracket Installation Step 1

Step 2: Use four expansion screws to secure the switch on a wall, as shown in Figure 3-4.

Figure 3-4   Mounting Bracket Installation Step 2

ℹ **Note**

For wall mounting, the switch can be mounted only on a concrete or non-flammable surface.

3.4 Grounding the Switch

The switch has a grounding stud on the rear panel. Connect the grounding stud to the grounding point of the rack and then connect the grounding point of the rack to the ground bar of the equipment room.
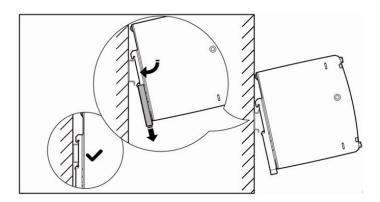
### Precautions

● The cross-sectional area of a grounding wire should be determined according to the maximum current. The grounding wires should be good conductors.

● Do not use bare conductors.

ℹ **Note**

● To avoid personal injury and device damage, connect the switch to earth ground properly. The resistance between the chassis and ground should be less than 1 ohm.

● The O&M personnel should check whether the AC outlet is reliably connected to the protective ground of the building. If not, the O&M personnel should use a protective grounding wire to connect the AC outlet protective earth terminal to the building protective ground.

● The power outlet should be installed near the device and easily accessible.

● During device installation, connect the grounding wire first and disconnect it last.

● The cross-sectional area of the protective grounding wire must be at least 2.5 mm^2 (12 AWG).
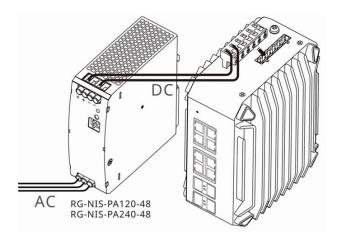
3.5 Installing the Power Module

The power module only supports DIN rail mounting. The installation procedure is as follows:

(1) Snap the top part of the DIN rail clamp on the DIN rail, pull the blade spring down, and then push the module inward until it is completely seated on the rail.

(2) Connect the power module to the switch, as shown in the following figure.

3.6 Connecting External Interface Cables

Precautions

Distinguish single-mode and multi-mode fiber-optic cables and interfaces.

Avoid a small bend radius at the connector.

Connection Procedure

(1) Connect the RJ45 connector of an Ethernet cable to the management Ethernet interface on the device, and the other end to an NM or control terminal.

(2) Identify the transmit and receive ends of the fiber-optic cables, and insert the single-mode or multi-mode fiber-optic cables into the corresponding interfaces according to the silkscreen labels.

(3) Distinguish crossover and straight-through cables, and insert the twisted pair cables with RJ45 connectors into the corresponding interfaces according to the silkscreen labels.

3.7   Bundling the Cables

Precautions

Bundle the power cords and other cables neatly.

When bundling fiber-optic cables, ensure that they have natural bends or large bend radius at the connectors.

Do not bundle fiber-optic cables and twisted pair cables too tightly, as this may press the cables and affect their service life and transmission performance.

Bundling Steps

(1)   Bundle the drooping part of the fiber-optic cables and twisted pair cables, and route them to both sides of the chassis for convenience.

(2)   On both sides of the chassis, fasten the fiber-optic cables and twisted pair cables to the cable management bracket or trough.

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

3.8   Verifying Installation

⚡ Danger

Turn off the power to avoid personal injury and damage to components caused by incorrect connection.

Verify that the grounding wire is properly connected.

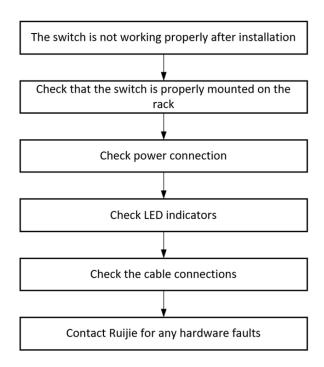Verify that the cables and power cords are properly connected.

Verify that the network cables with a length within 100 m (328.08 feet) are kept indoors. If not, check whether the power supply and interfaces are protected against lightning strikes.

Verify that there is a minimum clearance of 100 mm (3.94 in.) around the device.

4 Troubleshooting

4.1 Troubleshooting Flowchart

```
┌──────────────────────────────────────────────────┐
│  The switch is not working properly after installation │
└──────────────────────────────────────────────────┘
                          │
                          ▼
┌──────────────────────────────────────────────────┐
│   Check that the switch is properly mounted on the │
│                        rack                        │
└──────────────────────────────────────────────────┘
                          │
                          ▼
┌──────────────────────────────────────────────────┐
│               Check power connection               │
└──────────────────────────────────────────────────┘
                          │
                          ▼
┌──────────────────────────────────────────────────┐
│                Check LED indicators                │
└──────────────────────────────────────────────────┘
                          │
                          ▼
┌──────────────────────────────────────────────────┐
│              Check the cable connections           │
└──────────────────────────────────────────────────┘
                          │
                          ▼
┌──────────────────────────────────────────────────┐
│        Contact Ruijie for any hardware faults      │
└──────────────────────────────────────────────────┘
```

4.2 Troubleshooting Common Faults

Symptom	Possible Causes	Solution
The management interface login password is forgotten.	A password is manually configured but it is forgotten.	Press the reset button to restore the default settings.
The status LED is off after power-on.	The power supply is not enabled, or the power cable is loosened.	Check whether the power socket is normal. Check whether the power cable is correctly connected.
The RJ45 port is not connected or an error occurs when the port is receiving or transmitting frames.	The connected twisted pair cable is faulty. The length of the cable exceeds 100 m. The port has special configuration, which does not adapt to the working mode of the connected switch.	Replace the twisted pair cable. Check that the port configuration has the common working mode with the connected switch.

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

5 Appendix

5.1 Appendix A: Connectors and Connection Media

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

The 1000BASE-T/100BASE-TX/10BASE-T supports adaptation of three rates and automatic MDI/MDIX crossover at these three rates.

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

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

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

In addition to the preceding cables, the 100BASE-TX/10BASE-T can also use 100-ohm Category-3, Category-4, and Category-5 cables for 10 Mbps, and 100-ohm Category-5 cables for 100 Mbps, both of which can be up to 100 m. Figure A-2 shows the pinouts of the 100BASE-TX/10BASE-T.

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

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

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

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

Optical Fiber Connection

For the optical fiber ports, select single-mode or multimode optical fibers for connection according to the fiber module connected. Figure A-4 shows the connection schematic diagram.

Figure A-4 Optical Fiber Connections

5.2 Appendix B: Ruijie Reyee SFP Transceiver Modules

Current Industrial-grade SFP Module Models and Specifications

Rate	Standard	SFP Module Model
Ethernet 1000 Mbps	Short wavelength	NIS-GE-SFP-550M-MM850
	Long wavelength/Long distance	NIS-GE-SFP-10KM-SM1310 NIS-GE-SFP-20KM-SM1310-BIDI NIS-GE-SFP-20KM-SM1550-BIDI

ℹ️ Note

The NIS-GE-SFP-20KM-SM1310-BIDI and NIS-GE-SFP-20KM-SM1550-BIDI should be used in pairs.

Temperature and Humidity Requirements of Industrial-grade SFP Modules

Operating Temperature	–40 to +85°C (–40 to +185°F)
Storage Temperature	–40 to +85°C (–40 to +185°F)
Relative Humidity	10% RH to 90% RH (non-condensing)

Table 5-1   Current SFP Module Models and Specifications

Model	Wavelength (nm)	Fiber Type	DDM (Yes/No)	Transmitter Power (dBm)		Receiver Power (dBm)	
				Min.	Max.	Min.	Max.
NIS-GE-SFP-550M-MM850	850	MMF	Yes	–9.5	–3	–17	0
NIS-GE-SFP-10KM-SM1310	1310	SMF	Yes	–9.5	–3	–20	–3
NIS-GE-SFP-20KM-SM1310-BIDI	TX: 1310 RX: 1550	SMF	Yes	–9	–3	–22	–3
NIS-GE-SFP-20KM-SM1550-BIDI	TX: 1550 RX: 1310	SMF	Yes	–9	–3	–22	–3

⚠️ Caution

● An optical module is a laser transmitter. Do not look directly into the optical module to prevent it from burning your eyes.

● To keep the optical module clean, ensure that the unused ports remain capped.

Current SFP Module Cabling Specifications
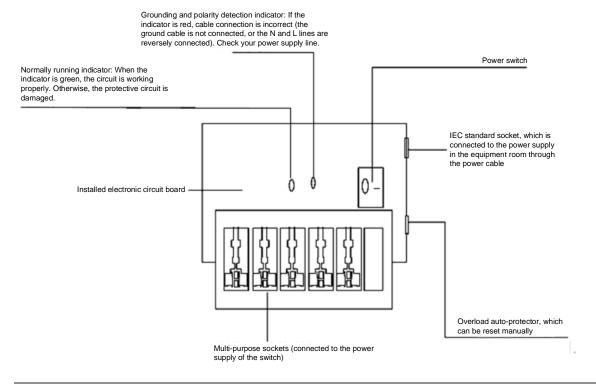
Model	Connector Type	Fiber Type	Core Size (µm)	Max. Cabling Distance
NIS-GE-SFP-550M-MM850	L/C	MMF	50/125	550 m (1640.42 ft)
NIS-GE-SFP-10KM-SM1310	L/C	SMF	9/125	10 km (32808.40 ft)
NIS-GE-SFP-20KM-SM1310-BIDI	L/C	SMF	9/125	20 km (65616.80 ft)
NIS-GE-SFP-20KM-SM1550-BIDI	L/C	SMF	9/125	20 km (65616.80 ft)

5.3   Appendix C: Surge Protection

Installing the AC Power Arrester (Surge Protection Cable Row)

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

Figure C-1 Schematic Diagram for the Power Arrester

Grounding and polarity detection indicator: If the indicator is red, cable connection is incorrect (the ground cable is not connected, or the N and L lines are reversely connected). Check your power supply line.

Power switch

Normally running indicator: When the indicator is green, the circuit is working properly. Otherwise, the protective circuit is damaged.

IEC standard socket, which is connected to the power supply in the equipment room through the power cable

Installed electronic circuit board

Overload auto-protector, which can be reset manually

Multi-purpose sockets (connected to the power supply of the switch)

⚠ Caution

The power arrester is not provided and customers have to purchase it.

Precautions for installation:

● Ensure that the PE terminal of the power arrester is properly grounded.

● After connecting the switch AC power plug to the socket of the power arrester (surge protection cable row), surge protection function implements if the RUN LED is Green and the ALARM LED is OFF.

● If the alarm LED on the power arrester is red, check whether there is the poor grounding connection or reversed connection of null and live lines. You can use the multimeter to check the polarity of the power socket for the arrester when the LED is red. If the N line is on the left and the L line is on the right, the arrester PE terminal is not grounded. If the L line is on the left and the N line is on the right, the polarity of the arrester power cable is reversed. If the LED is still red, the arrester PE terminal is not grounded.
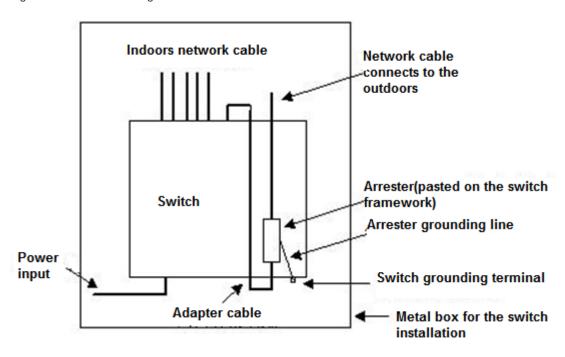
Installing the Ethernet Port Arrester

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

Tools: cross or straight screwdriver, multimeter, and diagonal pliers
Installation steps:

(1) Tear one side of the protection paper for the double-sided adhesive tape and paste the tape to the framework of the Ethernet port arrester. Tear the other side of the protection paper for the double-sided adhesive tape and paste the Ethernet port arrester to the switch framework. The paste location for the Ethernet port arrester must be as close to the grounding terminal of the switch.

(2) Based on the distance of the switch grounding terminal, cut the grounding line for the Ethernet port arrester and firmly tighten the grounding line to the grounding terminal of the switch.

(3) Use the multimeter to check whether the grounding line for the arrester is in good contact with the switch grounding terminal and the framework.

(4) According to the *Ethernet Port Arrester Hardware Installation Guide*, connect the arrester using the adapter cable (note that the external network cable is connected to the end of IN, while the adapter cable connected to the switch is connected to the end of OUT) and check whether the LED on the board is normal.

(5) Use the nylon button to bundle the power cables.

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

⚠ Caution
● The Ethernet port arrester applies to only the 10M/100M electrical Ethernet ports with the RJ45 connector.
● The Ethernet port arrester is provided by customers. For more information about arrester installation, refer to *Ethernet Port Arrester Hardware Installation Guide*.

To prevent the performance of the Ethernet port arrester from being affected, note the following points:

● Reversed direction of the arrester installation: Connect the external network cable to the IN end and connect the switch Ethernet port to the OUT end.

● Poor arrester grounding: The grounding line must be as short as possible to ensure that it is in good contact with the switch grounding terminal. Use the multimeter to confirm the contact after grounding.

● Incomplete arrester installation: If more than one port is connected to the peer device on the switch, install the arresters on all connection ports for surge protection.

5.4 Appendix D: Cabling Recommendations

When RG-NIS3100 series switches are installed in standard 19-inch cabinets, cables are tied in the binding rack on the cabinet by the cabling rack, and top or bottom cabling is adopted according to the actual situation in the equipment room. All cable connectors should be placed at the bottom of the cabinet in an orderly manner but not outside the cabinet. Power cables are routed beside the cabinet, and top or bottom cabling is adopted according to the actual situation in the equipment room, such as the position of the DC power distribution box, AC socket, or surge protection box.

Requirement for the Minimum Cable Bending Radius

- The bending radius of a power cord, communication cable, and flat cable should be five times greater than their respective diameters. The bending radius of these cables that often bend or is removed or installed should be seven times greater than their respective diameters.

- The bending radius of a common coaxial cable should be seven times greater than its diameter. The bending radius of this type of cables that often bend or is removed or installed should be 10 times greater than its diameter.

- The bending radius of a high-speed cable (for example, SFP cable) should be five times greater than its diameter. The bending radius of this type of cables that often bend or is removed or installed should be 10 times greater than its diameter.
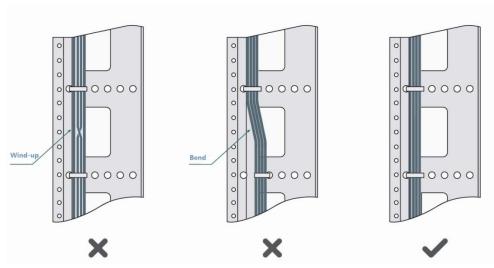
Requirement for the Minimum Fiber Bending Radius

- The diameter of a fiber tray to hold fibers cannot be 25 times less than the diameter of the fiber.

- When moving an optical fiber, the bending radius of the fiber should be equal to or 20 times greater than the diameter of the fiber.

- During cabling of an optical fiber, the bending radius of the fiber should be equal to or 10 times greater than the diameter of the fiber.

Precautions for Bundling Up Cables

- Before bundling up cables, correctly mark labels and stick the labels to cables.

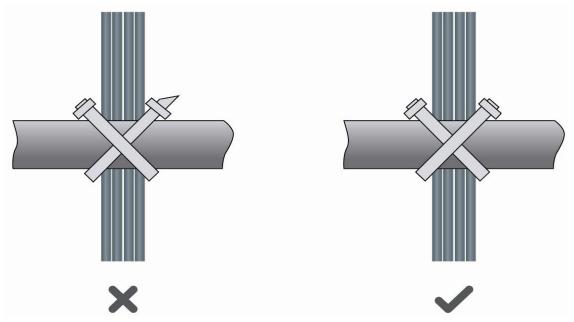- Cables should be neatly and properly bundled, as shown in Figure D-1.

Figure D-1 Bundling Up Cables

- Route and bundle power, signal, ground cables separately. When the cables are close to each other, cross them. When power cables are parallel to signal cables, the distance between them must be 30 mm (1.18 in.).
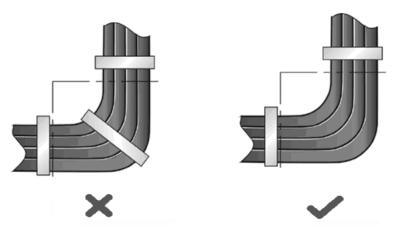
- All cable trays and their accessories must be smooth and free from sharp edges.

- Holes in metal, through which cables pass must have smooth or well-rounded surfaces, and be protected with insulating bushings.

- Use proper cable ties to bind cables together. Do not tie two or more cable ties to bind cables.

- Cut off excess cable tie cleanly with no sharp edges after bundling cables, as shown in Figure D-2.

Figure D-2 Cutting Off Excess Cable Tie

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

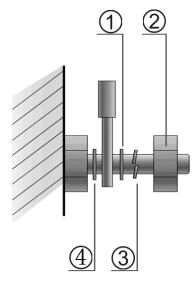Figure D-3 Preventing Cable Ties from Being Tied within the Bend

- Wrap up unnecessary or excess cables and bind them to the appropriate rack position, where device operation is not affected and no damages occur to the device and cables during commissioning.

- Do not bind power cords to the rails for moving parts.

- Leave a specified length of the cable connecting moving parts, such as the ground wire of the cabinet door, to avoid stress on the cable. When moving parts are in place, ensure that the excess cable length does not

contact heat sources, sharp corners, or edges. If heat sources are unavoidable, use high-temperature cables instead.

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

Figure D-4 Fastening Cable Lugs

Note	Flat washer	Spring washer
	Nut	Flat washer

● When using a stiff cable, fix it near the cable lug to avoid stress on the lug and cable.

● Do not use self-tapping screws to fasten terminals.

● Bundle cables of the same type and running in the same direction into groups. Keep cables clean and straight.

● Cables should be tied according to the following table.

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

● No knot is allowed in cabling or bundling.

● The metal parts of the cold-pressed terminal blocks, such as air circuit breakers, should not be exposed outside of the blocks.

5.5 Appendix E: Site Selection

- The equipment room should be at least 5 km away from the heavy pollution source such as the smelter, coal mine, and thermal power plant, 3.7 km away from the medium pollution source such as the chemical industry, rubber industry, and electroplating industry, and 2 km away from the light pollution source such as the food manufacturer and leather plant. If the pollution source is unavoidable, the equipment room should be located on the windward side of the pollution source perennially with advanced protection.

- The equipment room should be at least 3.7 km away from the sea or salt lake. Otherwise, the equipment room must be sealed, with air conditioner installed for temperature control. Saline soil cannot be used for construction. Otherwise, you should select devices with advanced protection against severe environment.

- Do not build the equipment room in the proximity of livestock farms. Otherwise, the equipment room should be located on the windward side of the pollution source perennially. The previous livestock house or fertilizer warehouse cannot be used as the equipment room.

- The equipment room should be firm enough to withstand severe weather conditions such as windstorm and heavy rain as well as away from dust. If the dust is unavoidable, keep the door and window away from the pollution source.

- The equipment room should be away from the residential area. Otherwise, the equipment room should meet the construction standard in terms of noise.

- Make sure that the air vent of the equipment room is away from the sewage pipe, septic tank, and sewage treatment tank. Keep the equipment room under positive pressure to prevent corrosive gas from entering the equipment room to corrode components and circuit boards. Keep the equipment room away from industrial boiler and heating boiler.

- The equipment room 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 that there are no cracks or holes in the wall and floor. If there are cable entries in the wall or window, take proper sealing measures. Ensure that the wall is flat, wear-resistant, and dust-free, which must meet requirements of 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.

- Pay attention to the location of the air conditioner. Keep the air conditioner from blowing wind straight toward the device or blowing water drops from the window or air vent toward the device.