Datasheet

SFP Multi-Rate Dual Transponder

Overview

The Fiber Driver® SFP Multi-Rate Dual Transponder (EM316DMR3G-3R) from MRV Communications defines a new level of deployment flexibility and inventory management. It combines software selectable data rates, any-port-to-any-port connectivity, and the use of Small Form-factor Pluggable (SFP) optical transceivers. It offers an extremely wide range of optical infrastructure solutions including media conversion, signal repeating, lambda conversion, Wave Division Multiplexing (WDM), and Optical Add/Drop Multiplexing (OADM). The EM316DMR3G-3R can create self-healing redundant links for mission critical applications or support physical layer multicast broadcasts of any protocol within its range.

SFP Multi-Rate Dual Transponder deployment is quick and easy. The module resides in a Fiber Driver chassis. The selected SFP transceivers are inserted, and the ports are set to the corresponding data rate. Changing the connection type at a later time means simply replacing the SFP transceivers and configuring the module for the new data rate.

SFP transceivers are easily reuseable at different locations for other applications. Reuse maximizes the investment in optical equipment and reduces the need for on-hand inventory. MRV Communications provides a complete range of optical and copper plug-in interfaces for the EM316DMR3G-3R and other Fiber Driver modules.

The Fiber Driver SFP Multi-Rate Dual Transponder performs full 3R signal regeneration - retransmission, reshaping, and retiming - on each channel at any selected data rate from 42 Mbps to 3.2 Gbps. This range covers Fast and Gigabit Ethernet, FDDI, ESCON, SONET (OC-3, OC-12 and OC-48), Fibre Channel (1 Gbps and 2 Gbps), Serial Digital Video Interface (SDI) SMPTPE-259M (270Mbps), High-Definition Serial Digital Video Interface (HD-SDI) SMTPE-292M (1.5Gbps) and DVB-ASI (270Mbps). Bypassing the signal retiming function creates a protocol-transparent 2R connection for more application options.

Features

- Wide range of applications:
  - Media conversion
  - Signal repeating
  - Lambda conversion
  - WDM
  - OADM
  - Self-healing redundant links
  - Physical layer multicasting

- Any-port-to-any-port connectivity

- Single-port-to-multiport connectivity

- 3R signal regeneration
  - Retransmission
  - Reshaping
  - Retiming

- Data rate support from 42 Mbps to 3.2 Gbps

- SFP transceivers for flexible configuration

- High port density - four data ports on a single slot

- SNMP management through MegaVision Pro® and a Fiber Driver network management module

- SFP Digital Diagnostics (SFF-8472)

Benefits

- Flexible and scalable
  - Add or change optics to adjust data or media rates
  - Maintain single item inventory

- Wide range of optical and copper interfaces
  - Standard wavelengths (850 nm, 1310 nm, 1550nm)
  - CWDM wavelengths
  - DWDM (ITU-T G.694.1-2002)
  - Ethernet, Fast Ethernet, and Gigabit Ethernet

The data rate may be set through one of the management interfaces available with a Fiber Driver network management module - SNMP, Telnet, SSH, or the local serial port - or by jumpers located on the module itself. The data rates available using the onboard jumpers without remote management are Fast and Gigabit Ethernet, Fibre Channel (1 Gbps and 2 Gbps), and SONET (OC-3).

The application of the SFP Multi-Rate Dual Transponder varies with the type of SFPs employed. The module may be used as a media converter to connect network segments of different media types, or as a lambda converter to connect network elements operating at different wavelengths. For example, a multi-mode link operating at 850 nm may connect to a single-mode link operating at 1550 nm by using the required SFPs. With its 3R functionality, the EM316DMR3G-3R long-haul optics also work perfectly as a repeater in a link spanning hundreds of kilometers.

Together with an externally connected Mux/DeMux unit such as the 4-channel or 8-channel Fiber Driver CWDM Passive Mux/DeMux (EM316PAMULC41, EM316PAMULC42 or EM316PAMULC8), the SFP Multi-Rate Dual Transponder becomes a part of an elaborate SFP-based WDM solution. It may be used to create a static trunk WDM system, a trunk switching WDM system, or a WDM repeater with or without lambda conversion. Deployed along a WDM trunk at customer service points using MRV Communications passive OADM technology, the SFP Multi-Rate Dual Transponder can create a sophisticated Add/Drop topology.

The EM316DMR3G-3R is factory-configured to support two independent data connections; ports 1 & 2 and ports 3 & 4 are paired for redundancy. It also supports any-port-to-any-port internal mapping. Port assignments may be changed through management at any time, allowing data routes to change as needed and enabling the module to perform physical layer multicasting for any protocol. For example, the device may be configured to retransmit the data signal entering port 1 out from ports 2, 3, and 4 simultaneously.
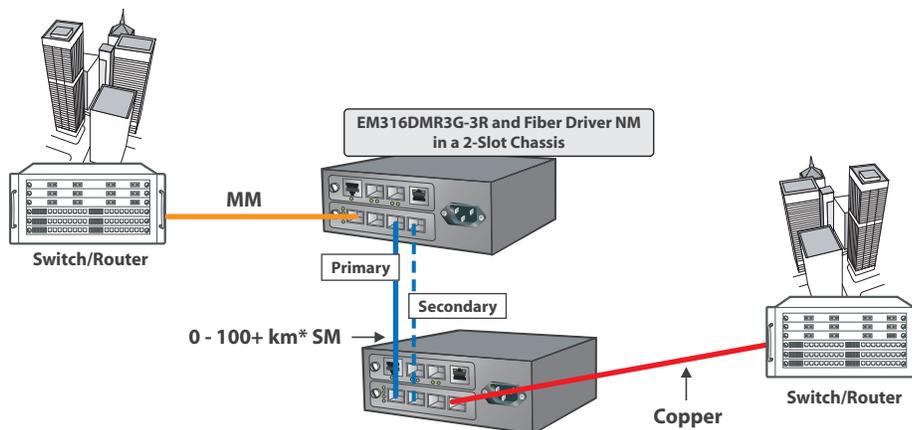
In mission critical installations that demand maximum uptime, EM316DMR3G-3R modules can establish a self-healing redundant link. In the event of link loss, the module pair is configured to automatically switch from the primary to the secondary data path. The switchover occurs in microseconds without the reconvergence times and data loss associated with slower solutions like OSPF or Spanning Tree.

The Fiber Driver SFP Multi-Rate Dual Transponder is a hot-swappable, single-slot module that is compatible with any powered Fiber Driver chassis. The EM316DMR3G-3R is SNMP manageable with a Fiber Driver network management module in the same chassis. MegaVision Pro®, the MRV network management system, uses SNMP to provide full graphical administration for all Fiber Driver and other addressable systems in the network.

The EM316DMR3G-3R supports the SFF-8472 standard including digital diagnostics. Together with the network manager it provides real-time access to information such as transceiver details, transceiver temperature, TX/RX optical power, and transceiver supply voltage.

Contact your MRV Communication sales representative for additional information about the full line of MRV Communications products or for pricing and availability.
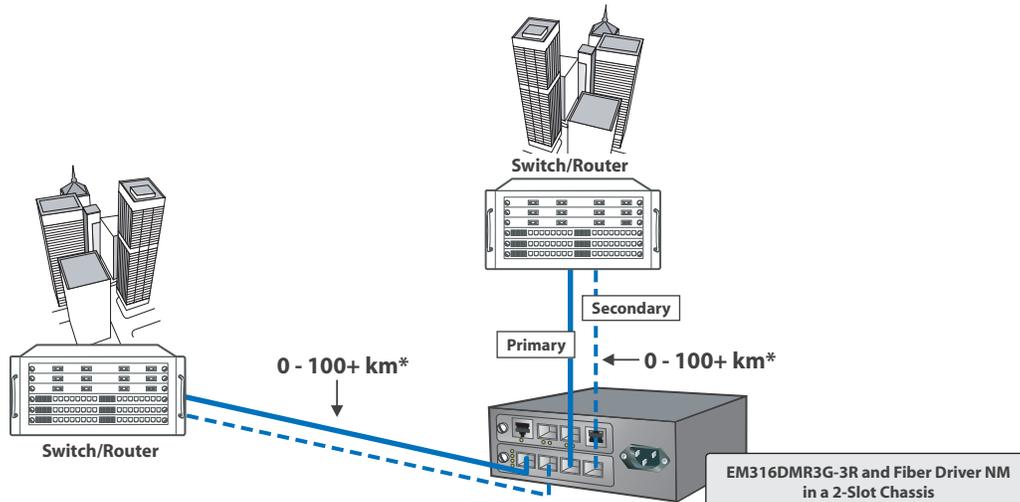
DMR Application # 1: *Point-to-Point Media Conversion with Redundant Link*

EM316DMR3G-3R and Fiber Driver NM in a 2-Slot Chassis

MM

Switch/Router

Primary

Secondary

0 - 100+ km* SM

Copper

Switch/Router

*Range determined by SFP transceivers used and quality of fiber plant

DMR Application # 2: *Point-to-Point Repeater with Redundant Link*

Switch/Router

Secondary

Primary

0 - 100+ km*

0 - 100+ km*

Switch/Router

**EM316DMR3G-3R and Fiber Driver NM
in a 2-Slot Chassis**

*Range determined by SFP transceivers used and quality of fiber plant

DMR Application Example #3: *8-Channel CWDM with OADM*

Los Angeles

Santa Monica

Switch/Router

GbE

2GFC

SAN

8-Channel WDM System

**EM316DMR3G-3R & Fiber Driver NM
in a 4-Slot Chassis**

LAX

**EM316DMR3G-3R & Fiber Driver NM
in a 4-Slot Chassis**

8-Channel WDM System

SDI

SDI

SDI

**Layer 1 Multicast
Video Streaming**

OC-12

Redundant Link

EM316DMR3G-3R

Hollywood

Switch/Router
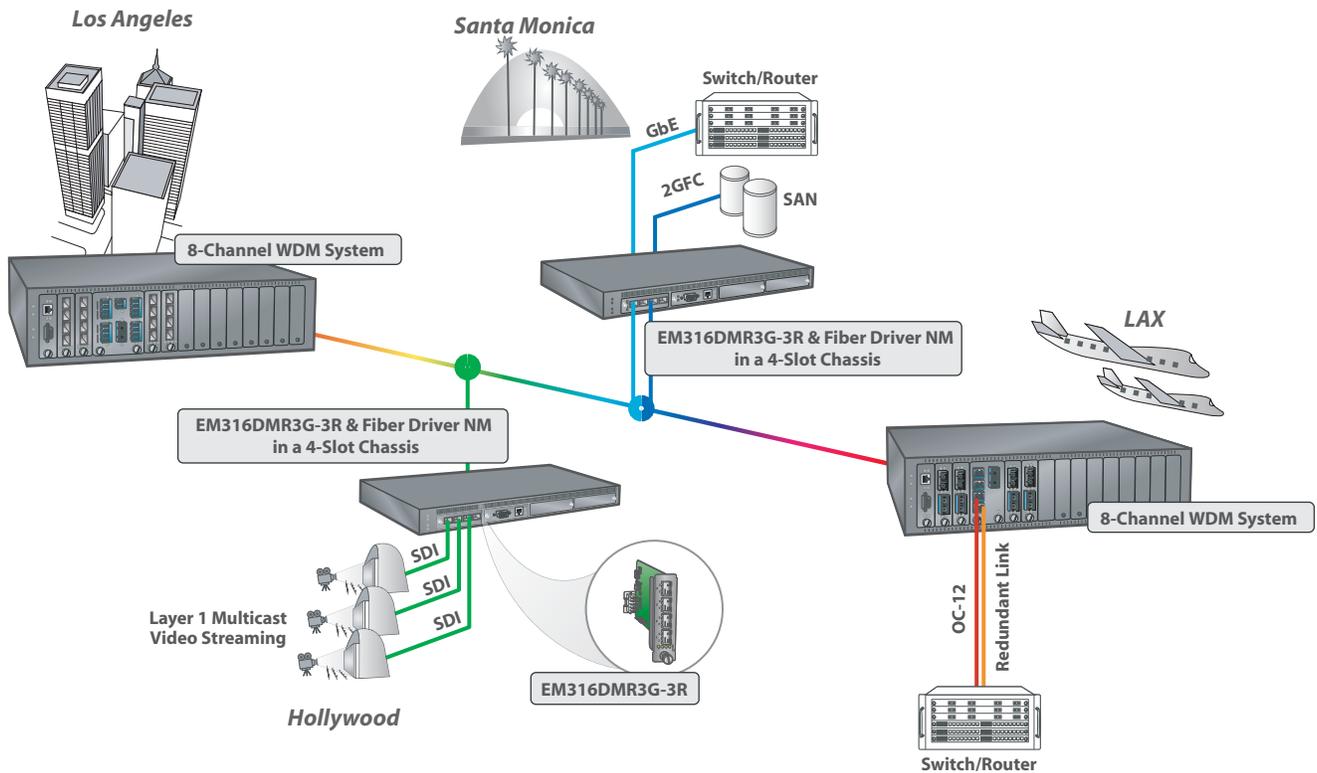
Physical Specifications

Operating Temperature Range	0°C to 60°C (32°F to 140°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Relative Humidity	85% maximum, non-condensing
Physical Dimensions	25 mm x 75 mm x 175 mm deep (1" x 3" x 7" deep)
Weight	Approximately 213 g (7.5 oz)
Regulatory Compliance	FCC Part 15 (Class A); IC (Class A); EMC Directive: Emission (Class A) and Immunity; RoHS Directive;
	China RoHS; WEEE Directive

Ordering Information

Model	Function	Protocol	Connectors	Wavelength (nm)	Budget (dB)	Range
EM316DMR3G-3R	4-port SFP multi-rate transponder module with quad CDR	Any from 42 Mbps to 3.2 Gbps in 3R mode	SFP (x4)	SFP dependent	SFP dependent	SFP dependent

MRV has more than 50 offices throughout the world. Addresses, phone numbers, and fax numbers are listed at www.mrv.com.
Please e-mail us at **sales@mrv.com** or call us for assistance.