CHAPTER 1

Cisco 1721 Router Overview

This chapter introduces the Cisco 1721 router, also referred to in this guide as *the router*, and covers the following topics:

Key Features

The Cisco 1721 router (see Figure 1-1) is a small, modular desktop router that links small- to medium-size remote Ethernet and Fast Ethernet LANs over one to four WAN connections to regional and central offices. Table 1-1 lists the key features of the router.

Figure 1-1 Cisco 1721 Router

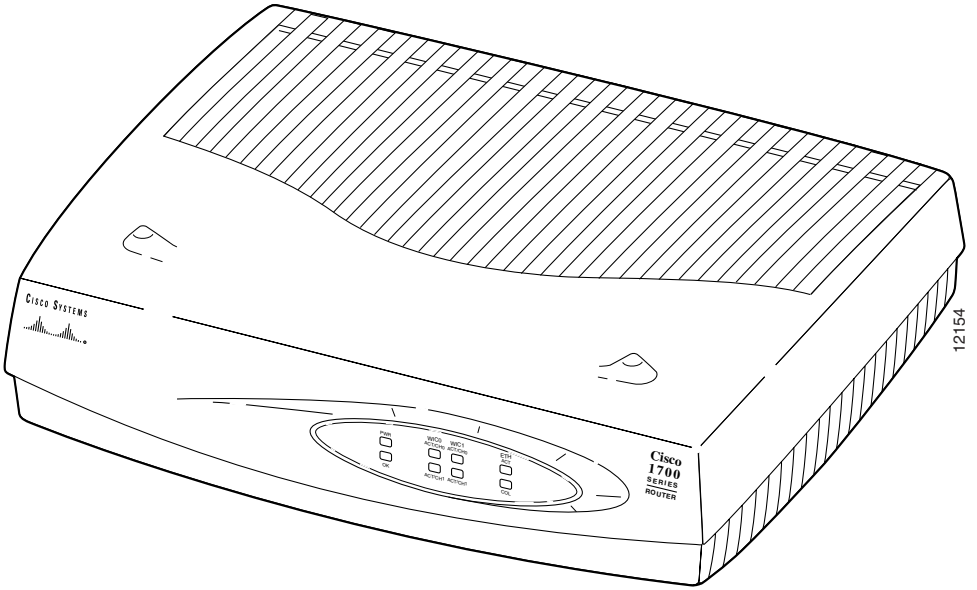

Table 1-1 Key Features

Feature	Description
One Fast Ethernet (10/100BASE-TX) port	• Operates in full- or half-duplex mode (with manual override available). • Supports autosensing for 10- or 100-Mbps operation. • Supports IEEE 802.1Q VLAN encapsulation.
Two Cisco WAN interface card (WIC) slots	• Supports a combination of any two of the following WICs: ISDN BRI, 56-kbps DSU/CSU, FT1/T1 DSU/CSU, high-speed serial, dual-serial, ADSL, G.SHDSL, and Ethernet. • The WAN interface configuration can be changed as your network requirements change.
Console port	Supports router configuration and management with a directly-connected terminal or PC. Supports up to 115.2 kbps.
Auxiliary port	Supports modem connection to the router, which can be configured and managed from a remote location. Supports up to 115.2 kbps.
VPN hardware-assisted 3DES encryption module	Provides IPSEC DES and 3DES hardware encryption.
SNMP support	Router can be managed over a network using Simple Network Management Protocol (SNMP).
AutoInstall support	Configuration files can be easily downloaded to the router over a WAN connection.
Kensington security slot	Router can be secured to a desktop or other surface using Kensington lockdown equipment.
Cisco ConfigMaker support	You can set up networks that include the Cisco 1721 router using the Cisco ConfigMaker application, a wizards-based software tool that helps you easily configure and address Cisco routers, access servers, hubs, switches, and networks.
Support for Cisco IOS software features	Supports IP, IPX, AppleTalk, IBM, Open Shortest Path First (OSPF), NetWare Link Services Protocol (NLSP), Resource Reservation Protocol (RSVP), encryption, network address translation, and the Cisco IOS Firewall Feature Set.

Back Panel Ports and LEDs

This section describes the router back panel ports and LEDs, which are shown in Figure 1-2 and described in Table 1-2 and Table 1-3.

Figure 1-2 Back Panel Ports and LEDs

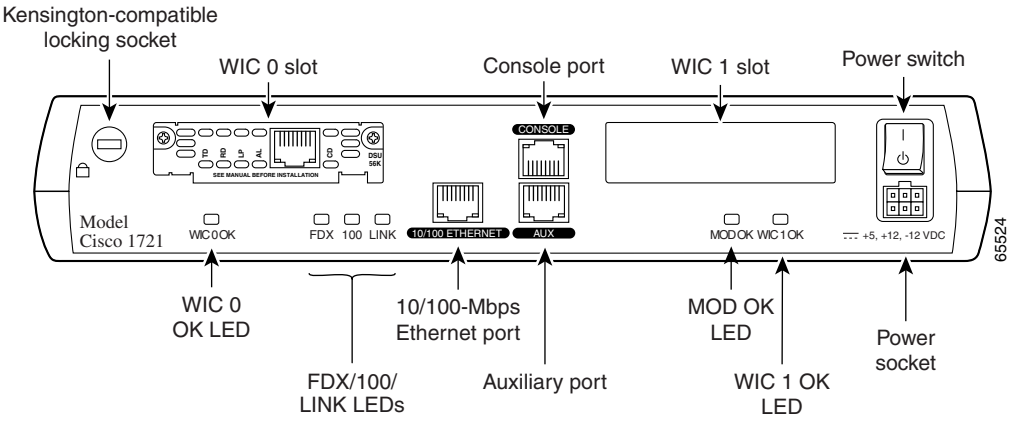

Table 1-2 Back Panel Connectors

Connector/Slot	Label/Color	Description
Ethernet port	10/100 ETHERNET (yellow)	Connects the router to the local Ethernet network through this port. This port autosenses the speed (10 Mbps or 100 Mbps) and duplex mode (full- or half-) of the device to which it is connected and then operates at the same speed and in the same duplex mode.
Auxiliary port	AUX (black)	Connects to a modem for remote configuration with Cisco IOS software.
Console port	CONSOLE (blue)	Connects to a terminal or PC for local configuration using Cisco IOS software.

Table 1-2 Back Panel Connectors (continued)

Connector/Slot	Label/Color	Description
WIC slot 0 (WIC0)	No label	Supports one Cisco WIC. For detailed information, refer to the *Cisco WAN Interface Cards Hardware Installation Guide*, which comes with every card.
WIC slot 1 (WIC1)	No label	Supports one Cisco WIC. For detailed information, refer to the *Cisco WAN Interface Cards Hardware Installation Guide*, which comes with every card.

Use the back panel LEDs during router installation to confirm that you have correctly connected all the cables to the router.

Table 1-3 Back Panel LEDs

LED Label	Color	Description
WIC0 OK	Green	On when a WIC is correctly inserted in the card slot.
FDX	Green	On solid—Ethernet port is operating in full-duplex mode. Off—Ethernet port is operating in half-duplex mode.
100	Green	On solid—Ethernet port is operating at 100 Mbps. Off—Ethernet port is operating at 10 Mbps.
LINK	Green	On when the Ethernet link is up.
MOD OK	Green	On when the VPN hardware encryption module is installed and recognized by the IOS.
WIC1 OK	Green	On when a WIC is correctly inserted in the card slot.

Front Panel LEDs

Use the router front panel LEDs to determine network activity and status on the Ethernet port and on the WIC ports. The front panel LEDs are illustrated in Figure 1-3 and described in Table 1-4.

Figure 1-3 Front Panel LEDs

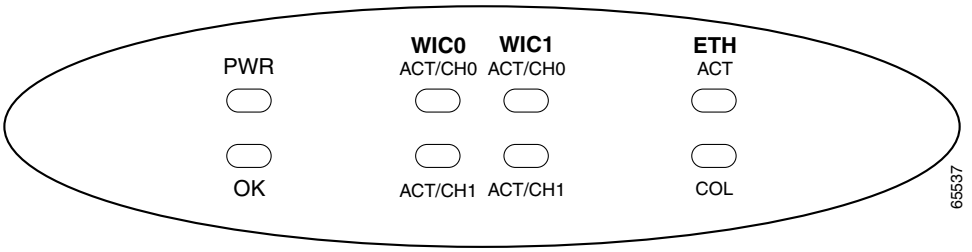

Table 1-4 Front Panel LEDs

LED Label	Color	Description
PWR	Green	On means that DC power is being supplied to the router.
OK	Green	On means that the router has successfully booted up and the software is functional. This LED blinks during the power-on self-test (POST). See the section "OK LED Diagnostics" in Chapter 3, "Troubleshooting," for information on how to use this LED for router diagnostics.
WIC0		
ACT/CH0	Green	Serial and DSU/CSU cards—Blinks when data is being sent to or received from the port on the card in the WIC0 slot.
		ISDN cards—On solid when the first ISDN B channel is up for the card in the WIC0 slot.
		2-port serial cards—Blinks when data is being sent to or received from the first port on the 2-port card in the WIC0 slot.
ACT/CH1	Green	Serial and CSU/DSU cards—Remains off.
		ISDN cards—On solid when the second ISDN B channel is up for the card in the WIC0 slot
		2-port serial cards—Blinks when data is being sent to or received from the second port on the 2-port card in the WIC0 slot.

Table 1-4 Front Panel LEDs (continued)

LED Label	Color	Description
WIC1		
ACT/CH0	Green	Serial and DSU/CSU cards—Blinks when data is being sent to or received from the port on the card in the WIC1 slot.
		ISDN cards—On solid when the first ISDN B channel is up for the card in the WIC1 slot.
		2-port serial cards—Blinks when data is being sent to or received from the first port on the 2-port card in the WIC1 slot.
ACT/CH1	Green	Serial and DSU/CSU cards—Remains off.
		ISDN cards—On solid when the second ISDN B channel is up for the card in the WIC1 slot.
		2-port serial cards—Blinks when data is being sent to or received from the second port on the 2-port card in the WIC1 slot.
ETH		
ACT	Green	Blinks when there is network activity on the Ethernet port.
COL	Yellow	Blinks when there are packet collisions on the local Ethernet network.

Router Memory

This section describes the types of memory stored in the router and how to find out how much of each type of memory is stored in the router.

For instruction on how to upgrade memory in the router, see Appendix C, "Installing and Upgrading Memory and Virtual Private Network Modules."

Types of Memory

The Cisco 1721 router has the following types of memory:

- Dynamic random-access memory (DRAM)—This is the main storage memory for the router. DRAM is also called *working storage*. It contains the dynamic configuration information. The Cisco 1721 router stores a working copy of the Cisco IOS software, dynamic configuration information, and routing table information in DRAM.
- Nonvolatile random-access memory (NVRAM)—This type of memory contains a backup copy of your configuration. If the power is lost or the router is turned off, this backup copy enables the router to return to operation without reconfiguration.
- Flash memory—This special kind of erasable, programmable memory contains a copy of the Cisco IOS software. The Flash memory structure can store multiple copies of the Cisco IOS software. You can load a new level of the operating system in every router in your network and then, when convenient, upgrade the whole network to the new level.

Amounts of Memory

The Cisco 1721 router supports a maximum of 32MB Flash memory and 128MB DRAM. Use the **show version** command to view the amount of DRAM, NVRAM, and Flash memory stored in your router. The following example of the **show version** command output displays the amount of memory in this router.

```
1721# show version
Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-K9SY-M), Version 12.2(4)YA EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 14-Jan-02 16:34 by ramesh
Image text-base: 0x80008108, data-base: 0x80BC77E8

ROM: System Bootstrap, Version 12.2(7r)XM1, RELEASE SOFTWARE (fc1)

1721 uptime is 4 days, 23 hours, 54 minutes
System returned to ROM by reload
Running default software
```

```
cisco 1721 (MPC860P) processor (revision 0x101) with 36864K/12288K
bytes of memory.
Processor board ID VEN0539000D (3033334544), with hardware revision
0000
MPC860P processor: part number 5, mask 2
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
1 Virtual Private Network (VPN) Modules(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x0
```

Unpacking the Router

Table 1-5 lists the items that come with your router. All these items are in the accessory kit that is inside the box that your router came in.

Table 1-5 Router Box Contents

• Power cord (black)
• Power supply
• DB-25 to DB-9 adapter
• Console cable, RJ-45 to DB-9 (light blue)
• Product documentation

Additional Required Equipment

Depending on your local network and on which Cisco WICs you install in your router, you will require other items, listed in Table 1-6, to complete your router installation.

Table 1-6 Additional Required Equipment

Equipment	When You Use It
Ethernet hub	A hub connects pieces of network equipment (including the Cisco 1721 router) to create a network. You can use a 10-, 100-, or 10/100-Mbps hub with the Cisco 1721 router.
Ethernet switch	A switch connects pieces of network equipment (including the Cisco 1721 router) to create a network. You can use a 10-, 100-, or 10/100-Mbps switch with the Cisco 1721 router.
Phillips screwdriver	Although the WICs use thumbscrews, you might need a Phillips screwdriver to loosen the WIC slot cover.
Cisco WIC	In order to make a WAN connection, the Cisco 1721 router must have a supported WIC installed. The router supports up to two cards. You can order the cards when you order the router, and they will be installed for you. Or, you can order the cards separately, after you receive the router, and then install them yourself.
Straight-through RJ-45-to-RJ-45 cable	This cable connects the router to the Ethernet LAN and connects the WICs to various WAN services, including ISDN, T1/FT1, and 56-kbps services. You will need one cable for each connection that requires this cable type.
Serial cable	This cable connects a serial card to serial services. You must order this cable from Cisco. For detailed information about serial cable types, refer to the *Cisco WAN Interface Cards Hardware Installation Guide*, which comes with every card.
NT-1	Some ISDN service providers require a Network Termination 1 (NT-1) device to connect an ISDN S/T port to the ISDN line.
Asynchronous modem	Connect a modem to the AUX port on the router when you want to configure the router from a remote location.