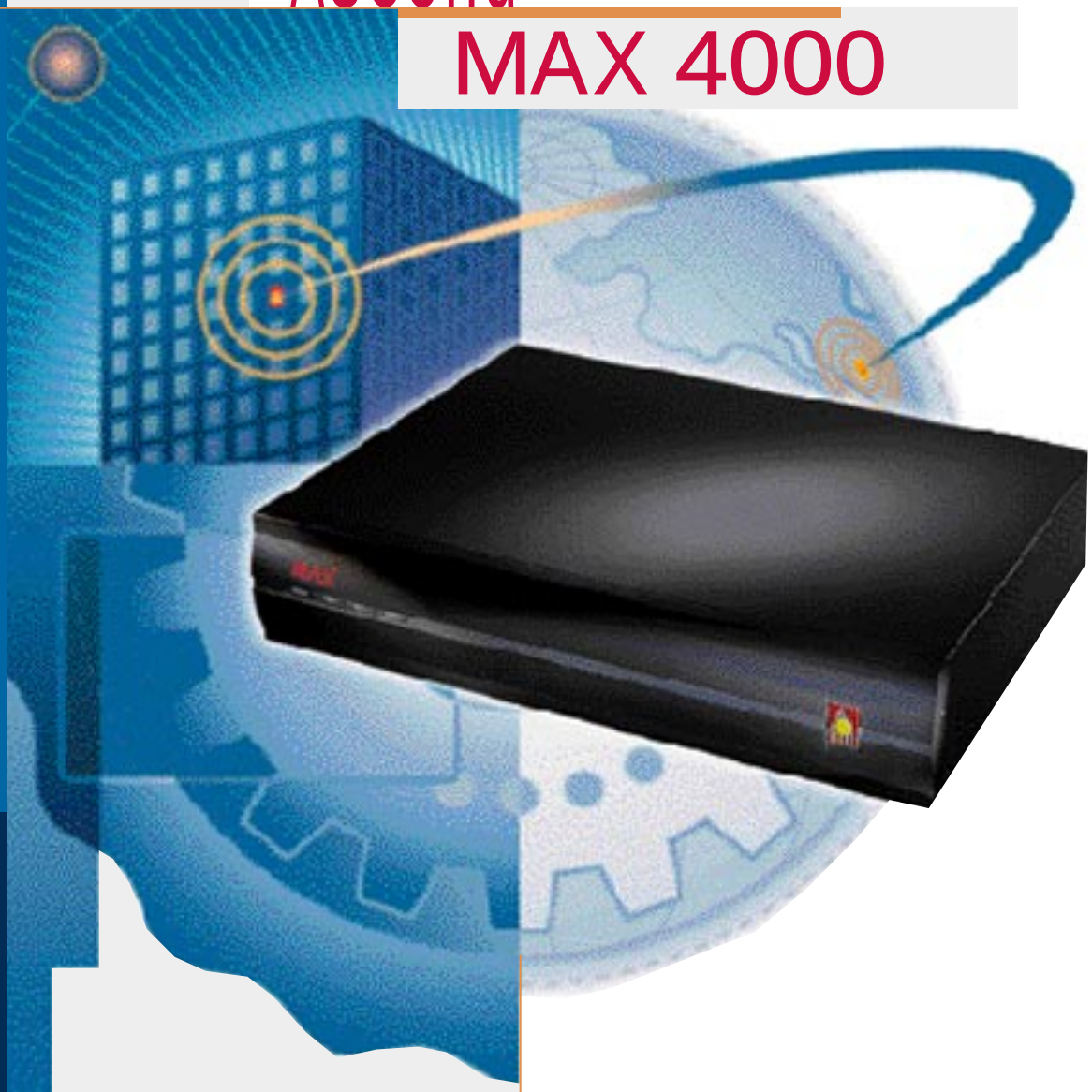
product information

Ascend MAX 4000



Most WAN access solutions just don't stack up to the MAX. The MAX 4000 is the industry's only high-density solution enough to keep up with your expanding wide area network.

Remote Access ▾ Teleworking ▾ Internet Access

The MAX™ 4000 is a high-powered, multiprotocol WAN access switch that allows corporations, carriers and service providers to extend their backbone networks to support remote office access, teleworking and Internet access. By consolidating analog and digital access lines over high-speed digital trunks, the MAX 4000 enhances call performance by maximizing line utilization and minimizing equipment problems.

The scalable architecture provides an easy migration path from analog-based solutions to the next generation of networking using Hybrid Access™ for ISDN, Frame Relay or leased line solutions. The MAX 4000 is the industry's only truly scalable product, allowing remote users to move from analog systems to digital connectivity, using existing carrier E1/T1/PRI circuits and supporting up to 120 digital users.

High-density digital modem cards can be added to eliminate the need for costly analog modem banks and the downtime that can result from inefficient connectivity. The MAX 4000 is tailor-made for users who want an integrated, scalable solution at the lowest price per port available.

ASCEND

Networking Solutions for Corporations and Service Providers

Consolidation drives down the cost of ownership

By eliminating the need for separate modem banks, terminal servers and routers, the MAX saves network equipment and transmission costs. With Hybrid Access, the MAX 4000 consolidates a dynamic mix of access lines over high-speed digital trunks for up to 96 (T1)/120 (E1) simultaneous connections.

- ISDN PRI
- ISDN BRI
- T1/E1, Fractional T1/E1 with integrated T1 CSU
- Frame relay
- Supports up to 72 modems per system

High-speed digital modems enhance call performance and reduce operating costs

Integrated, high-speed digital modems provide full access to analog callers that dial into the MAX over digital access lines such as channelized T1/E1 or PRI. The MAX 4000 uses the 12-port Digital Modem (DM-12) expansion module to ensure reliability and eliminate analog noise, downtime and operating costs that can be present with stand-alone analog modem technology.

- 12-port V.34 digital modem expansion module
- Upgradeable to 56K technology
- MNP and MNP10-EC error correction for cellular connections
- V.110 GSM Mobile Access
- V.42 bis data compression
- Data throughput up to 115.2 Kbps
- V.34 (33.6 Kbps), V.FC, V.32bis, V.32, V.22, V.22bis, V.21, Bell 212A and Bell 103 compatible
- Group 3 fax support with MAXDial software
- Remote downloadable modem firmware

Seamlessly connects to backbone network services over a variety of interfaces

The MAX 4000 provides users with options for connecting into a local or remote backbone network. Users can connect to switches or to backbone routers over any of the following transport options:

- Ethernet (AUI or 10Base-T) for connecting to the backbone network at up to 10 mbps
- Frame relay over a V.35 serial port for high-speed connections at up to 8 mbps
- T1/E1/PRI ports with integral T1 CSU for making remote connections to the backbone network

Multi-Chassis support provides scalability and optimizes resource management

The MAX Stack capability allows several MAX 4000 units to operate as a single, more powerful solution that facilitates negotiation of Multilink PPP (MP), Multilink Protocol Plus (MP+) and Bandwidth Allocation Control Protocol (BACP) calls across T1/E1/PRI lines. Any MP, MP+ or BACP call that is handled by a MAX in the "Stack" can have bandwidth allocation requests serviced by other units in the Stack.

- Shared IP pools across multiple MAX units
- MP/MP+/BACP calls span across multiple chassis
- Single "virtual NAS" to monitor and manage capacity management
- Calls can be routed to multiple destinations from one phone number

Bandwidth on demand maximizes performance and decreases costs

Dial-up connections are automatically set up and torn down for transparent client-server computing across the WAN. Dynamic Bandwidth Allocation™ aggregates multiple calls for greater bandwidth and lower costs.

- Dial-on-demand bandwidth based on packet address
- Increase or decrease bandwidth dynamically during an active session
- 56/64 Kbps to 4 mbps selectable bandwidth per call
- Bandwidth is controlled manually, automatically, or by time-of-day profile
- Supports inverse multiplexing protocols (MP, MP+, BONDING, AIM)
- Industry-standard STAC compression
- RFC 1144 TCP header compression

Multiprotocol routing, bridging and terminal server functions ensure network interoperability

Robust support for multiprotocol routing and bridging functions enables users to connect to a variety of resources within corporate networks. The proven technology in routing protocols and terminal server functionality permits service providers and carriers to extend their network to offer a broad range of services to users.

- RIP2 and OSPF routing protocols
- AppleTalk, TCP/IP and IPX routing protocols
- Bridging all protocols (BCP standard bridging)
- PPP, SLIP and C-SLIP terminal service
- Telnet, ARA
- Dynamic IP address assignment
- V.120 asynchronous rate adaption
- V.110 asynchronous rate adaption (optional module)

Integrated management features provide end-to-end network control

Manage all functions of the MAX 4000 through your choice of interface, either locally or remotely, using intuitive graphical configuration software.

- SNMP MIBs
- Password protected Telnet remote management
- Local management via VT-100 terminal
- PPP Link Quality Monitoring (LQM)

- Annex D Frame Relay link monitoring
- FLASH memory for easy software download
- ISDN event log and SYSLOG support

Expandable bandwidth on demand server for high-powered video and data applications

The MAX 4000 has been designed to integrate audio and video conferencing across the same WAN interfaces. By utilizing the bandwidth on demand technology and the Ascend Inverse Multiplexer (AIM) slot card, users can leverage the existing data network to support videoconferencing between two or more sites.

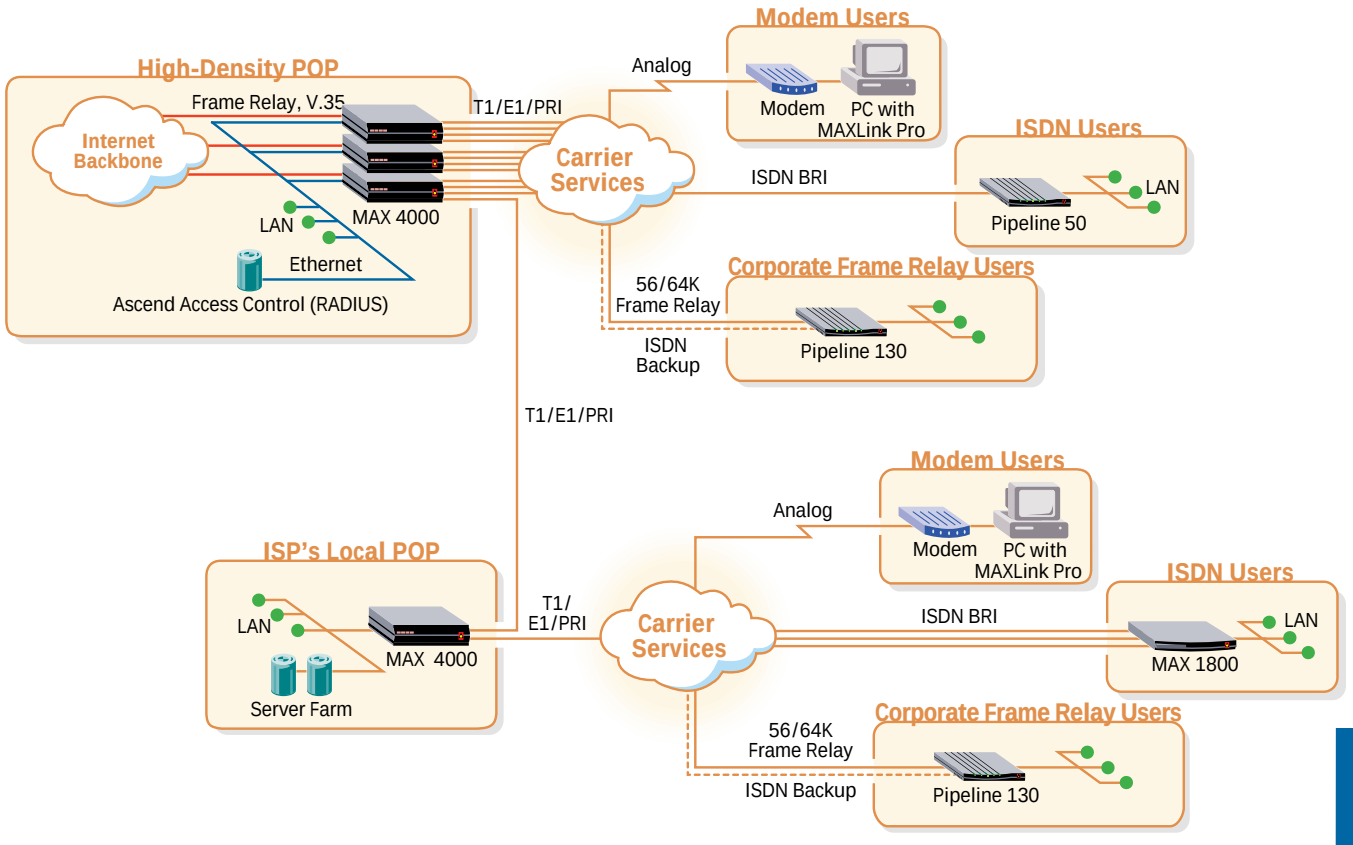
- Two- and six-port AIM slot cards
- Compatible with Multiband™ inverse multiplexers for greater density and specialized multimedia networks
- Port-to-port local switching
- Up to 64 channels per system
- Call routing by port, group or called number

Redundant power supply protects mission-critical applications

The optional redundant power supply on the MAX 4000 allows corporations, carriers and service providers to offer users reliable and uninterrupted operation. The loadsharing dual power supplies operate as back-up power sources for each other, maximizing uptime and ensuring high availability for all mission-critical applications.

- Power input from 47 to 63 Hz, 90-240 VAC
- Power consumption 200 Watts, 680 BTU/Hr

The MAX and Hybrid Access Allow Service Providers and Carriers to Offer Multiple Services to their Customers



The MAX 4000 supports up to 96 (T1)/120 (E1) simultaneous calls from ISDN BRI, Frame Relay or modem users to the backbone network over ISDN PRI, channelized T1/E1 or ISDN BRI lines. Up to 72 of the 96 (T1)/120 (E1) calls can be from modem users.

Iron-clad Security

Comprehensive security for iron-clad remote networking

Support for standard user-authentication systems fits into your current network security architecture. Networked, server-based authentication makes it easy to manage large-scale remote access applications from a central site. Ascend Access Control™ (RADIUS) allows service providers and network managers to integrate the accounting, authentication and authorization capabilities needed to manage their network.

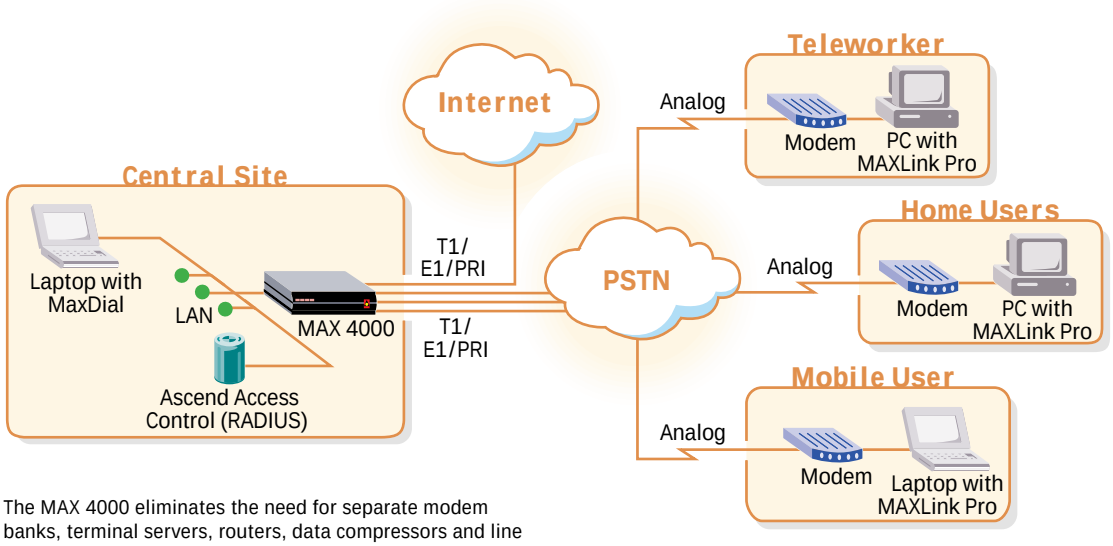
- PAP, CHAP and MS-CHAP
- Ascend Access Control (RADIUS), TACACS and TACACS+
- Encrypted token-card security
- Callback (digital connections)
- Calling Line ID (CLID)
- Password protected terminal server access
- Transmit and receive packet filtering
- Secure Access™ Firewall (optional)

Protect corporate resources with Ascend's Secure Access Firewall

Ascend's Secure Access Firewall is a software option on the MAX 4000 that uses state-of-the-art firewall technology and delivers a comprehensive, fully integrated security solution for corporate networks. Secure Access Firewall allows carriers and ISPs to offer secure services to their customers. It protects your company's information assets at the corporate LAN, remote offices and teleworkers' home offices. The standard security features that are offered on your Ascend remote networking system are integrated with comprehensive security features such as transparency, dynamic firewall, and monitoring and logging.

Secure Access Firewall provides a cost-effective single vendor solution for securing your company's remote network against attacks on sensitive data. (See the Secure Access Firewall datasheet or visit our web site for more information).

Analog Access for Mobile Users and Teleworkers



The MAX 4000 eliminates the need for separate modem banks, terminal servers, routers, data compressors and line adapters. A single MAX 4000 provides digital access for up to 72 analog modem callers in an eight centimeter high chassis. Hybrid Access adds support for up to 96 (T1)/120 (E1) digital sessions from ISDN and Frame Relay devices.

Enhanced Software Capabilities

The software for the MAX family allows corporations, carriers and service providers to use the scalable MAX architecture to optimize their networks. The MAX software enhances connectivity by providing a single solution for users with Hybrid Access, Frame Relay and ISDN.

Hybrid Access*

Hybrid Access is a software feature that gives users flexible connectivity from any access line. It provides integrated digital sessions via the T1/E1 or ISDN PRI interface. With Hybrid Access, users have integrated remote networking access for ISDN Switched 56 and 64k BRI as well as Frame Relay. The MAX 4000 can have up to 96 (T1)/ 120 (E1) remote 56 Kbps or 64 Kbps Frame Relay or ISDN connections.

Frame Relay software

Optional Frame Relay software integrates incoming Frame Relay traffic from Ascend's Pipeline® and other Frame Relay access devices with analog and digital dial-in traffic. A high-speed synchronous V.35 port connects directly to a Frame Relay switch at up to 8 Mbps.

- Route to multiple Frame Relay PVCs over single or multiple interfaces
- Supports up to 4096 PVCs with Ascend Access Control (RADIUS) authentication software
- Dial-in PPP to Frame Relay gateway function with PVC selected on a per user basis
- RFC 1490 encapsulation
- ANSI Annex D and ITU Annex A management
- PVC switching
- Frame relay forum UNI and NNI
- Dial Access Signaling Interface (DASI)

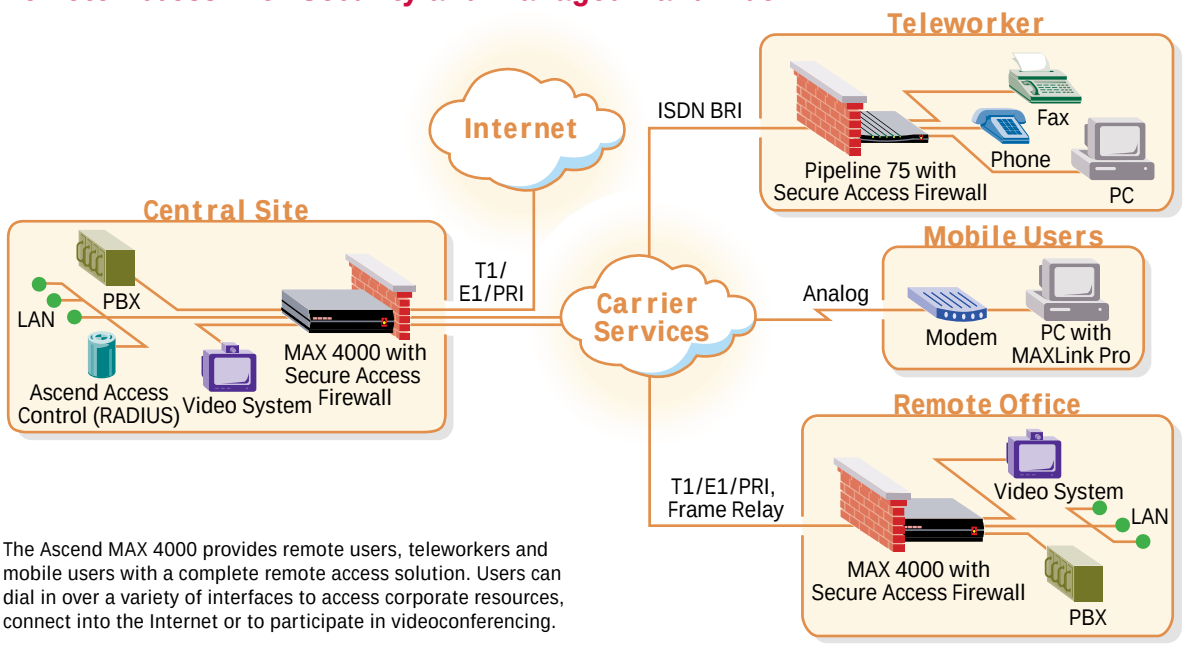
ISDN software

Optional ISDN signaling software supports incoming ISDN signaling from Ascend's Pipeline and MAX products as well as other ISDN access devices. The ISDN signaling supports ISDN connections for analog modem and digital services dial-in traffic.

- BRI with integrated NT1 (North America)
- PRI with integrated CSU (North America)
- PRI to T1 signaling conversion
- D4 to ESF conversion
- D-channel multiplexing
- Frame Relay over ISDN B-channels
- X.25 over ISDN B channels
- D-channel X.25 Packet Services
- Calling Line Identification (CLID)
- Signaling homologation in over 30 countries worldwide
- E1-R2 support for non-ISDN digital networks

* Hybrid Access is a bundled feature included with the MAX 4000. Hybrid Access is an optional feature on the North American MAX 4002 and 4004 products.

Remote Access with Security and Managed Bandwidth



The Ascend MAX 4000 provides remote users, teleworkers and mobile users with a complete remote access solution. Users can dial in over a variety of interfaces to access corporate resources, connect into the Internet or to participate in videoconferencing.

MAXLink Pro and MAXDial Client Software

Client Software

MAXLink Pro™ and MAXDial™ client software are provided with the MAX 4000 at no charge. However, the host software is available as an option.

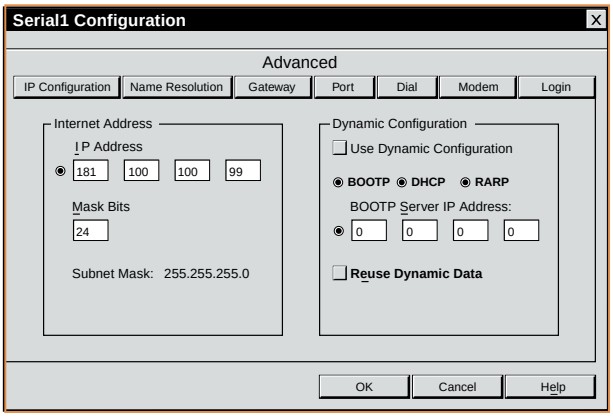
Use of MAXLink Pro and MAXDial client software assures complete interoperability between users and the MAX 4000 and provides an easy way to add users to your growing network.

MAXLink Pro software connects remote users with their offices

MAXLink Pro client software runs on a Macintosh or Windows platform, and allows a user to establish a connection to Novell and IP networks. It supports multiple applications including WebSurfer, FTP client, FTP server, TFTP, Telnet and includes both a TCP/IP and IPX stack. Through MAXLink Pro, users can do the following:

- Connect to a remote LAN using Macintosh or Windows (95, 3.1x or NT)
- Access network resources such as file servers, printers and electronic mail
- Define multiple dial-in connections to different LANs while saving them in a list
- Choose the frequency and number of attempts to redial a busy phone line
- Request dial-back from the server

MAXLink Pro

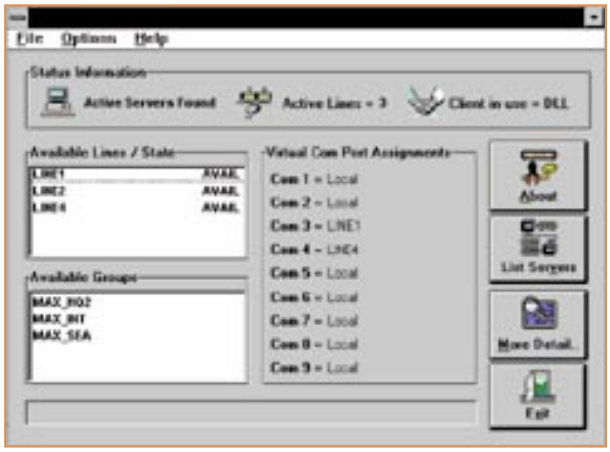


MAXDial software eliminates the need for stand-alone modems

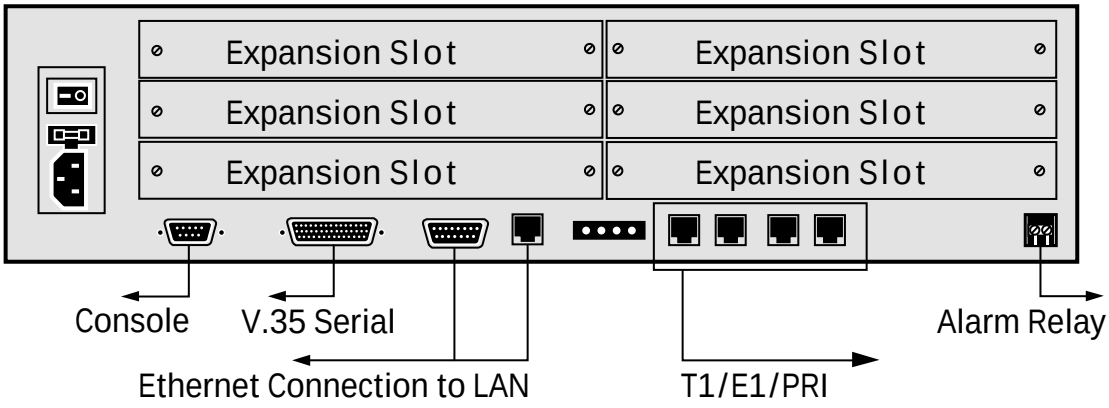
Users on the LAN can access the outside world through MAX and MAXDial software, which create a “virtual modem” at the desktop. MAXDial eliminates the need to install a direct line and a desktop modem in every office by providing the same functionality without the added expense. The software enables users to dial up modem calls or send out faxes via the modem cards in the MAX.

- Supports AT command set for V.34 modems
- Supports TCP/IP and Novell IPX LANs
- Runs under MS-DOS, Windows 3.x. and Windows 95
- Graphical User Interface (GUI) for easy configuration

MAXDial



MAX 4000 Back Panel



MAX 4000

MAX Product Family At A Glance

Feature	MAX 200Plus	MAX 1800	MAX 2000	MAX 4002†	MAX 4004†	MAX TNT††	MAX 4000††† (International)
E1	—	—	1	—	—	28	4
T1 with integrated CSUs	—	—	1	2	4	28	4 (CSU optional)
ISDN BRI (S/T)	Up to 4	8	—	up to 32	up to 32	0	up to 32
ISDN BRI (U)	Up to 4	8	—	—	—	—	—
T3	—	—	—	—	—	1	—
FrameLine	—	—	—	—	—	150	—
T3 Unchannelized	—	—	—	—	—	1	—
Ethernet	1	1	1	1	1	16	1
High-speed serial	—	1	1	1	1	30	1
Hybrid Access	—	included	included	optional	optional	optional	—
Frame Relay Software	—	optional	optional	optional	optional	optional	optional
Digital Modem Capacity	8*	16	24	48**	72	672	72
Concurrent Digital Sessions	—	16	24	48***	96	672	96/120(E1)
Expansion slots	8 type II PCMCIA	2	2	6	6	48	6
IMUX ports	—	2	2	6	6	—	6

* supports analog PCMCIA modems
** up to 72 with upgrade option
*** up to 96 with upgrade option

† available only in U.S. and Canada
†† information for a three-shelf system
††† available only outside U.S. and Canada in either T1 or E1 versions

Hardware Specifications

Dimensions	7.6 cm x 43.2cm x 30.5 cm [3 in x 17 in x 12 in]
Weight	6.8 kg [15 lbs]
LAN Interface	Ethernet 10Base-T via RJ-45 jack, Ethernet AUI via DB-15 connector
WAN Interfaces	4 T1/E1 lines (North America – integrated CSU), serial port
Software Upgrade	Via built-in flash RAM, remote downloadable
Power Requirements	200 watts, 47-63 Hz, 90-240 VAC, 680 BTU/hour
Operating Requirements	Temperature: 0-40˚C [32-104˚F] Altitude: 0-4500 meters [0-14,800 feet] Relative Humidity: 5-90% (non-condensing)
Safety Certifications	CSA 950, NTRL/UL 1950, TUV EN 60 950
EMI/RF	E55022, EN50082-1, FCC Part 68, FCC Part 15

Software Specifications

LAN Protocols Supported	TCP/IP, IPX
Routing Protocols Supported	Appletalk, BCP Bridging, RIP, RIP2, OSPF (IP only), IGMP multicast forwarding
WAN Protocols Supported	PPP, ARAP, SLIP, C-SLIP, Async PPP, Sync PPP, V.110 Async, HDLC, ARA, Async IPX, X.25 PAD, X.25 over B-channel, V.120, D4 framing (T1), G703/732 framing (R1), frame relay PVC, Hybrid Access, PPP-FR gateway, BONDING, AIM, FR NNI, ISDN signaling, E1-R2
Modem	V.34, MNP 10-EC, MNP, V.42bis, fax modem send up to 14.4 Kbps
Multimedia/Inverse	BONDING, local port-to-port switching, 56 or 64 Kbps Multiplexing adaption, AIM
Bandwidth Management	Multilink PPP, Multilink Protocol Plus™, BACP, TCP header compression, data compression (Ascend/Microsoft/STAC V9), AppleTalk Remote Access, compatible with ARA 1.0 and 2.0
Security	Secure Access Firewall, Ascend Access Control (RADIUS), TACACS+, Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), MicroSoft-CHAP (MS-CHAP), token card, Calling Line ID (CLID), packet filtering, SNMP, console management (VT-100), PPP call back, user authentication
Management	Console management software (runs on Windows 95 and Windows 3.x), Telnet, NASI, SNMPII, PPP LQM, Frame Relay Annex D, Frame Relay ITU Annex A, Frame Relay ANSI Annex D
Client Software	MAXLink Pro client software MAXDial client software

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Ascend Communications, Inc. is a leading, worldwide provider of remote networking solutions for corporate central sites, Internet Service Providers' points of presence, remote offices, mobile workers, and telecommuters. Ascend develops, manufactures, markets, sells and supports products which utilize bandwidth on demand to extend existing corporate networks for applications such as remote LAN access, Internet access, telecommuting, SOHO connectivity and video-conferencing/multimedia access. Detailed information on Ascend products, news announcements, seminars, service and support is available on Ascend's home page at the World Wide Web site: http://www.ascend.com.

Ascend markets the GRF, MAX, Multiband, MultiDSL, Pipeline, NetWarp and Security families of products. Ascend products are available in more than 30 countries worldwide.

Specifications are subject to change without notice.

DS-M4000-397

ASCEND **Remote Networking Solutions That Work.™**

ISO 9001 REGISTERED