


CM-100 Fast Ethernet Converters

 perle.com/products/fast-ethernet-managed-media-converter-module.shtml

100Base-TX to 100Base-FX Fiber Mode Conversion

- 100Base-TX to 100Base-FX Fiber Media Converters
- Extend network distances up to 120km
- SC, LC and ST Media Converters
- Advanced Features: Link Pass-Through, Far-End Fault, Auto-MDIX
- High density applications with Perle [Media Converter Chassis](#)
- Manage via SNMP, CLI - Telnet/SSH, Internet browser, or [PerleVIEW Centralized Management Package](#) with an [MCR-MGT Media Converter Management Module](#)



Installed in a high density [Perle Media Converter Chassis](#), Perle's feature rich **Managed Fast Ethernet Media Converter Modules** transparently connect UTP copper to fiber. Our fast ethernet media converters provide an economical path to extend the distance of an existing network, the life of non-fiber based equipment, or the distance between two devices.

Network Administrators can rest assured with Perle's advanced features such as Auto-Negotiation, Auto-MDIX, [Link Pass-Through](#), Far End Fault, and Pause which make the end to end link completely transparent. This allows for more efficient troubleshooting and less on-site maintenance. Along with a [Media Converter Management Module](#) in the chassis, configuration and monitoring of the copper and fiber ports can be performed. These cost and time saving features, along with a lifetime warranty and free worldwide technical support, make Perle's **managed fast ethernet media converter modules** the smart choice for IT professionals.

For those environments requiring a medium to large-scale deployment of media converters, a centralized platform that simplifies the configuration, administration, monitoring, and troubleshooting of this gear is recommended. [PerleVIEW Device Management](#) software is a multi-user, Windows server-based application that delivers this level of Enterprise-grade solution.

CM-100 Managed Media Converter Features

Configuration Mode selection	Select whether the module is to use the on-board DIP switches or enable the management module in the chassis to manage
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Auto / MDIX	Auto-MDIX (automatic medium-dependant interface crossover) detects the signaling on the 100Base-TX interface to determine the type of cable connected (straight-through or crossover) and automatically configures the connection when enabled. With Auto-MDIX enabled, either a straight-through or crossover type cable can be used to connect the media converter to the device on the other end of the cable. Can manually set Auto or MDIX on the copper port via on-board strap or via the management card
Module Information	<ul style="list-style-type: none"> • Chassis Slot number that the module is in • Media converter model and serial • User configurable module name • User configurable fiber port name • User configurable copper port name • Hardware revision number • Firmware version number
Module DIP switch settings	View hardware DIP switch settings
Port Control	Enable or disable individual fiber or copper port on the module
Copper Port Status	<ul style="list-style-type: none"> • Port Enabled (Yes/No) • Link Status (Up/Down) • Auto Negotiation Settings (Disabled, Complete or In Progress) • Resolved as crossover MDI or MDIX type
Fiber Port Status	<ul style="list-style-type: none"> • Port Enabled (Yes/No) • Connector type (SC, LC, ST) • Link Status (Up/Down) • Far End Fault (OK, Failed) • Fiber Loopback mode (On/Off)
Module Control	<ul style="list-style-type: none"> • Reset card • Reset to factory default • Phy specific commands such write/read config, read dip switches • Update firmware • Fiber Loopback mode. (On/Off) • Upload/download configuration
Backup and Restore	Provides fast and easy module replacement. Management module will always save a copy of the media converter configuration and will restore this configuration automatically to the media module when it is detected in the slot
Auto-Negotiation (802.3u)	The media converter supports auto negotiation on the fast ethernet 100Base-TX interface.

Link Pass-Through

With Link Pass-Through the state of the 100Base-TX receiver is passed to the 100Base-FX transmitter to make the media converter appear transparent to the end devices that are connected. In addition if Far-End Fault is enabled the media converter can turn off the 100Base-TX transmitter when a FAR-End Fault is received.

Using Link Pass-Through with Far-End Fault minimizes data loss when a fault occurs. Should a fault occur, the end devices have the indication of a failure available to them making trouble shooting easier.

Far-End Fault (FEF)

The media converter implements the 802.3 standard for Far-End Fault for the indication and detection of remote fault conditions on the 100Base-FX fiber connection. With Far-End Fault enabled the media converter transmits the Far-End Fault Indication over the 100Base-FX fiber connection whenever a receive failure is detected on the 100Base-FX fiber connection. The media converter continuously monitors the 100Base-FX fiber connection for a valid signal.

The action the media converter takes on receiving a Far-End Fault Indication is dependent on the Link Pass Through switch setting.

Pause (IEEE 802.3xy)

Pause signaling is an IEEE feature that temporarily suspends data transmission between two devices in the event that one of the devices becomes overwhelmed. The fast ethernet media converter supports pause negotiation on the 100Base-TX copper connection.

VLAN

The media converter is transparent to VLAN tagged packets.

Indicators

Power / TST

This green LED is turned on when power is applied to the media converter. Otherwise it is off. The LED will blink when in Loopback test mode.

Fiber link on / Receive activity (LKF)

This green LED is operational only when power is applied. The LED is on when the 100Base-FX link is on and flashes with a 50% duty cycle when data is received.

Copper link on / Receive activity (LKC)

This green LED is operational only when power is applied. The LED is on when the 100Base-TX link is on and flashes with a 50% duty cycle when data is received.

Switches: On-Board (If Auto/Switch strap is set to Switch)

Auto-Negotiation (802.3u)

Enabled (Default) - The media converter uses 802.3u Auto-negotiation on the 100Base-TX interface. It is set to advertise full duplex.
Disabled - The media converter sets the 100Base-TX port to full duplex.

Pause

Pause should be enabled when all devices connected to the media converter support pause. Auto-Negotiation must be Enabled to use this feature.

Enabled (Default) - The Media converter will advertise Pause capability during Auto-Negotiation on the 100Base-TX interface.

Disabled - The Media converter will advertise that it does not have Pause capability during Auto-Negotiation on the 100Base-TX interface.

Link Pass Through

Enabled (Default) - When the state of the receiver is changed on the 100Base-TX interface it is reflected on the 100Base-FX fiber transmitter. When the state of the receiver on the 100Base-FX interface is changed it is reflected on the 100Base-TX transmitter. When a Far-End Fault Indication is received on the fiber interface the 100Base-TX transmitter is turned off. When the Far-End Fault Indication is cleared the transmitter is turned back on.

Disabled - The 100Base-TX and the 100Base-FX fiber interface operate independently. Far-End Fault indication on the 100Base-FX fiber interface has no effect on the 100Base-TX interface.

Far-End Fault (FEF)

Enabled (Default) - The media converter transmits the Far-End Fault Indication over the 100Base-FX fiber connection whenever a receive failure is detected on the 100Base-FX fiber connection. The media converter continuously monitors the 100Base-X fiber connection and clears the Far-End Fault Indication condition when a valid signal is received.

Disabled - Far-End Fault Indications are not transmitted regardless of the condition of the receive signal on the 100Base-FX fiber connection.

Remote Loopback

The media converter can perform a loopback on the 100Base-X fiber interface.

Disabled (Default - Up)

Enabled - The 100Base-X receiver is looped to the 100Base-X transmitter. The 100Base-TX transmitter is taken off the interface.

Auto-MDIX (Strap)	<p>If Auto-Negotiation (802.3u) is enabled, the media converter uses the HP Auto-MDIX method for the 100Base-TX interface. If Auto-Negotiation (802.3u) is disabled the Media converter will use the RX Energy method on the 100Base-TX interface to set the port MDI or MDIX whichever is appropriate.</p> <p><i>Enabled (Default)</i> - Either a straight-through or crossover type cable can be used to connect the media converter to the device on the other end of the cable.</p> <p><i>Disabled</i> - If the partner device on the other end of the cable does not have the Auto-MDIX feature a specific cable, either a straight-through or crossover will be required to ensure that the media convertor's transmitter and the partner devices transmitter are connected to the others receiver. The Media Convertor's 100Base-TX port is configured as MDI with this switch setting.</p>
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Configuration Mode (Strap)	<p>Auto (default) enable management module to overwrite hardware switch settings</p> <p>Switch - Use onboard DIP switches</p>
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Cables

100Base-TX	RJ45 connector, 2 pair CAT 5, EIA/TIA 568A/B or better cable
Magnetic Isolation	1.5kv
Fiber Optic Cable	<p>Multimode: 62.5 / 125, 50/125, 85/125, 100/140 micron</p> <p>Single Mode: 9/125 micron (ITU-T 625)</p>

Packet Transmission Characteristics

Bit Error Rate (BER)	<10 ⁻¹²
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Environmental Specifications

Operating Temperature	0 C to 50 C (32 F to 122 F)
Storage Temperature	minimum range of -25 C to 70 C (-13 F to 158 F)
Operating Humidity	5% to 90% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude	Up to 3,048 meters (10,000 feet)
Heat Output (BTU/HR)	6.8

Maximum Power Consumption (watts)	2.0
MTBF (Hours)	595,000 (Calculation model based on MIL-HDBK-217-FN2 @ 30 °C)
Mechanical - Hot Swapping Card	
Edge Connector	32 pin DIN 41612 / IEC 60603-2 Type B/2 Male. First make, last break for ground and power
Card insertion and removal	Captive thumb screws enable fast insertion and removal. Can be further tightened with a screwdriver.
Product Weight	
Weight	0.15 kg, 0.33 lbs
Packaging	
Shipping Weight	0.33 kg, .73 lbs
Shipping Dimensions	203 x 38 x 152 mm, 8 x 1.5 x 6 inches
Regulatory Approvals	
	FCC Part 15 Class A, EN55022 Class A
	CISPR 22 Class A CISPR 32:2015/EN 55032:2015 (Class A) CISPR 24:2010/EN 55024:2010
Emissions	EN61000-3-2
Immunity	EN55024
	UL/EN/IEC 62368-1 CAN/CSA C22.2 No. 62368-1
	UL 60950-1 IEC 60950-1(ed 2); am1, am2 EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Safety	CE
	EN 60825-1:2007
Laser Safety	Fiber optic transmitters on this device meet Class 1 Laser safety requirements per IEC-60825 FDA/CDRH standards and comply with 21CFR1040.10 and 21CFR1040.11.
Environmental	<u>Reach, RoHS and WEEE Compliant</u>

ECCN: 5A991

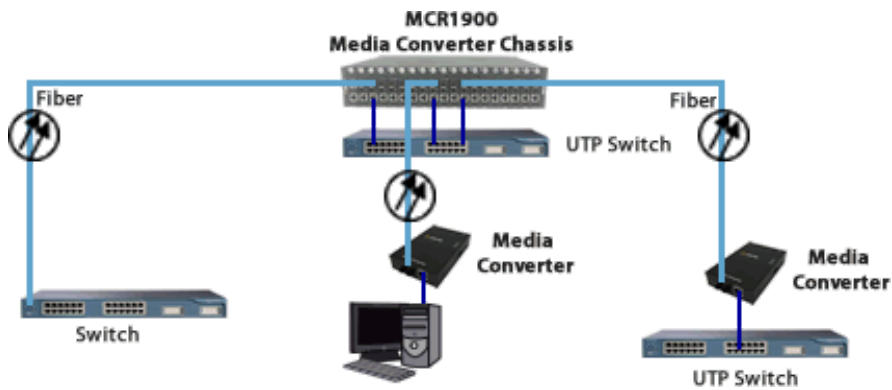
HTSUS Number: 8517.62.0020

Other

Perle Limited Lifetime Warranty

High Density Fiber Distribution from UTP Switch Equipment at Corporate Headquarters

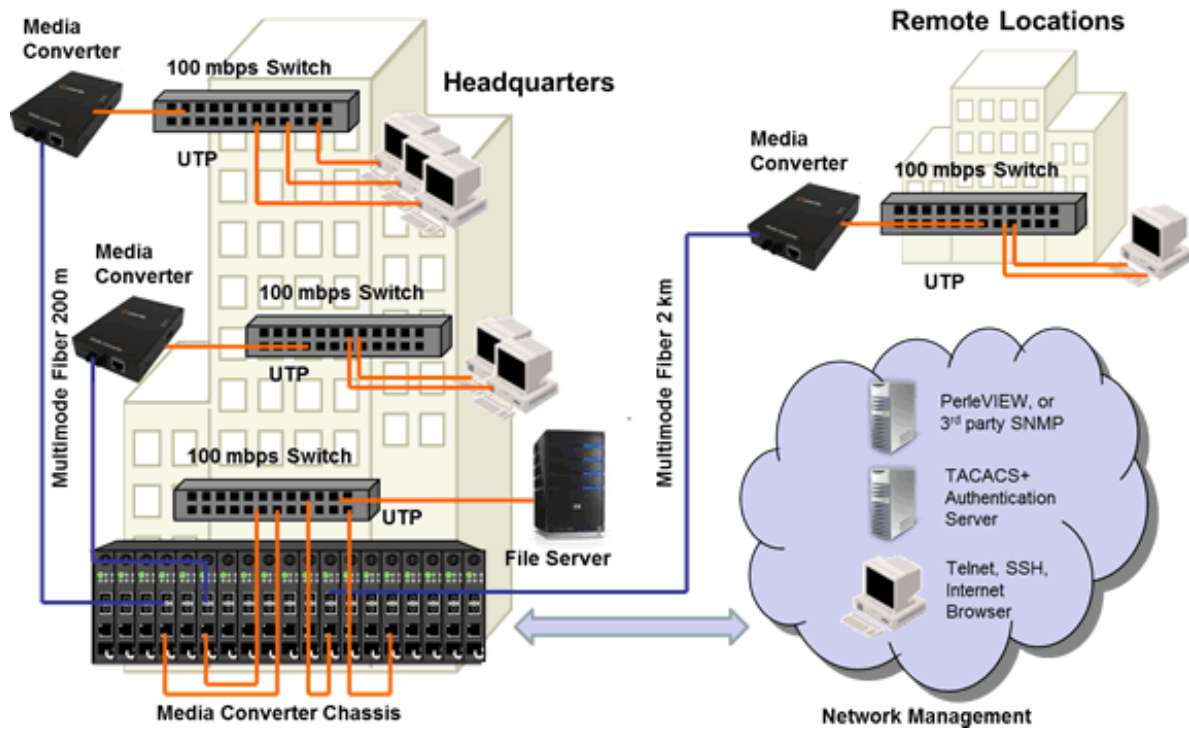
In this enterprise campus application, up to 18 Perle CM-100 Fast Ethernet to Fiber Media Converters are installed in the MCR1900 Media Converter Chassis. The 19th slot in the chassis is filled the MCR-MGT Management Module. All media converts in the chassis are managed by SNMP, Telnet or an internet browser interface. A remote fiber enabled Ethernet switch is connected directly to the central MCR1900 Chassis. A standalone S-100 Media Converter converts the fiber to Ethernet in a fiber-to-desktop application. Another S-100 Fiber Media Converter is connected to a remote office Ethernet switch. In all cases, multimode or single-mode fiber can be used. Fiber links can be extended up to 120km using single-mode fiber.



Ethernet to Fiber in a Campus Network

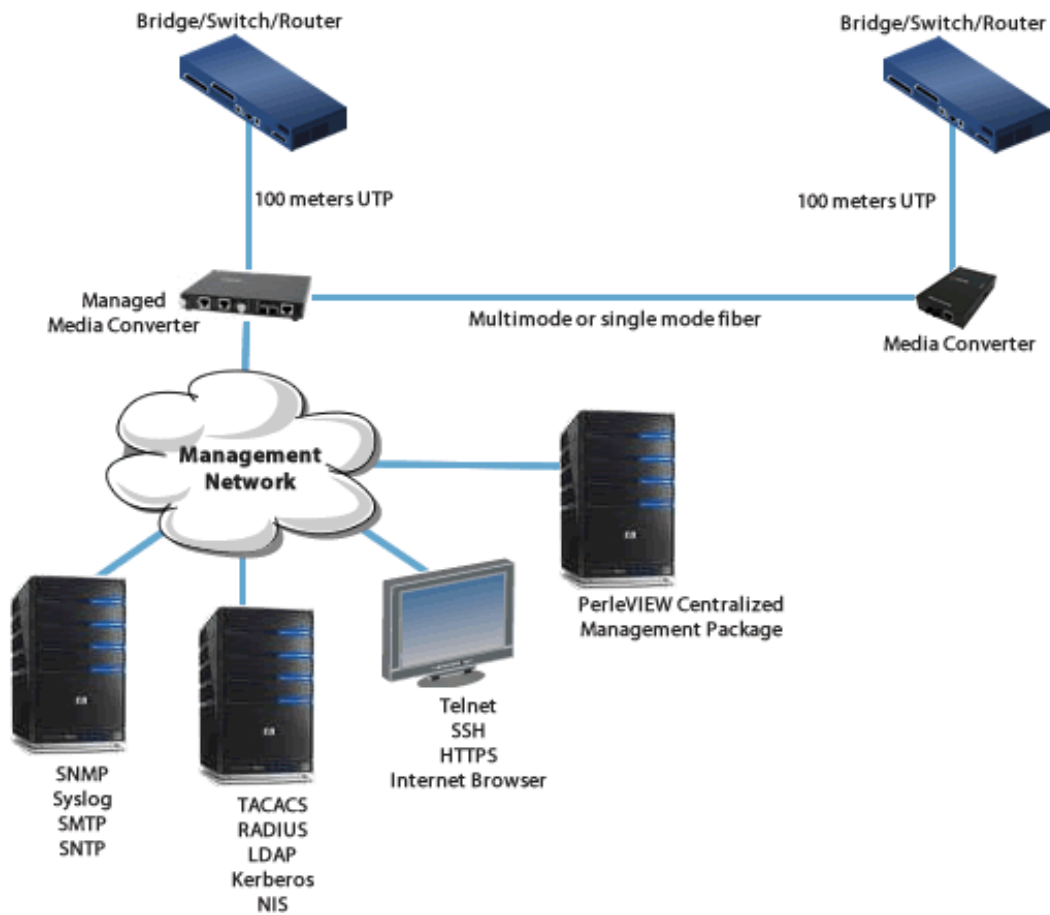
The use of chassis-based media converters is a cost effective means in providing fiber connectivity in a campus network. By consolidating Ethernet to fiber conversion in a rack mount media converter chassis, various types of fiber links can be brought into a single wiring closet platform. This simplifies deployment and maintenance and also provides a scalable means to grow your network as needed.

Managed Media Converter Platform



Managed Ethernet over Fiber Links

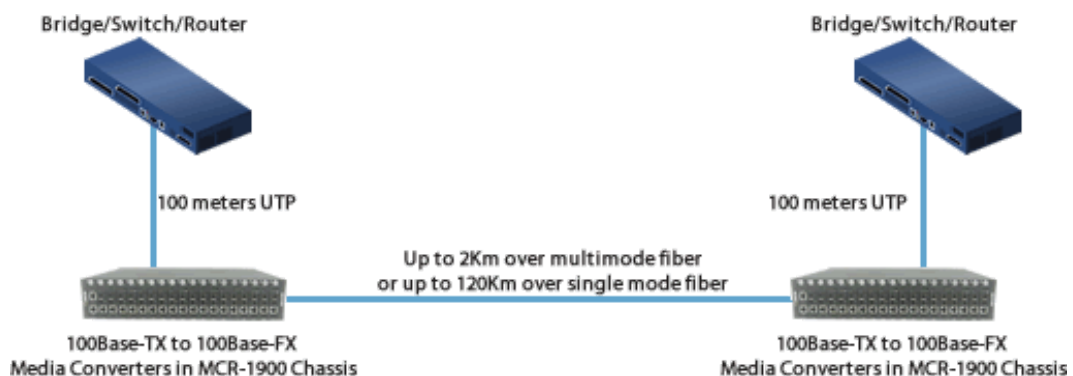
Manage your **copper to fiber** link with an MCR200 chassis housing a media converter and management module. Ideal for use in managed networks with low density fiber applications, this Managed Media Converter is connected across a fiber link to a remote media converter. The copper or fiber link on the managed standalone unit can provide vital information and status to network management tools such as SNMP.



Fast Ethernet UTP Switch to UTP Switch

Extend the network distance between two twisted pair switches

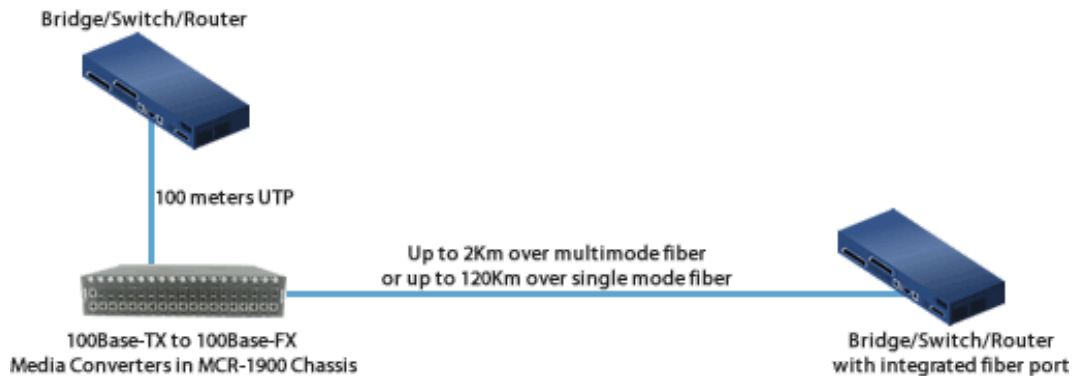
Two Fast Ethernet Media Converters can extend the distance between UTP Switches across a fiber link up to 120km in length.



Fast Ethernet UTP Switch to Fiber Switch

Interconnect a UTP Switch with a Fiber Switch

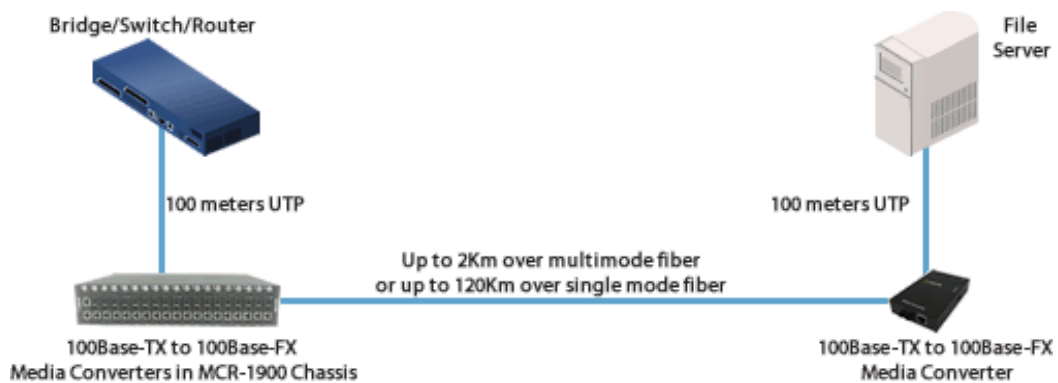
A media converter can interconnect a UTP copper based Switch port to a remote switch that has integrated fiber.



Fast Ethernet UTP Switch to File Server

Extend the network distance between switches and file servers

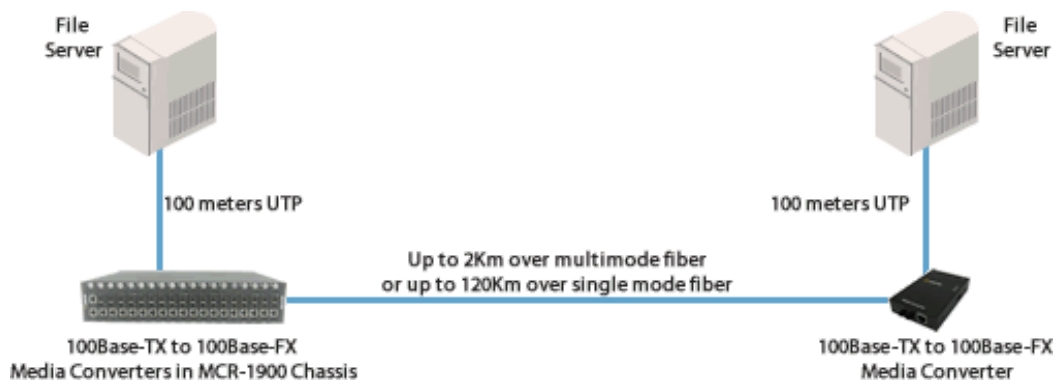
Two Fast Ethernet Media Converters can extend the distance between UTP Switches and remote file servers across fiber links up to 120km in length.



Direct Connect - Long Distance

Direct Connection between two remote devices

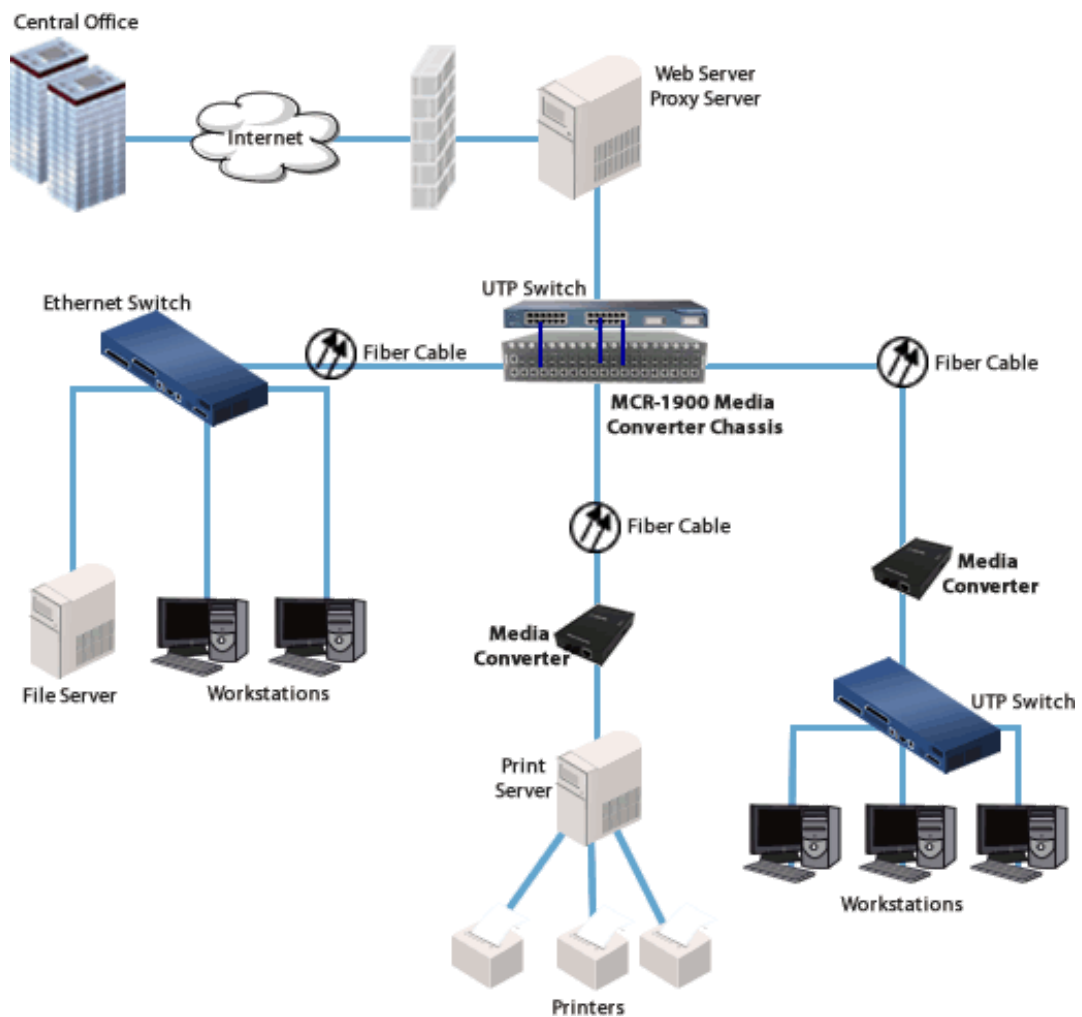
With a pair of Fast Ethernet Media Converters two devices, such as file servers, can be connected up to 120Km away across a fiber link.



Enterprise Infrastructure

Enterprise Infrastructure using Fiber Optics

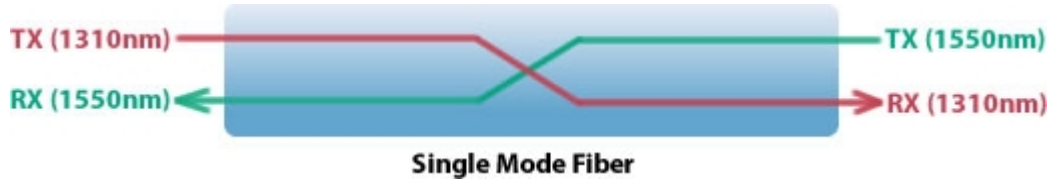
Create a fiber infrastructure for your enterprise network without any wholesale replacement of existing copper-based equipment.



Single Mode / Single Fiber

Connect copper ports over a single fiber strand (also referred to as “Bi-Directional” BiDi)

When Single Strand fiber is used, a pair of Single Fiber Media Converters is needed for the copper to fiber conversion. Perle Single Fiber Media Converters are also referred to as “Up/Down” models. For example the CM-100-S1SC20U (“Up”) and CM-100-S1SC20D (“Down”), shown below, must be used in pairs. An “Up” must be matched with a “Down” peer to deal with transmit and receive frequencies separately.



CM-100-S1SC20UCM-100-S1SC20D

The majority of installations for single mode fiber media converters are of the “dual connector” or “dual fiber” type where one fiber connection is used for transmit, the other for receive. These are physically “crossed” to match up the Transmit/Receive links.

However, to reduce costs, or where there are limits on available fiber, WDM technology may be utilized. WDM uses separate transmit and receive frequencies to communicate on a single fiber strand. WDM technology relies on the fact that optical fibers can carry many wavelengths of light simultaneously without interaction between each wavelength. Thus, a single fiber can carry many separate wavelength signals or channels simultaneously.

So remember, if Single Strand fiber is used, you will need an “Up” Media Converter on one side and a “Down” Media Converter on the other for copper to fiber conversion.

Perle offers a wide variety of Single Fiber (“Up/Down”) Media Converters to connect 10BaseT, Fast Ethernet and Gigabit to single fiber. Whether you need Managed or Unmanaged, Standalone or Modular Chassis Based, 20km or 120km, Perle has the right model to meet your fiber conversion requirement.

Select a Model to obtain a Part Number - Managed Media Converter Modules - Fast Ethernet to Fiber

Model	Connector	Type	Transmit (dBm)		Receive (dBm)		Power Budget (dBm)	Wavelength (nm)	Fiber Type	Operating Distance
			Min	Max	Min	Max				
CM-100-M2ST2	Dual ST	100Base-FX	-20.0	-12.0	-31.0	-14.0	11.0*	1310	MMF	2 km (1.2 mi)
CM-100-M2SC2	Dual SC	100Base-FX	-20.0	-12.0	-31.0	-14.0	11.0*	1310	MMF	2 km (1.2 mi)
CM-100-M2LC2	Dual LC	100Base-FX	-20.0	-12.0	-30.0	-14.0	10.0*	1310	MMF	2 km (1.2 mi)
CM-100-S2ST20	Dual ST	100Base-LX	-18.0	-7.0	-32.0	-3.0	14.0	1310	SMF	20 km (12.4 mi)
CM-100-S2SC20	Dual SC	100Base-LX	-18.0	-7.0	-32.0	-3.0	14.0	1310	SMF	20 km (12.4 mi)
CM-100-S2LC20	Dual LC	100Base-LX	-15.0	0.0	-34.0	-5.0	19.0	1310	SMF	20 km (12.4 mi)
CM-100-S2ST40	Dual ST	100Base-EX	-5.0	0.0	-34.0	-3.0	29.0	1310	SMF	40 km (25 mi)
CM-100-S2SC40	Dual SC	100Base-EX	-5.0	0.0	-34.0	-3.0	29.0	1310	SMF	40 km (25 mi)

<u>CM-100-S2LC40</u>	Dual LC	100Base-EX	-5.0	0.0	-34.0	-3.0	29.0	1310	SMF	40 km (25 mi)
<u>CM-100-S2ST80</u>	Dual ST	100Base-ZX	-5.0	0.0	-34.0	-3.0	29.0	1550	SMF	80 km (50 mi)
<u>CM-100-S2SC80</u>	Dual SC	100Base-ZX	-5.0	0.0	-34.0	-3.0	29.0	1550	SMF	80 km (50 mi)
<u>CM-100-S2LC80</u>	Dual LC	100Base-ZX	-5.0	0.0	-34.0	-3.0	29.0	1550	SMF	80 km (50 mi)
<u>CM-100-S2ST120</u>	Dual ST	100Base-ZX	0.0	5.0	-35.0	-3.0	35.0	1550	SMF	120 km (75 mi)
<u>CM-100-S2SC120</u>	Dual SC	100Base-ZX	0.0	5.0	-35.0	-3.0	35.0	1550	SMF	120 km (75 mi)
<u>CM-100-S2LC120</u>	Dual LC	100Base-ZX	0.0	5.0	-34.0	-3.0	34.0	1550	SMF	120 km (75 mi)

Single Fiber Models Recommended use in pairs

Model	Connector	Type	Transmit (dBm)		Receive (dBm)		Power Budget (dBm)	Wavelength (nm)	Fiber Type	Operating Distance
			Min	Max	Min	Max				
<u>CM-100-M1ST2U</u>	Single ST	100Base-BX-U	-15.0	0.0	-28.0	-8.0	13.0	1310 / 1550	MMF	2 km (1.2 mi)
<u>CM-100-M1ST2D</u>	Single ST	100Base-BX-D	-15.0	0.0	-28.0	-8.0	13.0	1550 / 1310	MMF	2 km (1.2 mi)
<u>CM-100-M1SC2U</u>	Single SC	100Base-BX-U	-15.0	0.0	-28.0	-8.0	13.0	1310 / 1550	MMF	2 km (1.2 mi)
<u>CM-100-M1SC2D</u>	Single SC	100Base-BX-D	-15.0	0.0	-28.0	-8.0	13.0	1550 / 1310	MMF	2 km (1.2 mi)
<u>CM-100-S1ST20U</u>	Single ST	100Base-BX-U	-14.0	-8.0	-32.0	-3.0	18.0	1310 / 1550	SMF	20 km (12.4 mi)
<u>CM-100-S1ST20D</u>	Single ST	100Base-BX-D	-14.0	-8.0	-32.0	-3.0	18.0	1550 / 1310	SMF	20 km (12.4 mi)
<u>CM-100-S1SC20U</u>	Single SC	100Base-BX-U	-14.0	-8.0	-32.0	-3.0	18.0	1310 / 1550	SMF	20 km (12.4 mi)
<u>CM-100-S1SC20D</u>	Single SC	100Base-BX-D	-14.0	-8.0	-32.0	-3.0	18.0	1550 / 1310	SMF	20 km (12.4 mi)
<u>CM-100-S1SC40U</u>	Single SC	100Base-BX-U	-8.0	-3.0	-33.0	-3.0	25.0	1310 / 1550	SMF	40 km (25 mi)
<u>CM-100-S1SC40D</u>	Single SC	100Base-BX-D	-8.0	-3.0	-33.0	-3.0	25.0	1550 / 1310	SMF	40 km (25 mi)

The minimum fiber cable distance for all converters listed is 2 meters.

*Based on use with 62.5/125 micron multimode fiber.

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