APPENDIX B

Troubleshooting

Your router goes through extensive testing and burn-in before leaving the factory. If you do encounter problems, use the information in this appendix to help isolate problems, or to rule out the router as the source of the problem.

This appendix contains the following sections:

- Problem Solving
- Reading Front-Panel LEDs
- Reading Module LEDs
- Reading WAN Interface Card LEDs
- Recovering a Lost Enable Password
- Recovering Software Images

If you cannot locate the source of the problem, contact a customer service representative for information on how to proceed. For technical support information, refer to the information packet that shipped with your router. Before you call, have the following information ready:

- Chassis type and serial number
- Maintenance agreement or warranty information
- Type of software and version number
- Date you received the new chassis
- Brief description of the problem
- Brief explanation of the steps you have taken to isolate the problem

Problem Solving

The key to problem solving is to isolate the problem to a specific subsystem by comparing what the router is doing to what it should be doing.

The LEDs on the front panel of the router enable you to determine router performance and operation. For a description of these LEDs, refer to the section “Reading Front-Panel LEDs” later in this appendix.

When problem solving, consider the following subsystems of the router:

- Power and cooling systems—Consider the external power source, power cable, router power supply and circuit breaker, and router blower and fan. Also consider inadequate ventilation or air circulation.
- module s—Use the LEDs on the module s to help identify a failure.
- Cables—Consider all the external cables that connect the router to the network.

Troubleshooting the Power and Cooling Systems

Both the system LED and the fans can help you to troubleshoot a power problem. Check the following items to help isolate the problem:

- With the power switch on, does the system LED go on?
  - If the LED is green, the router is receiving power and is functional.
  - If the LED is orange, the router is receiving power but is not functional.
  - If no, check the power source and power cable.
- With the power switch on and the system LED on, do the fans operate?
  - If no, check the fans.
- With the power switch on and the system LED off, do the fans operate?
  - If yes, the router is receiving power. The fans are connected directly to the DC outputs of the power supply.
  - If no, check the power source and power cable.

- Does the router shut down after being on a short time?
  - — Check for an environmentally induced shutdown. See the next section, “Environmental Reporting Features.”
  - — Check the environmental site requirements in the section “General Site Requirements” in the chapter “Preparing to Install the Router.”
  - — Check for a power supply failure by inspecting the system LED on the front panel of the router. If the system LED is on, the power supply should be functioning.
- Router partially boots, but LEDs do not go on.
  - — Check for a power supply failure by inspecting the system LED on the front panel of the router. If the system LED is on, the power supply should be functioning.
  - — If the system LED is not on, or has turned orange in color, refer to the information packet that shipped with your router for warranty information or contact customer service.

Environmental Reporting Features

If the router is operating at an abnormally high temperature, you see the following message displayed:

```
%SYS-1-OVERTEMP: System detected OVERTEMPERATURE condition. Please
resolve cooling problem immediately!
```

Some causes of abnormally high router temperature are the following:

- Fan failure
- Air conditioner failure in the room
- Air blockage to cooling vents

Take steps to correct the problem. See also the sections “Site Environment” and “Equipment Racks” in the chapter “Preparing to Install the Router.”

Troubleshooting Modules, Cables, and Connections

Network problems can be caused by a module, cables or cable connections, or external devices such as a modem, transceiver, hub, wall jack, WAN interface, or terminal. Check for the following symptoms to help isolate the problem:

- module is not recognized by the router.
  - Make sure the module is firmly seated in its slot.
  - Check the LEDs on the module. Each module has its own set of LEDs. For information on these LEDs, see the "Reading Module LEDs" later in this appendix.
  - Make sure you have a version of the Cisco IOS software that supports the module.
- module is recognized, but interface ports do not initialize.
  - Make sure the module is firmly seated in its slot.
  - Check external cable connections.
  - Make sure you have a version of the Cisco IOS software that supports the module.
- Router does not boot properly, or constantly or intermittently reboots.
  - Make sure the module is firmly seated in its slot.
  - Check the router chassis or software. Refer to the information packet that shipped with your router for warranty information or contact customer service.
- Router boots, but the console screen is frozen.
  - Check the external console connection.
  - Verify that the parameters for your terminal are set as follows:

    The data rate configured for the router (9600 bps is default)

    8 data bits

    No parity generated or checked

    2 stop bits

- Router powers on and boots only when a particular module is removed.
  - Check the module. Refer to the information packet that shipped with your router for warranty information or contact customer service.
- Router powers on and boots only when a particular cable is disconnected.
  - There may be a problem with the module or cable. Refer to the information packet that shipped with your router for warranty information or contact customer service.

Reading Front-Panel LEDs

The LEDs on the front panel of the router enable you to determine router performance and operation. Figure B-1 illustrates the LEDs on the front panel of the router. Table B-1 describes the system LED, Table B-2 describes the redundant power supply (RPS) LED, and Table B-3 describes the active, ready, and PCMCIA LEDs.

Figure B-1 Front Panel LEDs

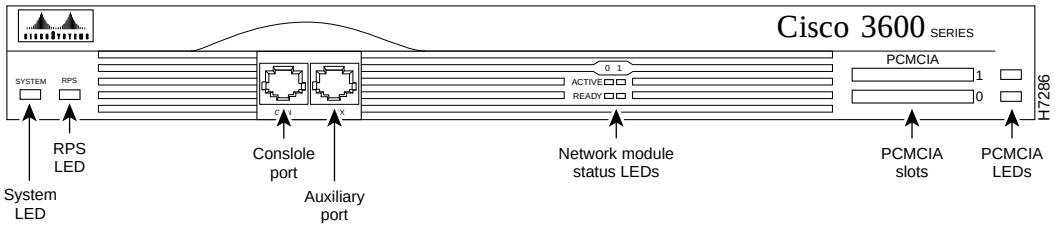


Table B-1 System LED

Color	Description
Off	The router is not powered
Green	The router is operating normally with active IOS
Blinking green	The router is operating normally in ROM monitor mode
Orange	The router is receiving power but not functioning properly

Table B-2 RPS LED

Color	RPS Status
Off	Not installed
Green	Operational
Amber	Installed but not operational

Table B-3 Active, Ready, and PCMCIA LEDs

LED	Description
ACTIVE 0, 1	Blinks to indicate network activity on the module installed in the indicated slot (0, 1).
READY 0, 1	A functional module has been installed in the indicated slot (0, 1). If the LED is off, the slot is empty or the module is not functional.
PCMCIA 0, 1	Data activity on the indicated PCMCIA slot

Reading Module LEDs

The module LEDs are all visible through cutouts in the rear of the chassis.

The following sections describe module LEDs:

- Module Enable LED
- Ethernet Module LEDs
- Ethernet and Token Ring Module LEDs
- Async /Sync Serial Module LEDs
- BRI/ST Modules
- BRI U Modules
- CT1/PRI Module LEDs

- CT1/PRI-CSU Module LEDs
- CE1/PRI Module LEDs

Module Enable LED

All module s have an enable LED. When on, the enable LED indicates the module has passed its self-tests and is available to the system.

Ethernet Module LEDs

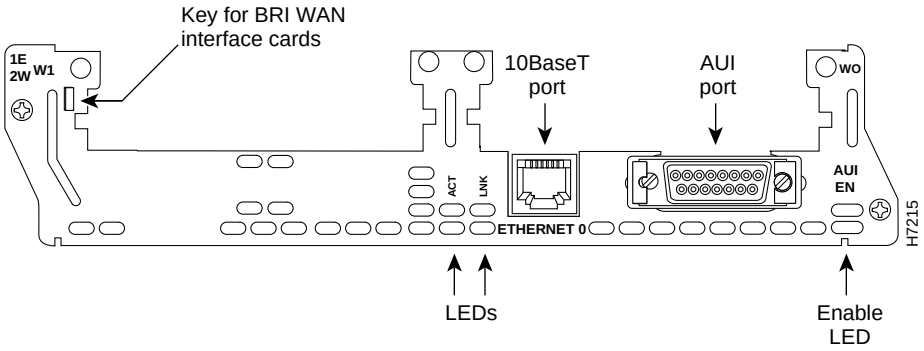
The LEDs on Ethernet modules are described in Table B-4.

Table B-4 LEDs on Ethernet Modules

LEDs	Indication
ACT (activity)	System is transmitting or receiving data
LNK (link)	10BaseT is selected and the link is available

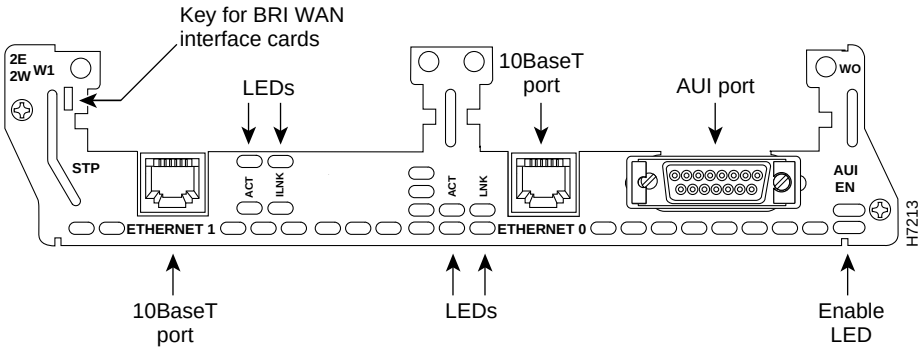
The LEDs on the 1E 2-slot module are labeled as shown in Figure B-2.

Figure B-2 1E 2-Slot Module LEDs



The LEDs on the 1E 2-slot module are labeled as shown in Figure B-3.

Figure B-3 2E 2-Slot Module LEDs



Ethernet and Token Ring Module LEDs

The LEDs on Ethernet and Token Ring modules are described in Table B-5.

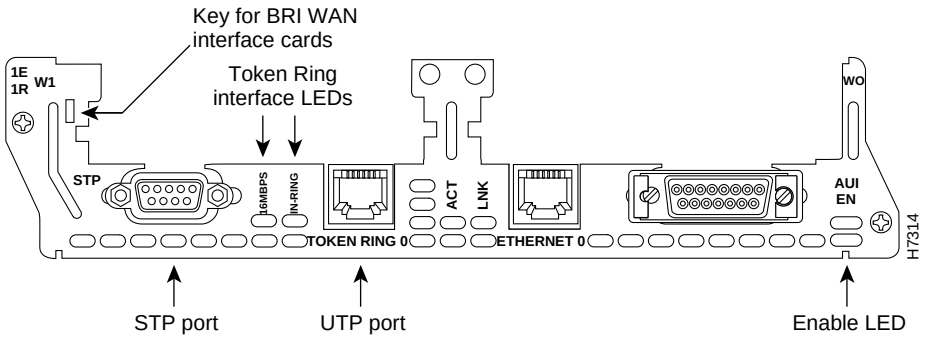
Table B-5 Token Ring Module LEDs

LEDs	Indication
16 MBPS lighted	Ring speed of 16 Mbps
16 MBPS unlighted	Ring speed of 4 Mbps
In-ring	Token Ring interface is inserted into the ring

The LEDs on the 1 Ethernet 1 Token Ring 2 WAN car slot (1E1R 2-slot) module are labeled as shown in Figure B-4.

Timesaver When the in-ring LED is off, you can unplug the Token Ring cable without causing a problem on the ring.

Figure B-4 1E1R 2-Slot Module LEDs



Async /Sync Serial Module LEDs

The LEDs on the A/S serial modules are described in Table B-6, and illustrated in Figure B-5, and Figure B-6.

Table B-6 LEDs on the A/S Serial Module

LEDs	Indication
CN/LP	Indicates connect when green, loopback when yellow
RXC	Receive clock
RXD	Receive activity
TXC	Transmit clock
TXD	Transmit activity

Figure B-5 4-Port A/S Serial Module LEDs

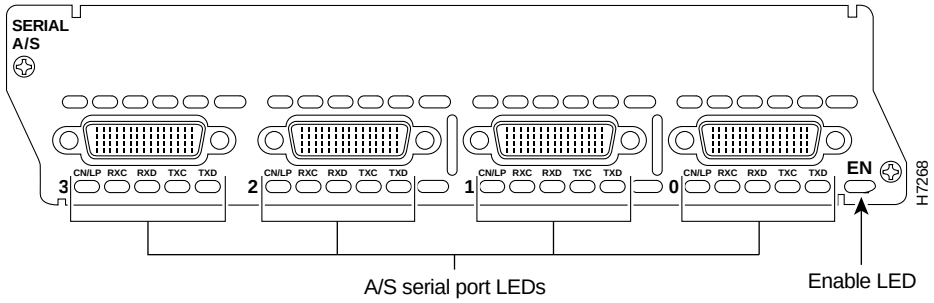
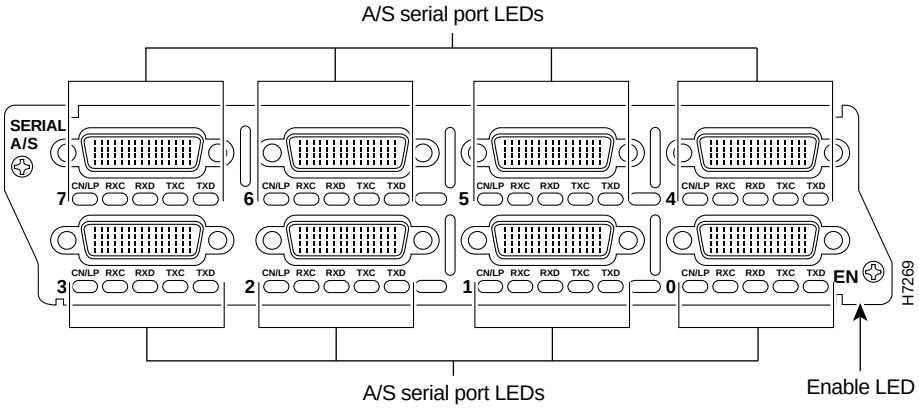


Figure B-6 8-Port A/S Serial Module LEDs



BRI/ST Modules

The LEDs on the BRI S/T modules are described in Table B-7, and illustrated in Figure B-7, and Figure B-8.

Table B-7 LEDs on the BRI S/T Module

LEDs	Indication
B1	Call established on the B1 channel
B2	Call established on the B2 channel

Figure B-7 4-Port BRI S/T Module LEDs

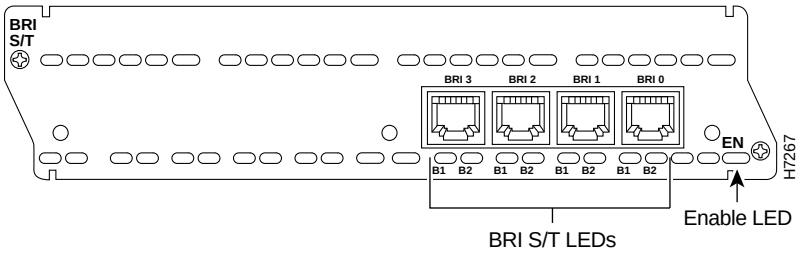
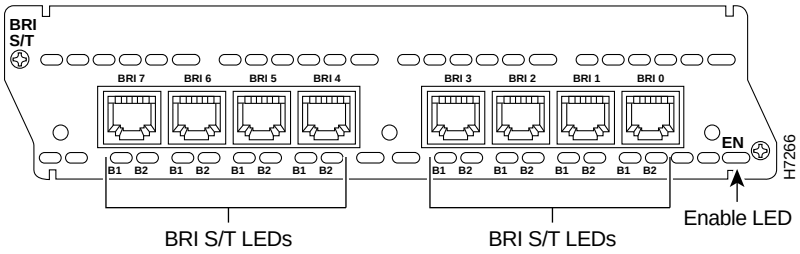


Figure B-8 8-Port BRI S/T Module LEDs



BRI U Modules

The LEDs on the BRI U modules are described in Table B-8. and illustrated in Figure B-9, Figure B-10.

Table B-8 LEDs on the BRI U Module

LEDs	Indication
B1	Call established on the B1 channel
B2	Call established on the B2 channel

LEDs	Indication
NT1	Synchronous status of the NT1—solid green indicates synchronization with the Telco ISDN switch

Figure B-9 4-Port BRI U Module LEDs

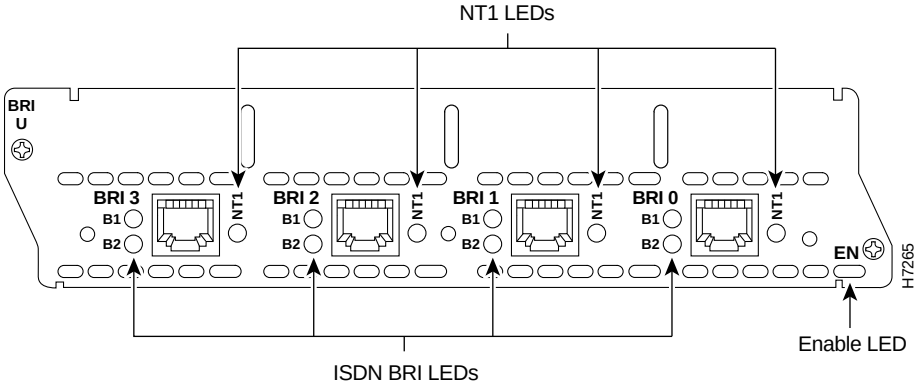
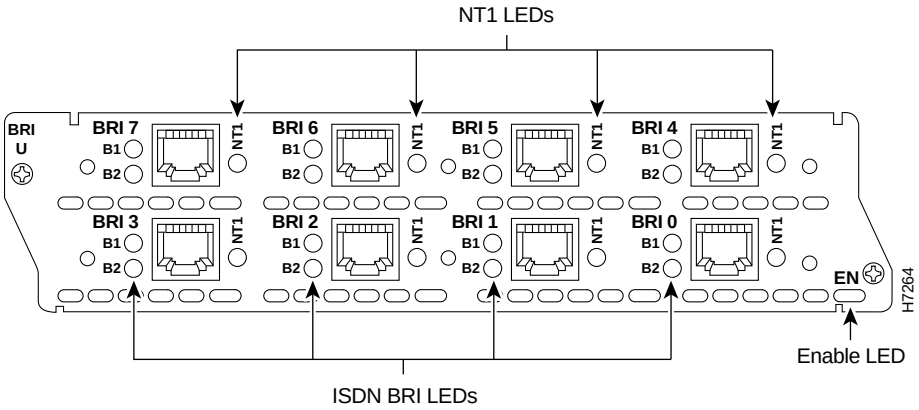


Figure B-10 8-Port BRI U Module LEDs



CT1/PRI Module LEDs

The LEDs on the CT1/PRI modules are described in Table B-9, and illustrated in Figure B-11, and Figure B-12.

Table B-9 LEDs on the CT1/PRI Module

LEDs	Indication
REMOTE ALARM	Remote alarm condition
LOCAL ALARM	Local alarm condition
LOOPBACK	Loopback condition
CARRIER DETECT	Received carrier on the telco link

Figure B-11 1-Port CT1/PRI Module LEDs

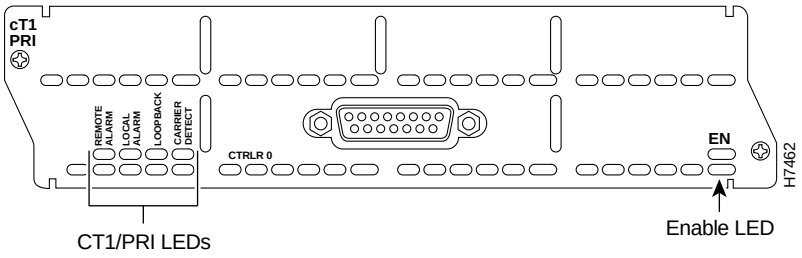
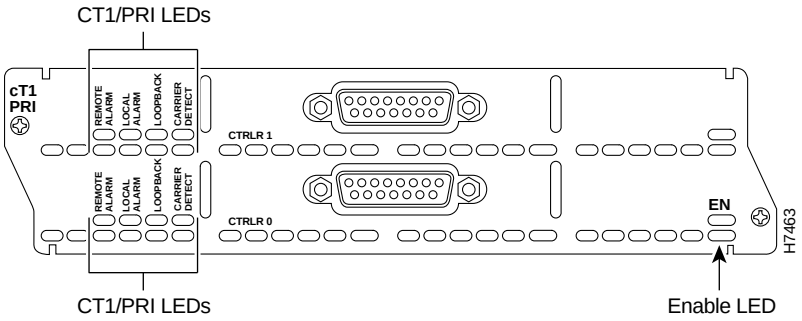


Figure B-12 2-Port CT1/PRI Module LEDs



CT1/PRI-CSU Module LEDs

The LEDs on the CT1/PRI-CSU modules are described in Table B-10, and illustrated in Figure B-13, Figure B-14.

Table B-10 LEDs on the CT1/PRI-CSU Module

LEDs	Indication
REMOTE ALARM	Remote alarm condition
LOCAL ALARM	Local alarm condition
LOOPBACK	Loopback condition
CARRIER DETECT	Received carrier on the telco link

Figure B-13 1-Port CT1/PRI-CSU Module LEDs

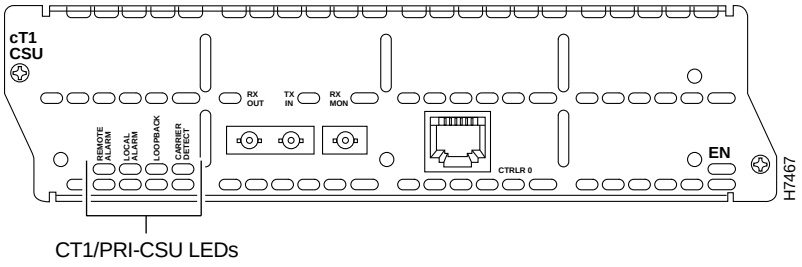
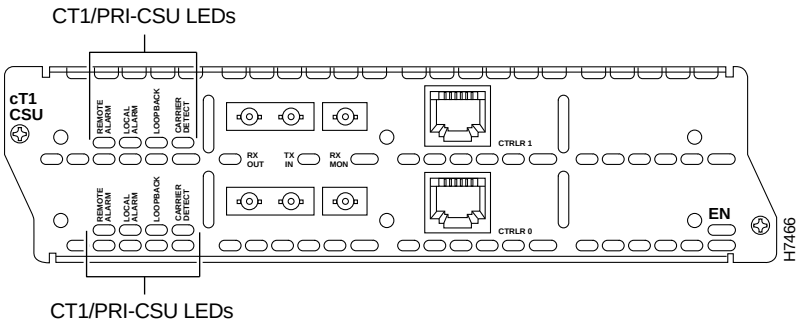


Figure B-14 2-Port CT1/PRI-CSU Module LEDs



CE1/PRI Module LEDs

The LEDs on the CE1/PRI-B and CE1/PRI-U modules are described in Table B-11, and illustrated in Figure B-15, Figure B-16. The same LEDs are used for balanced (120 ohm) and unbalanced (75 ohm) E1 interfaces.

Table B-11 LEDs on the CE1/PRI Modules

LEDs	Indication
REMOTE ALARM	Remote alarm condition
LOCAL ALARM	Local alarm condition
LOOPBACK	Loopback condition
CARRIER DETECT	Received carrier on the telco link

Figure B-15 1-Port CE1/PRI Module LEDs

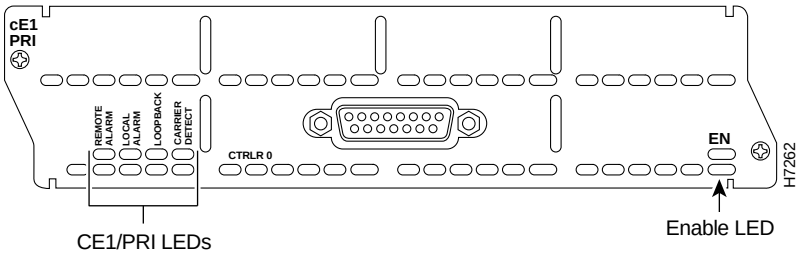
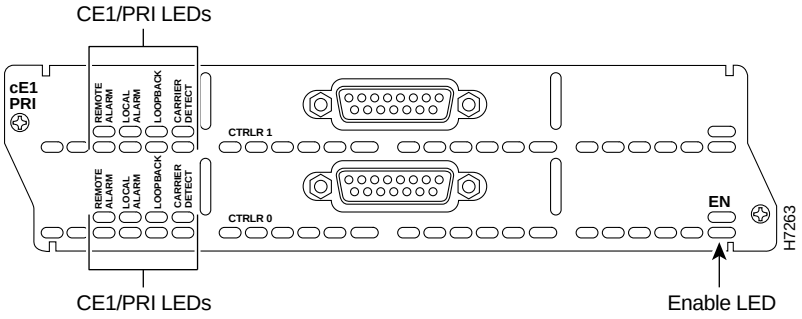


Figure B-16 2-Port CE1/PRI Module LEDs



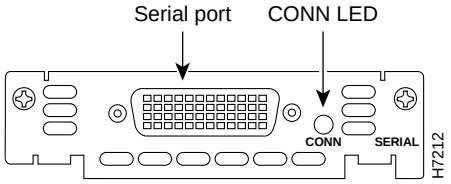
Reading WAN Interface Card LEDs

The WAN interface card LEDs are all visible on the faceplate of the card.

Serial WAN Interface Card LEDs

The serial WAN interface card has one LED (CONN) that indicates a connection on the serial port. (See Figure B-17.)

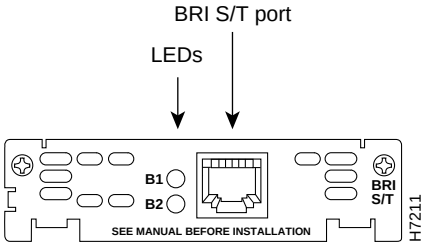
Figure B-17 Serial WAN Interface Card LEDs



BRI WAN Interface Card LEDs

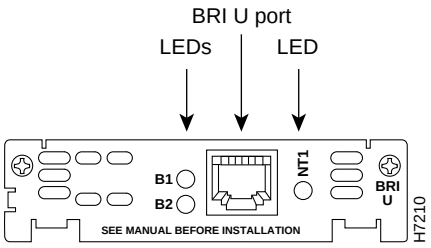
The BRI S/T WAN interface card has two LEDs. (See Figure B-18.) The LEDs, labeled B1 and B2, indicate the status (up/down) of the two ISDN BRI B channels.

Figure B-18 1-Port BRI S/T WAN Interface Card LEDs



The BRI U WAN interface card has three LEDs. (See Figure B-19.) Two of the LEDs, labeled B1 and B2, indicate the status (up/down) of the two ISDN BRI B channels. The third LED, labeled NT1, indicates the synchronous status of the NT1.

Figure B-19 1-Port BRI U WAN Interface Card LEDs



Recovering a Lost Enable Password

This section describes how to recover a lost enable password.

Note You cannot recover a lost enable secret password because this password is encrypted. You must erase the configuration and replace it with a new enable secret password.

Take the following steps to recover a lost enable password:

Step 1 Connect an ASCII terminal or a PC running a terminal emulation program to the console port on the front panel of the router. Refer to the section “Console Port” in the chapter “Installing the Router.”

Step 2 Reboot the router. Enter **no** at the prompt asking if you would like to enter the initial dialog:

```
Would you like to enter the initial dialog? [yes]: no
```

You are now in the router’s normal operating mode.

Step 3 After a few seconds you see the user EXEC prompt (Router>). Enter the **show version** command to display the existing configuration register and make a note of that value.

Step 4 If Break is enabled, send a Break. This action causes the terminal to display the ROM monitor prompt (rommon>). Proceed to Step 6.

Step 5 If Break is disabled, you do not know whether Break is enabled, or sending a Break fails, turn the router OFF, wait five seconds, and turn it ON again. Within five seconds of turning ON the router, press the Break key. This action causes the terminal to display the ROM monitor prompt (rommon>).

Step 6 Enter the **configure register** command (**conf reg)** at the ROM monitor prompt.

```
rommon> conf reg
```

Step 7 Enter **y** at the following prompt:

```
Do you wish to change the configuration? y/n [n]: y
```

Step 8 Enter **n** in response to all prompts until you reach the following prompt, then enter **y**:

```
enable "ignore system config info"? [y/n] n: y
```

Step 9 Enter **n** in response to all prompts until you reach the following prompt, then enter **y**:

```
change the boot characteristics? [y/n] [n]: y
```

Step 10 At the following prompt, enter **2** and press Return:

```
enter to boot: 2
```

A configuration summary is displayed.

Step 11 Enter **n** at the following prompt:

```
Do you wish to change the configuration? y/n [n]: n
```

Step 12 Enter **reset** at the ROM monitor prompt. The router reboots.

Step 13 Enter **n** at the following prompt:

```
Would you like to enter the initial dialog? [yes]: n
```

Step 14 Enter **enable** to enter privileged EXEC mode:

```
Router> enable
```

Configuration changes can be made only in enable mode. The prompt changes to the privileged EXEC prompt (#):

```
Router#
```

Step 15 Enter the **show startup-config** command to display the enable password in the configuration file:

```
Router# show startup-config
```

Step 16 Enter the **configure terminal** command to enter configuration mode:

```
Router# configure terminal
```

Step 17 Enter the **configure register** command followed by a number to return the original value you noted in Step 3.

Step 18 Press **Ctrl-Z** to exit configuration mode.

Step 19 Reboot the router and enter the recovered password.

Recovering Software Images

If both the boot and system images have been erased and only the ROM monitor is available, you can use the ROM monitor **xmodem** command to copy a Cisco IOS image to Flash memory from the console. The console can be connected directly to the router through the console port, or remotely through a modem connected to the auxiliary port.

Note Copying a Cisco IOS image from the console is very slow. This procedure should be used only in an emergency and is not recommended for normal Cisco IOS image upgrades.

Note Using a PCMCIA card to update the Cisco IOS image is much faster than using the console port and when available is the recommended method of recovering a software image.

Console Requirements

The console must have the following files to transfer a Cisco IOS image to Flash memory in the router:

- A terminal emulation program supporting one of the following file transfer protocols:
  - Xmodem
  - Xmodem–CRC
  - Xmodem–1K
  - Ymodem
- A Cisco IOS image file

Copying the Cisco IOS Image

Take the following steps to copy the Cisco IOS image to Flash memory:

Step 1 Connect the console following the instructions in the section "Network Connections" in the chapter "Installing the Router."

Step 2 Turn ON the router. The power-on self-test diagnostics run and the boot ROM searches for a valid boot image and Cisco IOS image in Flash memory. If the boot image and Cisco IOS image are not found, the boot ROM monitor prompt is displayed:

```
rommon 1>
```

Step 3 Enter the **xmodem** command and the name of the source file containing the Cisco IOS image.

```
rommon 1> xmodem filename
```

Step 4 The source file is searched for and found. Messages similar to the following appear:

```
Do not start upload program yet...
File size           Checksum   File name
2537948 bytes        (0x26b9dc)   3620-boot-l

WARN: This operation will ERASE bootflash. If the xmodem
download to bootflash fails, you will lose any good image
you may already have in bootflash.
Invoke this application only for disaster recovery.

Do you wish to continue? [yes/no]:
```

Step 5 Enter **yes** to copy the Cisco IOS image into Flash memory. Messages similar to the following appear:

```
Ready to receive file prog ...

Erasing flash at 0x3000000

program flash location 0x3000000

Transfer complete!
```