iConverter® **XG+**
Industrial Fiber Converter/Transponder

The iConverter XG+ is an industrial 10 Gigabit, protocol-transparent fiber converter/transponder with automatic speed selection of data rates from 6 Gbps to 11.32 Gbps. The XG+ features pluggable transceiver ports, and can be used as a fiber mode converter, a CWDM or DWDM transponder, or a fiber repeater supporting the three Rs (regeneration, retiming and reshaping).

The iConverter XG+ supports 10G Ethernet, 10G SONET/SDH, 10G Fibre Channel, 10G OTN (G.709) and CPRI rates up to option 8 (6 Gbps to 11.32 Gbps).

The iConverter XG+ supports 100% traffic throughput and has no packet size restrictions. Ultra-low packet latency (< 50nsec) enables high-performance connectivity for data centers and financial networks.

Three interface configurations are available: XFP to XFP, XFP to SFP+, and SFP+ to SFP+. Pluggable XFP and SFP+ transceivers can be used for multimode and single-mode applications, supporting short haul distances, long haul distances and WDM fiber links.

The iConverter XG+ supports high-power (power level 3 and 4) XFP transceivers and the latest generation of wavelength tunable DWDM XFP transceivers. Utilizing management, the wavelength of a tunable transceiver can be programmed and saved, eliminating the need for external programming equipment.

Built-in loopback functions, on-board status LEDs and link fault propagation modes facilitate easy setup and quick troubleshooting. Pluggable transceiver alarm conditions reported through the digital diagnostic monitoring interface are displayed by the on-board status LEDs or management interface on plug-in modules.

Built-in Self Diagnostic Circuit Test validates the fiber connection between two XG+ modules.

The iConverter XG+ is available as a compact, unmanaged standalone units, or chassis plug-in modules that can be managed with a Management Module (NMM2) or Network Interface Device (NID) installed in the chassis. The management module provides access to the advanced features available on the module.

The hot-swappable, plug-in modules can be mounted in a variety of chassis with AC and DC power supplies.

The XG+ standalone unit is available with an external AC to DC power adapter or with a 2-pin terminal connector for direct connection to DC power. The standalone modules can be DIN-Rail mounted using the optional DIN-Rail mounting bracket (8250-0).
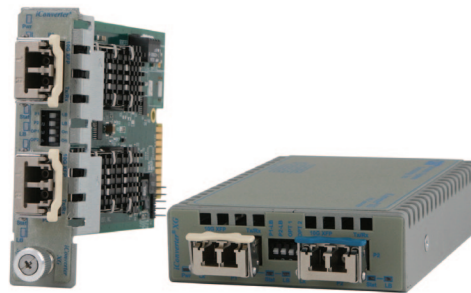
SFP+/XFPs not included

KEY FEATURES

- Supports commercial (0 to 50°C), wide (-40 to 60°C) and industrial (-40 to 75°C) temperature ranges

- Protocol-transparent 6 Gbps to 11.32 Gbps fiber converter and transponder with ultra-low latency

- Functions as a fiber mode converter, a CWDM or DWDM transponder, or a fiber repeater supporting the three Rs

- Automatic Speed Selection detects the data rate of the installed transceiver and the connected device

- Compatible with 10G Ethernet, 10G SONET/SDH, 10G Fibre Channel, 10G OTN (G.709) and CPRI options 6, 7, 7A and 8

- Compliant with MSA SFF-8472 and INF-8077i standards

- Supports MSA power level 3 and 4 XFP transceivers

- Provides management of wavelength tunable XFP transceivers

- Built-in loopback mode for installation verification and troubleshooting

- Self-Diagnostic Circuit Test for validating link connectivity

- Link fault detection modes facilitate quick fault detection, isolation and reporting

- Management of the plug-in module is available with the addition of a management module to the chassis

- SNMP management via NetOutlook® provides monitoring, configuration and fault notification

- Omnitron transceivers support SFP+ and XFP Digital Diagnostic Monitoring Interface (DDMI) bus

- Made in the USA

- Lifetime Warranty and free 24/7 Technical Support

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APPLICATIONS

iConverter XG+ and Tunable Transceivers

Tunable XFP transceivers are configurable to support a specific channel in a DWDM optical network. Tunable XFPs allow network operators to remotely change wavelengths (channel paths) when they need to redistribute bandwidth, or reconfigure/upgrade traffic patterns and services.

The iConverter XG+ management system supports the configuration of these tunable XFPs. When the XG+ is used in conjunction with an iConverter management module, it provides a user interface that allows the network operator to change the DWDM channel of the transceiver, eliminating the need to be physically on-site with external programming equipment.

In addition to changing the DWDM channel by specifying the wavelength or the transceiver-specific channel ID, the DWDM channel can be selected by inputting the industry-accepted ITU channel number.

Using tunable transceivers not only ensures quick responses to changes in network topology, it also lowers OpEx and CapEx by reducing truck rolls and eliminating up to hundreds of fixed-wavelength DWDM XFP transceivers from spares inventory.
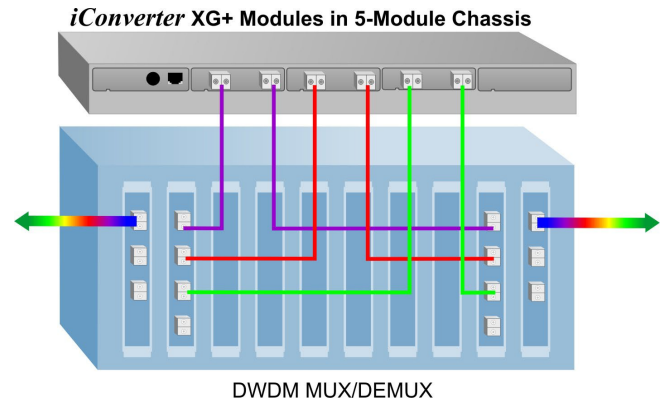
Direct Connect/Fiber Conversion Application

This application shows two 10G switches with SFP+ ports in two different locations. The switches are connected via long-haul, single-mode fiber (>80km) with a pair of iConverter XG+ 8599R-01 (SFP+to XFP) media converters. In the top location, a low-cost SFP+ Direct Attach Cable is used to connect the 10G switch port to the media converter because the distance is within the 10 meter limit of the Direct Attach Cable. In the bottom location, a pair of multimode SFP+ transceivers provide the connectivity between the media converters and the switches.

The key benefit of using XG+ fiber media converters in this application is that they cost much less than proprietary transceivers required in many fiber switches. In addition, the external fiber media converters do not invalidate fiber switch manufacturer's warranty.
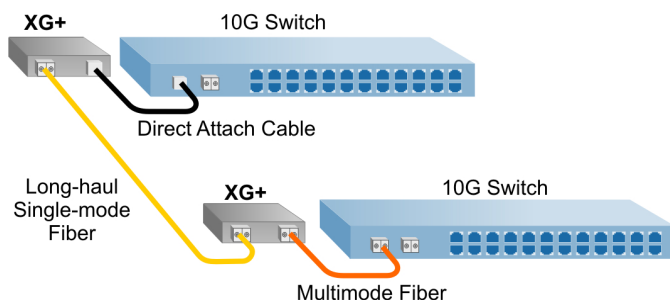
OTN Long-Haul DWDM Application

This application shows three 10G DWDM connections across an OTN network. Three iConverter XG+ modules with high-power XFPs are installed in a 5-Module Chassis and connected with fiber patch cables to DWDM Multiplexer. The iConverter XG+ modules function as fiber repeaters and wavelength transponders. The high-power XFPs perform Forward Error Correction on the incoming signal, then amplify and re-encapsulate the outbound OTN signal.

iConverter XG+ Modules in 5-Module Chassis

DWDM MUX/DEMUX

XG+

10G Switch

Direct Attach Cable

Long-haul Single-mode Fiber

XG+

10G Switch

Multimode Fiber

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SPECIFICATIONS

Description	*iConverter* Industrial XG+ Protocol-Transparent Fiber Converter/Transponder
Standard Compliances	IEEE 802.3ae (10G Ethernet), SONET OC-192, SDH STM-64, INCITS T11.2 (10G Fibre Channel), ITU-T G.709 OTN, CPRI option 6, 7, 7A and 8
Regulatory Compliances	UL, CE, FCC Class A, NEBS 3 Compliant, SFF-8077, SFF-8477
Environmental	RoHS, WEEE, REACH
Frame Size	Unlimited
Port Types	Fiber: 10GBASE-SR (SFP+, XFP) 10GBASE-LR (SFP+, XFP) 10GBASE-ER (SFP+, XFP) 10GBASE-ZX (XFP) 10GBASE-BR (Single-fiber: SFP+, XFP)
Cable Types	Fiber: Multimode: 50/125µm, 62.5/125µm Single-mode: 9/125µm
AC Power Requirements	AC Adapter: (US) 100 - 240VAC/50 - 60Hz 0.20A @ 120VAC (max)
	AC Adapter: (Universal) 100 - 240VAC/50 - 60Hz 0.20A @ 120VAC (max)
DC Power Requirements	DC Input: (Backplane) 3.3VDC, 3.75A @ 3.3VDC (Max)
	DC Input: (Terminal Block) 7 - 60VDC, 1.5A @ 9VDC, 1.1A @ 12VDC 2-Pin Terminal (non-isolated)
	DC Input: (AC Adapter) 7 - 60VDC, 1.5A @ 9VDC, 1.1A @ 12VDC 2.5mm Barrel Connector

Dimensions W x D x H	Plug-in:	0.85" x 4.5" x 2.8" (21.6 mm x 114.3 mm x 71.1 mm)
	Standalone:	3.1" x 4.8" x 1.0" (78.7 mm x 121.9 mm x 25.4 mm)
	Standalone: (Wall-mount)	3.8" x 4.8" x 1.0" (96.5 mm x 121.9 mm x 25.4 mm)
Weight	Plug-in: Standalone w/o Adapter: Standalone w Adapter:	8 oz. (226.8 grams) 1.0 lb. (453.6 grams) 1.5 lbs. (680.4 grams)
Temperature	Commercial: Wide: Industrial: Storage:	0 to 50°C -40 to 60°C -40 to 75°C -40 to 80°C
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4,000m	
MTBF (hrs)	Plug-in: Standalone w/o Adapter: Standalone w/ US Adapter: Standalone w/ Uni Adapter:	770,000 106,000 96,000 96,000
Warranty	Lifetime warranty with 24/7/365 free Technical Support	

TRANSCEIVER GUIDELINES

Typical SFP+ / XFP Power Levels		
SFP+	**XFP**	**Power Requirements**
Power Level 1		up to 1.0 watts
Power Level 2		up to 1.5 watts
	Power Level 1	up to 1.5 watts
	Power Level 2	1.5 to 2.5 watts
	Power Level 3	2.5 to 3.5 watts
	Power Level 4	3.5 to 5.5 watts
The XG+ supports a combination of transceivers up to 11 watts		

Power Levels for Omnitron Transceivers			
Omnitron Model Number	**Omnitron Description**	**Power Level**	**Power Required**
7406-0	10GBASE-SR SFP+ LC/MM/850nm (300m)	1	1.0W
7407-1	10GBASE-LR SFP+ LC/SM/1310nm (10km)	1	1.0W
7407-2	10GBASE-ER SFP+ LC/SM/1550nm (40km)	2	1.5W
7407-3	10GBASE-ZR SFP+ LC/SM/1550nm (80km)	2	1.5W
7426-0	10GBASE-SR XFP LC/MM/850nm (300m)	1	1.5W
7427-1	10GBASE-LR XFP LC/SM/1310nm (10km)	2	2.0W
7427-2	10GBASE-ER XFP LC/SM/1550nm (40km)	3	3.0W
7427-3	10GBASE-ZR XFP LC/SM/1550nm (80km)	3	3.5W

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ORDERING INFORMATION

Model Number	Description
8599R-ss-pt	iConverter XG+ with two pluggable transceiver receptacles, supporting power level 1, 2, 3 and 4 transceivers

Base Model Number: 8599R-ss-pt
Add transceiver option (**ss**), power option (**p**) and temperature range (**t**) to the model type selected.

Transceiver Options (ss):	
00 = Two SFP+ Transceiver Receptacles	**11 =** Two XFP Transceiver Receptacles
01 = One SFP+ Transceiver and one XFP Transceiver Receptacles	

Power Options (p):	
<leave blank> = Plug-in module	
A = Barrel Connector and AC/DC Power Adapter, 100-240VAC, 50-60Hz, with US power cord without integrated mounting brackets	**D =** Barrel Connector and AC/DC Power Adapter, 100-240VAC, 50-60Hz, with US power cord with integrated mounting brackets
B = Barrel Connector and Universal AC/DC Adapter, 100-240 VAC, 50-60Hz, No Power Cord, without integrated mounting brackets	**E =** Barrel Connector and Universal AC/DC Adapter, 100-240 VAC, 50-60Hz, No Power Cord, with integrated mounting brackets
C = Direct DC input, 2 pin terminal connector, no AC/DC power adapter, without integrated mounting brackets	**F =** Direct DC input, 2 pin terminal connector, no AC/DC power adapter, with integrated mounting brackets

Operating Temperature Options (t):	
W = Wide temperature (-40 to 60°C)	**Z =** Industrial temperature (-40 to 75°C)

iConverter XG+ 8599N model numbers are no longer available, and are replaced with iConverter XG 8599R model numbers. For more information on XG+ feature differences and improvements, download the Product Replacement Application Note.

The XG+ plug-in modules require specific chassis and installation configurations. For more information on XG+ chassis installation requirements, download the iConverter XG, XG+ and XGT+ Chassis Installation Guidelines for Airflow and Cooling Application Note.

Contact Omnitron for other configurations. Order the appropriate SFPs separately. Visit the Omnitron Optical Transceivers web page.

For chassis options, see iConverter Chassis Overview web page.

Accessories	
Model Number	**Description**
8250-0	DIN-Rail Mounting Bracket for Models without Integrated Mounting Brackets
8251-0	DIN-Rail Mounting Clips for Models with Integrated Mounting Brackets
8260-0	19" 1U Rack Mount Shelf for Models with Integrated Mounting Brackets (up to 4 converters)
7499-DC-1	1 meter 10G SFP+ Direct Attach Cable (Twinax)
7499-DC-3	3 meter 10G SFP+ Direct Attach Cable (Twinax)

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