

# Troubleshooting the Initial Hardware Configuration

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Cisco 4000 series routers are extensively tested before leaving the factory. However, if there are problems starting up your system, refer to this appendix to help identify the cause.

This appendix contains the following sections:

- Problem Solving
- Environmental Reporting Features
- Reading Front-Panel LEDs
- Reading Network Processor Module LEDs

Use the information in this appendix to help isolate problems or rule out the router as the source of the problem. If you cannot locate the source of your problem, contact a service representative for information on how to proceed. 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 you are having
- Brief explanation of what steps you have taken to isolate the problem

# Problem Solving

The key to problem solving in this system is to try to isolate the problem to a specific subsystem. By comparing what the system is doing to what it should be doing, the task of isolating a problem is greatly simplified.

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

- Power system—Includes the power supply and the wiring.
- Cooling system—The blower assembly should go on when you power up the router.
- Network processor modules—Problems with these modules can be the most difficult to troubleshoot. You can use the LEDs on the network processor modules to help identify a failure. For complete information on LEDs, refer to the section “Reading Front-Panel LEDs” later in this appendix.
- System cables—Includes all of the external cables that connect the router to the network.

## Troubleshooting the Power and Cooling Systems

Check the following items to help isolate the problem:

- With the power switch on, is the power LED on the front panel on?
  - If not, check the AC input, AC source, router circuit breaker, and the power supply cable to make sure they are securely connected.
  - If the power LED is still off, the problem might be a power supply failure.
- Does the system shut down after being on a short time?
  - Check the fan. If the fan is not working, the system will overheat and shut itself down.
  - Check the environmental site requirements in the section “General Site Requirements” in the chapter “Preparing to Install Cisco 4000 Series Routers” and ensure that the chassis intake and exhaust vents are clear.

## Troubleshooting the Network Processor Modules and Cables

Check for the following symptoms to help isolate the problem:

- Network processor module is not recognized by the system when you use the Cisco IOS **show version** command.
  - Check the front panel OK LED for the module. The OK LED should be on.
  - Check the LEDs on the network processor module.
  - Check to make sure the network processor module's connection to the motherboard is fully seated.
  - If the module has one or more daughter boards, check to make sure their connections to the module are correctly seated.
  - Check that the correct software version is installed. Refer to the section "Software Compatibility" in the chapter titled "Overview of the Cisco 4000 Series Routers."
- Network processor module is recognized when you use the **show interface** command, but interface port(s) will not initialize.
  - Check to make sure the network processor module's connection to the motherboard is fully seated.
  - Check the external cables to make sure they are securely connected.
  - Use the **show interface** command to make sure the module is not administratively shut down.
- System will not boot properly, or constantly or intermittently reboots.
  - Check to make sure the network processor module's connection to the motherboard is fully seated.
  - Check that the correct software version is installed. Refer to the section "Software Compatibility" in the chapter titled "Overview of the Cisco 4000 Series Routers."
  - Remove and then replace each network processor module one at a time. While each module is removed, reboot the system. If the system boots properly with one of the modules removed, the module might be at fault.
- System boots, but the console screen is frozen.
  - Check the external console connection to make sure it is secure.

- Verify that you are using the correct console baud rate in the documentation for the terminal.

## Environmental Reporting Features

If the router is operating at an abnormally high temperature, the following message will be displayed on the console screen:

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

Typical causes of an abnormally high system temperature are as follows:

- Fan failure
- Air blockage to cooling vents
- Air conditioner failure in the room where the router is located

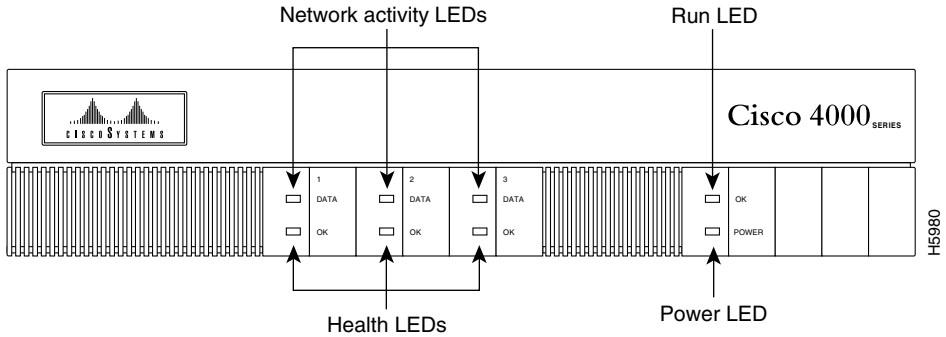
## Reading Front-Panel LEDs

The LEDs on the front panel of the router enable you to determine system performance and operation at a glance. This section contains information about the LEDs.

### System LED Operation

Figure B-1 shows the network activity, health, run, and power LEDs on the front panel of the router.

**Figure B-1 Cisco 4000 Series—Front Panel LEDs**



On the front panel, the three LEDs labeled OK correspond to the three network processor modules, if present, and show their status. The upper LEDs labeled DATA, when blinking, indicate network activity on the interfaces of each module.

When on, the LED labeled POWER indicates that the system card's power is on, and the OK LED above indicates that the processor is working.

## Reading Network Processor Module LEDs

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

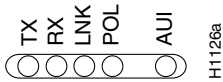
For a description of LEDs on network processor modules released after publication of this document, see the configuration notes that ship with the chassis and the spare modules, for example

- *Installing Fast Ethernet Network Processor Modules in the Cisco 4000 Series*
- *Installing 2T16S Network Processor Modules in the Cisco 4000 Series*
- *Installing and Configuring HSSI Network Processor Modules in Cisco 4000 Series Routers*

## Ethernet Network Processor Module LEDs

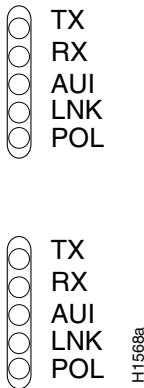
The LEDs on the single-port Ethernet network processor module are labeled as shown in Figure B-2. (Also see Figure 4-5.)

**Figure B-2 Single-Port Ethernet Network Processor Module LEDs**



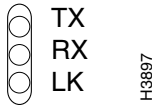
The LEDs on the dual-port Ethernet network processor module are labeled as shown in Figure B-3. (Also see Figure 4-9.)

**Figure B-3 Dual-Port Ethernet Network Processor Module LEDs**



The LEDs on the six-port Ethernet network processor module are labeled as shown in Figure B-4. (Also see Figure 4-10.)

**Figure B-4 Six-Port Ethernet Network Processor Module LEDs**



When the AUI LED is on, none of the other LEDs on the network processor module will be on. The other LEDs are meaningful only when you use 10BaseT, and you have a link.

The LEDs on Ethernet network processor modules are explained in Table B-1.

**Table B-1 Ethernet Network Processor Module LEDs**

LEDs	Indication
TX (transmit)	System is transmitting data
RX (receive)	System is receiving data
AUI (attachment unit interface)	AUI connection is selected
LNK (link)	10BaseT is selected and the link is available
POL (polarity)	Polarity has been switched to correct for defective polarity

## Token Ring Network Processor Module LEDs

The two LEDs in the Token Ring network processor module are labeled 16M and IN-RING. (See Figure B-5.)

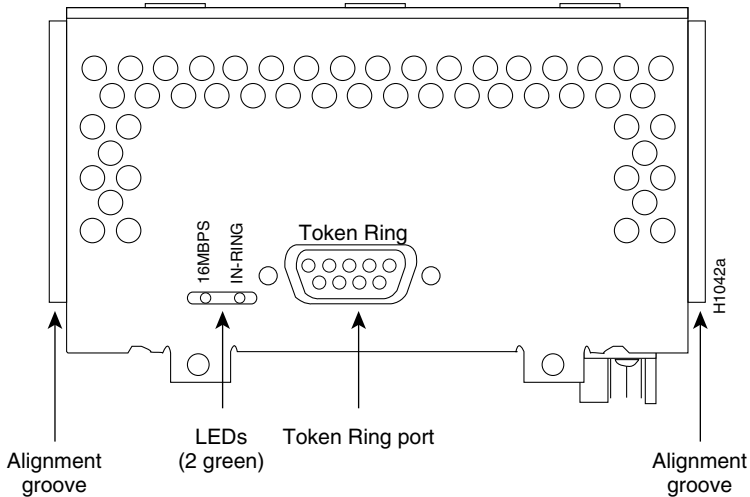
The 16M LED indicates ring speed. When on, it indicates a ring speed of 16 Mbps; when off, it indicates a ring speed of 4 Mbps.

The in-ring LED, when on, indicates that the network processor module is inserted into the ring. If the LED is off, the network processor module is not 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 Token Ring Module Network Connector**



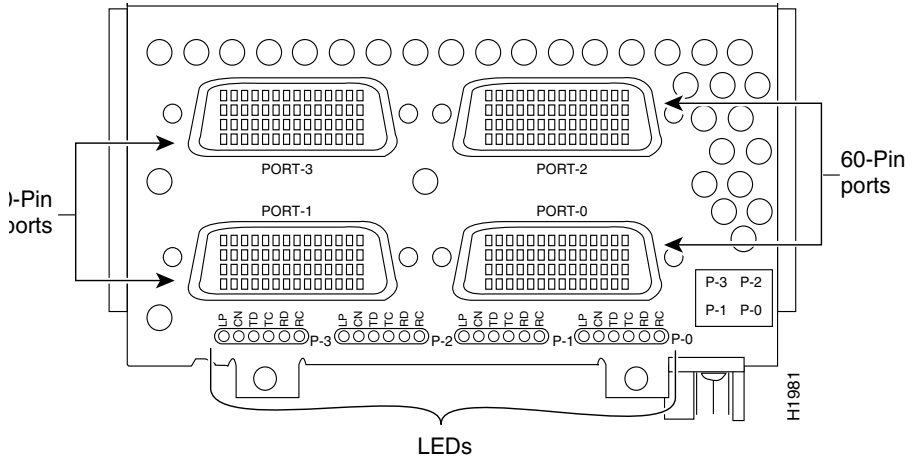
## Four-Port Serial Module LEDs

The four-port serial network processor module has six LEDs per port. (See Figure B-6 and Table B-2.) The functions of the LEDs on the four-port serial module are the same as the functions on the G.703/G.704 module and are different from the functions of the LEDs on the dual-port serial module.

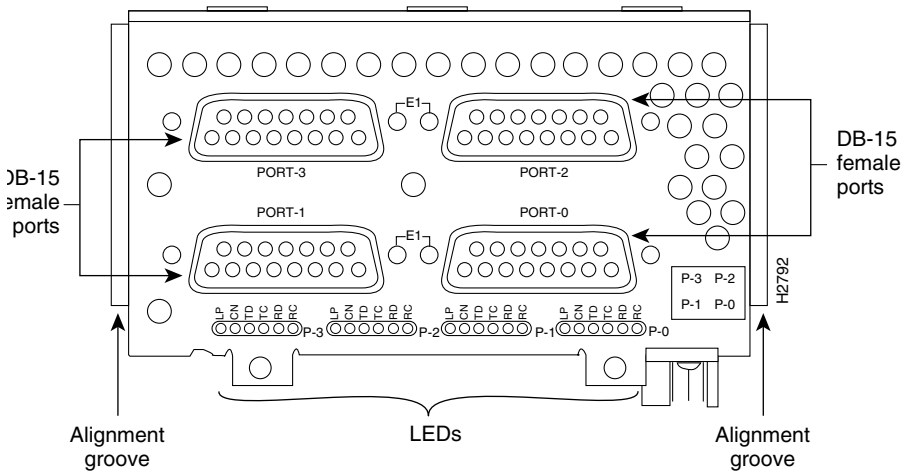
## G.703/G.704 Module LEDs

The G.703/G.704 network processor module has six LEDs per port. (See Figure B-7 and Table B-2.) The functions of the LEDs on the G.703/G.704 module are the same as the function on the four-port serial module and are different from the functions of the LEDs on the dual-port serial module.

**Figure B-6 Four-Port Serial Network Processor Module Ports**



**Figure B-7 G.703/G.704 Serial Network Processor Module Ports (DB-15)**



**Table B-2**      **Four Port Serial Network Processor Module LEDs**

<b>LEDs</b>	<b>LED Colors</b>	<b>Indication</b>
LP	Yellow	Loop
CN	Green	Connect (DSR, DTR, DCD, RTS, CTS)
TD	Green	Transmit Data
TC	Green	Transmit Clock
RD	Green	Receive Data
RC	Green	Receive Clock

TC, RC, TD, and RD are on only when the associated line is changing state; if a line is stuck high or low, the LED is off.

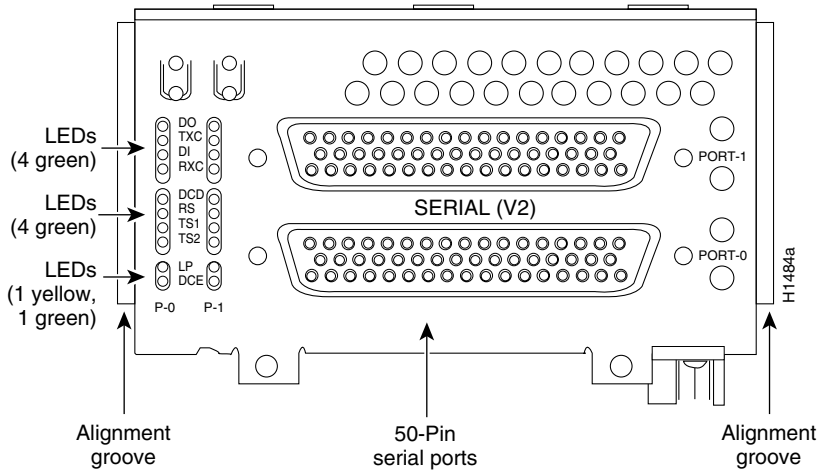
The CN LED on whenever activity is detected on any of the following circuits: data set ready (DSR), data terminal ready (DTR), data carrier detect (DCD), request to send (RTS), and clear to send (CTS).

TD is always associated with the data that is driven by the DTE port, regardless whether the port on the module is a DTE port or a DCE port. This means that TD reflects output data when the port is a DTE port and input data when the port is a DCE port. RD is controlled in a similar way. TC and RC are always associated with the clocks that are driven by the DCE: outputs for a DCE port and inputs for a DTE port.

## Dual-Port Serial Network Processor Module LEDs

The dual-port serial network processor module has two columns of LEDs. As viewed from the front (see Figure B-8), the left column is labeled P-0 (for port 0), and the right column is labeled P-1 (for port 1). There are ten LEDs per port. Serial network processor modules can be configured for either DTE or DCE.

**Figure B-8 Dual-Port Serial Network Processor Module**



When DCE cables are used and when the port is configured with the **clockrate** command as a DCE port, the DCE LED will go on. (See Figure B-8.) (For more information about the **clockrate** command, see the Cisco IOS configuration guides and command references.)

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**Note** An error message will be generated if there is a mismatch between the cable and the software configuration of the port—for example, if the cable is DTE and the clock rate is set, or if the cable is DCE and the clock rate is not configured.

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The convention used in this publication to indicate corresponding signals for DTE and DCE is to list DTE first. For example, Figure B-8 shows the top LED, D0, indicates transmit data (TXD) in DTE mode or receive data (RXD) in DCE mode.

The dual-port serial network processor module LEDs are explained in Table B-3.

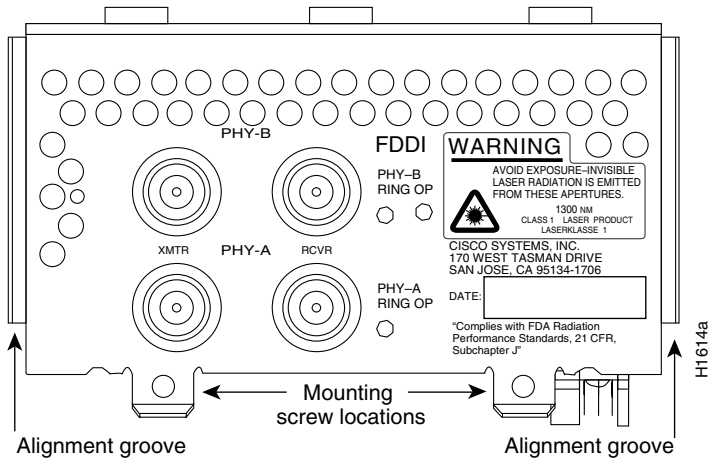
**Table B-3 Dual-Port Serial Network Processor Module LEDs**

<b>LEDs</b>	<b>Indication (DTE/DCE)</b>
DO	Data Out (TXD/RXD)
TXC	Transmit Clock
DI	Data In (RXD/TXD)
RXC	Receive Clock
DCD	Data Carrier Detect
RS	Receive Signaling
TS1	Transmit Signaling
TS2	Transmit Signaling
LP	Loop
DCE	On if the serial interface is DCE

## FDDI Network Processor Module LEDs

Dual-attachment FDDI network processor modules have one LED per port, which is located adjacent to the corresponding port on the module panel (see Figure B-9 and Figure B-10). Single-attachment modules have one LED, which is adjacent to the single port on the module panel. (See Figure B-11.)

**Figure B-9 Dual-Attachment Single-Mode FDDI Network Processor Module—End View**



**Figure B-10 Dual-Attachment Multimode FDDI Network Processor Module—End View**

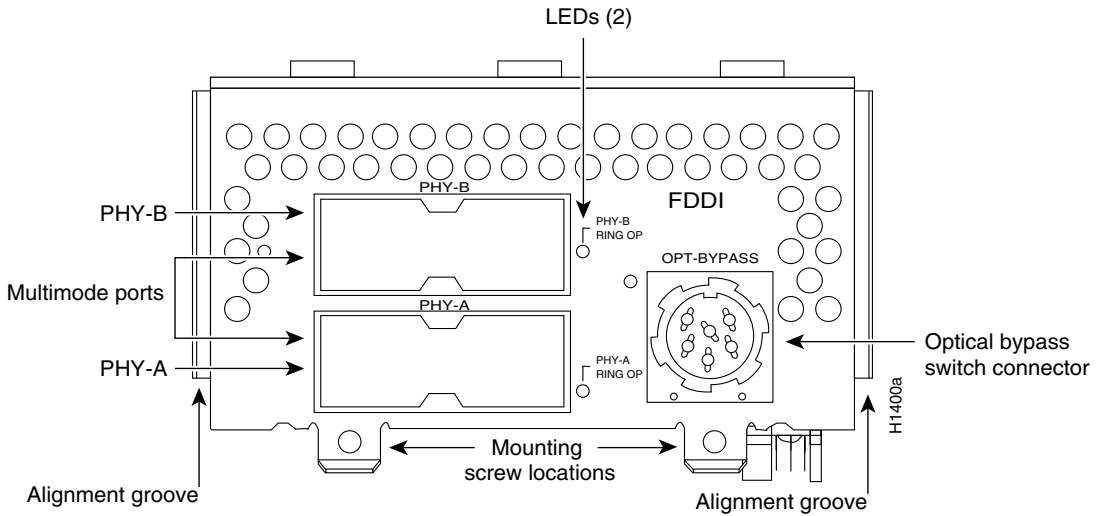
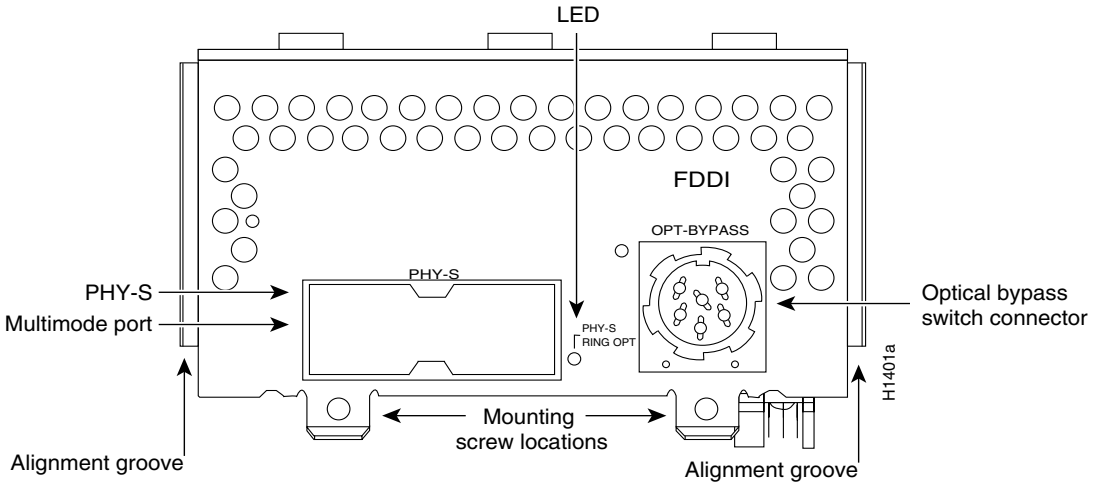


Figure B-11 Single-Attachment Multimode FDDI Module—End View



When on, a module LED indicates a ring up condition. Dual-attachment FDDI module LEDs indicate which PHY on the network processor module is inserted into the ring; if a PHY is not actively inserted into the ring, the LED is off. On a single-attachment module, the LED indicates ring up when it is on; when the LED is off, it indicates that the module is not inserted into a ring.

## BRI Network Processor Module LEDs

When on, the multiport BRI network processor module status LEDs indicate a Layer 1 connection on the corresponding port. When off, the LEDs indicate that the link is not established on the corresponding port.

Figure B-12 Eight-Port BRI Network Processor Module

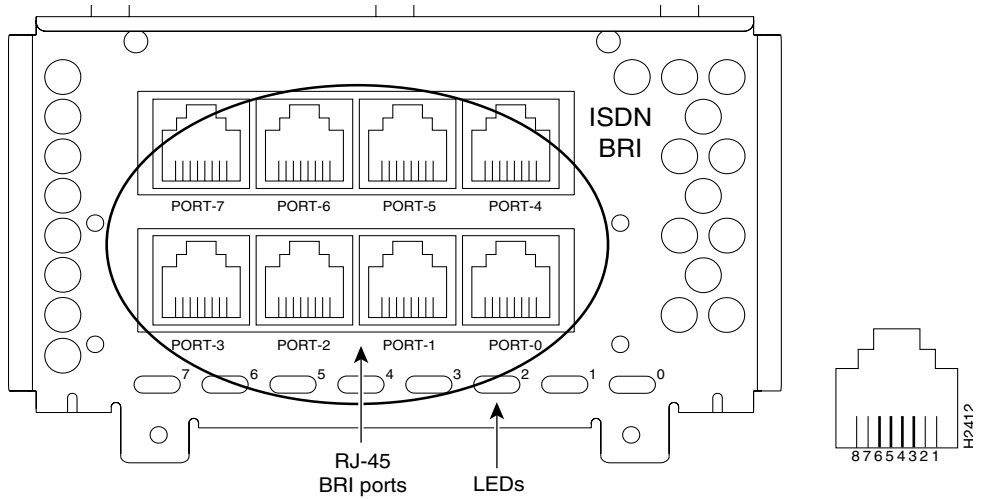
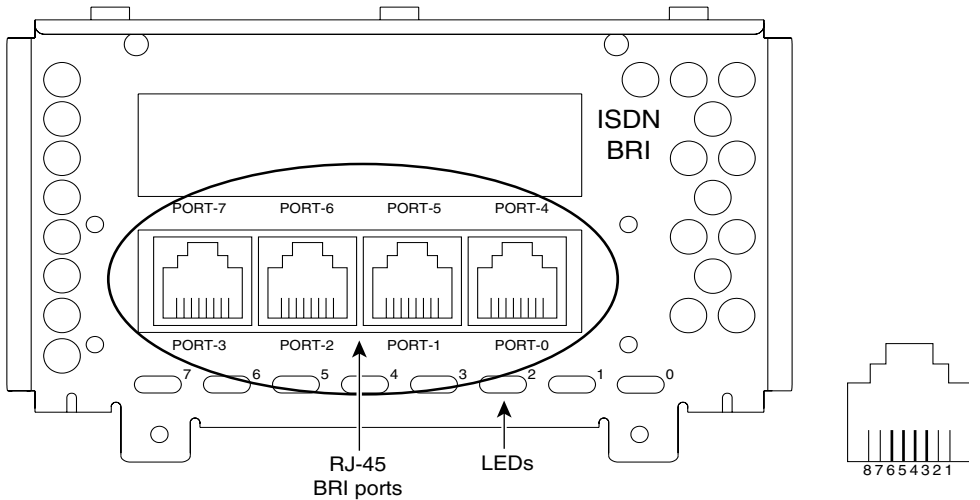


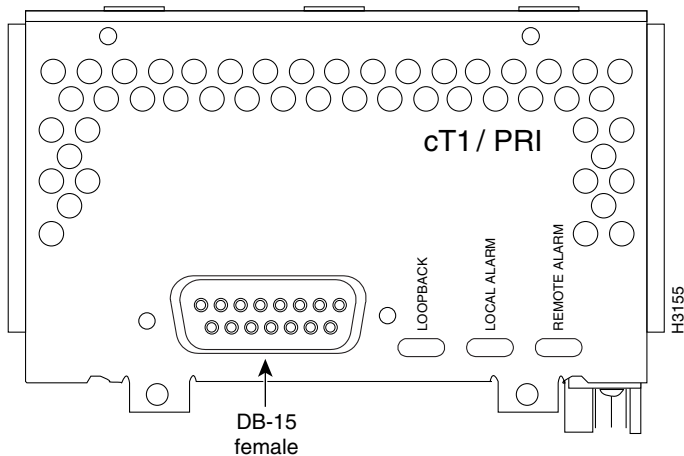
Figure B-13 Four-Port BRI Network Processor Module



## CT1/PRI Network Processor Module LEDs

The three LEDs on the CT1/PRI network processor module are labeled LOOPBACK, LOCAL ALARM, and REMOTE ALARM. (See Figure B-14.)

**Figure B-14 Channelized T1 Network Interface Processor**



The three LEDs on the CT1/PRI network processor module front panel are explained in Table B-4.

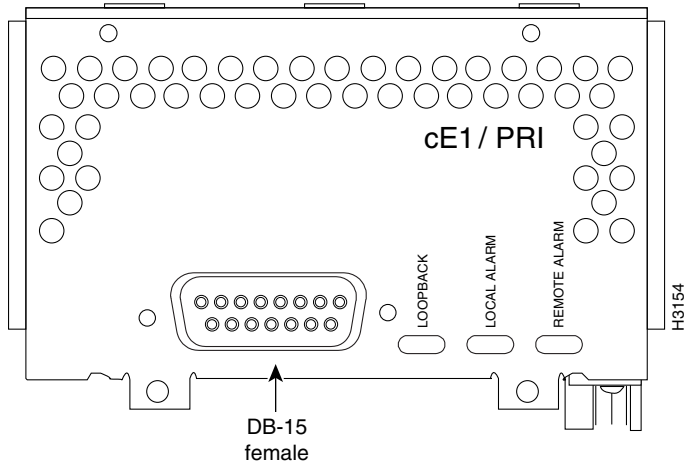
**Table B-4 CT1/PRI Network Processor Module LEDs**

LEDs	Indication (DTE/DCE)
Loopback	Controller loopback
Local alarm	Loss of signal, loss of frame, or unavailability due to excessive errors
Remote alarm	Remote end in local alarm

## CE1/PRI Network Processor Module LEDs

The three LEDs on the CE1/PRI network processor module are labeled LOOPBACK, LOCAL ALARM, and REMOTE ALARM. (See Figure B-15.)

**Figure B-15 CE1/PRI Network Processor Module**



The three LEDs on the CE1/PRI network processor module front panel are explained in Table B-5.

**Table B-5 CE1/PRI Network Processor Module LEDs**

LEDs	Indication (DTE/DCE)
Loopback	Controller loopback
Local alarm	Loss of signal, loss of frame, or unavailability due to excessive errors
Remote alarm	Remote end in local alarm

## ATM Network Processor Module LEDs

The four LEDs on the ATM network processor module are labeled BUSY, READY, RX CELLS, and RX ALARM. (See Figure B-16, Figure B-17, and Figure B-18.)

**Figure B-16** ATM Network Processor Module with STS-3c/STM-1 Single-Mode PLIM

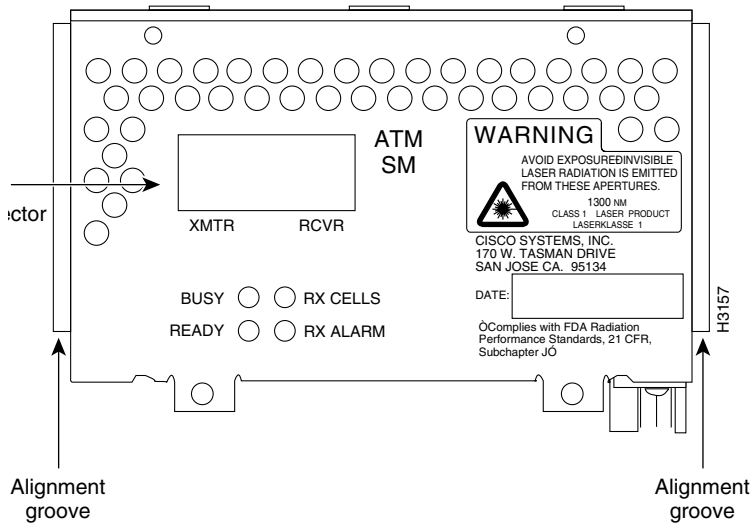
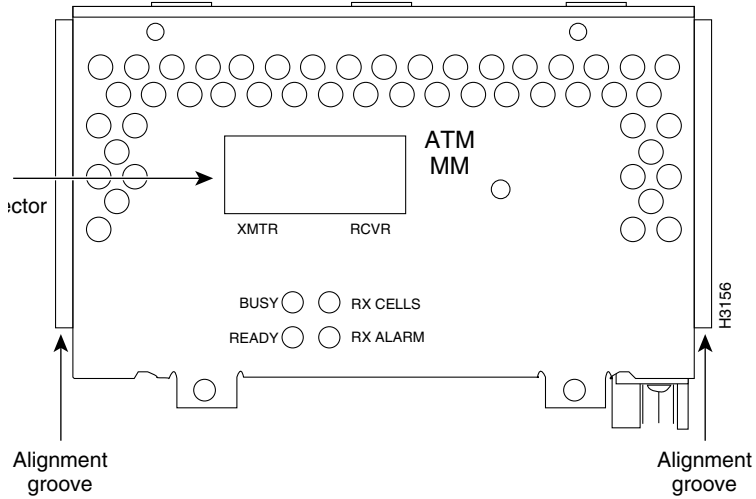
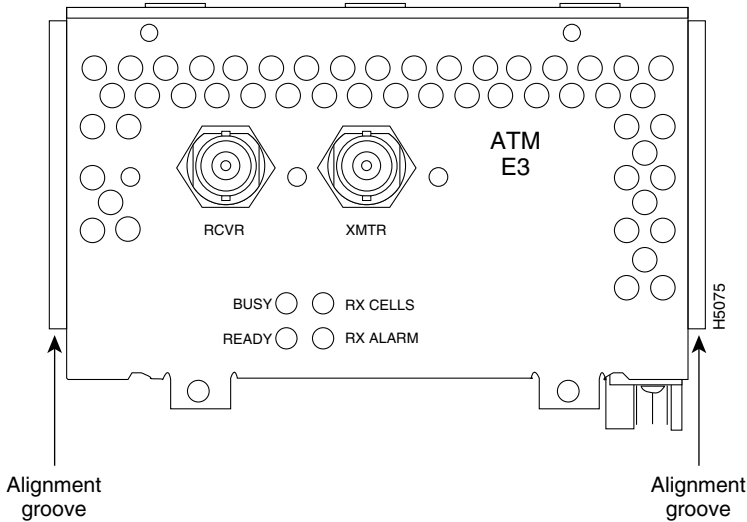


Figure B-17 ATM Network Processor Module with STS-3c/STM-1 Multimode PLIM



**Figure B-18 ATM Network Processor Module With E3/DS-3 PLIM**



The four LEDs on the ATM network processor module front panel are explained in Table B-6.

**Table B-6 ATM Network Processor Module LEDs**

LEDs	Indication
Busy	Not applicable in normal use
Ready	When on, configuration is complete and module is ready for use
RX cells	The module is receiving traffic (cells)
RX alarm	Loss of signal or remote alarm