Ruijie RG-PBOX Series Power Adapters

Hardware Installation and Reference Guide V1.01

Copyright Statement

Exemption Statement

Preface

Thank you for using our products. This manual will guide you through the installation of the device.

This manual describes the functional and physical features and provides the device installation steps, hardware troubleshooting, module technical specifications, and specifications and usage guidelines for cables and connectors.

Audience

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.

Obtaining Technical Assistance

- Ruijie Networks Website: http://www.ruijienetworks.com/
- Service Email: service_rj@ruijienetworks.com
- Technical Support: http://www.ruijienetworks.com/service.aspx
- Technical Support Hotline: +86-4008-111-000

Related Documents

Documents	Description
Configuration Guide	Describes network protocols and related mechanisms that supported by the product, with configuration examples.
Command Reference	Describes the related configuration commands, including command modes, parameter descriptions, usage guides, and related examples.

Symbol Conventions

The symbols used in this document are described as below:

 This symbol brings your attention to some helpful suggestions and references.

 This symbol means that you must be extremely careful not to do some things that may damage the device or cause data loss.

1 Product Overview

The PoE-capable RG-PBOX series power adapter, teaming up with RG-S2910-H series switches, is developed to meet the power supply requirement of the terminal device. Currently, there are two available models with up to 60W loading capacity: RG-PBOX-DC12 and RG-PBOX-AC24.

RG-PBOX Series Power Adapters

Model	10/100/1000M Ethernet Port	Power Output Port	Output Voltage
RG-PBOX-DC12	2	1	12VDC
RG-PBOX-AC24	2	1	24VAC

1.1 RG-PBOX-DC12

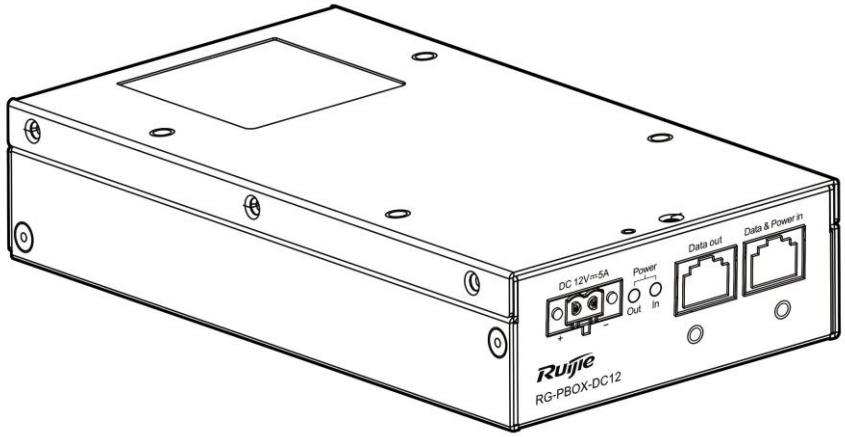
Specifications

Model	RG-PBOX-DC12
Power	Input voltage range: 43-57V DC Output voltage: 12VDC Rated current: 5A Rated output power: 60W
Power Consumption	12.5W max
Operating Temperature	-20ºC ~50ºC
Storage Temperature	-40ºC ~ 70ºC
Operating Humidity	10% ~ 90% RH (non-condensing)
Storage Humidity	10% ~ 90% RH (non-condensing)
Fan	Fanless
Temperature Alarm	Not supported.
IP Rating	IP40
EMI Standards	GB 9254 - 2008, FCC Part 15, CISPR (EN55022) Class A
EMS Standards	IEC/EN 61000-4-2 ESD contact discharge 8kV air discharge 15kV
	IEC/EN 61000-4-4 EFT communication line 1kV
	IEC/EN 61000-4-5 Surge power cord, cord/cord 1kV power cord, cord/ground 2kV data cable, cable/ground 6kV
Safety Standards	GB4943-2011
Dimensions (WxDxH)	187 mm x 89 mm x 36.5 mm
Weight	≈0.6kg

Product Appearance

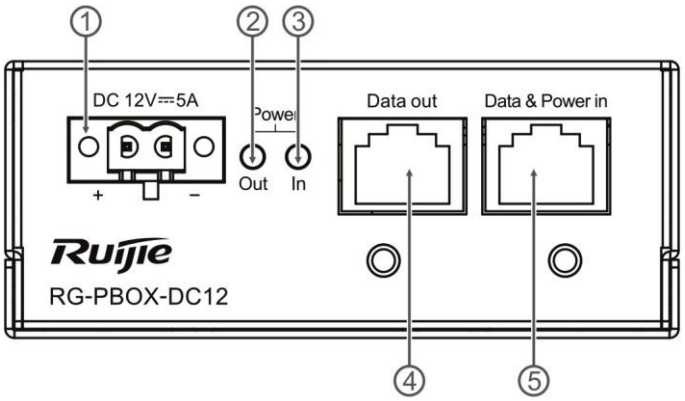
The RG-PBOX-DC12 power adapter provides two 10M/100M/1000M Ethernet ports and one 12V DC power port

Figure 1-1 Appearance of RG-PBOX-DC12 Power Adapter



Front Panel

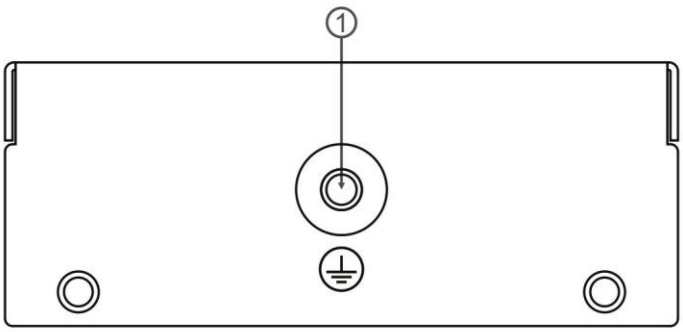
Figure 1-2 Front Panel of RG-PBOX-DC12 Power Adapter



Note	① 12V DC Power Output port ② 12V DC Power Output indicator ③ PoE Power In indicator ④ Data Output port	⑤ Power and Data Input port (PoE)

Back Panel

Figure 1-3 Back Panel of RG-PBOX-DC12 Power Adapter



Note	① Grounding connector (screw hole)	

Power Supply

The RG-PBOX-DC12 power adapter adopts PoE power supply input.

Input voltage range: 43-57V DC

Output voltage: 12VDC

Rated current: 5A

Rated output power: 60W

Heat Dissipation System

The RG-PBOX-DC12 power adapter adopts fanless design. For airflow for proper ventilation, the chassis should be mounted in a place with sufficient space(10cm at least) for air circulation.

LED

LED	Identification on the panel	Status	Meaning
Status LED	Power-in	Off	Abnormal PoE or no power supply
		Solid green	Normal PoE detection
	Power-out	Off	Abnormal 12VDC output or no power supply
		Solid green	Normal 12VDC output

1.2 RG-PBOX-AC24

Specifications

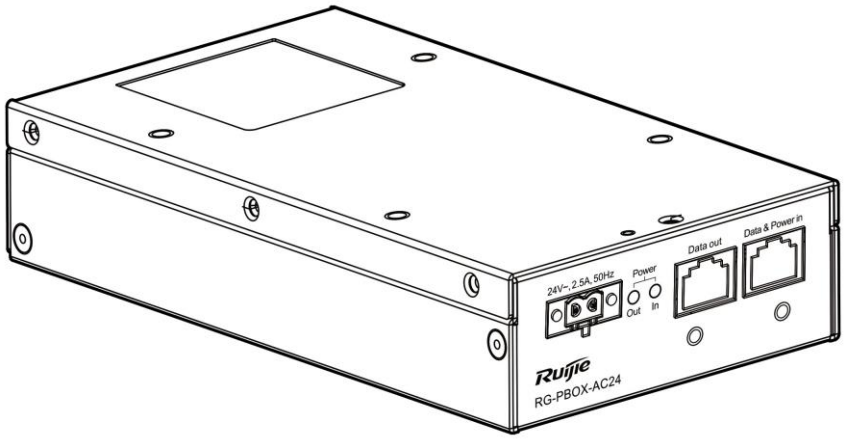
Model	RG-PBOX-AC24
Power	Input voltage range: 43-57V DC Output voltage: 24VAC Rated current: 2.5A Rated output power: 60W
Power Consumption	12.5W max
Operating Temperature	-20ºC ~50ºC
Storage Temperature	-40ºC ~ 70ºC
Operating Humidity	10% ~ 90% RH (non-condensing)
Storage Humidity	10% ~ 90% RH (non-condensing)

Fan	Fanless	
Temperature Alarm	Not supported	
Protection Level	IP40	
EMI Standards	GB 9254 - 2008,FCC Part 15, CISPR (EN55022) class A,	
EMS Standards **Safety Standards**	IEC/EN 61000-4-2 ESD	
	contact discharge	8kV
	air discharge	15kV
	IEC/EN 61000-4-4 EFT	
	communication line	1kV
	IEC/EN 61000-4-5 Surge	
	power cord, cord/cord	1kV
	power cord, cord/ground	2kV
	data cable, cable/ground	6kV
	GB4943-2011	
Dimensions (WxDxH)	187 mm x 89 mm x 36.5 mm	
Weight	≈ 0.72 kg	

Product Appearance

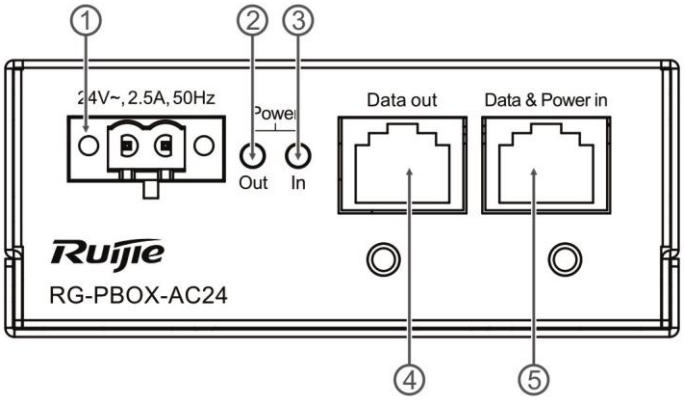
The RG-PBOX-AC24 power adapter provides two 10M/100M/1000M Ethernet ports and one 24V AC power port.

Figure 1-4 Appearance of RG-PBOX-AC24 Power Adapter



Front Panel

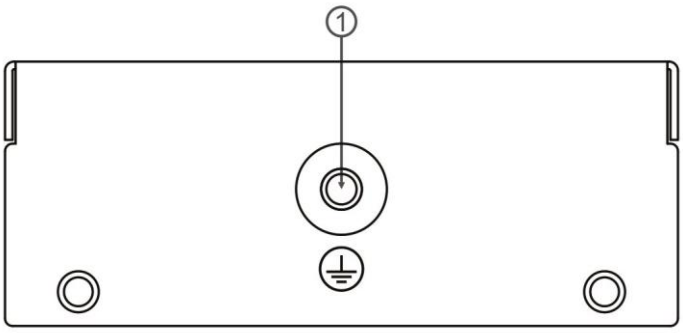
Figure 1-5 Front Panel of RG-PBOX-AC24 Power Adapter



Note	① 24V AC Power Output port ② 24V AC Power Out indicator ③ PoE Power In indicator ④ Data Output port	⑤ Power and Data Input port (PoE)

Back Panel

Figure 1-6 Back Panel of RG-PBOX-AC24 Power Adapter



Note	① Grounding connector (screw hole)	

Power Supply

The RG-PBOX-AC24 power adapter adopts PoE power supply input.

Input voltage range: 43-57V DC

Output voltage: 24VAC

Rated current: 2.5A

Rated output power: 60W

Heat Dissipation System

The RG-PBOX-DC12 power adapter adopts fanless design. For airflow for proper ventilation, the chassis should be mounted in a place with sufficient space(10cm at least) for air circulation.

LED

LED	Identification on the panel	Status	Meaning
status LED	Power-in	Off	Abnormal PoE or no power supply
		Solid green	Normal PoE detection
	Power-out	Off	Abnormal 24VAC output or no power supply
		Solid green	Normal 24VAC output

2 Preparation before Installation

2.1 Safety Suggestions

To prevent device damage and bodily injury, please read carefully the safety recommendations described in this chapter.

The recommendations do not cover all possible hazardous situations.

2.1.1 General Suggestions

- Ensure that the device is installed indoors or in semi-open space.
- The device is designed and evaluated just for operation at altitude below 5,000m. Therefore, the device can be safely used at altitude below 5,000m. And there may be potential risks at altitude beyond 5,000m.
- Keep the chassis clean and free of dusts.
- Do not place the equipment in a walking area.
- Do not wear loose clothes or any other things that may be caught by the chassis during installation and maintenance.
- Turn off the power and disconnect all cables before removing the chassis.

2.1.2 Safety Precautions for Removal

- Avoid moving the equipment frequently.
- Turn off all power supplies and unplug all power cables before you remove the equipment.
- Keep balance when moving the equipment, and avoid injuring your leg and feet or spraining your waist.

2.1.3 Electrical Safety

- Please observe local regulations and specifications when performing electrical operations. Relevant operators must be qualified.
- Please carefully check for any potential danger in the working area, for example, ungrounded power supply, unreliable grounding of the power supply and damp/wet ground or floor.
- Find out the location of the emergency power supply switch in the room before installation. First cut off the power supply in case of an accident.
- Avoid hot-line work by a single operator.
- Be sure to make a careful check before you shut down the power supply.
- Do not place the equipment in a damp/wet location. Do not let any liquid enter the chassis

2.1.4 Static Discharge Damage Prevention

Although much has been done in RG-PBOX to prevent static electricity, great damage may be caused to the circuitry and equipment when the static electricity exceeds a certain limit. In the communication network of the RG-PBOX, electrostatic induction may come from the following sources: External electric field produced by the high-voltage supply cable, lightning, etc; internal systems such as the indoor floor and the entire structure.

To prevent damage from static electricity, you must pay attention to the following:

- Properly ground the equipment.
- Take dust prevention measures in the room.
- Maintain an appropriate humidity.
- Do not let any clothes touch a circuit board.

2.2 Installation Site Requirements

RG-PBOX must be used in the room. To ensure normal operation and a prolonged useful life of the equipment, the installation site must meet the following requirements.

2.2.1 Ventilation Requirements

For airflow for proper ventilation, the RG-PBOX should be mounted in a place with sufficient space(10cm at least) for air circulation.

2.2.2 Temperature and Humidity Requirements

To ensure the normal operation and a prolonged useful life of the RG-PBOX, you must maintain an appropriate temperature and humidity in the equipment room. Too high or low temperature or humidity for a long period of time may damage the equipment.

- In an environment with high relative humidity, the insulating material may have bad insulation or even leak electricity, and sometimes the materials may suffer from mechanical performance change and metallic parts may get rusted.
- On the other hand, in an environment with low relative humidity, the insulating strip may dry and shrink, and static electricity may occur easily and endanger the circuit on the equipment.
- In an environment with high temperature, the equipment is subjected to even greater harm, as its performance may degrade significantly and its useful life may be shortened in the case of long-term exposure that expedites the aging process.

Temperature and Humidity Requirements of the RG-PBOX:

Operating Temperature	Operating Humidity
-20ºC ~ 50ºC	10%-90% RH (non-condensing)

The ambient temperature is measured at the point that is 1.5m above the floor and 0.4m before the equipment when there is no protective plate in front or back of the equipment rack.

2.2.3 Cleanness Requirements

Dust poses the top threat to the running of the equipment. The indoor dust falling on the equipment may be adhered by the static electricity, causing bad contact of the metallic joint. Such electrostatic adherence may occur more easily when the relative humidity is low, not only affecting the use life of the equipment, but also causing communication faults. The following table shows the requirements for the dust content and granularity in the equipment room.

Maximum Diameter (μm)	0.5	1	3	5
Concentration Limit (particles/m^3)	1.4 x 10	7 x 10	2.4 x 10	1.3 x 10

Apart from dust, the salt, acid and sulfide in the air in the equipment room must also meet strict requirements; as 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 (for example, SO_2, H_2S, NO_2 and Cl_2), whose requirements are listed in the following table.

Gas	**Average (mg/m^3)**	**Maximum (mg/m^3)**
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
Cl_2	0.01	0.3

2.2.4 Anti-interference Requirements

Although much has been done in RG-PBOX to resist interference, great damage may be caused to the equipment when the interference exceeds a certain limit. Various interference sources from outside the system, affect the working power adapter in the conductive ways such as capacitive coupling, inductive coupling, electromagnetic radiation, common-inpedance (including the grounding system) coupling and cables (including the power, signal and output cables).

- Keep the equipment away from high-power radio transmitter, radar transmitting station, and high-frequency large-current device.
- Measures must be taken to isolate static electricity. For example, use a shield cable as the interface cable.

2.2.5 System Grounding Requirements

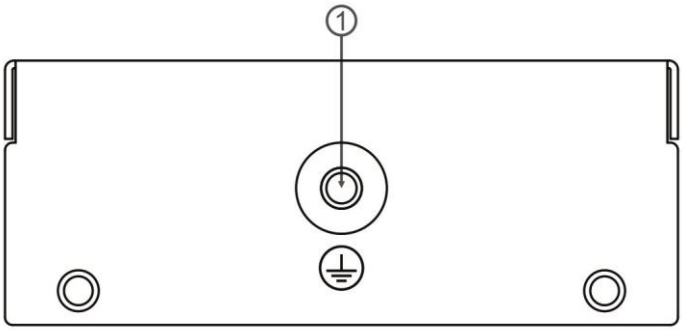
A good grounding system is the basis for the stable and reliable operation of the RG-PBOX. It is the key to prevent lightning stroke and resist interference. Please carefully check the grounding conditions on the installation site according to the grounding requirements, and perform grounding properly as needed.

⚠ A properly-connected grounding system servers as the primary guarantee for prevention of lightning stroke and resistance to interference. Therefore, please ensure correct grounding.

2.2.6 EMC Grounding

The ground required for EMC design includes shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The grounding resistance should be less than 1Ω. One grounding point is reserved at the back of the chassis.

Figure 2-1 RG-PBOX Power Adapter Grounding



2.2.7 EMI Consideration

Various interference sources, from either outside or inside the equipment or application system, affect the system in the conductive ways such as capacitive coupling, inductive coupling, and electromagnetic radiation.

There are two types of electromagnetic interferences: radiated interference and conducted interference, depending on the type of the propagation path. When the energy, often RF energy, from a component arrives at a sensitive component via the space, the energy is known as radiated interference. The interference source can be both a part of the interfered system and a completely electrically isolated unit. Conducted interference results from the electromagnetic wire or signal cable connection between the source and the sensitive component, along the cable the interference conducts from one unit to another. Conducted interference often affects the power supply of the equipment, but can be controlled by a filter. Radiated interference may affect any signal path in the equipment, and is difficult to shield.

- Effective measures should be taken for the power system to prevent the interference from the electric grid.
- The working ground of the routers should be properly separated and kept as far as possible from the grounding device of the power equipment or the anti-lightning grounding device.
- Keep the equipment away from high-power radio transmitter, radar transmitting station, and high-frequency large-current device.

Measures must be taken to isolate static electricity.

2.3 Installation Tools

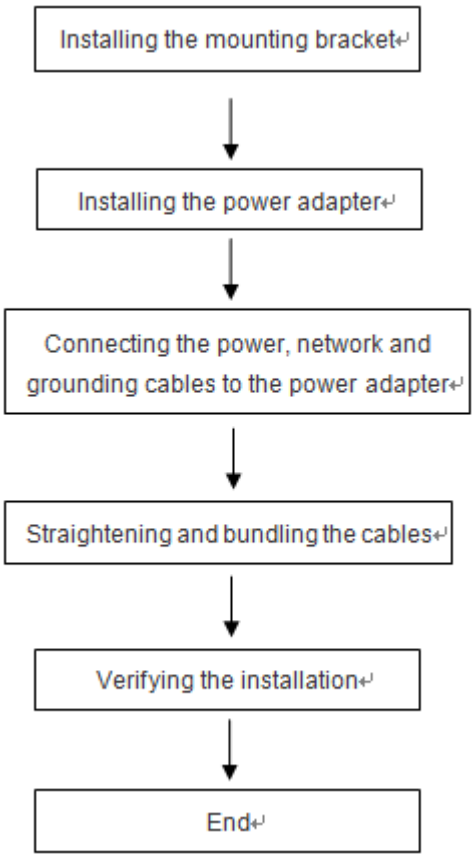
Common Tools	Cross screwdriver, straight screwdriver, related electric and optical cables Bolts, diagonal pliers, straps
Special Tools	Anti-static tools
Meter	Multimeter

The tool kit is customer supplied.

3 Product Installation

Make sure you have carefully read Chapter 2, and be sure that the requirements set forth in Chapter 2 have been met.

3.1 Installation Procedure



3.2 Installation Verification

Verify the following before installation:

- The installation location is of a good air flow.
- The installation location meets the temperature and humidity requirements of the equipment.
- The related network cables have already been deployed at the installation location.
- The selected power supply meets the system power.

3.3 Installing RG-PBOX Series Power Adapter

Cautions

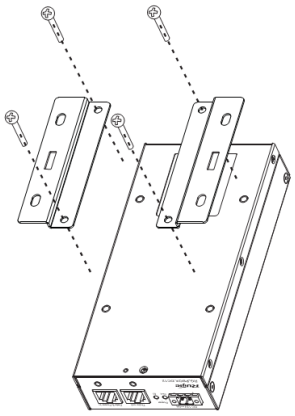
During installation, please note the following points:

- Ensure the wall or ceiling where the power adapter to be installed is dry enough and watertight.
- Keep the power adapter away from heat sources, electromagnetic radiation areas, power lines, inflammables and explosives.
- Make sure the 4 pairs of cables connected to the PoE input port in the RG-PBOX are of fine quality, for the maximum output of the power adapter. Cat5e cables and those of high specifications are top choices.
- Ensure that the RG-PBOX to be installed works properly.
- Identify the positive and negative ends of the DC-powered IP device.
- Make sure the power supply is properly connected.
- Don’t put heavy items on the power adapter.
- Ensure that the chassis should be mounted in a place with sufficient space(10cm at least) for air circulation. Don’t pile power adapters.
- Avoid direct sunlight. Keep the device away from high-power radio transmitter, radar transmitting station, and high-frequency large-current device. Measures must be taken to isolate static electricity. For example, use a shielded cable as the interface cable.

3.3.1 Wall Mounting

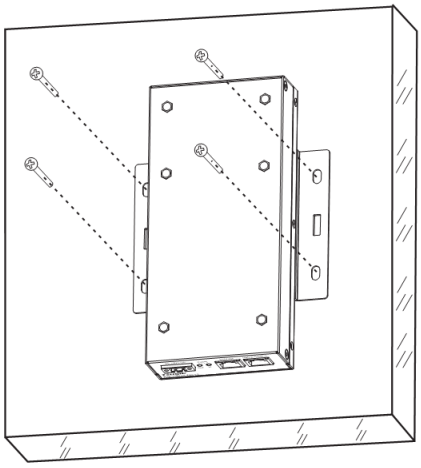
1) Take out the mounting bracket and expansion screws (M4*10). And install the bracket as shown in the following figure.

Figure 3-1 Install the Mounting Bracket



2) Place the power adapter at the desired position and make marks for the screw holes on the wall. Remove the power adapter, drill holes at the marks using the hammer drill, align the screw holes of the power adapter with the holes on the wall, tap wall anchors into the holes, and drive expansion screws (M4*20) through the power adapter into the anchors to fix the bracket. See the following figure.

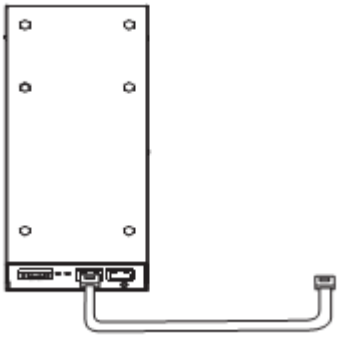
Figure 3-2 Installing the Power Adapter



3) Connect network cable 1.

Connect one end of the network cable to the "Data Out" port of the RG-PBOX power adapter and the other end to a terminal device such as a camera.

Figure 3-3 Connect network Cable 1



4) Connect the power cable.

The power cable should be shorter than 5 m. The recommended cable diameter is 18AWG. Connect one end of the power cable to the power adapter and the other end to a terminal device such as a camera. When installing a RG-PBOX-DC12, ensure that the positive end of the power adapter is connected to the positive end of the terminal device and that the negative end of the power adapter is connected to the negative end of the terminal device. Fasten the screws for the terminal connecting to the power adapter to ensure that the power adapter terminal will not disconnect.

Figure 3-4 Connect the Power Cable

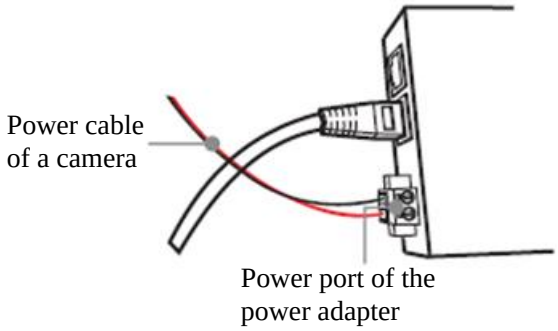
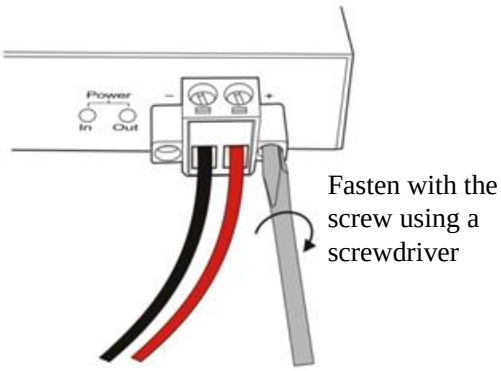


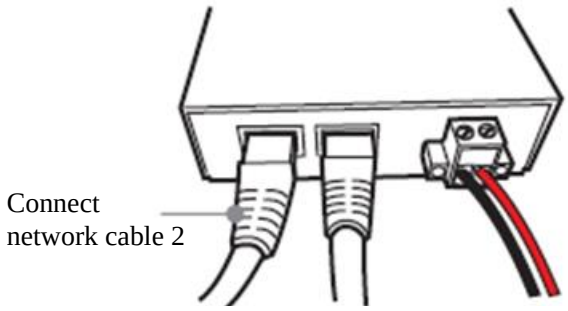
Figure 3-5 Connect the Power Cable



5) Connect power cable 2.

Connect the uplink (connected to any HPoE port) network cable to the "Data&Power in" port of the power adapter.

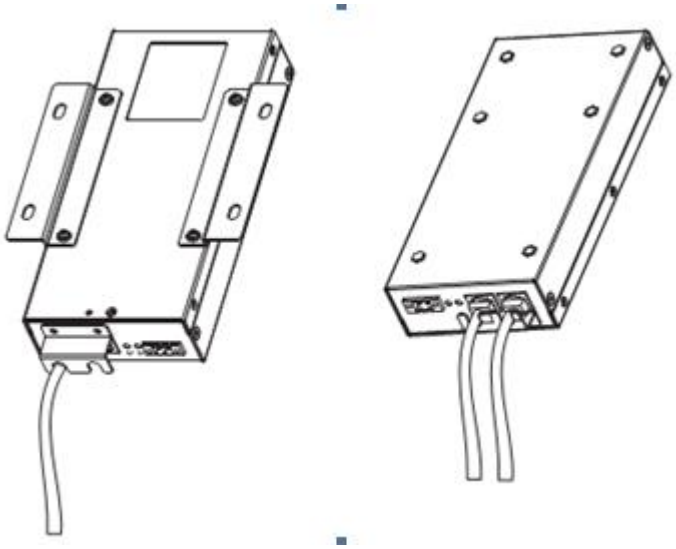
Figure 3-6 Connect Power Cable 2



6) Install the anti-loose bracket of the RJ45 connectors. (Only for cables without protective covers.)

Install the anti-loose bracket in the way as shown in the following figure, and fix it with screws.

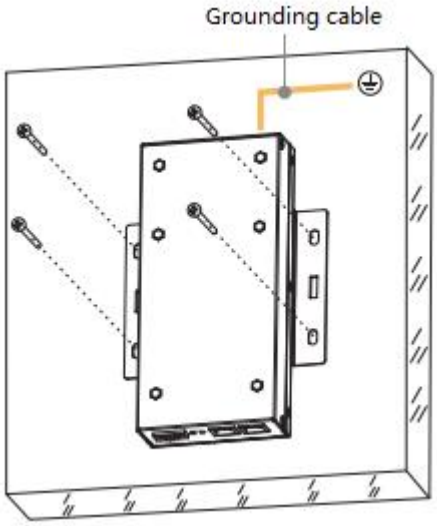
Figure 3-7 Installing the Anti-loose Bracket and Fix it with Screws



7) Connect the grounding cable.

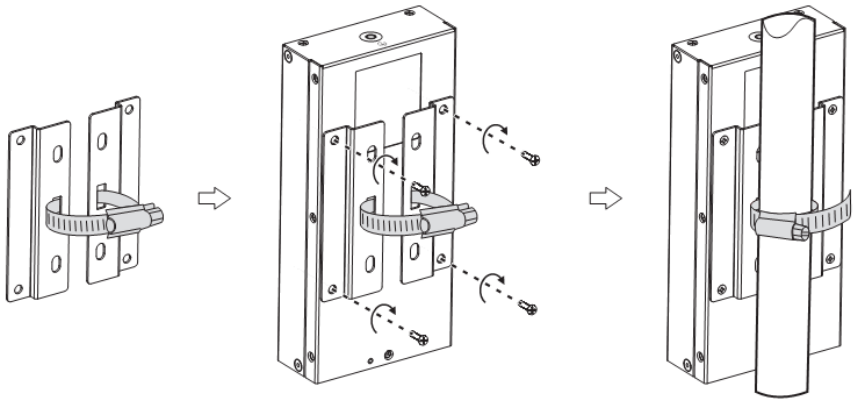
Fasten one end of the grounding cable to the screw hole on the back panel of the power adapter using screws, and ensure proper grounding of the other end.

Figure 3-8 Connecting the Grounding Cable



3.3.2 Pole Mounting (for V1.XX Products)

1) Insert a hose clamp to the holes on the mounting brackets, attach the mounting brackets to the power adapter using screws, mount the mounting brackets to the pole, and tighten the screw of the hose clamp using a socket wrench, as shown in the following figures.



2) The following steps are the same as step 3)-7) for wall mounting.

3.4 Installation Verification

⚠ To avoid device damage or body injury, please ensure power is turned off before verifying the installation.

- Verify that the grounding cable has been connected.
- Verify that the cables have been properly connected.
- Verify that sufficient space has been left for air circulation.

3.5 Cautions during Construction

1. To avoid delay in the engineering progress, unpredictable problems during construction should be reported to the engineering unit in good time, and solutions need to be provided to the unit for on-spot resolution.
2. Flaws in the engineering scheme observed during construction should be negotiated with the engineering unit in time and settled properly.
3. To guarantee quality, construction in some sites or sections should be checked before acceptance in a phase-wise and timely manner.
4. Make sure that power is off when installing or removing the power adapter or connecting cables to it. In the case of the RG-PBOX, it means to disconnect the input cable.
5. If the RG-PBOX produces smoke, stink or noise, please remove the input cable immediately and contact the distributor or service center.
6. When the RG-PBOX does not work, please contact the distributor or service center. Do not disassemble or modify the device in any way. (Ruijie assumes no responsibility for problems caused by unauthorized modification or repair.)