CM-10GT Managed Media Converter Modules

10GBase-T Copper, Fiber and Rate Conversion

- CM-10GRT supports 10/100/1000/2500/10000 rate conversion
- Use 10G transceivers supplied by Perle, Cisco or other MSA compliant SFP+ and XFPs
- Advanced features –Smart Link Pass-Through, Fiber Fault Alert, Built-in Link Test Generator and Loopback
- High density applications with Perle MCR1900 Media Converter Chassis
- Manage via SNMP, CLI - Telnet/SSH, Internet browser, or PerleVIEW Centralized Management Package with an MCR-MGT Media Converter Management Module
- Support for Power Level 1,2,3 as well as high-power Level 4 XFPs

Installed in a high density MCR1900 Media Converter Chassis, Perle **CM-10GT Media Converter Modules** transparently connect 10GBase-T Ethernet links over multimode or single mode fiber. The CM-10GRT additionally supports 10/100/1000/2500/10000 rate conversion. Each 10GbE Media Converter comes with one RJ45 10GBase-T port and an empty slot for one SFP+ or XFP module. These media converters can be used in an unmanaged environment or can be SNMP manageable to enable complete control and status viewing of your fiber links. 10GBASE-T Media Converter Modules are also available for unmanaged networks, or for low to mid-density application check out the stand alone SMI-10GT Managed Media Converter.

Copper to Fiber conversion is achieved by inserting XFP or SFP+ fiber transceivers that support multimode and single-mode fiber, including CWDM/DWDM wavelengths. Copper to copper is achieved by inserting SFP+ Direct Attach Cable (DAC), also known as twinax, or XFP 10Gbase-CX4 transceivers.

The empty transceiver port on the **CM-10GT Media Converter Modules** allow for flexible network configurations to meet any requirement using a variety of 10G transceivers supplied by Perle, Cisco or other manufacturers of MSA compliant SFP+ and XFPs. You can use these products to convert:

- 10GBase-T (RJ45) to SFP+
- 10GBase-T (RJ45) to XFP
- 1000Base-T (RJ45) to 1000Base-X (SFP)
- 10GBase-T (RJ45) to Direct Attach DAC copper twinax (SFP+)
- 10GBase-T (RJ45) to 10GBase-CX4 (XFP)
- 10/100/1000/2500/10000 Ethernet

Perle 10 Gigabit Ethernet to Fiber Converters provide an economical path to extend the distance of an existing 10GbE link. Network Administrators can "see-everything" with Perle's advanced features such as Smart Link Pass-Through, Fiber Fault Alert, a built-in Link Test capability and Loopback. Along with a Media Converter Management Module in the chassis, configuration and monitoring of the copper and fiber ports can be performed. This allows for more efficient troubleshooting and less on-site maintenance. These cost and time saving features, along with a **lifetime warranty** and **free worldwide technical support**, make **CM-10GT 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 Perle Managed Media Converters is recommended. PerleVIEW Device Management software is a multi-user, Windows server-based application that delivers this level of Enterprise-grade solution.

CM-10GT Managed Media Converter Features

Rate Conversion	The CM-10GRT Media Converter can automatically detect Ethernet port speed and do a rate conversion between the two ports if the Ethernet speed is different.
Cut-Through Forwarding	The CM-10GRT Media Converter can be configured for Cut-Through Forwarding. This will increase the media converter's throughput and reduce latency by performing packet forwarding in the most efficient manner possible. Forwarding of a packet will begin as soon as the destination address is processed.
SFP Speed Sensing	Automatically detects whether a SFP has been inserted and adjusts the speed accordingly.
Smart Link Pass-Through	When Smart Link Pass-Through is enabled (default), each port will reflect the state of its port peer. In this mode, if a link loss is detected on one port, the transmit signal on the other port is disabled "passing through" the state of the failed link. This enables managed switches and other devices to report link failures to their network NMS. When Smart Link Pass-Through is disabled, if a link loss is detected on one port the transmit signal remains enabled on the other port.
Fiber Fault Alert	With Fiber Fault Alert the state of the 10 Gigabit Ethernet receiver is passed to the transmitter. This provides fault notification to the partner device attached to the 10G Ethernet interface of the media converter.
Green Ethernet	Utilizes Green Ethernet energy saving technology based on industry standards such as: • Short Reach Mode (less than 30 meters) as per IEEE 802.3at. This enables 10GBase-T operation with less power consumption. • Energy Efficient Ethernet (EEE) as per 802.3az. This provides power savings during idle network activity.

Built-in Link Test	When enabled, the built-in packet generator transmits Ethernet test frames to its 10 Gigabit Ethernet peer. The remote media converter will auto-detect the test frames and loopback the test frames. Any frames received in error, will cause the Power, LK1 and LK2 LEDs to illuminate in a specific combination to identify the error. During the test different bit test patterns will be utilized every 5 seconds ensuring a thorough link test.
Test Mode Auto-detect	When enabled through the management interface, the remote media converter will enter test mode automatically when requested by its central site peer. This virtually eliminates unnecessary truck rolls to a remote site when diagnosing a link failure.
EDC Mode Control	Electronic Dispersion Compensation (EDC) is an algorithmic method used to compensate for optical dispersion that occurs on high speed 10 Gigabit links. EDC mode settings are automatically configured by the media converter based on the information retrieved from the SFP+ module. This will enable proper operation for extended multimode 10GBase-LRM as well as active or passive copper cabling.
Module Temperature Protection	Protects your DOM/DMI capable SFP+ or XFP module by monitoring its internal temperature and will automatically shut down the XFP or SFP if the module is operating above its maximum temperature threshold.
High Power Level 4 XFPs	High powered Level 4 XFPs.
Gigabit SFP support	The 10 Gigabit media converter model with the SFP+ slot can also support Gigabit (1000Base-X) SFPs. This allows users to use Gigabit SFPs today and migrate to 10G SFP+ in the future.
Jumbo Packets	Transparent to jumbo packets.
VLAN	Transparent to VLAN tagged packets.
Remote Loopback	Capable of performing a loopback on the 10 Gigabit interface. In this mode, all frames received on the port in loopback mode will be transmitted back. This provides users with the capability of utilizing their own in-house test generators for testing the link.

Additional features available when installed along with a Media Converter Management Module in a Perle MCR1900 Media Converter Chassis

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.
Module Information	- Chassis Slot number that the module is in - Media converter model and serial - User configurable module name - User configurable fiber port name - Hardware revision number - Firmware version number

Module DIP switch settings	View hardware DIP switch settings.	
Port Control	Enable or disable individual fiber ports on the module.	
Fiber Port Status	- Port Enabled (Yes/No) - Connector - Link Status (Up/Down) - Fiber Fault Alert (OK, Failed) - Fiber Loopback mode (On/Off)	
Module Control	- Reset card - Reset to factory default - Ability to specific read/write phy registers - Update firmware - Fiber Loopback mode (Yes/No) - 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.	
Manage Tune-able DWDM XFP modules	Select transceiver ITU 50GHz center wavelengths and channel numbering on tune-able XFP transceivers.	

Power	10GT to SFP	10GT to XFP
Maximum Power Consumption (watts)	CM-10GT: 10 CM-10GRT: 14*	15*
Indicators		
Power / TST	- On: Power indication and in normal operation - Blinking slowly: the unit is in loopback or test mode (either port) - Red solid: the unit has a hardware error (upon power up) - Red and blinking: the unit has a hardware error specified by combination of LK1 and LK2	
LK1 (SFP/XFP)	- On: Link present - Blinking quickly: Fiber link present and receiving data.(including test data) - Blinking slowly: Fiber link disabled because the other fiber link went down. - Blinking 1 sec on 3 sec off – module shut down due to high temperature. - Off: No fiber link present or no module inserted	
LK2	On: 10GBase-T link present	

- Blinking quickly: Link present and receiving data
- Blinking slowly: Link disabled because Link 1 went down
- Off: 10GBase-T link is not active

Switches

Link Mode	When the Link Mode is enabled (default), each port will reflect the state of its port peer using Smart Link Pass-Through. In this mode, if a link loss is detected on one port, the transmit signal on the other port is disabled "passing through" the state of the failed link. This enables managed switches and other devices to report link failures to their network NMS. When the switch is in the down position, Smart Link Pass-Through is disabled. If a link loss is detected on one port, the transmit signal remains enabled on the other port.
Fiber Fault Alert	*Enabled (Default - Up)* With Fiber Fault Alert the state of the 10 Gigabit ethernet receiver is passed to the transmitter. This provides fault notification to the partner device attached to the 10G ethernet interface of the media converter *Disabled (Down)*
Test Mode	Through the use of three dip switches the unit, and its peer, can be placed into a link test mode which will verify the integrity of the link through the use of its built-in link test generator. The unit can also be placed into a simple line loopback.
EEE Green Ethernet	When enabled (default), the media converter will operate as an IEEE 802.3az Energy Efficient Ethernet (EEE) compliant device.
Loopback	Capable of performing a loopback on the 10 Gigabit interface. In this mode, all frames received on the port in loopback mode will be transmitted back. This provides users with the capability of utilizing their own in-house test generators for testing the link.

Connectors	**10GT to SFP**	**10GT to XFP**
10GBase-T (RJ45)	IEEE 802.3an 100 meters on CAT6A or better	IEEE 802.3an 100 meters on CAT6A or better
Pluggable 10G Fiber Transceiver slot (Hot insertion and removable)	10 Gigabit SFP+ Slot • Power level 1, 2	10 Gigabit XFP Slot • Power level 1,2,3
Voltages supplied to XFP slots	-	1.8V, 3.3V, 5V and -5.2V
Supported 10 Gigabit Fiber	IEEE 802.3ae compliant: • 10GBase-SR	IEEE 802.3ae compliant: • 10GBase-SR

| pluggable transceivers	• 10GBase-LRM • 10GBase-LR • 10GBase-ER • 10GBase-ZR CWDM/DWDM	• 10GBase-LRM • 10GBase-LR • 10GBase-ER • 10GBase-ZR CWDM/DWDM
Supported 10 Gigabit Copper pluggable transceivers	SFP+ Direct Attach Cable (DAC). Also known as: • Twinax • 10GBase-CU • 10GSFP+Cu • 10GBase-CX1 • 10GBase-CR1 Note: Passive and Active cable types supported	IEEE 802.3ak compliant: • XFP 10GBase-CX4 copper
Supported 2.5 Gigabit Copper pluggable transceivers	S-10GR Model: SFP+ Direct Attach Cable (DAC). Note: Passive and Active cable types supported	N/A
Supported Gigabit Fiber SFPs	1000Base-SX 1000Base-LX/LH 1000Base-BX CWDM/DWDM Note: the RJ45 interface will auto-negotiate to 1000Base-T (Gigabit)	N/A
Chassis Slot profile	Two slot	Two slots
Environmental Specifications	**10GT to SFP**	**10GT to XFP**
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)	CM-10GT: 34 CM-10GRT: 48	51
MTBF (Hours)**	CM-10GT: 261,388 CM-10GRT: 143,838	286,082
Packaging		
Shipping Weight	0.25 kg, 0.55 lbs	
Shipping Dimensions	170 x 260 x 70 mm, 6.7 x 10.2 x 2.8 inches	
Regulatory Approvals		
Emissions	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	
	EN61000-3-2	
Immunity	EN55024	
Electrical Safety	UL 60950-1	
	IEC 60950-1(ed 2); am1, am2 EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013	
	CE	
Laser Safety	Dependent on SFPs used. SFPs that meet Class 1 Laser safety requirements per IEC-60825 FDA/CDRH standards and comply with 21CFR1040.10 and 21CFR1040.11 are recommended for use with this product.	
Environmental	Reach, RoHS and WEEE Compliant	
Other	ECCN: 5A991	
	HTSUS Number: 8517.62.0050	
	Perle Limited Lifetime Warranty	

*Maximum rating for both media converter and modules inserted. Actual rating is dependent on the power consumption of the SFP+/XFP modules inserted.

**Calculation model based on MIL-HDBK-217-FN2 @ 30 °C

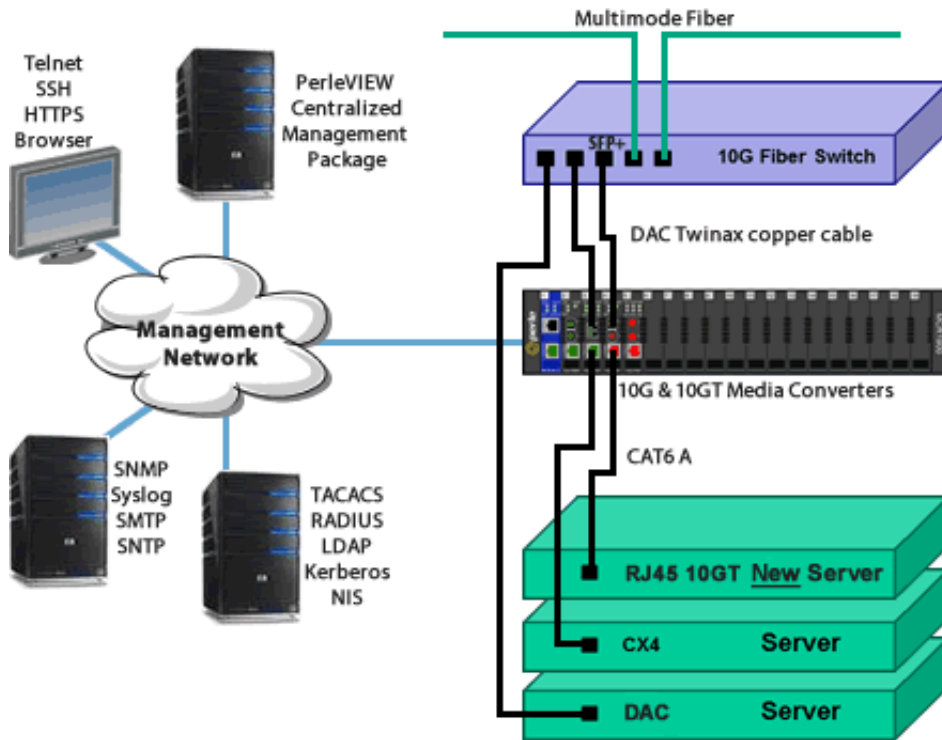| **10 Gigabit Copper to Fiber Media Conversion** |
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Convert one 10G Ethernet media to another

Convert your 10GBaseT copper link to multimode or single mode fiber. Ideal for large data centers and Co-Location applications where the distance required to connect top of rack switches exceeds the 100 meter limitation of 10G copper. Up to 18 Perle Media Converter Modules are installed in the MCR1900 Chassis. The 19th slot in the chassis is filled the MCR-MGT Management Module. All media converters in the chassis are managed by SNMP, Telnet or an internet browser interface. This allows the copper or fiber link to provide vital information and status updates to network various management tools.
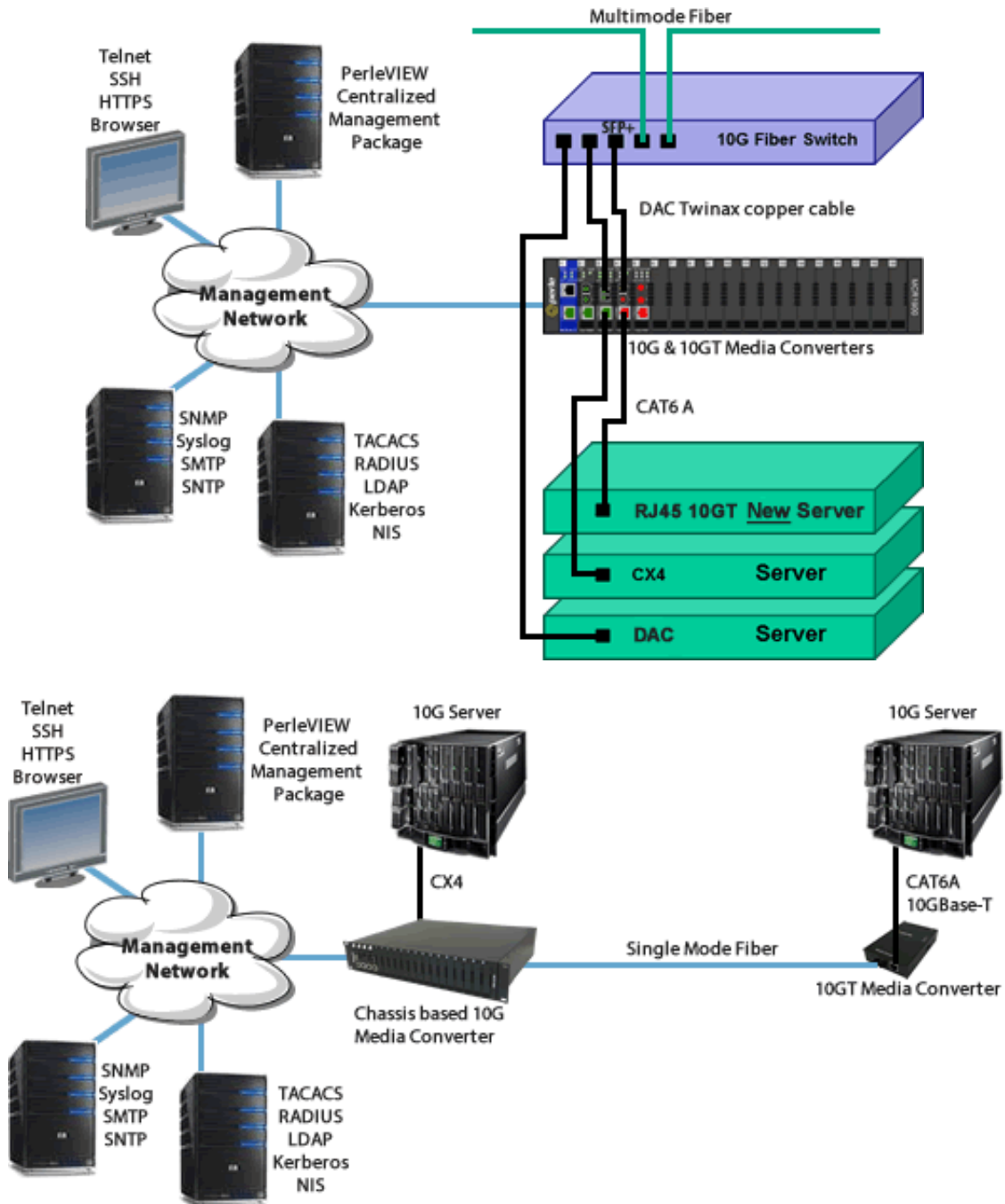
10 Gigabit Datacenter Upgrade

Add New 10GBase-T Servers to 10G Fiber Switch (SFP+)

Install new 10GBase-T Servers to existing top of rack switches. Connect your 10GBase-T server to SFP+ Switch with Direct Attach DAC copper cable. 10G Media Converters can also connect CX4 servers to SFP+ Switch.

CWDM Data Center

Connect XFP to SFP+ and SFP+ to SFP+ Media Converters to Fiber Mux

Convert copper to CWDM wavelengths for CX4 XFP copper to CWDM SFP+ conversion, Direct Attached Copper (DAC) or 10GBase-T to CWDM SFP+ conversion.