

## iConverter XG+ Plug-In Module Quick Start Guide

This Quick Start Guide describes the functions of the *iConverter XG+*, product revision 3.2. The product revision number can be found by accessing the management user interface, or on serial label as “xx/32.

### Product Overview

The *iConverter XG+* is a 10 Gigabit, protocol-transparent media converter with two pluggable transceiver ports. The *iConverter XG+* can be used as a copper-to-fiber converter, a fiber mode converter, a WDM transponder or a fiber repeater supporting the three Rs (regeneration, retiming and reshaping). The *iConverter XG+* supports tunable DWDM and high-power (power level 4) XFP transceivers up to a combined power of 11.0 watts.

See user manual 041-8955N-002x for tunable DWDM XFP transceiver configuration information.

### XFP to XFP (8599N-11)

XFP to XFP models are protocol transparent within the range of 9.95Gbps to 11.32Gbps, providing interoperability with common protocols including: 10G Ethernet, 10G SONET/SDH, 10G Fibre Channel and 10G OTN (G.709).

XFP to XFP models support two types of XFP transceivers: transceivers with internal clocking (more common) and transceivers requiring an external clock source (less common). The transceivers installed in the 8599N-11 must be the able to operate at the same data rate.

If both XFPs are internally clocked, the XG+ will automatically support rates from 9.95Gbps to 11.32Gbps.

If one or both transceivers requires external clocking, the XG+ will support rates from 9.95Gbps to 11.32Gbps by configuring the DIP-switches and jumper per Figure 3.

### SFP+ to XFP (8599N-01)

The SFP+ model supports speeds between 9.95Gbps to 10.71Gbps by setting the appropriate DIP-switches as shown in Figure 3. 10 Gigabit Ethernet (10.32Gbps) is selected by default.

The SFP+ transceiver installed in the 8599N-01 must be able to operate at the data rate as configured by the DIP-switches in Figure 3.

### Installation Procedure

- 1) Configure DIP-switches and Jumper
- 2) Install Module in Chassis and Connect Cables
- 3) Verify Operation

### 1) CONFIGURE DIP-SWITCHES AND JUMPER

#### DIP-SWITCH BANK 1

The location of the DIP-switches is shown in Figure 1.

The function of DIP-switch Bank 1 is outlined in Figure 2.

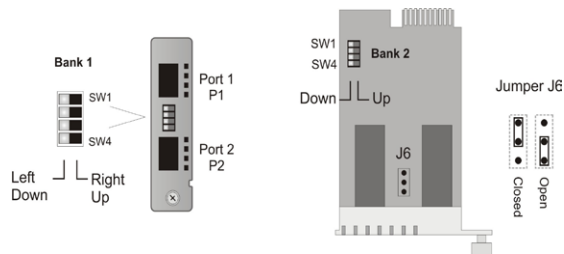


Figure 1: DIP-switch Locations

Switch	LEFT/DOWN (Default)	RIGHT/UP
SW1	Normal	P1 Loopback Enabled
SW2	Normal	P2 Loopback Enabled
SW3	Rate Selection (See Figure 3)	
SW4		

Figure 2: DIP-switch BANK 1 Definitions

#### SW1 - Port 1 LOOPBACK “P1-LB”

When this DIP-switch is in the LEFT/DOWN position (factory default), Port 1 (P1) loopback is disabled. When this DIP-switch is in the RIGHT/UP “P1-LB” position, loopback is enabled on P1. When enabled, all data received on P1 is transmitted out P1 and all data received on port P2 is dropped. No data is transmitted on Port 2 (P2) when loopback is enabled on P1.

For XFP transceiver models 8599N-01 and 8599N-11, only one port can be in loopback at any time.

#### SW2 - Port 2 LOOPBACK “P2-LB”

When this DIP-switch is in the LEFT/DOWN position (factory default), P2 loopback is disabled. When this DIP-switch is in the RIGHT/UP “P2-LB” position, loopback is enabled on P2. When enabled, all data received on P2 is transmitted out P2 and all data received on P1 is dropped. No data is transmitted on P1 when loopback is enabled on P2.

For XFP transceiver models 8599N-01 and 8599N-11, only one port can be in loopback at any time.

NOTE: For the 8599N-11, the availability of the loopback feature is dependent on the capability of the installed XFP. XFPs with XFI-side Loopback feature are required.

#### SW3, SW4 - RATE SELECTION

These switches are for the SFP+ models and XFP models with transceivers requiring external clocking.

These two switches, in conjunction with Jumper J6\*, configure the operating data rate of the supported XG+. Configure the module to the data rate that corresponds to the transport protocol used.

Jumper J6 is located on the module directly behind DIP-switch Bank 1. The factory default position is OPEN.

Jumper J6	SW3	SW4	Speed Mode
OPEN	LEFT/DOWN	LEFT/DOWN	10G Ethernet (10.3125 Gb/s)
OPEN	LEFT/DOWN	RIGHT/UP	10G SONET/SDH (9.95328 Gb/s)
OPEN	RIGHT/UP	LEFT/DOWN	10G Fiber Channel (10.51875 Gb/s)
OPEN	RIGHT/UP	RIGHT/UP	10G OTN (G.709) (10.70923 Gb/s)
CLOSED	LEFT/DOWN	LEFT/DOWN	*10GbE w/ FEC (11.049 Gb/s)
CLOSED	LEFT/DOWN	RIGHT/UP	*10GbE w/ FEC stuff bytes (11.095 Gb/s)
CLOSED	RIGHT/UP	LEFT/DOWN	*10GbFC w/ FEC (11.270 Gb/s)
CLOSED	RIGHT/UP	RIGHT/UP	*10GbFC w/ FEC stuff bytes (11.317 Gb/s)

Figure 3: DIP-switch BANK 1 Rate Selection

\* Only supported on the 8599N-11 model

#### DIP-SWITCH BANK 2

#### SW1,SW2, SW3 and SW4 - LINK MODES

These four DIP-switches configure the different link modes available on the XG+. It is recommended to have link modes set to Link Segment (default setting - all DOWN) during the initial installation. After the circuit has been tested and operational, configure the module for the desired mode. Refer to Figure 4 for configuration options.

SW1	SW2	SW3	SW4	Function
DOWN	DOWN	DOWN	DOWN	Link Segment (default)
UP	DOWN	DOWN	DOWN	Asymmetrical Link Propagate P1 to P2
DOWN	UP	DOWN	DOWN	Asymmetrical Link Propagate P2 to P1
UP	UP	DOWN	DOWN	Dual Asymmetrical Link Propagate
DOWN	DOWN	UP	DOWN	Remote Fault Detect for P1 and P2
UP	DOWN	UP	DOWN	RFD + Asymmetrical LP P1 to P2
DOWN	UP	UP	DOWN	RFD + Asymmetrical LP P2 to P1
UP	UP	UP	DOWN	RFD + Dual Asymmetrical LP
All combinations except UP, UP, UP			UP	Symmetrical Fault Detect (SFD)*
UP	UP	UP	UP	Self Diagnostic Circuit Test

Figure 4: DIP-switch BANK 2 Link Mode and Self Test Configurations

\* Symmetrical Fault Detect requires bookend configuration of two *iConverter* XG+ modules connected via Port 1. For detailed information on the operation of the different Link Modes, download the application note “*iConverter* Link Modes” available on Omnitron’s web page:

[http://www.omnitron-systems.com/downloads\\_iconverter.php](http://www.omnitron-systems.com/downloads_iconverter.php)

SELF DIAGNOSTIC CIRCUIT TEST (SFP+ models only)

When two XG+ modules are connected via Port 1 (Port 1 to Port 1), a self diagnostic circuit test is supported. The XG+ initiating the circuit test (all DIP-switches to UP) will generate and send a test pattern out Port 1 to the other XG+. The receiving XG+ will detect a good test pattern and return the test pattern back to the initiating XG+.

A successful test will produce a green blinking (5Hz) P1 LB LED on the initiating XG+ and a green blinking (1Hz) P1 LB LED on the receiving XG+. If the initiating XG+ does not receive a valid response, the P1 LB LED will be blinking amber (5Hz). When the self diagnostic circuit test is initiated, the traffic received on Port 2 of both XG+ converters will be discarded.

If loopback has been initiated, self diagnostic circuit test DIP-switch will be ignored. If self diagnostic circuit test has been initiated, loopback DIP-switches will be ignored.

## 2) INSTALL MODULE IN CHASSIS AND CONNECT CABLES

The XG+ module must be installed using the following chassis configurations/guidelines:

19-Module High Airflow Chassis 8201-x (AC) or 8207-x (DC). Each 120W High Airflow power supply can support up to 6 *iConverter* modules installed in the chassis, and three of the six modules can be XG+. The XG+ modules must be installed directly in front of the installed High Airflow power supply and the slot on the right side of the installed XG+ module must be empty. All empty slots must have a blank panel installed. The other *iConverter* modules can be installed anywhere in the chassis.

A maximum of nine XG+ modules can be installed in a 19-Module High Airflow Chassis. All empty slots must have a blank panel installed.

5-Module High Airflow Chassis 8221-x (AC) or 8227-x (DC). An XG+ module can be installed in all slots. All empty slots must have a blank panel installed.

2-Module High Airflow Chassis 8232-1 (AC) or 8238-1 (DC). Only one XG+ can be installed in the chassis. The other slot can have another *iConverter* module installed (NMM2, 10/100M2, etc). If the slot is empty, it must have a blank panel installed.

1-Module Chassis is not supported with the XG+ (recommend using a standalone model).

Refer to the *iConverter* XG, XG+ and XGT+ Chassis Installation Guidelines for Airflow and Cooling Application Note 002-A0006 for more detailed information.

The *iConverter* XG+ can be used in a managed configuration by installing a Management Module (such as an *iConverter* NMM2 or 10/100M2) that provides monitoring, configuration and trap notification in the same chassis.

- Carefully slide the XG+ module into an open slot in the chassis. Align the module with the installation guides and ensure that the module is firmly seated against the backplane. Secure the module by fastening the front panel thumbscrew (push in and turn clockwise to tighten) to the chassis front. Verify the “Pwr” LED is ON (indicating the chassis is powered).
- Insert the appropriate XFP or SFP+ transceivers into the corresponding port receptacle on the XG+.  
NOTE: The release latch of the transceiver must be in the closed position before insertion.
- When using copper CX4 XFP, connect the cable between the converter and external device using the recommended copper CX4 cable.
- Connect an appropriate multimode or single-mode fiber cable to the fiber transceiver ports on the XG+. It is important to ensure that the transmit (Tx) is attached to the receive side of the device at the other end and the receive (Rx) is attached to the transmit side.

## 3) VERIFY OPERATION

Once the module has been installed and configured per steps 1 and 2, verify the module is operational by viewing the LED indicators.

Legend	OFF State	Color	ON/Blinking State
Pwr	Off – No power	Green	Green – Power On
P1/P2 Lk	Off – No Transceiver detected or no fiber link	Green	Green Solid – Fiber link Green Blinking (1/2Hz) – When SFD is enabled, receiving remote fiber fault signal from link partner
P1/P2 Stat	Off – Transceiver does not support digital diagnostic or no transceiver installed	Green	Green Solid – Transceiver supports digital diagnostic and no DDMI Alarm Detected
		Amber	Amber Solid – Transceiver supports digital diagnostic and DDMI alarm detected
P1/P2 LB	Off – Port loopback mode not enabled or configured	Green	Green Solid – Port set to Loopback mode and port in loopback P1 LB Only Green Blinking (1 Hz) - Port responding to Circuit Test activation with valid Circuit Test response Green Blinking (5 Hz) - Port initiating Circuit Test and receiving valid Circuit Test response
		Amber	Amber Solid – Port set to loopback mode, but XFP does not support loopback P1 LB Only Amber Blinking (5 Hz) - Port initiating Circuit Test and not receiving valid Circuit Test response
P1 Lk, P1 Stat, P2 Lk, P2 Stat	-	Amber	Simultaneous Amber Blinking (1Hz) – Ports disabled due to installed XFP drawing more current than allowed

Figure 5: LED Indicators

**NOTE: The module does not generate data, it only passes the data it receives from the connected equipment. So both transceivers must be installed and connected in order for the module to pass data traffic. P1/P2 Lk LED indicates an optical connection has been established. It does not indicate the presence of data traffic .**

©2015 Omnitron Systems Technology, Inc. *iConverter* is a registered trademark of Omnitron Systems Technology, Inc. Trademarks are owned by their respective companies. Specifications subject to change without notice. All rights reserved.