



Troubleshooting the Installation

This chapter provides basic troubleshooting information to solve the most common installation problems with the Cisco uBR10012 universal broadband router. Your Cisco uBR10012 router went through extensive testing before leaving the factory. However, if you encounter problems starting the router, use the information in this chapter to help isolate the cause of the problems.

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Note

The procedures in this chapter assume that you are troubleshooting the initial system startup, and that your router is in the original factory configuration. If you have removed or replaced components or changed any default settings, the recommendations in this chapter might not apply.

Make sure to review the safety warnings listed in this manual, especially in [Chapter 2, “Preparing for Installation,”](#) before using the troubleshooting procedures in this chapter.

Troubleshooting Methods

This section describes the troubleshooting methods used in this chapter and describes how Cisco uBR10012 routers are divided into subsystems for more efficient problem solving.

Before You Call for Technical Assistance

If you are unable to easily solve the problem, contact a customer service representative for assistance and further instructions. Provide the representative with the following information:

- Date you received the router
- Chassis serial number
- Type of software and release number
- Brief description of the problem you are having
- Brief explanation of the steps you have taken to isolate and resolve the problem
- Maintenance agreement or warranty information

Problem Solving Using a Subsystems Approach

The key to solving problems with the system is isolating the problem to a specific subsystem. Because a startup problem is usually caused by a single component, it is more efficient to first isolate the problem to a subsystem rather than troubleshoot each component in the system. For these troubleshooting procedures, consider the following subsystems:

- Power subsystem—Includes the power supply and the external power cable.
- Processor subsystem—Includes the network processing card, the modular port adapter, the service module, and the fixed RF ports. The system memory and management functions reside on the network processing card, and the enabled LED on each port indicates if the port is initialized. A port adapter that is partially installed in the router can cause the system to hang and crash.
- Cooling subsystem—Includes the fans.

The following sections help you isolate a problem to one of these subsystems and direct you to the appropriate troubleshooting section.

Troubleshooting Installation Problems

This section contains general troubleshooting information to help you solve any problems you might encounter during the installation of the system.

General Troubleshooting Tips

All Cisco uBR10012 router FRUs (field replaceable units) are hot-swappable. Procedures for removing and replacing the FRUs can be found in [Chapter 5, “Maintaining the Cisco uBR10012 Router.”](#)

List of FRU modules:

- Fan module
- TCC+ modules
- Power entry modules (PEM)
- PRE modules
- Cable interface cards and uplink cards

[Table 4-1](#) lists general FRU fault symptoms and recommendations.

Table 4-1 **General Troubleshooting Tips**

Symptom	Steps to Take
System fails to power on	Check that: <ul style="list-style-type: none"> • All power cords are properly connected to the Cisco uBR10012 router and at the power connection end. • The DC PEM power switches are turned on and the POWER LED is illuminated (green). • The AC PEM power switches are turned on and the POWER LED is illuminated (green). • The fan assembly module is fully inserted, and the FANS OK LED is lighted (green).
System fails to boot up properly	If the system has power, check the FAIL LED on the PRE and any information on the alphanumeric display. If the FAIL LED is on, see Troubleshooting the Power Subsystem, page 4-7
DC PEM problem	<ul style="list-style-type: none"> • If the FAULT LED is illuminated, see Troubleshooting the Power Subsystem, page 4-7. • If the MISWIRE LED is on, the -48/-60VDC and return (RTN+) wires are reversed. Power off the PEM and reconnect the wires correctly (see the “Connecting DC Power to the Cisco uBR10012 Router” section on page 3-39).
AC PEM problem	<ul style="list-style-type: none"> • If the power LED on the AC PEM is off, check the AC power source. • If the fault LED is illuminated (yellow), check to see if the PEM is properly inserted in the chassis. • Check the Cisco IOS Release version that you are using. Versions earlier than Cisco IOS Release 12.2(4)XFI, 12.2(4)BC1, or later do not correctly identify the AC PEM’s error messages.
System experiences a critical alarm (Critical LED on the PRE is on)	Enter the show facility-alarm status command at the console.

Table 4-1 **General Troubleshooting Tips (continued)**

Symptom	Steps to Take
System experiences a major alarm (Major LED on the PRE is on)	Enter the show facility-alarm status command at the console.
System experiences a minor alarm (Minor LED on the PRE is on)	Enter the show facility-alarm status command at the console.
You cannot establish a console or Telnet connection to the system.	For information about troubleshooting Ethernet connections, see the “Troubleshooting Ethernet Connections” section on page 4-4. For information about troubleshooting the console port serial connections, see the “Troubleshooting the Console Port Serial Connection” section on page 4-5.
Fan failure	Perform the following if the fan failure LEDs illuminate: <ul style="list-style-type: none"> • Reseat the fan assembly module (see the “Removing and Replacing the Fan Assembly Module” section on page 5-6). • Remove the rear safety cover and be sure that the fan assembly module cable is connected securely (see the “Removing and Replacing the Fan Assembly Module” section on page 5-6).
System overheats	This may be due to a failure in the fan assembly module (see Fan Failure above), insufficient ventilation, or high ambient temperature. See the “Troubleshooting the Cooling Subsystem” section on page 4-14 for additional information.

Troubleshooting Ethernet Connections

If an Ethernet connection to your Cisco uBR10012 router fails to work properly, and the corresponding LNK (Link) LED is not illuminated, check for the following problems:

- Visually check that an Ethernet cable is connected to the correct Ethernet port on the PRE, and that the other end of the cable is connected to an Ethernet hub that is powered on and functioning properly.
- Check to see if you are using the correct type of cable. The cable must meet the specifications given in the [“Connecting to a 10Base-T Ethernet Network”](#) section on page 3-58.
- The cable might be bad or broken. Replace the cable with a known, reliable straight-through Ethernet cable, checking to be sure the LNK LED comes on (green).
 - If the LNK LED is still not illuminated, it is possible that the Ethernet port might be functioning properly, but the LED is not working. Check the Ethernet port (by trying to ping over it, for example) to determine if the problem is due to a bad LED or if the Ethernet link is bad.
- Make sure the PRE has booted up properly as follows:
 - The Status LED should be illuminated (green).
 - If the Fail LED is illuminated (yellow), refer to [Troubleshooting the Processor Subsystem](#), page 4-13.

- Check the hub:
 - Is the cable connected into the correct hub port (for example, the hub LED is illuminated, but the LNK LED on the PRE is not illuminated).
 - Be sure that the cable is not connected to an uplink port.
- If the LNK LED is illuminated (green), but the Ethernet port does not seem to be working properly, make sure that the port in question is configured properly and is not administratively shut down. If you have a working console connection, perform the following steps:

- At the router prompt, enter **show int fast0/0/0**. If the port is administratively down, enter these commands to enable it:

```
router# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.
router(config)# int fast0/0/0
router(config-if)# no shut
router(config-if)# exit
router(config)# exit
```

- Check that the Ethernet port in question has a valid IP address assigned to it.

**Note**

The Cisco uBR10012 router also has an internal Ethernet interface, Ethernet0/0/0, which PRE processors and line cards use to transfer packets between cards. This interface is not user-configurable, although you can see the configuration and run-time information using the **show interface** command.

For more information about configuring Ethernet ports, refer to the *Cisco uBR10012 Router Software Configuration Guide* at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/configuration/guide/scg.html>

If the cable, connections, power, and configuration all check out, and you still cannot connect to the Ethernet port on the module, you probably need to replace the PRE. Contact the Cisco TAC for further assistance.

Troubleshooting the Console Port Serial Connection

If the terminal connected to the Cisco uBR10012 router console port appears frozen or fails to work properly, check for the following problems:

- Check the console cable and make sure it is properly connected to the correct console port on the PRE, and to your terminal equipment at the other end.
- Verify that you are using the right type of cable and adapter. For additional information about cable pin-outs, refer to the “[Connecting the Console Port and Auxiliary Port](#)” section on page 3-55.
- To be sure the cable is not defective or broken, replace the cable with another high quality cable if possible.
- Check that your terminal equipment is working properly and configured with the correct settings for the console port. The default console port settings are:
 - 9600 baud
 - 8 data bits
 - 1 stop bit

- No parity
- No flow control
- Check the LEDs on the PRE to make sure that it is powered up properly.
- If the cable, connections, power, and terminal settings all check out and you still cannot connect to the console port on the module, you probably need to replace the PRE. Contact the Cisco TAC for further assistance. See the [“Obtaining Documentation and Submitting a Service Request”](#) section on page xvii.

Identifying Startup Problems

Startup problems are commonly due to the source power or to a line card that is not properly seated in the router. Although an overtemperature condition is unlikely at initial startup, the environmental monitoring functions are included in this chapter because they also monitor internal voltages.

When you start up the router for the first time, observe the startup sequence described in the [“Powering On the System”](#) section on page 3-66. This provides a detailed description of a normal startup sequence.

LEDs indicate all system states in the startup sequence. By checking the state of the LEDs, you can determine when and where the system failed in the startup sequence. Use the following descriptions to isolate the problem to a subsystem, and then proceed to the appropriate sections to try to resolve the problem.

When you start up the system by turning the power supply switch to the on (I) position, the following should occur:

1. Fans—the fans start operating. The FAN OK LED on the fan assembly module turns green. You should be able to feel the air being taken in at the bottom front of the router and blown out at the top rear of the router.

If not, proceed to the [“Troubleshooting the Cooling Subsystem”](#) section on page 4-14.

2. DC PEM—the POWER LED on each DC PEM turns green to indicate that the PEM is connected to an active DC power source and is supplying power to the chassis.
 - If the FAULT LED is illuminated (yellow), it indicates that the PEM is connected to an active DC power source but is not providing power to the chassis.
 - If the MISWIRE LED is illuminated (yellow), it indicates that the wires from the DC power source to this DC PEM are reversed.
 - Proceed to the [“Troubleshooting the Power Subsystem”](#) section on page 4-7.

3. PREs—the FAIL LED on the PRE modules briefly lights during the power-on sequence and then it turns off. If the FAIL LED remains on, try removing and reseating the PRE module, and verify that the card is fully inserted and that both locking levers are fully down in the locked position.

If the FAIL LED remains on, make a note of the failure code that appears in the PRE module’s LCD screen and call TAC for instructions.

4. Line cards—Verify the line card “Enabled” LEDs.

Each line card has an enabled LED that goes on initially at power-on and then goes off. The LED then goes on and remains on when the corresponding port is enabled and configured for operations.

If an enabled LED fails to go on at initial power-on, or if the LED fails to go on and remain on after the port is enabled and configured, proceed to the [“Troubleshooting the Cooling Subsystem”](#) section on page 4-14.

**Note**

The slot 0 and slot 1 LEDs only go on when the PC media card slot is being accessed by the system. These LEDs remain off during normal operation of the router and do not indicate startup problems.

- The initial system banner displays on the console screen.

If it is not displayed, see the “[Connecting Network Management Cables](#)” section on page 3-58 to verify that the terminal is set up correctly and that it is properly connected to the router’s console port.

Troubleshooting the Power Subsystem

The AC power entry modules, DC power entry modules, or an AC power shelf combined with the DC power modules are used to power on the Cisco uBR10012 router.

Troubleshooting the AC Power Subsystem

The following troubleshooting steps are applicable to both the AC PEM (UBR10-PWR-AC= and UBR10-PWR-AC-PLUS=) modules.

Use the following steps to isolate a problem with the AC power subsystem.

- Use the **show environment** command to display the general health of the power system.

```
Router# show environment
```

```
Temperature information:
```

```
Temperature normal: Inlet sensor      measured at 30C/86F
Temperature normal: Outlet sensor     measured at 40C/104F
```

```
Voltage information:
```

```
RP Voltage readings :
```

Channel	Margin	ADC Value
2.5v	Normal	2.47v
1.8v	N/A	1.80v
1.5v	Normal	1.48v
1.8vFPGA	Normal	1.78v
1.2v	Normal	1.18v
3.3v	Normal	3.26v

```
Fan: OK
Power Entry Module 0 type AC status: OK
Power Entry Module 0 Power: 3692w
Power Entry Module 0 Voltage: 71v
Power Entry Module 0 Power Last Successful Timestamp: 15:16:20 13 Dec 2012
Router#
```

**Note**

The **show environment** command provides accurate information on the AC PEM only when using Cisco IOS Release 12.2(4)XF1, 12.2(4)BC1a, or a later release. If using an earlier release, the **show environment** command does not correctly identify the AC PEM error messages. Starting Cisco IOS Release 12.2(33)SCG2 and later, the **show environment** command output has been modified to display the latest valid power and voltage values of the PEM module with timestamp.

Step 2 Verify that the temperatures are within the valid operating ranges, and that the fan assembly and both AC PEM modules are present and OK.

- a. If this is not the case, check for the following issues:
- Fan is reported MISSING—Insert the fan assembly or shut down the router immediately to avoid running the router beyond its operating temperature range.
 - AC PEM is not listed—Verify that both AC PEMs are present, and if so, that each PEM is fully inserted into the chassis.
 - The “Input/Output Voltage Fault” message indicates that the output voltage from one of the AC PEMs is not within the correct range. This can occur when the input AC voltage to the AC PEM is either too low or too high. Measure the input AC voltage, and if it is correct, the AC PEM has failed and should be replaced.



Note Wall input voltage for the AC PEM must be 200 - 240 VAC at 50/60Hz.

- b. Verify if the UBR10-PWR-AC-PLUS= AC PEM **show environment** command output displays a DC PEM module instead of AC PEM.

Router# **show environment**

Temperature information:

```
Temperature normal: Inlet sensor      measured at 31C/87F
Temperature normal: Outlet sensor     measured at 35C/95F
```

Voltage information:

```
RP Voltage readings:
Channel      Margin      ADC Value
=====
2.5v        Normal      2.49v
1.8v        N/A         1.81v
1.5v        Normal      1.49v
1.8vFPGA    Normal      1.79v
1.2v        Normal      1.20v
3.3v        Normal      3.29v
```

```
Fan: OK
Power Entry Module 0 type DC status: OK // DC PEM is displayed //
Power Entry Module 1 type AC status: OK
Power Entry Module 0 Power Last Successful Timestamp: 15:16:20 13 Dec 2012
```

- Upgrade to a supported Cisco IOS Release and then press the PRODUCT ID LED/switch.
- Reload the software or physically remove the AC PEM module for at least 1 minute and then reinsert it.



Note The **show environment** command provides accurate information on the 3300 W AC PEM if the Cisco uBR10012 router is running a supported Cisco IOS Release. If using an earlier Cisco IOS release, the **show environment** command will not correctly identify the error messages of the 3300 W AC PEM.

Step 3 Verify if the AC power cables are installed into the AC PEM receptacles and the facility power source is turned on. The AC power enable switch is set to the Standby (0) position.

- a. Check if the AC PEM is receiving power.

- The V1 POWER and V2 POWER LEDs on the UBR10-PWR-AC-PLUS= AC PEM should illuminate (green).

If these LEDs are not illuminated, check the external wiring and facility power source. If the fans are working and are audible, it indicates that the AC PEM is receiving power, so there could be a possibility that the LEDs are not working.

- The FAULT LED should illuminate (yellow).

If this LED is not illuminated, there could be a possibility that the LED is not working, therefore the LED cannot indicate a valid fault on the PEM.

- b. If the above LEDs do not illuminate but you are confident that PEM is receiving power, you can proceed to power on the PEM, see *AC Power Entry Module for the Cisco uBR10012 Universal Broadband Router*. Ensure that the POWER LED is not illuminated (green). If this LED is illuminated, the AC PEM should be replaced. See the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.

Step 4 Verify if the UBR10-PWR-AC-PLUS= AC PEM is powered on, and the V1 POWER and V2 POWER LEDs are illuminated (unless they may not be working, as above). The AC power enable switch on the AC PEM is set to the ENABLE (I) position.

- a. The FAULT LED should stop illuminating. If it remains illuminated, the AC PEM should be replaced because this is a valid fault. See the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.
- b. The POWER LED should illuminate (green). If this LED does not illuminate, and the FAULT LED is not illuminated, there might be a possibility that the POWER LED is not working. You may need to verify if the PEM is providing valid power to the system by checking the AC PEM voltage and current using the Cisco IOS Release running on the router. Contact technical support for assistance, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.

Step 5 The FAULT LED is illuminated (yellow).

- a. The FAULT LED illuminates when the PEM module detects an over-voltage or over-current condition, or when the PRE issues the command to shut down the PEM module (this could occur due to overheating). Ensure that none of these conditions exist in the system, and then try to switch the PEM module off and switch it on again.
- b. If another PEM module exists in the system that powers up the chassis, and the FAULT LED is not illuminated on that module, then ensure that the PRE does not issue the command to shut down the PEM module.
- c. If the problem persists, try another working unit. Else, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.

Step 6 If none of the above suggestions correct the problem, the AC PEM could be faulty. Contact a service representative for further instructions. See the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.

Troubleshooting the DC Power Subsystem

The following troubleshooting steps are applicable to both the DC PEM (UBR10-PWR-DC= and UBR10-PWR-DC-PLUS=) modules.

Use the following steps to isolate a problem with the DC power subsystem.

Step 1 The DC-input power cables are installed into the DC PEM terminal blocks and the facility power source is turned on. The DC power enable switch is set to the Standby (0) position.

Check if the DC PEM is receiving power.

a. The MISWIRE LED should not be illuminated. If it is illuminated (yellow), it indicates that the DC-input power cables are reversed, or one DC-input power cable was probably not connected. Correct the situation by reconnecting the power cables see, [“Connecting DC Power to the Cisco uBR10012 Router” section on page 3-39](#).

b. The V1 POWER and V2 POWER LEDs on the UBR10-PWR-DC-PLUS= DC PEM should illuminate (green).

If these LEDs are not illuminated, check the external wiring and facility power source. If the fans are working and are audible, it indicates that the DC PEM is receiving power, so there could be a possibility that the LEDs are not working.

c. The FAULT LED should illuminate (yellow).

If this LED is not illuminated, there could be a possibility that the LED is not working, therefore the LED cannot indicate a valid fault on the PEM.

If the above LEDs do not illuminate but you are confident that PEM is receiving power, you can proceed to power on the PEM. Ensure that the POWER LED is not illuminated (green). If this LED is illuminated, the DC PEM should be replaced. See the [“Obtaining Documentation and Submitting a Service Request” section on page -xvii](#).

Step 2 The UBR10-PWR-DC-PLUS= DC PEM is powered on, and the V1 POWER and V2 POWER LEDs are illuminated (unless they may not be working, as above). The DC power enable switch on the DC PEM is set to the ENABLE (I) position.

a. The FAULT LED should stop illuminating. If it remains illuminated, the DC PEM should be replaced because this is a valid fault. See the [“Obtaining Documentation and Submitting a Service Request” section on page -xvii](#).

b. The POWER LED should illuminate (green). If this LED does not illuminate, and the FAULT LED is not illuminated, there might be a possibility that the POWER LED is not working. You may need to verify if the PEM is providing valid power to the system by checking the DC PEM voltage and current using the Cisco IOS Release running on the router. Contact technical support for assistance, see the [“Obtaining Documentation and Submitting a Service Request” section on page -xvii](#).

Step 3 The FAULT LED is illuminated (yellow).

a. The FAULT LED illuminates when the PEM module detects an over-voltage or over-current condition, or when the PRE issues the command to shut down the PEM module (this could occur due to overheating). Ensure that none of these conditions exist in the system, and then try to switch the PEM module off and switch it on again.

b. If another PEM module exists in the system that powers up the chassis, and the FAULT LED is not illuminated on that module, then ensure that the PRE does not issue the command to shut down the PEM module.

c. If the problem persists, try another working unit. Else, see the [“Obtaining Documentation and Submitting a Service Request” section on page -xvii](#).

Step 4 The MISWIRE LED is illuminated (yellow).

If the MISWIRE LED is illuminated, the -48/-60 VDC and return (RTN+) wires are reversed. Ensure that the facility power source is turned off immediately, see [“Connecting DC Power to the Cisco uBR10012 Router” section on page 3-39](#) to reconnect the wires correctly before powering on the PEM module.

Step 5 The **show environment** command output on the UBR10-PWR-DC-PLUS= DC PEM module (shown below) displays AC PEM instead of DC PEM.

```
Router# show environment

Temperature information:
  Temperature normal: Inlet sensor      measured at 31C/87F
  Temperature normal: Outlet sensor     measured at 35C/95F

Voltage information:
  RP Voltage readings:
  Channel      Margin      ADC Value
  -----
  2.5v         Normal      2.49v
  1.8v         N/A        1.81v
  1.5v         Normal      1.49v
  1.8vFPGA     Normal      1.79v
  1.2v         Normal      1.20v
  3.3v         Normal      3.29v

Fan:                                OK
Power Entry Module 0 type AC status: OK // AC PEM is displayed //
Power Entry Module 1 type DC status:  OK
Power Entry Module 0 Power Last Successful Timestamp: 15:16:20 13 Dec 2012
```

Try one of the following:

- Upgrade to a supported Cisco IOS Release and then press the PRODUCT ID LED/switch.
- Reload the software or physically remove the DC PEM module for at least 1 minute and then reinsert it.

Step 6 Use the **show environment** command to display the general health of the power system:

```
Router# show environment

Temperature normal: chassis inlet measured at 29C/84F
Temperature normal: chassis core measured at 42C/107F
Fan:                                OK
Power Entry Module 0 type DC status: OK
Power Entry Module 1 type DC status: OK
Power Entry Module 0 Power Last Successful Timestamp: 15:16:20 13 Dec 2012
Router#
```



Note

Starting Cisco IOS Release 12.2(33)SCG2 and later, the **show environment** command output has been modified to display the latest valid power and voltage values of the PEM module with timestamp.

Verify that the temperatures are within the valid operating ranges, and that the fan assembly and both DC PEM modules are present and OK. If this is not the case, check for the following actions:

- Fan is reported MISSING—Insert the fan assembly or shut down the router immediately to avoid running the router beyond its operating temperature range.
- DC PEM is not listed—Verify that both DC PEMs are present, and if so, that each PEM is fully inserted into the chassis.
- An “External AC Supply Fault” message indicates that one of the power modules in the external power supply is reporting either a fault, an over-temperature condition, or is missing. Check the LEDs on the front panels of the power modules on the external power supply to discover which module has the fault.

**Note**

When using the external AC-input power shelf, the **show environment** command provides information on whether a power module in the power shelf is missing, is reporting a fault, is experiencing an over-temperature condition, or is not receiving AC-input power. For information on the external AC-input power shelf and on connecting it to the DC PEM, see [Cisco uBR10012 Universal Broadband Router Hardware Installation Guide](#).

- Step 7** Check to see if the DC power source supplying the proper power to the DC PEMs? (If you are using the 2400W AC-input power shelf, look to verify that the AC OK and DC OK LEDs are illuminated for each of the AC power supplies.)
- If no, and if the DC power source is connected to a valid power outlet, troubleshoot the DC power source.
 - If yes, turn off the DC power source and remove the DC PEM from the chassis. Verify that the DC power source is correctly wired to the terminal blocks underneath each PEM. See the “[Connecting DC Power to the Cisco uBR10012 Router](#)” section on page 3-39 for details.
- Step 8** If none of the above suggestions correct the problem, the DC PEM could be faulty. Contact a service representative for further instructions. See the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.

Troubleshooting the 2400 W AC-Input Power Shelf

Check the following to isolate a problem to the AC-input power shelf.

- Step 1** Check to see which version of the PEM you have in the chassis.
- If the Cisco uBR10012 router is running Cisco IOS Release 12.2(4)XF or a later release, you can use the **show environment** command to monitor the AC-input power shelf.


```
Router# show environment
Temperature normal: chassis inlet measured at 29C/84F
Temperature normal: chassis core measured at 42C/107F
Fan: OK
Power Entry Module 0 type DC status: OK
Power Entry Module 1 type DC status: OK

Router#
```
 - If the DC PEM status is either “External AC Supply Fault” or “Input/Output Voltage Fault,” a problem exists with the AC-input power shelf.
 - The “External AC Supply Fault” message indicates that one of the power modules is reporting either a fault, an over-temperature condition, or is missing. Check the LEDs on the front panels of the power modules on the external power supply to discover which module has the fault.
 - If the “Input/Output Voltage Fault” message indicates that one of the power modules is not receiving AC-input power then, check the LEDs on each power module, check that each power module is plugged into an AC-input power outlet, and that those outlets are providing power.
- Step 2** Verify that the DC and AC OK LEDs are illuminated.
- If yes, then the power shelf is operational.
 - If not, do the following:

- Make sure that the AC power cord is correctly plugged in to both the AC-output wall outlet and in to the back of the AC-input power shelf. (A separate power cord is used for each power supply.)
 - Make sure that the AC power supply is properly inserted, seated, and locked. If necessary, remove the AC power supply and reinsert it.
 - Check the external AC power source.
 - Swap the AC power supply with one of the others. If the failure follows the power supply, replace the power supply. If the failure remains in that particular power bay, double-check the external AC power source and the power cord connections; if they are correct, contact the Cisco TAC for additional troubleshooting information.
- c. If only DC OK LED is not illuminated, then check the wiring to the Cisco uBR10012 router DC-input terminal blocks.
- Step 3** Check to see if the FAULT LED is illuminated (yellow), if it is then:
- Check that the external AC power source is supplying consistent AC voltage at the proper levels, without spikes or brownouts.
 - Flip the circuit-breaker for the external AC power source.
 - Replace the power supply with a known good replacement.
- Step 4** If none of these measures work, contact a service representative for instructions. See the [“Obtaining Documentation and Submitting a Service Request”](#) section on page xvii.
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Troubleshooting the Processor Subsystem

The processor subsystem on the Cisco uBR10012 router consists of the performance routing engine (PRE) modules and the timing, communication, and control plus (TCC+) cards. At system startup, the following sequence should appear on the primary PRE.

1. The FAIL LED briefly comes on (yellow), turn off, and the STATUS LED starts flashing (yellow).
2. A series of messages appear on the PRE alphanumeric display indicating the progress of the boot-up sequence.
3. Upon successful completion of the boot-up sequence, the message IOS RUN appears on the alphanumeric display.
4. The STATUS LED comes on (green) to indicate this is the primary PRE.

The sequence on the redundant PRE is similar, except that the STATUS LED remains OFF and the messages on the alphanumeric display are slightly different. The final message upon a successful boot-up sequence is IOS STBY to indicate that this is the redundant PRE operating in stand-by mode.

Use the following procedure to troubleshoot the PRE modules.

- Step 1** Check the following if a problem appears on one of the PRE modules.
- a. Did the STATUS LED on the primary PRE light solid (green) at the end of the boot-up sequence?
 - b. If no, check the other LEDs on other modules in the chassis. If no other LEDs are lit, check for a problem in the power subsystem, as described in the [“Troubleshooting the Power Subsystem”](#) section on page 4-7.

- c. If no, and no other LEDs on the PRE are lit but LEDs on other modules are lit, remove the PRE from the slot, check for any bent or broken pins on the backplane connectors, and reinsert it, ensuring it makes solid contact with the backplane and is securely locked in by firmly closing both locking levers.
 - d. If no, but the FAIL LED is lit (yellow), remove the PRE and reinsert it. If that fails, insert a new PRE. If that fails, contact TAC for assistance.
- Step 2** Repeat the above steps for the redundant PRE, except that its STATUS LED should be OFF and its alphanumeric display should read IOS STBY if it is operating correctly.
- a. If both PREs are operating correctly, check the Power LEDs on each TCC+ card. Are the POWER LEDs on each TCC+ card lighted (green)?
 - b. If no, remove the TCC+ card and reinsert it, making it sure it firmly connects to the backplane and that both captive screws are tightly connected.
 - c. If yes, proceed to the next step.
- Step 3** Verify the Status LEDs on the TCC+ card.
- a. Is the STATUS LED on the primary TCC+ on (solid green) indicating that it is the primary card?
 - b. Is the STATUS LED on the secondary TCC+ flashing (green) indicating that it is the redundant card?
 - c. If no, verify that the version of Cisco IOS on the router supports the TCC+ card.
- Step 4** Contact TAC for assistance if necessary. See the [“Obtaining Documentation and Submitting a Service Request”](#) section on page xvii.
-

Troubleshooting the Cooling Subsystem

The following troubleshooting steps are applicable to both the fan assembly (UBR10-FAN-ASSY= and UBR10012-FAN-PLUS=) modules.

Check the following to help isolate a problem with the cooling system.

- Step 1** When you start up the system, do the fans start operating?
- When the fans are operating, you should be able to hear them. You should also be able to feel air being drawn in at the bottom front and expelled at the top rear of the chassis.
- a. Check for fan failure by checking the fan status LEDs and running the **show environment** command.


```
Router# show environment

Temperature normal: chassis inlet measured at 29C/84F
Temperature normal: chassis core measured at 42C/107F
Fan:                OK
Power Entry Module 0 type DC status:          OK
Power Entry Module 1 type DC status:          OK
Power Entry Module 0 Power Last Successful Timestamp: 15:16:20 13 Dec 2012
Router#
```
 - b. Ensure that no alarms are triggered on the fan assembly module.
 - c. Check if there is sufficient ventilation on the chassis intake and chassis exhaust.
 - d. Verify if the ambient temperature is within the specified range.

If the problem persists, see the [“Obtaining Documentation and Submitting a Service Request”](#) section on page -xvii.

Step 2 Are the two LEDs —SINGLE FAN FAIL and MULTI FAN FAIL—illuminated (yellow)?

Remove the fan assembly module and reinsert it. If this does not help, examine the LED that is illuminated. Else see, [“Obtaining Documentation and Submitting a Service Request”](#) section on page -xvii.

Step 3 Are the following messages displayed?

These messages indicate that the system has detected a critical over-temperature condition or out-of-tolerance power inside the chassis.

Queued messages:

```
00:01:19:%ENVM-4-ENVWARN:+2.5 V measured at +2.59
00:01:19:%ENVM-4-ENVWARN:+5.15 V measured at +5.31

00:00:19:%ENVM-2-ENVCRIT:chassis core measured at 31C/87F
00:00:19:%ENVM-2-ENVCRIT:chassis inlet measured at 27C/80F
00:00:19:%ENVM-2-ENVCRIT:chassis outlet 1 measured at 30C/86F
00:00:19:%ENVM-2-ENVCRIT:chassis outlet 2 measured at 30C/86F
```

Although an over-temperature condition is unlikely at initial startup, ensure that heated exhaust air from other equipment is not entering the inlet vent of the router and that there is sufficient clearance around the sides of the chassis to allow cooling air to flow.



Note

The message could also indicate a faulty component or temperature sensor. Use the **show environment** or **show environment table** command to display the internal chassis environment.

Step 4 Is the PRODUCT ID LED/switch on fan assembly module illuminated (green) and a FAN-MISSING alarm is randomly being triggered?

If you are running a Cisco IOS Release that does not support the PRODUCT ID LED/switch feature, then ensure that the PRODUCT ID LED/switch is not pressed and is not illuminated. Upgrade to a supported Cisco IOS Release on the chassis.



Note

If you cannot upgrade to a supported Cisco IOS Release, then ensure that the PRODUCT ID LED/switch is not pressed and not illuminated (green).

If you are running a Cisco IOS Release that supports this feature, but the FAN-MISSING alarm is still being triggered, then follow the steps below to clear the alarm so that the software recognizes the fan module:

- a. Ensure that the PRODUCT ID LED/switch is pressed and illuminated (green).
- b. Remove the fan assembly module.
- c. Wait for 1 minute and reinsert the fan assembly module.

If the alarm is still being triggered, and the software still does not recognize the fan, then the fan may be faulty, you may have to replace the fan module.

If none of the above solves the problem, see the [“Obtaining Documentation and Submitting a Service Request”](#) section on page -xvii.

If you experience trouble with the startup, and the issue is not resolved with these procedures, manually power off the router and contact a service representative for assistance and further instructions, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page -xvii.

Troubleshooting the Line Cards

Check the following to help isolate a problem to a line card.

-
- Step 1** Verify that *all* the “Enabled” LEDs are on.
If yes, the system is operational.
- Step 2** Check to see if *any* “Enabled” LEDs are off.
- If the enabled LED on a line card is off, first verify that the line card has been enabled and configured for operations. The enabled LED remains off when a line card has not been configured and enabled.
 - If a port has been enabled but its corresponding enabled LED is still off, reseal the line card in its slot (you do not have to turn off the system power when removing or replacing line card). After the system reinitializes the interfaces, the enabled LED on the line card should go on.
 - If the enabled LED remains off after the above checks, it is likely that the system has detected a processor hardware failure. Contact a service representative for instructions. See the “[Obtaining Documentation and Submitting a Service Request](#)” section on page xvii.
- Step 3** For all fiber optic connections, verify that the connections are clean. See *Cleaning and Checking the Bulkhead Optical Connectors* and *Cleaning and Inspecting the Fiber Optic Connections* at the following URL:
- http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/field_replaceable_units/ub_oc48.html

**Note**

Refer to the FRU documentation for the different cards at the following URL:

http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_installation_guides_list.html

Troubleshooting the HHGE Installation

To troubleshoot the HHGE installation, follow the instructions in [Table 4-2](#).

Table 4-2 Line Card Installation Troubleshooting

Symptom	Possible Cause	Corrective Action
Error message appears on the console every time the line card requests an image download. The error message is echoed and the PRE2 will not load the line card image.	<ol style="list-style-type: none"> 1. HHGE card is inserted in slot 1 or slot 2. 	<ol style="list-style-type: none"> 1. Remove the HHGE from the illegal slot and place the card in any of the following slots: <ul style="list-style-type: none"> • 3/0/0 or 3/1/0 • 4/0/0 or 4/1/0.
The PRE2 software shuts down the card. The reset line is asserted and the running configuration is updated with this slot in the shutdown state.	<ol style="list-style-type: none"> 1. HHGE card is inserted in slot 1 or slot 2, subslot 1. 	<ol style="list-style-type: none"> 1. Remove the line card from the illegal slot and place it in slot 3 or slot 4. 2. Use the no hardware module shut command to reset the slot <code>no hardware 2/0/0 shut</code>
Power entry modules (PEMs), fans, and other line cards do not operate	<ol style="list-style-type: none"> 1. Disconnected power cord. 2. Power switch is in the Off position. 	<ol style="list-style-type: none"> 1. Check that all power cords are properly connected to both the Cisco uBR10012 system and at the power connection end. 2. Set the PEM power switches to the On position.
The yellow FAIL LED does not light during portions of the POST	<ol style="list-style-type: none"> 1. The line card is not properly seated. 2. Bad line card slot or backplane connector. 	<ol style="list-style-type: none"> 1. Be sure the ejector levers are fully closed and that the captive screws have been tightened. 2. Remove the line card and install it in another chassis slot.
The yellow FAIL LED blinks	<ol style="list-style-type: none"> 1. The SFP GBIC has been rejected because: <ul style="list-style-type: none"> – An internal fault is detected. – Not a Gigabit Ethernet SFP. – Not a Cisco SFP. – Two SFPs with identical serial numbers are present in the system. – There is a hardware shut down 	<ol style="list-style-type: none"> 1. Replace with a Cisco SFP GBIC.

Table 4-2 *Line Card Installation Troubleshooting (continued)*

Symptom	Possible Cause	Corrective Action
The green LINK LED does not light when you plug in the Ethernet cable	<ol style="list-style-type: none"> 1. No Ethernet connection to upstream device. 2. The SFP GBIC was not fully inserted or seated properly. 3. Negotiation is not configured properly. 4. Hardware shut down for that port. 5. Improper SFP GBIC (FAIL LED should blink). 6. Bad cable. 	<ol style="list-style-type: none"> 1. Make sure the upstream device has an active Ethernet connection. 2. Reinstall the SFP GBIC. 3. Reconfigure negotiation. 4. Enable the port. 5. Replace with a Cisco SFP GBIC. 6. Replace the cable.
The green LINK LED is on, but does not pass traffic	<ol style="list-style-type: none"> 1. Negotiation is off, but set to on at the remote end. 2. Internal loopback is enabled. 	<ol style="list-style-type: none"> 1. Set local and remote negotiation settings to the same value. 2. Disable loopback. 3. ARP incomplete 4. IP address not configured