



# BLACK BOX<sup>®</sup>

## NETWORK SERVICES

## EtherLink II



### Key Features

- ▶ Supports G.SHDSL.BIS and G.SHDSL multi-rate line coding.
- ▶ Offers 802.3ah Firstmile Ethernet.
- ▶ Transmits your data up to a max speed of 22.8 Mbps over distances up to 5 kilometer with 1 mm wires (2,4km with 0,4mm wires).
- ▶ Switches automatically to G.SHDL-mode when distances exceed 2,4 kilometer.

Build a Metro Ethernet network with the new EtherLink II family of DSL modem/extenders from Black Box. The EtherLink II operates within the 802.3ah standard and provides bandwidth, compatibility and manageability.

Use these modem/extenders to send your data up to 5 kilometer at up to 22.8 Mbps using the 802.3ah/ G.SHDSL.BIS standard. You can send your data even further using the G.SHDSL Standard. Distances of more than 10km are possible depending on the quality and diameter of your wires (see table on next page).

The new Ether Link II is available in 2-wire, 4-wire and 8-wire models. These modems can be mixed and matched with existing Black Box DSL Modems from MDS93x series downgrading the functionality to G.SHDSL Standard only.

Using the G.SHDSL Standard the maximum performance is 2.3 Mbit/s over 2 wires. The 4-wire model can achieve 4.6 Mbit/s and the 8-wire model can run at maximum speeds of 9.2 Mbit/s.

By using the G.SHDSL.BIS Standard the maximum performance is 5.7 Mbit/s over 2 wires. The 4-wire model runs at 11.4 Mbit/s and the 8-wire model at a maximum of 22.8 Mbit/s.

Note: The G.SHDSL.BIS Standard is only operable at distances below 5 kilometer using 1mm wires. The thinner the wires used, the shorter is the maximum distance for G.SHDSL.bis. E.g. with 0,4mm wires G.SHDSL.bis works up to 2,4 km. At higher distances the MDS95x Series will drop down to the G.SHDSL Standard.

In addition the 4- and 8-wire models also offer redundancy.

The 8-wire model operates by using 4 routes with 2 wires. Thus your DSL route is still operational even when some of the wires fail. Additionally the performance of one pair of wires does not influence the performance of the other pairs. For example one pair can run at 2,3 Mbit/s and another pair can operate at 500 Kbit/s. Giving you a

total performance of 2,8 Mbit/s.

802.3ah management features enable you to diagnose the modem/extender remotely. What's more, all models are protected against voltage surges from line failures or lightning.

The modem/extenders must usually be used in pairs. However, to build a "Y-style" application, you need to order one 4-wire modem and two 2-wire modem/extenders.

When building a bigger DSL network you can use the MDS920 racks to aggregate the routes in your data center. So you can have a data center where 50 or more high performance and long distance DSL routes start.

## Specifications

**Line code** — GSHDSL.BIS/802.3ah,  
G.SHDSL, TC-PAM

**Line rates** — 72, 136, 200, 264, 328, 392,  
456, 520, 584, 648, 712, 776, 840, 904,  
968, 1032, 1096, 1160, 1224, 1288, 1352,  
1416, 1480, 1544, 1608, 1672, 1736, 1800,  
1864, 1928, 1992, 2056, 2120, 2184, 2248,  
2312, 5700 kbps for each 2-wires

**Line connector** —  
MDS952AE-10BT: (1) RJ45;  
MDS954AE-10BT, MDS958AE-10BT:  
(2) RJ45

**Monitor** — VT100 RS232 DB9F,  
Telnet RJ45

**User Interfaces** — (1) 10/100BaseT RJ45  
(PC or HUB)

**Bridging** — IEEE802.3 IEEE802.1q,  
IEEE802.1d (Spanning Tree Algorithm)

**Management** — VT100, Telnet, SNMP

**Electrical** — AC Adapter:  
Input 230VAC, 50/60Hz  
Output: 48VDC

**Safety** — UL & CE. EMC/EMI, FCC

**Surge** — Meet IEC 1000-4-5 class 2

**Over Voltage Protection** — ITU-T  
Rec. K.20/K.21

**Physical dimensions** —  
220 x 170 x 40 mm / 0,5kg Desktop Units

**Environmental Specs** —  
Operating Temperature: -30° up to +60° C  
Storage Temperature: -50° up to +60° C

## Range

By operating within the G.SHDSL Standard higher distances are possible. Depending on the quality and diameter of the wires used, the following bandwidth is possible:

Diameter	Distance	Speed
0,4mm wire	3,5 Kilometer	2,3 Mbps
0,4mm wire	5 Kilometer	1 Mbps
0,6mm wire	7 Kilometer	2,3 Mbps
0,6mm wire	9 Kilometer	1 Mbps
0,8mm wire	9 Kilometer	2,3 Mbps
0,8mm wire	12 Kilometer	1 Mbps
1,0mm wire	12 Kilometer	2,3 Mbps
1,0mm wire	16 Kilometer	1 Mbps
1,2mm wire	15 Kilometer	2,3 Mbps
1,2mm wire	20 Kilometer	1 Mbps

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## Ordering information

### ITEM

### CODE

EtherLink II 802.3ah Modem/Extender .....	
2-wire Desktop Unit .....	.MDS952AE-10BT
4-wire Desktop Unit .....	.MDS954AE-10BT
8-wire Desktop Unit .....	.MDS958AE-10BT
2-wire Card for rackmount housing .....	.MDS952C
4-wire Card for rackmount housing .....	.MDS954C
8-wire CARD for rackmount housing .....	.MDS958C
DSL Rackmount Chassis 19" .....	
14-Slots 6U (2) 48VDC .....	.MDS920AE-RMDC
14-Slots 6U (1) 48VDC (1) 230VAC .....	.MDS920AE-RMAC
14-Slots 6U (2) 230VAC .....	.MDS920AE-RMAC2
2-Slots 2U (1) 18-72VDC .....	.MDS920AE-2RMDC
1-Slot 1U (1) 48VDC (1) 230VAC .....	.MDS920AE-MRACDC

## 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 seconds, find the right product with our technical experts.

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

**On-line** — receive technical knowledge on-line, including technology overviews, Black Box Explains and the Knowledge Box.

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