



## Passive Mux/Demux Modules & Cables



### Overview

The Fiber Driver Passive Mux/Demux modules and cables deliver the benefits of a Wave Division Multiplexer in a fully passive solution. With matching units placed at each end of an optical link, up to 16 Full Duplex data channels can be combined and transmitted over a Single Mode fiber trunk. Using the Mode Conditioning module 4 data channels can be multiplexed over a single Multimode fiber link to a distance of up to 1 km, and 8 channels can be transmitted up to 500 m.

Protocol and topology independent, the operation of the Passive Mux/Demux remains transparent to both the network and the end user. With plug-n-play setup and a design that minimizes budget loss, it can readily and seamlessly be integrated into an existing environment. The unit's small form factor and no requirement for power means it can be placed virtually anywhere.

### Features

- Multiplexes up to 16 Full Duplex data channels
- Protocol and topology independent
- Transparent operation
- Secure physical separation between data channels
- Minimal dB loss per link
- Fully passive device - requires no power
- Compact form factor



**EM316PAMULC4N\***

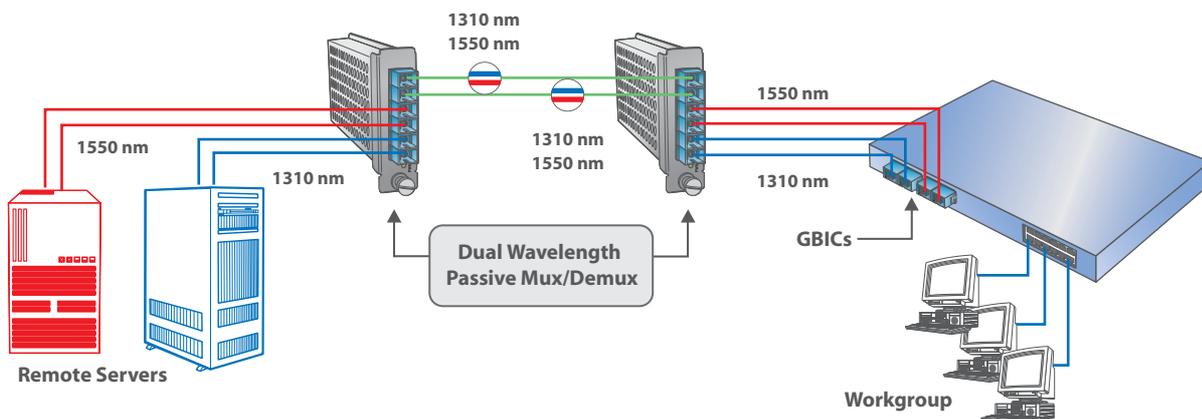


**EM316WP2/53S\***



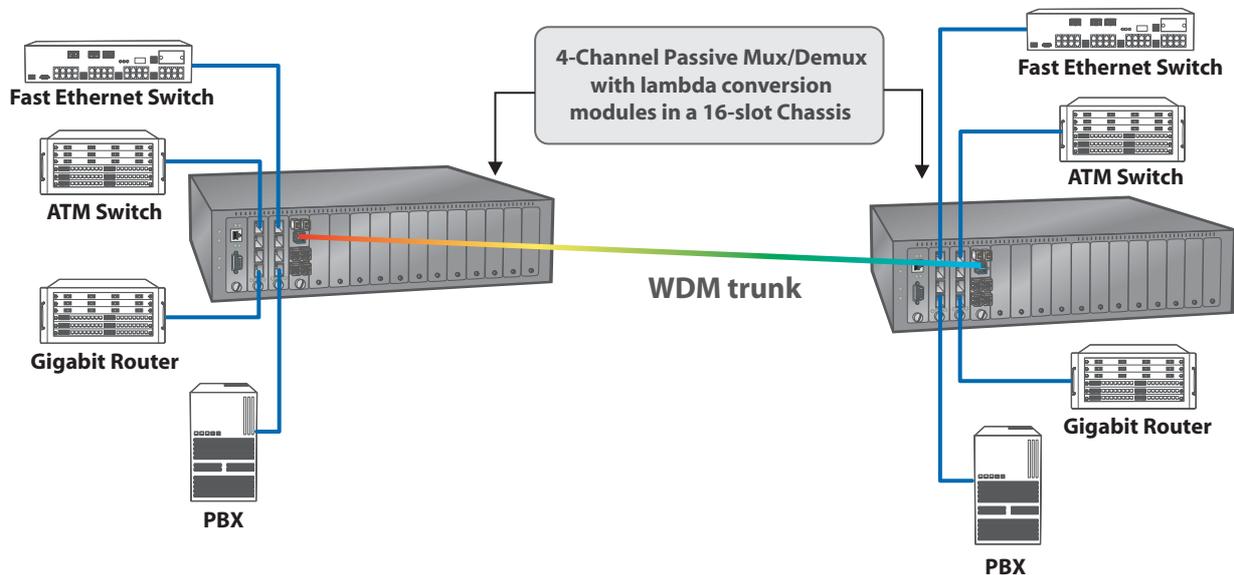
\*Photographs are for reference only. Please refer to the ordering information for specifications.

### Typical 2-Channel Passive Mux/Demux Application





**Typical 4-channel passive Mux/Demux module application**



The direct benefit of a Fiber Driver Passive Mux/Demux is its ability to maximize the utilization of existing fiber plant at a fraction of the time and expense of installing additional fiber. It increases network capacity while allowing for greater deployment flexibility as data channels can be added or changed as needed.

The Fiber Driver Passive Mux/Demux modules are available in 2-, 4-, 8- and 16-channel configurations. Designed in a high-density form factor, each is a single-slot module that can be placed in any powered or non-powered Fiber Driver chassis.

The Passive Mux/Demux cables support two channels using separate wavelengths: 1550 nm and 1590 nm. They are simply connected to the transceiver of each network device and then connected to a Single Mode fiber link.

The 2-channel Passive Mux/Demux module utilizes wavelengths of 1310 nm and 1550 nm. The 4- and

8-channel modules utilize wavelengths that fall within the ITU-T G.694.2 (2002) grid from 1470 nm to 1610 nm (see the wavelength chart under Ordering Information for details), and are available with an optional 1310 nm service channel. The 16-channel modules follow the ITU-T G.694.2 grid from 1310 nm to 1610 nm, and require the use of low water peak fiber.

When operated in a chassis configured with the Fiber Driver Network Management Module (EM316NM), a Passive Mux/Demux module provides essential management information. This includes the diagnostic ability to verify the port connection wavelengths, e.g. identify an incoming wavelength of 1470 nm on a unit that does not support it.

For additional information on these or any of the full line of MRV Communications products, including pricing and availability, contact your MRV Communications representative.

| Physical Specifications: Passive Mux/Demux Modules |  |
|--|--|
| <b>Operating Temperature Range:</b>                | 0° C to 70° C (32° F to 158° F)  |
| <b>Storage Temperature:</b>                        | -40° C to 85° C (-40° F to 185° F)   |
| <b>Relative Humidity:</b>                          | 85% maximum, non-condensing  |
| <b>Physical Dimensions:</b>                        | 25 mm x 90 mm x 175 deep (1" x 3.5" x 7" deep)   |
| <b>Weight:</b>                                     | 425 g (15 oz)  |
| <b>Emission Compliance:</b>                        | FCC - PART 15, SUBPART B, 1999, CLASS A; CE MARK - EN 50081-1:1992;<br>EN 50082:1997; EN 55024:1998; EN 55022:1998; AS/NZS 3548:1995 |


**Physical Specifications: Passive Mux/Demux Cable**

|  |                                   |
|--|-----------------------------------|
| <b>Center Wavelength, nm</b>                                 | 1311 - 1611 (in 20 nm increments) |
| <b>Center Wavelength Accuracy, nm</b>                        | < ± 1                             |
| <b>Bandpass @ 0.5 dB, nm</b>                                 | > 13 or Customer Specify          |
| <b>Channel Spacing, nm</b>                                   | 20                                |
| <b>Add/Drop Channel Insertion Loss (C-P<sub>1</sub>), dB</b> | ≤ 1.2                             |
| <b>Express Channel Insertion Loss (C-P<sub>2</sub>), dB</b>  | ≤ 0.8                             |
| <b>Add/Drop Channel Ripple, dB</b>                           | ≤ 0.3                             |
| <b>Isolation (C-P<sub>1</sub>), dB</b>                       | ≥ 30                              |
| <b>Isolation (C-P<sub>2</sub>), dB</b>                       | ≥ 12                              |
| <b>Directivity, dB</b>                                       | ≥ 50                              |
| <b>Optical Input Return Loss, dB</b>                         | ≥ 45                              |
| <b>Polarization Dependent Loss, dB</b>                       | ≤ 0.1                             |
| <b>Polarization Mode Dispersion (PMD), ps</b>                | ≤ 0.1                             |
| <b>Thermal Stability, dB/°C</b>                              | ≤ 0.005                           |
| <b>Thermal Stability Drift, nm/°C</b>                        | ≤ 0.005                           |
| <b>Optical Power, mW</b>                                     | ≥ 300                             |
| <b>Tensile Load, N</b>                                       | > 5                               |
| <b>Operating Temperature, °C/°F</b>                          | 0° to 70° / 32° to 158°           |
| <b>Storage Temperature, °C/°F</b>                            | -40° to 85° C / -40° to 185°      |
| <b>Relative Humidity</b>                                     | 85% (± 5)                         |

**PASSIVE WDM MODULES**

| Ordering Info | Part Number          | Description   | Connectors Port / Link | Wavelength Port / Link (nm)                  | Approx. Budget Loss per Link (dB) |
|---------------|----------------------|---|------------------------|--|-----------------------------------|
|               | <b>EM316WP/53S</b>   | Single Channel Passive WDM, Single Mode, Single Fiber | SC / SC                | 1310 (x1), 1550 (x1) / 1310 & 1550 (x1)      | 1.2                               |
|               | <b>EM316WP/5155</b>  | Single Channel Passive WDM, Single Mode, Single Fiber | SC / SC                | 1510 (x1), 1550 (x1) / 1510 & 1550 (x1)      | 1.2                               |
|               | <b>EM316PLC/5559</b> | Single Channel Passive WDM, Single Mode, Single Fiber | LC / SC                | 1550 (x1), 1590 (x1) / 1550 (x1) & 1590 (x1) | 1.2                               |
|               | <b>EM316PSC/5559</b> | Single Channel Passive WDM, Single Mode, Single Fiber | SC / SC                | 1550 (x1), 1590 (x1) / 1550 (x1) & 1590 (x1) | 1.2                               |
|               | <b>EM316WP2/53S</b>  | Dual Channel Passive WDM, Single Mode, Dual Fiber     | SC / SC                | 1310 (x2), 1550 (x2) / 1310 & 1550 (x2)      | 2                                 |
|               | <b>EM316WP2/5155</b> | Dual Channel Passive WDM, Single Mode, Dual Fiber     | SC / SC                | 1510 (x2), 1550 (x2) / 1510 & 1550 (x2)      | 2                                 |
|               | <b>EM316WP2/5961</b> | Dual Channel Passive WDM, Single Mode, Dual Fiber     | SC / SC                | 1590 (x2), 1610 (x2) / 1590 & 1610 (x2)      | 2                                 |



|               | Part Number     | Description   | Connectors |       |     | Wavelength (nm)* |             | Budget Loss per Link (dB) |
|---------------|-----------------|---|------------|-------|-----|------------------|-------------|---------------------------|
|               |                 |   | Port       | Trunk | OSC | Port / Link      | OSC         |                           |
| Ordering Info | EM316PAMULC41   | 4-channel Passive Mux/Demux , Single Mode                               | DMU (x4)   | DLC   | N/A | 1470 to 1530     | N/A         | 2.5                       |
|               | EM316PAMULC41N  | 4-channel Passive Mux/Demux with Service Channel, Single Mode           | DMU (x4)   | DLC   | DMU | 1470 to 1530     | 1310        | 4                         |
|               | EM316PAMULC42   | 4-channel Passive Mux/Demux , Single Mode                               | DMU (x4)   | DLC   | N/A | 1550 to 1610     | N/A         | 2.5                       |
|               | EM316PAMULC42N  | 4-channel Passive Mux/Demux with Service Channel, Single Mode           | DMU (x4)   | DLC   | DMU | 1550 to 1610     | 1310        | 4                         |
|               | EM316PAMUSCM41  | 4-channel Passive Mux, Single Mode                                      | MU (x4)    | SC    | N/A | 1470 to 1530     | N/A         | 2                         |
|               | EM316PAMUSCD41  | 4-channel Passive Demux, Single Mode                                    | MU (x4)    | SC    | N/A | 1470 to 1530     | N/A         | 2                         |
|               | EM316PAMUSCM42  | 4-channel Passive Mux, Single Mode                                      | MU (x4)    | SC    | N/A | 1550 to 1610     | N/A         | 2                         |
|               | EM316PAMUSCD42  | 4-channel Passive Demux, Single Mode                                    | MU (x4)    | SC    | N/A | 1550 to 1610     | N/A         | 2                         |
|               | EM316MUX41N315B | 4-channel Passive Mux with Service Channel, Single Mode, Single Fiber   | MU (x4)    | SC    | MU  | 1470 to 1530     | 1310 / 1350 | 4                         |
|               | EM316DMX41N315B | 4-channel Passive Demux with Service Channel, Single Mode, Single Fiber | MU (x4)    | SC    | MU  | 1470 to 1530     | 1310 / 1350 | 4                         |
|               | EM316MUX42N315B | 4-channel Passive Mux with Service Channel, Single Mode, Single Fiber   | MU (x4)    | SC    | MU  | 1550 to 1610     | 1310 / 1350 | 4                         |
|               | EM316DMX42N315B | 4-channel Passive Demux with Service Channel, Single Mode, Single Fiber | MU (x4)    | SC    | MU  | 1550 to 1610     | 1310 / 1350 | 4                         |
|               | EM316PAMULC8    | 8-channel Passive Mux/Demux, Single Mode                                | DMU (x8)   | DLC   | N/A | 1470 to 1610     | N/A         | 3.7                       |
|               | EM316PAMULC8N   | 8-channel, Passive Mux/Demux with Service Channel, Single Mode          | DMU (x8)   | DLC   | DMU | 1470 to 1610     | 1310        | 5                         |
|               | EM316PAMUSCM8   | 8-channel Passive Mux, Single Mode                                      | MU (x8)    | SC    | N/A | 1470 to 1610     | N/A         | 3                         |
|               | EM316PAMUSCD8   | 8-channel Passive Demux, Single Mode                                    | MU (x8)    | SC    | N/A | 1470 to 1610     | N/A         | 3                         |
|               | EM316MUX8N316BD | 8-channel Passive Mux with Service Channel, Single Mode, Single Fiber   | MU (x8)    | MU    | MU  | 1470 to 1530     | 1310 / 1350 | 5                         |
|               | EM316DMX8N316BD | 8-channel Passive Demux with Service Channel, Single Mode, Single Fiber | MU (x8)    | MU    | MU  | 1470 to 1530     | 1310 / 1350 | 5                         |
|               | EM316MUXMUSC16  | 16-channel Passive Mux, Single Fiber, Low Water Peak Single Mode        | MU (x16)   | SC    | N/A | 1310 to 1610     | N/A         | 8.2                       |
|               | EM316DMXMUSC16  | 16-channel Passive Demux, Single Fiber, Low Water Peak Single Mode      | MU (x16)   | SC    | N/A | 1310 to 1610     | N/A         | 8.2                       |

\* See Wavelength Chart below

| Wavelength Chart | (XX) | Wavelength | (XX) | Wavelength |
|------------------|------|------------|------|------------|
|                  | 31   | 1310 nm    | 47   | 1470 nm    |
|                  | 33   | 1330 nm    | 49   | 1490 nm    |
|                  | 35   | 1350 nm    | 51   | 1510 nm    |
|                  | 37   | 1370 nm    | 53   | 1530 nm    |
|                  | 39   | 1390 nm    | 55   | 1550 nm    |
|                  | 41   | 1410 nm    | 57   | 1570 nm    |
|                  | 43   | 1430 nm    | 59   | 1590 nm    |
|                  | 45   | 1450 nm    | 61   | 1610 nm    |


**CABLES**

| Ordering Info | Part Number         | Function                           | Protocol | Connectors Port/Link | Wavelength (nm) | Insertion Loss (dB) |
|---------------|---------------------|------------------------------------|----------|----------------------|-----------------|---------------------|
|               | <b>PASCSC/3155</b>  | Passive 2 Wavelength WDM Cable, SF | Any      | SC(x2)/SC            | 1310 / 1550     | 1.2                 |
|               | <b>PAWSC/5559</b>   | Passive 2 Wavelength WDM Cable, SF | Any      | SC(x2)/SC            | 1550 / 1590     | 1.2                 |
|               | <b>PAWLCSC/5559</b> | Passive 2 Wavelength WDM Cable, SF | Any      | LC/SC                | 1550 / 1590     | 1.2                 |

| Ordering Info | Part Number            | Function                   | Connectors Port / Link | Fiber Length (m) |
|---------------|------------------------|----------------------------|------------------------|------------------|
|               | <b>10600120 - 0002</b> | Cable, Passive 2-color, SM | MU / LC                | 0.5              |
|               | <b>10600120 - 0003</b> | Cable, Passive 2-color, SM | MU / SC                | 0.5              |

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