

Troubleshooting

8

This chapter explains how you can troubleshoot a specific problem at system power-up, such as abnormal LED activity or no system power.

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Diagnosing Problems

The information in this chapter can help you identify problems by observing diagnostic signs. Your initial response to a system problem should be to check power connections, observe the system's LEDs carefully, and check cable connections on the system modules.

If a problem is beyond the scope of this chapter, refer to *Appendix F, Customer Service* for instructions.

Power Failure

When you power up the system and it does not respond normally, refer to the troubleshooting suggestions in Table 8-1.

LED Activity

Module LEDs can show you the immediate status of a module and alert you to a problem with the module or one of its ports. It is helpful to familiarize yourself with LED activity so that you can easily detect and correct a module-related problem with minimal or no system downtime. See Table 8-2 and Table 8-3 for specific information on normal LED activity. See Table 8-4 for specific information on troubleshooting abnormal LED activity.

Module Cables

See *Chapter 4, Cabling the ERX System*, for information about cabling modules.

Initialization Sequence

Each ERX line module is initialized independently. As a result, the CLI on the SRP module may become available before the line modules have completed initialization. Commands relating to a line module may fail if the module has not completed initialization. The **show version** command can be used to display line module status. Do not enter commands for a line module until its state is “online.”

Troubleshooting Power Failures

The system’s distributed power system is designed to consume low levels of power and dissipate low levels of heat. See *Appendix A, System Specifications* for specifications of power consumption and heat dissipation. If you suspect a power problem, refer to Table 8-1.

Table 8-1 Causes of power failures

Symptom	Possible Problems	Actions
System does not power up.	<ul style="list-style-type: none"> • System is not receiving power. • A module’s power supply has malfunctioned. • Power source cannot handle system load. 	<p>Note: <i>The following actions apply to all of the possible problems.</i></p> <ol style="list-style-type: none"> 1 Verify that all power connections are correct. 2 Verify that the power supply is delivering the correct voltage, current, and wattage to the system. Refer to <i>Appendix A, System Specifications</i>. 3 If the system still does not operate, contact Juniper Networks Customer Service.

Table 8-1 Causes of power failures (continued)

Symptom	Possible Problems	Actions
System shuts down.	<ul style="list-style-type: none"> Temperature too high Loss of power 	<p>Note: The following actions apply to all of the possible problems.</p> <ol style="list-style-type: none"> 1 Verify that power connections are properly attached. 2 Verify that system is receiving power. 3 Check whether or not the LEDs are lit. 4 Run diagnostics on SRP and line modules. 5 If system will not reset, contact Juniper Networks Customer Service.

Understanding Status LEDs

When you power up the system, it runs a series of tests for each module installed in the system. Refer to the tables in this section to understand normal and abnormal LED activity. For troubleshooting information, see Table 8-4.

LED Identification

The system's modules have two sets of status LEDs. The top set indicates generic router and module status. The bottom set indicates module-specific status, such as port status (line modules) or fan status (SRP module).

The number against the port status LED on a line module corresponds to the number of the port on the I/O module. Some line modules have more port status LEDs than the number of ports on the I/O module. In these cases, only the LEDs for the corresponding ports on the I/O modules are active.

For example, an OCx/STMx line module can pair with either an OC3-4 or an OC12/STM4 I/O module. Consequently, the line module has four port status LEDs for OC3/STM1 operation. However, only the top two sets of port status LEDs are active during OC12/STM4 operation.

Table 8-2 shows the functions of the module and port status LEDs.

Table 8-2 LED identification and activity descriptions

LED Location	LED Label	LED Indicator	LED Color	OFF to ON	ON to OFF
All modules	OK	Module status	Green	Self-test passed	Failure detected
	FAIL	Module status	Red	Failure detected	Diagnostic test running
	ONLINE	Module status	Green	Module online	Module offline

Table 8-2 LED identification and activity descriptions (continued)

LED Location	LED Label	LED Indicator	LED Color	OFF to ON	ON to OFF
All modules	REDUNDANT	Redundancy	Green	See <i>Redundancy Status</i> later in this chapter. Note: The REDUNDANT LED on the cOCx/STMx, FE-8, GE/FE, HSSI, OC3 (dual port), OCx/STMx, and X.21/V.35 line modules is nonfunctional.	
SRP module	POWER A OK	Power	Green	Power online on source A	Power off
	POWER B OK	Power	Green	Power online on source B	Power off
	FAN OK	Fan	Green	Fan online	Fan failure
	FAN FAIL	Fan	Red	Fan failure	Fan online
	LINK	Ethernet	Green	Ethernet link up	Ethernet link down
	ACTIVITY	Ethernet	Green	Blinks when Ethernet traffic on link	No Ethernet traffic on link
Ethernet line modules	LINK	Ethernet	Green	Ethernet link up	Ethernet link down
	ACTIVITY	Ethernet	Green	Blinks when Ethernet traffic on link	No Ethernet traffic on link
HSSI line module	SYNC	Port status	Green	If the port is configured as DTE, the LED lights when both the DCE and the clock source are available. If the port is configured as DCE, the LED lights when the DTE is available.	If the port is configured as DTE, the LED goes out when either the DCE or the clock source becomes unavailable. If the port is configured as DCE, the LED goes out when the DTE becomes unavailable.
	YEL ALM	Note: This LED is not functional on the HSSI line module.			
	RED ALM	Port status	Red	If the port is configured as DTE, the LED lights when either the DCE or the clock source becomes unavailable. If the port is configured as DCE, the LED lights when the DTE becomes unavailable.	If the port is configured as DTE, the LED goes out when both the DCE and the clock source are available. If the port is configured as DCE, the LED goes out when the DTE is available.

Table 8-2 LED identification and activity descriptions (continued)

LED Location	LED Label	LED Indicator	LED Color	OFF to ON	ON to OFF
X.21/V.35 line module	ACTIVE	Port status	Green	Port configured	Port not configured
	LOOPBK	Port status	Yellow	Port in local loopback or remote loopback, depending on the type of connection. (See)	Port not in loopback
	ERROR	Port status	Red	Port is enabled or comes online	Port is disabled or goes offline
	V.35	Port status	Green	V.35 cable connected	V.35 cable disconnected
	X.21	Port status	Green	X.21 cable connected	X.21 cable disconnected
	DCE	Port status	Green	DCE cable connected	DCE cable disconnected
	DTE	Port status	Green	DTE cable connected	DTE cable disconnected
Other line modules	SYNC	Port status	Green	In frame	Not in frame
	YEL ALM	Port status	Yellow	Far end receive failure (FERF) exists	No FERF present
	RED ALM	Port status	Red	Loss of sync/frame	In frame

The following figures show a representative module for each of the three variations:

- SRP module (Figure 8-1)
- Ethernet line module (Figure 8-2)
- Other line modules (Figure 8-3)

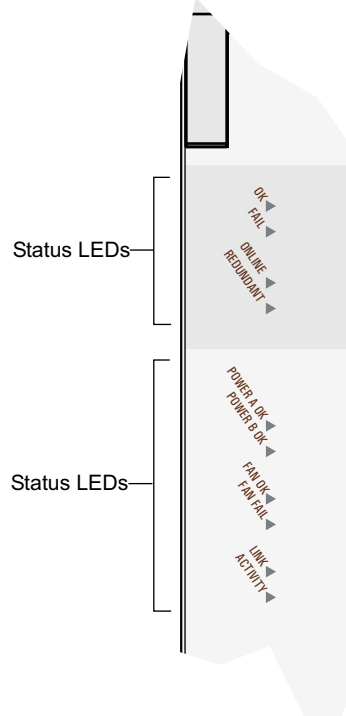


Figure 8-1 SRP module LEDs



Note: The primary SRP illuminates the REDUNDANT LED only when the SRP detects that there is a secondary or standby SRP module online. The standby SRP monitors an activity signal from the primary SRP module to determine its state; it does not shadow the operations of the primary SRP. If the standby SRP detects that the primary SRP is not active, it reboots the system and takes control.

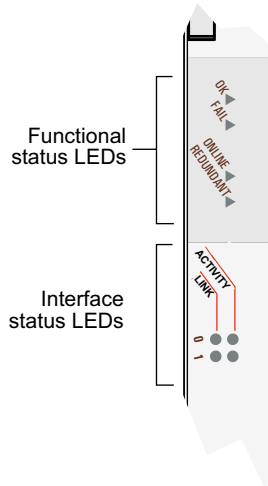


Figure 8-2 FE2 module LEDs

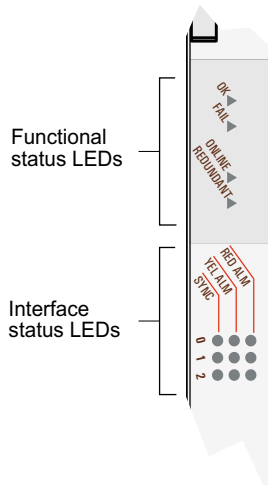


Figure 8-3 E3 and T3 module LEDs

LED Activity During Booting

When the system boots, it runs diagnostic tests, and the module status LEDs display various configurations. Observe the scenario presented in Table 8-3 to verify that the system has booted properly.



Note: When you reboot the system after installing a new version of the software, the line modules will appear to boot twice.

Table 8-3 Normal activity of functional status LEDs during booting

OK	FAIL	ONLINE	Status Process
off	on	off	1 Module is in the power-up restart state; the FAIL LED stays on briefly.
off	off	off	2 Module is initializing, and diagnostic tests are running.
on	off	off	3 Module passed the diagnostics; the system boots.
on	off	on	4 Module is now up and running.

If the system detects an error during booting, the FAIL LED turns on. Some failure conditions may cause the board not to boot. In this case, the LEDs may all be off. The system should then reset the board.

If the operational software detects an error, the FAIL LED turns on. Some errors may cause a board reset. Crash information can be displayed from the console and is printed to the screen on the next reboot.

Abnormal LED Activity

See Table 8-4 to diagnose and correct problems.

Table 8-4 Troubleshooting abnormal LED activity on modules

Diagnostic Signs	Possible Problems	Actions
<ul style="list-style-type: none"> POWER A OK is not lit POWER B OK is not lit 	<ul style="list-style-type: none"> System is not receiving power from Power A. System is not receiving power from Power B. 	<ol style="list-style-type: none"> 1 Check Power A and Power B terminal connections. 2 Verify that power switches are on. 3 Check connections to power sources. 4 If system still does not operate, contact Juniper Networks Customer Service.
FAIL LED lights	<ul style="list-style-type: none"> The line module and I/O module are incompatible. A hardware failure, such as a failed module. 	<ol style="list-style-type: none"> 1 Check that the line and I/O modules are compatible; replace if necessary. 2 If you replaced the I/O module only, issue the reload slot slot_number command. 3 If you replaced the line module or if there was a hardware failure, the system should automatically reset the module. 4 If condition persists, contact Juniper Networks Customer Service.
<ul style="list-style-type: none"> FAN OK does not light FAN FAIL LED lights 	<ul style="list-style-type: none"> Fan is not working properly or has slowed down. Fan needs replacement. 	Contact Juniper Networks Customer Service; the system must be serviced.

Table 8-4 Troubleshooting abnormal LED activity on modules (continued)

Diagnostic Signs	Possible Problems	Actions
LINK LED is not lit	<ul style="list-style-type: none"> Ethernet connection is down. 	<ol style="list-style-type: none"> 1 Check that Ethernet cables are properly connected to both the Ethernet port and the appropriate network device. 2 Contact Juniper Networks Customer Service.
RED ALM	<ul style="list-style-type: none"> System does not recognize a port connection. Cabling is not connected properly. Cable is faulty. Clocking problem exists. 	<ol style="list-style-type: none"> 1 Check that all cables are firmly plugged into OC3 ports and the attached network device. 2 Verify that cables are clean. 3 Test for faulty cables. 4 Verify clock source and configuration. 5 Reset system. <p>Note: Problem is corrected when normal LED activity is observed.</p>
YEL ALM Note: This LED is not functional on the HSSI line module.	<ul style="list-style-type: none"> Far end receive failure (FERF) exists. 	<ol style="list-style-type: none"> 1 Correct FERF problem. 2 Reset system. <p>Note: Problem is corrected when normal LED activity is observed.</p>
<ul style="list-style-type: none"> System will not boot. Module(s) held offline. FAIL LED lights 	A slot group is overloaded.	<ol style="list-style-type: none"> 1 Issue the show version command to display board status. 2 Review section on proper slot group configuration in <i>Chapter 3, Installing ERX Modules</i>. 3 Reconfigure system with correct slot group configuration. 4 Reset system.
None	<ul style="list-style-type: none"> System temperature is too high. Vents are blocked. Fans are not operating. 	<ol style="list-style-type: none"> 1 Check your console for a message indicating the problem. If you have the "system" log set to a severity of WARNING or higher, a Warning message indicating the failure is displayed. 2 Issue the show environment command to display the temperatures. If the temperature is too high, power down the system. 3 Regulate temperature. 4 Reset system.

Redundancy Status

You can determine the redundancy state of line modules by examining the online and redundant status LEDs. See Table 8-5.



Note: The REDUNDANT LED on the cOCx/STMx, FE-8, GE/FE, HSSI, OC3 (dual port), and OCx/STMx modules is nonfunctional.

Table 8-5 Redundancy status of a line module

ONLINE LED	REDUNDANT LED	State of the Line Module
Off	Off	Module is booting or is an inactive primary line module.
On	Off	Module is active, but no standby module is available.
Off	On	Module is in standby state.
On	On	Module is active, and a standby module is available.

Monitoring Temperatures of Modules

You can view the temperature of each module by issuing the **show environment all** and **show environment table** commands. In addition, the system generates detailed log messages if the temperature of a module is outside normal operating limits.

If the temperature of any module exceeds the upper temperature limit, the system immediately goes into thermal protection mode. Once the system has entered thermal protection mode, you must resolve the cause of the high temperature.

Table 8-6 Troubleshooting high-temperature conditions

Cause of High Operating Temperature	Symptoms	Resolution
Air vents to system are blocked	Space around system does not meet specifications (see <i>Appendix A, System Specifications</i>).	Increase space around system.
Ambient temperature exceeds specifications	Ambient temperature exceeds specifications (see <i>Appendix A, System Specifications</i>).	Provide extra cooling or heating in the room where the system is located.
Cooling fan failure	<ul style="list-style-type: none"> FAN OK LED on SRP module is not illuminated. FAN FAIL LED on SRP module is illuminated. 	Replace fan tray (see <i>Chapter 7, Maintaining the ERX System</i>).
Module failure	FAIL LED on module is illuminated.	Replace module (see <i>Chapter 3, Installing ERX Modules</i>).

When you have resolved the cause of the high temperature, you must power cycle the system to reset the modules.

Resetting Line Modules and SRP Modules

Two recessed buttons on line modules and SRP modules provide the mechanisms for resetting. You can use the NMI button to reset the software on the module and the board reset button to reset the module. See Figure 1-8 and Figure 1-9.

If a line module fails to respond for an extended period of time, there may be a software problem with that module. You can depress the software reset button with a paper clip to suspend the current software task. Depending on the situation, this action may also reset the software on the module.

If depressing the software reset button fails to correct the issue with the line module, depress the board reset button. This action reboots the line module.

The buttons work in the same way for the SRP module. Depressing the board reset button on an SRP module is equivalent to rebooting the ERX system and causes all the line modules to reboot.

Double-Bit Errors on SRP Modules

SRP modules include error checking and correction (ECC) to protect their SDRAM. ECC provides error detection of single-bit and double-bit errors and correction of single-bit errors for the SDRAM as follows:

- If ECC detects a single-bit error, it automatically corrects the error, and operation continues.
- If ECC detects a double-bit error, it logs the error, stops the main processor on the controller, and takes the SRP module offline.

Detecting Double-Bit Errors

The following message appears on the console if ECC detects a double-bit error:

```
ALERT 05/10/2000 13:10:33 os: failed: ECC DOUBLE BIT ERROR
OCCURRED
Address = 0xe95db10
Data (Upper 32Bits) = 0xe95db20
Data (Lower 32Bits) = 0x55d06c
ECC Data Bits = 0x2b
ECC 1Bit Error Counter = 0x0
*** YOU MUST PERFORM A HARD RESET TO CONTINUE ***
ALERT 05/10/2000 13:10:34 os: PROCESSOR EXCEPTION: 0x200n
```

If ECC detects a double-bit error in a system that contains a redundant SRP module, the redundant module becomes active and the system continues to operate. However, you must still troubleshoot the SRP module with the double-bit error. If ECC detects a double-bit error in a system that does not contain a redundant SRP module, you must troubleshoot the SRP module immediately. See *Fixing Double-Bit Errors*.

Fixing Double-Bit Errors

To fix a double-bit error:

- 1 Remove the second SRP module, if there is one.
- 2 Reboot the system with the board reset button on the SRP module (see Figure 1-8).

These actions attempt to correct a transient double-bit error. However, if the console displays a memory test failure for the SRP module after you reboot, or if the FAIL LED on the SRP module stays on during rebooting, the SDRAM is permanently damaged and needs replacing. In this event, call Juniper Networks Customer Service to arrange for repair.