

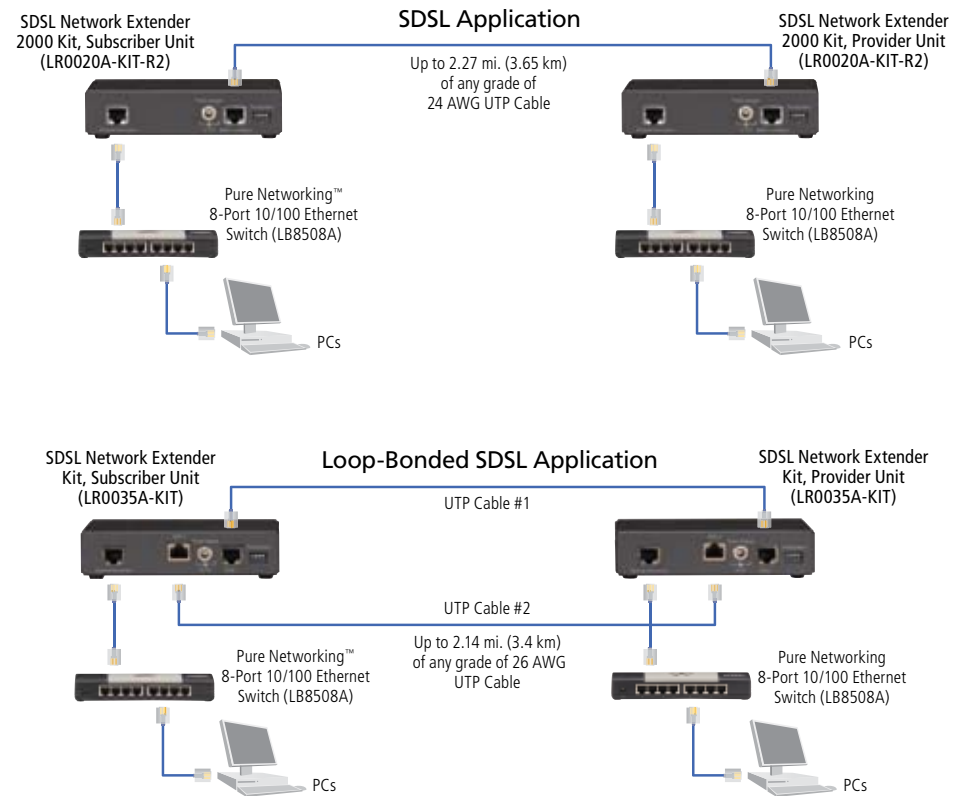
Network Extender Kits

Extend your LAN over
ordinary voice-grade copper—
using one, two or four pairs



FEATURES

- » Ideal for provider-based services who want to offer greater bandwidth over longer distances.
- » Send data at 2.3, 4.6, or 9.2 Mbps.
- » Loop bonding technology multiplexes two or four 2.3-Mbps copper pairs into one for double the bandwidth at any distance.
- » Use in point-to-point applications.
- » Switch-selectable data rates.
- » Automatic failover and recovery.
- » Use in half- or full-duplex modes.



OVERVIEW

Our [SDSL and IDSL 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 existing copper cables already installed at your site. 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 IDSL Network Extender Kits](#)

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.

IDSL Subscriber Unit

The LR0012A is a 1-port subscriber unit that connects to our discontinued 12-port provider units with AC (LR0011A-AC) or DC (LR0011A-DC) power.

The 12-to-1 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.

Data Rates

The [SDSL and IDSL Network Extender](#) Kits 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 has one DIP switch that you can use to control this function. 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.

For point-to-point applications that need plenty of 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 11,300 feet (3444.2 m), and slower data can be sent farther—up to 20,200 feet (6156.9 m) for 272 kbps.

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 feet (5486.4 m) of cable, no matter what the cable's wire gauge is.

For additional information, see the Data Rate and Distance (Maximum) specification on the next page.

Technically Speaking

DSL

Digital Subscriber Line (DSL) was introduced as a low-cost, high-speed way to transmit data over ordinary phone lines. It actually shares a phone line with analog phone service. This is possible because analog phone service uses only a small amount of bandwidth, enabling DSL to piggyback high-speed data traffic onto the line.

To provide the ever-faster bandwidth customers demand, telco providers and other carriers have kept pace by offering ever-faster DSL variations, known collectively as xDSL.

DSL Alphabet Soup

Digital Subscriber Line (DSL) — DSL service can support transmissions over a local loop ranging up to 18,000 feet from the CO.

As with most xDSL services, data rates will increase near the CO and taper off with distance. Note also:

Asymmetric DSL (ADSL) — ADSL provides speeds ranging from downstream/upstream rates of 9 Mbps/640 kbps over a relatively short distance to 1.544 Mbps/16 kbps as far away as 18,000 feet.

ADSL's asymmetrical nature provides more than sufficient bandwidth for downstream transmissions such as receiving data from a host computer or downloading multimedia files.

The lopsided nature of ADSL is what makes it most likely to be used for high-speed Internet access. And the various speed/distance options available within this range are one more point in ADSL's favor. And ADSL enables you to lease and pay for only the bandwidth you need.

SDSL (Symmetric DSL) — This represents the two-wire version of HDSL—which is actually symmetric DSL, albeit a four-wire version. Also known as HDSL2, it essentially offers the same capabilities as HDSL with T1 rates (1.544 Mbps) at ranges up to 10,000 feet. It's primarily designed for business applications.

SHDSL — Also known as G.SHDSL, combines ADSL and SDSL features for transmittal of T1, E1, ISDN, IP, and ATM communications over a single pair of copper. SHDSL transmits symmetrical data at 192 kbps both upstream and downstream up to 24,000 feet. At shorter, 5000-foot distances, it supports speeds up to 5.7 Mbps downstream and upstream.

G.lite — Also known as ADSL lite and Universal ADSL, G.lite is a simplified xDSL offering standardized as G.992.2 by the ITU. When it was first introduced, G.lite represented the closest thing to plug-and-play DSL. G.lite, however, didn't quite catch on, mainly because of its speeds (1.5-Mbps downstream/512-kbps upstream rates) compared to those offered by other DSL technologies.



LR0020A-KIT-R2

TECH SPECS

Compliance —

EMI/RFI: LR0020A-KIT-R2: CE (EN 55022), FCC Part 15 Subpart B Class A, IC Class/classé A, CSA C108.8;
 LR0010A-KIT, LR0012A: FCC Part 15 Subpart B Class B, IC Class/classé B;
 Safety: All models: UL® 1950, CSA C22.2 No. 950, EN 60950, IEC 950

Data Rate and Distance (Maximum) —

LR0020A-KIT-R2: Depends on the length of standard telephone wire between the provider and subscriber units, and are user-configurable to any of these settings over 26 AWG wire: 2.32 Mbps at up to 11,300 ft. (3444.2 m); 2.064 Mbps at up to 12,200 ft. (3718.6 m); 1.552 Mbps at up to 12,800 ft. (3901.4 m); 1.04 Mbps at up to 16,000 ft. (4876.8 m); 784 kbps at up to 16,800 ft. (5120.6 m); 528 kbps at up to 18,400 ft. (5608.3 m); 400 kbps at up to 19,400 ft. (5913.1 m); 272 kbps at up to 20,200 ft. (6156.9 m)
 LR0010A-KIT, LR0012A: 128 or 144 kbps over up to 18,000 ft. (5486.4 m) of standard telephone wire of any gauge

NOTE: Connections made with cable of a lesser gauge (for example, 24 AWG) will link up at greater distances.

Bandwidth — LR0040A-KIT: Selectable up to 2.3 Mbps per SHDSL port, up to 9.2 Mbps loop bonded (symmetrical);
 LR0035A-KIT: Selectable up to 2.3 Mbps per SDSL port or up to 4.6 Mbps loop bonded (symmetrical);
 LR0020A-KIT-R2: Selectable 272 kbps, 528 kbps, 784 kbps, 2.3 Mbps (symmetrical);

Enclosure — Steel

Encoding — LR0020A-KIT-R2: G.SHDSL (TC-PAM);
 LR0010A-KIT, LR0012A: 2B1Q

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

Standard — IEEE 802.3 Ethernet v2

User Controls — All on provider units;

LR0020A-KIT-R2: (1) Rear-mounted 3-position DIP switch for data rate;
 LR0010A-KIT: (1) Rear-mounted 2-position DIP switch: (1) position for data rate, (1) position reserved for future use

Interface —

All models: 10BASE-T;
 LR0020A-KIT-R2: SDSL;
 LR0010A-KIT, LR0012A: IDSL

CE Approval — Yes

Protocols — IEEE 802.3 Ethernet 10BASE-T; SDSL/SHDSL: TC-PAM encoding

Connectors — LR0040A-KIT: Each unit: Network:

(1) RJ-45; SHDSL: (4) RJ-11/RJ-45 hybrid;
 LR0035A-KIT: Each unit: Network: (1) RJ-45;
 SDSL: (2) RJ-45 2-wire;
 LR0020A-KIT: Each unit: Network: (1) RJ-45;
 SDSL: (1) RJ-45

Indicators — (6) front-mounted LEDs: WAN Connection, Power, Ethernet Collision, Ethernet Rx, Ethernet Tx, and Ethernet Link

Temperature Tolerance —

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

Humidity Tolerance — 5 to 95% noncondensing

Altitude Tolerance — -200 to +16,400 ft. (-60.9 to +4998.7 m)

Power —

LR0040A-KIT, LR0035A-KIT, LR0020A-KIT-R2: 100–120 VAC, 60 Hz, external;
 LR0010A-KIT, LR0012A: 100 to 120 VAC, 60 Hz

Size — 1.25"H x 5.5"W x 4.6"D (3.2 x 14 x 11.7 cm)

Weight — 0.6 lb. (0.3 kg)

Item

Code

For point-to-point 9.2-Mbps SHDSL transmissions over four copper pairs, order...

SHDSL Network Extender Kit **LR0040A-KIT**

For point-to-point 4.6-Mbps SDSL transmissions over two copper pairs, order...

SDSL Network Extender Kit with Loop Bonding **LR0035A-KIT**

For 2.3-Mbps SDSL applications with 10-Mbps Ethernet support, order...

SDSL Network Extender 2000 Kit **LR0020A-KIT-R2**

For IDSL, choose...

IDSL Network Extender Kit **LR0010A-KIT**
 IDSL Subscriber Unit **LR0012A**

You may also need...

CAT5 Solid-Conductor Cables (UTP), 100-MHz, 24 AWG, RJ-45, 4-Pair, T568B, PVC, NEC® CMR Straight-Pinned **EYN737MS**

CAT5 Unshielded 100-MHz Bulk Cable, 24 AWG, Solid, 4-Pair Spool **EYN840A-1000**
 Box **EYN840A-B**

CAT3 Telco Connector Cables, 24 AWG, Straight-Wired, AVAYA Style, 25-Pair, 50-Pin Telco Male to Open End (Blunt Cut)

PVC **ELN25T-M**
 Plenum **ELN25TP-M**

CAT5 100BASE-TX Surge Protectors Primary (to 2.0 kV) **SP250A-R2**
 Secondary (to 0.5 kV) **SP251A-R2**