

RG-NIS-PA Series Power Modules

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 Ruijie Reyee: https://www.ruijienetworks.com/products/reyee
- Technical Support Website: https://www.ruijienetworks.com/support
- Case Portal: https://caseportal.ruijienetworks.com
- Community: https://community.ruijienetworks.com
- Technical Support Email: <u>service_rj@ruijienetworks.com</u>

Conventions

1. Signs

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



An alert that calls attention to safety operation instructions that if not understood or followed when operating the device can result in physical injury.



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

Caution

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

Note

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

Specification

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

2. Note

This manual provides the device installation steps, hardware troubleshooting, module technical specifications, and specifications and usage guidelines for cables and connectors. It is intended for the users who have some experience in installing and maintaining network hardware. At the same time, it is assumed that the users are already familiar with the related terms and concepts.

1 Product Introduction

1.1 Power Modules

1.1.1 RG-NIS-PA240-48

1. Appearance



2. External Ports

- (1) RG-NIS-PA240-48 is a DC power module that provides DC power input to switch and supplies 48 V/5 A rated voltage to the system.
- (2) The front panel has a three-pin power connector at the bottom for connecting a standard 10 A power cord.
- (3) ADJ port: outputs adjustable voltage from 48 V to 53 V based on adjustable resistance.
- (4) DC OK Relay Contact: Rated: 30 V at 1 A, resistive load. The relay contacts are normally "ON" (closed) when the output (Vout) is greater than 90% of its rated value.

3. LEDs

LED	Silkscreen Label	Status	Description
Output status	DC ON	Off	The power supply is off.
LED	20 011	Solid green	The power supply is on.

4. Technical Specifications

Module Model	RG-NIS-PA240-48
Rated Voltage Range	100–240 V, 50/60 Hz
Max. Voltage Range	85–264 V, 47–63 Hz
Max. Output Power	240 W
Ground-Leakage Current	≤ 0.5 mA
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Storage Humidity	Maximum: 95% RH (non-condensing)
Operating Humidity	Maximum: 90% RH (non-condensing)
Weight	0.65 kg (1.43 lbs.)
Power Cord Specification	10 A power cord

Item	Working Conditions			Value
	Operating temperature	-40°C to -25°C (-40°F to −13°F)		3.34%/℃
		45°C to 70°C (113°F to 158°F)	115 V AC input	2.0%/℃
Output power derating	derating	60°C to 70°C (140°F to 158°F)	230 V AC input	2.5%/℃
	Input voltage derating	85 V AC to 100	V AC	0.67%/V AC
Short circuit protection	After the short circuit is eliminated, the power supply is restored within 10s.			Hiccup mode: Maintain constant current for 1s and power off for 10s to provide long-term short circuit protection and self-recovery.
Overcurrent protection	230 V AC, rated load	Ordinary temperature, high temperature		110%–200% lo, self-recovery

		Low temperature	≥ 105% lo, self-recovery
Overvoltage protection	48 V		≤ 60 V (hiccup, self-recovery after an exception is eliminated)
Overtemperature protection	230 V AC, rate	d load	80°C (176°F)

Caution

If it is used on the RG-SWITCH, the temperature and power consumption parameters depend on the power module specifications of the RG-SWITCH.

Warning

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

The power supply is not user-serviceable. To prevent electric shock, do not open the device.

Danger

- When the power module is powered on, its surface temperature is high. Do not touch the surface to avoid
- No flammable or combustible items are allowed at the bottom of the power module.

1.1.2 RG-NIS-PA120-48

1. Appearance



2. External Ports

- 1. RG-NIS-PA120-48 is a DC power module that provides DC power input to switch and supplies 48 V/2.5 A rated voltage to the system.
- 2. The front panel has a three-pin power connector at the bottom for connecting a standard 10 A power cord.
- 3. ADJ port: outputs adjustable voltage from 47 V to 53 V based on adjustable resistance.
- 4. DC OK Relay Contact: Rated: 30 V at 1 A, resistive load

The relay contacts are normally "ON" (closed) when the output (Vout) is greater than 90% of its rated value.

3. LEDs

LED	Silkscreen Label	Status	Description
Output status LED	DC ON	Off	The power supply is off.
Odiput status EEB		Solid green	The power supply is on.

4. Technical Specifications

Module Model	RG-NIS-PA120-48
Rated Voltage Range	100–240 V, 50/60 Hz
Max. Voltage Range	85–264 V, 47–63 Hz
Max. Output Power	120 W
Ground-Leakage Current	≤ 1 mA
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Storage Humidity	20% RH to 95% RH (non-condensing)
Operating Humidity	Maximum: 90% RH (non-condensing)
Weight	0.49 kg (1.08 lbs.)
Power Cord Specification	10 A power cord

Item	Working Conditions			Value
	_	–40°C to −2	5°C (−40°F to −13°F)	3.34%/℃
Output power derating	Operating temperature derating	55°C to 70°C (131°F to 158°F)	85 V AC to 164 V AC input	2.0%/℃

		60°C to 70°C (140°F to 158°F)	165 V AC to 264 V AC input	2.5%/°C
	Input voltage derating	85 V AC to	100 V AC	0.67%/V AC
Short circuit protection	After the short restored within		nated, the power supply is	Hiccup mode: Maintain constant current for 1s and power off for 10s to provide long-term short circuit protection and self-recovery.
Overcurrent	230 V AC,	Ordinary te	mperature, high e	105%–200% lo, self-recovery
protection	otection rated load	Low temperature		≥ 105%, full load after derating, self-recovery
Overvoltage protection	48 V	48 V		≤ 60 V (hiccup, self-recovery after an exception is eliminated)
Overtemperature	230 V AC, 70%	6 load	Start of overtemperature protection	90°C (194°F)
protection	on 230 v AC, 70%		End of overtemperature protection	Lowest: 60°C (140°F)

Caution

If it is used on the RG-SWITCH, the temperature and power consumption parameters depend on the power module specifications of the RG-SWITCH.

Warning

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

The power supply is not user-serviceable. To prevent electric shock, do not open the device.

Danger

- When the power module is powered on, its surface temperature is high. Do not touch the surface to avoid
- No flammable or combustible items are allowed at the bottom of the power module.

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-NIS-PA series.



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.
- 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.

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 0.

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

2.2 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 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/ m3	≤ 3.5 x 106
Diameter ≥ 5 μm	Particles/ m3	≤ 3 x 104

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)
SO2	0.3	1.0
H2S	0.1	0.5
NO2	0.5	1.0
Cl2	0.1	0.3

0

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.

2.2.5 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.



🛕 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.



 Λ 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 mm² (18 AWG).



Use the 3-core power supply line. The sectional area of each pin should be at least 0.75 mm² 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-NIS-PA series switch back plane is reserved with one grounding pole, as shown below.

2.2.6 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.

2.2.7 Lightning Resistance

When the AC power cable is imported outdoors and directly connected to the power port of the RG-NIS-PA 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.



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



The tool kit is customer-supplied.

3 Product Installation



Ensure that you have read chapter 2 carefully.



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

3.1 **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.

3.2 Grounding the Power

The Power Module 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.

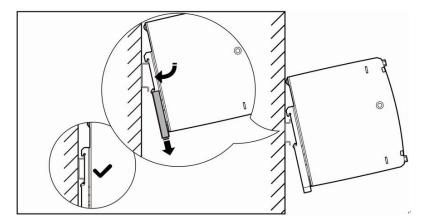


- To avoid personal injury and device damage, connect the switch to earth ground properly. The resistance between the chassis and ground should be less than 1 ohm.
- The O&M personnel should check whether the AC outlet is reliably connected to the protective ground of the building. If not, the O&M personnel 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 mm² (12 AWG).

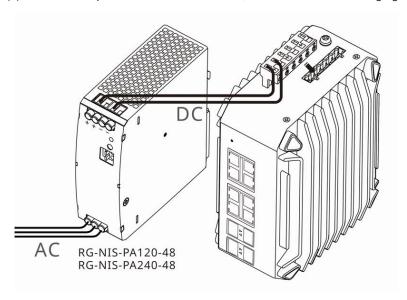
Installing the Power Module

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.



3.4 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.

3.5 Verifying Installation



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