Omnitron Systems

Application Note

iConverter®
Managed Fiber Media Converter Product Family

iConverter XG, XG+ and XGT+ Product Selection Guidelines

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1.0 SCOPE

This document describes the key differences between the iConverter XG+ and the iConverter XG products.

	Port 1	Port 2	Standalone Model Number	Plug-in Model Number
XG	SFP+	SFP+	8599P-00-x	8599P-00
	SFP+	XFP	8599P-01-x	8599P-01
	XFP	XFP	8599P-11-x	8599P-11
XG+	SFP+	SFP+	8599R-00-x	8599R-00
	SFP+	XFP	8599R-01-x	8599R-01
	XFP	XFP	8599R-11-x	8599R-11

Table 1. XG and XG+ model numbers addressed in this document

Section 2.0 of this document provides transceiver power level guidelines.

Section 3.0 of this document provides criteria that will allow users determine whether the XG+ or XG is the appropriate model for their application.

Section 4.0 of this document provides information for the XGT+ 8589N-0 (SFP+ to 10GBASE-T) and 8589N-1 (XFP to 10GBASE-T) models.

2.0 DEFINITIONS

2.1 Transceiver Power Levels Defined

Throughout this document, transceivers are referenced by their "Power Level". These Power Level ratings are shown in the following table:

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	3.3 to 5.5 watts

Table 2. SFP+ and XFP Power Levels

Users should always be aware of the Power Level rating for their transceivers, as this will determine whether the XG or XG+ is the appropriate model. This information is commonly found on the manufacturer's transceiver data sheets.

For reference, the following table shows the Power Level ratings for Omnitron's XFP 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

Table 3. Omnitron XFP Power Levels

Third party transceivers will vary in Power Level ratings. Shorter distance, fixed wavelength transceivers will typically have a lower Power Level rating. Transceivers supporting longer distances, OTN framing, and tunable wavelengths will typically have a higher Power Level rating.

2.2 High Power Draw Conditions Defined

A High Power Draw condition exists if any one or more of the following conditions are met:

- Two (2) Power Level 3 XFPs are used, or
- One (1) or Two (2) Power Level 4 XFPs are used

3.0 DESIGN RULES – WHEN TO USE XG+ VS. XG

3.1 Summary

The following tables outline the capability of each of the XG (8599P) XG+ (8599R) models.

		Port 2 - SFP+					Port 2 - XFP			
		Power Level 1	Power Level 2	Power Level 3	Power Level 4		Power Level 1	Power Level 2	Power Level 3	Power Level 4
Port 1 SFP+	Power Level 1	8599P-00	8599R-00	-	-		8599P-01	8599P-01	8599R-01	8599R-01
	Power Level 2	8599R-00	8599R-00	-	-		8599R-01	8599R-01	8599R-01	8599R-01
	Power Level 3	-	-	-	-		-	-	-	-
	Power Level 4	-	-	-	-		-	-	-	-
Port 1 XFP	Power Level 1	-	-	-	-		8599P-11	8599P-11	8599R-11	8599R-11
	Power Level 2	-	-	-	-		8599P-11	8599P-11	8599R-11	8599R-11
	Power Level 3	-	-	-	-		8599R-11	8599R-11	8599R-11	8599R-11
	Power Level 4	-	-	-	-		8599R-11	8599R-11	8599R-11	8599R-11

Table 4: XG/XG+ Power Level Requirements

For XG plug-in and standalone applications:

- The SFP+/SFP+ XG (8599P-00 or 8599P-00-x) supports two (2) Power Level 1 transceivers
- The SFP+/XFP XG (8599P-01 or 8599P-01-x) supports one Power Level 1 or 2 XFP transceiver and one Power Level 1 SFP+ transceiver
- The XFP/XFP XG (8599P-11 or 8599P-11-x) supports one or two Power Level 2 XFP transceivers

The XG plug-in configurations shown in the table above do not generate elevated levels of heat, and therefore require no special airflow/cooling or spacing requirements.

For XG+ plug-in applications:

- XG+ supports any combination of Power Level SFP+ or XFP transceivers
- The XG+ must be used in High Power Draw Conditions, and/or
- The XG+ must be used when tunable XFP transceivers are used and management is required

The XG+ plug-in configurations shown in Table 4 can generate elevated levels of heat depending on the installed transceivers. The appropriate chassis must be selected to meet the appropriate power and airflow requirements for these modules.

For XG+ standalone applications:

- XG+ must be used in High Power Draw Conditions
- XG+ are equipped with a fan to provide the proper airflow

3.2 XG+ – High Power Draw Conditions

The iConverter XG+ is designed to provide additional power to the installed transceivers – beyond what the standard iConverter XG module can support. The iConverter XG+ must therefore be used in high power draw conditions.

This information is summarized in the following table:

		SFP+/XFP Models			
		Port 2 - XFP			
		Power Level 1	Power Level 2	Power Level 3	Power Level 4
Port 1 SFP+	Power Level 1	XG	XG	XG+	XG+
	Power Level 2	XG+	XG+	XG+	XG+
	Power Level 3	-	-	-	-
	Power Level 4	-	-	-	-

Table 5: SFP+/XFP Models

		XFP/XFP Models			
		Port 2 - XFP			
		Power Level 1	Power Level 2	Power Level 3	Power Level 4
Port 1 XFP	Power Level 1	XG	XG	XG+	XG+
	Power Level 2	XG	XG	XG+	XG+
	Power Level 3	XG+	XG+	XG+	XG+
	Power Level 4	XG+	XG+	XG+	XG+

Table 6: XFP/XFP Models

Attempting to use Power Level 3 and/or Power Level 4 XFP transceivers in any manner contrary to the above tables may result in faulty product operation.

The iConverter XG+ can accommodate Power Level 4 XFPs up to 5.5W (max.) per port. Power Level 4 XFPs that require greater than 5.5W each should not be used in the XG+.

3.3 Tunable DWDM XFP Transceivers

Certain XFP manufacturers offer special long range DWDM XFPs that allow users to tune the frequency (or lambda, or DWDM channel) at which the XFP operates. These devices typically fall into the Power Level 3/Power Level 4 category. The XG+ has the ability to configure and save the tunable XFP parameters through special CLI menu screens. Therefore, if a user desires to utilize this functionality, the XG+ plug-in module (and Network Management Module) must be used. The XG does not support these tunable XFP management screens.

Tunable wavelength XFPs may be used in XG+ standalones, but the tuning functionality in a standalone cannot be configured by the iConverter management system. It must be configured using a separate programming device.

In a standalone application, however, it is still important to follow the High Power Draw guidelines in Tables 3 and 4.

3.4 Summary Flow Chart

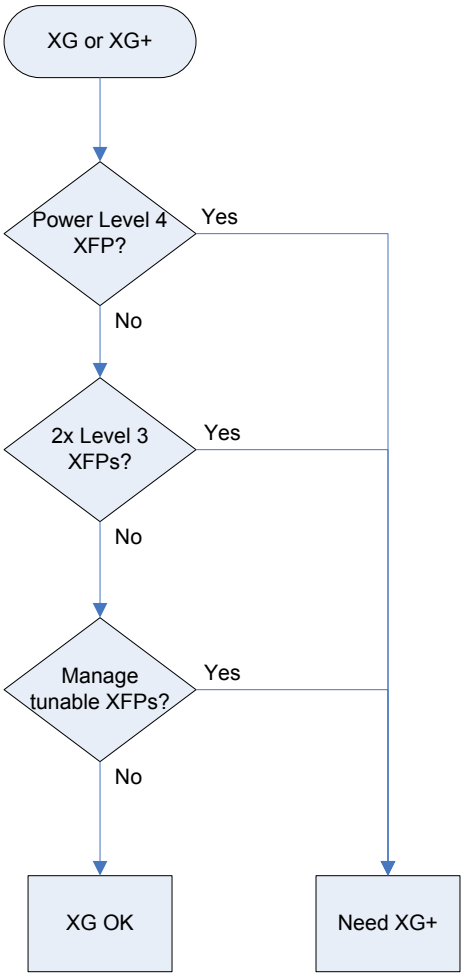

Figure 1. Summary Flowchart

4.0 iConverter XGT+

The XGT+ converts 10GBASE-T copper to Fiber:

- 8589N-0: RJ45 to SFP+
- 8589N-1: RJ45 to XFP

The XFP-based 8589N-1 supports Power Level 1, 2, 3 and 4 XFP transceivers.

Power Level 4 XFP transceivers are supported up to 5.5W maximum. Power Level 4 XFPs that require greater than 5.5W should not be used in the XGT+.

The XGT+ also is compatible with tunable DWDM XFP transceivers as defined in Section 3.3.