



Applying Power and Verifying the Installation

This chapter provides information and instructions for understanding the boot process, applying power to the chassis, and verifying that the installation was successful.



Important

This chapter assumes that the ASR 5000 chassis, its sub-components, as well as application and line cards have been physically installed. The system has also been cabled to interoperate with management and traffic networks.

This chapter includes the following sections:

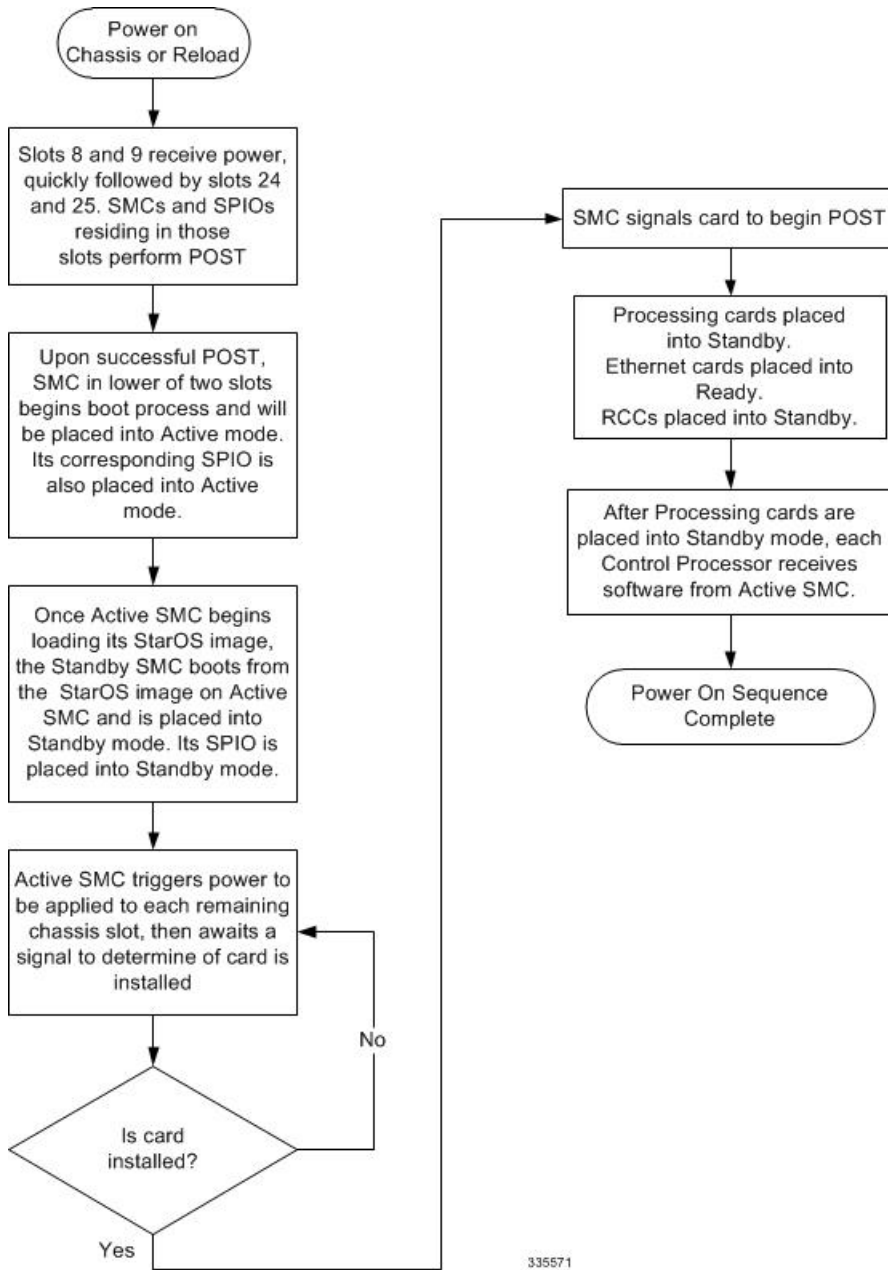
- [Understanding the System Boot Process, page 1](#)
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Understanding the System Boot Process

Before you apply power to the system, it is important that you understand the boot process and how the hardware components are brought on line.

The following figure provides a flowchart that explains each step in the startup process.

Figure 1: Boot Process Flowchart



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Step 1 When power is first applied to the chassis, or after a reboot, only the SMC in slots 8 and 9 receive power. Therefore, the SMCs are the first cards to boot and their LEDs are the first to light up. Once the system confirms that cards are located in slots 8 and 9, power is quickly applied to the SPIOs in slots 24 and 25.

Step 2 During the startup process, each card performs a series of Power-On Self Tests (POSTs) to ensure that the hardware is

operational.

- Step 3** If the SMC in slot 8 successfully executes all POSTs, it becomes the active SMC for the system. The SMC in slot 9 becomes the standby. Note that if there is a problem with the SMC in slot 8, the card in slot 9 becomes the active SMC.
- Step 4** Once the active and standby order is determined, the SPIO cards in slots 24 and 25 are placed into active and standby mode, determined by the direct mapping of the active and standby SMCs.
- Step 5** The active SMC begins loading the operating system software image designated in the boot stack. The boot stack entries are contained in the boot.sys file that resides on the SMC's CompactFlash device.
- Step 6** The standby SMC observes the active card's startup. If the file on the active card is loading normally, the standby SMC boots from the active card's image. If the active SMC experiences a problem during this phase, the standby card loads its software image, designated by its own boot stack entry in its boot.sys file, and takes control of the system as the active card.
- Step 7** After the software image is loaded into the SMCs' RAM, the active card determines if other cards are installed in the chassis by applying power to the other slots and signalling them. If the chassis slot contains an application or line card, power is left on to that slot. All empty slots are powered off.
- Important** If no SMCs are installed, or if they are installed incorrectly, no other card installed in the system will boot.
- Step 8** When power is applied to the installed packet processing cards and line cards, they each perform their own series of POSTs.
- Step 9** After successful completion of the POSTs, each of the packet processing cards enter standby mode. Note that the redundant card for an XGLC in slot 17 would be installed in slot 32. Use only the upper slot number when referring to this card. Installed line cards remain in ready mode until their corresponding packet processing card is made active via configuration. Once the packet processing card is active, the line card installed in the upper-rear chassis slot behind the card is also made active. The line card installed in the lower-rear chassis slot behind the card enters the standby mode.
- Step 10** After entering the standby mode, each of the packet processing card's control processors communicate with the SMC to receive the appropriate code.
- Step 11** Upon successful loading of the software image, the system loads a configuration file designated in the boot stack (boot.sys file). If this is the first time the system is powered on and there is no configuration file, the active SMC invokes the system's Quick Setup Wizard. Use the Quick Setup Wizard to configure basic system parameters that enable the system to communicate across the management network.
- Step 12** The Wizard creates a configuration file, saved as system.cfg, that can be used as a starting point for subsequent configurations. The system is configured by automatically applying the configuration file during any subsequent boot. For additional information about system configuration files, refer to the *System Administration Guide*.



Caution

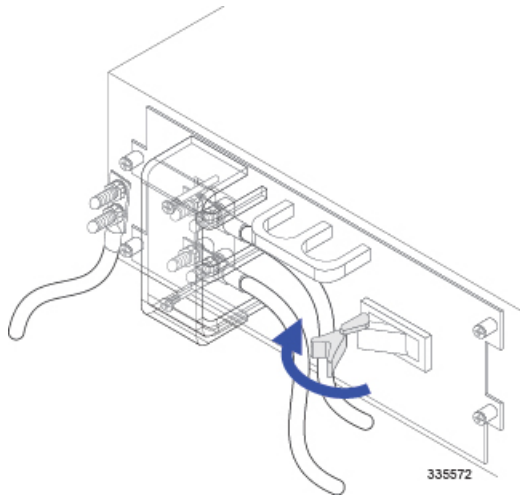
Never operate the chassis if any slots are uncovered. This reduces airflow through the chassis and could cause it to overheat. Make sure a card or blanking panel is installed in every chassis slot at all times.

After the system successfully boots and the initial configuration is applied, the system is ready to be configured or offer services.

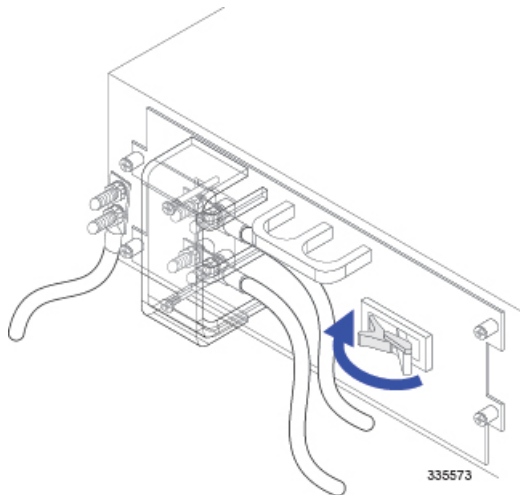
Applying Power to the Chassis

Once you have properly connected all power and ground cables to the chassis according to the instructions in "Cabling the Power Filter Units", follow the instructions below to apply power to the system.

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- Step 1** Connect a terminal to the Console port of the primary SPIO.
- Step 2** Ensure that the circuit breakers on the system's Power Filter Units (PFUs) are in the OFF position.
- Step 3** Turn the power source on.
- Step 4** Check the voltage level and polarity at the terminals for each PFU. Place the positive probe of a voltage meter on the -VDC terminal and the common probe of the meter on the RTN terminal. The meter should display a voltage approximately equal to that of power source.
- Step 5** Power on the system PFUs.
- Optional. If the circuit breaker on your PFU is equipped with a locking clip, move the clip to the left unlocking the circuit breaker's actuator.



- Flip the circuit breaker on the PFU to the ON position.
- Optional. If the circuit breaker on your PFU is equipped with a locking clip, lock the circuit breaker in place. Move the breaker's locking clip to the left until the clip's inside tang is recessed in the breaker's actuator opening.



d) Repeat step a through step c for the second PFU.

Verifying the Installation

When power is applied to the chassis, power is provided to the upper and lower fan trays, and every installed application and line card.

Each PFU, application card, and line card installed in the chassis has light emitting diodes (LEDs) that indicate its status. This section describes how to interpret the LEDs to verify that all of the installed components are functioning properly.

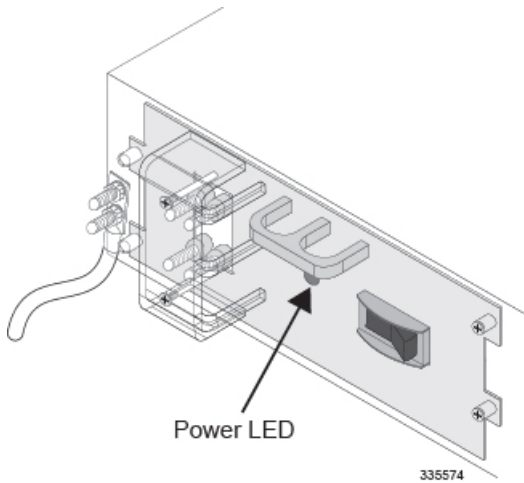


Important

As the system progresses through its boot process, some cards may have no immediate LED activity. Line cards have sporadic Link and Activity LED activity. It is recommended that you allow several minutes to elapse prior to checking the LEDs on the various cards to verify the installation.

Checking the LED on the PFU

Each PFU has a single status LED labeled POWER. This LED is green during normal operating conditions.



If the LED is not green, use the following troubleshooting information to diagnose the problem.

Table 1: PFU Power LED States

Color	Description	Troubleshooting
Green	PFU powered with no errors detected	None needed.
None	PFU is not receiving power	Verify that the power switch is in the ON position.
		Verify that the RTN and -VDC lugs are attached properly according to the instructions provided in this document.
		Verify that the ground lug is attached properly.
		Verify that the power source is on and is supplying the correct voltage and sufficient current.
		Check the cables from the power source to the rack for continuity.
		If a fuse panel is installed between the Power Distribution Frame (PDF) and the chassis, verify that the fuses are intact.
		If a fuse panel is installed between the PDF and the chassis, check the cables from the fuse panel to the chassis for continuity.
		If all of the above suggestions have been verified, then it is likely that the PFU is not functional. Please contact your service representative.

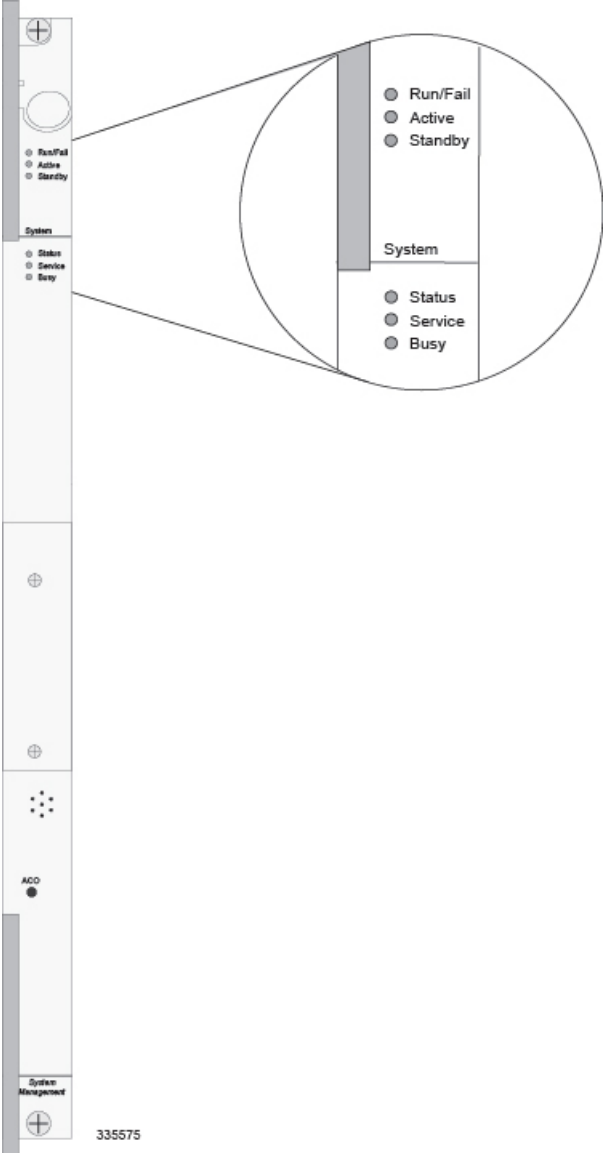
Checking the LEDs on the SMC(s)

Each SMC is equipped with the following LEDs as shown in the following figure:

- Run/Fail
- Active
- Standby
- Status
- Service
- Busy

The possible states for all SMC LEDs are described in the sections that follow.

Figure 2: SMC LEDs



SMC Run/Fail LED States

The SMC's Run/Fail LED indicates the overall status of the card. This LED is illuminated steady green for normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 2: SMC Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Blinking Green	Card is initializing and/or loading software	This is normal operation during boot-up.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during boot. Refer to the <i>System Administration Guide</i> for troubleshooting information.
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU, on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the SMC is not functional. Please contact your service representative.

SMC Active LED States

The Active LED on the SMC indicates that the software is loaded on the card and it is ready for operation. For the SMC installed in slot 8, this LED is illuminated green during normal operation. For the SMC installed in slot 9, this LED is off during normal operation.

The possible states for this LED are described in the following table. If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 3: SMC Active LED States

Color	Description	Troubleshooting
Green	Card is active	None needed for the SMC in slot 8. If green for the SMC in slot 9, verify that the SMC in slot 8 is installed properly according to the instructions in this document.

Color	Description	Troubleshooting
Blinking Green	Tasks or processes being migrated from the active SMC to the redundant/secondary SMC	Verify that the Standby LED on the redundant SMC is also blinking green. If so, there is an issue with the active SMC.
None	Card is not receiving power OR	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to SMC Run/Fail LED States, on page 8 for troubleshooting information.
	Card in Standby Mode	Check the state of the Standby LED. If it is green, the card is in standby mode.

SMC Standby LED States

The Standby LED on the SMC indicates that software is loaded on the card and it is serving as a redundant component. For the SMC installed in slot 9, this LED is illuminated steady green during normal operation. For the SMC installed in slot 8, this LED is off during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 4: SMC Standby LED States

Color	Description	Troubleshooting
Green	Card is in redundant mode	None needed for the SMC in slot 9. If green for the SMC in slot 8, then verify it is installed properly according to the instructions in this document.
Blinking Green	Tasks or processes are being migrated from the active SMC to the redundant/secondary SMC	Verify that the Active LED on the redundant SMC is also blinking green. If so, there is an issue with the active SMC.
None	Card is not receiving power OR	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to SMC Run/Fail LED States, on page 8 for troubleshooting information.
	Card in Active Mode	Check the state of the Active LED. If it is green, the card is in active mode.

SMC Status LED States

The Status LEDs on the SMC indicate the status of system level hardware, such as installed cards, fans, and PFUs. This LED is illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information also provided to diagnose the problem.

Table 5: SMC Status LED States

Color	Description	Troubleshooting
Green	No system errors detected	None needed.
Red	Failures Detected	Check the Run/Fail LEDs for all installed application cards, and line cards. If any are red or off, refer to the troubleshooting information in this chapter pertaining to that device.
None	Card is not receiving power	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to SMC Run/Fail LED States , on page 8 for troubleshooting information.

SMC Service LED States

The Service LEDs on the SMCs indicate that the system requires maintenance or service. Examples are that the system could not locate a valid software image at boot-up, or that a high temperature condition exists.

This LED is off during normal operation.

The possible states for this LED are described in the following table. Use the troubleshooting information in the table to diagnose the problem.

Table 6: SMC Service LED States

Color	Description	Troubleshooting
Yellow	System requires maintenance (fan filter, temperature warning, PFU outage etc.)	Refer to the appropriate section of this guide for troubleshooting information.
None	Card is not receiving power	No maintenance needed.

SMC Busy LED States

The Busy LEDs on the SMCs indicate that there is activity on one of their memory devices:

- CompactFlash module

- PCMCIA device
- Nand Flash (used to store SMC firmware)
- Hard drive

The possible states for this LED are described in the following table. If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 7: SMC Busy LED States

Color	Description	Troubleshooting
Green/ Blinking Green	Data is being read from or written to one of the memory devices.	No maintenance needed. NOTE: If you are removing an SMC from the chassis, it is recommended that you wait until this LED is off to ensure the integrity of all data being transferred to or from the memory device.
None	The memory devices are not in use.	No maintenance needed.

Checking the LEDs on Packet Processing Cards

Each packet processing card is equipped with status LEDs as shown in the following figure:

- Run/Fail
- Active
- Standby
- Status
- Service

The possible states for all of the packet processing card's LEDs are described in the sections that follow.

Figure 3: Packet Processing Card LEDs



PSCA, PSC2, PSC3 and PPC Run/Fail LED States

The packet processing card's Run/Fail LED indicates the overall status of the card. This LED is illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 8: Packet Processing Card Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Blinking Green	Card is initializing and/or loading software	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process.
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU, on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the packet processing card is not functional. Please contact your service representative.

PSCA, PSC2, PSC3 and PPC Active LED States

The Active LED on the packet processing card indicates that the software is loaded on the card and that the card is ready for operation. When the system first boots up, all installed packet processing cards are booted into standby mode. You must then configure the system to designate which packet processing cards are to serve as redundant components (in standby mode) and which are to function as active components.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 9: Packet Processing Card Active LED States

Color	Description	Troubleshooting
Green	Card is active	The first time power is applied to the system, all of the packet processing cards should be booted into the standby mode. Therefore, this LED should be off.

Color	Description	Troubleshooting
Blinking Green	Tasks or processes are being migrated from an active packet processing card to a redundant/secondary packet processing card	Verify that the Standby LED on a redundant packet processing card is also blinking green. If so, there is an issue with the packet processing card that was active and is transferring its processes.
None	Card is not receiving power OR Card in Standby Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to the PSCA, PSC2, PSC3 and PPC Run/Fail LED States , on page 13 for troubleshooting information.
		Check the state of the Standby LED. If it is green, the card is in standby mode. This is normal operation for the initial power-up.

PSCA, PSC2, PSC3 and PPC Card Standby LED States

The Standby LED on the packet processing card indicates that software is loaded on the card and the card is serving as a redundant component. When the system first boots up, all installed packet processing cards are booted into standby mode. You must then configure the system to designate which packet processing cards are to serve as redundant components (in standby mode) and which are to function as active components.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 10: PSCA, PSC2, PSC3 and PPC Standby LED States

Color	Description	Troubleshooting
Green	Card is in redundant mode	The first time power is applied to the system, all of the packet processing cards should be booted into the standby mode. This is normal operation.
Blinking Green	Tasks or processes being migrated from the active SMC to the redundant/secondary SMC	Verify that the Active LED on the redundant packet processing card is also blinking green. If so, there is an issue with the active packet processing card and the system is transferring its processes.
None	Card is not receiving power OR Card is in Active Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to PSCA, PSC2, PSC3 and PPC Run/Fail LED States , on page 13 for troubleshooting information.
		Check the state of the Active LED. If it is green, the card is in active mode.

Checking the LEDs on the SPIO(s)

Each SPIO is equipped with status LEDs:

- Run/Fail
- Active
- Standby

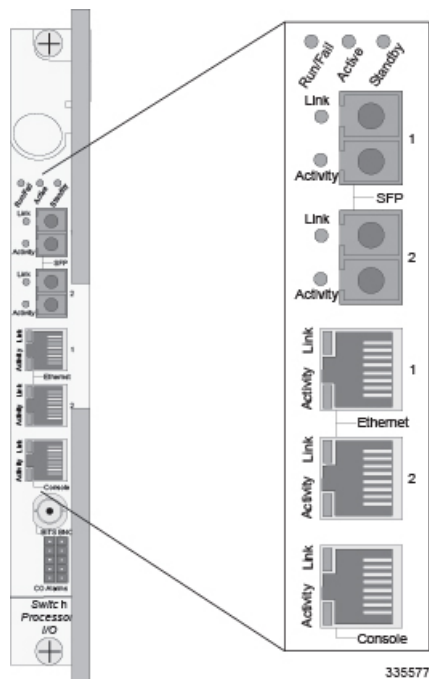
In addition to the status LEDs, each the RJ-45 and SFP interfaces to the management network are equipped with the following LEDs:

- Link
- Activity

The following figure shows the LEDs on the SPIO.

The possible states for all of the SPIO's LEDs are described in the sections that follow.

Figure 4: SPIO LEDs



SPIO Run/Fail LED States

The SPIO's Run/ Fail LED indicates the overall status of the card. This LED is illuminated steady green for normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 11: SPIO Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process. Refer to the <i>System Administration Guide</i> for troubleshooting information.
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU, on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the SPIO is not functional. Please contact your service representative.

SPIO Active LED States

The Active LED on the SPIO indicates that the software is loaded on the card and that the card is ready for operation. For the SPIO installed in chassis slot 24, this LED is steady green during normal operation. For the SPIO installed in slot 25, this LED is off during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 12: SPIO Active LED States

Color	Description	Troubleshooting
Green	Card is active	None needed for SPIO in slot 24. If green for SPIO in slot 25, verify that SPIO in slot 24 is installed according to the instructions in this document.

Color	Description	Troubleshooting
None	Card is not receiving power.	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to SPIO Run/Fail LED States , on page 16 for troubleshooting information.
	OR Card is in Standby Mode.	Check the state of the Standby LED. If it is green, the card is in standby mode. Refer to the <i>System Administration Guide</i> for information on making the card active

SPIO Standby LED States

The Standby LED on the SPIO indicates that software is loaded on the card and that it is serving as a redundant component. For the SPIO installed in slot 25, this LED is illuminated steady green during normal operation. For the SPIO installed in slot 24, this LED is off during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 13: SPIO Standby LED States

Color	Description	Troubleshooting
Green	Card is in redundant mode	None needed for SPIO in slot 25. If green for SPIO in slot 24, check the status of the SMC installed in slot 8. If the SMC in slot 8 is in standby mode, it is possible that there is a configuration problem.
None	Card is not receiving power.	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to SPIO Run/Fail LED States , on page 16 for troubleshooting information.
	OR Card is in Active Mode.	Check the state of the Active LED. If it is green, the card is in active mode.

SPIO Interface Link LED States

The Link LED, associated with a particular SPIO interface indicates the status of the network link. This LED is illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.



Important

During system startup, some Link and/or Activity LEDs may momentarily illuminate. This activity is normal and does not indicate any network link or data transfer status. The line card has not yet been initialized and placed into a stable operational state by the system.

Table 14: SPIO Interface Link LED States

Color	Description	Troubleshooting
Green	Link is up	None needed. NOTE: This LED will not indicate the presence of a network link until the interface parameters are set during the software configuration process.
None	No power to card OR Link is down.	Verify that the Run/Fail LED is green. If so, the card is receiving power. If it is off, refer to SPIO Run/Fail LED States , on page 16 for troubleshooting information. Verify that the device on which the interface is located is cabled and powered properly.

SPIO Interface Activity LED States

The Activity LED associated with a particular SPIO interface indicates the presence of traffic on the network link. This LED is illuminated steady green when data is being transmitted or received over the interface.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.



Important

During system startup, some Link and/or Activity LEDs may momentarily illuminate. This activity is normal and does not indicate any network link or data transfer status. The line card has not yet been initialized and placed into a stable operational state by the system.

Table 15: SPIO Interface Activity LED States 6

Color	Description	Troubleshooting
Flashing Green	Traffic is present on the link	None needed.
None	No traffic is present on the link	None needed if there is no activity on the link. Prior to configuration, this is normal operation.

Checking the LEDs on the Ethernet Line Cards

This section describes the LEDs for the following Ethernet cards:

- Fast Ethernet 10/100 Line Card (FLC2)
- Gigabit Ethernet 1000 (GLC2)
- Quad Gigabit Ethernet Line Card (QGLC)

- 10 Gigabit Ethernet Line Card (XGLC)

Each Ethernet card is equipped with status LEDs:

- Run/Fail
- Active
- Standby

In addition to the status LEDs, each network interface is equipped with:

- Link
- Activity

The possible states for all LEDs on the Ethernet line cards are described in the sections that follow.

Ethernet Line Card Run/Fail LED States

The Run/Fail LEDs on the Ethernet Line Cards indicate the overall status of the cards. These LEDs are illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 16: Ethernet Line Card Run/Fail LED States 7

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process. Refer to the <i>System Administration Guide</i> for troubleshooting information.
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU , on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the line card is not functional. Please contact your service representative.

Ethernet Line Card Active LED States

The Active LEDs on the Ethernet Line Cards indicate that the operating software is loaded on the card and that the card is ready for operation.

The line cards installed remain in ready mode until their corresponding packet processing card is activated during configuration. While in ready mode, the Active LED is off. When the packet processing card is activated, the line card installed in the upper-rear chassis slot behind the packet processing card is also activated. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 17: Ethernet Line Card Active LED States 8

Color	Description	Troubleshooting
Green	Card is active	<p>None needed for line cards installed in slots 17 through 23 and 26 through 32 after configuration.</p> <p>If green for line cards in slots 33 through 39 and 42 through 48, verify that the corresponding line card installed in the upper-rear chassis slot is installed properly according to the instructions in this document.</p> <p>For example, if this LED is green for a line card in slot 33, verify that the line card in slot 17 is installed properly.</p>
None	Card is in Ready Mode	This is normal prior to configuration. Neither the Active or the Standby LED on the card will be on.
	OR Card is not receiving power	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Ethernet Line Card Run/Fail LED States , on page 20 for troubleshooting information.
	OR Card is in Standby Mode	Check the state of the Standby LED. If it is green, the card is in standby mode. Refer to the <i>System Administration Guide</i> for information on making the card active.

Ethernet Line Card Standby LED States

The Standby LEDs on the Ethernet Line Cards indicate that software is loaded on the cards and that they are serving as redundant components.

The line cards remain in ready mode until their corresponding packet processing card is activated during configuration. While in ready mode, the Active LED is off. After the packet processing card activated, the line card installed in the upper-rear chassis slot behind the packet processing card is also activated. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 18: Ethernet Line Card Standby LED States 9

Color	Description	Troubleshooting
Green	Card is in redundant mode	None needed for line cards installed in slots 33 through 39 and 42 through 48 after configuration. If green for line cards installed in slots 17 through 23 and 26 through 32, refer to the <i>System Administration Guide</i> for troubleshooting information.
None	Card in Ready Mode OR Card is not receiving power OR Card in Active Mode	This is normal prior to configuration. Neither the Active nor Standby LEDs on the card will be on.
		Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Ethernet Line Card Run/Fail LED States, on page 20 for troubleshooting information.
		Check the state of the Active LED. If it is green, the card is in standby mode.

Ethernet Line Card Interface Link LED States

The Link LEDs, associated with a particular network interface on the Ethernet Line Cards, show the status of the network link. These LEDs are illuminated steady green for normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.



Important

During system startup, some Link and/or Activity LEDs may momentarily illuminate. This activity is normal and does not indicate any current network link or data transfer status. The line card has not yet been initialized and placed into a stable operational state by the system.

Table 19: Ethernet Line Card Interface Link LED States 10

Color	Description	Troubleshooting
Green	Link is up	None needed. NOTE: This LED will not indicate the presence of a network link until the interface parameters are set during the software configuration process.

Color	Description	Troubleshooting
None	No power to card OR Link is down	Verify that the Run/Fail LED is green. If so, the card is receiving power. If it is off, refer to <i>Ethernet Line Card Run/Fail LED States</i> section for troubleshooting information.
		Verify that the interface is cabled properly.
		Verify that the device where the interface is connected to is cabled and powered properly.
		Check the cable for continuity.

Ethernet Line Card Activity LED States

The Activity LEDs are associated with a particular network interface on the Ethernet line cards. The LEDs are illuminated steady green when data is being transmitted or received on the network link.

If the LED is not green, use the troubleshooting information in the following table to diagnose the problem.



Important

During system startup, some Link and/or Activity LEDs may momentarily illuminate. This activity is normal and does not indicate any current network link or data transfer status. The line card has not yet been initialized and placed into a stable operational state by the system.

Table 20: Ethernet Line Card Activity LED States 11

Color	Description	Troubleshooting
Flashing Green	Traffic is present on the link	None needed.
None	No traffic is present on the link	None needed if there is no activity on the link. Prior to configuration, this is normal operation.

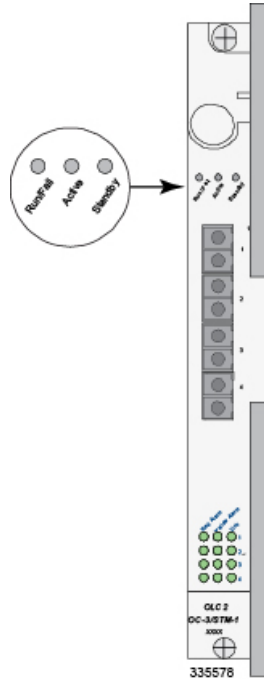
Checking the Card-Level LEDs on the Optical (ATM) Line Card

Each Optical (ATM) line card (OLC2) is equipped with card-level status LEDs:

- Run/Fail
- Active
- Standby

The location of these LEDs is displayed in the figure below and the various states are described in the following three tables.

Figure 5: Card-Level Status LEDs for the Optical (ATM) Line Card



Optical (ATM) Line Card Run/Fail LED States

The Run/Fail LED on the ATM line card indicates the overall status of the card. These LEDs are illuminated steady green for normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 21: Optical (ATM) Line Card Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process. Refer to the <i>System Administration Guide</i> for troubleshooting information.

Color	Description	Troubleshooting
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU, on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the line card is not functional. Please contact your service representative.

Optical ATM Line Card Active LED States

The Active LED on the Optical (ATM) line card indicates that the operating software is loaded on the card and that the card is ready for operation.

The line cards installed will remain in a ready mode until their corresponding packet processing card is made active via configuration. While in ready mode the Active LED is off. After the packet processing card is made active, the line card installed in the upper-rear chassis slot behind the packet processing card is also active. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

The possible states for this LED are described in the following table. If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 22: Optical (ATM) Line Card Active LED States

Color	Description	Troubleshooting
Green	Card is active	<p>None needed for line cards installed in slots 17 through 23 and 26 through 32 after configuration.</p> <p>If green for line cards in slots 33 through 39 and 42 through 48, verify that the corresponding line card installed in the upper-rear chassis slot is installed properly according to the instructions in this document.</p> <p>For example, if this LED is green for a line card in slot 33, verify that the line card in slot 17 is installed properly.</p>

Color	Description	Troubleshooting
None	Card in Ready Mode OR	This is normal prior to configuration. Neither the Active or the Standby LED on the card will be on.
	Card is not receiving power OR	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Optical (ATM) Line Card Run/Fail LED States , on page 24 for troubleshooting information.
	Card in Standby Mode	Check the state of the Standby LED. If it is green, the card is in standby mode.

Standby LED States

The Standby LED on the Optical (ATM) line card indicates that software is loaded on the card, but that it is serving as a redundant component.

The installed line cards remain in ready mode until their corresponding packet processing card is activated during configuration. While in ready mode, the Active LED is off. After the packet processing card is activated, the line card installed in the upper-rear chassis slot behind the packet processing card is also activated. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 23: Optical (ATM) Line Card Standby LED States

Color	Description	Troubleshooting
Green	Card is in Redundant mode	None needed for line cards installed in slots 33 through 39 and 42 through 48 after configuration. If green for line cards installed in slots 17 through 23 and 26 through 32, refer to the <i>System Administration Guide</i> for troubleshooting information.
None	Card is in Ready Mode OR	This is normal prior to configuration. Neither the Active nor Standby LEDs on the card will be on.
	Card is not receiving power OR Card is in Active Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Optical (ATM) Line Card Run/Fail LED States , on page 24 for troubleshooting information.
		Check the state of the Active LED. If it is green, the card is in standby mode. Refer to the <i>System Administration Guide</i> for information configuring the card to serve as a redundant component.

Checking the Alarm and Link LEDs on the Optical (ATM/POS OC-3) Line Card

Each Optical (ATM) line card provides alarm LEDs for each of its four ports. These LEDs are located directly below the fourth port, as illustrated in the figure below.

Figure 6: Alarm and Link LEDs on the Optical (ATM) Line Card

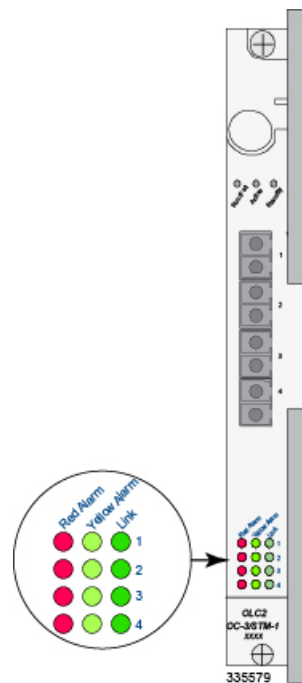


Table 24: Alarm/Link States for Optical (ATM) Line Card

LED	LED Color	Description
Red Alarm	Red (ON) OFF	Illuminates when the port is in a fault condition, such as LOS or LOF. Off when there is no alarm for this port.
Yellow Alarm	Yellow (ON) OFF	Illuminates when the port is receiving a signal indicating a problem at the remote end, for example, RDI. Off when there is no alarm for this port.

LED	LED Color	Description
Link	Green (On)	Illuminates Green when a fiber optic cable is plugged into the port and the receive signal is detected by the SFP module.
	Yellow (On)	Illuminates Yellow when an SFP module is plugged into the port.
	OFF	Off indicates that there is no SFP module plugged into the port.

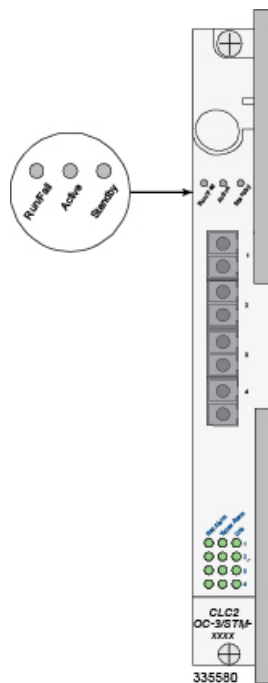
Card-Level LEDs on the Channelized (STM-1/OC-3) Line Card

Each Channelized line card (CLC2) is equipped with card-level status LEDs:

- Run/Fail
- Active
- Standby

The location of these LEDs is displayed in the figure below. The various states are described in the following three tables.

Figure 7: Card-Level Status LEDs for the Channelized Line Card



Channelized Line Card Run/Fail LED States

The Run/Fail LED on the Channelized line card indicates the overall status of the card. These LEDs are illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 25: Channelized Line Card Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process.
None	Card is not receiving power	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU , on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the line card is not functional. Please contact your service representative.

Channelized Line Card Active LED States

The Active LED on the channelized line card indicates that the operating software is loaded on the card and that the card is ready for operation.

Installed line cards remain in ready mode until their corresponding packet processing card is activated during configuration. While in ready mode the Active LED is off. After the packet processing card is activated, the line card installed in the upper-rear chassis slot behind the packet processing card is also activated. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 26: Channelized Line Card Active LED States

Color	Description	Troubleshooting
Green	Card is active	<p>None needed for line cards installed in slots 17 through 23 and 26 through 32 after configuration.</p> <p>If green for line cards in slots 33 through 39 and 42 through 48, verify that the corresponding line card installed in the upper-rear chassis slot is installed properly according to the instructions in this document.</p> <p>For example, if this LED is green for a line card in slot 33, verify that the line card in slot 17 is installed properly.</p>
None	Card in Ready Mode OR	This is normal prior to configuration. Neither the Active or the Standby LED on the card will be on.
	Card is not receiving power OR	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Channelized Line Card Run/Fail LED States , on page 29 for troubleshooting information.
	Card in Standby Mode	Check the state of the Standby LED. If it is green, the card is in standby mode. Refer to the <i>System Administration Guide</i> for information on making the card active.

Channelized Line Card Standby LED States

The Standby LED on the channelized line card indicates that software is loaded on the card and it is serving as a redundant component.

The installed line cards remain in ready mode until their corresponding packet processing card is activated via configuration. While in ready mode, the Active LED is off. After the packet processing card is activated, the line card installed in the upper-rear chassis slot behind the packet processing card is activated. The line card installed in the lower-rear chassis slot behind the packet processing card enters standby mode.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 27: Channelized Line Card Standby LED States

Color	Description	Troubleshooting
Green	Card is in redundant mode	<p>None needed for line cards installed in slots 33 through 39 and 42 through 48 after configuration.</p> <p>If green for line cards installed in slots 17 through 23 and 26 through 32, refer to the <i>System Administration Guide</i> for troubleshooting information.</p>

Color	Description	Troubleshooting
None	Card in Ready Mode	This is normal prior to configuration. Neither the Active nor Standby LEDs on the card will be on.
	OR Card is not receiving power OR Card in Active Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to Channelized Line Card Run/Fail LED States , on page 29 for troubleshooting information.
		Check the state of the Active LED. If it is green, the card is in standby mode.

Checking the Alarm and Link LEDs on the Channelized Line Card 2

Each CLC2 provides alarm and link LEDs that indicate the status of each port. These LEDs are located at the bottom of the front panel, as illustrated in the figure below.

Figure 8: Alarm/Link LEDs for the Channelized Line Card

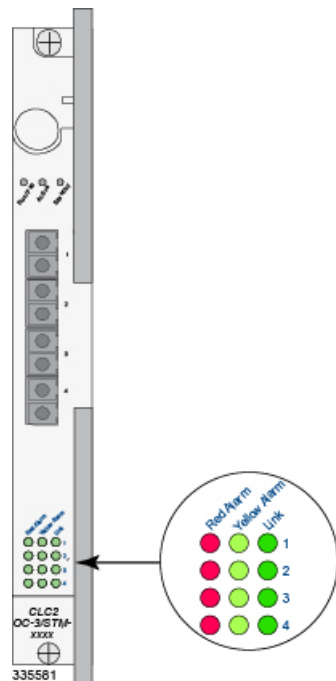


Table 28: Alarm/Link States for Channelized Line Card

LED	LED Color	Description
Red Alarm	Red (ON) OFF	Illuminates when the port is in a fault condition, such as LOS or LOF. Off when there is no alarm for this port.
Yellow Alarm	Yellow (ON) OFF	Illuminates when the port is receiving a signal experiences a problem at the remote end, such as RDI. Off when there is no alarm for this port.
Link	Green (ON) Yellow (ON) OFF	Illuminates Green when a fiber optic cable is plugged into the port and the receive signal is detected by the SFP module. Illuminates Yellow when an SFP module is plugged into the port. Off indicates that there is no SFP module plugged into the port.

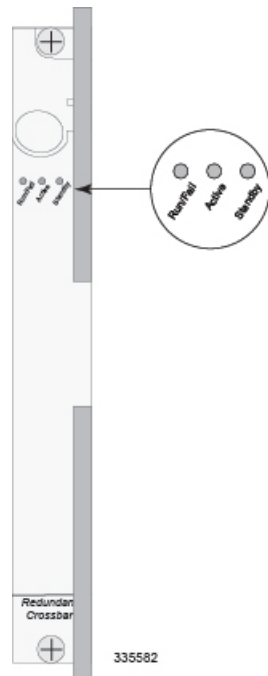
Checking the LEDs on the RCC(s)

Each RCC is equipped with status LEDs shown in the following figure:

- Run/Fail
- Active
- Standby

The possible states for all of the SPIO's LEDs are described in the sections that follow.

Figure 9: RCC LEDs



RCC Run/Fail LED States

The RCC Run/Fail LED indicates the overall status of the card. This LED is illuminated steady green during normal operation.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 29: RCC Run/Fail LED States

Color	Description	Troubleshooting
Green	Card powered with no errors detected	None needed.
Red	Card powered with error(s) detected	Errors were detected during the POSTs. It is likely that the errors were logged to the system's command line interface during the boot process.

Color	Description	Troubleshooting
None	Card powered with error(s) detected	Verify that the POWER LEDs on the PFUs are green. If they are not, refer to Checking the LED on the PFU, on page 5 for troubleshooting information.
		Verify that the power source is supplying ample voltage and current to the chassis.
		Verify that the card is properly installed per the instructions in this document.
		If all of the above suggestions have been verified, it is possible that the RCC is not functional. Please contact your service representative.

RCC Active LED States

The Active LED on the RCC indicates that the card is being used. During normal operation, this LED is off on both RCCs.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 30: RCC Active LED States

Color	Description	Troubleshooting
Green	Card is active	<p>The RCC is actively routing traffic from a line card installed behind a packet processing card that has failed to a redundant packet processing card.</p> <p>The RCC installed in chassis slot 40 processes traffic for the line cards in chassis slots 17 through 23 and 26 through 32. The RCC installed in chassis slot 41 processes traffic for the line cards in slots 33 through 39 and 42 through 48.</p> <p>See Checking the LEDs on Packet Processing Cards, on page 12 to determine which packet processing card has failed. Information on determining the cause of the failure can be found in the <i>System Administration Guide</i>.</p>
None	Card is not receiving power OR Card in Standby Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to RCC Run/Fail LED States, on page 33 for troubleshooting information.
		Check the state of the Standby LED. If it is green, the card is in standby mode. This is the normal operating mode.

RCC Standby LED States

The Standby LED on the RCC indicates that software is loaded on the card. The card is ready to provide a path for data or signalling traffic from a line card to a redundant packet processing card. This LED is on during normal operation for both installed RCCs.

If the LED is not green, use the troubleshooting information in the table to diagnose the problem.

Table 31: RCC Standby LED States

Color	Description	Troubleshooting
Green	Card is in standby mode	This is the normal operating mode.
None	Card is not receiving power OR Card in Active Mode	Verify that the Run/Fail LED is green. If so, the card is receiving power and POST test results are positive. If it is off, refer to RCC Run/Fail LED States, on page 33 for troubleshooting information.
		Check the state of the Active LED. If it is green, the card is in active mode and the RCC is actively routing traffic from a line card installed behind a packet processing card that has failed. See Checking the LEDs on Packet Processing Cards, on page 12 to determine which packet processing card has failed.

Completing Initial System Configuration

After power is applied to the chassis and the ASR 5000 has successfully booted, the command line interface (CLI) appears on a terminal connected to the Console port of the SPIO.

The initial configuration requires completing the following tasks via the CLI:

- Configuring the system for remote access
- Configuring the management interface with a second IP Address (optional)
- Configuring system timing
- Enabling CLI timestamping
- Configuring system administrative users
- Configuring TACACS+ for system administrative users (optional)
- Configuring a chassis key
- Configuring virtual MAC addresses
- Configuring packet processing and line card availability
- Configuring line card and SPIO port redundancy
- Configuring ASR 5000 link aggregation (optional)
- Configuring ORBEM and the Web Element Manager (optional)

- Configuring SNMP support and trap generation

The *Getting Started*, *Configuring System Settings* and *Configuring Management Settings* chapters of the *System Administration Guide* provide detailed procedures for completing the above tasks.