Black Box Corporation
The World's Source for Connectivity

Compact Media Converter
Installation Guide

LMC001A-R2 - LMC002A-R2 - LMC003A-R2
LMC004A-R2 - LMC005A-R2 - LMC006A-R2
LMC007A-R2 - LMC008A-R2 - LMC009A

Black Box's **Compact Media Converter** is a low-cost, preconfigured, IEEE 802.3 single-conversion media converter that converts between 10Base-T twisted pair and 10Base-FL (multi-mode or single-mode) fiber or 10Base-2 thin coax. It is available with one RJ-45 connector for the twisted pair port and one pair ST or SC connectors for the fiber port or one BNC connector for the coax port.

Compact Media Converter is a 1U high, standalone unit that includes diagnostic LEDs for each port and a universal (100-240 VAC) power supply. The following **Compact Media Converter** versions are available:

10BT (RJ-45) - 10BFL — 10Base-T twisted pair/10Base-FL 850 nm multi-mode fiber; includes one RJ-45 connector and one pair ST (LMC001A-R2) or SC (LMC002A-R2) connectors.

10BT (RJ-45) - 10BFL/1300 — 10Base-T twisted pair/10Base-FL 1300 nm multi-mode fiber; includes one RJ-45 connector and one pair ST (LMC003A-R2) or SC (LMC004A-R2) connectors.

10BT (RJ-45) - 10BFL SM — 10Base-T twisted pair/10Base-FL 1300 nm single-mode fiber; includes one RJ-45 connector and one pair ST (LMC005A-R2) or SC (LMC006A-R2) connectors.

10BT (RJ-45) - 10BFL SM/PLUS — same as above with higher power budget; includes one RJ-45 connector and one pair ST (LMC007A-R2) or SC (LMC008A-R2) connectors.

10BT (RJ-45) - 10B2 (BNC) — 10Base-T twisted pair/10Base-2 thin coaxial; includes one RJ-45 connector and one BNC connector (LMC009A)
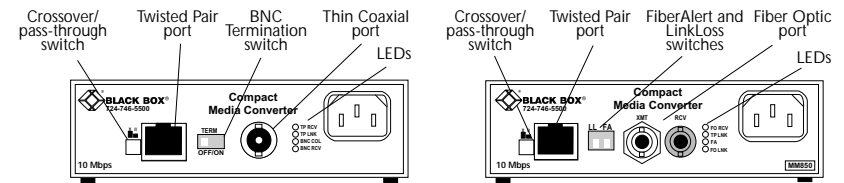
Installing *Compact Media Converter*

Compact Media Converter comes ready to install. The only adjustments that may need to be made come after installation.

To install **Compact Media Converter**, first make sure that the unit is placed on a suitable flat surface. Attach the cables between the **Compact Media Converter** and each device that will be interconnected, then plug the unit into a reliable, filtered power source.

Configuring *Compact Media Converter*

The diagram on the following page shows the switches and connections on **Compact Media Converter TP/BNC** and **TP/FO.**

Compact Media Converter TP/BNC (left) and TP/FO (right), Front View

Once installed, you can configure **Compact Media Converter TP/FO** for the following:

- Select a crossover or pass-through connection for the twisted pair port (default = OUT/crossover)
- Enable *LinkLoss* (default = DOWN/disabled)
- Enable *FiberAlert* (default = DOWN/disabled)

Compact Media Converter TP/BNC can be configured for the following features:

Select a crossover or pass-through connection for the twisted pair port (default = OUT/crossover)
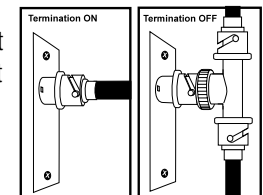Disable BNC port termination (default = ON position/enabled)

Twisted Pair Crossover/Pass-Through Switch

The twisted pair port on **Compact Media Converter** has one RJ-45 connector for a single shielded or unshielded twisted pair link segment, and features a push-button switch, located next to the twisted pair connector, for selecting a crossover workstation connection or pass-through repeater/hub connection. Select a pass-through connection by pressing the push-button IN. A crossover connection is selected when the push-button is OUT.

If uncertain whether a crossover or pass-through connection is needed, set the push-button to the position that makes the link LED glow.

BNC Port Termination

Compact Media Converter TP/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 **Compact Media Converter TP/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 switch is in the left position.

If a thin Ethernet segment is to be terminated at the **Compact Media Converter TP/BNC**, attach the cable directly to the BNC connector and set the termination switch to ON (enabled – factory default) by moving the switch to the right position.

Troubleshooting with *LinkLoss* and *FiberAlert*

LinkLoss and *FiberAlert* are advanced troubleshooting features that can help you use your **Compact 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 **Compact Media Converter**.

If you are unfamiliar with *FiberAlert* and *LinkLoss*, 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 **Compact 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 **Compact 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 fiber link, *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.
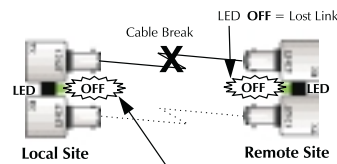
Using *FiberAlert*, a local site administrator is notified of a fault and can quickly determine where a cable fault is located without having to go to the remote site.

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.

FIBERALERT/LINKLOSS COMPARED		
Feature	**Fault Location**	**Disabled LEDs**
FiberAlert	Fiber	Fiber
LinkLoss	Fiber	Twisted Pair

If a **Compact Media Converter** is not receiving a fiber link, *LinkLoss* disables the transmitter on the **Compact Media Converter**'s twisted pair port. This results in a loss of link on the remote twisted pair device.

Enabling and Using FiberAlert and LinkLoss

FiberAlert and *LinkLoss* are configured on **Compact 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 **Compact Media Converter**s' 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 **Compact Media Converter** by itself, you must have an appropriate fiber patch cable. First, connect **Compact 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 **Compact Media Converter**.
- Make sure that you are using the appropriate twisted pair cable or have the crossover/pass-through button on the **Compact Media Converter** set correctly.

LED Operation

Compact Media Converter TP/FO features four diagnostic LEDs. They are:

FO RCV	Blinks yellow when module is receiving data.
TP LNK	Glows green when a twisted pair link is established.
FA	Glows green when *FiberAlert* is enabled.
FO LNK	Glows green when a fiber link is established.

The LED functions for *Compact Media Converter TP/BNC* are as follows:

TP RCV	Flickers yellow 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 yellow when BNC port is receiving data.

(*Note: On a -10* Compact Media Converter TP/BNC*, the TP RCV, TP LNK and the BNC RCV LEDs flicker at a rate proportional to rate that data being passed on the ports. Under low traffic conditions, the LEDs flicker visibly, while they appear to glow under high traffic conditions.*)

Specifications

Environmental
Operating Temperature: 32° - 104° F (0° - 40° C)
Storage Temperature: 21° - 160° F (-6° - 71° C)
Humidity: 5 - 95% (non-condensing)

Power
AC Input Load: 100/240V±10% ~ 50/60 Hz, 0.1/0.05A
Heat generated: 25 BTU/hr.

Dimensions
1.50″H x 4.65″W x 4.43″D (3.8 cm x 11.8 cm x 11.3 cm)
1.3 lbs. (.6 kg)

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 electrostatic 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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