



Doc. No. 78-4335-02

# Cisco 12012 Gigabit Switch Router Blower Module Replacement Instructions

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**Product Number: GSR12-BLOWER=**  
**Document Order Number: DOC-784335=**

This document contains instructions for installing or replacing a blower module in the Cisco 12012 Gigabit Switch Router (GSR).

The sections in this document include the following:

- Product Overview, page 1
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## Product Overview

The Cisco 12012 has two card cages; the upper card cage and the lower card cage. (Refer to Figure 1.) The upper card cage has 12 user-configurable slots available for line cards and a route processor (RP). One additional slot (rightmost slot) in the upper card cage is non-configurable; it is reserved for an alarm card. The line cards and the RP are not slot dependent; you can install the line cards and the RP in any of the first 12 available slots.

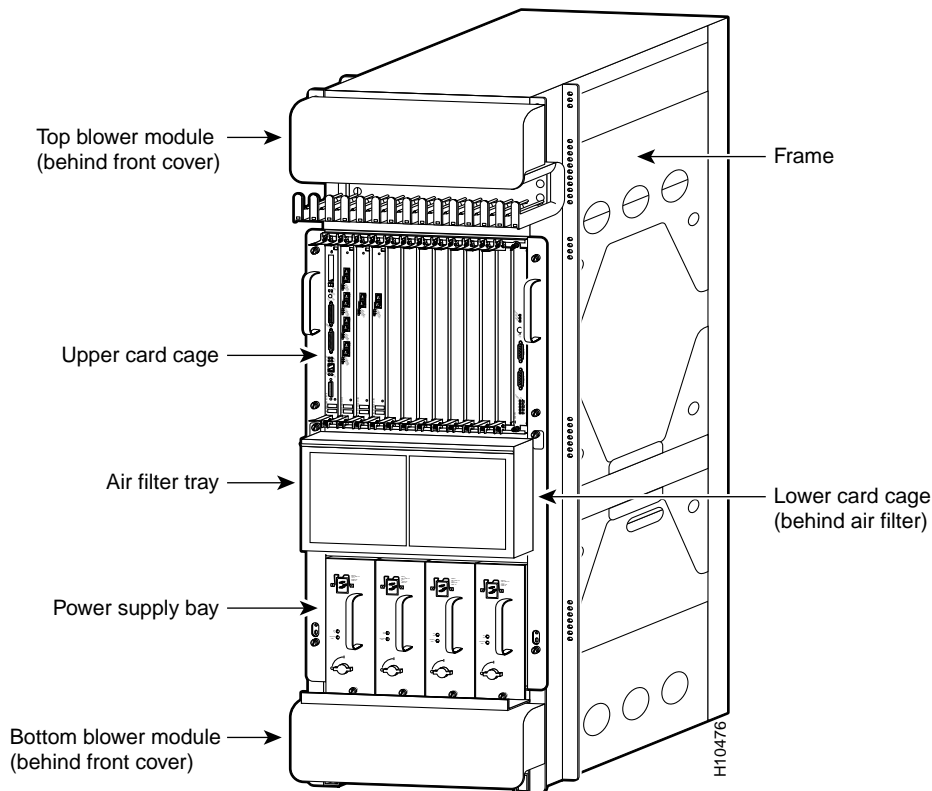
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Figure 1 Cisco 12012—Front View



The lower card cage, located behind the air filter, has five horizontal slots for switch fabric cards.

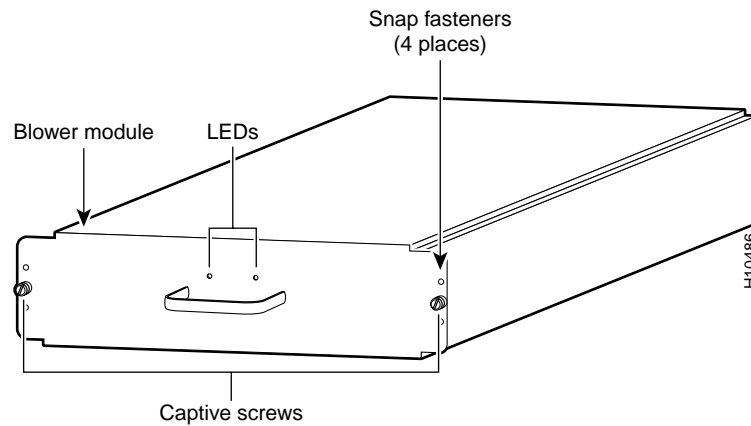
Below the lower card cage is a power supply bay. Up to four AC-input power supplies or two DC-input power supplies can be installed in the bay.

The Cisco 12012 has two blower modules; one located above the upper card cage and one located below the power supply bay. (Refer to Figure 1.) They draw cooling air in through both card cages and the power supply bay to maintain acceptable operating temperatures for the internal components.

The blower module is a sheet metal enclosure containing three fans, a controller card, and two faceplate LEDs. Each blower module slides into and out the front of the frame on two rails attached to the frame. The blower modules are secured to the frame with two captive screws. Electrical connections between the blower module and the system are made through a connector at the back of the blower module.

The top and bottom blower modules (refer to Figure 2) are identical and are interchangeable. A snap-on plastic front cover is mounted over the blower module faceplate. Two blower module LEDs are visible through the front cover.

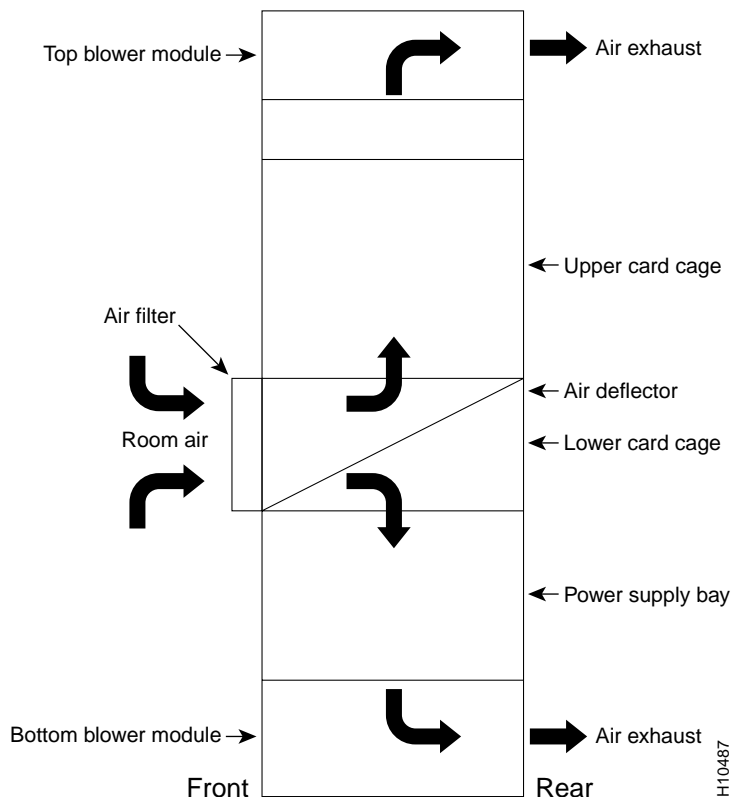
**Figure 2 Cisco 12012 Blower Module**



The blower module is available as a spare part. If any of the internal parts fail (fans, controller card, or LEDs), you must remove and replace the blower module.

The blower modules draw room air in through an air filter on the front of the lower card cage (refer to Figure 3.) The top blower module draws the air up through the upper card cage and out through exhaust vents on the back of the blower module; the bottom blower module draws the air down through the lower card cage and power supply bay, and out through exhaust vents on the back of the blower module.

Figure 3 Internal Air Flow—Side View



A controller card in the blower module monitors and controls the operation of the three variable-speed fans. The variable-speed feature enables quieter operation by running the fans at the speed required to maintain an acceptable operating temperature inside the card cage assembly.

Temperature sensors throughout the system monitor the internal air temperature. When the ambient air temperature is within normal operating range, the fans operate at their lowest speed, which is 55 percent of the maximum speed.

If the air temperature inside the card cage assembly exceeds the normal range, the blower module controller card increases the fan speed to provide additional cooling air to the internal components. If the temperature continues to rise, the blower module controller card linearly increases the fan speed until the fans reach 100 percent (full speed). If the internal air temperatures continue to rise beyond the specified threshold, the system environmental monitor shuts down all internal power to prevent equipment damage from excessive heat.

If the system detects that one of three fans within a blower module has failed, it displays a warning message on the console screen. In addition, the two remaining fans go to full speed to compensate for the loss of the one fan. If a second fan fails, an overtemperature condition in the card cage assembly is likely to occur.

### Blower Module LEDs

The blower module has two LEDs (red and green) on the faceplate. (Refer to Figure 2.) The green LED, when on, indicates that the blower module’s three fans are operating normally. The red LED indicates that a fault has been detected in the blower module. This fault can be one or more stopped fans, one or more fans running below speed, or the controller card has a fault.

## Safety Guidelines

Before you begin this installation, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

In addition, review the safety warnings listed in the document *Regulatory Compliance and Safety Information for the Cisco 12012 Gigabit Switch Router* (Document Number 78-4347-xx) that supports your Cisco 12012 before installing, configuring, or maintaining the router.

## Safety with Equipment

The following guidelines will help ensure your safety and protect the equipment. This list is not inclusive of all potentially hazardous situations, so *be alert*.

- Always disconnect all power cords and interface cables before moving the system.
- Keep tools and components away from walk areas.
- Do not work alone if potentially hazardous conditions exist.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

## Safety with Electricity

The line cards, RP, switch fabric cards, alarm card, blower modules, and redundant power supplies are designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system.

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the interior of the Cisco 12012, locate the emergency power-off switch for the room in which you are working.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself. Disconnect power to the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.
- Disconnect all power and external cables before installing or removing a router.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never install equipment that appears damaged.

## Tools and Parts Required

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In addition, use the guidelines that follow when working with any equipment that is disconnected from a power source, but still connected to telephone or network wiring:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

## Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic boards or components are handled improperly, can result in intermittent or complete failures.

Following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist strap or ankle strap and ensure that it makes good skin contact.
- When removing or installing a blower module, connect the equipment end of a ground strap to one of the two ESD connection sockets on the front edge of the upper card cage, or to bare metal on the frame.
- If you are returning a replaced component to the factory, immediately place it in a static shielding bag to avoid ESD damage.
- The wrist strap only protects the component from ESD voltages on the body; ESD voltages on clothing can still cause damage.



**Caution** For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

## Tools and Parts Required

You need the following tools and parts to remove and replace a blower module:

- 1/4-inch flat-blade screwdriver
- ESD-preventive wrist strap
- The replacement blower module (Product Number GSR12-BLOWER=) and the old blower module front cover.

## Removing and Replacing a Blower Module

This section provides the procedures you need to remove and replace a blower module.

The Cisco 12012 supports online insertion and removal of field replaceable units (FRUs), which means you can remove and replace a blower module while the Cisco 12012 remains powered up.



**Caution** With the Cisco 12012 powered on and one of the blower modules removed, all of the cooling for that half of the system is lost. Remove and replace the defective blower module before the system overheats.



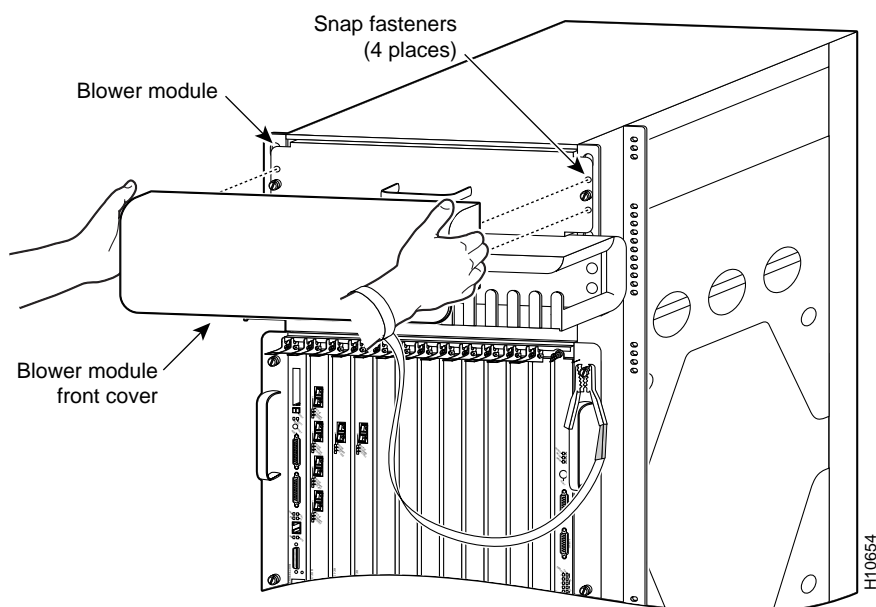
**Caution** Always wear an antistatic wrist strap to prevent ESD when removing and replacing a blower module.

### Removing a Blower Module

Perform the following steps to remove a blower module:

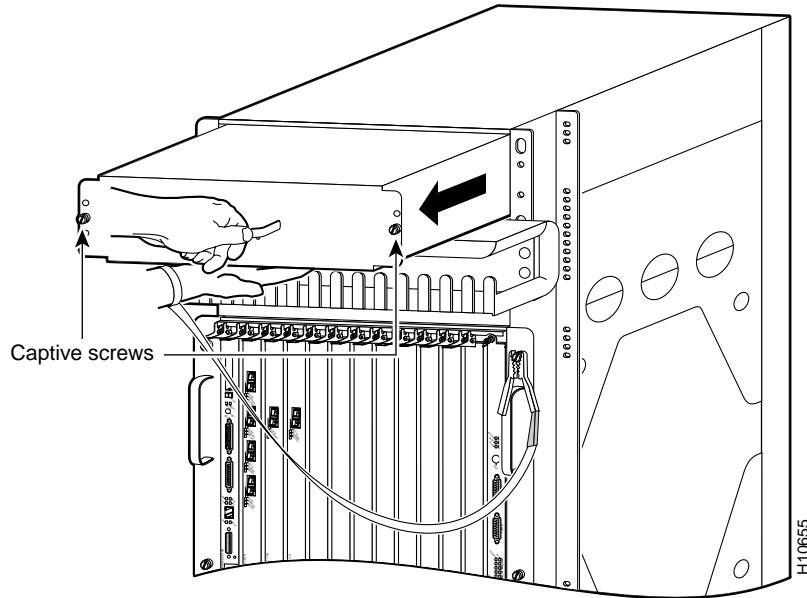
- Step 1** Attach an ESD wrist strap to your wrist and to one of the two ESD connection sockets located on the front edges of the upper card cage or to bare metal on the frame.
- Step 2** Grasp both edges of the blower module front cover and pull straight out to detach the cover from the blower module. (Refer to Figure 4.) Set the front cover aside.

**Figure 4 Removing the Blower Module Front Cover—Top Blower Module**



**Step 3** Loosen the two captive screws on the blower module faceplate. (Refer to Figure 5.)

**Figure 5** Removing the Blower Module—Top Blower Module



**Caution** The blower module weighs 22 lb (10 kg). Use two hands when handling a blower module.

**Step 4** Grasp the blower module handle and pull it straight out to disconnect the blower module from the frame connector. Slide the blower module halfway out of the frame.

**Step 5** Place your free hand underneath the blower module for support and slide the blower module completely out of the frame.

If you plan to return the old blower module to the factory, repackage it in the shipping container you received with the replacement blower module.



## Replacing a Blower Module

Perform the following steps to replace a blower module:



**Caution** The blower module weighs 22 lb (10 kg). Use two hands when handling a blower module.

**Step 1** Attach an ESD wrist strap to your wrist and to one of the two ESD connection sockets located on the front edges of the upper card cage or to bare metal on the frame.

**Step 2** Using two hands to support the blower module, orient the replacement blower module in front of the frame so that the blower module connector (recessed in the back corner of the blower module) is aligned with the connector mounted on the back corner of the frame.

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**Note** When you install the top blower module, the blower module connector should be on the right side (facing the frame). When you install the bottom blower module, the blower module connector should be on the left side (facing the frame).

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**Step 3** Slide the blower module on the frame rails into the frame. Stop when the blower module connector makes contact with the frame connector.

**Step 4** Firmly push on the blower module handle to seat the blower module connector in the frame connector. (When completely seated, the blower module faceplate flanges should be in contact with the frame.)

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**Note** All electrical and control line connections are made automatically when the two connectors mate. The blower module will immediately power up.

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**Step 5** Tighten the two captive screws on the blower module faceplate.

**Step 6** Position the blower module front cover over the blower module faceplate. Snap the front cover onto the blower module faceplate.

This completes the blower module replacement procedure.

Proceed to the following section, “Checking the Installation,” to verify that the removal and replacement procedure was performed correctly.

### Checking the Installation

Complete the following steps to verify that the replacement blower module is operating properly:

- Step 1** Check the following components to make sure that they are secure:
- The blower module is inserted all the way into the frame and the two captive screws are tightened.
  - The blower module front cover is securely installed on the front of the blower module.
- Step 2** Observe the green OK LED visible through the blower module front cover. The LED should come on as soon as the blower module is installed and power is applied to the system.
- Step 3** Observe the red fail LED visible through the blower module front cover:
- The LED should remain off, indicating the three fans are operating normally.
  - If the red LED comes on, check that the blower module is completely installed in the frame. Try reseating the blower module.
  - If the red LED does come on, and the blower module is completely installed in the frame, the replacement blower module might be faulty or the frame connector might be damaged. Swap the top and bottom blower modules and see if the problem is with the blower module or with the frame connector.
- Step 4** Listen for the sound of the fans in the blower module. In noisy environments, it might be difficult to hear the fans operating. Place your hand at the back of the frame behind the blower module and feel for the airflow generated by the fans in the module.

If the blower module fails to operate properly, contact a service representative for assistance.

## FCC Class A Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

## Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: [cco.cisco.com](http://cco.cisco.com)
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact [cco-help@cisco.com](mailto:cco-help@cisco.com). For additional information, contact [cco-team@cisco.com](mailto:cco-team@cisco.com).

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**Note** If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or [tac@cisco.com](mailto:tac@cisco.com). To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or [cs-rep@cisco.com](mailto:cs-rep@cisco.com).

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This document is to be used in conjunction with the *Cisco 12012 Gigabit Switch Router Installation and Configuration Guide*.

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