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Linksys One Business Series RPS1000 Installation and Administration Guide

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LINKSYS BUSINESS SERIES RPS1000 INSTALLATION AND ADMINISTRATION GUIDE

Linksys One Business Series 380W Redundant Power Supply

Model RPS1000

cisco

Document Revision History

Revision	Date	Description
1.1	March 16, 2007	Edits from feedback
1.0	December 15, 2006	Initial release

Preface

Audience

This publication is designed for people who have some experience installing networking equipment such as routers, hubs, servers, and switches. We assume the person installing and troubleshooting the RPS1000 is familiar with electronic circuitry and wiring practices and has experience as an electronic or electromechanical technician.

Purpose

This guide documents the hardware features of the Linksys Business Series 380W Redundant Power Supply Unit (RPS1000). It describes the physical and performance characteristics of the RPS1000, explains how to install the RPS1000, and provides troubleshooting information.

The RPS1000 provides redundant power for the Linksys Business Series family of Ethernet switches.

To determine if your switch can use the RPS1000, refer to your switch's documentation.

Organization

This guide is organized into the following chapters:

- Chapter 2, "Product Overview,"is a physical and functional overview of the RPS1000. It describes the features, the LEDs and includes examples of how the RPS1000 could be deployed.
- Chapter 3, "Installation," contains the procedures on how to install the RPS1000 on a rack, table, or shelf, and how to connect the RPS1000 to supported devices.
- Appendix A, "Technical Specifications," lists the specifications for the RPS1000.
- Appendix B, "Troubleshooting," describes how to identify and resolve some of the problems that might arise when installing the switch.
- Appendix C, "Linksys Contact Information," lists the various methods for contacting Linksys for assistance.
- Appendix D, "Connector and Cable Specifications,"describes the connectors, cables, and adapters that can be used to connect to the RPS1000.

Related Documentation

Refer to the following documents for additional information related to the Linksys Business Series solution:

- *SFE2000 Fast Ethernet Switch Quick Installation Guide*
- *SFE2000P Fast Ethernet Switch Quick Installation Guide*

- *SGE2000 Gigabit Ethernet Switch Quick Installation Guide*
- *SGE2000P Gigabit Ethernet Switch Quick Installation Guide*
- *SFE2000/SFE2000P Fast Ethernet Administration Guide*
- *SFE2000/SFE2000P Fast Ethernet Reference Guide*
- *SGE2000/SGE2000P Gigabit Ethernet Administration Guide*
- *SGE2000/SGE2000P Gigabit Ethernet Reference Guide*

Product Overview

The RPS1000 provides N+1 redundancy. The RPS1000 provides seamless failover to internal power supply failures for one of up to six switches. The RPS1000 automatically senses when a connected device has experienced an internal power supply failure. It then begins to supply power to the device. The RPS1000 supplies power until the power supply of the failed device is replaced or the device is replaced. You can then return the RPS1000 to active mode so that it is available to supply power to another device.

If a connected device fails, the RPS1000 sends status information to the other connected devices and to network management software.

This status information alerts administration that these devices are not supported until the failed device or the power supply of the failed device is brought up or replaced. To achieve one-to-one redundancy, you must connect each device to a different RPS1000.

NOTE: The RPS1000 is designed to provide backup for internal power supply failures of connected device power supplies. It is not designed to act as a backup power source that protects against losses of power due to external power outages. We recommend using an uninterruptable power system (UPS) as protection against power outages.

The RPS1000 was designed to support specific Linksys Business Series products. Connectors are not interchangeable.

Consult your switch documentation to determine if it supports the RPS1000 product.

Features

The Linksys Business Series RPS1000 is shown in the figure below.

The RPS1000 has these features:

- Six output channels to support multiple devices
- RPS1000 status information available through the network management application on the device
- Front-panel LEDs to show status for each output channel, internal power supplies, fans, and temperature
- Quick switch over capability to ensure that the switch does not reboot if the internal switch power supply should fail
- Support for the SFE2000/2000P and SGE2000/2000P Ethernet switches
- Small form-factor suitable for rack-mounting to provide maximum wiring closet port density
- Two output levels:
  - –48 VDC / 5.6A
  - 12 VDC / 8.5A

  The two output levels provide a maximum total output power of 380 W. The –48 VDC mode powers telephone systems in Power over Ethernet (PoE) switches.
- A single 48-inch (1.2-meter) 16-pin-to-14-pin connector cable (part number: RPSCBL1) to allow connection to an external device. Additional cables can be ordered separately.

Front-Panel Description

The RPS1000 front panel includes the status LEDs for the RPS1000 and a STBY/ACTIVE button.

LEDs

The LEDs display the status of the RPS1000 and show whether the RPS1000 is powering a connected device. LEDs can be off, green, or amber.

The six DC output LEDs display the status of the six output connectors that you use to connect to supported devices. The output LEDs are numbered 1 to 6, which corresponds to the numbers on the DC outputs.

LED	Off	Green	Amber
STBY/ ACTIVE	The RPS1000 is not powered up.	The RPS1000 is in active mode and available to back-up a failed device.	(Blinking) The RPS1000 is in standby mode. You can connect devices to the RPS1000, and it does not attempt to back them up until you press the STBY/ ACTIVE button and place the RPS1000 into active mode.
DC	The RPS1000 is not powered up.	The RPS1000 internal power supplies are up and running.	The DC output power is not functioning correctly.
TEMP	The RPS1000 is not powered up.	The RPS1000 internal temperature is in the acceptable range.	The RPS1000 is approaching an over-temperature condition.

LED	Off	Green	Amber
FAN	The RPS1000 is not powered up.	The fan is running.	The fan is not operating properly.

STBY/ACTIVE Button

Color	DC Output Status
Off	No device is connected to the output connector.
Green	A device is connected to the output connector.
Blinking green	The RPS1000 is unavailable to the connected device. The RPS1000 is providing power to another connected device.
Blinking amber	The RPS1000 is providing power to the connected device; the output is active.
Amber	The RPS1000 is in standby mode or in a fault condition.

The RPS1000 has a front panel STBY/ACTIVE button.

NOTE: The RPS1000 is in active mode (STBY/ACTIVE LED green) when it powers up. It must be in standby mode every time you connect devices to it.

If you connect a device to the RPS1000 when it is in active mode (STBY/ACTIVE LED green), the RPS1000 might unnecessarily begin supplying backup power to the device. This situation might occur if you connect the device before it is powered up, or if the RPS1000 does not immediately sense that the device power supply was supplying power. In this case, the RPS1000 would not be available as a backup power source for other connected devices.

Press the **STBY/ACTIVE** button to change the RPS1000 from active mode to standby mode when you connect devices. When you change the mode to active, the STBY/ACTIVE LED turns green.

When you want to connect additional devices, press the STBY/ACTIVE button to place the RPS1000 in standby mode. The STBY/ACTIVE LED flashes amber. When you have connected and powered up all devices, press the STBY/ACTIVE button again to put the RPS1000 into active mode.

NOTE: When the RPS1000 is in standby mode, all of the DC Output LEDs are amber.

NOTE: When the RPS1000 is in standby mode, the RPS1000 LED that is on the connected device is amber; this means that the RPS1000 is connected but is not functioning. When you press the STBY/ACTIVE button, the RPS1000 LED that is on the connected device changes to green to show that the RPS1000 is operating properly.

Rear-Panel Description

The RPS1000 rear panel has an AC power input connector and six DC output connectors (numbered 1 to 6) to connect to supported devices.

1 2 2 2 2 2 2 3

1	AC input connector
2	DC output connectors
3	Fan exhaust

Use the supplied AC power cord to connect to an AC power outlet.

The DC output connectors require a Cisco 16-pin-to-14-pin cable (RPSCBL1) to connect to supported devices. (One cable is supplied with the RPS1000; you can order additional cables separately.) The

16-pin connector plugs into the RPS1000, and the 14-pin connector plugs into the device. Use only the Cisco cable for this connection.

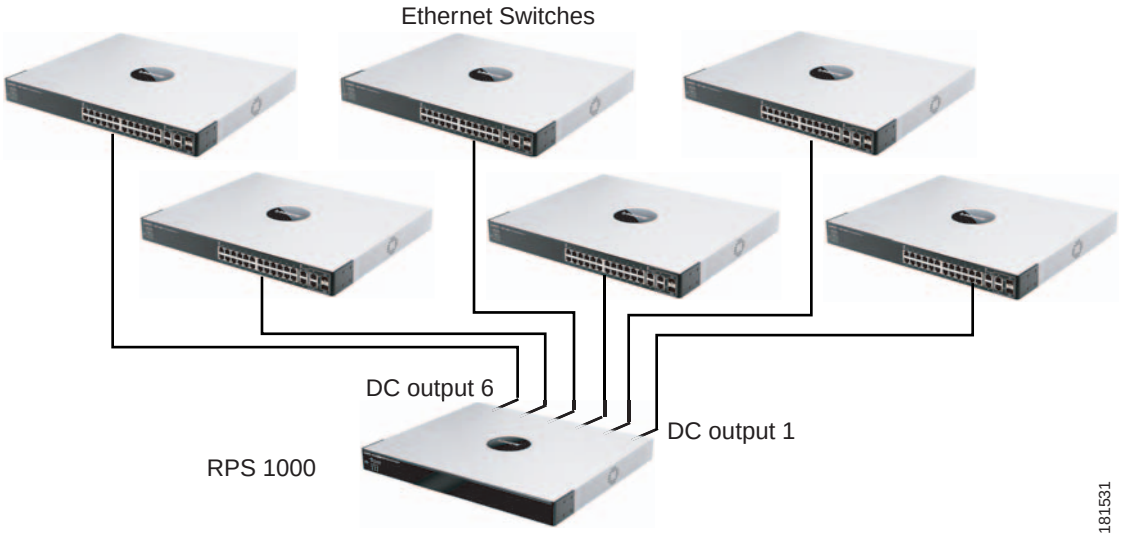
WARNING: Attach only the RPS1000 cable (part # RPSCBL1) to the RPS1000 receptacle.

Deployment Strategies

You can deploy the RPS1000 in a variety of situations with mission-critical applications.

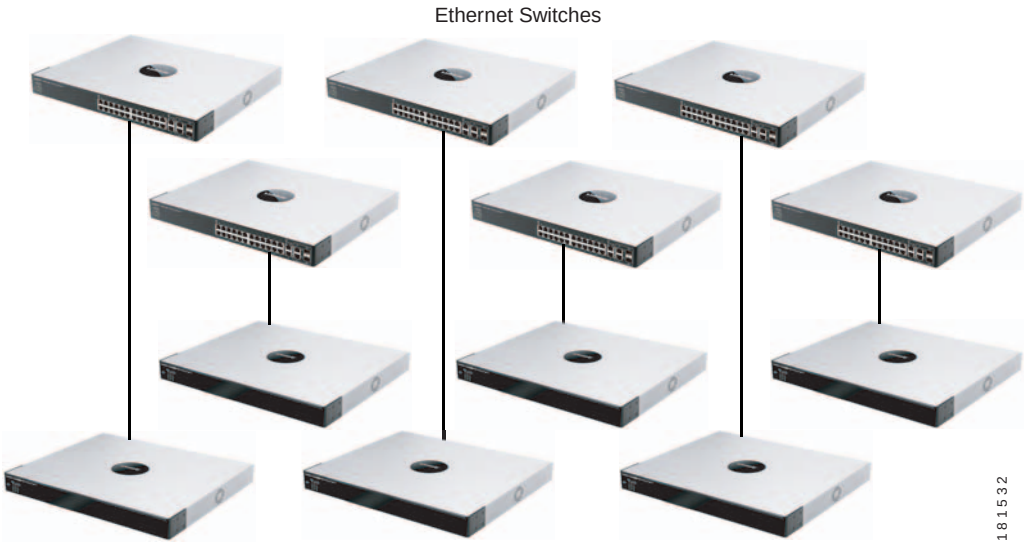
One application might be in a voice and data network in which Linksys Business Series switches are connected to Linksys Business Series IP phones and PCs. Connecting an RPS1000 to the switches can prevent voice network failures that are caused by switch failures.

Another application might be that of using traditional data 10/100/1000 Ethernet switches that carry mission-critical data. These applications would typically use one RPS1000 to support one to six switches as shown below.



In this configuration, if one device has a power-supply or power-related failure, the RPS1000 immediately begins to supply power to this device and is no longer available as a backup power source for the other devices. The RPS1000 sends status information to network management software to alert the system administrator that the other devices are not supported until the failed device or the power supply in the failed device is repaired or replaced.

When the network supports mission-critical applications that require one-to-one redundancy, an RPS1000 is connected to each supported device to ensure that each switch is always supported. This one-to-one redundant configuration is shown below.



Installation

This chapter describes how to install and connect the RPS1000 and includes these topics:

- Preparing for Installation
- Installing the Switch
- Connecting the RPS1000

Preparing for Installation

Read these sections and perform the procedures in the order that they are presented:

- Site Requirements
- Verifying the Package Contents

Warnings.

WARNING: To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 113°F (45°C). To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings.

WARNING: Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

WARNING: If a RPS1000 is not connected to the switch, install an RPS1000 connector cover on the back of the switch.

WARNING: Do not work on the system or connect or disconnect cables during periods of lightning activity.

WARNING: Read the installation instructions before connecting the system to the power source.

WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

WARNING: This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

WARNING: The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device.

WARNING: This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

WARNING: Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

WARNING: Ultimate disposal of this product should be handled according to all national laws and regulations.

WARNING: No user-serviceable parts inside. Do not open.

WARNING: Installation of the equipment must comply with local and national electrical codes.

In addition, you should always follow these guidelines:

- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.

Site Requirements

Be sure to observe these requirements as you determine where to place the RPS1000:

WARNING: This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

For proper operation, where you locate the RPS1000 is extremely important. If the equipment is placed too close together, the ventilation is inadequate, and panels are inaccessible, malfunctions and shutdowns might result, and maintenance will be difficult.

Consider this information when you plan the location of the chassis:

- Provide for access to both the front and rear panels of the RPS1000.
- Make sure that the room where the RPS1000 operates has adequate ventilation. Ambient air temperature might not cool equipment to acceptable operating temperatures without adequate ventilation. See the RPS1000—Business Series 380W RPS Quick Installation Guide for temperature requirements.

Verifying the Package Contents

NOTE: Carefully remove the contents from the shipping container and check each item for damage. If any item is missing or damaged, contact your Cisco representative or reseller for support. Replace all packing material into the shipping container and save it.

These items are shipped:

- The RPS1000
- This *Linksys Business Series RPS1000 Redundant Power System Hardware Installation Guide*
- Product Registration Card
- AC power cord
- One 16-pin-to-14-pin DC connector cable
- Mounting kit that contains:
  - Four rubber feet for mounting the switch on a table
  - Two mounting brackets
  - Four Phillips flat-head screws for attaching the brackets to the switch
  - Four Phillips truss-head screws for attaching the brackets to the switch

– Four Phillips machine screws for attaching the brackets to a rack

Installing the Switch

This section describes these installation procedures:

- Table or Shelf-Mounting, page 14
- Rack-Mounting, page 14

Table or Shelf-Mounting

WARNING: Do not stack the chassis on any other equipment. If the chassis falls, it can cause severe bodily injury and equipment damage.

Follow these steps to install your chassis on a table or shelf:

1. Unpack the RPS1000.
2. Attach the rubber feet from the accessory kit into the round recesses that are located on the bottom of the chassis.
3. Place the RPS1000 chassis on an appropriate table, shelf, or desktop.

NOTE: If you have questions or need assistance, see the Appendix C, "Linksys Contact Information," section.

Rack-Mounting

To install the chassis in a 19-inch or 24-inch rack, follow the instructions described in these procedures.

NOTE: A 24-inch rack requires optional mounting hardware.

Planning Your Rack-Mount Installation

WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Consider this information when you plan your equipment rack installation:

- Enclosed racks must have adequate ventilation. Make sure that the rack is not congested because each unit generates heat. The intake ports of equipment that is located higher in the rack can draw heat upward from the equipment that is located near the bottom of the rack. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, make sure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated in the rack.
- Baffles can isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which you can determine by experimenting with different configurations.
- When equipment installed in a rack (particularly in an enclosed rack) fails, try this test: Operate the equipment by itself, if possible. Power off other equipment in the rack and in adjacent racks to allow the unit under test a maximum of cooling air and clean power.
- Install the RPS1000 and the external devices to which it will connect in adjacent shelves in a rack.

Tools and Equipment Required

To rack-mount the RPS1000, you need these tools and equipment:

- Number 12 Phillips screwdriver
- Number 8 Phillips screwdriver
- Screws for attaching the brackets to the RPS1000 and the RPS1000 to the rack
- Rack-mount brackets (19-inch or 24-inch) from the accessory kit

Attaching the Brackets to the RPS1000

The bracket orientation and the screws that you use depend on whether you are attaching the brackets for a 19-inch or a 24-inch rack. Use two of the supplied screws to attach each bracket, according to the following guidelines:

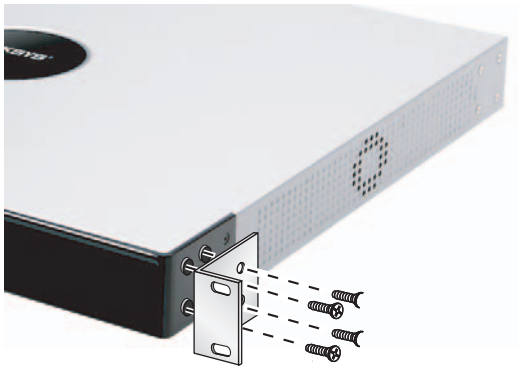
- For a 19-inch rack, use the supplied number-8 Phillips flat-head screws to attach the long side of the bracket to the RPS1000.
- For a 24-inch rack, use the supplied number-8 Phillips truss-head screws to attach the short side of the bracket to the RPS1000.

NOTE: If you install the switch in a 24-inch rack, an optional bracket kit that is not included with the switch is required. You can order a kit that contains the 24-inch rack-mounting brackets and hardware from Cisco (part number RCKMNT-1RU=).

You can install the RPS1000 into a rack with either the front panel or the rear panel facing forward.

NOTE: If you plan to use the optional cable guide, you should mount the RPS1000 with the rear panel forward.

The following figures show how to attach a bracket to one side of the RPS1000 for installation into 19-inch or 24-inch racks with the front panel facing forward The device can also be mounted so that the rear panel of the RPS1000 faces forward.



Mounting the RPS1000 in a Rack

After the brackets are attached to the RPS1000, use the four supplied number-12 Phillips machine screws to securely attach the brackets to the rack, as shown below.

Connecting the RPS1000

CAUTION: Make sure that the RPS1000 is either in standby mode or that the RPS1000 AC power is disconnected before you connect the RPS1000 to a switch. This precaution is necessary because when you connect the RPS1000 to the AC power, the RPS1000 automatically becomes active.

NOTE: Do not use different power sources to power up the RPS1000 and the connected device. If you connect to separate AC power sources, reset conditions might occur.

NOTE: The switch might restart when it changes from RPS1000 power to its own internal power. This situation might occur after the power supply on a switch fails, the RPS1000 takes over, and the switch reverts to its own power. We advise you to assume this possibility and plan accordingly when you restart a switch using its internal power after using the RPS1000 as backup power.

WARNING: Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.

With the RPS1000 on a desktop or in a rack, connect devices as follows:

1. If the RPS1000 is already connected to AC power, press the **STBY/ACTIVE** button on the RPS1000 to put it into standby mode or disconnect the RPS1000 from the AC power. If you pressed the **STBY/ACTIVE** button, the STBY/ACTIVE LED should begin blinking amber. If the STBY/ACTIVE LED does not blink amber, see Chapter B, "Troubleshooting".
2. Connect one end of an RPS1000 connector cable (part number: RPSCBL1) to an RPS1000 DC output connector. To ensure proper operation, be sure that you completely seat the connector and that you securely tighten the screw.

NOTE: The connector is designed to be inserted into the receptacle in its correct orientation.

WARNING: Attach only the Cisco RPS1000 (model PWR675-AC-RPS-N1) to the RPS1000 receptacle.

3. Connect the other end of the RPS1000 connector cable to the RPS1000 receptacle on the switch.
4. Repeat 2. through 3. for each switch that the RPS1000 will support.

5. Connect all supported devices to an AC power source.

NOTE: The RPS1000 is designed to provide backup for internal power supply failures of connected device power supplies. It is not designed to act as a backup power source that protects against losses of power due to external power outages. We recommend using an uninterruptable power system (UPS) as protection against power outages.

6. If the RPS1000 is not already connected to AC power, connect the AC power cable to the RPS1000, and connect the other end of the power cable to an AC power source.
7. Press the RPS1000 **STBY/ACTIVE** button to put the RPS1000 into active mode.

The STBY/ACTIVE, Output Power, Temperature, and Fan LEDs on the RPS1000 front panel should be green. The DC Output LEDs for the connected devices should also be green. If they are not green, see "LEDs" section on page 5 for the appropriate action to take.

Technical Specifications

The following table lists the technical specifications for the RPS1000.

Environmental Ranges	
Operating temperature	32 to 113°F (0 to 45°C)
Storage temperature	–4 to 149°F (–20 to 65°C)
Operating humidity	10 to 85% (noncondensing)
Storage humidity	5 to 95% (noncondensing)
Operating altitude	Up to 10,000 ft (3,000 m)
Storage altitude	Up to 15,000 ft (4,570 m)
Power Requirements	
AC input voltage	100 to 240 VAC (auto ranging) 6 to 10 A, 50 to 60 Hz 875 W
Power delivery (available power) Total	375 W per –48 VDC output and 300 W per 12 VDC output
Standby power	25 W
KVA	0.875 KVA
Physical Dimensions	
Weight	11.5 lb. (5.22 kg)
Dimensions (H x W x D)	1.75 x 17.5 x 14.88 in. (4.45 x 44.45 x 37.8 cm)

Safety	**EMC**
UL 60950	FCC Part 15 Class A
CAN/CSA 22.2 No. 60950	BSMI
IEC 60950/EN 60950	EN 55022: 1998 (CISPR22) Class A

AS/NZS 3260, TS001	EN 55024: 1998 (CISPR24)
CE	VCCI Class A
CCC approval pending	AS/NZS 3548 Class A
CLEI code	CE
NOM	CNS 13438 Class A
	MIC

Troubleshooting

The RPS1000 is not repairable in the field. The following table shows the appropriate action to take for specific LED indications.

Symptom	Condition	Action
STBY/ACTIVE LED is blinking amber.	The RPS1000 is in standby mode.	Press the STBY/ACTIVE button to put the RPS1000 in active mode.
STBY/ACTIVE LED is off.	The AC power connection to one or both of the internal power supplies is faulty or not connected.	Check the AC power connection to external power. If the AC power is connected properly, the problem might be with the RPS1000 internal power supplies.
Output Power LED is amber.	The DC output power from the internal power supplies is not available or is not functioning correctly.	An internal power supply is defective, or the RPS1000 has reacted to an over-current condition. Press the STBY/ACTIVE button. If the LED color does not turn green, replace the RPS1000.
Temperature LED is amber.	The RPS1000 is approaching an over-temperature condition.	Reduce the ambient temperature.
Fan LED is amber.	The fan is not operating properly.	The fan is defective. Replace the RPS1000.
One or more DC Output LEDs are blinking green.	The RPS1000 is unavailable to the connected device. It is either providing power to another connected device or a fault condition exists.	Verify that the RPS1000 is supplying power to one device. If so, this is a normal indication and will change when that external device is again supplying its own power and you press the STBY/ACTIVE button.
One or more DC Output LEDs are solid amber.	The RPS1000 is in standby mode.	Press the STBY/ACTIVE button to put the RPS1000 into active (or ready) mode.

Linksys Contact Information

Need to contact Linksys?

Visit us online for information on the latest products and updates to your existing products at:
`http://www.linksys.com/international`

If you experience problems with any Linksys product, you can e-mail us at:

In Europe	E-mail Address
Austria	support.at@linksys.com
Belgium	support.be@linksys.com
Czech Republic	support.cz@linksys.com
Denmark	support.dk@linksys.com
Finland	support.fi@linksys.com
France	support.fr@linksys.com
Germany	support.de@linksys.com
Greece	support.gr@linksys.com (English only)
Hungary	support.hu@linksys.com
Ireland	support.ie@linksys.com
Italy	support.it@linksys.com
Netherlands	support.nl@linksys.com
Norway	support.no@linksys.com
Poland	support.pl@linksys.com
Portugal	support.pt@linksys.com
Russia	support.ru@linksys.com
Spain	support.es@linksys.com
Sweden	support.se@linksys.com
Switzerland	support.ch@linksys.com
United Kingdom	support.uk@linksys.com

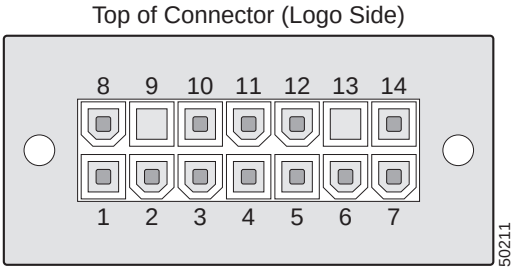
Outside of Europe	E-mail Address
Asia Pacific	asiasupport@linksys.com (English only)
Latin America	support.portuguese@linksys.com or support.spanish@linksys.com
Middle East & Africa	support.mea@linksys.com (English only)
South Africa	support.ze@linksys.com (English only)
UAE	support.ae@linksys.com (English only)
U.S. and Canada	support@linksys.com

Connector and Cable Specifications

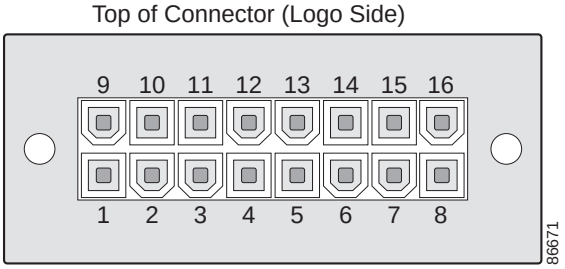
This appendix describes the cable connector that is used to connect the RPS1000 to a supported device. The cable (CAB-RPS-1614=) is a 48-inch (1.2-meter) cable with a 16-pin connector on one end and a 14-pin connector on the other end. The following figures show the pinout information.

TIP: The connector is keyed to insert into the receptacle only in its correct orientation.

14-Pin Connector Pinouts



16-Pin Connector Pinouts



Pin Number	14-Pin Designation	16-Pin Designation
1	GND	GND–48 V
2	–48 V	–48 V
3	12 V	12 V

Pin Number	14-Pin Designation	16-Pin Designation
4	12 V	12 V
5	12 V	12 V
6	12 V	12 V
7	GND	GND–12
8	GND	GND–12
9	–48 V	GND–48 V
10	RPS_PRES (RPS1000 present)	–48 V
11	RPS_CTRL 0	RPS_PRES (RPS1000 present)
12	RPS_CTRL 1	RPS_CTRL 0
13	PWR_GOOD (power is good)	RPS_CTRL 1
14	GND	PWR_GOOD (power is good)
15		GND–12
16		GND–12 V

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