



Figure 1

1. INTRODUCTION

This Instruction Sheet covers the installation and use of Tyco Electronics CX-4 active optical cable ZL60615. A typical optical cable is shown in Figure 1.



Dimensions in this manual are in metric units [with U.S. customary units in brackets].

2. DESCRIPTION

Tyco Electronics active optical cable family is a fully integrated cable designed for direct connection to standard 4-wide I/O electrical high-speed connectors. Designed for interconnection applications in enterprise data centers and high-performance computer clusters, the optical fiber-based cable delivers significant reach, weight, flexibility and BER advantages compared with electrical-based cabling. The cables have four differential electrical inputs and outputs, capable of handling a range of high-speed data rates and cable length. The optical cable family targets data rates up to InfiniBand[†] DDR (Dual Data Rate) of 5 Gbps per channel, as well as covering InfiniBand SDR (2.5 Gbps) and XAU[‡] 10 GbE applications of 3.125 Gbps per channel.

For system ports installed with media detect, the cable requires no configuration and is a true 'plug-and-play' solution.

3. OVERVIEW OF MODELS

A list of currently available part numbers is provided in Figure 2.

Part #	Data Rate (Gbps)	Fiber Jacket Type	Cable Length, m [ft]
ZL60615MJDA	5	OFNR	3 [9.8]
ZL60615MJDC	5	OFNR	5 [16.4]
ZL60615MJDE	5	OFNR	10 [32.8]
ZL60615MJDF	5	OFNR	15 [49.2]
ZL60615MJDG	5	OFNR	20 [65.6]
ZL60615MJDI	5	OFNR	30 [98.4]
ZL60615MJDJ	5	OFNR	40 [131.2]
ZL60615MJDK	5	OFNR	50 [164.0]
ZL60615MJDN	5	OFNR	60 [196.8]
ZL60615MLDA	5	OFNP	3 [9.8]
ZL60615MLDC	5	OFNP	5 [16.4]
ZL60615MLDE	5	OFNP	10 [32.8]
ZL60615MLDF	5	OFNP	15 [49.2]
ZL60615MLDG	5	OFNP	20 [65.6]
ZL60615MLDI	5	OFNP	30 [98.4]
ZL60615MLDJ	5	OFNP	40 [131.2]
ZL60615MLDK	5	OFNP	50 [164.0]
ZL60615MLDN	5	OFNP	60 [196.8]

Figure 2

[†] InfiniBand is a trademark of InfiniBand Trade Association.

[‡] XAU is a trademark of the 10Gigabit Ethernet Alliance XAU Interoperability Group.

3.1. Data Rate

The cable has four differential electrical inputs and outputs, each capable of handling data rates up to 5 Gbps per channel, 20 Gbps duplex aggregate. The product is specifically designed to cover XAUI10 GbE applications as well as InfiniBand[†] use at both single (2.5 G) and double (5 G) Data Rate (SDR and DDR).

3.2. Cable Length

The cable is available in standard lengths up to 60 m [196.8 ft], though it is possible extend the cable reach as far as 100 m [328.0 ft].

The handling instructions described below should be considered when choosing the correct length. How and where the cable will be installed is an important consideration prior to ordering. For example, the length should be chosen to ensure that extreme fiber bends are avoided and that the cable is not pulled taut. In general it is better to choose a slightly longer cable than one that is too short. Due to the light weight and flexibility of the cable storing excess length is straightforward.

3.3. Fiber Jacket Type

The cable family is available in two standard optical fiber jacket types.

OFNR (Optical Fiber Nonconductive Riser) is a fiber type designed by the National Fire Protection Association (NFPA). The fiber is certified for use in riser applications and engineered to prevent the spread of fire from floor to floor in a building. The Riser compliant cable has a flame propagation of less than 3.6 m [12 ft] and has a temperature of 454 degrees C [850 degrees F] or less at a height of 3.6 m [12 ft] per UL 1666.

OFNP (Optical Fiber Nonconductive Plenum) is a fiber type regulated under the National Fire Protection Association standard NFPA 90A. The fiber is certified for use in plenum applications spaces. The space can facilitate air circulation for heating and air conditioning systems, by providing pathways for either heated / conditioned or return airflows. Plenum compliant cable pass UL 910, Test for Flame-Propagation and

Smoke-Density Values for Electrical and Optical-Fiber Cables Used in Spaces Transporting Environmental Air.

In general plenum cables can always replace riser cables, but riser cable cannot replace plenum cable in plenum applications.

The end-user is strongly advised to check with their relevant local authorities on health and safety and fire regulations before choosing the appropriate fiber jacket type for their installation.

4. INSTALLATION

4.1. Handling of Delivered Parts

The cable is delivered individually sealed in vacuum packed anti-static bags, as shown in Figure 3. The bag is labeled with the part number in both text and bar code format.



Figure 3

4.2. Fiber Handling (Figure 4)

The cable uses a multi-mode optical fiber as the interconnection medium. At installation of the cable into the infrastructure the following additional handling factors should be followed:

- The axial pull force or tensile load on the optical cabling section on the fiber cable should NOT exceed 22 N [4.9 lbf].
- The tensile load (during installation, not related to the force applied to the connector) should not exceed 200 N [45 lbf].

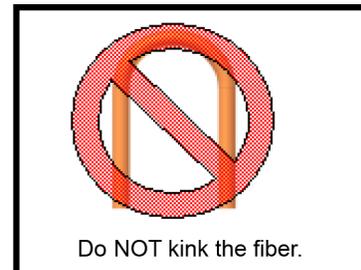
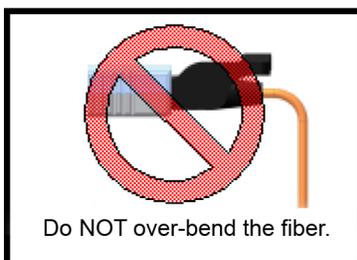


Figure 4

[†] InfiniBand is a trademark of InfiniBand Trade Association.

[‡] XAUI is a trademark of the 10Gigabit Ethernet Alliance XAUI Interoperability Group.

- The minimum allowed Bend Radius of the cable is 25 mm [1 in.], provided that tensile does not exceed 50 N [11.2 lbf].
- The fiber must only be bent in direction perpendicular to the flat side of the fiber ribbon "up" or "down" with connector placed horizontally.
- The connector should NOT be twisted to achieve the correct orientation. The user should reach back approximately 1m [3 ft] on the fiber, and twist the fiber ribbon to allow the connector to rotate to the proper orientation. Failure to do so may result in all the rotational forces acting directly at the fiber terminations.
- Kinking the cable can cause the optical fiber to break.

4.3. Electrical Installation

Install the cable as follows:

1. Align the connector as shown in Figure 5.



Figure 5

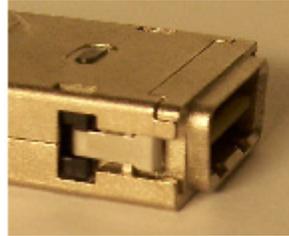
2. Insert the connector into the port receptacle as shown in Figure 6.



Figure 6

3. Ensure the latches (male) on the connector interlock properly with the latch (female) in the CX4 port connector. Refer to Figure 7.

Latch (male)



Latch (female)

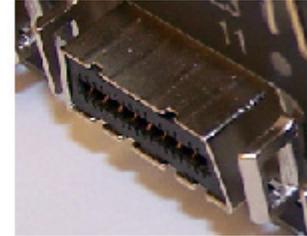


Figure 7

After installation, the active cable should function without operator intervention.

4. To remove the connector from the port perform the installation in reverse order. Starting to pull the handle causes the cable to detach. Ensure that the latch is then back in its locked position prior to installation into another port. Refer to Figure 8.



Figure 8

4.4. Status LED

The ZL60615 CX-4 active optical cable provides status LEDs at each connector end to facilitate installation. Refer to Figure 9 and Figure 10.

On installing the connector into the port the following LED conditions will be observed:

- No Light: indicates no power is being supplied to the connector
- Green Light ONLY: the connector is powered on AND is transmitting traffic on all channels
- Red & Green Light: the connector is powered but a fault has been detected on at least one data channel
- Red Light ONLY: the connector is powered but a hardware fault has been detected in the cable

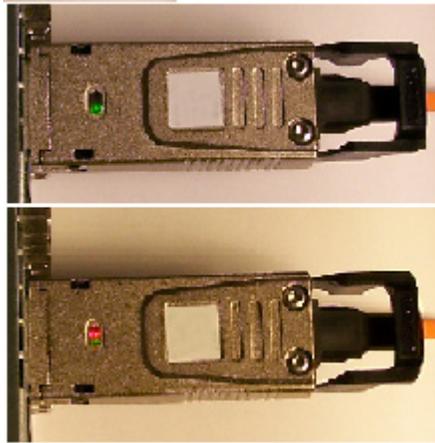


Figure 9

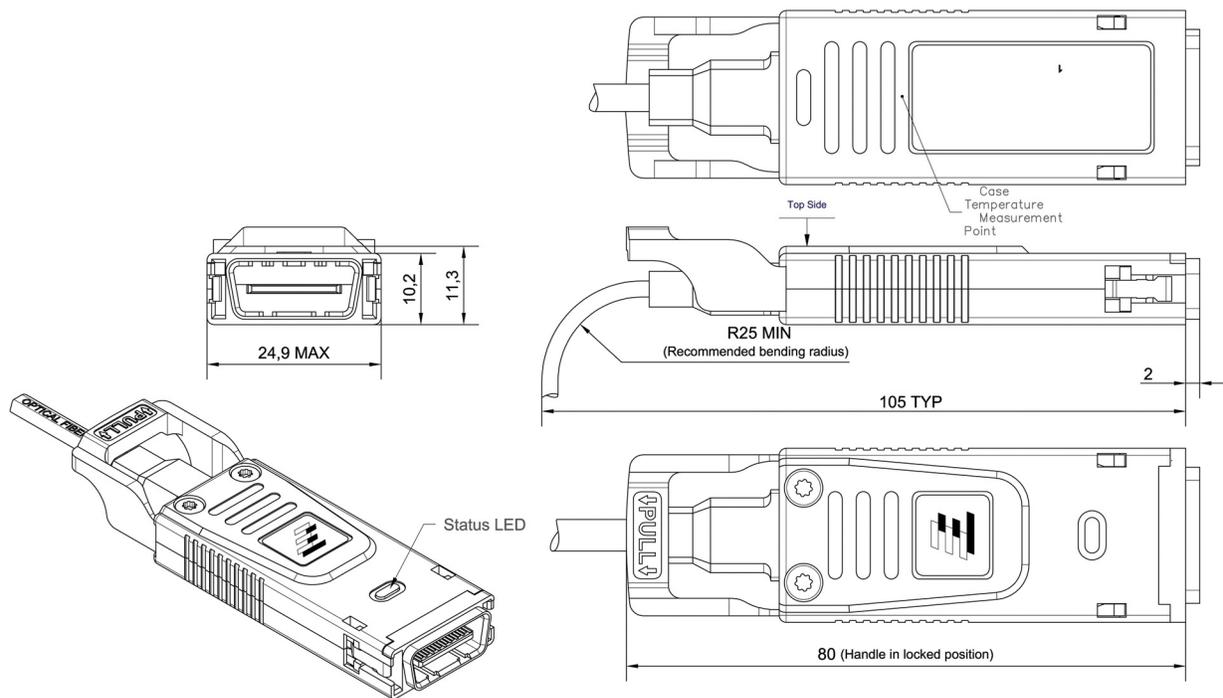


Figure 10

4.5. Regulatory Approvals

The product is CE approved and has been certified as passing FCC Part 15 Class B requirements

Classified in accordance with IEC 60825-1/A2:2001, IEC 60825-2: 2000

Class 1 Laser Product

Emitted wavelength: 840 nm

Compliant to the EU directive 2002/95/EC issued 27 January 2003 [RoHS].

5. FIRE CODES

The end-user is strongly advised to check with their relevant local authorities on Health and Safety and Fire regulations before choosing the appropriate fiber jacket type for their installation.

6. CONTACTING TYCO ELECTRONICS

We are dedicated to delivering high quality technical support service that enhances the value of our manufactured products. Regardless of where you are in the world, be assured that the initial and ongoing support will be delivered professionally, effectively and with a focus on your ultimate satisfaction.

Your first contact should be were the product is purchased. To find the contact information for your country, look up Purchasing Information on Tyco Electronics site (<http://www.tycoelectronics.com/>).

7. DISCLAIMER

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The dimensions in this document are for reference purposes only and are subject to change without notice. Specifications are subject to change without notice. Please consult Tyco Electronics for the latest dimensions and design specifications.

Part numbers in this document are RoHS Compliant[†], unless marked otherwise.

[†] As defined at <http://www.tycoelectronics.com/leadfree>

