

Datasheet

# EM316T3E3-XY



## Overview

Fiber grooming (media conversion and optimization) incorporates a wide variety of data transmission functions traditionally implemented through multiple independent solutions. The MRV multi-function (XY) media converters work in pairs to combine media conversion, distance extension, and fiber optimization into versatile multi-function modules.

The EM316T3E3-XY is the T3/E3 chameleon of the Fiber Driver Optical Multi-Service Platform. The module uses two DIN 1.0/2.3 copper ports and two modular SFP ports to repeat, convert, multiplex, and add redundancy to T3/E3 data networks.

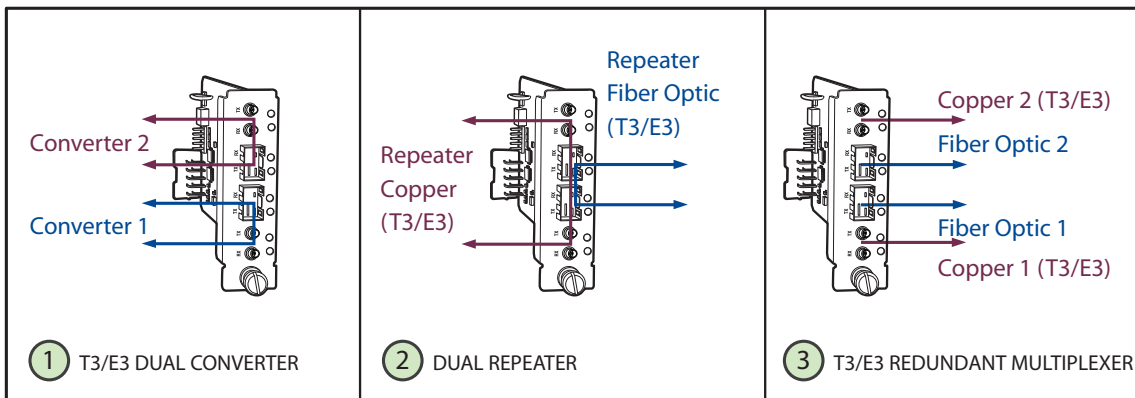
- Dual (Copper-to-Fiber) Converter – T3/E3 to fiber-optic
- Dual Repeater – T3/E3 copper-to-copper and fiber-to-fiber
- Redundant (T3/E3) Multiplexer – two-channel T3/E3 TDM multiplexing with optional optical trunk redundancy

In addition to these applications, the EM316T3E3-XY provides advanced remote management that allows the CO resident converter to fully manage its CPE partner and the optical link between them.

## Highlights

- Many optional functions in one single module
- DIP-switch selectable: T3 or E3
- Three operational modes:
  - Dual T3/E3 copper-to-fiber converter
  - Redundant two-channel T3/E3 copper to fiber multiplexer
  - Dual T3/E3 repeater - fiber-to-fiber and copper-to-copper
- Remote Management
  - Inventory management (module, SFP)
  - Remote module and port management
  - Link management
  - Alarm management
  - Last gasp
- Jitter attenuation on copper ports for improved BER performance
- B3ZS/HDB3 line code support
- LIN link fault pass-through (AIS)
- Network diagnostics tools
  - Per port loopback
  - PRBS generator and detector
  - Error counter for T3/E3 monitoring
- Optical performance monitoring through SFP Digital Diagnostics (SFF-8472)
- Advanced SNMP management
- Compatibility with all Fiber Driver powered chassis
- Hot-swap support

FIGURE 1: EM316T3E3-XY Applications



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The revolutionary paradigm of the versatile XY converter family simplifies network planning and installations while reducing replacement inventory requirements.

The same module may be deployed as a central office (CO) converter or as a customer premises (CPE) remote converter, providing the managed T3/E3 service. The two copper and two modular SFP ports may be configured and combined in many ways to serve the traditional converter, repeater, and channel multiplexer roles with the flexibility for modern media and protocols. A single Fiber Driver module now fills the roles of several legacy network components, with SFP options multiplying the possible applications still further.

The module optical links run at 125 Mbps to support Fast Ethernet/OC-3 SFPs. The SFP-based interfaces allow connection to many media types, limited only by pluggable fiber-optic interface options:

- Single or dual fiber
- Multi-mode (MM) or MM extended (MMX)
- Single-mode at 1310 nm or 1550 nm (up to 120 km)
- Coarse and dense wave division multiplexing (CWDM and DWDM)

A DIP-switch sets the module to serve a T3 or E3 copper media conversion and link extension.

Most available SFPs use MSA-compliant Digital Diagnostics SFF-8724 that specify this advanced optical performance monitoring for proactive network administration and maintenance. The small form-factor is designed for portability and interoperability, so inventory costs and downtime are reduced with fewer spare parts shared between many systems.

In some applications, the EM316T3E3-XY has built-in remote management capabilities. A separate management communication channel is multiplexed over the fiber optic link in addition to the T3 or E3 signal(s). The CO-located converter fully manages its CPE-located partner through this remote management channel with full monitoring and provisioning capabilities. The CO module shares management data with an EM316LNxNM-OT Network Management (NM) module residing in the CO chassis for full inventory management, link and module monitoring, provisioning, and alarm condition identification and propagation.

The EM316T3E3-XY module is upgradable in the field for continued support of the latest features. Each module may be upgraded with new microcode through an EM316LNxNM-OT network manager located in the same chassis.

The EM316E3T3-XY offers advanced network diagnostics for easy deployment and onsite troubleshooting. These advanced tools include interface-specific (copper and fiber) loopback and built-in PRBS generator with error analysis.

The module can identify a power failure at the remote CPE site and send a "last-gasp" alarm indication, which remotely distinguishes a power failure from other link or module failures.

Link Integrity Notification (LIN), a unique feature in Fiber Driver modules, propagates link loss from an EM316T3E3-XY interface to affected interfaces. A fiber link loss propagates to both copper ports. A copper link loss propagates to its peer copper port over the fiber optic link. Standard T3/E3 Alarm Indication Signal (AIS) alarms indicate lost link signal.

The EM316E3T3-XY provides specific T3/E3 performance statistics. The card monitors two types of errors: bi-polar violations and PRBS.

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### Traditional Applications

A flexible EM316T3E3-XY internal architecture, multiple operational modes, advanced remote management, performance monitoring, and networking diagnostics tools make the EM316T3E3-XY the industry's best (and only) T3/E3 media converter. Typical application modes listed in Figure 1 are described further below.

#### 1. Dual T3/E3 Copper-to-Fiber Converter

The module provides two independent copper-to-fiber T3 or E3 converters. (See Figure 1, panel 1) This configuration doubles the density of a central office chassis with up to 30 converters in a managed 16-slot chassis for the price of a single converter. The EM316T3E3-XY high-density solution promotes media conversion and distance extension over fiber while minimizing the investment in inflexible legacy inter-networking systems that still use built-in fiber optics.

#### 2. Dual Repeater - Fiber Optic Repeater and Copper Repeater

The module acts as a pair of repeaters. (See Figure 1, panel 2)

- Optical repeater between the two SFP interfaces connecting to remote EM316T3E3-XY modules (T3/E3)
- Copper repeater between the two T3/E3 interfaces

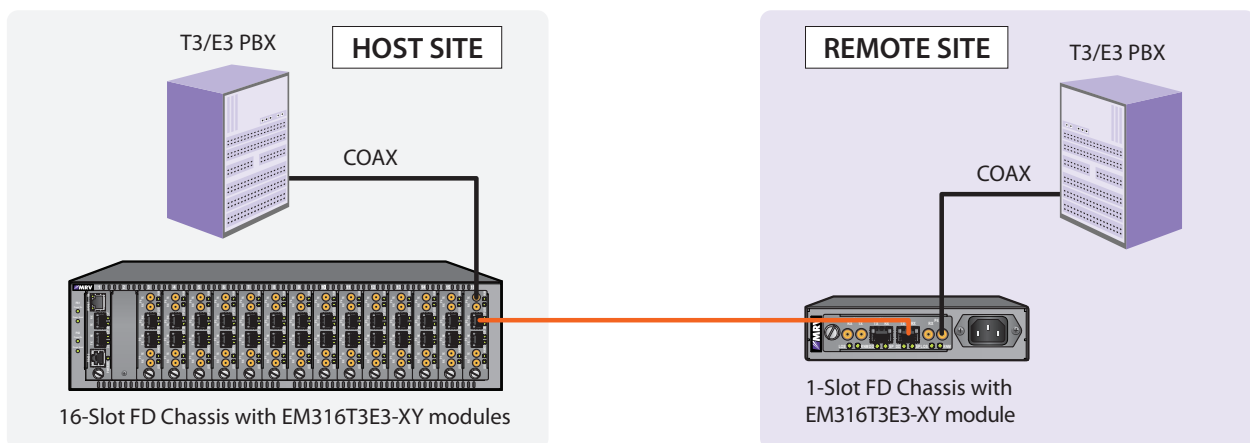
The fiber-optic repeater enables distance extension over a fiber-optic cable with full data and clock regeneration for extended distances. The copper repeater offers distance extension over a 75 ohm coaxial cable infrastructure, settable for short or longer cables.

#### 3. Dual T3/E3 Coax-to-Fiber Multiplexer with Redundant Trunk

The module becomes a T3 or E3 channel TDM multiplexer, aggregating the two channels in a redundant fiber (dual SFP) link. Two logically parallel fiber optic paths extend the segments with virtually no downtime. By connecting only one optical port, this application becomes a simple T3/E3 multiplexer. (See Figure 1, panel 3)

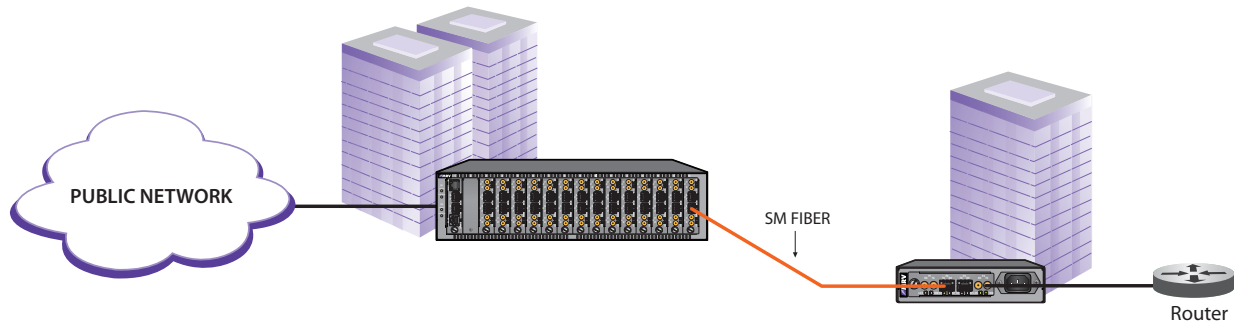
MRV's unique self-healing protection (redundancy) allows optical path exchange with nearly zero data loss and without detection by link-based internetworking protocols.

### Application A: PBX Interconnection



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Application B: *Link Extension*



Physical Specifications	
Maximum Power	1A @ 5V
Operating Temperature	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	Approximately 143 g (5.1 oz)
Regulatory Compliance	FCC Part 15, Class A; IC, Class A; EMC Directive: Emission (Class A) and Immunity; WEEE Directive: Wheelie Bin Mark; RoHS Directive; China RoHS; REACH SVHC

Ordering Info	Model	Function	Protocol	Connectors
	EM316T3E3-XY	T3/E3 multifunction media converter with redundant fiber-optic link	T3/E3	SFP (x2) DIN 1.0/2.3 (x2)

ACCESSORIES

Ordering Info	Model	Function
	1600125-001R	1.0/2.3 BNC cable (4 per module)

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