b. Insert the appropriate 10G SFP+ or XFP transceiver into the corresponding port receptacle on the XG+. The release latch of the transceiver must be in the closed position before insertion.

c. When using copper CX4 XFP, connect the cable between the converter and external device using the recommended copper CX4 cable.

d. 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.

NOTE: FOR 8599N-01 AND 8599N-11 BOTH TRANSCEIVERS MUST BE INSTALLED FOR THE XG+ TO PROPERLY FUNCTION. WHEN ONLY ONE XFP TRANSCEIVER IS INSTALLED AND THERE IS NO TRANSCEIVER INSTALLED IN THE OTHER PORT, THE TRANSMITTER OF THE INSTALLED TRANSCEIVER IS DISABLED.

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.

NOTE: THE XG+ P1 AND P2 LINK LEDS (LK) WILL TURN ON (GREEN) WHEN BOTH TRANSCEIVERS ARE INSTALLED AND PROPERLY CABLED TO THE CONNECTED EQUIPMENT. THIS IS AN INDICATION THAT THE OPTICAL (LIGHT) CONNECTION IS GOOD, BUT NOT NECESSARILY AN INDICATION THAT THERE IS DATA BEING TRANSMITTED OR RECEIVED.

THE USER WILL RECEIVE CONFIRMATION OF DATA FLOW BY CHECKING TO SEE IF THE LINK LED IS ILLUMINATED ON THE CONNECTED EQUIPMENT.

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 LB	Off – Port loopback mode not enabled or configured	Green	Green Solid – Port set to Loopback mode and port in loopback 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 Amber Blinking (5 Hz) - Port initiating Circuit Test and not receiving valid Circuit Test response
P2 LB	Off – Port loopback mode not enabled or configured	Green	Green Solid – Port set to Loopback mode and port in loopback
		Amber	Amber Solid – Port set to loopback mode, but XFP does not support loopback
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

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iConverter XG+ Standalone Module User Manual

This User Manual describes the functions of the *iConverter* XG+ Revision 3.2.

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 high-power (power level 4) XFP transceivers up to a combined power of 11.0 watts. Power level 4 XFP transceivers typically perform OTN functions, where error correction is required to achieve distance requirements. Typically, most single-mode applications will require power level 2 or power level 3 XFP transceivers.

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 - those which provide internal clocking (more common) and those which require an external clock source (less common). The transceivers installed in the 8599N-11 must have matching speeds.

If both XFPs are internally clocked, the XG+ will automatically support rates from 9.9Gbps to 11.3Gbps.

If one or both transceivers requires external clocking, the XG+ will support rates from 9.9Gbps to 10.7Gbps. In this case, the user must select the speed using the DIP switches in Figure 3.

SFP+ to XFP (8599N-01) and SFP+ to SFP+ (8599N-00)

Models with SFP+ support can operate between the speed range of 9.95Gbps to 10.71Gbps by setting the operating speed DIP-switches in Figure 3. 10 Gigabit Ethernet (10.3Gbps) 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.

Please contact Omnitron for configuring operating speed to 11Gbps operation.

Installation Procedure

1) Configure DIP-switches

2) Install Standalone Module and Connect Cables

3) Verify Operation

1) CONFIGURE DIP-SWITCHES

DIP-SWITCH BANK 1

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

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

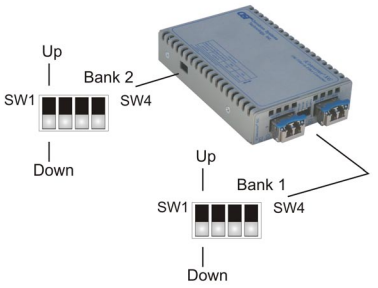

Figure 1: DIP-switch Location

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

Figure 2: DIP-switch BANK 1 Definitions

SW1 - P1 LOOPBACK “P1-LB”

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

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

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

SW2 - P2 LOOPBACK “P2-LB”

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

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

SW3, SW4 - RATE SELECTION

These switches are for the 8599N-00, 8599N-01 and 8599N-11 models when using XFP transceivers requiring external clocking.

These two switches configure the operating data rate of the XG+ with XFPs requiring external clocking. Configure the module to the data rate that corresponds to the transport protocol used.

SW3	SW4	Rate
DOWN	DOWN	10G Ethernet (10.3125 Gbps) - factory default
DOWN	UP	10G SONET/SDH (9.95328 Gbps)
UP	DOWN	10G Fibre Channel (10.51875 Gbps)
UP	UP	10G OTN (10.70923 Gbps)

Figure 3: DIP-switch BANK 1 Rate Selection

Consult Omnitron for the following speed options: 10G Ethernet w/FEC (11.049 Gbps), 10G Ethernet w/ FEC stuff bytes (11.095 Gbps), 10G Fibre Channel w/ FEC (11.270 Gbps) and 10G Fibre Channel w/ FEC stuff bytes (11.317 Gbps).

DIP-SWITCH BANK 2

LINK MODES

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+s 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

SELF DIAGNOSTIC CIRCUIT TEST (SFP+ models only)

When two XG+ converters 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 STANDALONE MODULE AND CONNECT CABLES

a. The XG+ is available in tabletop and wall-mount models. For wall-mounting, attach the XG+ to a wall, backboard or other flat surface. For tabletop installations, place the unit on a flat level surface. Attach the rubber feet to the bottom of the XG+ to prevent the unit from sliding. Make sure the unit is placed in a safe, dry and secure location.

   To power the unit using the AC/DC adapter, connect the AC/DC adapter to an AC outlet. Then connect the barrel plug at the end of the wire on the AC/DC adapter to the 2.5mm DC barrel connector (center-positive) on the unit. Confirm that the unit has powered up properly by checking the power status LED located on the front of the unit.

   To power the unit using a DC power source, prepare a power cable using a two conductor insulated wire (not supplied) with a 14 AWG gauge minimum. Cut the power cable to the length required. Strip approximately 3/8 of an inch of insulation from the power cable wires. Connect the power cables to the unit by fastening the stripped ends to the DC power connector.

   Connect the power wires to the DC power source. The Power LED should indicate the presence of power.

   WARNING: Note the wire colors used in making the positive and negative connections. Use the same color assignment for the connection at the DC power source.

   NOTE: If mounting with a safety ground attachment, use the safety ground screw at the rear of the unit.