BLACK BOX®
NETWORK SERVICES

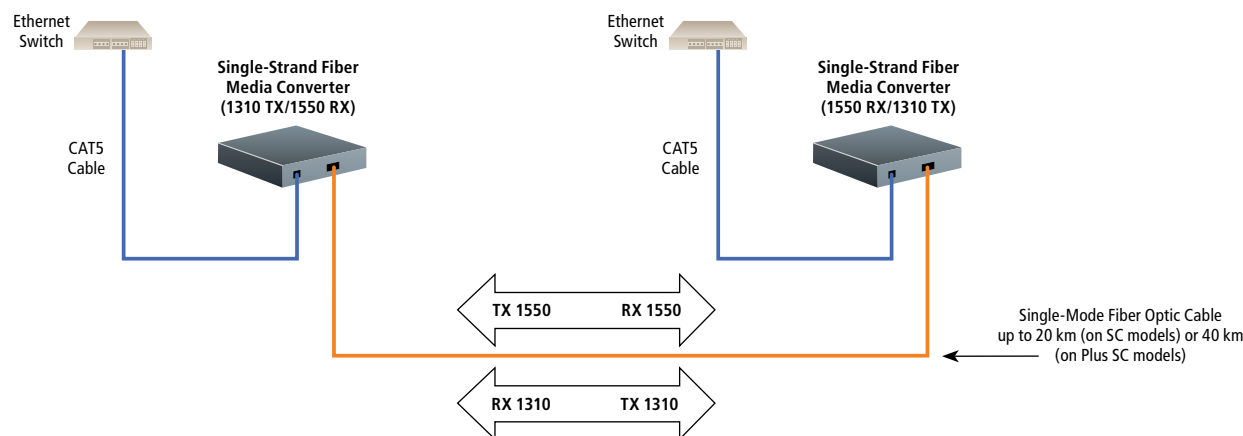## Single-Strand Fiber Media Converters

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

FEATURES

» Convert 100BASE-TX to single-strand 100BASE-FX.
» Double your fiber capacity without pulling more cable.
» Fiber 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.

Extend the distance between two CAT5 Ethernet switches up to 20 km or 40 km over single-strand single-mode fiber optic cable.

Ethernet Switch

Ethernet Switch

Single-Strand Fiber Media Converter (1310 TX/1550 RX)

Single-Strand Fiber Media Converter (1550 RX/1310 TX)

CAT5 Cable

CAT5 Cable

TX 1550   RX 1550

Single-Mode Fiber Optic Cable up to 20 km (on SC models) or 40 km (on Plus SC models)

RX 1310   TX 1310

OVERVIEW

Minimize the amount of fiber optic cabling you need in your new or existing installation with BLACK BOX® Single-Strand Fiber Media Converters.

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

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

How does it work? Well, typical duplex fiber depends on a separate connector for transmit and receive optics, so it requires fiber to run in pairs. Single-strand fiber, 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-fiber run. To perform this wavelength duplexing, you must use the Single-Strand Fiber 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 fiber

segment. With the Plus SC models, you can extend your 100-Mbps Ethernet network up to 40 km (24.9 miles) over fiber optic cable. The regular SC models support 20-km (12.4-mile) distances over fiber. 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 converters ship to you ready to install. All you have to do is consider each one for LinkLoss™, which notifies you of "silent failures" in your network and helps you save time when troubleshooting.

With LinkLoss, a copper or fiber 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.

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 fiber 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.

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LHC5129A-R3

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 Fiber Media Converter has four LEDs:

- FX RCV turns yellow when the fiber port receives data.
- TX LNK turns green when the converter establishes a twisted-pair link.
- FX LL turns green when you enable FX LinkLoss.
- FX LNK turns green when the converter establishes a fiber 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 Fiber Optic Converter selects between a crossover workstation or passthrough repeater or hub connection.

TECH SPECS

Approvals: FCC Part 15, Subpart B Class A; UL®; CSA; CE
Distance (Maximum):
    LH5129A-R3–LHC5130A-R3: 20 km (12.4 miles) on fiber side;
    LH5132A-R3–LHC5133A-R3: 40 km (24.9 miles) on fiber side
    NOTE: Distances depend on actual fiber budget and installation loss.
Ethernet Type: 100-Mbps Ethernet
Fiber Optic Characteristics:
    TX minimum: -15;
    Average TX launch: -11;
    TX maximum: -7;
    RX sensitivity (dBm): -33;
    Average budget (dB): 22
Fiber Optic Type: Single-mode
Fiber Wavelength:
    LHC5129A-R3, LHC5132A-R3: (1)1310-nm transmit/1550-nm receive unit;
    LHC5130A-R3, LHC5133A-R3: (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 (fiber optic port receive data), TX LNK
    (twisted-pair link established), FX LL (LinkLoss enabled); FX LNK
    (fiber optic link established)
Temperature Tolerance:
    Operating: 32 to 122°F (0 to 50°C);
    Storage: 0 to 160°F (-18 to +71°C)
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 4.9"D (3.8 x 11.9 x 12.4 cm)
Weight: 1.3 lb. (0.6 kg)

What's included

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

Item	Code
Single-Strand Fiber 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**

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