High-Density Media Converter System II

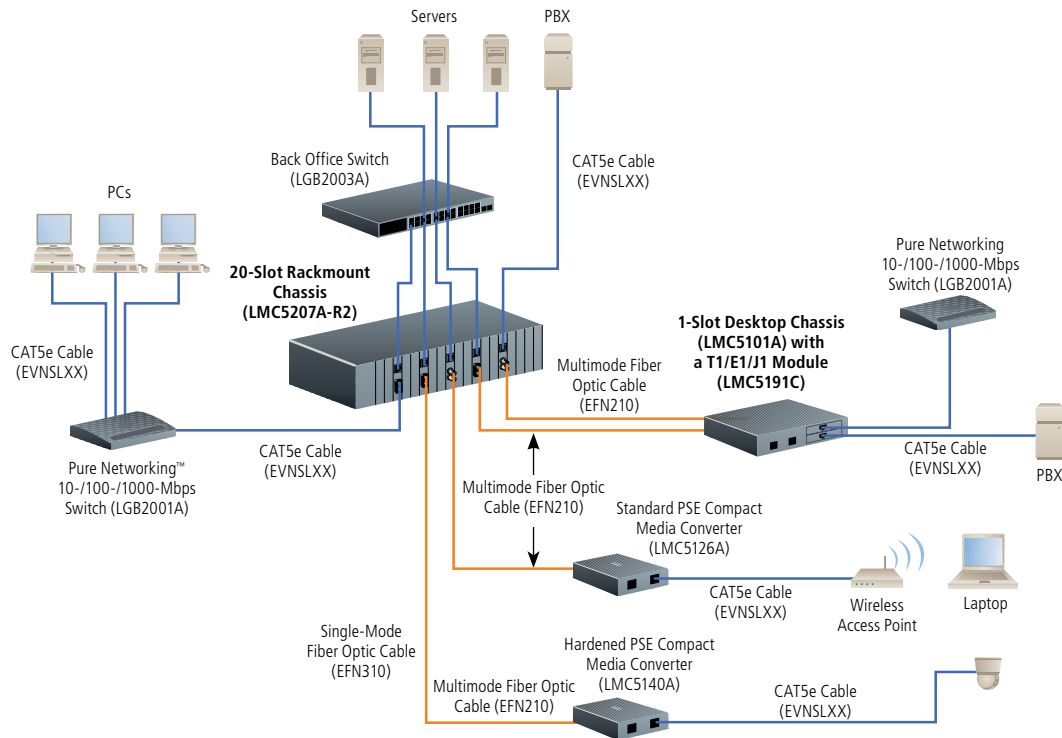# Fully manageable systems with Layer 1 or Layer 2 conversion options.

FEATURES

» Customize this versatile system to your application.

» Chassis available can be ordered with or without SNMP management capabilities.

» For remote locations, order compact desktop chassis.

» LinkLoss and/or FiberAlert diagnostics for troubleshooting.

» Bandwidth Manager enables you to control per-port bandwidth.

» Copper-to-fiber, fiber-to-fiber, copper-to-copper, and single-strand fiber modules available.

» Layer 2 converters increase network efficiency.

Servers   PBX

PCs

Back Office Switch (LGB2003A)

CAT5e Cable (EVNSLXX)

Pure Networking 10-/100-/1000-Mbps Switch (LGB2001A)

20-Slot Rackmount Chassis (LMC5207A-R2)

1-Slot Desktop Chassis (LMC5101A) with a T1/E1/J1 Module (LMC5191C)

CAT5e Cable (EVNSLXX)

Multimode Fiber Optic Cable (EFN210)

CAT5e Cable (EVNSLXX)

PBX

Pure Networking™ 10-/100-/1000-Mbps Switch (LGB2001A)

CAT5e Cable (EVNSLXX)

Multimode Fiber Optic Cable (EFN210)

Standard PSE Compact Media Converter (LMC5126A)

CAT5e Cable (EVNSLXX)

Wireless Access Point

Laptop

Single-Mode Fiber Optic Cable (EFN310)

Hardened PSE Compact Media Converter (LMC5140A)

CAT5e Cable (EVNSLXX)

Multimode Fiber Optic Cable (EFN210)

Table of Contents

Effectively manage the media converters in your network without ever leaving your computer room. Extend your managed network over fiber optic cable, over ordinary phone wire via vDSL, or even over T1. The High-Density Media Converter System II provides a full range of options, making it an ideal solution for any managed enterprise network.

High-Density Media Converter System II is particularly well suited for network-extension applications, offering a wide range of hot-swappable media converter modules for network extension over fiber. Additionally, the system offers a range of modules such as T1/E1 and vDSL, that are not usually available with chassis-based media converter systems.

Choose from a wide range of chassis options ranging from a large rackmount chassis with modular SNMP management for your IT center down to a tiny unmanaged desktop chassis for remote desktop locations. Modules in unmanaged chassis can also be managed, although the chassis themselves cannot.

With more than 100 modules to choose from, this system can adapt to even the most demanding network configurations. Many media converter modules perform Layer 2 media conversion, which increases the efficiency of your network compared with using a traditional Layer 1 media converter.

All media converter modules are hot-swappable—you never need to power down a chassis to change a module.

The High-Density Media Converter System II is easy to integrate into any managed network. Not only does it support industry-standard SNMP, but fiber modules include LinkLoss™ and/or FiberAlert™ to alert you if a fiber link is interrupted. LEDs on each module show link status at a glance.

SNMP helps you diagnose network problems by monitoring both copper and fiber link status as well as the chassis' temperature and voltage levels. SNMP traps can alert you to potential network failures so you incur less downtime and spend less time troubleshooting. You can assign a name to each of the various ports and if a link failure occurs, you'll be notified with the port's name.

Plus, we've expanded the High-Density Media Converter System II family to include manageable media converter cards for connecting copper segments to a fiber backbone. Just plug one of these into one of our compact desktop chassis and get a higher level of control across the link.

For assistance specifying your complete system, contact our FREE Tech Support experts.

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High-Density Media Converter System II Chassis with Modular SNMP

*LMC5207A-R2
(with modules installed)*

Get full control of your media converter connections in your enterprise by ordering a High-Density Media Converter System II Chassis as well as a plug-in SNMP Management Module.

Choose from a desktop 3-slot chassis, a 1U rackmount or desktop 6-slot chassis, or a 3U rackmount 20-slot chassis (the chassis ship with blank plates already installed, and the 6- and 20-slot models include rackmounting hardware).

Each chassis has one additional slot for the SNMP Management Module, which you order separately and install in the chassis to enable both module and chassis management. You can even install chassis as an unmanaged chassis and then add SNMP later—a perfect solution for an unmanaged network that might migrate to a managed one at a later date.

Module's GUI gives you detailed conversion ports info.

The SNMP Management Module not only also includes MIBs for SNMP; it also comes with a CD-ROM that contains iView management software. This software enables you to configure the chassis and the media converter modules plugged into it in minutes and provides you with a cross-platform application for managing intelligent networking devices from virtually any 32-bit Windows® system. The module is compatible with Windows® as well as HTML.

The user-friendly, comprehensive iView program uses a clear graphical user interface (GUI). This shows an on-screen representation of the actual device control panels and gives you detailed information about the conversion ports.

You can also use the module's included MIBs with any standard SNMP program, such as HP® OpenView®. This enables you to view SNMP's in-depth technical data in the easy-to-use iView interface. You can even display statistics as charts.

Lock in SNMP configuration and specify backup power.

In situations where you need to disable chassis management, simply move the SNMP switch to the off position. Even though this makes the modules unmanageable, the SNMP agent continues to communicate with installed modules. Turning management back on returns the modules to management control and any settings you've set in iView.

For peace of mind, an SNMP write-lock switch protects the configurations of your installed modules from being accidentally overwritten. Even better, the SNMP slot saves your SNMP settings even when the SNMP Management Module is removed from the chassis.

And, for the chassis themselves, we offer redundant power supplies, which help you isolate mission-critical applications from points of failure. A "last gasp" feature alerts you when one of the power supplies or AC power fails. What's more, the 3-slot chassis can even be configured with both an AC and a DC power supply, enabling you to fall back on DC power should your AC power fail.

And there are even more features to ensure reliability:

The 20-slot chassis has dual fans that are easily field replaceable, and the 3-slot and 6-slot chassis boast a fan test feature and have fans that activate only when the chassis reaches a preset temperature. Fan speed and chassis temperature can be monitored remotely via SNMP.

Connect to your network and configure with ease.

The chassis connects to your LAN via an external 10BASE-T/100BASE-TX twisted-pair connection on the installed SNMP Management Module. Simply plug one end of a CAT5 or higher UTP cable into the module's MGMT port and plug the other end into a switch, hub, or other networking device on your LAN.

Because the twisted-pair port has an auto-cross design, it automatically enables either a crossover or a straight-through connection to match the pinning of your connected device. No crossover cables are required!

Once you connect a chassis to your network, you can assign the device its own IP address.

This initial IP address configuration can be done in-band through the management module's twisted-pair port while using the HubControl utility (included on the iView CD) or out-of-band through the management module's RS-232 port using Dynamic Host Configuration Protocol (DHCP). (Because the chassis has an embedded DHCP agent, its IP address is dynamically assigned when connected to a LAN with a DHCP server.) The SNMP Management Module also includes a TFTP client and supports Telnet™.

Of the two IP address assignment routes, the second is the simplest. Simply plug the included straight-through-pinned cable into the module's DB9 connector and the other end into the appropriate port on your computer or terminal that's set for VT100™ emulation.

The HubControl utility can also be used to initiate remote SNMP configuration for SNMP-manageable devices. This way, you can get a head start on adding subnet masks, trap assignments, and other management functions. You can also use HubControl to upload new versions of the system software and new MIB information.

Once the chassis has an IP address assigned, use the iView software or another SNMP-compatible network management system, such as HP OpenView, to remotely configure, monitor, and manage the modules you install in the chassis. Program subnet masks and default gateways, create community strings (for both read-only and read/write access), configure traps—all within a password-protection process!

VLAN tagging enables you to separate each user's traffic into a separate and secure data stream. These converters also support 802.1Q "Q-in-Q" extra tagging.

Managed modules and media converters

Managed High-Density Media Converter System II Modules and Multiport Managed Media Converters (**page 13**) offer the same management features as the SNMP module, but can be managed independently of a chassis with an SNMP Management Module.

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TECH SPECS

Chassis:

Approvals — FCC Class B, Part 15; CE

Indicators — LNK, FDX, RCV, XMT, MGMT, SNMP

Temperature Tolerance — Operating: 32 to 122° F (0 to 50° C);
Storage: -13 to +158° F (-25 to +70° C)

Humidity Tolerance — 5 to 95% (noncondensing)

Power — LMC5233A, LMC5203A, LMC5227A, LMC5207A-R2:
100–240 VAC, 50/60 Hz, autosensing, 1/0.5 A;
LMC5234A, LMC5204A: 100–240 VAC, 50/60 Hz,
autosensing, 0.5/0.25 A;
LMC5235A, LMC5206A: -48 VDC, 1 A;
LMC5236A, LMC5205A: 48 VDC, 2 A;
LMC5237A, LMC5228A: 115–240 VAC, 50–60 Hz, autosensing,
plus -48 VDC, 2.5 A;
LMC5208A: -48 VDC, 2.5 A

Size — LMC5233A–LMC5237A: 1.75"H (1U) x 7.5"W x 8.6"D
(4.4 x 19.1 x 21.8 cm);
LMC5203A–LMC5206A: 1.75"H (1U) x 17.4"W x 13.8"D
(4.4 x 44.2 x 35.1 cm)
LMC5227A, LMC5207A-R2–LMC5208A, LMC5228A: 5.2"H (3U) x 19"W x
13.8"D (13.2 x 48.3 x 35.1 cm);

Weight — LMC5233A, LMC5235A: 3.2 lb. (1.5 kg);
LMC5234A, LMC5236A–LMC5237A: 3.6 lb. (1.6 kg);
LMC5203A–LMC5206A: 5 lb. (2.3 kg);
LMC5227A, LMC5207A-R2–LMC5208A, LMC5228A: 30 lb. (13.6 kg)

SNMP Management Module:

Approvals — FCC Class B, Part 15; CE

SNMP Supported — V1 and V2c compatible

Connectors — MGMT (network management):
(1) RJ-45 (10BASE-T/100BASE-TX);
Serial management: (1) DB9 F (RS-232), with included serial cable;
Also have an OPTION port for future use

Indicators — LNK/ACT, FDX/COL, TEMP, PS, FAN A/FAN B

Temperature Tolerance — Operating: 32 to 122° F (0 to 50° C);
Storage: -13 to +158° F (-25 to +70° C)

Humidity Tolerance — 5 to 95% (noncondensing)

Power — From the chassis

Item	Code
High-Density Media Converter System II Chassis with Modular SNMP Management	
3-Slot Desktop Chassis	
AC Power	**LMC5233A**
Dual AC Power	**LMC5234A**
DC Power	**LMC5235A**
Dual DC Power	**LMC5236A**
AC/DC Power	**LMC5237A**
6-Slot Rackmount or Desktop Chassis	
AC Power	**LMC5203A**
Dual AC Power	**LMC5204A**
DC Power	**LMC5206A**
Dual DC Power	**LMC5205A**
20-Slot Rackmount Chassis	
AC Power	**LMC5227A**
Dual AC Power	**LMC5207A-R2**
Dual DC Power	**LMC5208A**
Dual AC/DC Power	**LMC5228A**
For SNMP management, you need…	
SNMP Management Module	**LMC5200A**
To add a spare power supply to a 6-Slot Chassis, order…	
Spare Power Supplies for 6-Slot Rackmount or Desktop Chassis	
AC Module	**LMC5214A**
DC Module	**LMC5213A**
To add a spare power supply to a 20-Slot Chassis, order…	
Spare Power Supplies for 20-Slot Rackmount Chassis	
AC Module	**LMC5210A-R2**
DC Module	**LMC5212A**
For power connections, you may also need…	
North American Power Adapter Clip	**LMC5216A**
European Power Adapter Clip	**LMC5215A**
To mount a 3-Slot Desktop Chassis, order…	
Rackmount Shelf	**LMC5238A**
You may also need…	
Backup/Spare Fan Assembly for 20-Slot Chassis	**LMC5209A**

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High-Density Media Converter System II Unmanaged Chassis

LMC5103A

Choose 1- or 2-Slot Desktop Chassis for use as remote unmanaged media converters in your High-Density Media Converter System II application. With these tabletop units, you can customize your network to the protocols and media most appropriate for your application.

Although these models are designed primarily to work as remote chassis when paired with a larger, managed High-Density Media Converter System II Chassis, you can also use them on their own, particularly in applications where you don't require an SNMP card or chassis management.

The chassis are not only ideal for areas with limited space, they also feature a rugged enclosure that makes them suitable for out-of-the-way areas of your network.

The compact 1-Slot Chassis are perfect for when you only need to add one fiber link to bring fiber to the desktop. They hold one media converter module and are powered by either an autosensing 115–240-VAC power supply or a combination AC/DC power supply.

The combination AC/DC power supply model strongly suits industrial environments. It features an AC power adapter and a DC 4-screw terminal block. When operating on DC power, it can be used in -40 to +158° F (-40 to +70° C) environments. What's more, a mounting clip included with the chassis enables you to mount it on a DIN-35 rail. Depending on the installation, you can mount the AC/DC 1-Slot High Density Media Converter System II parallel or perpendicular to the DIN rail.

The 2-Slot Chassis feature a small footprint, house two converter modules, and come with an AC power supply.

In addition to internal power supplies, all chassis feature redundant, 6.8-cfm-rated cooling fans to keep them from becoming overheated and causing downtime.

If you're short on desktop space, order Rackmount or Wallmount Brackets with your chassis. Or order a Rackmount Shelf, which enables you to install up to three High-Density Media Converter System II Unmanaged Chassis in a standard rack.

Once you choose your chassis, order the High-Density Media Converter System II modules (**pages 6–8**) appropriate for your applications. To install a module in the chassis, slide it in until the module is firmly seated in the backplane and secure it by tightening a screw. The modules can then be interconnected to other devices in your network.

TECH SPECS

Approvals — FCC Class B, Part 15; CE
Indicators — LNK, FDX, RCV, XMT, MGMT, SNMP
Operating Temperature — LMC5101A, LMC5201A:
    32 to 122° F (0 to 50°C);
    LMC5103A: With AC adapter: 32 to 122° F (0 to 50° C);
    Without AC adapter: -40 to +158° F (-40 to +70° C)
Humidity Tolerance — 5 to 95% (noncondensing)
Power — LMC5101A, LMC5201A: 115–240 VAC, 50–60 Hz, autosensing;
    LMC5103A 115–240 VAC, 50–60 Hz, autosensing, plus -48 VDC, 2.5 A;
Size — LMC5101A, LMC5103A: 1.5"H x 4.8"W x 7.3"D
    (3.8 x 12.2 x 18.5 cm);
    LMC5201A: 2.3"H x 4.8"W x 7.3"D (5.8 x 12.2 x 18.5 cm)
Weight — LMC5101A, LMC5103A: 1.4 lb. (0.6 kg);
    LMC5201A: 3.2 lb. (1.5 kg)

Item	Code
High-Density Media Converter System II Unmanaged Chassis	
1-Slot Desktop Chassis	
AC Power	**LMC5101A**
AC/DC Power	**LMC5103A**
2-Slot Desktop Chassis	
AC Power	**LMC5201A**
To mount the 1- or 2-Slot Unmanaged Desktop Chassis, order…	
Rackmount Brackets	**LMC5167A-RM**
Rackmount Shelf	**LMC5165A-RM**
Wallmount Brackets	**LMC5166A-WM**
You may also need…	
North American Power Adapter Clip	**LMC5216A**
European Power Adapter Clip	**LMC5215A**

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Layer 1 Media Converter Modules

Layer 1 Media Converter Modules for the High-Density Media Converter System II convert the incoming electrical signal from one cable type and then transmit it over another type. These media converters bridge the gap between two different Ethernet types and are totally transparent to network operation, having no effect on the data being sent across the link.

Layer 1 Media Converter Modules include the LinkLoss feature, which notifies you of "silent failures" on copper-to-fiber links. LinkLoss enables you to troubleshoot network problems just by looking at the media converter's Link LED—the link status of the fiber segment will always be reflected by the twisted-pair segment so you're informed quickly of fiber problems.

Many of the twisted-pair modules feature autocrossover ports to eliminate the worry of whether to use straight- or cross-pinned cabling. This built-in MDI/MDI-X function automatically determines whether the converter has to cross over between the four pairs on the twisted-pair port's RJ-45 connector.

The twisted-pair modules without automatic termination have a push button for you to choose the crossover.

10BASE-T to 10BASE-FL

These 10-Mbps media converter modules offer traditional conversion between 10BASE-T Ethernet devices and 10BASE-FL multimode or single-mode fiber optic devices. Use a pair of these converters at opposite ends of the same fiber optic link to increase your fiber reach.

100BASE-TX to 100BASE-FX

Order these 100-Mbps modules to convert between 100BASE-TX and 100BASE-FX devices. For converters that support autosensing 10/100-Mbps Ethernet, see our Layer 2 Media Converter Modules for the High-Density Media Converter System II (**pages 8–9**).

100BASE-TX to 100BASE-FX Single Strand

Get more mileage from your fiber cable. These modules extend Fast Ethernet connections over a single strand of fiber cable by compressing the transmit and receive wavelengths into *one* single-mode fiber strand.

The conversion is done with Wave-Division Multiplexing (WDM) technology. WDM technology transmits two signals simultaneously at different wavelengths on the same fiber. One unit transmits at 1550 nm and receives at 1310 nm. The other unit transmits at 1310 nm and receives at 1550 nm. The two wavelengths operate independently and don't interfere with each other. This bidirectional traffic flow effectively converts a single fiber into a pair of "virtual fibers," each driven independently at different wavelengths.

1000BASE-TX to 1000BASE-SX

Choose these modules for Gigabit Ethernet connections of up to 200 meters (656.2 ft.)—enough distance to support Gigabit fiber backbone runs either within a building or between neighboring buildings in a campus environment.

1000BASE-TX to 1000BASE-LX

For longer Gigabit fiber runs, choose 1000BASE-LX Gigabit Ethernet modules, which achieve blazing Gigabit throughput at distances of up to 40 kilometers (24.9 mi.) over single-mode fiber cable.

1000BASE-TX to 1000BASE-SSLX

Send Gigabit Ethernet at distances of up to 40 kilometers (24.9 mi.) over a single fiber strand—truly the best performance you can get from your fiber infrastructure.

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LMC5014C-R2

Item	Code
High-Density Media Converter System II Layer 1 Media Converter Modules	
10BASE-T to 10BASE-FL	
Multimode, 850-nm	
4 km ST	**LMC5014C-R2**
SC	**LMC5015C-R2**
Multimode, 1300-nm	
10 km ST	**LMC5016C-R2**
SC	**LMC5017C-R2**
Single-Mode Plus, 1310-nm	
40 km ST	**LMC5020C-R2**
SC	**LMC5021C-R2**
10BASE-T/100BASE-TX to 100BASE-FX	
Multimode, 850-nm	
300 m ST	**LMC5040C**
100BASE-TX to 100BASE-FX	
Multimode, 850-nm	
300 m ST	**LMC5182C-R2**
SC	**LMC5181C-R2**
Multimode, 1300-nm	
2 km ST	**LMC5022C-R2**
SC	**LMC5023C-R2**
Single-Mode Plus, 1310-nm	
40 km ST	**LMC5026C**
SC	**LMC5027C**
Single-Mode Long, 1310-nm	
80 km ST	**LMC5111C-R2**
SC	**LMC5110C-R2**
Single-Mode Long, 1550-nm	
100 km SC	**LMC5180C-R2**

Item	Code	
High-Density Media Converter System II Layer 1 Modules (Continued)		
100BASE-TX to 100BASE-LX Single-Strand		
Single-Mode *(Must be used in complementary pairs.)*		
1310-nm TX/1550-nm RX		
20 km SC	**LMC5113C-R2**	
1550-nm TX/1310-nm RX		
20 km SC	**LMC5114C-R2**	
Single-Mode Plus *(Must be used in complementary pairs.)*		
1310-nm TX/1550-nm RX		
40 km SC	**LMC5116C-R2**	
1550-nm TX/1310-nm RX		
40 km SC	**LMC5117C-R2**	
1000BASE-TX to 1000BASE-SX		
Multimode, 850-nm		
220 m SC	**LGC5108C-R3**	
1000BASE-TX to 1000BASE-LX		
Single-Mode, 1310-nm		
15 km SC	**LGC5184C-R2**	
Single-Mode Plus, 1310-nm		
40 km SC	**LGC5109C-R3**	
1000BASE-TX to 1000BASE-SSLX Single-Strand		
Single-Mode *(Must be used in complementary pairs.)*		
1310-nm TX/1550-nm RX		
15 km SC	**LGC5844C-R2**	
1550-nm TX/1310-nm RX		
15 km SC	**LGC5845C**	
Single-Mode Plus *(Must be used in complementary pairs.)*		
1310-nm TX/1550-nm RX		
40 km SC	**LGC5846C-R2**	
1550-nm TX/1310-nm RX		
40 km SC	**LGC5847C-R2**	

Layer 2 Media Converter Modules

Unlike Layer 1 media converters, which only convert one Ethernet media type to another, Layer 2 Media Converter Modules for the High-Density Media Converter System II are true switches—they actively store, filter, and forward Ethernet packets like any other MAC layer switch.

Layer 2 converters increase network efficiency and reduce network overhead, significantly increasing data throughput.

Because Layer 2 converters are also switches, they incorporate 10/100 or 10/100/1000 ports in contrast to the single-speed ports of Layer 1 converters. You can set the RJ-45 ports for autonegotiation or set them for 10-, 100-, or 1000-Mbps speed as well as for half- or full-duplex. The fiber port can be set for half- or full-duplex, too.

Layer 2 Media Converter modules include the LinkLoss feature, which notifies you of "silent failures" on copper-to-fiber links. With LinkLoss, a fault on the fiber port is mirrored to the Ethernet twisted-pair port. If the fiber link is lost at the converter, the converter disables the twisted-pair Link LED so you can see at a glance that the link is down.

Twisted-pair ports feature autocrossover ports to eliminate the worry of whether to use straight- or cross-pinned cabling. This built-in MDI/MDI-X function determines automatically whether the converter has to cross over between the four pairs on the twisted-pair port's RJ-45 connector.

10BASE-T/100BASE-TX to 100BASE-FX/LX

These converters feature an autosensing 10/100 copper port and a 100-Mbps fiber port. They're a good choice for remote Fast Ethernet connections to Ethernet devices that may later be upgraded to Fast Ethernet.

10BASE-T/100BASE-TX to 100BASE-LX Single-Strand

These modules extend Fast Ethernet connections over a single strand of fiber cable by compressing the transmit and receive wavelengths into the one single-mode strand. The copper port is autosensing for speed; the fiber port is Fast Ethernet.

10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-SX

Choose these short-range modules for Gigabit Ethernet connections of up to 220 meters (721.8 ft.). Autosensing 10-/100-/1000-Mbps ports on the copper side provide maximum versatility.

10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-X

These modules achieve Gigabit throughput at distances of up to 70 kilometers (43.4 mi.) over single-mode cable. The copper port supports Ethernet, Fast Ethernet, and Gigabit Ethernet and autonegotiates speed and duplex.

10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-SSLX Single-Strand

Send Gigabit Ethernet at distances of up to 15 or 40 kilometers (9.3 or 24.8 mi.) over a single fiber strand. Maximum fiber utilization plus autosensing 10/100/1000 ports make it extremely versatile.

Multiport 10BASE-T/100BASE-TX Ports

Switch between five 10-/100-Mbps copper ports and increase port density in your system. This copper switching module enables you to extend Ethernet up to 328 feet away from a source.

Multiport 10BASE-T/100BASE-TX to 100BASE-FX SFP

Available in 3- and 4-port models, this switch module supports plugging in one or two optional SFPs for switching to 100-Mbps fiber backbone(s).

Multiport 10BASE-T/100BASE-TX to 100BASE-FX/LX

Instead of a switching module with SFP slots, you can order 10/100 copper-to-fiber modules with fixed ports for duplex or single-strand fiber connectivity for links up to 40 kilometers (24.8 mi.) over single-mode fiber. These support up to 1000 MAC address learning, as well as flow control, autonegotiating, duplex, and MDI-II/MDI-X UTP cable connection features.

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LGC5942C

Item	Code
High-Density Media Converter System II Layer 2 Switching Modules	
10BASE-T/100BASE-TX to 100BASE-FX/LX	
Multimode, 1300-nm (100BASE-FX)	
2 km ST®	**LMC5118C-R2**
SC	**LMC5119C-R2**
Single-Mode Plus, 1310-nm (100BASE-LX)	
40 km ST	**LMC5120C**
SC	**LMC5121C**
10BASE-T/100BASE-TX to 100BASE-LX Single-Strand	
Single-Mode *(Order one of each.)*	
1310-nm TX/1550-nm RX	
20 km SC	**LMC5123C-R2**
1550-nm TX/1310-nm RX	
20 km SC	**LMC5124C-R2**
Single Mode Plus *(Order one of each.)*	
1310-nm TX/1550-nm RX	
40 km SC	**LMC5126C-R2**
1550-nm TX/1310-nm RX	
40 km SC	**LMC5127C-R2**
10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-SX	
Multimode, 850-nm	
220 m SC	**LGC5950C-R2**
10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-X	
Single-Mode, 1310-nm	
15 km SC	**LGC5951C-R2**
Single-Mode Plus, 1310-nm	
40 km SC	**LGC5952C-R2**
Single-Mode Long, 1550-nm	
70 km SC	**LGC5953C-R2**
10BASE-T/100BASE-TX/1000BASE-T to 1000BASE-SSLX Single-Strand	
Single-Mode *(Order one of each.)*	
1310-nm TX/1550-nm RX	
15 km SC	**LGC5940C**
1550-nm TX/1310-nm RX	
15 km SC	**LGC5941C-R2**
Single-Mode Plus *(Order one of each.)*	
1310-nm TX/1550-nm RX	
40 km SC	**LGC5942C**
1550-nm TX/1310-nm RX	
40 km SC	**LGC5943C**

Item	Code
High-Density Media Converter System II Layer 2 Multiport Switching Modules	
(5) 10BASE-T/100BASE-TX Ports	**LMC5605C**
(4) 10BASE-T/100BASE-TX to (1) 100BASE-FX SFP Slot (1550-nm)	
	LMC5604C-1SFP
(3) 10BASE-T/100BASE-TX to (2) 100BASE-FX SFP Slots (1550-nm)	
	LMC5603C-2SFP
(3) 10BASE-T/100BASE-TX to (1) 100BASE-FX/LX	
Multimode, 850-nm (100BASE-FX)	
2 km ST	**LMC5603C-ST-2KM**
2 km SC	**LMC5603C-SC-2KM**
Multimode, 1300-nm (100BASE-FX)	
5 km ST	**LMC5603C-ST-5KM**
5 km SC	**LMC5603C-SC-5KM**
Single-Mode Plus, 1310-nm (100BASE-LX)	
40 km ST	**LMC5603C-ST-40KM**
40 km SC	**LMC5603C-SC-40KM**
(3) 10BASE-T/100BASE-TX to (1) 100BASE-LX Single-Strand	
Single-Mode *(Order one of each.)*	
1310-nm TX/1550-nm RX	
20 km SC	**LMC5603C-10SC-20KM**
1550-nm TX/1310-nm RX	
20 km SC	**LMC5603C-50SC-20KM**
Single-Mode Plus *(Order one of each.)*	
1310-nm TX/1550-nm RX	
40 km SC	**LMC5603C-10SC-40KM**
1550-nm TX/1310-nm RX	
40 km SC	**LMC5603C-50SC-40KM**

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T1/E1/J1 Modules

T1/E1/J1 modules for the High-Density Media Converter System II enable you to extend 1.544-Mbps T1/J1 or 2.048-Mbps E1 copper-based circuits over duplex fiber optic cable. They're ideal for use with PBX systems or legacy telco circuits.

These modules are selectable to support 1.544-Mbps T1 (ANSI T1.403), 2.048-Mbps E1 (G.703), or 1.544-Mbps J1.

They include full diagnostics, including three modes of operation for loopback testing (Fiber Analog Loopback, Fiber Digital Loopback, and Twisted-Pair Digital Loopback), a line integrity test feature, and a Transmit Data Source diagnostic feature. Built-in jitter removal ensures maximum throughput. An MDI/MDI-X switch configures the RJ-48 port for crossover or straight-through cable connection automatically. This eliminates the worry of whether to use straight- or cross-pinned cabling.

LME001A

TECH SPECS

Encoding — AMI, B8ZS, HDB3
Fiber Type — 50/125-µm or 62.5/125-µm multimode; or 9/125-µm single-mode
Speed (Maximum) — T1, J1: 1.544 Mbps; E1: 2.048 Mbps
CE Approval — Yes
Connectors — T1/E1/J1: (1) RJ-48; Fiber optic: (1) pair of ST®, SC, or MT-RJ
Power — From the High-Density Media Converter System II chassis

Item		Code
High-Density Media Converter System II T1/E1/J1 Modules		
Twisted Pair (RJ-48) to Multimode, 1300-nm		
2 km	ST®	**LME001A**
	SC	**LME002A**
	MT-RJ	**LME003A**
Twisted Pair (RJ-48) to Single-Mode, 1310-nm		
40 km	ST	**LME004A**
	SC	**LME005A**
Twisted Pair (RJ-48) to Single-Mode, 1310-nm		
80 km	ST	**LME006A**
	SC	**LME007A**
Twisted Pair (RJ-48) to Single-Mode, 1550-nm		
80 km	SC	**LME008A**
Twisted Pair (RJ-48) to Single-Strand Single-Mode *(Must be used in complementary pairs.)*		
1310-nm TX/1550-nm RX		
20 km	SC	**LMC5192C**
1550-nm TX/1310-nm RX		
20 km	SC	**LMC5191C**
1310-nm TX/1550-nm RX		
40 km	SC	**LMC5190C**
1550-nm TX/1310-nm RX		
40 km	SC	**LMC5189C**

10-/100-Mbps Ethernet VDSL2 Extender Module

The 10-/100-Mbps Ethernet VDSL2 Extender Module provides an easy, affordable way to extend a 10/100 Ethernet network over existing CAT3 voice-grade wiring within buildings or sites. It uses second-generation VDSL2 technology (Band Plan 997/998) and offers user-selectable symmetrical and asymmetrical data transmission. The extender provides maximum VDSL bandwidth and adjusts automatically to obtain best bandwidth performance.

Item	Code
High-Density Media Converter System II Ethernet VDSL2 Extender Module	
(1) Twisted-Pair RJ-45 to (1) RJ-11 VDSL2	**LMC5601C-VDSL2**

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DS3/E3/STS-1 Modules

DS3/E3/STS-1 Modules for the High-Density Media Converter System II provide conversion from BNC coax cable to fiber for DS3, E3, or STS-1 applications.

They're ideal in Municipal Area Network (MAN) access applications, for linking buildings over a campus area network, or anywhere incoming coaxial circuits need to be converted to fiber for distribution. Use fiber to extend high-speed coax circuits at greater distances and never worry about interference.

The modules are selectable for DS3 (45 Mbps), E3 (34 Mbps), or STS-1 (52 Mbps) and support half- or full duplex operation. Advanced line conditioning and jitter removal features ensure maximum throughput.

Fiber loopback and coax loopback test capabilities enable you to troubleshoot remote units from a central location. The modules also include FiberAlert for troubleshooting the fiber link and a transmit data source diagnostic feature, which by sending specific patterns of data, enables you to identify problems with the attached cable.

TECH SPECS

Fiber Type — 50/125-µm or 62.5/125-µm multimode; or 9/125-µm single-mode

Speed (Maximum) — DS3: 45 Mbps;
E3: 34 Mbps;
STS-1: 52 Mbps

CE Approval — Yes

Connectors — DS3/E3/STS-1: (1) BNC;
Fiber optic: (1) pair of ST or SC

Power — From the High-Density Media Converter System II chassis

LME020A

Item	Code
DS3/E3/STS-1 Modules for the High-Density Media Converter System II	
BNC Coax to Multimode, 1300-nm, 2 km	
ST	**LME020A**
SC	**LME021A**
BNC Coax to Multimode, 1300-nm, 40 km	
ST	**LME022A**
SC	**LME023A**
BNC Coax to Multimode, 1310-nm, 80 km	
ST	**LME024A**
SC	**LME025A**
BNC Coax to Multimode, 1550-nm, 100 km	
SC	**LME026A**
BNC Coax to Single-Strand Single-Mode, 20 km (Order one of each.)	
1310-nm Transmit/1550-nm Receive, SC	**LMC5188C**
1550-nm Transmit/1310-nm Receive, SC	**LMC5187C**
BNC Coax to Single-Strand Single-Mode, 40 km (Order one of each.)	
1310-nm Transmit/1550-nm Receive, SC	**LMC5186C**
1550-nm Transmit/1310-nm Receive, SC	**LMC5185C**

SFP/SFP Mode Converter Module

The SFP/SFP Mode Converter Module is a dual SFP-port, SNMP-manageable module that you use to incorporate multiple fiber types and wavelengths within a network. It enables you to use SFPs to convert between different wavelengths or single-mode to multimode fiber, single-mode to single-mode fiber, or multimode to single-strand single-mode fiber.

The module supports variable-speed SFPs and user-configurable LinkLoss for isolating cable faults and failures. Plus, it's an Industrial Equipment (IE) device and works in extended-temperature areas.

Item	Code
High-Density Media Converter System II SFP/SFP Mode Converter Module	
(1) SFP Slot to (1) SFP Slot	**LMC5601C-2SFP**

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Fiber Mode Conversion Modules

These protocol-independent modules convert multimode to single-mode fiber. Use them to add extra distance—up to 70 kilometers (43.5 miles)—to your fiber infrastructure. Or use them for migrating your multimode fiber infrastructure to single mode.

Modules that support up to 155 Mbps are typically used for Ethernet or Fast Ethernet, although, because they are transparent to protocol, they can also be used in an OC-3 ATM (155-Mbps) environment. Use the modules that support up to 1250 Mbps for Gigabit Ethernet or OC-12 ATM.

Use a Repeater Module anywhere you need extra distance on a single-mode fiber link. Repeater modules support distances of up to 40 kilometers and can be daisychained for fiber cable runs hundreds of kilometers long.

The repeater modules retime the data signal, remove jitter, and retransmit the amplified signal. User-selectable transmission speeds range from 622-Mbps (OC-12) up to 1250-Mbps Gigabit Ethernet.

Both Fiber Mode Conversion Modules and Fiber Repeater Modules include FiberAlert to notify you of "silent failures" and help you troubleshoot problems. No more time wasted searching for them! You can check a link by observing the status of the media converter's Link LED.

The FiberAlert function informs you when a fault occurs on one fiber strand and the link can't carry bidirectional communications between two fiber devices. With FiberAlert, the link status of one end is mirrored at the opposite end. If a strand isn't available, and you have FiberAlert enabled, the receiver end device notes the loss of the link and stops transmitting data until it receives a signal or link pulse. This means that the link status can be seen at **both ends** through the respective Link LEDs, thus helping you to identify and isolate faults anywhere in the fiber loop. FiberAlert works even if the fiber devices are separated by great distances.

LMC5032C

Item	Code
Fiber Mode Conversion Modules for the High-Density Media Converter System II	
155 Mbps (Fast Ethernet)	
Multimode, 850-nm to Single-Mode, 1310-nm, 2 km	
Multimode/40 km Single-Mode	
ST/ST	**LMC5032C**
Multimode, 850-nm to Single-Mode, 1310-nm, 2 km	
Multimode/80 km Single-Mode	
ST/ST	**LMC5034C**
SC/SC	**LMC5035C**
Multimode, 1300-nm to Single-Mode, 1310-nm, 2 km	
Multimode/40 km Single-Mode	
ST/ST	**LMC5028C-R2**
SC/SC	**LMC5029C**
Multimode, 1300-nm to Single-Mode, 1310-nm, 2 km	
Multimode/80 km Single-Mode	
ST/ST	**LMC5030C**
SC/SC	**LMC5031C**
622 Mbps (OC-12 ATM)	
Multimode, 1300-nm to Single-Mode, 1300-nm, 40 km	
SC/SC	**LMC5010C**
1250 Mbps (Gigabit Ethernet or OC-12 ATM)	
Multimode, 850-nm to Single-Mode, 1310-nm, 2 km	
Multimode/10 km Single-Mode	
SC/SC	**LMC5036C**
Multimode, 850-nm to Single-Mode, 1310-nm, 2 km	
Multimode/40 km Single-Mode	
SC/SC	**LMC5011C**
Multimode, 850-nm to Single-Mode, 1550-nm, 2 km	
Multimode/70 km Single-Mode	
SC/SC	**LMC5012C**
Single-Strand Multimode to Single-Strand Single-Mode, 40 km *(Order one of each.)*	
1310-nm Transmit/1550-nm Receive, SC/SC	**LMC5169C**
1550-nm Transmit/1310-nm Receive, SC/SC	**LMC5168C**
Fiber Repeater Modules	
Single-Mode Plus, 1310-nm to Single-Mode Plus, 1310-nm, 40 km	
SC	**LE1029C**

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Layer 2 managed modules and media converters

Managed High-Density Media Converter System II Modules work with all High-Density Media Converter System II chassis. Because management features are built into the module, not the chassis, the modules are fully manageable even if installed in an unmanaged chassis.

Multiport Managed Media Converters work as remote units with the chassis-based modules. Use the fiber port to extend your network, use the three or four 10-/100-Mbps copper ports to add Ethernet links at the remote site.

Managed High-Density Media Converter System II Modules work together with Multiport Managed Media Converters to create an ideal "last-mile" solution, bringing bandwidth-managed secure content to users up to 100 kilometers (62 miles) away. This combination is also an ideal solution for ISPs or multitenant building owners who need to provide secure connections to several individual users.

Management

Both the modules and the standalone media converters include a comprehensive range of management options that enables carrier-grade delivery of transparent network services with tight security and full control of network traffic. The converters are fully SNMP manageable for integration into your managed network and include VLAN tagging.

TECH SPECS

Multiport Managed Media Converters:
Altitude — 0 to 10,000 ft. (0 to 3048 m)
Distance (Maximum) — Downlinks: 100 m (328 ft.);
  Uplink: LH1310A, LH1410A: 100 m;
    LH1311A–LH1312A, LH1411A–LH1412A: 2 km (1.2 mi.);
    LH1313A–LH1314A, LH1319A– LH1320A, LH1413A–LH1414A,
      LH1420A– LH1421A: 40 km (24.9 mi.);
    LH1315A–LH1316A, LH1415A–LH1416A: 80 km (49.7 mi.);
    LH1317A–LH1318A, LH1418A–LH1419A: 20 km (12.4 mi.);
    LH1321A–LH1321A: 60 km (37.3 mi.);
    LH1417A: 100 km (62.1 mi.)
Enclosure — Steel
Forwarding — 10 Mbps: 14,880 pps;
  100 Mbps: 148,800 pps
Management — In-band via included iView software;
  SNMP v1 and v2c compatible; Support for Telnet™
Operation — Half- or full-duplex
Standards — IEEE 802.3i, IEEE 802.3u, IEEE 802.1p, IEEE 802.1Q
CE Approval — Yes
Environmental — Storage Temperature: -13 to +158° F (-25 to +70° C);
  Operating Temperature: +32 to +122° F (0 to +50° C);
  Humidity: 5–90%, noncondensing
Power — 100–240 VAC, 50–60 Hz external power supply
Size — 3-Port models: 0.9"H x 3.5"W x 4.4"D (1 x 8.9 x 11.2 cm);
  4-Port models: 1.5"H x 4.75"W x 7.2"D (3.2 x 12.1 x 18.4 cm)
Weight — 3-port models: 1.1 lb. (0.5 kg);
  4-port models: 1.6 lb. (0.6 kg)

Item	Code
Managed High-Density Media Converter System II Modules	
(1) 10-/100-Mbps Copper to (1) 100-Mbps Duplex Fiber	
Multimode, 1300-nm, 2 km	
ST	**LMC546C**
SC	**LMC547C**
Single-Mode, 1310-nm, 40 km	
ST	**LMC548C**
SC	**LMC549C**
Single-Mode, 1310-nm, 80 km	
ST	**LMC550C**
SC	**LMC551C**
Single-Mode, 1550-nm, 100 km	
SC	**LMC552C**
(1) 10-/100-Mbps Copper to (1) 100-Mbps Single-Strand Fiber	
(Order one of each.)	
Single-Mode, 20 km	
1310-nm TX/1550-nm RX, SC	**LMC553C**
1550-nm TX/1310-nm RX, SC	**LMC554C**
Single-Mode, 40 km	
1310-nm TX/1550-nm RX, SC	**LMC555C**
1550-nm TX/1310-nm RX, SC	**LMC556C**
Single-Mode, 60 km	
1310-nm TX/1550-nm RX, SC	**LMC557C**
1550-nm TX/1310-nm RX, SC	**LMC558C**
With SFP Interface	
(1) 10-/100-Mbps Copper to (1) 155-Mbps SFP Slot	
	LMC543C
(1) 155-Mbps SFP Slot to (1) 155-Mbps SFP Slot	**LMC544C**
	LH1410A
Multiport Managed Media Converters	
(4) 10-/100-Mbps Copper to (1) 100-Mbps Duplex Fiber	
Multimode, 1300-nm, 2 km	
ST	**LH1411A**
SC	**LH1412A**
Single-Mode, 1310-nm, 40 km	
ST	**LH1413A**
SC	**LH1414A**
Single-Mode, 1310-nm, 80 km	
ST	**LH1415A**
SC	**LH1416A**
Single-Mode, 1550-nm, 100 km	
SC	**LH1417A**
(4) 10-/100-Mbps Copper to (1) 100-Mbps Single-Strand Fiber	
(Order one of each.)	
Single-Mode, 20 km	
1310-nm TX/1550-nm RX, SC	**LH1418A**
1550-nm TX/1310-nm RX, SC	**LH1419A**
Single-Mode, 40 km	
1310-nm TX/1550-nm RX, SC	**LH1420A**
1550-nm TX/1310-nm RX, SC	**LH1421A**

NOTE: Single-Strand models must be used in matched pairs or with the equivalent High-Density Media Converter System II module. For details, contact our FREE Tech Support.

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