# Ascend

MAX 4048

A cost-effective, preconfigured WAN access switch with support for T1/PRI and Frame Relay. The MAX 4048 supports 48 high-speed Series56™ (K56flex-compatible) Digital Modems, integrated dynamic firewall, IP/IPX/AppleTalk Routing, MAXDial™ (dial-out/fax software), Virtual Private Networking, RADIUS server support and a Java configuration utility.

SELLING BRIEF

Where to Sell MAX 4048

The MAX™ 4048 provides a comprehensive analog and digital remote networking solution, and is ideal in the following applications:

- **Telecommuting -** for dial-in access from high-speed analog modems, ISDN BRI terminal adapters or routers
- **Remote Access** - dial-in by mobile workers to the corporate LAN over analog phone lines
- **Branch Office Connectivity** - via Switched 56, Frame Relay, and Internet Virtual Private Networks
- **Internet Access** - via Frame Relay for Internet backbone access
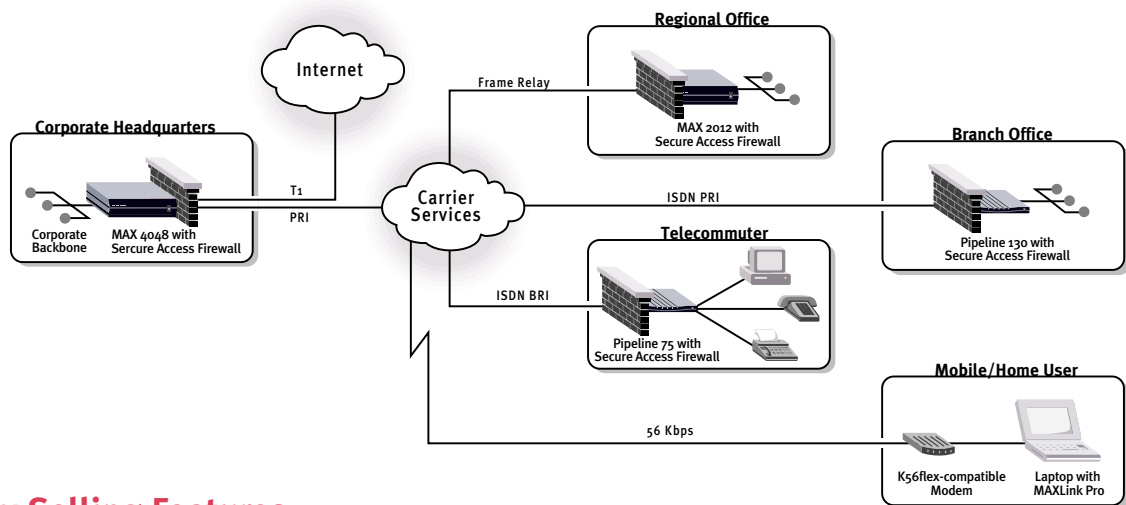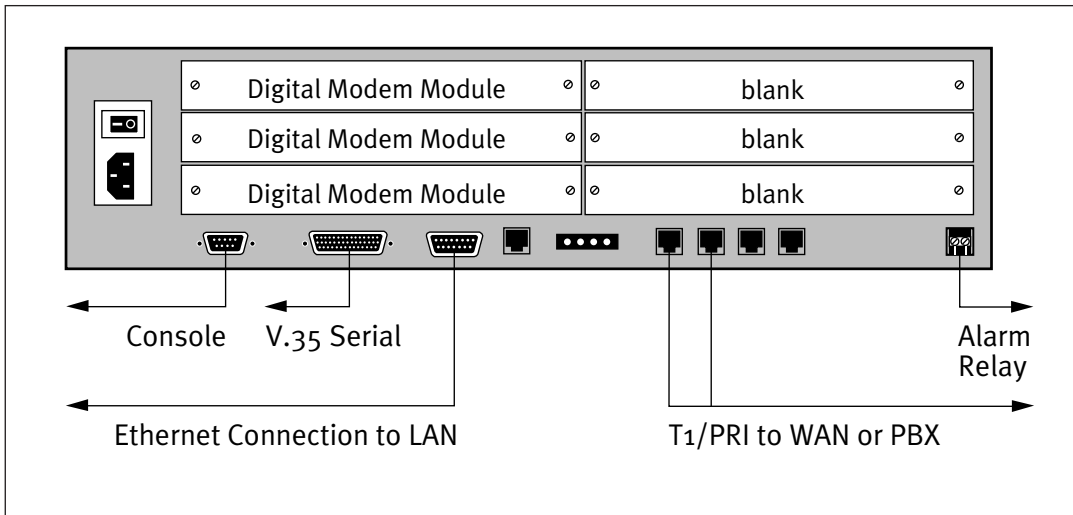

Key Selling Features

- **Most cost-effective high-performance access concentrator** - Per port costs up to 56% lower than the competition.
- **Robust security** - PAP, CHAP, enhanced RADIUS and dynamic firewall provide iron-clad remote networking for the corporate LAN.
- **Superior performance** - Industry leading Series56 Digital Modems; DSP-based digital modems off-load central CPU for maximized throughput under high-load conditions.
- **Easy to configure and manage** - Java-based configuration utility minimizes user setup and management time.
- **Scalability with flexible bandwidth** - MAX units can be stacked and interconnected as a single "virtual network access switch" for bandwidth sharing and enhanced performance.
- **Proven track record and investment protection** - Ascend has over 2.2 million digital modems installed—the largest installed base of any access switch in the world.
- **Hybrid Access™ and multiprotocol routing** - Allows smooth upgrade path to Frame Relay and Switched 56 services, or IPX and AppleTalk dial-in access.

MAX 4048 Features

Diagram labels:
- Digital Modem Module / blank
- Digital Modem Module / blank
- Digital Modem Module / blank
- Console
- V.35 Serial
- Ethernet Connection to LAN
- T1/PRI to WAN or PBX
- Alarm Relay

MAX 4048 Back Panel

Product Overview

The MAX 4048 is a cost-effective, preconfigured access switch ideal for medium to large corporations with predominantly analog users. The MAX 4048 includes two T1 interfaces, and 48 Series56 (K56flex-compatible) Digital Modems (three 16-modem cards) for high-speed dial-in analog access. Preloaded with all software and hardware needed to start with analog dial-in, the MAX 4048 also includes ISDN and Frame Relay support for easy growth. MAX 4048 units can interconnect to act as a single virtual network access switch with multichassis bandwidth management to scale quickly and cost effectively.

Software options include Secure Access™ Firewall (MXHP-SO-ASA), Remote Networking for multiprotocol routing (MX-SO-RNS), Virtual Private Networking (MX-SO-VPN) and Ascend Access Control™ for extended RADIUS support (AAC-CD).

The MAX 4048 bundle is designed to be very cost effective with features most demanded by corporate customers. However, if the MAX 4048 bundle exceeds your customers requirements, see the MAX 4004 (MXHP-4T1-4). The MAX 4004 includes six slots, four T1's and integrated CSUs, for integration with a wide range of hardware and software options. Typical scenarios that require a MAX 4004 over a MAX 4048 include primarily ISDN or Frame Relay environments (no or few modems required), videoconferencing, or other applications needing up to four T1 connections.

Competition

Feature	MAX 4048	3Com AccessBuilder 5000	Bay Annex 6300	Shiva Access Switch	Cisco AS5200	USR Total Control
List Price per port/Density	$229	$349	$495	$199	$249	$299
Modem configuration/box	48	48	24**	48	48	48
Price/Modem @ 48 modems	$550	$1,250*	$1,200	$1,125***	$756	$920
WAN Connectivity/ Bandwidth Management						
T1	Yes	Yes	Yes	Yes	Yes	Yes
V.34	Yes	Yes	Yes	Yes	Yes	Yes
K56flex	Yes	NO	NO	Q3 97	Q3 97	NO
ISDN BRI	Yes	Yes	Yes	NO	NO	NO
ISDN PRI	Yes	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Option	Yes	NO	NO	NO	Yes	Yes
Multichassis MP/MP	Yes	Yes	Yes	Yes	Yes	Yes
MP+/BACP	Yes	NO	NO	NO	NO	NO
Hardware Data Compression	Yes	NO	NO	NO	NO	NO
Security						
PAP/CHAP	Yes	Yes	Yes	Yes	Yes	Yes
Integrated Dynamic Firewall	Yes	NO	NO	NO	NO	NO
RADIUS	Yes	Yes	Yes	Yes	Yes	Yes
Extended RADIUS	Yes	NO	NO	NO	NO	NO
VPN Tunneling support	Yes	Yes	Yes	Yes	Yes	Yes
Management and Control						
Full SNMP MIB Support	Yes	Yes	Yes	Yes	Yes	Yes
Client Software	Yes	Yes	Yes	Yes	NO	Total
Modem Round-Robin Allocation	Yes	NO	Yes	NO	NO	NO
GUI Configurator	Yes	Yes	NO	Yes	Yes	Yes
Multivendor Network Management	Yes	NO	NO	NO	NO	NO
Routed Protocol Support						
IP	Yes	Yes	Yes	Yes	Yes	Yes
IPX	Yes	Yes	Yes	Yes	Yes	Yes
AppleTalk	Yes	Yes	Yes	Yes	Yes	NO

**January 1997 DataCommunications Magazine
**Most competitive product from Bay Networks in this class of product
***Shiva recently announced they would unbundle software and security products, and introduce new pricing in June 1997.
Matrix accurate as of June 1997. Subject to change.

Selling Against the Competition

3Com AccessBuilder 5000

- **Very high cost per port** - Ascend wins hands down. MAX 4048 is 56% less per port than AccessBuilder 5000's.
- **Lacks firewall feature** - MAX 4048 has optional integrated dynamic firewall to protect corporate networks from unauthorized access. 3Com offers no similar option.
- **Lacks Multi-chassis support** - MAX 4048 can be stacked for scalability, treating all incoming bandwidth on multiple chassis' as a single manageable pool. 3Com limits bandwidth management to a single chassis.
- **Lacks comprehensive RADIUS support** - Ascend offers comprehensive RADIUS support with 120+ control and accounting variables. 3Com only recently added basic RADIUS support to the AB 5000.
- **Lacks Frame Relay support** - MAX 4048 supports Frame Relay. Whereas, 3Com require an additional cost, dedicated Frame Relay device/router.

Shiva LanRover Access Switch

- **Very high cost per port** - Ascend wins hands down. MAX 4048 is 51% lower per port than Access Switch.
- **Lacks Frame Relay support** - MAX 4048 supports Frame Relay. Access Switch requires a dedicated Frame Relay device/router at an additional cost.
- **Lacks high security options** - MAX 4048 has optional integrated dynamic firewall to protect corporate networks from unauthorized access. Access Switch offers no similar option.
- **Lacks comprehensive RADIUS support** - Ascend offers comprehensive RADIUS support with 120+ control and accounting variables. Access Switch has only basic RADIUS support.
- **Shiva's questionable financial standing** - Shiva is by far the smallest company in the access switch/router market. Communications Week Magazine notes on April 28, 1997, "Network managers are jittery about the company's prospects for long-term survival."

Bay Networks Remote Annex 6300

- **High cost per port** - Ascend wins hands down. MAX 4048 is 54% lower per port than Remote Annex 6300.
- **Lacks high security options** - MAX 4048 has optional integrated dynamic firewall to protect corporate networks from unauthorized access. Access Switch offers no similar option.

- **Lacks MP+ and multichassis support** - Annex 6300 is a nonscalable product. Ascend MAX 4048 can be stacked for bandwidth and management scalability.
- **Lacks cross-platform configuration utility** - Java Configurator included free with every Ascend MAX.
- **Lacks Frame Relay support** - Access Switch forces customers to buy a dedicated Frame Relay device/router at an additional cost. MAX 4048 includes Frame Relay.
- **Lacks hardware data compression** - Ascend includes Stac, Microsoft and Ascend compression support to maximize throughput. Remote Annex does not offer this comprehensive level of compression support.

Cisco AS5200

- **High cost per port** - Ascend wins hands down. MAX 4048 is 27% low per port than AS5200.
- **Lacks high security options** - MAX 4048 has optional integrated dynamic firewall to protect corporate networks from unauthorized access. AS5200 does not offer a similar option.
- **Lacks comprehensive RADIUS support** - Ascend offers comprehensive RADIUS support with 120+ control and accounting variables. AS5200 has only basic RADIUS support.
- **Requires separate modem management software -** MAX 4048 has built-in modem management support to simplify management.
- **A limited and unproven product** - Cisco's AS5200 products are new to market and offer only base level features with an unproven design. Ascend's MAX products have been field tested extensively for three years, and are standard in the world's largest Internet Service Providers.

US Robotics Total Control

- **Very high cost per port** - Ascend wins hands down. MAX 4048 is 40% lower per port than Total Control.
- **Proprietary 56Kbps modem technology** - Ascend is dedicated to an open standard for 56 Kbps modem technology representing 70% of the market—and has FLASH memory to allow for any future changes. USR supports only its own proprietary 56K modems.
- **Lacks high security options** - MAX 4048 has optional integrated dynamic firewall to protect corporate networks from unauthorized access. Total Control offers no similar option.
- **Lacks Frame Relay support** - Total Control forces customers to buy a dedicated Frame Relay device/ router at an additional cost. MAX 4048 includes Frame Relay.

Software Specifications

Routed LAN Protocols

- IP via RIP, RIPv2, OSPF

WAN Protocols

- PPP, SLIP, CSLIP, 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-FR Gateway, Frame Relay UNI/NNI, ISDN Signaling

Bandwidth Management

- MP, MP+, BACP, TCP Header Compression, Data Compression (Ascend, Stac V9, Microsoft)

Security

- Standard: PAP, CHAP, MS-CHAP, RADIUS, TACACS, TACACS+, CLID, PPP Call-back, token card, packet filtering
- Optional: Secure Access Firewall, Ascend Access Control (extended RADIUS), Virtual Private Network (VPN) with ATMP, PPTP

Management

- Java-based Configurator, NASI, SNMP MIB II, and Enterprise Extensions, Telnet, PPP LQM, Frame Relay Annex D, Frame Relay ITU Annex A

Remote Networking Software

- Transparent Bridging (BCP)
- IPX and Async IPX with local spoofing
- AppleTalk and AppleTalk Remote Access 1.0 and 2.0
- MAXLink Pro™ client software for dial-in support from the remote PC
- MAXDial™ client software for dial-out and fax-out capability from the LAN
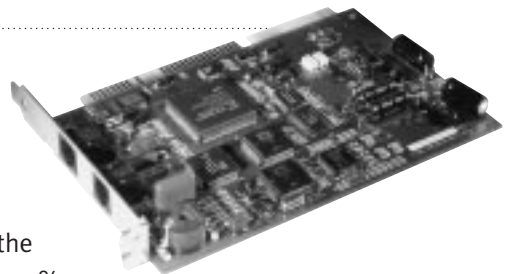
Hardware Specifications

- LAN Interface: Ethernet 10Base-T via RJ45 jack, Ethernet AUI via DB-15 connector.
- MAX Stack "virtual-NAS" support
- WAN Interface: Two T1/PRI with integrated CSUs. One FT1/T1 for leased line services. Serial WAN V.35/T1
- Software Upgrade: Built-in flash RAM, remote downloadable
- Modems: Compatible with K56flex, V.34, MNP 10-EC, MNP, V.42bis, fax modem up to 14.4 kbps
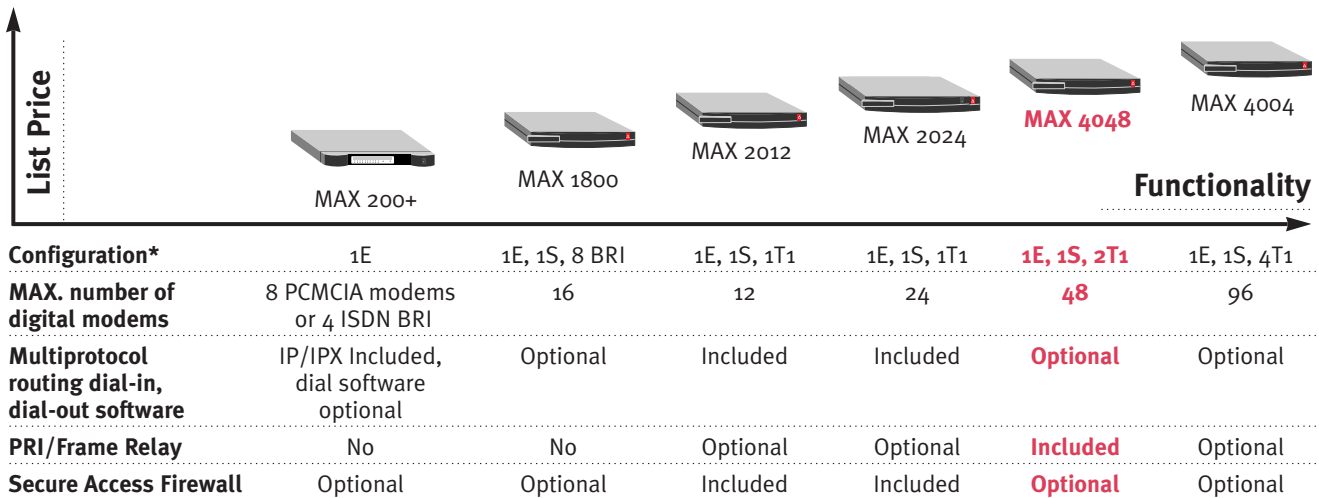
DM-16 Series56 Modem Module

- DM-16 V.34- and K56flex-compatible digital modems use Rockwell's market leading Digital Signal Processing (DSP) technology to support wire-speed K56flex* operation with V.34 modem compatibility.
- Improved system performance due to hierarchical processing in the Series56 Digital Modems improves overall system throughput by 50% over V.34 modems.
- True digital operation based on DSP-based design contains no analog components— assuring optimal performance.
- Software upgrades to modem code can be done locally, or across the network. New hardware is not required if standards change.

* Current FCC restrictions, line conditions and other external factors will reduce transmission rates and may reduce them significantly.

Ascend's MAX Central Site Family

List Price / Functionality chart showing: MAX 200+, MAX 1800, MAX 2012, MAX 2024, MAX 4048, MAX 4004

	MAX 200+	MAX 1800	MAX 2012	MAX 2024	MAX 4048	MAX 4004
Configuration*	1E	1E, 1S, 8 BRI	1E, 1S, 1T1	1E, 1S, 1T1	**1E, 1S, 2T1**	1E, 1S, 4T1
MAX. number of digital modems	8 PCMCIA modems or 4 ISDN BRI	16	12	24	**48**	96
Multiprotocol routing dial-in, dial-out software	IP/IPX Included, dial software optional	Optional	Included	Included	**Optional**	Optional
PRI/Frame Relay	No	No	Optional	Optional	**Included**	Optional
Secure Access Firewall	Optional	Optional	Included	Included	**Optional**	Optional

E=Ethernet, S=High Speed Serial Interface, T1=T1 Interface

Part Numbers

MAX 4048: 48 Port WAN Access Switch	Description	MSRP
MXHP-2T1-48-NA	MAX 4048 w/ two T1, CSUs, 48 K56flex modems. Includes ISDN PRI signaling, Frame Relay, and digital access for 48 channels	$26,400
Software Options		
MXHP-SO-ASA	Secure Access Firewall Software	$4000
MX-SO-RNS	Remote Networking Software for Multiprotocol routing, MAXDial for dial-in, dial-out and fax, and MAXLink Pro for IP/IPX access	$4000
MX-SO-VPN	Virtual Private Networking Software for ATMP and PPTP support	$1500
AAC-CD	Ascend Access Control Software for Extended RADIUS Server Support (NT/UNIX)	$3000

For pricing, availability and information on Ascend's demo program, please call your distribution partner. Government and educational discounts available.

Why Partner With Ascend?

- **Market leadership** - enhanced name recognition and credibility with your customers
- **54% dominance of the access concentrator market** (ISDN and analog ports)*
- **84% of total ISP access server ports worldwide***
- **Most comprehensive remote and central site solution** - Ascend's MAX and Pipeline® product lines represent the largest range of flexible solutions for corporate, small office/home office, telecommuting, Internet access and remote access.
- **Complete remote networking solution with remote and central site products to fit every need.**

* Source: Dell'Oro Market Research Group, 1996