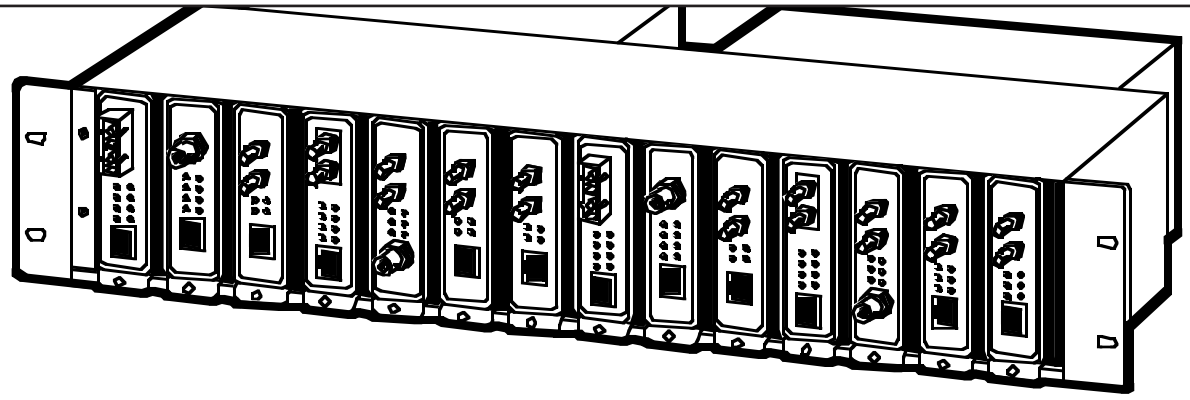
BLACK BOX®
NETWORK SERVICES

FLEXPOINT MODULAR MEDIA AND RATE CONVERTERS



These media and rate converters grow with your network—from 10 to 100 Mbps, from copper to fibre, from multimode to single-mode fibre.

Key Features

- ***Standalone or mounted in a chassis—you decide!***
- ***Hot-swappable: Install or remove modules while the network stays up.***
- ***Hot-swappable power supplies on the Power Chassis ensure continuous network operation.***
- ***Supports Ethernet, Fast Ethernet, Token Ring, UTP, coax, single-mode fibre, and multimode fibre.***
- ***Easy installation—requires no software.***

Lay out your network the way you like—not the way your equipment forces you to.

With these FlexPoint™ Media and Rate Converters, you choose what kind of network works best for you. And as your network grows, the FlexPoint system will keep up.

In smaller applications, you can use the media or rate converters as standalone units. As your network grows, you can mount them in a rack with the 5-Position Rackmounting Kit or use them as modules in the 14-slot Power Chassis.

FlexPoint Power Chassis

This chassis organizes up to 14 media or rate converters and supplies power to them. Each power supply is hot-swappable. An optional redundant power supply keeps your media or rate converters going even if one power supply fails. When they're both working, the two power supplies share the load. The chassis fits standard 19-inch racks.

Media Converters

10BASE-T/BNC

This media converter joins unshielded twisted-pair (UTP) and coax LANs together to form one network.

For UTP, the 10BASE-T/BNC converter supports Category 3, 4, and 5 wiring at distances of 100 m (328 ft.). This model also corrects wiring-polarity reversals and eliminates crossed cables with a crossover switch.

For coax, this converter has a BNC connector that supports 50-ohm cable at up to 185 m (606 ft.). And you don't need a T-connector—switch-selectable termination is built in.

10BASE-FL/BNC

This 10BASE-FL to 10BASE2 media converter connects a ThinNet LAN to fibre to form one network.

For fibre, this converter uses ST connectors. It comes in 850-nm multimode, 1300-nm multimode, and 1300-nm single-mode models. The fibre length is limited to 2 km (1.24 mi.) per IEEE 802.3 timing.

For coax, the converters have BNC connectors and support 50-ohm cable at distances of up to 185 m (606 ft.). Thirty workstations

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Typical Application

These media converters are a great choice for smoothing out your network transition from copper to fibre or from multimode to single-mode fibre.

(continued from page 1)

can be connected to this segment per the 802.3 IEEE standard.

A switch-selectable terminator is built in.

10BASE-FL/10BASE-T

This media converter joins unshielded twisted-pair (UTP) and fibre LANs into one network. It supports half- and full-duplex (10- and 20-Mbps) operation.

For fibre, this converter uses ST connectors. It comes in 850-nm multimode, 1300-nm multimode, and 1300-nm single-mode models.

For UTP, this media converter uses an EIA/TIA modular 568 RJ-45 connector and supports Category 3, 4, and 5 wiring, connecting at distances up to 100 m (328 ft.).

The 10BASE-FL/10BASE-T converter also corrects wiring-polarity reversals and eliminates crossed cables with a crossover switch.

100BASE-TX/100BASE-FX

This group of media converters connects fast Ethernet 100BASE-FX fibre to 100BASE-TX UTP LANs. They use auto-negotiation for full- and half-duplex operation and can handle numerous fibre types.

These converters auto-adapt to the highest performance level supported by the device that is connected to the UTP port. When the device supports full-duplex, the converter adapts to full-duplex mode and creates a 200-Mbps bandwidth. When the connected device supports only half-duplex, the converter adapts to this mode and creates a 100-Mbps bandwidth. Full- and half- duplex operation can also be controlled by a manual override switch.

The fibre side of these converters operates at 1300 nm and uses ST or SC connectors. Multimode models can support distances of up to 2 km (1.24 mi.), and a specialized single-mode model can operate at distances of 58 km (36 mi.).

The UTP port, which supports distances of up to 100 m (328 ft.), has a modular 568 RJ-45 connector for Category 5 wiring. A crossover switch eliminates the need for crossed cables.

Token Ring UTP/Fibre

For Token Ring LANs with fibre-to-copper conversions, this model automatically senses and configures itself to the network ring speed. It also self-configures to attached devices through an automatic sensing circuit.

The UTP port can attach to a workstation's network interface card, ring-in/ring-out port, or lobe. This converter can also support server or workstation fibre attachments and fibre ring extensions.

Category 3, 4, and 5 wiring can be used. At 16 Mbps, Category 5 wiring can support distances of 150 m (492.1 ft.). At 4 Mbps, Category 5 wiring will support distances of 500 m (1604.4 ft.). With fibre, the converter supports 2.5 km (1.6 mi.) using multimode fibre and 20 km (12.4 mi.) using single-mode fibre.

These models also test cable integrity in the network.

MM-SM Fibre

These media converters connect to the network over multimode fibre. But between Media Converters, they connect with single-mode fibre to give you distances up to 28 km.

For 100BASE-FX, the 100BASE-FX MM-SM Fibre Media Converter supports Token Ring, Ethernet, and Fast Ethernet.

For OC-3, the OC-3 MM-SM Fibre Media Converter supports all standards over ATM networks and the Synchronous Optical Network (SONET).

For Gigabit, the Gigabit MM-SM Fibre Media Converter supports speeds up to 1000 Mbps. And it complies with IEEE 802.3 and 1000BASE-LX/SX standards.

Rate Converters

10/100 Mbps MM

The rate converter joins 10BASE-T and 100BASE-FX networks. You control the speed and duplex mode of the UTP port and fibre port. And you get full-wire-speed data packet transfer thanks to its 1-MB memory buffer. What's more, you don't even need a crossover cable. A handy crossover switch makes the connection.

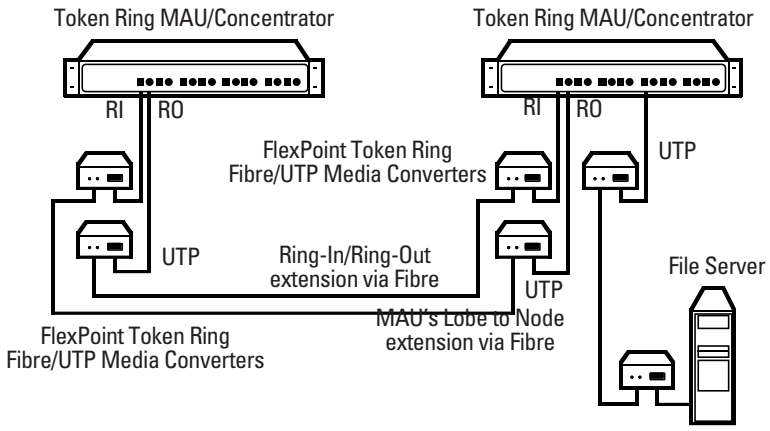
10/100BASE-TX to 100BASE-FX

This group of rate converters connects fast Ethernet 100BASE-FX fibre to 10BASE-T or 100BASE-TX UTP LANs. They use auto-negotiation for full-and half-duplex operation and can handle numerous fibre types. An override switch provides total manual control over the 10/100 operation of the UTP port and the half/full duplex operation of both the fibre and UTP port.

The fibre port operates at 1300 or 1550 nm (depending on the model) and features SC, ST, or MT-RJ connectors. Multimode models support distances of 2 km, and single-mode models support up to 28 km. Long-haul (LH) models support distances of up to 58, 85, or 100 km.

These converters also feature a 1MB store-and-forward buffer and MAC address learning.

Use the Token Ring UTP/Fibre Media Converter to extend your network for less!



Specifications

Power Chassis

Indicators: (1) Power LED

Power: 115–230 VAC, 50–60 Hz, autosensing (single or dual) power supply

Size: 3"H x 19"W x 10"D (7.6 x 48.3 x 25.4 cm)

Weight: 7 lb. (3.2 kg)

Media Converters

Compliance — CE

Protocol:
- LMC210A, LMC212A: IEEE 802.3, 10BASE-FL, 10BASE2;
- LMC213A, LMC214A: IEEE 802.3, 100BASE-TX, 100BASE-FX;
- LTM215A: 4/16 Mbps, IEEE 802.5j
- LMC250A, LMC1000A: IEEE 802.3;
- LMC155A: OC-3, SONET

Distance:
- LMC210A: UTP: 328 ft. (100 m); Thin Coax: 606 ft. (185 m);
- LMC211A: Thin Coax: 606 ft. (185 m); Fibre: 1.2 mi. (2 km);
- LMC212A: UTP: 328 ft. (100 m);
  - Multimode 850-nm Fibre: 1.2 mi. (2 km);
  - Multimode 1300-nm Fibre: 3.1 mi. (5 km);
  - Single-Mode 1300-nm Fibre: 9.3 mi. (15 km);
- LMC213A: UTP: 328 ft. (100 m);
  - Multimode 1300-nm Fibre: 1.2 mi. (2 km);
  - Single-Mode 1300-nm Fibre: 15.5 mi. (25 km);
- LMC214A: UTP: 328 ft. (100 m);
  - Single-Mode 1300-nm Fibre: 36 mi. (58 km);
- LTM215A: Category 3 UTP, 4 Mbps: 492.1 ft. (150 m);
  - Category 3 UTP, 16 Mbps: 328.1 ft. (100 m);
  - Category 5 UTP, 4 Mbps: 984.3 ft. (300 m);
  - Category 5 UTP, 16 Mbps: 492.1 ft. (150 m);
  - Multimode Fibre: 1.56 mi. (2.5 km);
  - Single-Mode Fibre: 12.4 mi. (20 km);
- LMC250A: Ethernet and Token Ring:
  - Multimode Fibre: 2 km (1.2 mi);
  - Single-Mode Fibre: 20 km (12.4 mi);
  - Fast Ethernet:
  - Multimode:
    - Half-Duplex: 412 m (1351.7 ft.);
    - Full-Duplex: 2 km (1.2 mi);
  - Single-Mode:
    - Half-Duplex: 412 m (1351.7 ft.)
    - Full-Duplex: 28 km (17.4 mi);
- LMC155A:
  - Multimode: 2 km (1.2 mi);
  - Single-Mode: 28 km (17.4 mi);
- LMC1000A:
  - Multimode: 220 m (721.8 ft.);
  - Single-Mode: 50 km (31.1 mi)

Indicators: LMC210A: (1) Power, (1) Jabber, (1) Device Detected (UTP), (1) Data Received (UTP), (1) Collision (UTP), (1) Polarity (UTP), (1) Data Received (Coax), (1) Collision (Coax);
- LMC211A: (1) Power, (1) Jabber, (1) Device Detected, (1) Data Received (Coax), (1) Data Received (Fibre), (1) Collision;
- LMC212A: (1) Power, (1) Device Detected (Fibre), (1) Data Received (Fibre), (1) Device Present (UTP), (1) Data Received (UTP), (1) Polarity (UTP);
- LMC213A, LMC214A: (1) Power, (1) Auto-negotiation, (1) Full-Duplex, (1) Half-Duplex, (1) Link/Receive (Fibre), (1) Error (Fibre), (1) Link/Receive (UTP), (1) Error (UTP);
- LTM215A: (1) Power, (1) Insert, (1) Error (Power), (1) Test, (1) Fibre Ready, (1) UTP Ready
- LMC250A, LMC155A, LMC1000A: (1) Power, (1) Link/Receive

Cables: LMC210A:
- 10BASE-T UTP: Categories 3, 4, & 5 (EIA/TIA 568);
- 10BASE2 Coax: 50 ohm, RG-58A/U, RG58C/U, RG-58 or equivalent;
- LMC211A: MM fibre: 50/125, 62.5/125, 100/140 µm;
  - SM fibre: 9/125 µm;
  - 10BASE2 Coax: 50 ohm, RG-58A/U, RG58C/U, RG-58 or equivalent;
- LMC212A: MM fibre: 50/125, 62.5/125, 100/140 µm;
  - SM fibre: 9/125 µm;
  - 10BASE-T UTP: Categories 3, 4, & 5 (EIA/TIA 568);
- LMC213A, LMC214A: UTP: Cat 5;
  - MM fibre: 50/125, 62.5/125, 100/140 µm;
  - SM fibre: 9/125 µm;
- LTM215A: UTP: EIA/TIA 568;
  - MM fibre: 50/125, 62.5/125, 100/140 µm;
  - SM fibre: 9/125 µm
- LMC250A, LMC155A, LMC1000A:
  - MM fibre: 50/125, 62.5/125, 100/140 µm;
  - SM fibre: 9/125 µm

Connectors:
- LMC210A: (1) BNC, (1) RJ-45;
- LMC211A: (1) BNC, (1) Pair ST;
- LMC212A, LTM215A: (1) RJ-45, (1) Pair ST;
- LMC213A, LMC214A: (1) RJ-45, (1) Pair ST or SC;
- LMC250A, LMC155A, LMC1000A: (2) Pairs of SC

Switches:
- LMC210A: UTP crossover: straight/crossed;
  - Coax termination: 50 ohm in/out;
- LMC211A: 50 ohm in/out;
- LMC212A, LTM215A:
  - UTP crossover: straight/crossed;
- LMC213A, LMC214A:
  - UTP crossover: straight/crossed;
  - UTP auto-negotiation: auto-negotiation/manual;
  - Duplex Mode: full-duplex, half-duplex

Power: 115 VAC, 60 Hz, external; 230-VAC, 50-Hz version on request

Size: 2.5H x 7.6W x 10.2D cm (1"H x 3"W x 4"D)

Weight: 0.9 kg (2 lb.)

5-Position Rackmounting Kit

Size: 4.4H x 48.3W x 12.7D cm (1.75"H (1U) x 19"W x 5"D)

Weight: 0.9 kg (2 lb.)

Rate Converters

Maximum Distance:
- 10/100 UTP: Half-Duplex: 100 m (328 ft.); Full-Duplex: 100 m (328 ft.);
- 100BASE-FX Fibre:
  - Multimode: Half-Duplex: 412 m (1351.7 ft.); Full-Duplex: 2 km (1.2 mi);
  - Single-Mode: Half-Duplex: 412 m (1351.7 ft.); Full-Duplex: 28 km (17.4 mi)

Connectors: (1) RJ-45; (1) pair of SC, ST, or MT-RJ

Indicators: (8): Power; Autonegotiation (UTP); Full-Duplex (UTP); Full-Duplex (Fibre); Link/Receive (UTP); Link/Receive (Fibre); 10 Mbps (UTP); 100 Mbps (UTP)

Power: 110 VAC, 60 Hz, external (230-VAC, 50-Hz version on request)

Size: 2.5H x 7.6W x 10.2D cm(1"H x 3"W x 4"D)

Weight: 0.2 kg (0.4 lb.)

Additional Equipment You May Need

- ThinNet Cable, PVC (LCN300)
- CAT5® Bulk Cable (EVNSL05A-xxxx)
- Duplex Fibre Optic Cable, PVC, ST-ST, Multimode (EFN062-CC)
- Terminated Fibre Optic Cable, SC-SC, Multimode (EFN4025-xxxM)
- Single-Mode Duplex Fibre Optic Cable, ST-ST (EFN5009-xxxM)
- Single-Mode Duplex Fibre Optic Cable, SC-SC (EFN5010-xxxM)

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.

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.

Ordering Information

ITEM	CODE
FlexPoint 14-Slot Power Chassis	
Single Power Supply	LMC200
Dual Power Supply	LMC200-2PS
FlexPoint Media Converters	
10BASE-T/BNC	LMC210A
10BASE-FL/BNC	
850 nm, Multimode, 2 km	LMC211A-MM
1300 nm, Multimode, 2 km	LMC211A-13MM
1300 nm, Single-Mode, 2 km	LMC211A-SM
10BASE-FL/10BASE-T	
850 nm, Multimode, 2 km	LMC212A-MM
1300 nm, Multimode, 5 km	LMC212A-13MM
1300 nm, Single-Mode, 15 km	LMC212A-SM
100BASE-TX/100BASE-FX	
1300 nm, Multimode, 2 km	
ST	LMC213A-MMST
SC	LMC213A-MMSC
1300 nm, Single-Mode, 25 km	
ST	LMC213A-SMST
SC	LMC213A-SMSC
1300 nm, Single-Mode Plus, 58 km	
ST	LMC214A-STP
SC	LMC214A-SCP
10/100BASE-TX to 100BASE-FX, 1300 nm	
Multimode SC, 2 km	LMC100A-SC
Single-mode/SC, 28 km	LMC100A-SMSC
Single-mode/ST, 28 km	LMC100A-SM
Multimode/MT-RJ, 2 km	LMC100A-RJ
Single-mode/MT-RJ, 28 km	LMC100A-SMRJ
10/100BASE-TX to 100BASE-FX, 1550 nm	
Single-mode/SC/LH, 58 km	LMC100A-SMSC-LH
Single-mode/SC/LH, 85 km	LMC100A-SMSC-XLH
Single-mode/SC/LH, 100 km	LMC100A-SMSC-SLH
Token Ring UTP/Fibre	
850 nm, Multimode, 2.5 km	LTM215A-MM
1300 nm, Single-Mode, 20 km	LTM215A-SM
Multimode/Single-Mode Fibre	
100BASE-FX	LMC250A
OC-3	LMC155A
Gigabit	LMC1000A
FlexPoint Modular 10/100 Rate Converter (Multimode)	LMC100A
5-Position Rackmounting Kit	LMC205
Wallmounting Hardware	LMC206-WALL
Redundant Power Supply for Power Chassis	PSFP200