



Cisco 600W Redundant Power System Quick Start Guide with License and Warranty Information

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1 Cisco 90-Day Limited Hardware Warranty Terms

There are special terms applicable to your hardware warranty and various services that you can use during the warranty period. Your formal Warranty Statement, including the warranty applicable to Cisco software, is included on the CD that accompanies your Cisco product. Follow these steps to access and download the *Cisco Information Packet* and your warranty document from the CD or from Cisco.com.

1. Launch your browser, and go to this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/cetrans.htm

The Warranties and License Agreements page appears.

2. To read the *Cisco Information Packet*, follow these steps:

- a. Click the **Information Packet Number** field, and make sure that the part number 78-5235-02F0 is highlighted.
- b. Select the language in which you would like to read the document.
- c. Click **Go**.

The Cisco Limited Warranty and Software License page from the Information Packet appears.

- d. Read the document online, or click the **PDF** icon to download and print the document in Adobe Portable Document Format (PDF).



Note

You must have Adobe Acrobat Reader to view and print PDF files. You can download the reader from Adobe's website: <http://www.adobe.com>

3. To read translated and localized warranty information about your product, follow these steps:

- a. Enter this part number in the Warranty Document Number field:

78-5236-01C0

- b. Select the language in which you would like to read the document.
- c. Click **Go**.

The Cisco warranty page appears.

- d. Review the document online, or click the **PDF** icon to download and print the document in Adobe Portable Document Format (PDF).

You can also contact the Cisco service and support website for assistance:

<http://www.cisco.com/en/US/support/>

Duration of Hardware Warranty

Ninety (90) days.

Replacement, Repair, or Refund Policy for Hardware

Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of a Return Materials Authorization (RMA) request. Actual delivery times can vary, depending on the customer location.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

To Receive a Return Materials Authorization (RMA) Number

Contact the company from whom you purchased the product. If you purchased the product directly from Cisco, contact your Cisco Sales and Service Representative.

Complete the information below, and keep it for reference:

Company product purchased from	
Company telephone number	
Product model number	
Product serial number	
Maintenance contract number	

2 Documents, Equipment, and Tools

User Documentation

The documents described here are available online and on the documentation CD-ROM that you might have received with your router. To be sure of obtaining the latest information, you should access the online documentation.

To print a document in its original page format, access the online document, and click the PDF icon.

For more information about obtaining user documentation, see the “Obtaining Documentation” section on page 14.

To access online user documentation on Cisco.com (PDF and HTML formats):

Start on Cisco.com at <http://www.cisco.com>, and select **Products & Services > Accessories > Power Supplies > Instructions and Guides > Document type > Document**.



Note You can also access user documents on the previous Cisco website. On the Cisco.com home page, click on “Technical Documentation on Cisco Connection Online” and follow the navigation paths described below.

To access user documentation on the Documentation CD-ROM (HTML format only) or on Cisco Connection Online (CCO):

Start at **Cisco Product Documentation** and navigate to user documents using the paths described below.



Tip To navigate to the next higher level in the documentation hierarchy, click on **CONTENTS** in the navigation bar at the top of each page.

Cisco RPS Documentation

Regulatory Compliance and Safety Information

The regulatory compliance and safety document provides essential safety information applicable to the Cisco RPS. This document contains foreign-language translations of the safety warnings applicable to the Cisco RPS.

You can access this document at **Cisco Product Documentation > Access Servers and Access Routers > Cisco 600W Redundant Power System > Regulatory Compliance and Safety Information**.

Hardware Installation Guide

A hardware installation guide provides specifications and additional instructions for installing and connecting the Cisco RPS.

You can access this document at **Cisco Product Documentation > Access Servers and Access Routers > Cisco 600W Redundant Power System > Cisco RPS Hardware Installation Guide**.

Related Hardware Installation

Additional hardware installation documents provide information about installing interconnection adapters in routers and about rack-mounting the Cisco RPS.

You can access these documents at **Cisco Product Documentation > Access Servers and Access Routers > Cisco 600W Redundant Power System > Procedures for Spare Parts: Adapter Plates and Rack Brackets.**

Release Notes

Release notes for the Cisco RPS provide information about the use of the Cisco RPS with various switches, hubs, and repeaters.

You can access this document at **Cisco Product Documentation > Access Servers and Access Routers > Cisco 600W Redundant Power System > Cisco Redundant Power System (RPS) Release Notes.**

Items Included with Cisco RPS

The following items are supplied with each Cisco RPS except as noted:

- Rack-mount brackets with screws for 19-inch rack
- Two AC power cords
- (With Cisco RPS -CAB model only) Four 1-to-1 DC output cables, 22-pin to 18-pin, for quasi-redundant DC power for:
 - Cisco hubs and switches
 - Cisco 2600 series routers; Cisco 3620, Cisco 3640, and Cisco 3725 routers; and Cisco 4000 series routers
- *Regulatory Compliance and Safety Information* document
- *Cisco Redundant Power System Quick Start Guide* (this document)

Separately Orderable Items

One or more of the following cables are required for use with the Cisco RPS -NCAB model, which ships without DC output cables. See Table 2 on page 8 for cable usage and ordering information.

- 1-to-1 DC output cable, 22-pin to 18-pin
- 1-to-1 DC output cable, 22-pin to 8-pin
- 2-to-1 Y cable, 22-pin to 18-pin or 22-pin to 8-pin

The following optional rack-mounting brackets can be ordered separately:

- Rack-mount brackets with screws for 23-inch and 24-inch racks
- Rack-mount brackets with screws for telco racks

An RPS adapter module is required for each of the following Cisco devices powered by a Cisco RPS: Cisco 2500 series routers; Cisco 2600 series routers; Cisco 4000 series routers; Cisco 3620, Cisco 3640, and Cisco 3725 routers, and Cisco MC3810 series concentrators. See Table 1 on page 8 for adapter plate usage and ordering information.

Items Not Included

Individual items in this list may be required for your application:

- Interface module to adapt the router or concentrator for use with the Cisco RPS
- Four screws for installing the chassis in a rack
- Phillips screwdriver
- Small blade screwdriver
- Cable ties for cable management

3 Install the Chassis

Safety Information

For safety information you need to know before working on your Cisco RPS, see the *Regulatory Compliance and Safety Information* document that accompanied this device.

Chassis Installation Methods



Warning

Only trained and qualified personnel should be allowed to install or replace this equipment. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

You can set the chassis on a desktop or install it in a rack. See the applicable instructions following.



Caution

Your chassis installation must allow unrestricted airflow for chassis cooling. For installation on a desktop, be sure to install the rubber feet; they provide clearance for cooling airflow.

Installation in a Rack

You can install the Cisco RPS in a 19-inch, 23-inch, or 24-inch rack with the following chassis orientations:

- In a 19-, 23-, or 24-inch rack:
 - Brackets attached at the front of the chassis with the front panel facing forward
 - Brackets attached at the rear of the chassis with the rear panel facing forward
- In a center-mount telco rack:
 - Brackets attached at the front of the chassis with the front panel facing forward
 - Brackets attached at the rear of the chassis with the rear panel facing forward

The rack-mounting brackets are shown in Figure 1 and Figure 2.

Figure 1 Brackets for 19-, 23-, and 24-Inch Rack-Mounting

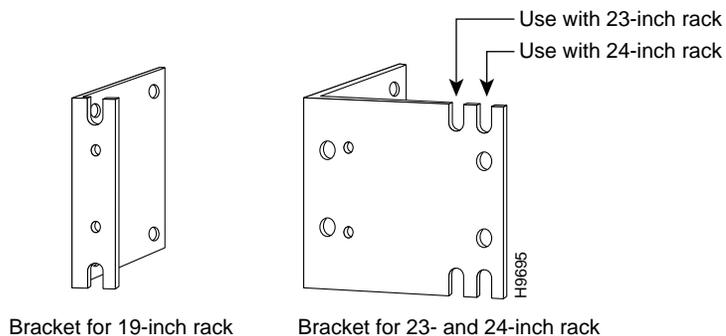
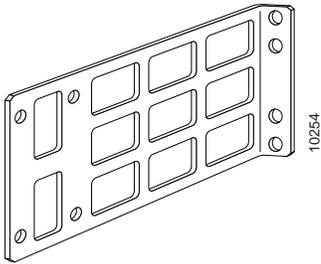


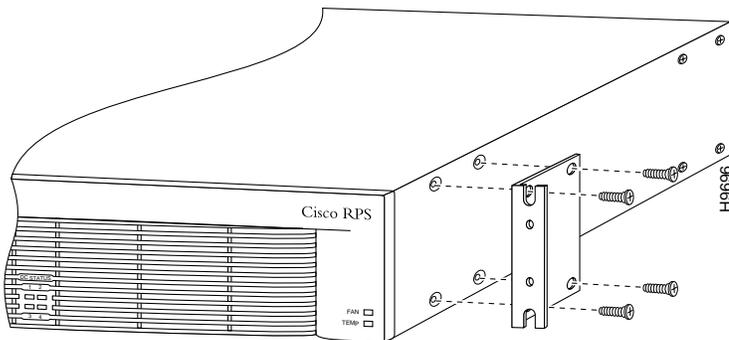
Figure 2 *Brackets for Telco Rack-Mounting*



Attaching Brackets

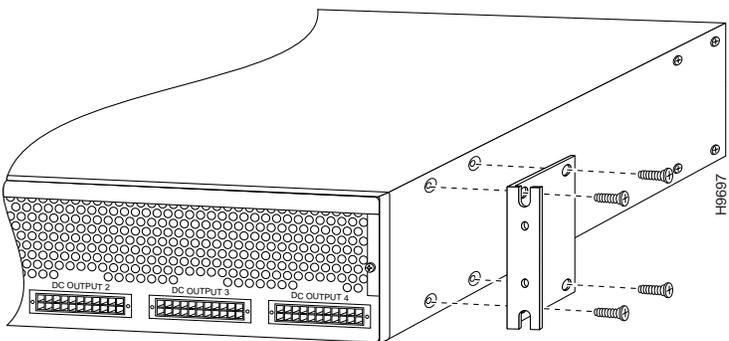
Attach the mounting brackets to the chassis as shown in Figure 3, Figure 4, or Figure 5, using the screws provided in the bracket kit. Use a number 2 Phillips screwdriver to install the bracket screws.

Figure 3 *Bracket Attachment for 19-, 23-, or 24-Inch Rack with Front Panel Forward*



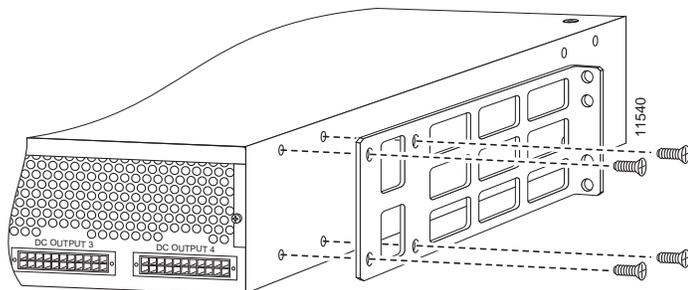
Note: The second bracket attaches to the other side of the chassis.

Figure 4 *Bracket Attachment for 19-, 23-, or 24-Inch Rack with Rear Panel Forward*



Note: The second bracket attaches to the other side of the chassis.

Figure 5 Bracket Attachment for Telco Rack with Rear Panel Forward



Note: The second bracket attaches to the other side of the chassis.
The brackets can also be installed with the Cisco RPS front panel forward.

Installing the Chassis in a Rack

Install the chassis in the rack. Rack-mounting screws are not provided with the router. Use two screws for each side (supplied with the rack).

Installation on a Desktop

For desktop installation, attach the rubber feet from the accessory kit in the round recesses on the chassis bottom.



Caution

If you place the Cisco RPS on a desktop, do not place anything that weighs more than 10 lb (4.5 kg) on top of the chassis.

4 Connect Cables



Caution

The Cisco RPS is power-factor-corrected to comply with certain International Electrotechnical Commission (IEC) standards. Do not connect the Cisco RPS to an uninterruptible power supply (UPS) that has not been tested and designed for power-factor-corrected power systems. Do not connect the Cisco RPS to a ferro-resonant transformer. If you do either of these things, you could damage the Cisco RPS.

Connection Options and Requirements

RPS Interface Modules

To connect to a Cisco RPS, Cisco routers and Cisco MC3810 series concentrators must be equipped with an RPS interface module. Interface modules are provided with installation instructions.

The FastHub 400 series hubs, Cisco 1516M hub (HP 10BASE-T Hub-16M), Catalyst 1900 and Catalyst 2820 series switches, and Catalyst 2900 series and Catalyst 3500 series XL switches ship with an RPS connector and do not require an RPS adapter module.

Table 1 summarizes the RPS interface module requirements.

Table 1 RPS Interface Modules

Powered Device	RPS Interface Module
Cisco 2500 series, Cisco MC3810	ACS-2500RPS=
Cisco 2600 series	ACS-2600RPS=
Cisco 3620	ACS-3620RPS=
Cisco 3640	ACS-3640RPS=
Cisco 3725	ACS-3725RPS=
Cisco 4000 series	ACS-4000RPS=

Connection Methods and Cables

Table 2 summarizes the redundancy options and cable requirements for the various external devices that can be supported by the Cisco RPS.

Table 2 Redundancy Options and Cable Requirements

Redundancy Configuration	DC-Powered Device	Cable Description	Cable Order Number
Quasi-redundant (Routers, hubs, and switches)	Cisco 1516M hub (HP 10BASE-T Hub-16M) FastHub 400 series hubs Catalyst 1900 series, Catalyst 2820 series, Catalyst 2900 series and Catalyst 3500 series XL switches Cisco 2600 series and Cisco 4000 series routers Cisco 3620, Cisco 3640, and Cisco 3725 routers	One-to-one cable, 22-pin to 18-pin, 4 ft. (1.22 m) ¹	CAB-RPS-2218=
	Cisco 2500 series routers and access servers Cisco MC3810 multiservice concentrators	One-to-one cable, 22-pin to 8-pin, 4 ft. (1.22 m) ¹	CAB-RPS-2208=
Fully redundant (Routers only)	Cisco 2600 series and Cisco 4000 series routers Cisco 3620, Cisco 3640, and Cisco 3725 routers	Two-to-one cable, 22-pin to 18-pin, 4 ft. (1.22 m) ¹	CAB-RPSY-2218=
	Cisco 2500 series routers and access servers Cisco MC3810 multiservice concentrators	Two-to-one cable, 22-pin to 8-pin, 4 ft. (1.22 m) ¹	CAB-RPSY-2208=
Redundant with reboot ² (Hubs and switches only)	FastHub 400 series hubs Catalyst 1900 series, Catalyst 2820 series, Catalyst 2900 series and Catalyst 3500 series XL switches	One-to-one cable, 22-pin to 18-pin, 4 ft. (1.22 m) ¹	CAB-RPS-2218=

1. The cables come in only one length. Custom cable-lengths are not available. Excessive voltage drop and marginal or failed operation can occur with cables of different lengths. Use of cables other than the ones listed can cause damage to the Cisco RPS or external device.
2. This configuration is not recommended due to the 30-second reboot and downtime.

The connection options are shown in the following figures:

- Quasi-redundant—Figure 6. The AC input to the Cisco RPS is fully redundant, but the DC output to the external devices is not.



Note

Quasi-redundant is the only recommended configuration for Cisco switches and hubs.

- Fully redundant—Figure 7. The power source is fully redundant because there are two AC input modules and two DC output power modules connected to each external device. If any power module fails, there is a full backup.



Note This configuration is not supported for switches and hubs.

- Redundant with reboot—Figure 8. In normal operation, the hub or switch is powered directly by its AC power connection. If the internal power system of the hub or switch fails, the device powers down for about 30 seconds until the Cisco RPS begins supplying power.



Note Redundancy with reboot works for the following devices only: FastHub 400 series hubs, Catalyst 1900 series and Catalyst 2820 switches, and Catalyst 2900 series and Catalyst 3500 series XL switches.

- Mixed quasi-redundant and fully redundant—Figure 9. Three external devices can be powered, with two in quasi-redundant mode and one in fully redundant mode.

Figure 6 *Quasi-Redundant Configuration*

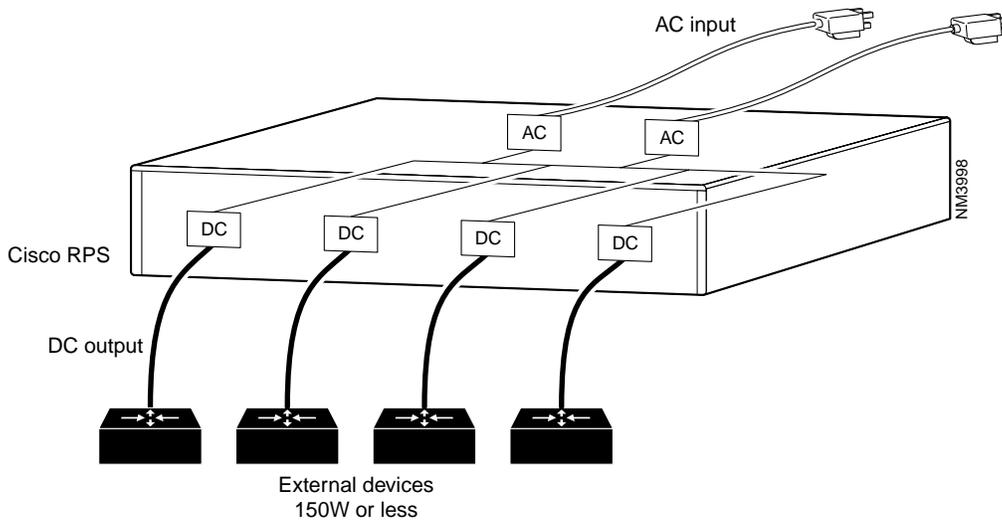


Figure 7 *Fully Redundant Configuration*

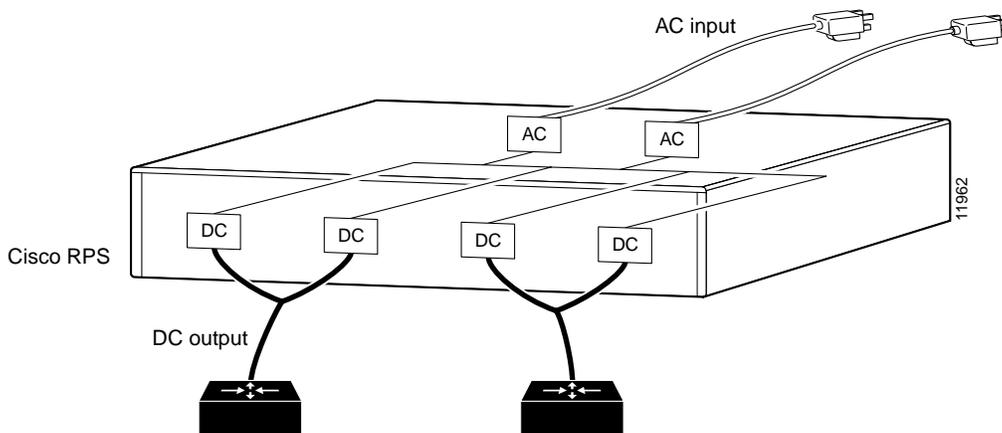


Figure 8 Redundant-with-Reboot Configuration

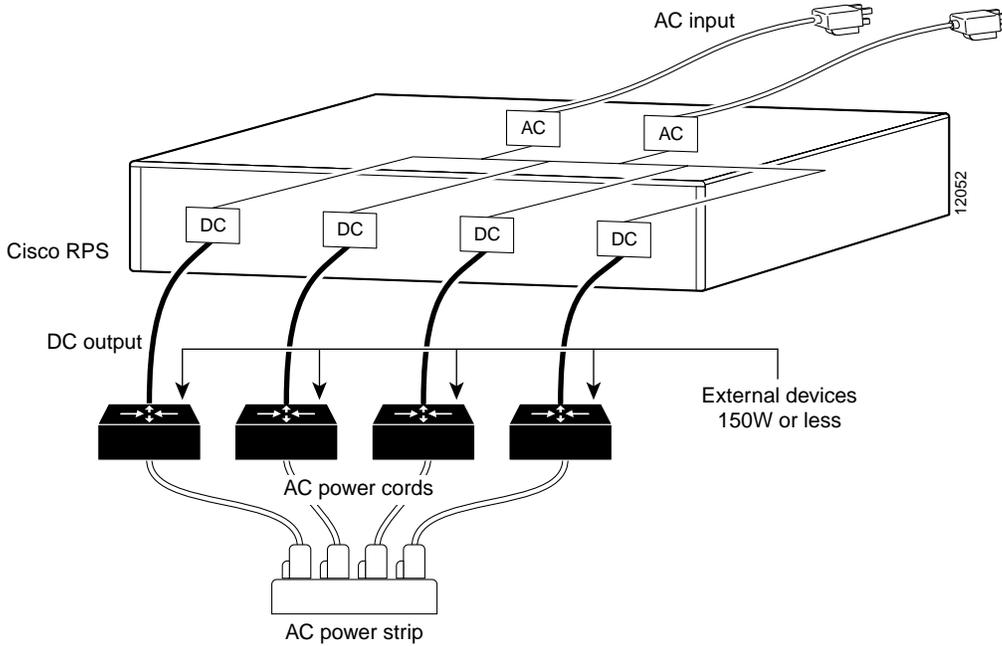
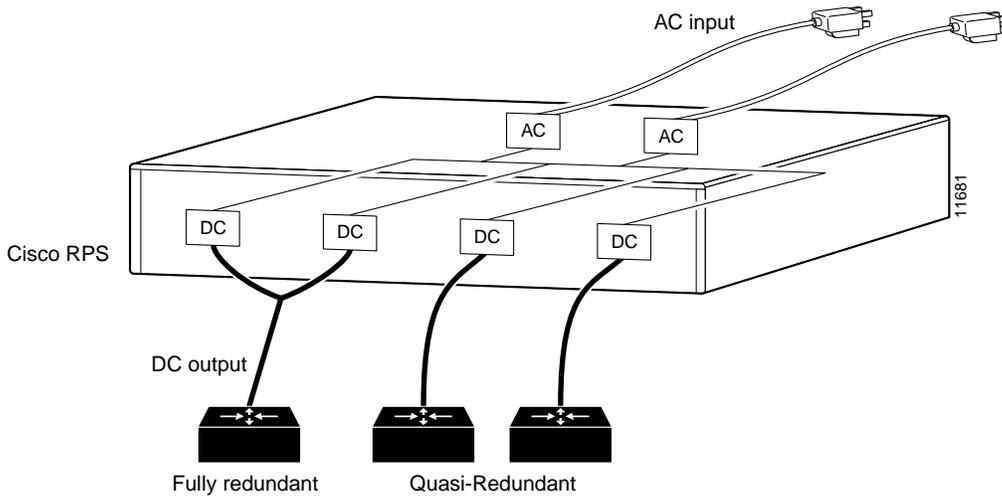


Figure 9 Mixed Configuration



Cable Connection Procedures

Before connecting to external devices, read the power warnings below. Cisco recommends that you disconnect all power before beginning.



Note You can connect an additional external device to a Cisco RPS that is already powered up without interrupting power to the Cisco RPS or to any other connected external devices. Be sure to connect your cable to the Cisco RPS first and then to the external device. However, in a redundant-with-reboot configuration, to ensure proper operation, you must power up the switch or hub before powering up the Cisco RPS. Therefore, always connect the switch to AC before you connect it to the Cisco RPS. Failure to follow the proper power-up sequence can result in incorrect LED displays.


Warning

Attach only the Cisco RPS (model PWR600-AC-RPS) to the RPS receptacle. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.


Warning

Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.


Warning

Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.


Warning

This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

To connect an external hub, switch, router, or concentrator to a Cisco RPS, perform the following steps:

- Step 1 Disconnect the AC power cord on a hub or switch; turn the power switch to the OFF position on a router or concentrator.
- Step 2 Connect the DC-output end of the cable to the RPS connector on the rear panel of the hub, switch, router, or concentrator. The DC-output end of the RPS cable has either 8 or 18 pins in the connector. (For connector locations, see Figure 10 through Figure 13.)

Figure 10 RPS Connector Location on a Cisco Hub (Typical)

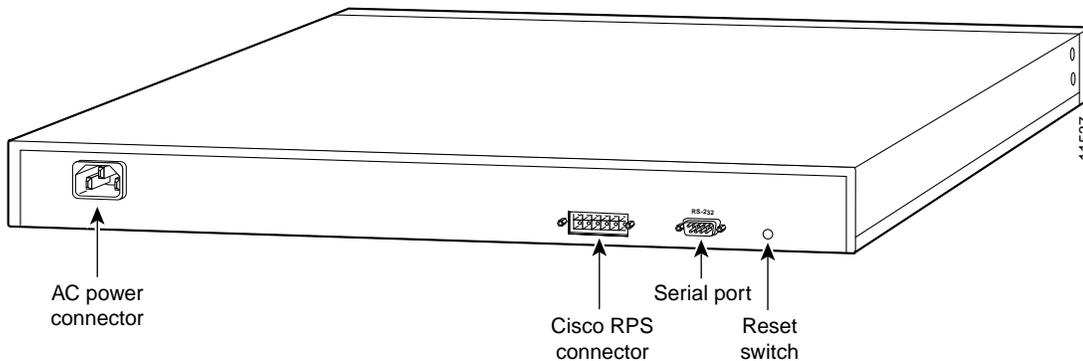


Figure 11 RPS Connector Location on a Cisco Switch (Typical)

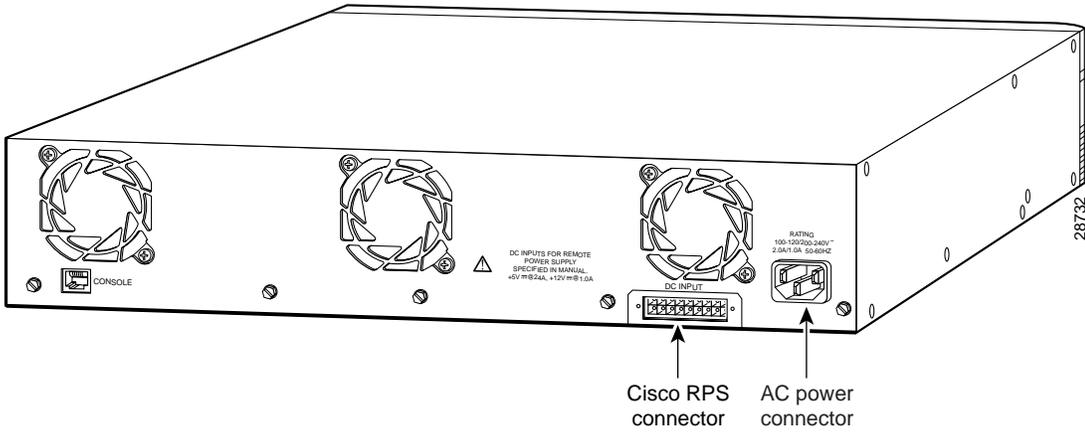


Figure 12 RPS 8-Pin Connector Location on a Cisco Router or Concentrator (Typical)

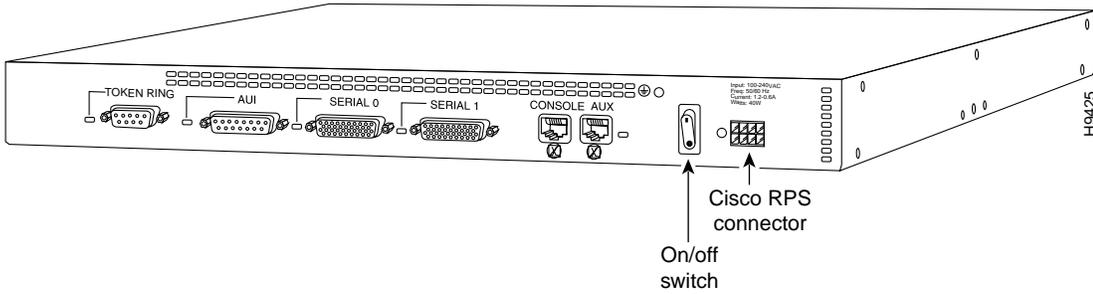
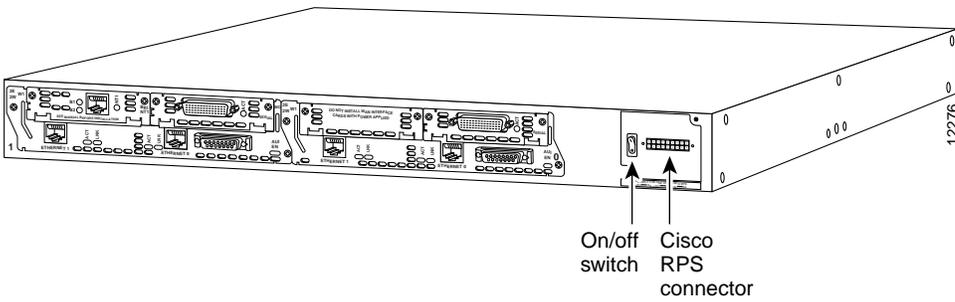


Figure 13 RPS 18-Pin Connector Location on a Cisco Router (Typical)



Step 3 Connect the DC-input end of the cable to a Cisco RPS rear-panel connector as shown in Figure 14 or Figure 15.

Figure 14 Connecting a One-to-One Cable to a Cisco RPS for Quasi-Redundant Power

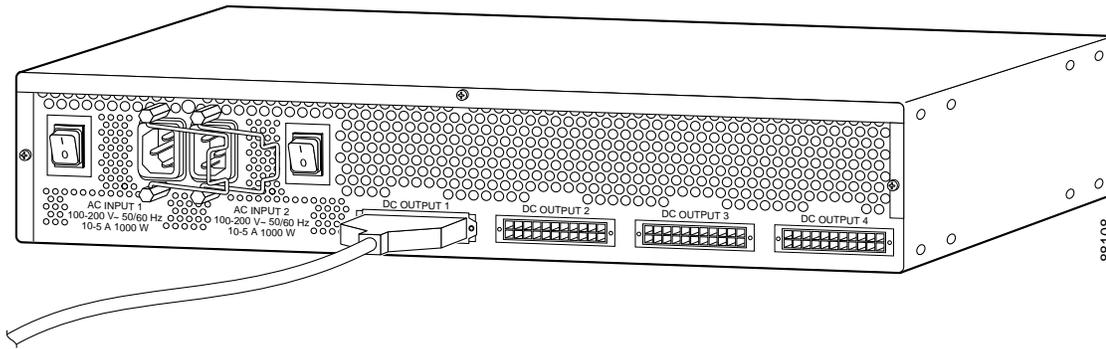
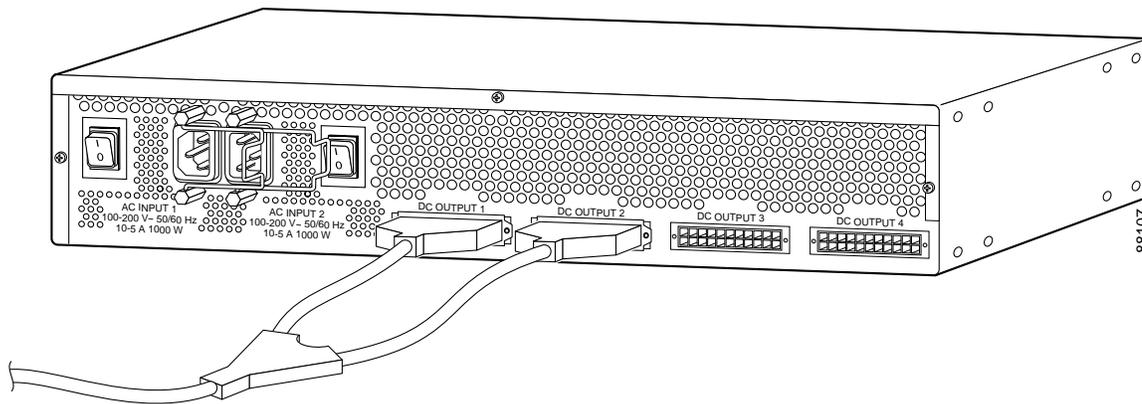
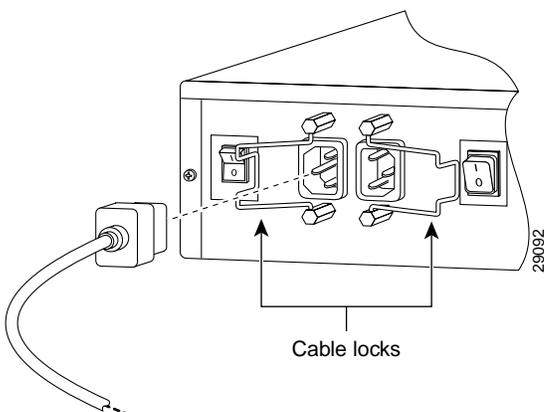


Figure 15 Connecting a Two-to-One Y-Cable to a Cisco RPS for Fully Redundant Power



Step 4 On the Cisco RPS rear panel, connect one or two AC power cables. A single AC power cable can go into either AC connector. Two AC power cables provide parallel AC power sources. Use the cable locks on the Cisco RPS to lock the cables in place. (See Figure 16.)

Figure 16 Connecting AC Power Cables to the Cisco RPS



5 Power Up the Equipment

Step 1 If you are using the redundant-with-reboot configuration (not recommended), power up the switch by connecting the AC power cord of the hub or switch to an AC power outlet.

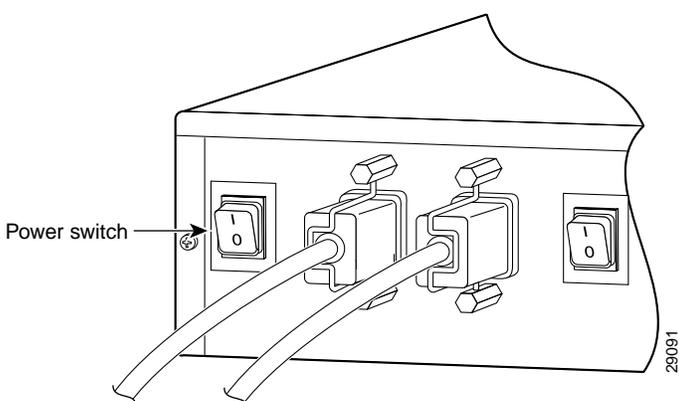


Note If you use the redundant-with-reboot configuration, it is important to power up the hub or switch *before* powering up the Cisco RPS to ensure correct operation. If the Cisco RPS powers up first, the LEDs might not indicate the actual state.

Step 2 Plug the other end of the Cisco RPS AC power cable into an AC power outlet.

Step 3 Power up the Cisco RPS. There is a separate power switch for each AC input power source. Make sure that the power switch is on for each AC power source used. (See Figure 17.)

Figure 17 Powering Up the Cisco RPS



The Cisco RPS provides power in 10 to 15 seconds. The Cisco RPS is working properly when all its front-panel LEDs are solid green. If the external device does not power up, refer to troubleshooting section of the *Cisco Redundant Power System Hardware Installation Guide* on Cisco.com.

6 Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Registered Cisco.com users can order the Documentation CD-ROM (product number DOC-CONDOCCD=) through the online Subscription Store:

<http://www.cisco.com/go/subscription>

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:
<http://www.cisco.com/en/US/partner/ordering/index.shtml>
- Registered Cisco.com users can order the Documentation CD-ROM (Customer Order Number DOC-CONDOCCD=) through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can email your comments to bug-doc@cisco.com.

You can submit your comments by mail by using the response card behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

7 Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) Website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity

- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

To obtain customized information and service, you can self-register on Cisco.com at this URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The avenue of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Cisco TAC Website

You can use the Cisco TAC website to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC website, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://tools.cisco.com/RPF/register/register.do>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

<http://www.cisco.com/en/US/support/index.html>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC website so that you can describe the situation in your own words and attach any necessary files.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

8 Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:
http://www.cisco.com/en/US/products/products_catalog_links_launch.html
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco monthly periodical that provides industry professionals with the latest information about the field of networking. You can access *Packet* magazine at this URL:
http://www.cisco.com/en/US/about/ac123/ac114/about_cisco_packet_magazine.html
- *iQ Magazine* is the Cisco monthly periodical that provides business leaders and decision makers with the latest information about the networking industry. You can access *iQ Magazine* at this URL:
http://business.cisco.com/prod/tree.taf%3fasset_id=44699&public_view=true&kbns=1.html
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in the design, development, and operation of public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:
http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html
- Training—Cisco offers world-class networking training, with current offerings in network training listed at this URL:
http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html



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