Optical Ethernet Services Demarcation - 802.3ah

Overview

The Fiber Driver® Optical Ethernet Service Demarcation (OESD) modules from MRV Communications enable service providers to build a fully managed point-to-point fiber optic link with a single manager entity at one end of the link instead of at each end. Using the OAM 802.3ah standard and its vendor extensions, they provide management control of both ends of the link from the Central Office (CO) end. The remote CPE and OAM ports are managed as if they were local ports on the CO module.

By eliminating CPE management devices and incorporating plug-n-play functionality, the Fiber Driver OESD modules reduce costs of both equipment and configuration. The robust management and diagnostic features include remote loopback, Digital Diagnostics, and remote software downloads. They improve operational expenses by reducing the need for service truck rolls while enhancing customer support to ensure maximum return on all network investments.

OESD modules are available for Ethernet and Fast Ethernet (EM316EFRMAHSH-5) and for Gigabit Ethernet (EM316GRMAHSH-5) applications. They include solutions for dual fiber, single fiber, self-healing links, and redundant trunk configurations.

These modules deliver the full functionality of an optical Ethernet data channel to the end user - including support for packet sizes of up to 1900 bytes - while providing the management features required by service providers. They offer rate limiting at a resolution of 32 kbps for Ethernet and Fast Ethernet data channels and at 1 Mbps for Gigabit Ethernet data channels, enabling multi-tiered service plans.

Features

- Optical Ethernet, Fast Ethernet, and Gigabit Ethernet Demarcation

- Remote upgrades through firmware download

- IEEE 802.3ah remote management
  - Remote monitoring and provisioning
  - Last Gasp notification for advanced status propagation
  - Vendor-specific extensions

- IEEE Ethernet standard compatibility

- Large packet size support
  - 1914 bytes - EM316EFRMAHSH-5
  - 2044 bytes - EM316GRMAHSH-5

- Rate limiting at a fine resolution
  - 32 kbps EM316EFRMAHSH-5
  - 1 Mbps EM316GRMAHSH-5

- Link Integrity Notification (LIN) for fault detection and propagation

- Access port selection
  - RJ-45 with auto-negotiation and automatic MDI/MDIX sensing
  - SFP-based optical port

- SFP-based (trunk) interface with link redundancy at no additional cost

- Flexible SFP fiber optic interfaces
  - Reduced inventory needs
  - Simple replacement and upgrades
  - Beyond 120 kilometer 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

- Hot-swap support for reduced network interruption

- Single slot design for simple installation with any Fiber Driver chassis

MRV

Management features common to all the Fiber Driver OESD modules include Last Gasp, LIN, and remote loopback. Last Gasp allows the module to send a management alert before shutting down in the event of power loss. With LIN enabled, loss of link on any port of a module disables all downstream AH ports. Devices dependent on the link status can react to the problem, which is critical in mission critical network designs. Remote loopback can test and verify the integrity of the entire link.

Every Fiber Driver OESD module is upgradeable to the latest features and standards available by remotely downloading the microcode and firmware.

The OESD modules are compatible with any powered Fiber Driver chassis and they fit into a single slot. Each module includes an auto-sensing 10/100 Mbps RJ-45 data port that also features automatic MDI/MDIX selection. The SFP ports support Digital Diagnostics (SFF-8472), and they may be configured with any of the wide range of SFP interfaces available from MRV.
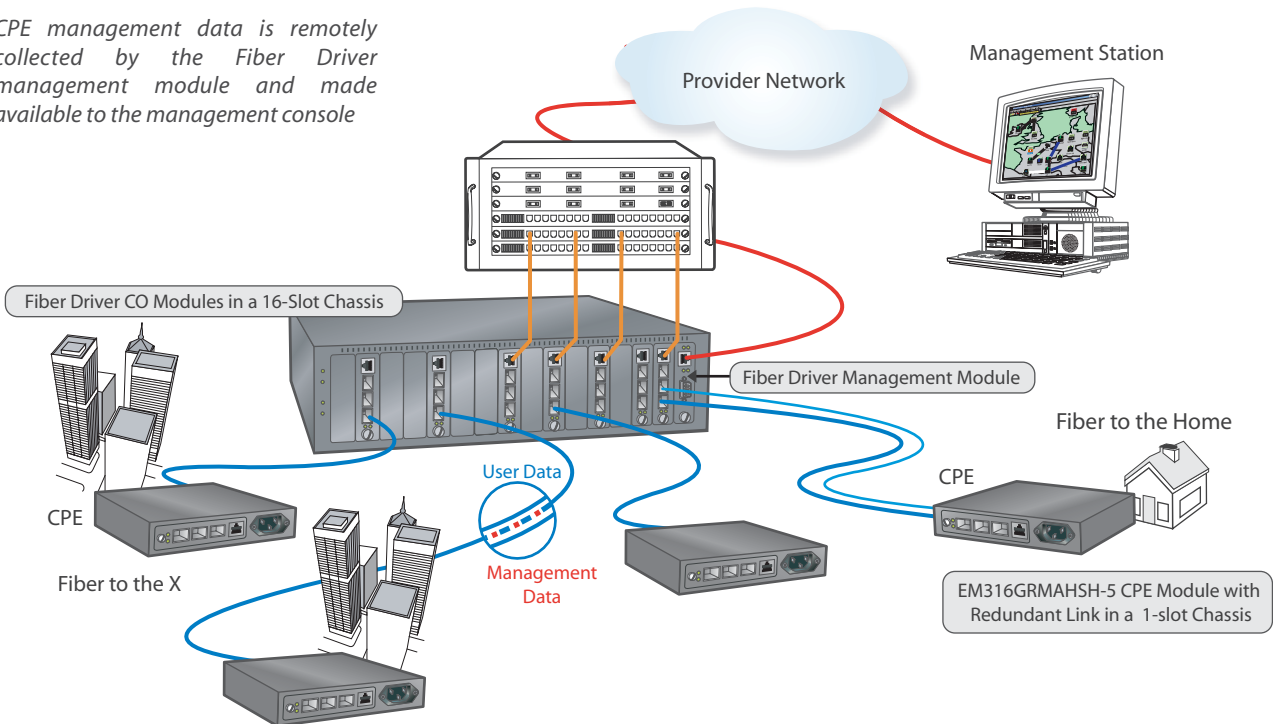
Self-healing and redundant link versions of the Fiber Driver OESD modules are standard for mission critical applications. Both single-homed and dual-homed configuarations are supported. The redundant link feature includes primary and secondary interfaces for both the OAM and trunk ports. If the active link fails, the module automatically switches to the secondary path. The switchover time is less than 100 nanoseconds with parallel links, so the event remains transparent to the network and eliminates loss of service and data.

Fiber Driver OESD modules support the full range of short-haul, long-haul, dual-fiber, single-fiber, Fast Ethernet, and Gigabit Ethernet SFPs available from MRV.

For more information on the complete line of MRV Communications pluggable transceivers and other products, visit our website at: *http://www.mrv.com/plugins/* or contact an MRV representative.

802.3ah Remote Management Example

CPE management data is remotely collected by the Fiber Driver management module and made available to the management console

Management Station

Provider Network

Fiber Driver CO Modules in a 16-Slot Chassis

Fiber Driver Management Module

Fiber to the Home

CPE

User Data

CPE

Management Data

Fiber to the X

EM316GRMAHSH-5 CPE Module with Redundant Link in a 1-slot Chassis

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
Dust	Less than 10^6 particles/m³ (30,000 particles/ft³)
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
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[1] Port/Link	Wavelength (nm) Port / Link	Budget (dB)[2] Port / Link	Range[3] Port / Link
EM316EFRMAHSH-5	Auto-Sense 10/100Base-TX/SFP to SFP with 802.3ah Remote Management. Redundant trunk, and data links.	Ethernet/ Fast Ethernet	RJ-45 & SFP/ SFP (x2)	N/A or SFP/ SFP Dependent	N/A or SFP/ SFP Dependent	1-100 m or SFP/ SFP Dependent
EM316GRMAHSH-5	10/100/1000Base-TX/SFP data port to SFP trunk port with 802.3ah Remote Management. Redundant trunk, and data links.	Gigabit Ethernet	RJ-45 & SFP/ SFP (x2)	N/A or SFP/ SFP Dependent	N/A or SFP/ SFP Dependent	1-100 m or SFP/ SFP Dependent

[1] Default connectors listed, others optional.
[2] Higher budgets available.
[3] All specifications, distance claims and operational parameters are based on industry average fiber cable performance; 9µ Singlemode performance of 0.25 dB/km for 1550 nm and 0.5 dB/km for 1310 nm, and 62.5µ Multimode performance of 3 dB/km for 850 nm and 1.5 dB/km for 1300 nm. For non-standard fiber applications or additional information contact MRV Communications

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. Please e-mail us at **sales@mrv.com** or call us for assistance.

MRV (West Coast USA)
20415 Nordhoff St.
Chatsworth, CA 91311
800-338-5316
818-773-0900

MRV (East Coast USA)
295 Foster St.
Littleton, MA 01460
800-338-5316
978-952-4700

MRV (International)
Business Park Moerfelden
Waldeckerstrasse 13
64546 Moerfelden-Walldorf
Germany
Tel. (49) 6105/2070
Fax. (49) 6105/207-100