E1/T1 & Ethernet/Fast Ethernet Multiplexer

with Remote Management

EM316EFE1RM-5

EM316EFT1RM-5 or
EM316EFE1RJRM-5

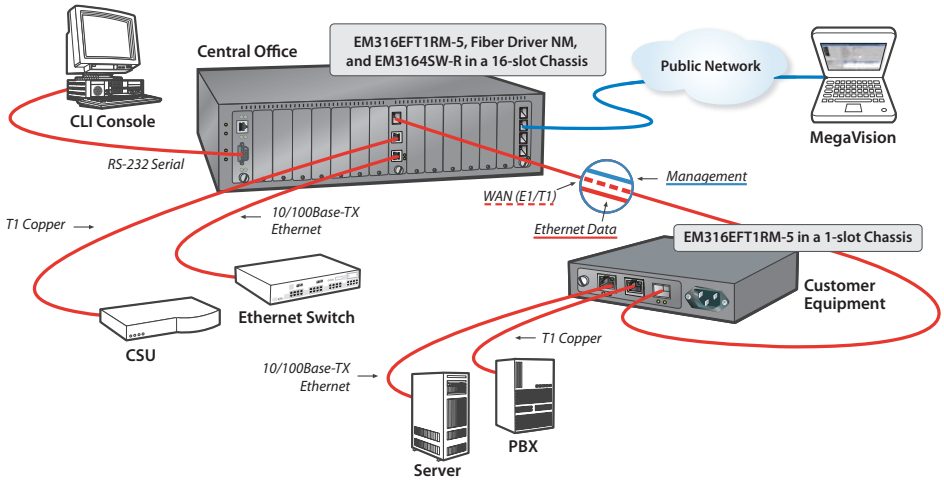
Overview

Fiber Driver® EM316EFx1RM modules from MRV Communications extend the distance and functionality of optical Ethernet networks while optimizing the use of existing fiber optic plant. Using advanced Time Division Multiplexing (TDM) technology, they combine and simultaneously transmit a 10/100 Mbps Ethernet data channel with either an E1 (EM316EFE1RM-5/EM316EFE1RMRJ-5) or T1 (EM316EFT1RM-5) channel across a full-duplex fiber optic trunk to distances only limited by the trunk interface used. The modules are transparent to framing format, and they support HDB3 and AMI line codes.

The EM316EFx1RM-5 modules use Small Form-factor Pluggable (SFP) trunk interfaces for ultimate deployment flexibility and ease of maintenance. The hot-swappable interfaces may be quickly and easily changed as needed, and may be re-used at different sites. Accordingly, SFP-based network equipment reduces the need for parts inventory as a small number of spare SFP interfaces can support the needs of a large installation.

Features

- One E1 or T1 channel and one Fast Ethernet link multiplexed over a full-duplex fiber optic trunk
  - E1/T1 and Ethernet links extended to remote locations
  - Fiber plant or wavelngth optimization
- IEEE 802.3ah remote management
  - Remote monitoring and provisioning
  - Last Gasp notification for advanced status propagation and proactive network management
- Flexible SFP fiber optic trunk port interface
  - Reduced inventory needs
  - Simple replacement and upgrades
  - Beyond 120 kilometers range on single-mode fiber without amplification
  - Single fiber transceivers
  - WDM colored optics for further fiber optimization (CWDM or DWDM)
- SFP Digital Diagnostics (SFF-8472) for optical performance management
- Local and remote loopback for fault isolation and root cause analysis
- Advanced performance monitoring statistics
- Plug-n-play Ethernet port
  - RJ-45 connector
  - 10 Mbps / 100 Mbps auto-negotiation
  - MDI/MDIX automatic sensing
- Standard E1/T1 port options
  - E1: BNC or RJ-48
  - T1: RJ-48
- Hot-swap support for reduced network interruption
- Single slot design for simple installation with any Fiber Driver chassis



Remote Management

The Fiber Driver EM316EFx1RM-5 modules fully support the IEEE 802.3ah remote management standard, greatly simplifying end-to-end network management and reducing operating expense. By overlaying a management channel along the data path, fiber supports remote link management without the complexity and cost incurred by standard IP/SNMP management.

The benefits of the 802.3ah remote management technology include:
- Capital expense and equipment cost savings - no expensive management agent required at the remote site
- Simplified deployment - fewer devices on the network and fewer IP addresses used
- Reduced operating expense - fewer truck rolls needed to service remote sites

A network management module controls the Fiber Driver EM316EFx1RM-5 module from a primary (CO) location.

The modules support SFP Digital Diagnostics, port RMON counters, Last Gasp notification, and both local and remote loopback for the most comprehensive remote management features available.

SFP Technology

SFPs are extremely small, hot-swappable transceivers that insert into an access port of any supporting network device to create a data link interface. SFP modules conform to a Multi-Source Agreement (MSA), an industry standard that specifies physical and electrical characteristics ensuring wide support for the technology.

SFP modules provide a wide variety of options for the multiplexed trunk link. Select from single-mode, multi-mode, and coarse or dense wave division multiplexing (CWDM and DWDM) to meet the demands of any network. Depending on the SFPs used, the remotely managed trunk link can span over 120 kilometers without amplification or multiplex dozens of optical transmissions into a single fiber to maximize available cable usage. The flexibility of SFPs can reduce cost, optimize traffic, support redundancy, and reduce operational costs and overhead.

Digital Diagnostics

Many SFPs provide powerful digital diagnostics tools for managing the interface. Fully supported by the EM316EFx1RM-5 modules, Digital Diagnostics is a Multi-Source Agreement (SFF-8472) that includes many manageable parameters.
- Optical transmit power
- Optical receive power
- Voltage & temperature measurement
- Vendor code, wavelength, serial number
- Alarms for various parameter thresholds
- Other factory parameters

Sales, Service, and Support

Delivering value-added service and support for nearly 20 years, MRV Communications provides worldwide technical assistance through a highly trained team of dedicated engineers and certified channel partners.

Whether you need 24x7 dedicated support, same day replacement parts shipment, on-site support, or network design and installation services, you will enjoy a responsive and professional partnership with the MRV service and support experts.

Visit *http://www.mrv.com or* contact an authorized MRV representative for more information on the EM316EFx1RM and other Fiber Driver products.

Physical Specifications:	
Operating Temperature Range	0°C to 50°C (32°F to 122°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	120-240 g (4.2 - 8.5 oz) depending on configuration
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	Port Connector	Trunk Connector	Wavelength (nm)	Range (km)
EM316EFE1RM-5	E1 & Ethernet/Fast Ethernet with Remote Management	E1 & Ethernet/ Fast Ethernet	BNC (E1) & RJ-45 (Ethernet)	SFP	(SFP Dependent)	(SFP Dependent)
EM316EFT1RM-5	T1 & Ethernet/Fast Ethernet with Remote Management	T1 & Ethernet/ Fast Ethernet	RJ-48 (T1) & RJ-45 (Ethernet)	SFP	(SFP Dependent)	(SFP Dependent)
EM316EFE1RJRM-5	E1 & Ethernet/Fast Ethernet with Remote Management	E1 & Ethernet/ Fast Ethernet	RJ-48 (E1) & RJ-45 (Ethernet)	SFP	(SFP Dependent)	(SFP Dependent)

* Management requires EM316NM-5 (or EM316LNXNM-OT) network management module.

Compatibility Note: The"-5" models are not interoperable or compatible with earlier revisions of these modules. Management of these line cards requires a compatible Fiber Driver network management module. Contact MRV customer support for more compatibility details and upgrade or downgrade information.

MRV has more than 50 offices throughout the world. Addresses, phone numbers, and fax numbers are listed at www.mrv.com.
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