



# BLACK BOX<sup>®</sup>

## NETWORK SERVICES

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Black Box Corporation.

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## SINGLE-STRAND FIBRE MEDIA CONVERTERS

**Compact Media Converter**

100 Mbps

AN FX LL

1310 XMT/1550 RCV

FX RCV  
TX LNK  
FX LL  
FX LNK

*Cut your fibre optic cable costs!  
Send data across one duplex fibre.*

### Key Features

- ▶ **Convert 100BASE-TX to single-strand 100BASE-FX.**
- ▶ **Double your fibre capacity without pulling more cable.**
- ▶ **Fibre distances up to 40 km (24.9 miles) with Plus SC models.**
- ▶ **Configure automatically for correct UTP cabling.**
- ▶ **Autonegotiates for full-duplex.**
- ▶ **Replacement units available.**
- ▶ **Internal, autosensing power supply.**

Minimise the amount of fibre optic cabling you need in your new or existing installation with BLACK BOX<sup>®</sup> Single-Strand Fibre Media Converters.

They're ideal for fibre-to-subscriber service providers, enterprise LAN networks, or just about any application where fibre optic cabling is in short supply or too expensive to add. Use the converters, for instance, in a campus environment to double fibre capacity without pulling new cable.

The standalone converters perform copper-to-fibre conversion (100BASE-TX twisted pair to 100BASE-FX single-strand fibre) in a most economic way. They enable two individual data channels to share one strand of fibre, so you can essentially double the capacity of your single-mode fibre optic cable or reduce the amount of fibre cable you need by one-half.

How does it work? Well, typical duplex fibre depends on a separate connector for transmit and receive

optics, so it requires fibre to run in pairs. Single-strand fibre, however, uses optics that transmit and receive on two different wavelengths—in this case, 1310 and 1550 nm. Each individual wavelength carries a different signal (TX data and RX data) and, as long as you have complementary transmit and receive optics at each end of the cable, you can send data over a single-fibre run. To perform this wavelength duplexing, you must use the Single-Strand Fibre Media Converters in pairs (or connect one converter to a precisely compatible single-strand product, such as LMC5112C).

IEEE 802.3-compliant, each of these Layer 1 media converters has an RJ-45 connector for copper input and an SC connector for linking to a fibre segment. With the Plus SC models, you can extend your 100-Mbps Ethernet network up to 40 km (24.9 miles) over fibre optic cable. The regular SC models support 20-km (12.4-mile) distances

over fibre. Order an SC or a Plus SC matched-pair kit now, and if either of the included units becomes defective, order a single unit as a replacement.

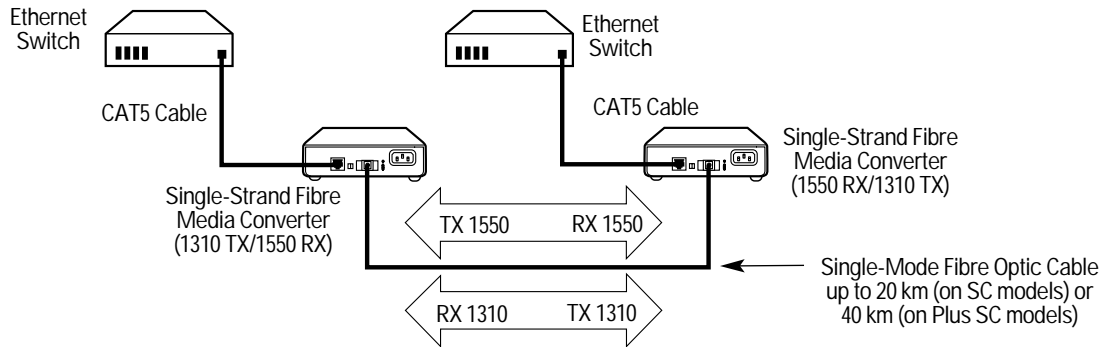
The matched-pair units ship to you ready to install. About all you have to do is consider each one for LinkLoss<sup>™</sup>, which notifies you of "silent failures" in your network and helps you save time when troubleshooting.

With LinkLoss, a copper or fibre link can be checked by physically observing the status of a front-panel LED. It not only informs you that a converter unit is receiving valid link pulses from a connected device, but you know that the converter's link pulses are being received at other end. The latter function is handy in situations where you're unable to see a remote device's LED to ensure that it's receiving link integrity pulses. Essentially, with LinkLoss the link status of one segment is always mirrored on the opposite segment.

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# Typical Single-Strand Fibre Media Converter Application



(continued from page 1)

If, for example, a fault occurs on a converted fiber segment, FX LinkLoss™ detects the fault and passes this information to the twisted-pair segment. It then disables the twisted-pair port's transmitter, resulting in a loss of link on the device connected to that port. TX LinkLoss performs a similar function, detecting faults on twisted-pair segments and passing this along to the fibre port.

With autonegotiation enabled, the converter negotiates as a 100-Mbps full-duplex device and, if the connected device can

operate at that speed and duplex, it establishes a link.

To activate FX LinkLoss and autonegotiation functions, simply flip a switch on the faceplate of the converter. Internal jumpers control TX LinkLoss.

For diagnostic and monitoring purposes, each Single-Strand Fibre Media Converter has four LEDs:

- FX RCV glows yellow when the fibre port receives data.
- TX LNK turns green when the converter establishes a twisted-pair link.
- FX LL glows green when you enable FX LinkLoss.

- FX LNK glows green when the converter establishes a fibre link.

Compact yet durable, the converter's design benefits from a metal casing and four preinstalled rubber feet for placing the unit on a desktop. And because its autosensing, universal power supply is internal, there's no bulky transformer to crowd your work space further.

Plus, you won't need any crossover cables to complicate connections at the 100BASE-TX

port. You can get away with using straight-through cabling only to connect your copper devices. That's because the converter has an MDI/MDIX function that automatically determines whether the converter has to cross over between the four pairs on the RJ-45 connector. Depending on the connected device, a Single-Strand Fibre Optic Converter selects between a crossover workstation or passthrough repeater or hub connection.

## Specifications

**Approvals:** FCC Part 15, Subpart B Class A; UL®; CSA; CE

**Distance (Maximum):**  
LHC5128A–LHC5130A:  
20 km (12.4 miles) on fibre side;  
LHC5131A–LHC5133A:  
40 km (24.9 miles) on fibre side

*NOTE:* Distances depend on actual fibre budget and installation loss.

**Ethernet Type:** 100-Mbps Ethernet

**Fibre Optic Characteristics:**  
TX minimum: -15;  
Average TX launch: -11;  
TX maximum: -7;  
RX sensitivity (dBm): -33;  
Average budget (dB): 22

**Fibre Optic Type:** Single-mode

**Fibre Wavelength:** LHC5128A, LHC5131A: (1) 1310-nm transmit/1550-nm receive unit and (1) 1550-nm transmit/1310-nm receive unit in a matched set;

LHC5129A, LHC5132A:  
(1)1310-nm transmit/1550-nm receive unit;  
LHC5130A, LHC5133A: (1) 1550-nm transmit/1310-nm receive unit

**Connectors:** Each standalone unit:  
(1) RJ-45; (1) SC or Plus SC; (1) IEC 3-prong power receptacle

**Indicators:** (4) LEDs: FX RCV (fibre optic port receive data), TX LNK (twisted-pair link established), FX LL (LinkLoss enabled); FX LNK (fibre optic link established)

**Temperature Tolerance:**  
Operating: 32 to 104°F (0 to 40°C);  
Storage: 0 to 160°F (-18 to +71°C)

**Humidity Tolerance:** Up to 95% noncondensing

**Power:** Internal 100–240 VAC, 50–60 Hz, 0.1/0.05 A on an IEC-320 connector

**Size:** Each standalone unit:  
1.5"H x 4.7"W x 4.4"D  
(3.8 x 11.9 x 11.2 cm)

**Weight:** 1.3 lb. (0.6 kg)

## Package Includes:

- (1) or (2) matched standalone media converters
- (1) or (2) power cords
- Users' manual

## Ordering Information

ITEM	CODE
Single-Strand Fibre Media Converters	
SC (up to 20 km)	
(1) Standalone Unit 1310 TX/1550 RX .....	LHC5129A-R3
1550 RX/1310 TX .....	LHC5130A-R3
Plus SC (up to 40 km)	
(1) Standalone Unit 1310 TX/1550 RX .....	LHC5132A-R3
1550 RX/1310 TX .....	LHC5133A-R3

