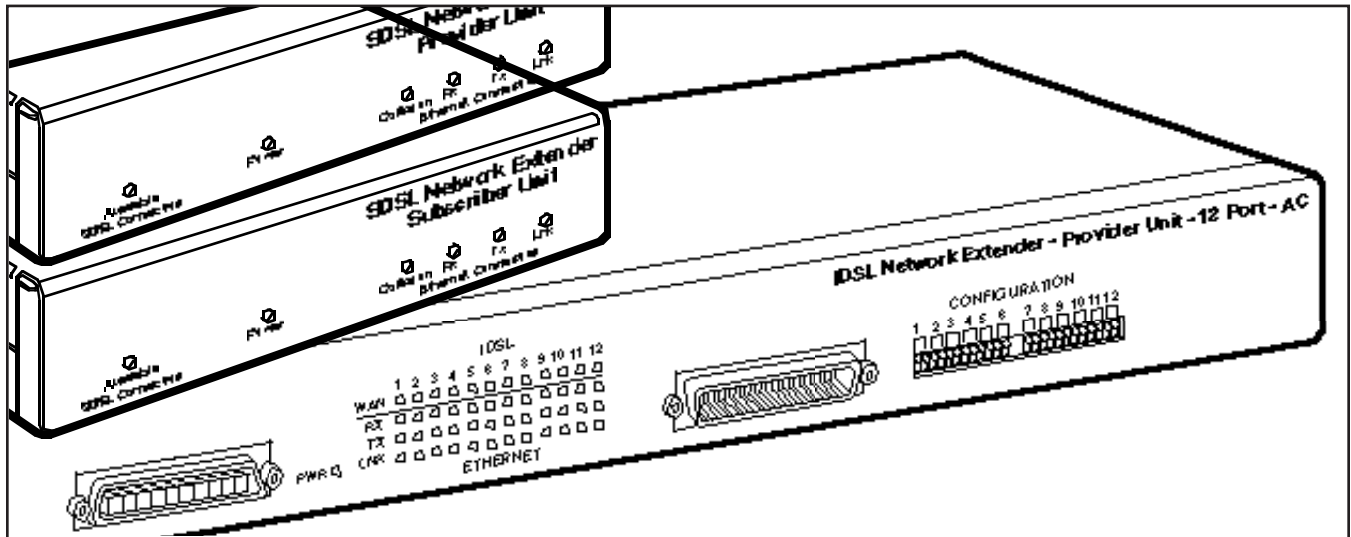# BLACK BOX ®

NETWORK SERVICES

SDSL AND IDSL NETWORK EXTENDERS

Key Features

- **Low-cost, high-speed LAN and Internet connections for home or business.**

- **Operates over existing telco lines—no pricey T1 lines and no new installation expenses.**

- **Switch-selectable data rates for high- and low-bandwidth applications.**

- **Simple setup and little configuration means no substantial training or operating costs.**

- **1U rack height saves cabinet space.**

Our IDSL and SDSL Network Extenders provide home users and businesses with dedicated digital Internet and LAN connections over copper pairs. They're ideal for use in situations where the local network and the gateway to the ISP aren't close enough to be directly attached to each other—places like campus-based businesses, multiple-unit apartment buildings, and urban areas.

They work over the phone-line cables already installed at your site (although they *mustn't* be attached to working phone lines). So you won't be paying for new installations or expensive T1 connections—and you don't even have to subscribe to DSL service. Because installation is simple and the only thing you have to configure is the data rate, you won't incur extra training costs.

All models do symmetrical data transfer, which makes them ideal for applications in which two network segments—two clinics at a hospital, for instance—need to be able to send and receive data at equally fast rates.

A broadcast-limiting feature ensures that broadcast traffic only consumes up to 20% of the total bandwidth. However, this only applies to pure broadcast traffic; unicast and multicast traffic are guaranteed at least 80% of the available bandwidth.

SDSL Network Extender 2000 and SDSL and IDSL Network Extender Kits

All of these kits—and the Extender 2000 is one too, even if it's not named that way—consist of a single-port Provider Unit and a single-port Subscriber Unit. They create a point-to-point digital link between two 10BASE-T Ethernet network segments.

Both the 10BASE-T network interface and the Unit-to-Unit DSL interface are carried on RJ-45 connectors.

For SDSL, choose the regular Extender Kit for less-critical, lower-speed links (up to 1.1 Mbps at 12,000 ft. [3660 m]), or the Extender 2000 for higher speeds (up to 2.3 Mbps at that distance).

SDSL and IDSL 12-Port Provider Units with Subscriber Units

The SDSL and IDSL Network Extenders can also be used to provide high-speed network access to individual users. Just connect a 12-Port Provider Unit to as many as 12 Subscriber Units.

This configuration is intended for applications in which high-speed LAN and Internet access are essential for distributed local sites—an on-site office with various local clients, for instance.

Each 12-Port Provider Unit has one RJ-21 (50-pin telco) port for connecting to the 10BASE-T network and another RJ-21 port for the DSL connection.

Data Rates

The SDSL and IDSL Network Extenders don't require software. In fact, they almost don't require configuration or control at all. The one exception is the data rate at which they operate.

Each Provider Unit will have one or more DIP switches on it that you can use to control this function. (12-Port Provider units have a separate set of these DIP switches for each port.) At installation time, you can try the highest available data rate, and if the Provider and Subscriber Units fail to link at that rate, just step down to the next and try again. You can keep doing this until you reach a data rate at which the Units can communicate successfully.

The IDSL Network Extenders are designed for networks that will send only a low volume of data across the DSL link. You can set these Extenders for either 128 or 144 kbps, which is double the top V.90 modem speed and the equal or better of ISDN. (Plus it's all on your own equipment, so you don't have to pay—or depend on—the telco.) The Extenders can send and receive data at these rates across as much as 18,000 ft. (5490 m) of cable, no matter what the cable's wire gauge is.

For applications with higher bandwidth requirements, or that need multipoint distribution, you can use the regular SDSL Network Extenders. They can be set to any of four data rates: 272, 528, or 784 kbps or 1.168 Mbps. These Extenders can send at 1.168 Mbps across as much as 3660 m (12,000 ft.) of 24-AWG cable; at lower speeds, longer distances are attainable, up to 20,000 ft. (6100 m) for 272 kbps. Cable built with thinner wire such as 26 AWG will not be able to run quite as far.

For point-to-point applications that need even more bandwidth, the SDSL Network Extender 2000 can transmit data at any of eight rates from 272 kbps to 2.32 Mbps. Even on 26-AWG cable, 2.32-Mbps data can be sent as far as 12,000 ft. (3660 m), and slower data can be sent farther—up to 20,000 ft. (6100 m) for 272 kbps.

For more specific information, see the **Maximum Data Rates and Distances** specification below.

Specifications

Compliance:
EMI/RFI:
LR0020A-KIT: CE (EN 55022), FCC Part 15 Subpart J Class A, IC Class/classe A, CSA C108.8;
All other models: FCC Part 15 Subpart J Class B, IC Class/classe B;
Safety:
All models: UL® 1950, CSA C22.2 No. 950, EN 60950, IEC 950;
DC-powered models: NEBS Level 3

Standard: IEEE 802.3 Ethernet v2

Interfaces:
All models: 10BASE-T;
SDSL models: SDSL;
IDSL models: IDSL

Encoding:
LR0020A-KIT: CAP;
All other models: 2B1Q

Maximum Data Rates and Distances:
IDSL models: 128 or 144 kbps over up to 18,000 ft. (5490 m) of standard telephone wire of any gauge;
SDSL models: Depend on the length of standard telephone wire between the Provider and Subscriber Units, and are user-configurable to any of these settings:
LR0020A-KIT (over 26-AWG wire):
2.32 Mbps at up to 3660 m (12,000 ft.);
2.064 Mbps at up to 3960 m (13,000 ft.);
1.552 Mbps at up to 4270 m (14,000 ft.);
1.04 Mbps at up to 4570 m (15,000 ft.);
784 kbps at up to 4880 m (16,000 ft.);
528 kbps at up to 5490 m (18,000 ft.);
400 kbps at up to 5790 m (19,000 ft.);
272 kbps at up to 6100 m (20,000 ft.);
All other SDSL models (over 24-AWG wire):
1.168 Mbps at up to 3660 m (12,000 ft.);
784 kbps at up to 4570 m (15,000 ft.);
528 kbps at up to 5490 m (18,000 ft.);
272 kbps at up to 6100 m (20,000 ft.)

User Controls: All on Provider Unit;
LR0005A-KIT: (1) Rear-mounted 2-position DIP switch for data rate;
LR0006A models: (12) Front-mounted 2-position DIP switches for data rate, (1) for each channel;
LR0010A-KIT: (1) Rear-mounted 2-position DIP switch:
(1) position for data rate,
(1) position reserved for future use;
LR0011A models: (12) Front-mounted 2-position DIP switches, (1) for each channel:
(1) position for data rate,
(1) position reserved for future use;
LR0020A-KIT: (1) Rear-mounted 3-position DIP switch for data rate

Indicators:
On 12-Port Provider Units:
(49) Front-mounted LEDs:
(1) Power;
(1) for each port: WAN Connection, Ethernet Rx, Ethernet Tx, and Ethernet Link;
On all other units:
(6) Front-mounted LEDs: WAN Connection, Power, Ethernet Collision, Ethernet Rx, Ethernet Tx, and Ethernet Link

Connectors:
On 12-Port Provider Units:
Front-mounted:
(1) RJ-21 male for Ethernet,
(1) RJ-21 female for IDSL or SDSL;
On all other units:
Rear-mounted:
(1) RJ-45 female for Ethernet,
(1) RJ-45 female, designed to accept both RJ-45 and RJ-11 plugs, for SDSL

Leads/Signals Supported:
On RJ-45 Ethernet ports: Standard 10BASE-T pinning (RX+ on Pin 1, RX– on Pin 2, TX+ on Pin 3, TX– on Pin 4);
On RJ-45 DSL ports: Tip on Pin 4, Ring on Pin 5; corresponds to Pin 2 and Pin 3 respectively of any 4-wire RJ-11 cable you might connect to these

Altitude Tolerance: –200 to +16,400 ft. (–60 to +5000 m)

Temperature Tolerance:
Operating: 0 to 50°C (32 to 122°F);
Storage: –40 to +70°C (–40 to +158°F)

Humidity Tolerance: 5 to 95% noncondensing

Enclosure: Steel

Power:
LR0020A-KIT: For Provider or Subscriber Unit:
Input: 100 to 125 VAC (1 amp) at 47 to 63 Hz;
Output: 5 VDC at a maximum of 1.5 amps;
Consumption: 7.5 watts maximum;
LR0006A-DC, LR011A-DC: 40 to 56 VDC, positive ground;
All other units: 100 to 120 VAC, 60 Hz

Size:
LR0006A-AC: 4.5 (1U) x 43.2 x 43.2 cm (1.75"H x 17"W x 17"D);
LR0006A-DC: 4.5 (1U) x 43.2 x 35.6 cm (1.75"H x 17"W x 14"D);
LR0011A models: 4.5 (1U) x 43.2 x 45.7 cm (1.75"H x 17"W x 18"D);
All other units: 3.2 x 14 x 11.7 cm (1.25"H x 5.5"W x 4.6"D)

Weight:
12-Port Provider Units: 3.5 kg (7.7 lb.);
All other units: 0.3 kg (0.6 lb.)

Ordering Information

ITEM	CODE
SDSL Network Extender 2000	LR0020A-KIT
SDSL Network Extender Kit	LR0005A-KIT
SDSL 12-Port Provider Unit	
with AC Power	LR0006A-AC
with DC Power	LR0006A-DC
SDSL Subscriber Unit	LR0007A
IDSL Network Extender Kit	LR0010A-KIT
IDSL 12-Port Provider Unit	
with AC Power	LR0011A-AC
with DC Power	LR0011A-DC
IDSL Subscriber Unit	LR0012A

You might also need:

Category 5 solid-conductor unshielded twisted-pair (UTP) cable, 4-pair, straight-pinned, PVC:

Preterminated patch cable (specify length)	EYN737MS
Unterminated bulk cable, 1000 ft. (304.8 m):	
Spool	EYN840A-1000
Box	EYN840A-B

50-pin telco cable, PVC (specify length):

RJ-21 female on one end, unterminated on the other	ELN25T-F
RJ-21 male on one end, unterminated on the other	ELN25T-M

Category 5 data-line surge protectors (RJ-45 F/F):

Primary (for point where cable enters building)	SP250A
Secondary (for point where cable attaches to device)	SP251A

Call Black Box Technical Support for help determining your best options for UPSes and AC-power surge protection.