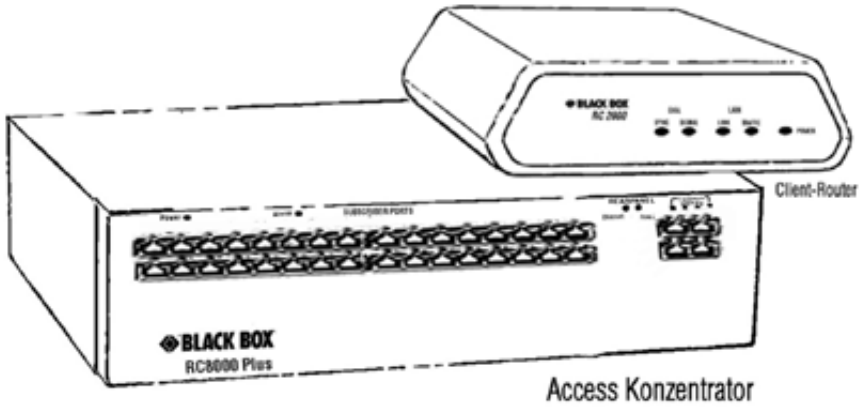
BLACK BOX®
NETWORK SERVICES

DSLAM Multiplexer

Key Features

- Supports multiple revenue generating services
- Easy deployment and management
- Integrated routing,bridging, and switching
- Faster time to profit
- Fits all types of properties



A Better Solution For Delivering Affordable High-Speed Internet Services

MDSR8 SDSL Access Concentrators*
Every day thousands of people in businesses, apartments and hotels want to take advantage of today's high-speed Internet services in their work, leisure and communication. For service providers and property managers, delivering these DSL-driven services and applications just got easier with the MDSR8* comprehensive line of SDSL next generation access concentrators.

The MDSR8* product family is the most flexible multi-service platform choice for in-building SDSL deployment. It enables service providers and property managers to deliver multiple services such as Internet access, Voice over DSL (VoDSL), Voice over Internet Protocol (VoIP), video and virtual private networking (VPN) in one easy-to-install package easily and profitably.

Because it offers the lowest price per port and the best selection of port counts in the industry – 8, 16, or 32 – this solution means more buildings can be lit up in less time for faster return on investment.

Fast Track To Value Added Services
The MDSR8* offers exceptional flexibility beginning with its industry-leading AnyPair ™ technology, which delivers SDSL connections over conventional phone lines being used simultaneously to carry voice traffic. Costly installation and rewiring expense is eliminated, so services can be delivered in a matter of hours. Because this technology supports distances up to 10km at a high-speed rate of up to 2.3 Mbps, building risers can be traversed up and down, allowing maximum flexibility in the location of the access concentrator. Its WAN capability provides network access over any available connection such as T1 or T3, Frame Relay or ATM, and Ethernet.

The MDSR8* features flexible, subscriber bandwidth management under software control with burst capability that allows service providers and property managers to offer tiered services. Because it was designed specifically as an in-building access concentrator, its small form factor and plug-and-play MDSR2000 CPE meet the space and manageability requirements of a broad range of multi-tenant unit applications.

Based on industry standards and protocols, the MDSR8* product family makes it easy for service providers and property managers to offer tenants and hotel guests high-speed Internet connections without reconfiguring their computers or laptops. Network Address Translation (NAT) provides additional security from general access to users' computers and supports IP address sharing. Application software also provides support for VPN, a remote access technology that uses the public Internet to provide users a secure, low-cost connection to their corporate networks.

Building Success
The MDSR8* product family makes it easy to deliver quality, cost-effective services that users want today. It provides integrated voice and data through partnerships with Integrated Access Device (IAD) vendors, ensuring interoperability with existing voice gateway equipment. An IAD resides at each user's location and multiplexes all of the user's voice and data traffic onto a single copper pair. These components work with the MDSR8* to provide toll quality voice and data services over packet-based access networks. (Please see back page)

The Complete Package

Specifications

In-building DSL Interfaces —

Ports	8, 16, or 32 ports
Connectors	RJ-48C
Line Coding	SDSL 2B1Q per Bellcore TA-NWT-001210
Protocol	Frame Relay (RFC1490)

Physical Data Rates —
2.320 Mbps
Automatic rate adaptation or fixed rate

Subscriber Data Rates —
Software configurable bandwidth management

Maximum Reach MDSR8* —
Supports distances up to 3km at a line rate of 2.3Mbps with High Speed more than 30 km

Unique AnyPair™ Feature —
In-building SDSL may use any spare pair or may share active pairs with analog telephone service. FCC Part 68 approved

Ethernet Interface —

Port	Single 10/100 BaseT/TX Ethernet configured as a local port or as a WAN port
Connector	RJ-45
Protocol	IEEE 802.3 compliant

WAN Interface

E1 (RC8100) —

Ports	Two or four E1 ports with built-in CSU/DSU
Connector	Industry-standard RJ-48C
Framing	Non CRC-4 or CRC-4 framing (unchannelized)
Line Coding	HDB3
Protocol	Frame Relay (user or network DTE)

Standards:
- ETSI: ETS 300 233 & ETS 300 011
- ITU-T: G.703

DS3/ATM on request —

Ports	Single DS3 port
Connector	Dual 75-Ohm BNC coax connectors
Framing	C bit (unchannelized)
Line	Coding B3ZS
Protocol	ATM UNI

Standards:
- ANSI: T1.102,T1.107, TI.404 & T1. 404a
- AT&T: 54014
- ATM Forum: af-phy-0054.000
- ITU-T: G.704

Frame Relay
128 maximum PVCs over all ports
Configurable committed information rate (CIR), excess burst size (Be), and committed burst size (Bc)

Protocols
LMI: Original, Q.933 Annex A or T1.617 Annex D
Frame Relay Forum: UNI FRF.1
ANSI: T1.606-1990, T1.606a-, T1.617-1991, T1.617a-1994, T1.618-1991 & T1.633-1993

ATM —
1023 VPI/VCIs per DS3 port; Rate control enforcement per VCI (inbound and outbound) Priority queuing for packet voice; Per-VCI queuing for multi-service QoS

Protocols
ITU: G.804 PLCP ATM Cell Insertion Method
ATM: Forum af-uni-0010.002 ATM Cell Support
ITU-T: I.363 AAL5 Support for Data
IETF: RFC 1483 data encapsulation
Frame Relay Forum: FRF.8 interworking for packet voice

Standard IP Routing —
TCP/IP over Frame Relay per RFC1490
TCP/IP over Ethernet per RFC894
TCP/IP over ATM per RFC1483
Aggregates IP traffic onto one WAN VC
Multi-link PPP per RFC1990

Network Address Translation (NAT) —
Multiple private IP addresses can be mapped to a single registered IP address
Blocks unwanted public access to subscribers' private networks; DHCP server for each SDSL part (auto IP option)

Virtual Circuit Switching —
Frame Relay switching (SDSL PVC to T1/E1 PVC); ATM switching (SDSL PVC to DS3 VPI/VCI); Avoids traffic aggregation (one-to-one VC switching); MAC encapsulation (per RFC1490 or RFC1483) for MDSR2000

FRF.8 Packet Voice and Data —
AAL5 encapsulated data
AAL5 encapsulated AAL2 packet voice
Separate PVC for each IAD voice connection. Compatible with leading vendor voice gateways. Compatible with IADs from leading vendors.

Bridge Mode —
Supports bridging Ethernet via SDSL ports over Frame Relay, ATM, or Ethernet WAN ports. Compatible with PPPoE subscriber management systems from leading vendors

Priority Queuing —
For voice and data
Maintains QoS for voice

Multi-service IP QoS Routing —
Routing using IP source and destination addresses and masks
Also known as "policy routing" or "layer 4 routing" Requires MDSR2000

CPE Compatibility

MDSR2000 Features —
Traffic filtering; Multi-service IP QoS routing (up to 4 PVCs) Based on source and destination IP addresses and masks; Bridged VC switching mode (to Frame Relay or ATM WAN VC); Supports NAT mode on MDSR8*, Configuration management integrated into MDSR8*, MDSR10 AnyPair module built into MDSR2000

Integrated Access Devices (IADs) Features —
Packet voice and data on the same SDSL circuit; Leading vendor compatible CPE IP routing for data; Packet voice and data with FRF.8 interworking feature of MDSR8*, Priority queuing for voice in MDSR8*, Class5 gateway compatible

Console Access Options —
ASCII terminal via 9 pin serial Craft Port
Telnet via Ethernet or WAN port
FTP via Ethernet or WAN port
Remote code update of MDSR8* via FTP/TFTP

Configuration Management —
Consistent, menu-driven user interface
Simplified configuration, diagnostics, monitoring, and trouble isolation

Performance Monitoring —
MDSR8* statistics accessible via console
Supports SNMP MIBs: RFC1213 MIB-II, RFC1604 Frame Relay, RFC1406 DS1/E1 and RFC2665 Ethernet
Additional MIBs RFC2496 DS3 and RFC2515 ATM T1 performance statistics available via ANSI T1.403 PRMs

Diagnostics —
Self test; In-band and FDL T1 loop-back command support; LED status indicators for all high-speed ports

Physical Dimensions —
Height 8.9cms/3.5"(2U);
length 30.5cm/12"; width 34.9cm/13.75"
Weight 5.22 kg/11.5 lbs.
19" rack or wall mountable with brackets
Optional space-saving shelf bracket available

Environment —
Operating temp: 0 to 55°C/32° to 131°F
Storage temp: -25° to 60°C/-13° to 140°F
Relative Humidity: 5 to 90%, non-condensing

Agency Approvals

Safety —
UL & cUL per UL1950, 3rd Edition
CSA C22.2 No. 950-95
IEC 60950 2nd Edition plus A1 – A4
CB Certificate

EMI —
Federal Communication Commission (FCC) Part 15, Class A
Industry Canada, ICES-003, Class A
EN55022, Class A

Telecommunications —
T1: FCC Part 68 and Industry Canada CS-03
E1: CTR12 and ETSI TBR12

Immunity —
EN 55024

Power —
90 to 240 VAC auto-switching
50 or 60 Hz
120 Watts typical

Options —
MDSR10 and MDSR10HD16 AnyPair modules for use with in-service pairs
MDSR8* Family User Guide
Shelf-mounting bracket
50-pin Telco Connector Cable Assembly

Black Box Network Services - The world's largest network services company

We are, with 25 years of experience, the world leader in network infrastructure services.

On the Phone — no charge, answer calls in less than 20 secounds, find the right product with our technical experts.

On-site — superior design and engineering, Certified installations, end-to-end service.

On-line — receive techincal knowledge on-line, including technology overviews, BLACK BOX Explains and the Knowledge Box.

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The world's best customer service — Custom design services and products, the best warranties, money-saving discount programs.

Black Box exclusives — Certification Plus. Guaranted-for-life products and services.

Ordering information

ITEM	CODE
DSLAM Multiplexer	
ISP-equipment	
8-Port Access-Concentrator	MDSR8108
16-Port Access-Concentrator	MDSR8116
32-Port Access-Concentrator	MDSR8132
Client equipment	
SDSL-Router for Data and Voice	MDSR2000
SDSL-Router for Data	MDSR2010
Options	
AnyPair Module, 1-Port	MDSR10
AnyPair Installtion block, 16 lines	MDSR10HD16