

C-10G Media Converter Modules

 perle.com/products/10-gigabit-media-converter-modules.shtml

10 Gigabit Copper, Fiber and Rate Converters

- 1000Base-T to 1000Base-X Fiber Media Converters
- C-10GR supports 10/100/1000/2500/10000 rate conversion
- Uses a variety of 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
- Support for Power Level 1,2,3 as well as high-power Level 4 XFPs
- Optical signal regeneration: 3R (re-amplify, reshape, and retime)



Installed in a high density MCR1900 Media Converter Chassis, Perle **C-10G Media Converter Modules** transparently connect 10 Gigabit Ethernet links over multimode or single mode fiber. Each 10GbE Media Converter comes with two pluggable transceiver ports that support fiber to fiber, copper to fiber or copper to copper media conversion. The C-10GR additionally supports 10/100/1000/2500/10000 rate conversion. 10G Media Converter Modules are also available for managed networks with AAA security or and as stand alone models.

Fiber to Fiber and 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 ports on the **C-10G 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:

- SFP+ to SFP+
- XFP to XFP
- XFP to SFP+
- SFP to SFP (1000Base-x to 1000Base-x)
- SFP+ to CX4
- 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. These cost and time saving features, along with a lifetime warranty and free worldwide technical support, make **C-10G Media Converter Modules** the smart choice for IT professionals.

C-10G Media Converter Features

Rate Conversion	The C-10GR 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 C-10GR 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	<p>When the Smart Link Pass-Through switch 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.</p> <p>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.</p>
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.
3R – Optical Signal Regeneration	Optical signal regeneration: 3R (Re -amplify, Res hape, and Re time the signal) ensures that there is a quality link at 10 Gigabit speeds.
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+ or XFP 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/DOMI 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 are supported in XTSH and XTXH models.
Gigabit SFP support	The 10 Gigabit media converter model with dual SFP+ slots can also support Gigabit (1000Base-X) SFPs. This allows users to use Gigabit SFPs today and migrate to 10G SFP+ in the future. Both slots must be populated with Gigabit SFPs.
Jumbo Packets	Transparent to jumbo packets.
VLAN	Transparent to VLAN tagged packets.
Remote Loopback	Capable of performing a loopback on each 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.

Power	Dual SFP	Dual XFP	XFP to SFP
Maximum Power Consumption (watts)	C-10G: 6.7 C-10GR: 17.2*	XTX: 12.0 * XTXH: 16.3 *	XTS: 9.1 * XTSH: 16.3 *
Total Transceiver Power Supported (watts)	3.0	XTX: 7.0 XTXH: 11.0	XTS: 5.0 XTSH: 7.0

Indicators

Power / TST	<ul style="list-style-type: none"> 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, LK2	<ul style="list-style-type: none"> On: Fiber 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

Switches

Smart Link	When the Smart Link Pass-Through switch is enabled (default), each port will reflect the
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Pass-Through 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 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)

EDC Mode 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+ or XFP module. This will enable proper operation for extended multimode 10GBase-LRM as well as active or passive copper cabling.
 In the default UP switch position the media converter will automatically set the 10G transceiver to match the EDC type declared by the SFP+ / XFP module to either to “linear” or “limiting”.
 In the event that there is a mismatch, setting the switch to the Down position on the media converter will flip the setting to that declared by the module.

Loopback Capable of performing a loopback on each 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	Dual SFP	Dual XFP	XFP to SFP
Pluggable 10G Fiber Transceiver slots (Hot insertion and removable)	Two 10 Gigabit SFP+ Slots <ul style="list-style-type: none"> • Power level 1, 2 	Two 10 Gigabit XFP Slots <ul style="list-style-type: none"> • Power level 1,2,3 • Power Level 4 (XTSH model) 	One 10 Gigabit SFP+ <ul style="list-style-type: none"> • Power Level 1, 2 One 10 Gigabit XFP <ul style="list-style-type: none"> • Power level 1,2,3 • Power Level 4 (XTSH model)
Voltages supplied to XFP slots	-	1.8V, 3.3V, 5V and -5.2V	1.8V, 3.3V, 5V and -5.2V
Supported 10 Gigabit Fiber pluggable transceivers	IEEE 802.3ae compliant: <ul style="list-style-type: none"> • 10GBase-SR • 10GBase-LRM • 10GBase-LR • 10GBase-ER • 10GBase-ZR 	IEEE 802.3ae compliant: <ul style="list-style-type: none"> • 10GBase-SR • 10GBase-LRM 	IEEE 802.3ae compliant: <ul style="list-style-type: none"> • 10GBase-SR • 10GBase-LRM • 10GBase-LR • 10GBase-ER • 10GBase-ZR

	CWDM/DWDM	<ul style="list-style-type: none"> • 10GBase-LR • 10GBase-ER • 10GBase-ZR 	CWDM/DWDM
		CWDM/DWDM	
Supported 10 Gigabit Copper pluggable transceivers	<p>SFP+ Direct Attach Cable (DAC). Also known as:</p> <ul style="list-style-type: none"> • Twinax • 10GBase-CU • 10GSFP+Cu • 10GBase-CX1 • 10GBase-CR1 <p>Note: Passive and Active cable types supported</p>	<p>IEEE 802.3ak compliant:</p> <ul style="list-style-type: none"> • XFP <p>10GBase-CX4 copper</p>	<p>SFP+ Direct Attach Cable (DAC). Also known as:</p> <ul style="list-style-type: none"> • Twinax • 10GBase-CU • 10GSFP+Cu • 10GBase-CX1 • 10GBase-CR1 <p>Note: Passive and Active cable types supported</p> <p>IEEE 802.3ak compliant:</p> <ul style="list-style-type: none"> • XFP 10GBase-CX4 copper
Supported 2.5 Gigabit Copper pluggable transceivers	<p>S-10GR Model:</p> <p>SFP+ Direct Attach Cable (DAC).</p> <p>Note: Passive and Active cable types supported</p>	N/A	N/A
Supported Gigabit Fiber SFPs	<p>1000Base-SX</p> <p>1000Base-LX/LH</p> <p>1000Base-EX</p> <p>1000Base-ZX</p> <p>1000Base-BX</p> <p>CWDM/DWDM</p> <p>Note: In this mode both SFP modules must operate 1000Base-X</p>	N/A	N/A
Chassis Slot profile	One slot	<p>XTX: one slot</p> <p>XTXH: two slots</p>	<p>XTS: one slot</p> <p>XTSH: two slots</p>
Environmental Specifications	Dual SFP	Dual XFP	XFP to SFP
Operating	0° C to 50° C (32° F to 122° F)		

Temperature			
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)	C-10G: 22.9 C-10GR: 59	XTX: 39.2 XTXH: 55.6	XTS: 31.0 XTSH: 55.6
MTBF (Hours)**	C-10G: 367,714 C-10GR: 190,717	335,191	335,191
Packaging			
Shipping Weight	0.25 Kg, 0.55 lbs		
Shipping Dimensions	Standard Power Models: 150 x 210 x 40 mm, 5.9 x 8.3 x 1.6 inches High Power models (XTXH, XTSH): 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)		
	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	<u>Reach, RoHS and WEEE Compliant</u>		

Other ECCN: 5A991

HTSUS Number: 8517.62.0050

Perle Limited Lifetime Warranty

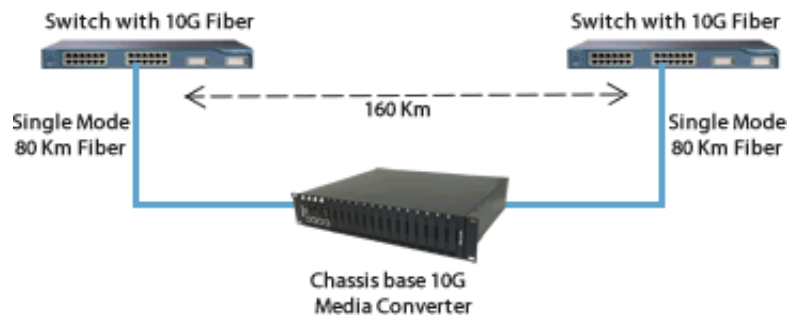
*Maximum rating for both media converter and modules inserted. Actual rating is dependent on the power consumption of the SFP+/XFP modules inserted.

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

10 Gigabit Ethernet Fiber Repeater

Extend the network distance of 10 Gigabit Fiber Links

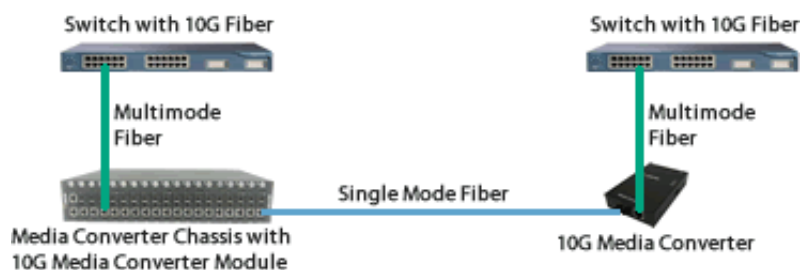
Create a 10 Gigabit Ethernet fiber link that can extend up to 160km.



10 Gigabit Ethernet Fiber Extender

Extend the network distance between two 10 Gigabit Fiber Switches

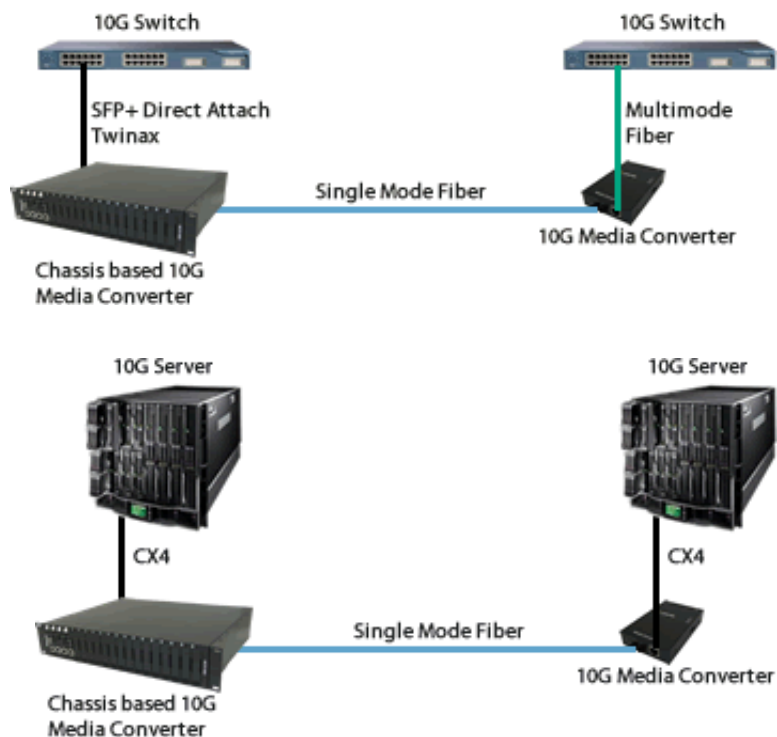
Two 10 Gigabit Mode Media Converters can extend the distance between 10 Gigabit Multimode Switches across a fiber link up to 80km in length.



10 Gigabit Copper to Fiber Media Conversion

Convert one 10G Ethernet media to another

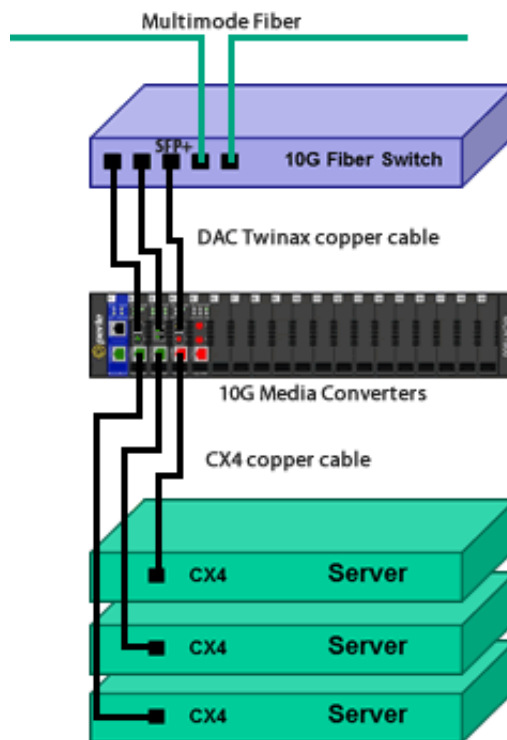
Convert your 10G SFP+ Direct Attach (Twinax) or XFP CX4 copper to multimode or single mode fiber. Ideal for large data centers and Co-Location applications where the distance required to connect top of rack switches exceeds the 100 meter limitation of 10G copper.



10 Gigabit Datacenter Fiber Upgrade

Replace old CX4 switch with a new fiber switch

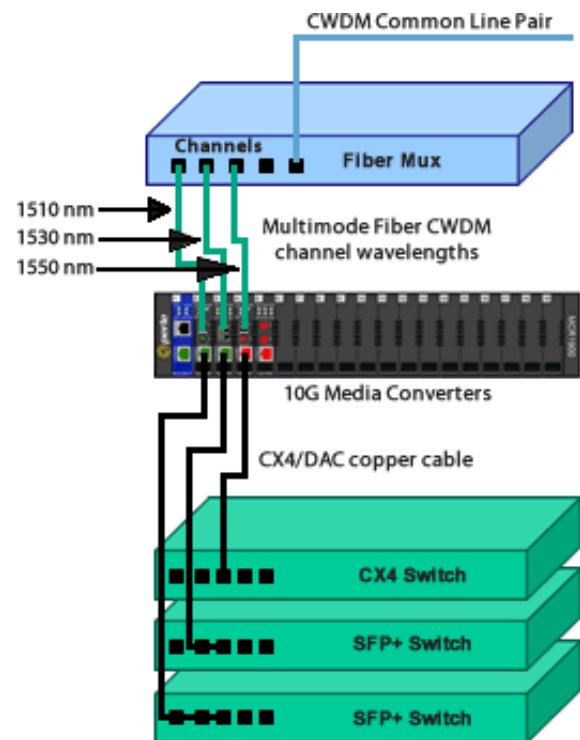
Install XFP to SFP+ media converters for CX4 copper to SFP+ DAC copper conversion.



CWDM Transponder

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

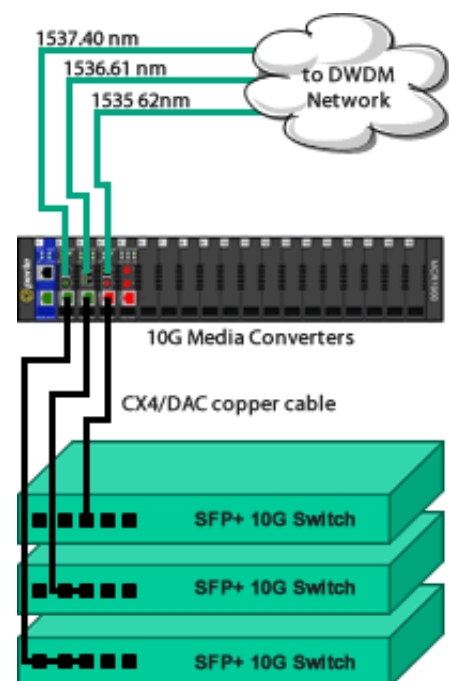
Convert copper to CWDM wavelengths for CX4 XFP copper to CWDM SFP+ conversion or Direct Attached Copper (DAC) to CWDM SFP+ conversion.



DWDM Transponder

Set wavelength on tune-able XFP DWDMs via media converter management

Install XFP to SFP+ and SFP+ to SFP+ to media converters for CX4 XFP copper to DWDM SFP+ conversion or Direct Attached Copper (DAC) to DWDM SFP+ conversion.



Model	Port	Slot	10/100/1000/2500/10000 Rate Conversion	SFP+ Power Levels	XFP Power Levels	Maximum Total Transceiver Power Supported
<u>C-10G- STS</u>	Port 1	SFP+	NO	Level 1 (up to 1.0 watts)	-	3.0 watts
				Level 2 (up to 1.5 watts)	-	
	Port 2	SFP+	NO	Level 1 (up to 1.0 watts)	-	
				Level 2 (up to 1.5 watts)	-	
<u>C-10GR- STS</u>	Port 1	SFP+	YES	Level 1 (up to 1.0 watts)	-	3.0 watts
				Level 2 (up to 1.5 watts)	-	
	Port 2	SFP+	YES	Level 1 (up to 1.0 watts)	-	
				Level 2 (up to 1.5 watts)	-	
<u>C-10G- XTS</u>	Port 1	XFP	NO	-	Level 1 (up to 1.0 watts)	5.0 watts
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	
	Port 2	SFP+	NO	Level 1 (up to 1.0 watts)	-	
				Level 2 (up to 1.5 watts)	-	
				-	-	
<u>C-10G- XTSH</u>	Port 1	XFP	NO	-	Level 1 (up to 1.0 watts)	7.0 watts
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	

				-	Level 4 (3.5 to 5.5 watts)	
	Port SFP+ 2			Level 1 (up to 1.0 watts)	-	
				Level 2 (up to 1.5 watts)	-	
<u>C-10G- XTX</u>	Port XFP 1		NO	-	Level 1 (up to 1.0 watts)	7.0 watts
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	
	Port XFP 2			-	Level 1 (up to 1.0 watts)	
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	
<u>C-10G- XTXH</u>	Port XFP 1		NO	-	Level 1 (up to 1.0 watts)	11.0 watts
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	
				-	Level 4 (3.5 to 5.5 watts)	
	Port XFP 2			-	Level 1 (up to 1.0 watts)	
				-	Level 2 (1.5 to 2.5 watts)	
				-	Level 3 (2.5 to 3.5 watts)	
				-	Level 4 (3.5 to 5.5 watts)	