

# Cisco SOHO Cable Modem: Cisco uBR904



The Cisco uBR904 cable modem is a fully functional Cisco IOS® universal broadband router and an integral Data-over-Cable Service Interface Specification (DOCSIS) cable modem designed for use in the small office/home office (SOHO). It is a compact device that has the familiar features and programming interface of other routers in the extensive line of small and medium-sized business product offerings from Cisco. It provides packet data transport for TCP/IP applications between home or office computers and the cable head end.

The Cisco uBR904 has a single-cable, F-connector interface for connection to the hybrid fiber coaxial (HFC) system and a built-in Ethernet 10BaseT hub, providing four RJ-45 ports to which subscriber devices can be connected. All four ports are treated as one Ethernet interface by Cisco IOS software. More hosts can be connected to the Cisco uBR904 by connecting one of the 10BaseT ports to a hub. Additionally, the Cisco uBR904 has an RJ-45 console interface for configuration and diagnostic purposes.

The cable interface requires no configuration or setup procedures other than connecting the unit to the cable system. Ethernet interface configuration is provided through a command-line interface (CLI) parser, which can be reached

either through the console port or via Telnet to the Cisco uBR904 Ethernet port. Console and TTY sessions are supported. In addition to the CLI configuration interface, modifications will be made to the PC ClickStart™ configuration utility to support Cisco uBR904 configuration. The console CLI can also be disabled and the configuration is then controlled solely from a downloaded file.

The Cisco uBR904 is compatible with DOCSIS specifications, including some optional features that are not supported by standard residential cable modems. These optional features include quality of service (QoS), IP tunneling, and IP routing.

## Cisco uBR904 Product Features

- IP routing using Cisco IOS software
- DOCSIS-compliant cable modem
- Support for unlimited number of PC and other IP devices
- External power “brick” supply, detached power cord for domestic or overseas applications
- Four-port Ethernet hub (4 x RJ-45)
- Cable F interface
- Cisco IOS software-based standard firmware for link/network layer communication
  - Bridging
  - IP routing
  - IP tunneling
  - QoS
  - Firewall
- Support for unicast, broadcast, and multicast IP packets
- Variable-length packet cable Media Access Control (MAC) transport layer
- Mix of contention and reservation-based upstream transmission

- Ease of configuration and piracy control provided by resident or downloaded code from a cable modem termination shelf (CMTS)
- Support for 6-MHz downstream and 200K-3200 KHz upstream cable channel bandwidth
- Peak downstream data rates of 38 Mbps
- Peak upstream data rates of 10 Mbps
- Support for up to 3500 small sized 64-byte packets per second aggregate throughput
- Support for full 10-Mbps peak transfer rate at the Ethernet interface
- Comprehensive power-up and CMTS-initiated diagnostic features
- Continuous downstream and upstream channel performance and impairment information gathering

### Cisco uBR904 Applications

Depending on the software package selected, the Cisco uBR904 can be configured to fit the needs of various types of applications, including telecommuters, small offices, and branch offices.

#### Telecommuters

The Cisco uBR904 provides telecommuters with secure, high-speed access to their corporate intranet and the Internet. With the integration of Cisco's industry leading IOS software incorporated into the cable modem, we bring the technology powering 80% of the Internet into the home.

Broadband access to the corporate intranet and the Internet enables the telecommuter to achieve peak Internet and intranet connection speeds of 10 Mb/s upstream and 40 Mb/s downstream. Using the QoS feature built into the Cisco uBR904's IOS operating system, telecommuters can maintain this high-speed connection even during peak traffic hours.

Secure access to the corporate intranet enables both the telecommuter and the corporate information technology group to trust their data to the high-speed cable access capability of the Cisco uBR904. Although the typical cable network is by nature a shared medium in which data is broadcast to a large number of users, security is provided through full implementation of the RSA public-key Data Encryption Standard (DES), widely recognized as the standard for ensuring security and privacy in telecommunications infrastructures. The scalability and power of the IOS operating system will mean that uBR 904 users will have access to enhanced virtual private network (VPN) functionality in early 1999.

Support for multiple IP devices means that telecommuters can use the Cisco uBR904 to connect all of the IP-enabled equipment in their home to the internet,

including PCs, fax machines, printers, and scanners. This allows the telecommuter to expand their home computing environment without costly upgrades to the cable modem hardware.

#### Small Offices

The Cisco uBR904 offers small offices high-speed access to the Internet, security, and the ability to support multiple PCs and other IP devices in the office network. By integrating a fully functional Cisco IOS router and cable modem, the Cisco uBR904 provides small offices with the ability to support up to 100 IP devices in their local area network (LAN) environment.

A full security suite for the company LAN enables the small business to trust their data to the high-speed cable access capability of the Cisco uBR904. While cable networks are, by nature, a shared medium, the Cisco uBR904 offers RSA public-key Data Encryption Standard (DES), widely recognized as the standard for ensuring security and privacy in telecommunications infrastructures. The scalability of the Cisco uBR904's IOS operating system will allow advanced firewall security to be available in early 1999.

Guaranteed high-speed access to the Internet is provided through the advanced QoS capabilities of the Cisco IOS software embedded in the Cisco uBR904. Regardless of the time of day or the number of other users online, QoS ensures the small office that its employees get constant, high-speed access and ensures that potential customers get high speed access to locally hosted Web site information.

Support for multiple IP devices means that small businesses can use the Cisco uBR904 to connect all of their PCs to the internet. This provides a tremendous cost savings compared to using a dedicated modem for each PC. By combining the functionality of a full-featured router with a cable modem, the Cisco uBR904 also enables business users to replace combinations of routers, bridges, hubs, and single-port cable modems with just one product. With the ability to link up to 100 IP devices to the Cisco uBR904, small businesses will find that the Cisco uBR904 provides a future-proof investment as their network grows.

#### Branch Offices

The Cisco uBR904 provides branch offices with secure, high-speed access to their corporate intranet and the Internet. By integrating a fully functional Cisco IOS router and cable modem, the Cisco uBR904 also provides branch offices with the ability to bring this high speed intranet and Internet connectivity to up to 100 IP devices.



High-speed access between the branch office LAN, the corporate intranet, and the Internet is provided by the Cisco uBR904s' integrated cable modem. This allows the Cisco uBR904 to offer peak connection speeds of up to 10 Mb/s upstream and 40 Mb/s downstream. Using the QoS feature built into the Cisco uBR904's IOS operating system, the entire branch office can maintain this high-speed connection even during peak traffic hours.

Advanced security features enables both the branch office and the corporate information technology group to trust their data to the high-speed cable access capability of the Cisco uBR904. Although the typical cable network is by nature a shared medium in which data is broadcast to a large number of users, security is provided through full implementation of the RSA public-key Data Encryption Standard (DES), widely recognized as the standard for ensuring security and privacy in telecommunications infrastructures. The scalability and power of the IOS operating system will mean that branch offices using the Cisco uBR904 will have the ability to create a virtual private network (VPN) with their headquarters in early 1999.

Support for multiple IP devices means that branch offices can use the Cisco uBR904 to connect all of their PCs to an internal LAN, the corporate intranet, and the Internet. By combining the functionality of a full-featured router with a cable modem, the Cisco uBR904 also enables the branch office to replace combinations of routers, bridges, hubs, and single-port cable modems with just one product. With the ability to link up to 100 IP devices to the Cisco uBR904, they

can also link all of their other IP devices including printers, scanners, and fax machines to their local area network (LAN).

Cable Remote Subscriber Unit (CREST) is a standalone box that bridges desktop and laptop computers via a 10BaseT connection to the HFC system. The equipment will provide packet data transport for TCP/IP applications between a home computer and a Cisco Headend Cable Router for Internet access.

**Cisco uBR904 Physical Description**

The front of the Cisco uBR904 (Figure 2) provides a basic operating status display using several LEDs: power, cable, Ethernet, and message (msg).

Figure 1 Cisco uBR904—Front View

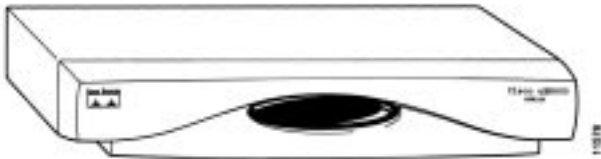
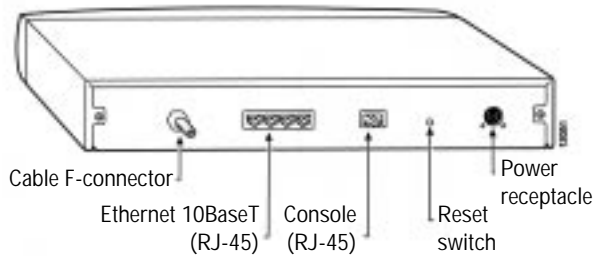


Figure 2 Cisco uBR904–Rear View



## Cisco uBR904 Specifications

Table 1 Cisco uBR904 Specifications

Cisco uBR904 Configuration	
Processor Type	Microcontroller 68EN360 operating at 33 MHz with integrated Ethernet MAC
Boot EPROM and Boot Flash	2 MB used to store the following: <ul style="list-style-type: none"> <li>Power-up diagnostics program for onboard components</li> <li>A factory installed startup version of microcode boot code, including decompressing operating code</li> <li>the UART serial interface for debug</li> </ul>
Configuration NVRAM	8 KB nonvolatile memory to store configuration parameters
Flash Memory	4 MB used to store the operating system; Multiple images can be stored to ensure the modem will boot up even if there is a power failure during code download
DRAM	8 MB used to store operating microcode, the running configuration parameters, and the data buffers for packets in transition
Software	Cisco IOS software feature sets to be specified at a later date
Cisco uBR904 Physical Specifications	
Dimensions (H x W x D)	2.19 x 11.15 x 8.67 in. (5.56 x 28.32 x 22.02 cm)
Weight	1.65 pounds (0.75 kilograms) minimum 1.80 pounds (0.82 kilograms) maximum
Consumption	10W
DC Input Voltage	5V, 8V, 40V



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