Introduction

Conec IP 67 LC Duplex (ODVA) Fiber Optic Connector System

Purpose

- Introduce CONEC's Industrial Fiber Optic LC Duplex Connector System

Objectives

- Explain available options
- Discuss applications

Content

- 9 pages

Learning time

- 5 minutes

Welcome to CONEC's Industrial Fiber Optic training module. This module is an overview introducing CONEC's Industrial Fiber Optic LC Duplex product offering with all it's various options.

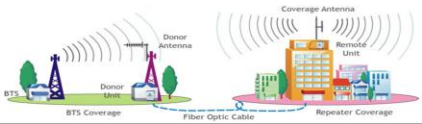
Industrial Fiber Optic Applications

Primary Use Application: F/O application subject to harsh environments, especially the need for sealing against liquids and dust.

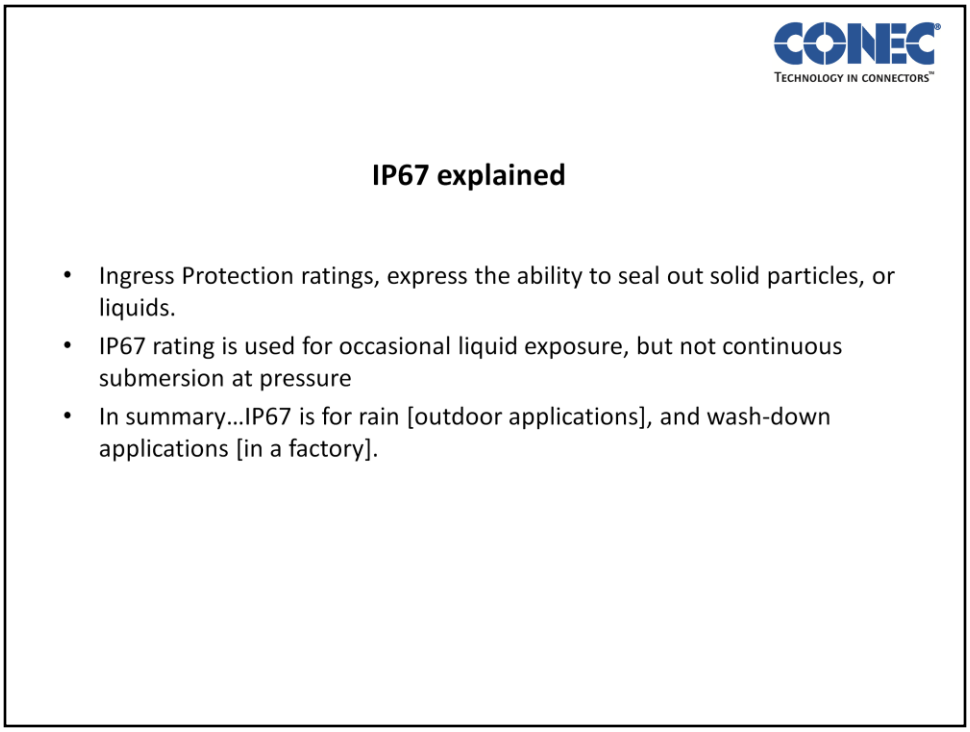
The IP67-rating allows designers to incorporate Fiber Data ports in harsh environments in applications ideal for:

- Communications, WiMax and LTE Base Stations
- Industrial Ethernet- Outdoor and Indoor
- Remote Radio Head Units (RRU) in cell relay towers (FTTA – Fiber To The Antenna)
- Security and surveillance equipment
- Drop-down cables with ODVA LC Fiber Connectors
- Head-end Repeaters, Base Station, Fiber Transmit/Receive remote repeaters

Provide increased protection from contamination and moisture in addition to mechanical stability, temperature resistance and vibration



Outside the normal office environment, there are many instances where the advantages of fiber optics are needed to transfer very high speed data over longer distances. Because these distances are likely to include the outdoors, the need for a more robust sealed connector system is necessary.



The LC Duplex connector family is designed specifically for challenging environments such as outdoors. Typically an IP67 rating means that the connector can be 'splashed' or 'rained on'. The official test involves submerging a mated pair to 1 meter depth for 30 minutes, with no water leakage observed. In addition, these connectors also withstand most common industrial liquids that they may come in contact with, when used in a factory environment.

Fiber Optic Definitions…Terms used in this PTM

CONEC
TECHNOLOGY IN CONNECTORS

• ODVA (**O**pen **D**eviceNet **V**endors **A**ssociation)
is an international organization defining computing network technologies based upon the Common Industrial Protocol (CIP), including *DeviceNet, EtherNet/IP, CIP Safety* and *CIP Sync*. Members of ODVA include representatives of leading automation companies.

Cable Types

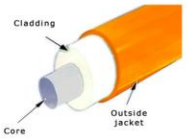
• OFNR (**O**ptical **F**iber **N**onconductive **R**iser)
Designates a class of cable JACKET, with properties making it suitable in "riser" applications, per UL1666. They are engineered to prevent the spread of fire from floor to floor in a building.
Jacket selection can also be based on Indoor, or Outdoor needs, or resistance to chemicals.

• Single Mode: as the name implies is an optical fiber designed to carry only a single ray of light (mode). Often designated as 8-10 µm, and used for very long runs, 2000 meters or more.

• Multi Mode: as compared to SM has much larger core diameter, typically 50–100 micrometers; much larger than the wavelength of the light carried in it, and offered in 'speed classes'.

• OM1: (62.5/125µm) these fibers easily support applications ranging from Ethernet (10 Mbit/s) to Gigabit Ethernet (1 Gbit/s).

• OM3: (50/125µm) for increased performance over greater distances. Fibers that meet this designation provide sufficient bandwidth to support 10 Gigabit Ethernet up to 300 meters.



Fiber Optic cables are specified based on several parameters. The jacket, just as for copper cables, must withstand the environment that it's used in, plus meet any fire resisting standards, often per UL specifications, especially when used indoors. Many FO applications are outdoors, so look for 'outdoor' ratings. In addition the optical cores are chosen, to optimize: signal speed, distance needed, and cost of the fibers as well as the equipment at the ends. Multi Mode is most common, and lower in cost, if distances are not long.

Product Features

Receptacle and Plug Housings:

- Bayonet coupling mechanism to IEC 61076-3-016 standards
- Fast & Secure fastening by audible “click” when locking connector halves
- Tethered protective covers to protect vital F/O connectors when not used
- IP67 protection when connected or covered
- Available rugged full metal die-cast housings, Or plastic housings
- Front or rear panel mount

Fibers Optic Cable types:

- Single Mode, Multi Mode, and APC
- Rugged OFNR breakout cable
- MM 62.5 (OM1) and 50/125 (OM3) double ended patch cords

The LC Duplex connector family is designed specifically for challenging environments such as outdoors. The connector system features easy one-hand bayonet coupling, built in seals, UV resistance, and robust construction consistent with industrial ruggedness. All plastic, or all metal housings, can be used with the popular types of fiber optic cables.

IP67 Fiber Optic LC Duplex RECEPTACLE COUPLER

CONEC Technology in Connectors

- Available as a kit, with or without a cap
- Black plastic, or zinc die-cast housing
- Maximum panel thickness of 3.2mm
- Silicone panel gasket, and mounting nut included
- Also accepts standard LC duplex SM, MM, & APC connectors
- Square flange 4 hole mounting also available in die-cast version only

Round Receptacle, avail. in Plastic or Diecast zinc

Full Metal Diecast – shown with 4 hole square flange mounting style

The LC Duplex Coupler is intended to bring fiber connections through a panel or enclosure. The metal version is available in two mounting configurations: the familiar panel nut, or Square flange 4 hole mounting. Either choice will give you a secure connection to the panel, and IP67 sealing.

Patch Cords

- Standard length from 1-80 meters
- Custom lengths available
- Double ended
- Single mode, multi mode and APC
- Rugged OFNR breakout cable
- Suitable for indoor or outdoor use
- Cables are 100% inspected for attenuation and insertion loss

Performance	Value				Unit
	Single Mode		Multi Mode		
Attenuation	0.08	0.08	0.07	0.04	dB
Return loss	55	56	31	32	dB
Operating Temp.	-40 to +85				°C
Storage Temp.	-40 to +85				°C

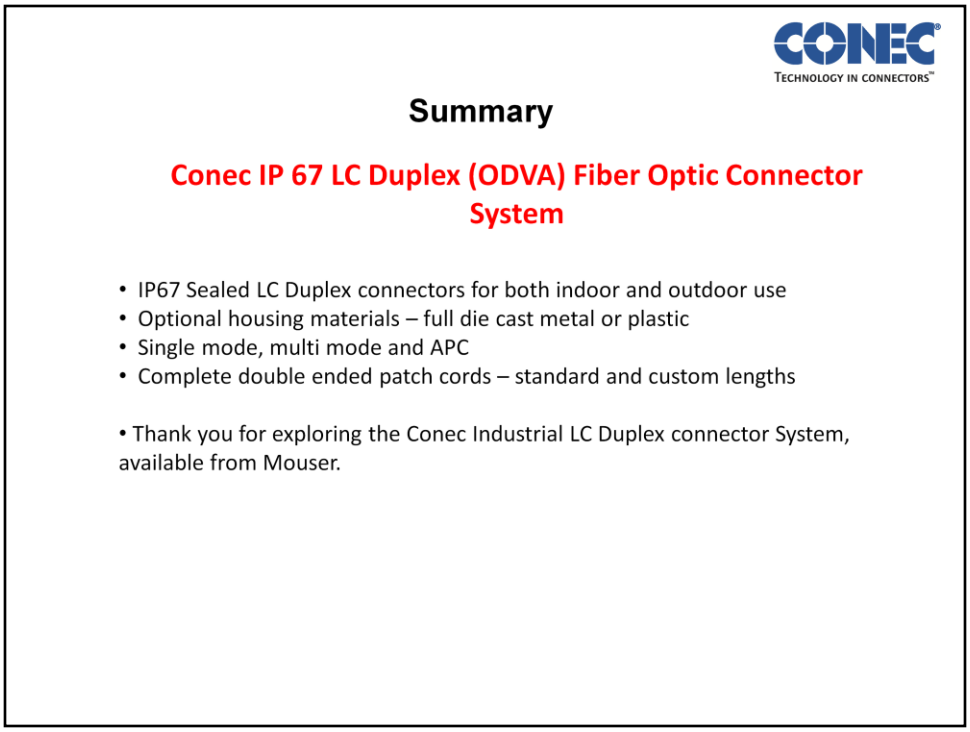
Fully assembled double ended patch cords are available in standard lengths of 1 through 80 meters. Special lengths are also available, just consult your Mouser representative and tell us what you need. All patch cord assemblies are available in either die-cast metal or plastic and are supplied complete with protective caps. For enhanced performance over greater distances (up to 300 meters), multi mode 10 gigabit OM3 cable is available.

IP67 Fiber Optic LC Duplex PLUG KITS

For maximum flexibility, LC Duplex Plug Kits are available ready for termination in the field or by qualified assemblers.

- Complete kits with all necessary components (except epoxy)
- Designed to terminate to breakout style cables
- Single mode, Multi mode & APC
- Plastic or metal die cast housings
- Ceramic FO ferrules

If pre-made patch cords are not optimum for your application, Conec has plug kits so you can terminate your particular fiber optic cable.



In summary, the Industrial LC Duplex connector system from CONEC is designed for harsh environments, and provides a fast yet reliable connection for many applications. For further information on this LC Duplex connector system…or other IP67 Industrial products from CONEC, please contact Mouser, or visit us at www.conec.com for more complete product offerings, assembly instructions and other available technical documentation.