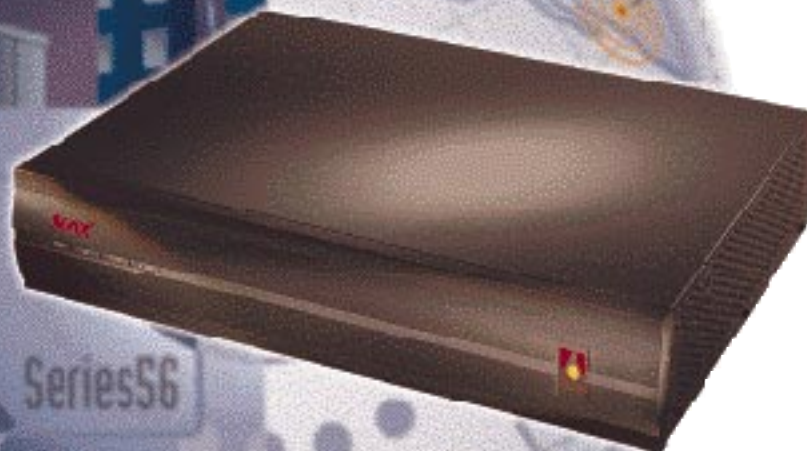# Ascend
MAX 4048 & 4060

Series56

Increase your functionality with a rock-solid remote access solution. The MAX 4048 and 4060 WAN access switches extend your networking capabilities while protecting your infrastructure investment.

Remote Access ▾ Telecommuting ▾ Internet Access

The MAX™ 4048 and 4060 WAN access switches address the access infrastructure needs of small- to mid-sized network service providers and the remote networking needs for companies of all sizes. Both switches are easy to configure and offer the scalability, robust software features and high-performance Series56™ Digital Modems needed for building high-density remote networks.

The MAX 4048 offers a low-entry cost and a two-T1 chassis with 48 Series56 Digital Modems. The MAX 4060 is a two-E1 system offering up to 60 digital modems. Both products integrate modem, router and remote access server functionality into a single unit, driving down the cost of ownership while conserving rack space.

Enhanced system capabilities provide a migration path from analog-based solutions to the next generation of networking. These capabilities give service providers the flexibility to satisfy diverse end user needs and bolster functionality without investing in additional equipment. Integrated security allows service providers to offer reliable, secure access to the Internet, a corporate intranet or a Virtual Private Network (VPN). The MAX 4048 and 4060 include everything needed for offering complete yet cost-effective remote access.

ASCEND

Ascend provides corporations and businesses with remote networking software that allows remote users, telecommuters, mobile users and LAN users to have all of the capabilities needed to make secure connections to and from the network at corporate headquarters.

Multiprotocol Call Routing

The MAX 4048 and 4060 Remote Networking Software includes IPX and AppleTalk protocol support as well as bridging. Multiprotocol call routing lets network administrators extend their network to offer a broad range of applications to their users. This optimized solution links network users in remote or branch offices to corporate backbones for server access. Users can send e-mail, share data between servers and access remote databases. It also supports IPX spoofing and AppleTalk ARA.

MAXLink Pro

MaxLink Pro is an available option for both the MAX 4048 and the MAX 4060. This client software combines protocol stack software with an award-winning suite of applications to provide simultaneous access to both IP and IPX network services. It is an easy and economical way to add remote users to a growing network. Once connected, users become full-fledged nodes on the LAN with access to file servers, printers, the Internet and electronic mail. Both Windows and Macintosh users alike can access the corporate network from anywhere—whether they are traveling, telecommuting or working at a remote site.

MAXDial

Users on the corporate LAN can access the outside world using MAXDial software and the MAX 4048 and 4060. 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. It lets users dial out or send out faxes via the modem cards in the MAX 4048 and 4060. MAXDial runs under Windows 3.1x and Windows 95 and supports the AT command set for V.34 and all other modem modes.

Corporate Remote Access
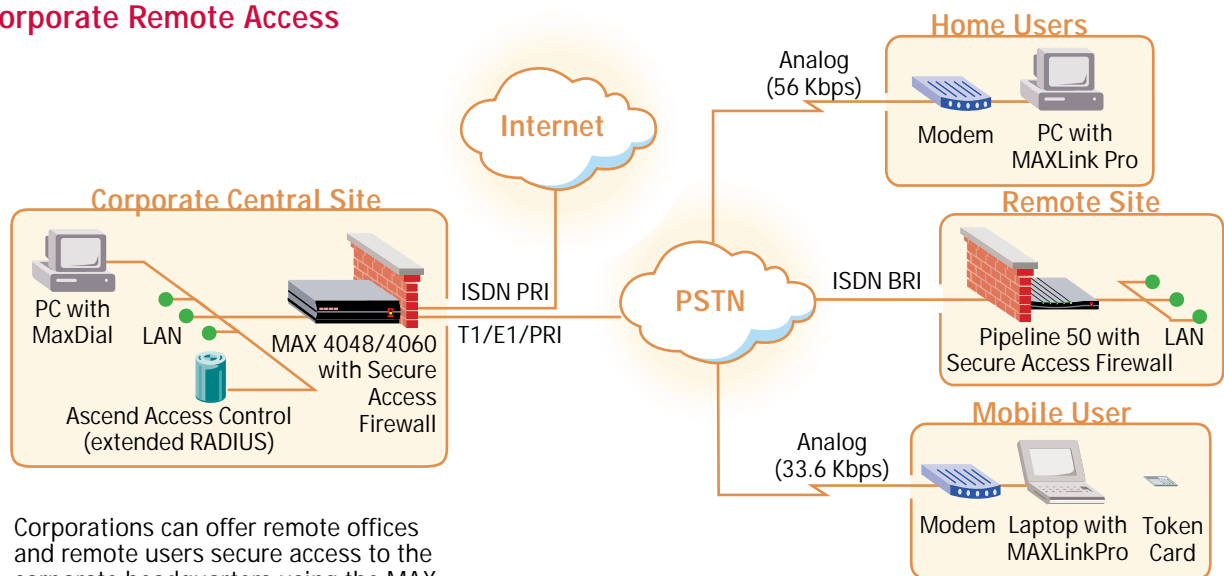
Corporations can offer remote offices and remote users secure access to the corporate headquarters using the MAX 4048 and 4060 with Secure Access Firewall.

Networking Solutions for Service Providers and Corporations

High-speed Series56 Digital Modems enhance call performance and reduce operating costs

Integrated Series56 Digital Modems provide full access to analog callers that dial into the MAX over digital access lines such as channelized T1, PRI or E1 R2. The MAX 4048 and 4060 use Series56 Digital Modems to ensure reliability and eliminate the downtime as well as the operating costs that can be present with stand-alone analog modem technology.

- Series56 (V.34 and K56flex-compatible) Digital Modem modules
- MNP and MNP10-EC error correction for cellular connections
- V.42 bis data compression
- Data throughput up to 115.2 Kbps
- K56flex, V.34, V.FC, V.32bis, V.32, V.22, V.22bis, V.21 and below
- Group 3 fax support with MAXDial software
- Remote downloadable modem firmware

Integrated Software protects investment

The MAX 4048 and 4060 both offer a scalable platform that lets network service providers add functionality without incurring additional expense. Software enhancements and MAX Stack capabilities allow them to integrate users and additional MAX units seamlessly into their network.

- Software-upgradable Series56 Digital Modem modules allow support for analog and cellular callers
- Hybrid Access™ 4000 is included for additional functionality (ISDN PRI signaling, HDLC processing, Frame Relay support)
- MAX Stack aggregates multiple MAX systems by allowing them to act as a single WAN access switch

## Point-and-click, Java-based configurator provides end-to-end network control

A Java-based configuration utility helps network administrators get up and running in less than 15 minutes. This utility guides them through the applications with complete HTML-based on-line help. In addition, network administrators can manage all functions of the MAX 4048 and 4060 through their choice of interface, either locally or remotely, using intuitive graphical configuration software.

- Java-based configurator for point and click management
- SNMP MIBs II
- 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

Routing, bridging and terminal server functions ensure network interoperability

Integrated support for industry-standard routing and bridging functions enables users to connect to a variety of resources within corporate networks. These protocols complement the Remote Networking Software package which includes support for IPX and AppleTalk ARA. The proven technology in routing and terminal server protocols permits service providers to extend their network to offer a broad range of services to users.

- Remote Networking Software package supports IPX and ARA as well as:
  - MAXLink Pro™
  - MAXDial™
- TCP/IP with RIP2 and OSPF routing protocols
- Bridging all protocols (BCP standard bridging)
- PPP, SLIP and C-SLIP terminal service

High-speed Internet Access
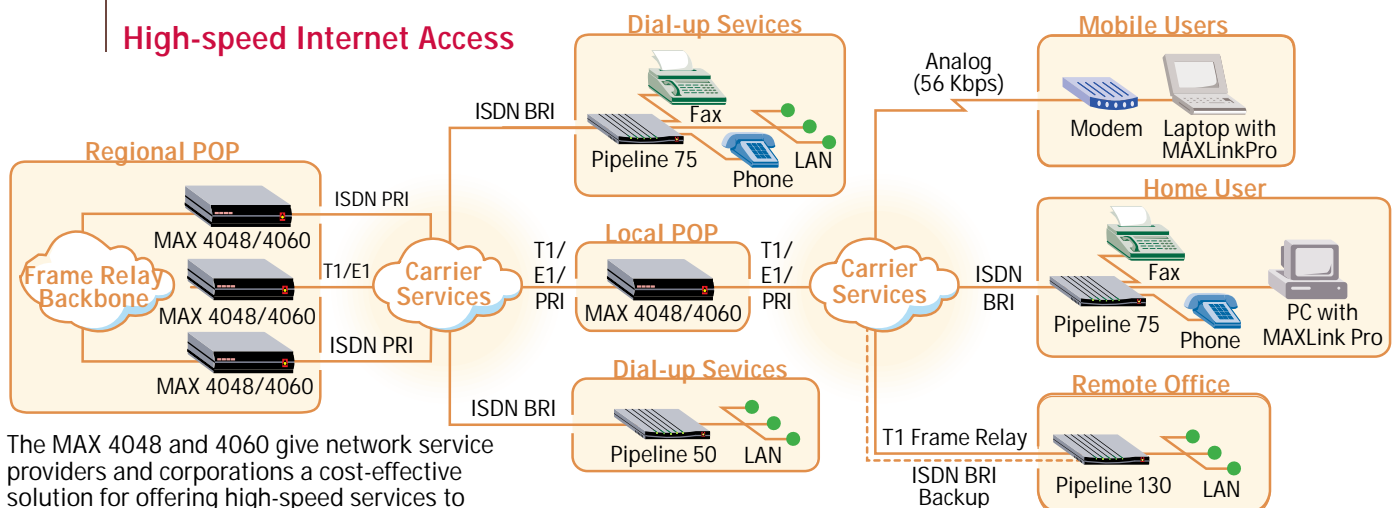
The MAX 4048 and 4060 give network service providers and corporations a cost-effective solution for offering high-speed services to home users, remote offices and mobile users over a variety of interface lines.

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 4048 and 4060 consolidate a dynamic mix of access lines over high-speed digital trunks for up to 48 simultaneous connections for the MAX 4048 and 60 for the MAX 4060.

- ISDN PRI and BRI
- T1, fractional T1 with integrated CSU or E1
- Frame Relay
- MAX 4048 supports 48 Series56 Digital Modems per system
- MAX 4060 supports 60 Series56 Digital Modems per system

Flexible platform allows seamless connections to backbone services over a variety of interfaces

The MAX 4048 and 4060 provide 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
- Two T1/PRI ports with an integral CSU for remotely connecting to the backbone network with a MAX 4048
- Two E1/PRI ports with integral CSU for remotely connecting to the backbone network with the MAX 4060

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 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+, BACP)
- Industry-standard STAC compression
- RFC 1144 TCP header compression

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. Extended RADIUS functionality 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 with 120 attributes and extended capabilities)
- TACACS and TACACS+
- Encrypted token-card security
- Integral ATMP or PPTP support for offering virtual private networking services
- Callback (digital connections)
- Calling Line ID (CLID)
- Password protected terminal server access
- Transmit and receive packet filtering
- Secure Access Firewall (optional)

Secure Access Firewall

Ascend's Secure Access™ Firewall is a software option on the MAX 4048 and 4060 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 a company's information assets at the corporate LAN, remote offices and telecommuters' home offices. It also integrates the standard security features that are offered on your Ascend remote networking system 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 a company's remote network against attacks on sensitive data. (See the Secure Access Firewall datasheet or visit our web site for more information).

Virtual Private Networking

Using Ascend's optional Ascend Tunnel Management Protocol (ATMP) or Point-to-Point Tunneling Protocol (PPTP) support, service providers can offer VPN services that provide the safety of a true private network. The VPN services in the MAX 4048 and 4060 allow customers to utilize local dial-in resources and the Internet to achieve secure remote connectivity at a very low cost.

The software for the MAX family allows corporations, carriers and service providers to use the scalable MAX architecture to optimize their networks. The MAX 4048 and 4060 enhance connectivity by providing a single solution for users with Hybrid Access, Frame Relay and ISDN.

Hybrid Access 4000

Hybrid Access 4000 consists of digital access, ISDN PRI signaling and Frame Relay support for 48 or 60 modems.

Digital Access

With Hybrid Access, users have integrated remote networking access for ISDN Switched 56 as well as Frame Relay. Users select what they need today and upgrade via software to the next generation digital technologies, while preserving the investment in their platform.

• 56/64 Kbps B-channels for ISDN
• 56/64 Kbps Frame Relay
• Up to 48 remote digital sessions for MAX 4048
• Up to 60 remote digital sessions for MAX 4060

ISDN PRI signaling

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.

• PRI with integrated CSU
• ITU-T R2 signaling on E1
• PRI to T1 signaling conversion
• D4 to ESF conversion
• D-channel multiplexing and X.25 packet services
• Frame Relay or X.25 over ISDN B-channels
• Calling Line Identification (CLID)
• Signaling homologation in over 30 countries worldwide

Frame Relay software

The MAX 4048 and 4050 can have up to 48 or 60 remote 56K or 64K Frame Relay or ISDN connections. The 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 (extended 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)

MAX Stack

MAX Stack increases the scalability of the MAX 4048 and 4060 while allowing network service providers to fully utilize their existing resources to better manage the bandwidth on their network. A MAX Stack allows several MAX units to operate as a single, more powerful solution that facilitates the negotiation of Bandwidth Allocation Control Protocol (BACP), Multilink PPP (MP) or Multilink Protocol Plus (MP+) calls across the T1/E1/PRI lines. If a request for additional channels is made and the MAX that originally handled the call has no available channels, additional channels can be allocated from other MAX units in the stack.

MAX Stack is also ideal in situations where a network-service provider has assigned a single hunt group to all the T1/E1/PRI lines on the Stack. It allows calls to be routed to multiple destinations from one phone number without the need for duplicating equipment or services.

MAX 4048 & 4060
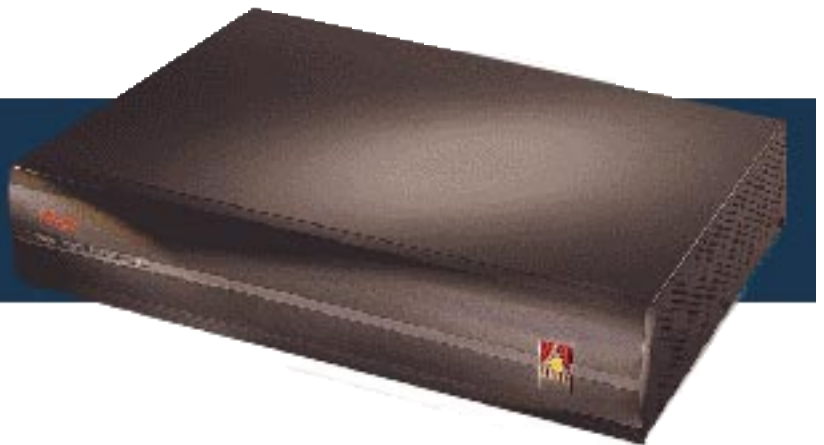
Hardware Specifications

Dimensions	3 in x 17 in x 12 in [7.6 cm x 43.2cm x 30.5 cm]
Weight	15 lbs [6.8 kg]
LAN Interface	Ethernet 10Base-T via RJ-45 jack, Ethernet AUI via DB-15 connector
WAN Interfaces	2 T1 ports with integrated CSU and a V.35 interface (4048) 2 E1 ports and a serial interface (4060)
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: 32-104˚F [0-40 ˚C] Altitude: 0-14,800 feet [0-4500 meters] Relative Humidity: 5-90% (non-condensing)
Safety Certifications	CSA 950, NTRL/UL 1950, TUV EN 60 950
EMI/RF	FCC Part 68, FCC Part 15, E55022, EN50082-1

Software Specifications

Routed LAN Protocols	TCP/IP via RIP, RIP 2, OSPF
WAN Protocols	PPP, SLIP, C-SLIP, Async PPP, Sync PPP, X.25 PAD, X.25 over B-channel, V.120, D4 framing (T1/E1), G703/732 framing (R1), Frame Relay PVC, PPP-Frame Relay gateway, FR NNI, ISDN signaling, ITU-T R2 on E1
Modem Support	K56flex, V.34, MNP 10-EC, MNP, V.42bis, fax modems send up to 14.4 Kbps
Bandwidth Management	Multilink PPP (MP), Multilink Protocol Plus (MP+), Bandwidth Allocation Control Protocol (BACP), TCP header compression, data compression (Ascend/Microsoft/STAC V9)
Security	Secure Access Firewall, Ascend Access Control (extended RADIUS), RADIUS, TACACS, TACACS+, Password Authentication Protocol (PAP), Challenge Authentication Protocol (CHAP), MS-CHAP, token card, Calling Line ID (CLID), packet filtering, SNMP, console management (VT-100), PPP callback, user authentication, ATMP and PPTP
Remote Networking Software	Multiprotocol Call Routing: bridging, IPX and Async IPX with local spoofing, AppleTalk and AppleTalk Remote Access 1.0 and 2.0, MAXDial, MAXLink Pro
Management	Java configurator, Telnet, NASI, SNMP MIB-2, PPP, LQM, Frame Relay Annex D, Frame Relay ITU Annex A, Frame Relay ANSI Annex D
Client Software	MAXLink Pro MAXDial

MAX 4048 and 4060 Back Panel

Console   V.35 Serial

Ethernet Connection to LAN

T1/E1/PRI to WAN or PBX

Alarm Relay
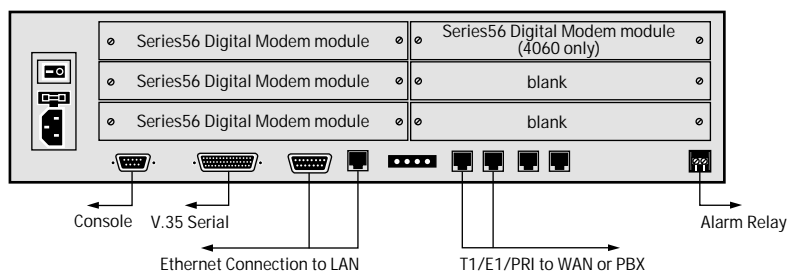
Ascend's Series56 Digital Modems are based on K56flex technology.

ISO 9001 REGISTERED

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 videoconferencing/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.

Remote Networking Solutions That Work.™