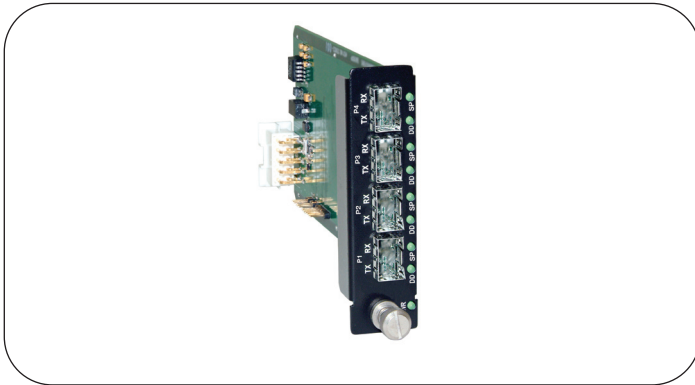




EM316xxMX2R

2-channel, Gigabit-speed TDM with Redundant Link



Overview

The Fiber Driver® EM316xxMX2R from MRV Communications is a TDM (Time Division Multiplexing) access module for Gigabit Ethernet (GbE) or 1-Gig Fibre Channel (1GFC) designed to boost optic fiber and wavelength utilization while providing trunk redundancy capabilities. The EM316xxMX2R allows for a significant cost reduction and higher fiber utilization over a pure optical multiplexing solution. The module aggregates two (2) Gigabit-speed data channel tributaries onto one bidirectional SFP-based fiber optic trunk.

EM316xxMX2R utilizes standard SFP (Small Form Pluggable) field-installable transceivers, allowing each interface to be optimized as needed for a given application. The module supports the full range of MRV GbE and 1GFC SFPs for Single Mode fiber, Multimode fiber, Extended Multimode, and Copper interfaces. For this reason, it is an excellent tool for a wide range of applications. For example, using a CWDM (Coarse Wave Division Multiplexing) SFP on the aggregation port allows direct connection to a WDM Mux/Demux or OADM without the need for a transponder.

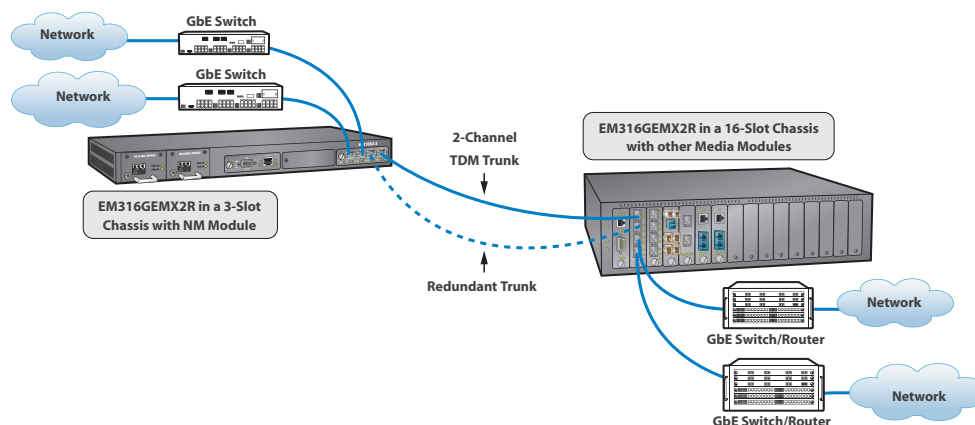
Features and Benefits

- **Transports two Gigabit-speed data channels (GbE or FC) over one bidirectional trunk using a single wavelength** – optimizes the utilization of existing fiber plant and available wavelengths
- **Network transparent operation** – does not alter data or packet framing
- **SFP interfaces** – add/change optics as needed, create a WDM wavelength-specific trunk
- **Ultra low latency** – excellent for Digital Video applications
- **Real-time SFP interface monitoring through Digital Diagnostics (SFF-8472)** – early detection of possible network problems before service is affected
- **Trunk link redundancy with <100 ns switchover** – eliminates loss of service in the event of primary link failure, essential for mission-critical applications
- **Per-channel indication of remote link**
- **Extremely compact 1-slot form factor**
- **SNMP manageable, MegaVision Web supported** – end-to-end network performance management
- **Can be used in 3-, 4- or 16-slot Fiber Driver chassis**
- **Cost effective solution that reduces both CapEx and OpEx**

Applications

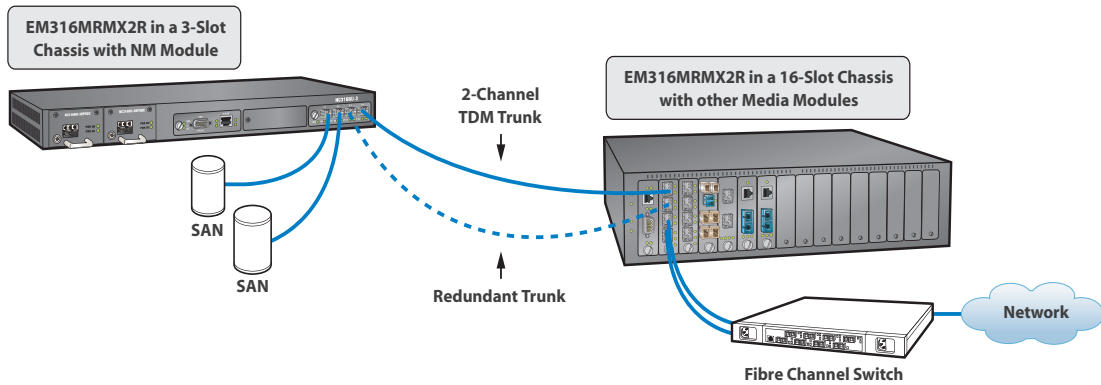
- Fiber limited installations
- Mission-critical services requiring maximum up time
- Sub-wavelength aggregation for WDM transport

EM316GEMX2R multiplexing two GbE data channels and using a redundant link





EM316MRMX2R multiplexing two FC data channels and using a redundant link



Such an application not only doubles the capacity of each GbE or 1GFC WDM channel but in some cases can even allow for the usage of lower-cost CWDM technology because of the subsequent reduction in channel count. Multiplexing thirty-two (32) Gigabit-speed data channels would normally require the use of DWDM technology with one wavelength dedicated to each channel. However, with the EM316xxMX2R the number of required wavelengths is halved to sixteen (16), which makes the use of CWDM technology an option.

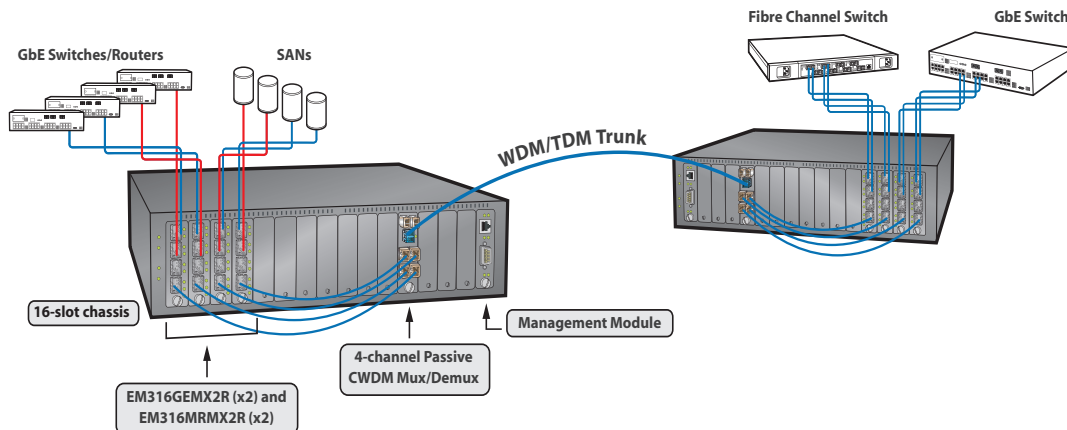
Combined with the Fiber Driver EM316NM management module, the EM316xxMX2R module and host Fiber Drive chassis can be managed both in-band (SNMP) and out-of-band (CLI, Telnet), and are both fully supported through the GUI element manager of MegaVision Web, MRV Communications' own comprehensive NMS. Management provides real-time access to vital operating information including link status, operating temperature, fan status, power supply voltage, performance monitoring and more.

Many SFPs provide a powerful Digital Diagnostics tool for managing the pluggable interface. Fully supported by the EM316xxMX2R, Digital Diagnostics is a Multi-Source Agreement (SFF-8472) that includes an additional number of management parameters, including:

- Optical Transmit Power
- Optical Receive Power
- Voltage & Temperature Measurement
- Vendor Code, Wavelength, Serial Number and other factory settings

The EM316xxMX2R comes standard with redundant SFP trunk interfaces, an invaluable feature for mission critical applications. Should a link be lost on the primary trunk the module will automatically switch over to the secondary trunk and send a management alert. At <100 ns the switchover happens so quickly that no data is lost and no link-state protocol such as Spanning Tree, RIP or OSPF is triggered. The event remains transparent to the end user. Time of Day trunk switchovers, and even switchovers based upon optical receive power thresholds can be set through management.

EM316GEMX2R and EM316MRMX2R modules used in conjunction with a 4-channel Mux/Demux to transport eight (8) gigabit-speed data channels over one bidirectional fiber trunk



**Physical Specifications:**

Operating Temperature Range:	0°C to 50°C (32°F to 122°F)
Storage Temperature:	-10°C to 60°C (-16°F to 140°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)
Emissions Compliance:	FCC - PART 15, SUBPART B, 1999, CLASS A; CE MARK - EN 50081-1:1992; EN 50082:1997; EN 55024:1998; EN 55022:1998; AS/NZS 3548:1995

Ordering Info	Part Number	Description
	EM316GEMX2R	SFP-based TDM module capable of multiplexing two (2) GbE data channels onto one trunk with redundant link.
	EM316MRMX2R	SFP-based TDM module capable of multiplexing two (2) FC data channels onto one trunk with redundant link.

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