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NETWORK SERVICES

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Miniature Media Converters • Industrial MultiPower Media Converters

These media converters enable you to use fiber almost anywhere!

FEATURES

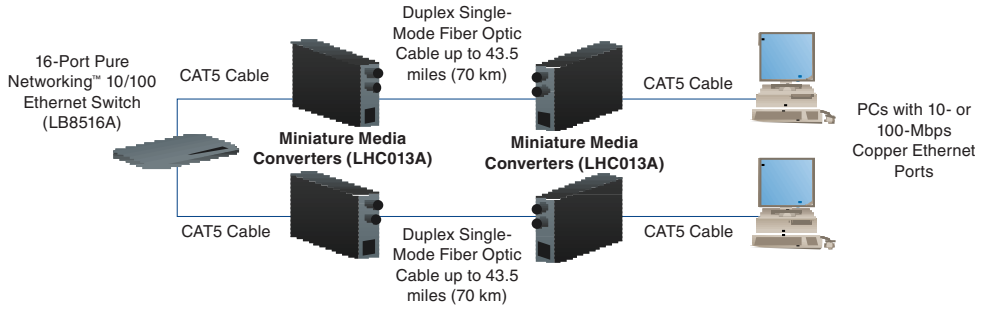
Miniature Media Converters:

- Convert 10- or 100-Mbps copper ports to fiber optic cable.
- Bring fiber to the desktop more economically than fiber NICs.
- Compact size makes them easy to integrate.
- Autonegotiating for speed and duplex.

Industrial MultiPower Media Converters:

- Four power options.
- Convert 10-/100-Mbps copper to duplex or single-strand
- 100-Mbps fiber, autonegotiating for speed on the copper side.
- Single-Mode Long versions support distances up to 49.7 miles (80 km).
- Operational from -13 to +158° F.
- Include clips for mounting on DIN rails.

Miniature Media Converters extend your 10/100BASE-T network beyond the 328-foot (100-m) limit—perfect for connecting remote workstations.



OVERVIEW

Now it's easier than ever to bring fiber to your network, no matter if your network is spread across a business campus, a large industrial site, or over great distances and/or subjected to temperature extremes.

Choose from Miniature Media Converters that bring fiber to the desktop or hardened Industrial MultiPower Media Converters that can be powered up one of four ways and operate in temperature extremes from -13 to +158° F (-25 to +70° C).

Good things, small packages.

Miniature Media Converters are easy to install (literally plug-and-play), tiny enough to fit in anywhere, and very economical.

Use them to bring fiber to the desktop or add fiber segments to your network to gain extra distance—up to 43.5 miles (70 km) with single-mode fiber.

Twice the conversion power!

A Miniature Media Converter enables you to connect 10-Mbps and 100-Mbps twisted-pair network segments to fiber optic cabling. It's both a media and data rate converter with 10/100 auto-negotiation on the twisted-pair port. The fiber port operates at 100 Mbps.

You can also choose Gigabit models to link 1000BASE-TX twisted-pair network segments to 1000BASE-LX fiber optic cabling.

All Miniature Media Converters have an HDX/FDX function for half- and full-duplex autosensing.

Installation is easy.

Just connect a Miniature Media Converter to the RJ-45 connector on your PC's 10- or 100-Mbps Ethernet port using CAT5e cable, then connect fiber optic cable to the other side of the media converter.

What's more, these tiny converters tuck unobtrusively behind your PC.

Go the distance with fiber.

Miniature Media Converters using multimode fiber support distances of up to 984.2 feet (300 m) or 1.2 miles (2 km)—enough distance for most LAN applications. For more extensive campus applications, choose Single-Mode or Single-Mode, Single-Strand models for long-distance runs of up to 6.2, 12.4, 24.8, or 43.5 miles (10, 20, 40, or 70 km).

Three power options.

Miniature Media Converters can be powered one of three ways: by an external AC power supply included with each unit, by an optional USB Power Adapter Cable that plugs into a PC's USB port, or by an optional rackmount PowerTray.

The AC power supply is a universal external transformer that requires a nearby AC power outlet. The PowerTray provides power for up to 18 converters in only 1.5U of rack space. Rackmount ears are included.

More power to you.

Equipped with all the features of the Miniature Media Converters, the plug-and-play Industrial MultiPower Media Converters offer additional power options, including support for the IEEE 802.3af Power over Ethernet (PoE) standard. Plus, Industrial MultiPower Media Converters are designed for use in harsh industrial environments.

Power Tray (LHC018A-AC-R2) filled with Miniature Media Converters.

In all, there are four different ways to power the converter: with its AC adapter, using 5–50-VDC terminal block power, via an optional USB Power Adapter Cable, or over a PoE link.

You can even use multiple power options at the same time to provide maximum redundancy and ensure that your mission-critical applications remain up and running. For instance, you can connect a converter to power sourcing equipment (PSE) for PoE while also using AC adapter power, DC terminal block power, and USB bus power. Then, if any one of these power sources fails, the other sources will continue to supply power to the converter seamlessly.

You can also connect a PSE switch to an uninterruptible power supply to ensure that the switch and each connected media converter always have power.

The converters come with DIN clips, so you can attach them to a DIN rail. When installing multiple Industrial MultiPower Media Converters on a DIN rail, use one DC input source, then cascade from one DC block to the next until you reach the maximum current available.

Technically Speaking

There are many variations of the IEEE 802.3 Ethernet spec: 10BASE2, 10BASE-T, 10BASE5, 10BASE-FL, etc. Each standard clearly defines unique requirements for network communications using different components and different cables. The media converter's job is to bridge the gap between these various Ethernet types.

Media converters convert the incoming electrical signal from one cable type and transmit it over another type—thick coax to Thin, UTP to fiber, and so on. Because they operate at the Physical Network Layer, they're totally transparent to network operation. They don't slow data throughput, and there's no limit to how many you can install.

Media converters are primarily used for integrating modern UTP or fiber networks with legacy standard or Thin Ethernet networks. Another popular application is to use a pair of media converters to extend the reach of a copper-based network with fiber optic cable. This is an easy way to extend your network without adding to your repeater count.

Types of media converters.

If you only need to translate between two wiring systems (10BASE-T to fiber, for example), a standalone media converter is all you need. These can be desktop boxes or card-based converters that plug into a PC slot alongside a 10BASE-T card.

As your network expands, however, you're likely to need to translate many cable types. That's when a media converter chassis comes in handy. It multi-plies the number of converter options available for your users, and it houses everything in one place, so you save space.

Some chassis-based media converters even support internal power supplies or have space for redundant backup power supplies. If your installation is growing fast, you can choose a media converter such as one of our FlexPoint Media Converters, which can be used individually as a standalone converter and then rackmounted in a chassis when your network expands.

Other UTP-to-fiber media converters incorporate redundant link functions. These smart converters not only extend a network across fiber, but they switch communications to a backup link automatically if the primary link fails. They may even work as Layer 2 switches, separating each link into its own collision domain, so you get faster throughput and better security.

Sometimes, all you want to do is link mismatched fiber types to extend your network. For this, there are mode-type media converters, which translate signals from multimode to single-mode fiber optic signals. This way, you can seamlessly integrate multimode and higher-bandwidth single-mode segments.

Take care to calculate maximum cable lengths.

When using media converters to join segments, you need to pay attention to the overall length of every cable that makes up the circuit. That's because all cable types have a maximum distance limit specified by the IEEE, and even though you're mixing media, you need to observe these limits relative to the overall segment length.

For example, if your central fiber run is 3328 feet (50 percent of the 6656-foot limit specified for 10BASE-FL), the combined length of both UTP segments at each end of the fiber may not exceed 164 feet, or 50 percent of the 328-foot 10BASE-T limit. Otherwise, the sum of the various cable-limit percentages would exceed 100 percent—a condition that could cause problems on your network.

LGC010A

TECH SPECS

Miniature Media Converters:
Cable Requirements —
Twisted pair: CAT5 or above shielded or unshielded;
Multimode fiber: 50/125- or 62.5/125-µm duplex;
Single-mode fiber: 9/125-µm duplex or single-strand
Distance (Maximum) —
Twisted pair: 328 ft. (100 m);
Multimode duplex fiber: 984.2 ft. (300 m) or 1.2 mi. (2 km);
Single-mode duplex fiber: 6.2, 24.8, or 43.5 mi. (10, 40, or 70 km);
Single-mode single-strand fiber:12.4 or 24.8 mi. (20 or 40 km)
Operating Environment —
Temperature: 32 to 104° F (0 to 40° C);
Humidity: 5 to 95%, noncondensing
Standards — IEEE 802.3 10BASE-T;
IEEE 802.3u 100BASE-TX;
IEEE 802.3u 100BASE-FX
Connectors — LHC013A, LHC036A: (1) RJ-45, (1) pair of ST®;
LHC014A– LHC015A, LGC010A–LGC013A: (1) RJ-45, (1) pair of SC;
LHC028A–LHC031A, LGC014A–LGC017A: (1) RJ-45, (1) SC
Indicators — LEDs: Per twisted-pair port: (1) TX Link/ACT, (1) FX Link/ACT;
Per fiber port: (1) XMT, (1) RCV
Power — From the included external 100–240-VAC, 50–60-Hz adapter;
Via USB Power Adapter Cable (LHC021A) connected to a computer's USB port;
From the PowerTray with a 100–240-VAC, 50–60-Hz (LHC018-AC) or 48-VDC (LHC018A-DC) power supply
Size — Media Converters: 0.8"H x 1.8"W x 3.4"D (2 x 4.6 x 8.6 cm);
PowerTrays: 2.3"H x 16.9"W x 9.2"D (5.8 x 42.9 x 23.4 cm)
Industrial MultiPower Media Converters:
Cable Requirements —
Twisted pair: CAT5 or above, shielded or unshielded;
Multimode fiber: 50/125- or 62.5/125-µm duplex;
Single-mode fiber: 9/125-µm duplex or single-strand
Mounting — With included DIN clip on DIN-35 rails
Operating Environment —
Temperature:
Using AC adapter: 32 to 122° F (0 to 50° C);
Using other available power sources: -13 to +158° F (-25 to +70° C);
Humidity: 5 to 95%, noncondensing
Switching Engine — Store and forward; autonegotiating; broadcast storm protection; supports oversized packets up to 1916 bytes
Connectors — All: (1) RJ-45, with autocross for MDI-II/MDI-X;
LIC022A, LIC024A, LIC026A: also have (1) pair of ST;
LIC023A, LIC025A, LIC027A: also have (1) pair of SC;
LIC052A–LIC057A: also have (1) SC
Power — From the included external 100–240-VAC, 50–60-Hz adapter;
Via the terminal block: 5 to 50 VDC;
Via the USB Power Adapter Cable (LHC021A) connected to a computer's USB port;
From a PSE over a Power over Ethernet link
Size — 0.8"H x 1.8"W x 3.4"D (2 x 4.6 x 8.6 cm)

Why Buy From Black Box? Exceptional Value. Exceptional Tech Support. Period.

Recognize any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 p.m. and you need help, but your vendor's tech support line is closed.

According to a survey by *Data Communications* magazine, 90% of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application.

Don't waste time and money—call Black Box today.

LHC013A

Item	Code
Miniature Media Converters	
10-/100-Mbps Copper to 100-Mbps Duplex Fiber	
Multimode, 1300-nm, 2 km	
ST®	**LHC013A**
SC	**LHC014A**
Single-Mode, 1310-nm, 40 km	
ST	**LHC036A**
SC	**LHC015A**
1000-Mbps Copper to 1000-Mbps Duplex Fiber	
Multimode, 850-nm, 300 m	
SC	**LGC010A**
Single-Mode, 1310-nm, 10 km	
SC	**LGC011A**
Single-Mode, 1310-nm, 40 km	
SC	**LGC012A**
Single-Mode, 1550-nm, 70 km	
SC	**LGC013A**
10-/100-Mbps Copper to 100-Mbps Single-Strand Fiber	
Single-Mode, 1310-nm TX/1550-nm RX, 20 km	
SC	**LHC028A**
Single-Mode, 1550-nm TX/1310-nm RX, 20 km	
SC	**LHC029A**
Single-Mode, 1310-nm TX/1550-nm RX, 40 km	
SC	**LHC030A**
Single-Mode, 1550-nm TX/1310-nm RX, 40 km	
SC	**LHC031A**
1000-Mbps Copper to 1000-Mbps Single-Strand Fiber	
Single-Mode, 1310-nm TX/1550-nm RX, 10 km	
SC	**LGC014A**
Single-Mode, 1550-nm TX/1310-nm RX, 10 km	
SC	**LGC015A**
Single-Mode, 1310-nm TX/1550-nm RX, 40 km	
SC	**LGC016A**
Single-Mode, 1550-nm TX/1310-nm RX, 40 km	
SC	**LGC017A**
To replace a Miniature Media Converter's power supply, order...	
Spare Power Supply with US and European Adapter Plugs	**LHC020A**
UK Adapter Plug for Miniature Media Converter Power Supply	**LHC022A-UK**
Australian Adapter Plug for Miniature Media Converter Power Supply	**LHC023A-AU**
To rackmount Miniature Media Converters, order...	
PowerTray, 18-Slot	
with AC Power	**LHC018A-AC**
with DC Power	**LHC018A-DC**

Item	Code
Industrial MultiPower Media Converters	
10-/100-Mbps Copper to 100-Mbps Duplex Fiber	
Multimode, 1300-nm, 2 km	
ST	**LIC022A**
SC	**LIC023A**
Single-Mode, 1310-nm, 40 km	
ST	**LIC024A**
SC	**LIC025A**
Single-Mode Long, 1310-nm, 80 km	
ST	**LIC026A**
SC	**LIC027A**
10-/100-Mbps Copper to 100-Mbps Single-Strand Fiber	
Single-Mode, 1310-nm TX/1550-nm RX, 20 km	
SC	**LIC052A**
Single-Mode, 1550-nm TX/1310-nm RX, 20 km	
SC	**LIC053A**
Single-Mode, 1310-nm TX/1550-nnm RX, 40 km	
SC	**LIC054A**
Single-Mode, 1550-nm TX/1310-nm RX, 40 km	
SC	**LIC055A**
Single-Mode, 1310-nm TX/1550-nm RX, 60 km	
SC	**LIC056A**
Single-Mode, 1550-nm TX/1310-nm RX, 60 km	
SC	**LIC057A**

NOTE: All single-strand Miniature Media Converters and Industrial MultiPower Media Converters must be used in matched pairs. For example, if you order an LIC052A for one end of your 20 kilometer link, you must order an LIC053A on the other end of the link.

To power a single media converter via your computer's USB port, order...	
USB Power Adapter Cable	**LHC021A**
For optimum performance and a 20% savings, order...	
GigaBase® 350 CAT5e Patch Cable, 4-Pair, Straight-Pinned, PVC, 10-ft. (3.0-m)	**EVNSL85-0010**
Premium Ceramic, Multimode 62.5-Micron Fiber Optic Patch Cable, Duplex, Riser, ST–ST, Custom Lengths	**EFN110-STST**
Single-Mode Duplex Fiber Optic Cable, PVC, SC–SC, Custom Lengths	**EFN5010**