BLACK BOX®
NETWORK SERVICES

Twister Media Converters
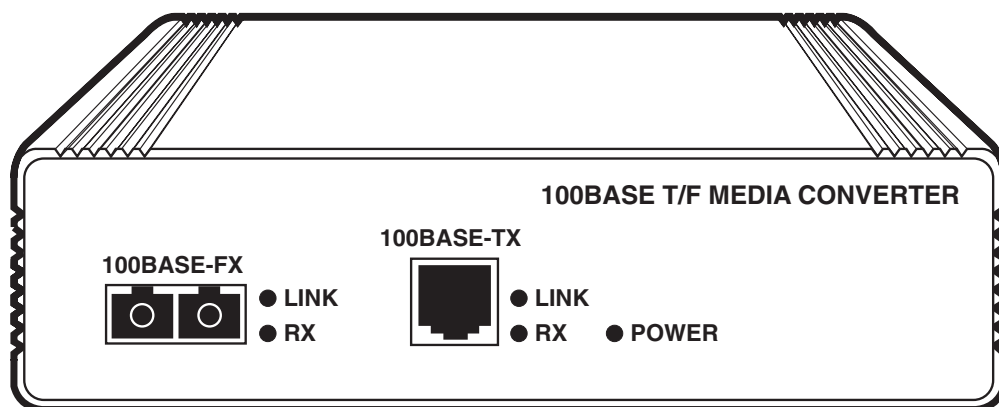
Get transparent translation between 100BASE-TX and multimode or single-mode 100BASE-FX segments, and extend your LAN farther than you ever thought possible!

100BASE T/F MEDIA CONVERTER

100BASE-FX **100BASE-TX**

○ ○ ● LINK ⬛ ● LINK
● RX ● RX   ● POWER

Key Features

▶ *Transparent integration of twisted-pair and fibre optic Fast Ethernet segments.*

▶ *Multimode models support fibre distances up to 2 km (1.2 mi.) and come with either SC or ST connectors.*

▶ *Single-mode models have SC connectors and support 15- or even 40-km (9.3- or 24.8-mi.) fibre optic runs.*

▶ *Half- or full-duplex operation.*

▶ *The lowest throughput delay in the industry— 15 bit-times—makes them virtually invisible to your network.*

▶ *Full-packet retiming maintains synchronisation at any supported distance.*

Are your 100BASE-TX segments or networks isolated from each other by distances that you just can't cross with copper wiring? Would you like to hook them together—without slowing them down with pokey, pay-the-phone-company WAN equipment? A pair of Twisters and some fibre cable will do the job nicely.

The Twisters are state-of-the-art media converters that translate the electrical signals on your copper 100BASE-TX networks to light pulses for transmission across a 100BASE-FX fibre link.

If the "gap" you need to cross between your segments is not wider than 2 km (1 mile) or so, you can use less-expensive multimode fibre cable with one of our two multimode Twister models. One of these models has ST connectors and one has SC connectors. (Any distance greater than 412 m [1350 ft.] will require that you operate in full-duplex.)

On the other hand, if you need to run cable halfway across a large campus or a small county, single-mode fibre optic cable is the way to go. The campus application calls for our regular single-mode Twister, which can drive optical signals as far as 15 km (9.3 miles). The cross-county-type application will require our "long haul" single-mode Twister, which can power optical signals up to 40 km (24.8 miles).

The Twisters can operate in either half-duplex up to 100 Mbps or full duplex up to 200 Mbps: Whatever format is detected on the copper side is automatically used on the fibre side. (The regular Twisters do *not* translate half-duplex to full duplex; to do this, you'll need one of our SuperTwisters [LH1100A series].)
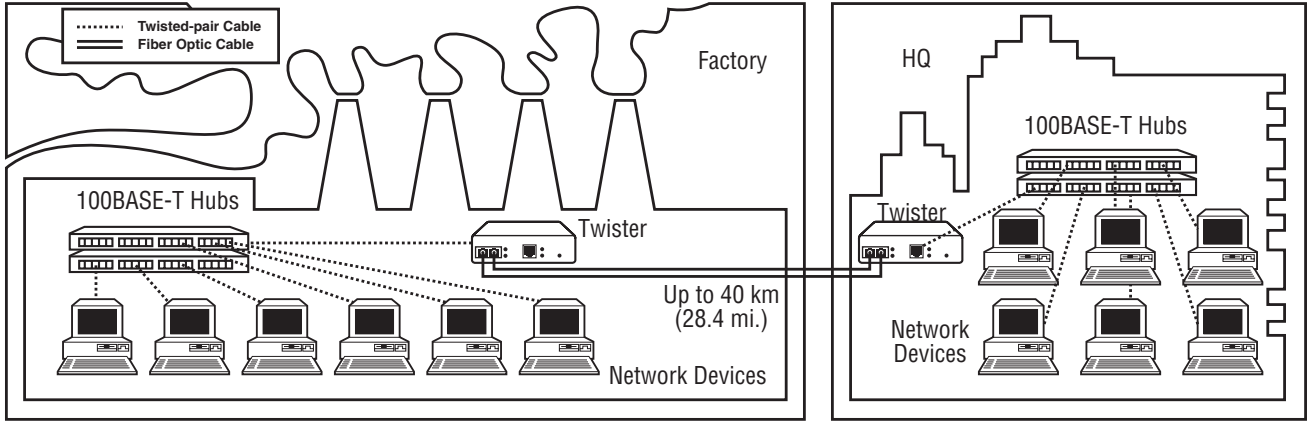
Add this to the full-packet retiming they perform; their simple, software-free installation and operation; and their lowest-in-the-industry throughput delay of 15 bit-times (about 150 nanoseconds), and you've got a machine that seamlessly, imperceptibly welds your Fast Ethernet network together—no matter how far apart the pieces are.
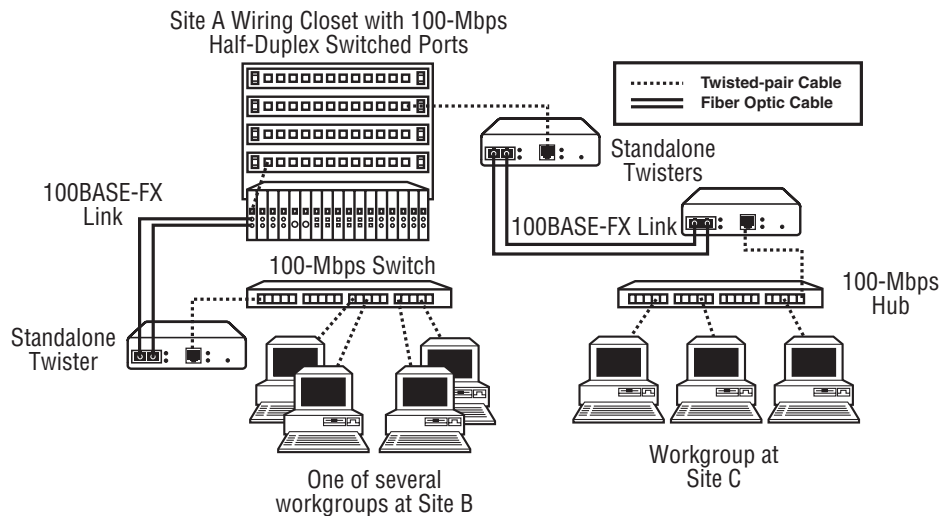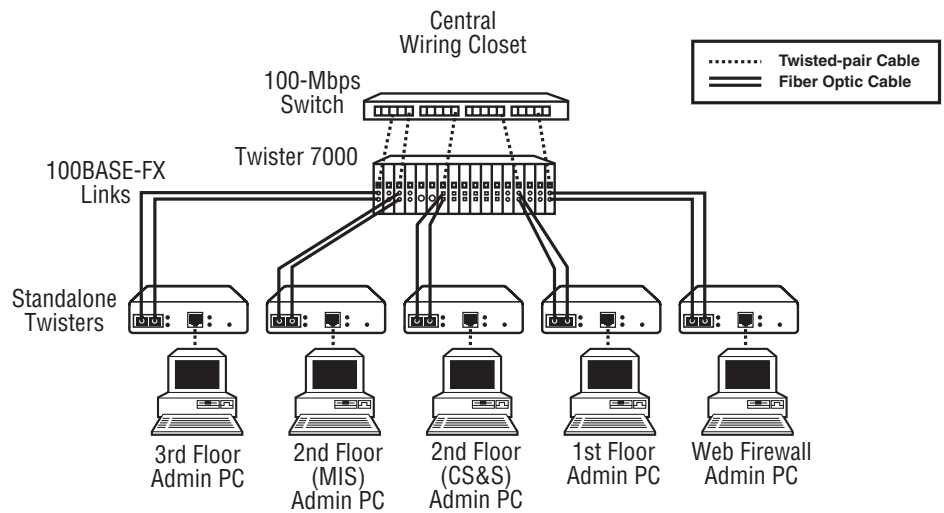
Typical Application

Run fibre between a pair of Twisters from your main 100BASE-TX network to the 100BASE-TX workgroup at your research lab down the road.

Run fibre from a Twister attached to each of your campus' 100BASE-TX networks to a central 100BASE-FX switch.

If you have to run 100-Mbps Ethernet farther than copper will go, Twisters will help you bridge the gap with fibre—even if it's a underline wide gap.

Twisted-pair Cable
Fiber Optic Cable

Factory

HQ

100BASE-T Hubs

100BASE-T Hubs

Twister

Twister

Twister

Up to 40 km
(28.4 mi.)

Network
Devices

Network Devices

Use standalone Twisters with the Twister 7000 (our product code LE7300A) to create a centralised 100-Mbps administration system (above right) or a centralised 100-Mbps network for all of your local sites (below right).

Central
Wiring Closet

100-Mbps
Switch

Twister 7000

100BASE-FX
Links

Twisted-pair Cable
Fiber Optic Cable

Standalone
Twisters

3rd Floor
Admin PC

2nd Floor
(MIS)
Admin PC

2nd Floor
(CS&S)
Admin PC

1st Floor
Admin PC

Web Firewall
Admin PC

Site A Wiring Closet with 100-Mbps
Half-Duplex Switched Ports

Twisted-pair Cable
Fiber Optic Cable

100BASE-FX
Link

Standalone
Twisters

100BASE-FX Link

100-Mbps
Hub

100-Mbps Switch

Standalone
Twister

One of several
workgroups at Site B

Workgroup at
Site C

Specifications

Standard — IEEE 802.3u:
Copper: Section 25;
Fibre: Section 26

Interface —
Copper: 100BASE-TX;
Fiber: 100BASE-FX

Cable Type —
Copper: Category 5
unshielded twisted pair;
Fibre:
LE1345 models: 50/125-μm,
62.5/125-μm, or
100/140-μm duplex
multimode;
LE1346 models:
8.3/125-μm, 8.7/125-μm,
9/125-μm, or 10/125-μm
duplex single-mode

Impedance (Copper) —
100 ohms nominal

Signal-Level Output (Copper) —
2 to 2.8 Volts

Signal-Level Input (Copper) —
350 mV minimum

Wavelength (Optical) —
All models: 1300 nm

RX Input Sensitivity (Opt.) —
LE1345 models: –31 dBm
peak, minimum;
LE1346A: –31 dBm peak;
LE1346A-40KM: –35 dBm
minimum

Output Power (Optical) —
LE1345 models:
Into 50-μm cable: –22.5 to
–14 dBm;
Into 62.5-μm cable: –19 to
–14 dBm;
LE1346A: –8 to -15 dBm peak,
typical, into 9-μm cable;
LE1346A-40KM: 0 to –5 dBm
into 9-μm cable

Data Rate — 100 Mbps (half-
duplex) or 200 Mbps (full-
duplex)

Maximum Distance —
Copper (half-duplex): 100 m
(328.1 ft.);
Fibre:
Half-duplex:
412 m (1350 ft);
Full duplex:

LE1345 models: 2 km
(1.2 mi.);
LE1346A: 15 km (9.3 mi.);
LE1346A-40KM: 40 km
(24.8 mi.)

User Controls — None; begins
operating as soon as it's
plugged in

Indicators —
(3) Front-mounted LEDs:
(1) POWER;
(1) 100BASE-TX LINK;
(1) 100BASE-FX LINK

Connectors —
100BASE-TX ports (all
models): Shielded RJ-45
female;
100BASE-FX ports:
LH1345A; Duplex
multimode ST female;
LH1345A-SC; Duplex
multimode SC female;
LH1346 models: Duplex
single-mode SC female

Power —
From external autosensing
power supply:
Input: 90 to 260 VAC, 50 or
60 Hz;
Output: +5 VDC at 1.2 amps

Temperature Tolerance —
Operating: 0 to 55° C
(32 to 131° F)
Storage: –25 to +70° C (–13
to +158° F)

Humidity Tolerance —
5 to 95% noncondensing

Enclosure — Metal

Size — 4.7 x 9.7 x 11.4 cm
(1.9"H x 3.8"W x 4.5'"D)

Weight — 1.4 kg (**3** lb.)
including power supply

The complete package:

- The Twister itself.
- Its power supply.
- (4) Rubber mounting feet.
- A users' manual.

Additional equipment you might need:

- CAT5 cable for 100BASE-TX runs.
- Multimode or single-mode cable for 100BASE-FX runs.
- AC-power surge protectors or uninterruptible power supplies.
- Data-line surge protectors.

Ordering Information

PRODUCT NAME	PRODUCT CODE
Twister Media Converters:	
Multimode Fibre:	
SC Connectors, up to 2 km (1.2 mi.)	LE1345A-R3
ST Connectors, up to 2 km (1.2 mi.)	LE1345A-ST-R3
Single-Mode Fibre:	
SC Connectors, up to 15 km (9.3 mi.)	LE1346A-R3
SC Connectors, up to 40 km (24.8 mi.)	LE1346A-40KM-R2

OPTIONAL ACCESSORY	PRODUCT CODE
CAT5 Solid-Conductor Cable, 4 Pairs, Straight-Through-Pinned, PVC, 3.1 m (10 ft.)	EYN737MS-0010
Bulk Duplex Multimode Fibre optic Cable, PVC	EFN062
SC-SC Terminated Single-Mode Fibre optic Cable, PVC	EFN5010
Primary CAT5 Surge Protector (for use at the point where the 100BASE-TX line enters the building)	SP250A
Secondary CAT5 Surge Protector (for use at the point where each 100BASE-TX line is connected to the SuperTwister or the attached device)	SP251A

If you would like a UPS or AC-power surge protector, please call Black Box Technical Support to discuss your requirements.