

# Troubleshooting

---

Your router goes through extensive testing and burn-in before leaving the factory. If you encounter problems, use the information in this appendix to help isolate problems or to eliminate 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 publication 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.
- Modules—Use the LEDs on the modules 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 troubleshoot a power problem. Check the following items to help isolate the problem:

- With the power switch on, does the System LED go on or blink?
  - 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 or blinking, the power supply should be functional.
- 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 functional.
  - If the System LED is not on, refer to the information packet 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 on the console screen:

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

Some causes of abnormally high router temperature are:

- 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:

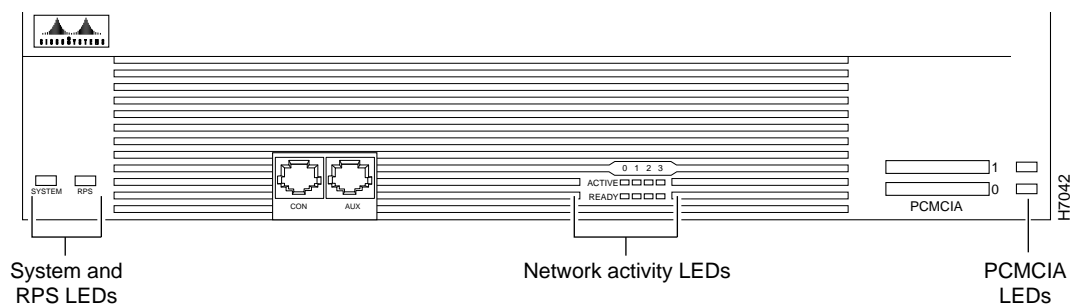
- Module is not recognized by the router.
  - Make sure the module is firmly seated in its slot.
  - Check the LEDs on the module. Each module has its own set of LEDs. For information on these LEDs, see the section “Reading Module LEDs” later in this appendix.
  - Make sure you have a version of Cisco IOS software that supports the module. Check the configuration note for the affected module’s software requirements.
- 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 Cisco IOS software that supports the module. Check the configuration note for the affected module’s software requirements.
- 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 publication 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:
    - (a) The data rate configured for the router (9600 bps is the default)
    - (b) 8 data bits
    - (c) No parity generated or checked
    - (d) 2 stop bits

- Router powers on and boots only when a particular module is removed.
  - Check the module. Refer to the information packet publication that accompanied your order 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 publication 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**



## Reading Front Panel LEDs

---

**Table B-1      System LED**

| <b>Color</b>                | <b>Description</b>  |
|-----------------------------|---|
| Off                         | The router is not receiving power.  |
| Blinking green              | The router is running the ROM monitor. No errors detected.  |
| Solid green                 | The router is operating normally. No errors detected.   |
| Amber                       | The router is receiving power but not functioning properly. Possible power-on self-test error or over-temperature condition detected. |
| Alternating amber and green | Power-on self-test detected. The router is attempting to reload the ROM monitor.  |

**Table B-2      RPS LED**

| <b>Color</b>   | <b>RPS Status</b>   |
|----------------|---|
| Off            | Not installed   |
| Blinking green | The RPS and the model 3640 power supplies are both operational. Because the model 3640 can only accept power from one source, you can do either of the following: <ul style="list-style-type: none"><li>• Unplug the model 3640 power supply and use the RPS.</li><li>• Turn off the RPS and use the model 3640 power supply. The RPS can still be connected.</li></ul> |
| Solid green    | Operational   |
| Amber          | Installed but not operational   |

**Table B-3 Active, Ready, and PCMCIA LEDs**

| LED               | Description  |
|-------------------|--|
| ACTIVE 0, 1, 2, 3 | Blinks to indicate network activity on the module installed in the indicated slot (0, 1, 2, 3).  |
| READY 0, 1, 2, 3  | A functional module has been installed in the indicated slot (0, 1, 2, 3). 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 the module LEDs:

- Module Enable LED
- Ethernet Module LEDs
- Token Ring LEDs
- A/S Serial Module LEDs
- CT1/PRI Module LEDs
- CT1/PRI-CSU Module LEDs
- CE1/PRI Module LEDs
- BRI S/T Modules
- BRI U Modules

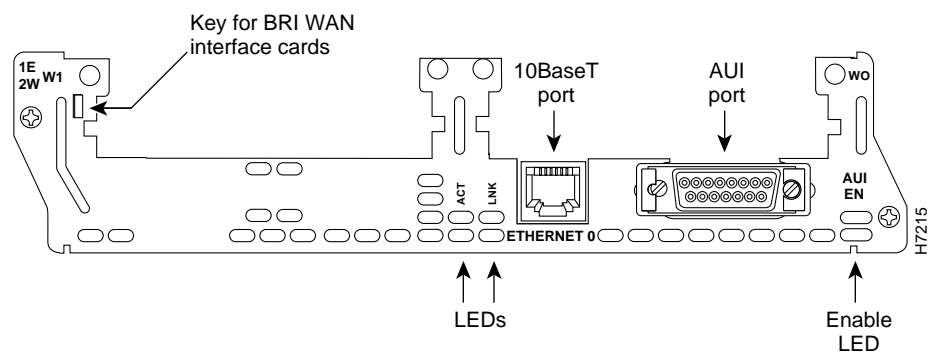
### Module Enable LED

All modules 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

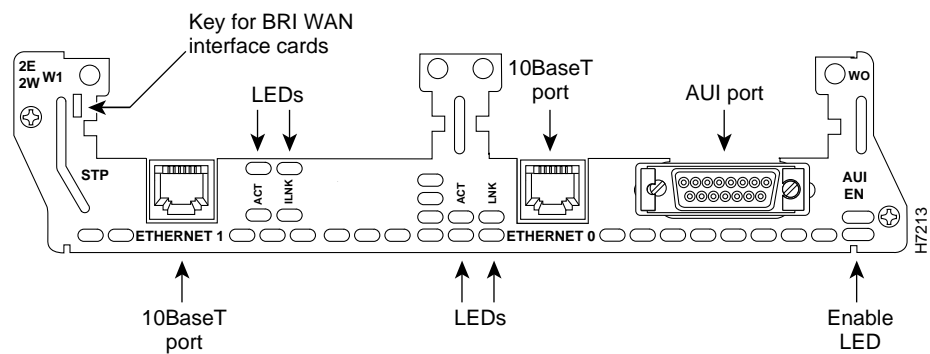
The LEDs on the 1E 2-slot module are labeled as shown in Figure B-2.

**Figure B-2 1E 2-Slot Module LEDs**



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

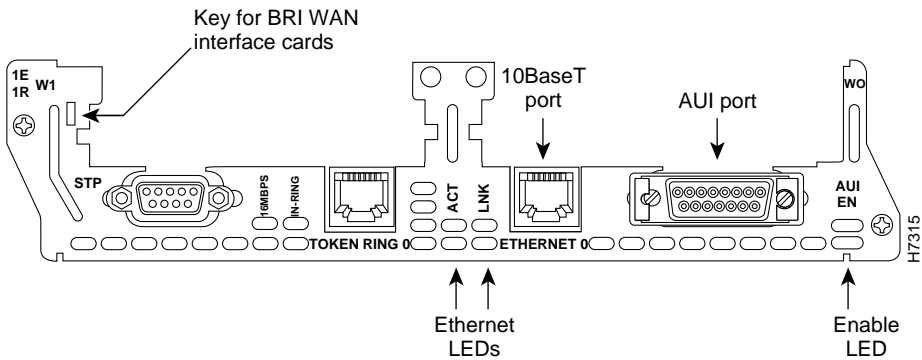
**Figure B-3 2E 2-Slot Module LEDs**





The LEDs on the 1E1R 2-slot module are labeled as shown in Figure B-4.

**Figure B-4      1E1R 2-Slot Module Ethernet LEDs**



The Ethernet LEDs on 2-slot modules are described in Table B-4.

**Table B-4      Ethernet Module LEDs**

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

## Reading Module LEDs

### Token Ring LEDs

The two Token Ring LEDs in the 1E1R 2-slot module are labeled 16MBPS and IN-RING. (See Table B-5 and Figure B-5.)

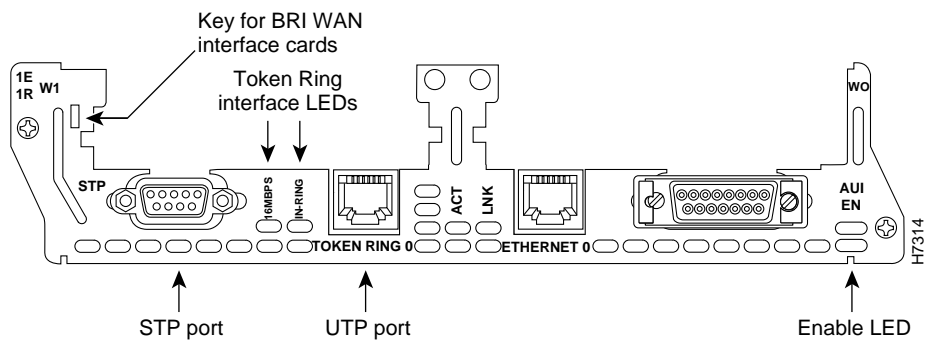
**Table B-5**      **Token Ring LEDs**

| LEDs    | Indication                                     |
|---------|--|
| 16MBPS  | Ring speed of 16 Mbps                          |
| IN-RING | Token Ring interface is inserted into the ring |



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

**Figure B-5**      **1E1R 2-Slot Module Token Ring LEDs**



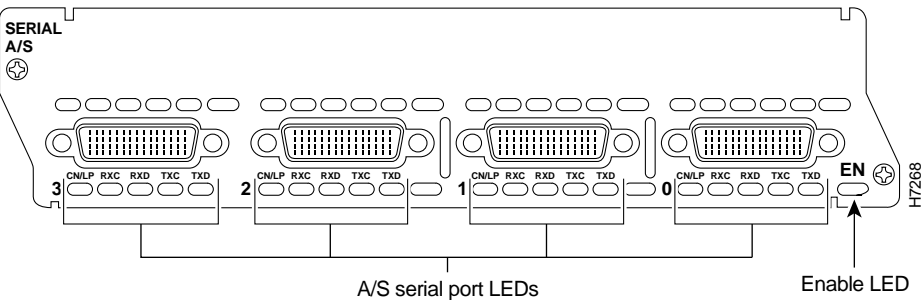
A/S Serial Module LEDs

The LEDs in the A/S serial modules are described in Table B-6 and shown in Figure B-6 and Figure B-7.

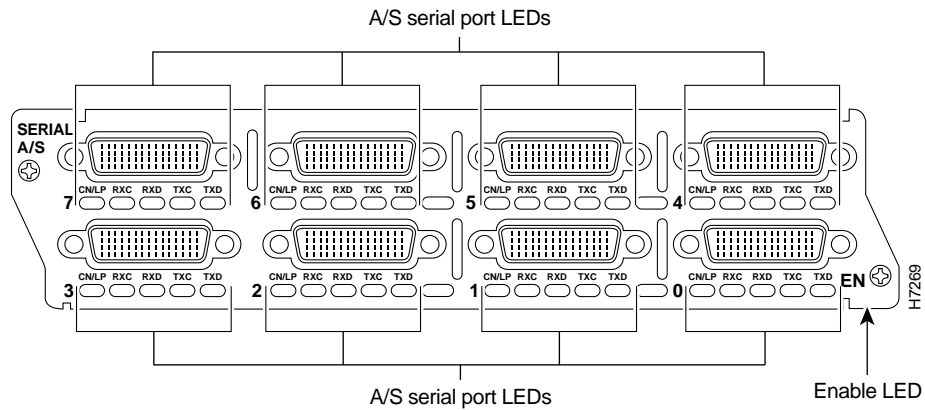
Table B-6      A/S Serial Module LEDs

| LEDs  | Indication                               |
|-------|--|
| CN/LP | Connect when green, loopback when yellow |
| RXC   | Receive clock                            |
| RXD   | Receive activity                         |
| TXC   | Transmit clock                           |
| TXD   | Transmit activity                        |

Figure B-6      4-Port A/S Serial Module LEDs



**Figure B-7 8-Port A/S Serial Module LEDs**



## CT1/PRI Module LEDs

The LEDs in the CT1/PRI modules are described in Table B-7 and shown in Figure B-8 and Figure B-9.

**Table B-7 CT1/PRI Module LEDs**

| 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-8 1-Port CT1/PRI Module LEDs

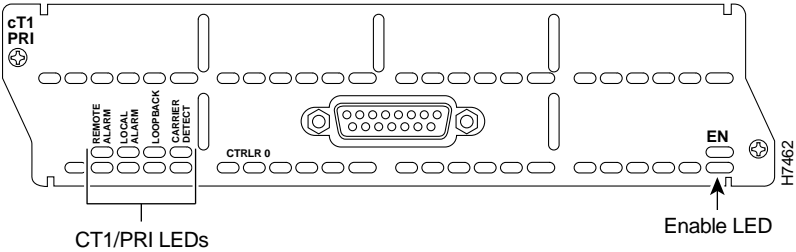
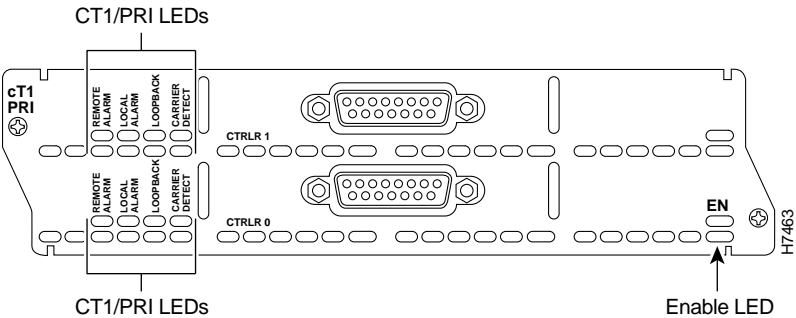


Figure B-9 2-Port CT1/PRI Module LEDs



CT1/PRI-CSU Module LEDs

The LEDs in the CT1/PRI-CSU modules are described in Table B-8 and shown in Figure B-10 and Figure B-11.

Reading Module LEDs

Table B-8 CT1/PRI-CSU Module LEDs

| 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-10 1-Port CT1/PRI-CSU Module LEDs

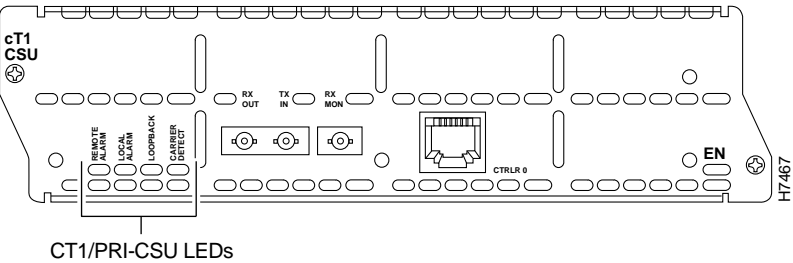
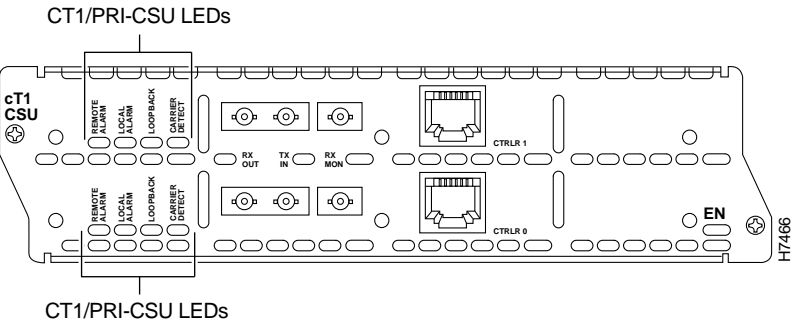


Figure B-11 2-Port CT1/PRI-CSU Module LEDs



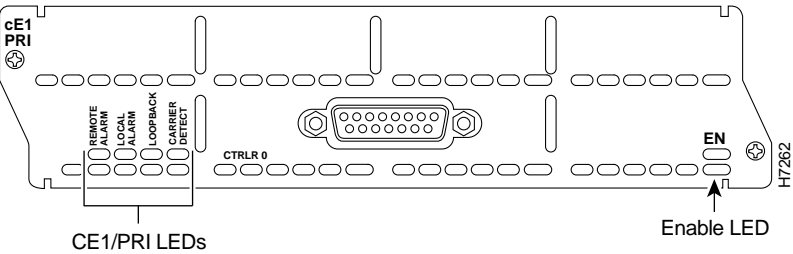
CE1/PRI Module LEDs

The LEDs in the CE1/PRI-B and CE1/PRI-U modules are described in Table B-9 and shown in Figure B-12 and Figure B-13. The same LEDs are used for balanced (120 ohm) and unbalanced (75 ohm) E1 interfaces.

Table B-9 CE1/PRI Module LEDs

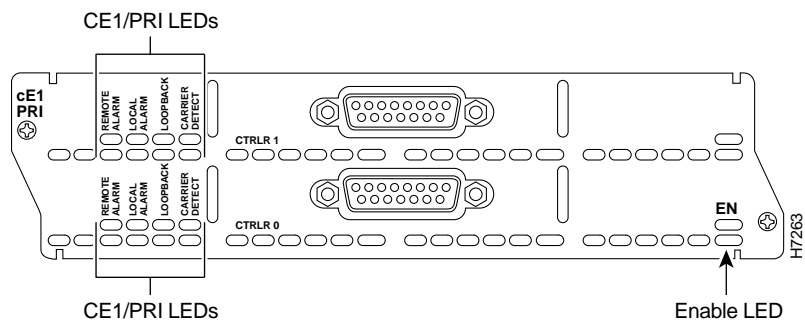
| LEDs           | Indication                         |
|----------------|------------------------------------|
| REMOTE ALARM   | Remote alarm condition             |
| LOCAL ALARM    | Local alarm condition              |
| LOOPBACK       | Loopback condition                 |
| CARRIER DETECT | Received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

Figure B-12 1-Port CE1/PRI Module LEDs



## Reading Module LEDs

**Figure B-13 2-Port CE1/PRI Module LEDs**



## BRI S/T Modules

The LEDs in the BRI S/T modules are described in Table B-10 and shown in Figure B-14 and Figure B-15. BRI S/T modules connect to the network with an S/T interface.

**Table B-10 BRI S/T Module LEDs**

| LEDs | Indication                 |
|------|----------------------------|
| B1   | Activity on the B1 channel |
| B2   | Activity on the B2 channel |



Figure B-14 4-Port BRI S/T Module LEDs

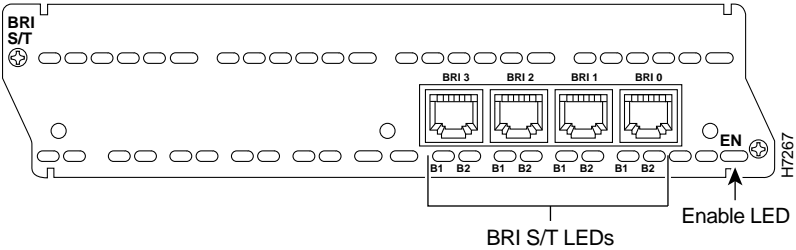
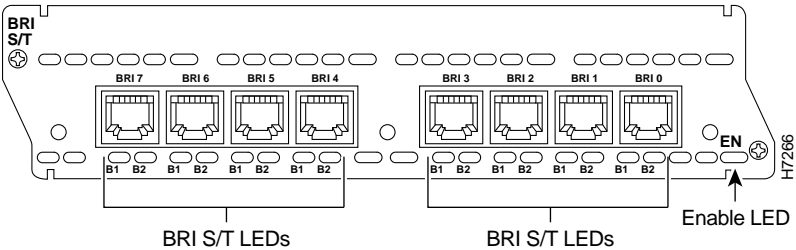


Figure B-15 8-Port BRI S/T Module LEDs



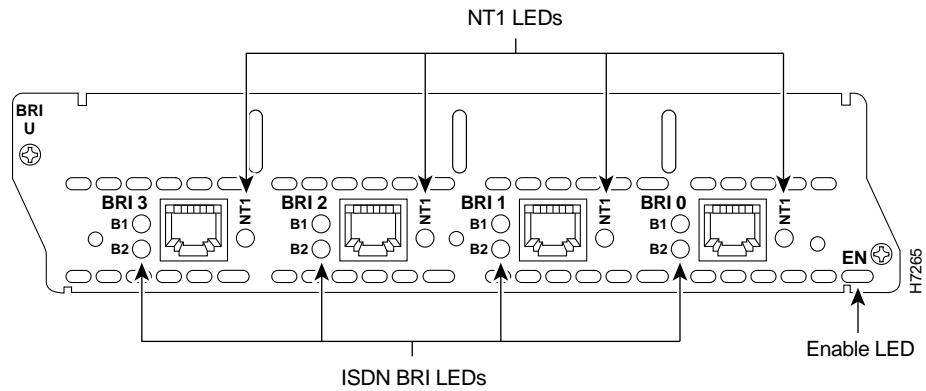
BRI U Modules

The LEDs in the BRI U modules are described in Table B-11 and shown in Figure B-16 and Figure B-17. The BRI U modules connect to the network with a U interface.

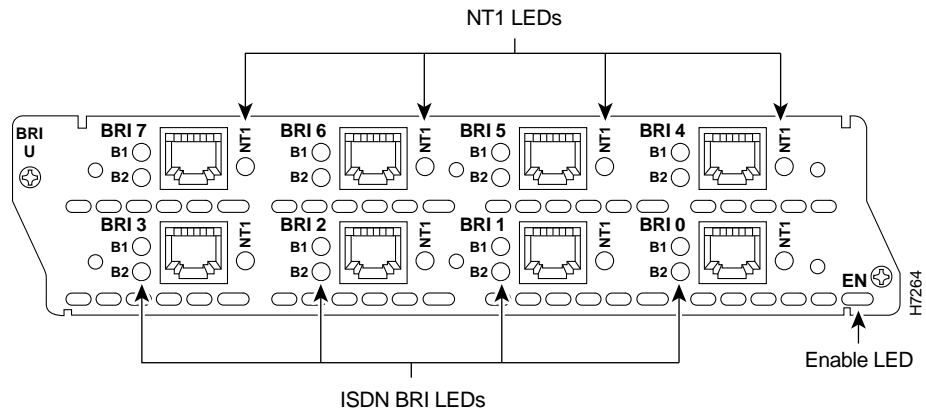
Table B-11 BRI U Module LEDs

| LEDs | Indication                    |
|------|-------------------------------|
| B1   | Activity on the B1 channel    |
| B2   | Activity on the B2 channel    |
| NT1  | Sync status of the NT1 device |

**Figure B-16 4-Port BRI U Module LEDs**



**Figure B-17 8-Port BRI U Module LEDs**



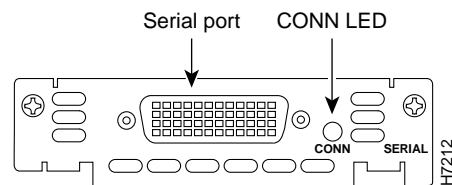
## Reading WAN Interface Card LEDs

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 that indicates data activity on the serial port. (See Figure B-18.)

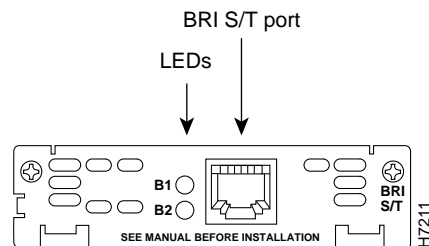
**Figure B-18 Serial WAN Interface Card LEDs**



### BRI S/T WAN Interface Card LEDs

The BRI S/T WAN interface card has two LEDs. (See Figure B-19.) The LEDs, labeled B1 and B2, indicate status (up/down) of the two ISDN BRI B channels.

**Figure B-19 1-Port BRI S/T WAN Interface Card LEDs**

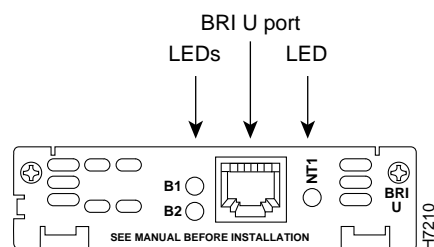


## Recovering a Lost Enable Password

---

The BRI U WAN interface card has three LEDs. (See Figure B-20.) 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-20** 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.

---

Follow this procedure to recover a lost enable password:

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

**Step 2** Reboot the router. If asked whether you would like to enter the initial dialog, answer **no**:

```
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 value. Record the setting of the configuration register.
- Step 4** If Break is enabled, send a Break by pressing the **Break** key. 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, power OFF the router, wait five seconds, and power it ON again. Within five seconds of powering ON the router, press the **Break** key. This action causes the terminal to display the ROM monitor prompt (rommon >).
- Step 6** Enter **conf reg** at the ROM monitor prompt.
- Step 7** Enter **y** at the following prompt:  
Do you wish to change the configuration? y/n [n]:
- Step 8** Enter **n** in response to all the 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 the prompts until you reach the following prompt, then enter **y**:  
change the boot characteristics? [y/n] [n]:
- Step 10** At the following prompt, enter **2** and press **Return**. 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]: **no**

## Recovering Software Images

---

- 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 found 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.

---

## Console Requirements

The console must have the following files to use this procedure:

- A terminal emulation application 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

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

- Step 1** Connect the console following the instructions in the section “Connecting the Console Terminal and Modem” in the chapter “Installing the Router.”
- Step 2** Power 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
```

## Recovering Software Images

---

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

```
Do not start upload program yet...
File size           Checksum   File name
2537948 bytes       (0x26b9dc)  3640-boot-1

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 display:

```
Ready to receive file prog ...

Erasing flash at 0x3000000

program flash location 0x3000000

Transfer complete!
```