Black Box Corporation
The World's Source for Connectivity

PC Media Converters
Installation Guide

LE6601C   LE6602C   LE6603C   LE6604C   LE6605C
LE6606C   LE6607C   LE6608C   LE6609C

PC Media Converter™ is a fixed-configuration, IEEE 802.3 single-conversion PC Media Converter Adapter that is designed to convert RJ-45 (10Base-T twisted pair), BNC (10Base-2 thin coax), ST or SC (10Base-FL 850 nm multi-mode, 1300 nm multi-mode or single-mode) fiber. *PC Media Converter* can be mounted in any PC with a standard ISA or PCI slot. All versions of *PC Media Converters* include diagnostic LEDs for each port and a 4-pin peripheral power supply connector.

The following *PC Media Converter* versions are available:

UTP/FO — 10Base-T twisted pair/10Base-FL 850 nm multi-mode fiber; includes one RJ-45 connector and one pair ST (LE6601C) or SC (LE6602C) connectors

UTP/FO 1300 — 10Base-T twisted pair/10Base-FL 1300 nm multi-mode fiber; includes one RJ-45 connector and one pair ST (LE6603C) or SC (LE6604C) connectors

UTP/FO-SingleMode — 10Base-T twisted pair/10Base-FL 1300 nm single-mode fiber; includes one RJ-45 connector and one pair ST (LE6605C) or SC (LE6606C) connectors

UTP/FO-SingleMode/PLUS — same as above with higher power budget; includes one pair ST (LE6607C) or SC (LE6608C) connectors

UTP/BNC — 10Base-T twisted pair/10Base-2 thin coaxial; includes one RJ-45 connector and one BNC connector (LE6609C)

Installing PC Media Converter

To install *PC Media Converter*, turn off the power on your PC and remove the cover. Find an empty ISA or PCI slot and align *PC Media Converter* in the slot. Then mount *PC Media Converter* by screwing its bracket to the computer casing.

> *NOTE: PC Media Converter does not plug into the mother board. Also, make sure PC Media Converter does not extend past the edge of your case.*

Mini-Power Connector
Male Standard Connector
Female Standard Connector
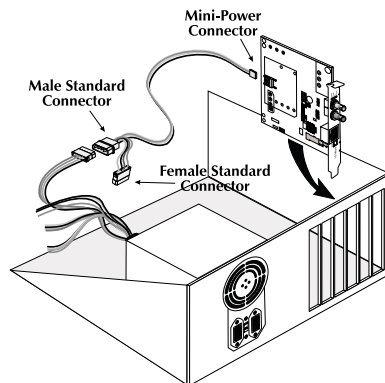
Attach the keyed mini-power connector to *PC Media Converter*. Attach the male end of the "Y" connector to a standard size power connector in your computer. Replace the cover. Attach the cables between *PC Media Converter* and the devices that will be interconnected.

> *NOTE:* PC Media Converter *only needs power from the computer; no additional power source is necessary.*

After installation, you can configure *PC Media Converter* for the following features, depending on the requirements of your installation:

- Crossover/pass-through connection on the twisted pair port
- BNC Port Termintation
- *FiberAlert*
- *LinkLoss*

Twisted Pair Crossover/Pass-Through Switch

Each twisted pair port on *PC Media Converter* has one RJ-45 connector for a single shielded or unshielded twisted pair link segment, and features a push-button, located next to the TP connector, for selecting a crossover workstation connection or pass-through repeater/hub connection. To select a pass-through connection, simply press the push-button IN. A crossover connection is selected when the push-button is OUT.

BNC Port Termination

PC Media Converter UTP/BNC features a 2-position switch next to the BNC connector that allows a thin coaxial segment to be terminated at the port without an additional 'T' connector and terminator.

If *PC Media Converter UTP/BNC* is attached to a mid-point of a thin Ethernet segment, attach a 'T' connector to the BNC port. Termination must be OFF (disabled). Termination is disabled when the toggle is in the left position.

Termination ON   Termination OFF

If a thin Ethernet segment is to be terminated at the *PC Media Converter UTP/BNC*, attach the cable directly to the BNC connector and set the termination to ON (enabled – factory default). Toggle the switch to the ON position to enable termination.
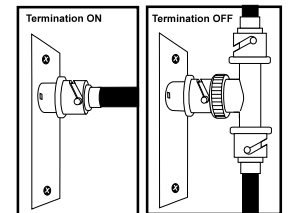
Troubleshooting with *LinkLoss* and *FiberAlert*

LinkLoss and *FiberAlert* are advanced troubleshooting features that can help you use your *PC Media Converter* to locate "silent failures" on your network. It is vital that you understand exactly how *FiberAlert* and *LinkLoss* work and how they will react in your network configuration before attempting to use your *PC Media Converter*.

Enabling and Using FiberAlert and LinkLoss

FiberAlert and *LinkLoss* are configured on *PC Media Converter* by adjusting a two-position switch located on the faceplate, next to the fiber connectors. The switch for *LinkLoss* is labeled "LL." The switch for *FiberAlert* is labeled "FA." Enable *LinkLoss* or *FiberAlert* by moving the corresponding switch to the up (ON) position. Disable either (default) by moving the switch to the down (OFF) position.

In a central site to remote site media conversion, the manufacturer recommends you enable your *PC Media Converters'* troubleshooting features as follows: *FiberAlert* on the remote site only, and *LinkLoss* on both the central and remote site. This will ensure that most faults can be detected by an administrator located at the central site, no matter where they occur on the network.

Installation Troubleshooting

- During installation, first test your fiber and twisted pair connections with all troubleshooting features disabled. Then enable these features, if desired, just before final installation. This will reduce the features' interference with testing.
- To test *PC Media Converter* by itself, you must have an appropriate fiber patch cable. First, connect *PC Media Converter* to the twisted pair device with a twisted pair cable. Next, loop a single strand of fiber from the transmit port to the receive port of your media converter. Finally, verify that you have both twisted pair and fiber link on your *PC Media Converter*.
- Make sure that you are using the appropriate twisted pair cable or have the crossover/pass-through button on the *PC Media Converter* set correctly.

LED Operation

PC Media Converter features diagnostic LEDs. LED functions on *PC Media Converter TX/FX* and *PC Media Converter UTP/FO* are:
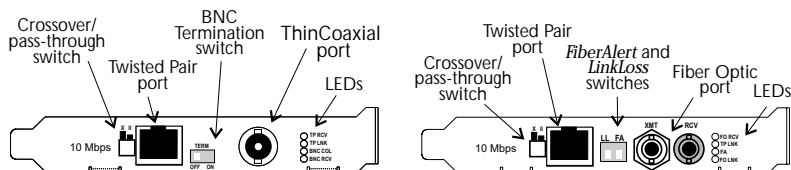
FX RCV	Flickers amber when fiber port is receiving data
TX LNK	Glows green when a twisted pair link is established
FA	Glows green when *FiberAlert* is enabled
FX LNK	Glows green when a fiber link is established

Installing modules without understanding the effects of *LinkLoss* **and** *FiberAlert* **can cause perfectly funcitoning units to apear flawed or even dead!**
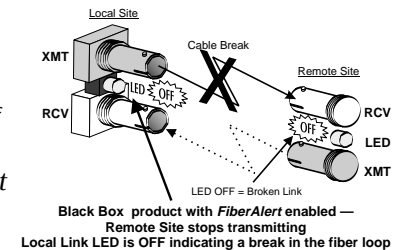
If you are unfamiliar with *LinkLoss* and *FiberAlert*, the manufacturer strongly encourages you to read the following information.

About Link Integrity

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When a *PC Media Converter* receives valid link pulses, it knows that the device to which it is connected is up and sending pulses, and that the copper or fiber cable coming from that device is intact. The appropriate "LINK" LED is lit to indicate this. The *PC Media Converter* also sends out link pulses from its copper and fiber transmitters, but normally has no way of knowing whether the cable to the other device is intact and the link pulses are reaching the other end. The combination of *FiberAlert* and *LinkLoss* allows this information to be obtained, **even when physical access to a remote device (and its link integrity LED) is not available.**

What Is FiberAlert?

FiberAlert lets you know when a fault occurs on your fiber loop by stopping data transmissions and affecting fiber LEDs on both sides of your network. If a media converter is not receiving a fiberlink, *FiberAlert* disables the media converter's fiber transmitter, thus mirroring the link status of the opposite end of the fiber. Both fiber link LEDs on either end of the link should extinguish, alerting you to the fault.

**Black Box product with *FiberAlert* enabled —
Remote Site stops transmitting
Local Link LED is OFF indicating a break in the fiber loop**

Using *FiberAlert*, a local site administrator is notified of a fault and can quickly determine where a cable fault is located without having to go to the remote site.

> *NOTE:* FiberAlert *should only be enabled on one side of a media conversion. Enabling it on both sides would keep both transmitters off indefinitely.*

What Is LinkLoss?

LinkLoss functions much like *FiberAlert* in that faults on one port are mirrored on the other. In the case of *LinkLoss*, however, a fault on the fiber port is passed to the Ethernet twisted pair port. If a *PC Media Converter* is not receiving a fiber link, *LinkLoss* disables the transmitter on the *PC Media Converter*'s twisted pair port. This results in a loss of link on the remote twisted pair device.

The LED functions on *PC Media Converter UTP/BNC* are as follows:

TP RCV   Flickers amber when twisted pair port is receiving data

TP LNK   Glows green when a twisted pair link is established

BNC COL Flickers red in normal operation indicating normal collisions are being detected on the BNC segment

BNC RCV Flickers amber when BNC port is receiving data

Black Box Customer Service Information

CALL: **(724) 746-5500** 7 a.m. Monday to midnight Friday; 8 a.m. to 4 p.m. Saturday (EST)

FAX: **(724) 746-0746** 7 a.m. Monday to midnight Friday; 8 a.m. to 4 p.m. Saturday (EST)

Mail Order: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018

Technical support, phone and fax orders 24 hours a day.

Fiber Optic Cleaning Guidelines

Fiber Optic transmitters and receivers are extremely susceptible to contamination by particles of dirt or dust, which can obstruct the optic path and cause performance degradation. Good system performance requires clean optics and connector ferrules.

1) Use fiber patch cords (or connectors, if you terminate your own fiber) only from a reputable supplier; low-quality components can cause many hard-to-diagnose problems in an installation.

2) Dust caps are installed by the manufacturer to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Assure that the fiber is properly terminated, polished and free of any dust or dirt, and that the location is as free from dust and dirt as possible.

3) Store spare caps in a dust-free environment such as a sealed plastic bag or box so that when reinstalled they do not introduce any contamination to the optics.

4) Should it be necessary to disconnect the fiber device, reinstall the protective dust caps.

5) If you suspect that the optics have been contaminated, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

Electrostatic Discharge Precautions

Electrostatic discharge (ESD) can cause damage to your add-in modules. Always observe the following precautions when installing or handling an add-in module or any board assembly.

1) Do not remove unit from its protective packaging until you're ready to install it.

2) Wear an ESD wrist grounding strap before handling any module or component. If you do not have a wrist strap, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.

WARNING! Integrated circuits and fiber optic components are extremely susceptible to electro-static discharge damage. Do not handle these components directly unless you are a qualified service technician and use tools and techniques that conform to accepted industry practices.

3) Hold boards by the edges only; do not touch the electronic components or gold connectors.

4) After removal, always place the boards on a grounded, static-free surface, ESD pad or in a proper ESD bag. Do not slide the board over any surface.

*Please contact Black Box for complete warranty, FCC and Safety Certification information.

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1000 Park Drive • Lawrence, PA 15055-1018 USA
TEL: (724) 746-5500 • FAX: (724) 746-0746
www.blackbox.com