Introduction:

Wavelength Division Multiplexing (WDM) is a technique, which uses a special property of fiber-optics. This property allows the combination of multiple signals onto a single strand of fiber. Each signal is assigned to a different wavelength, of light. Since one wavelength does not affect another wavelength, the signals do not interfere.

Figure 1: Typical Application of a 1310/1550-nm WDM

Coarse WDMs perform two functions. First, they filter the light, ensuring only the desired wavelengths are used. Second, they multiplex or demultiplex multiple wavelengths, which are used on a single fiber link **(See Figures 2a & 2b).** The difference lies in the wavelengths, which are used. In CWDM space, the **1310-band** and the **1550-band** are divided into smaller bands, each only 20-nm wide. In the multiplex operation, the multiple wavelength bands are combined (i.e. *muxed*) onto a single fiber. In a demultiplex operation, the multiple wavelength bands are separated (i.e. *demuxed*) from a single fiber. The used wavelengths are defined by the International Telecommunications Union; reference ITU G.694.2 for the ITU CWDM Wavelength Grid.
Note: The CWDM Grid lists eighteen center wavelengths, from 1270 nm to 1610 nm, at 20 nm spacing.

Specifications for "Standard" CWDM Modules

Application Note

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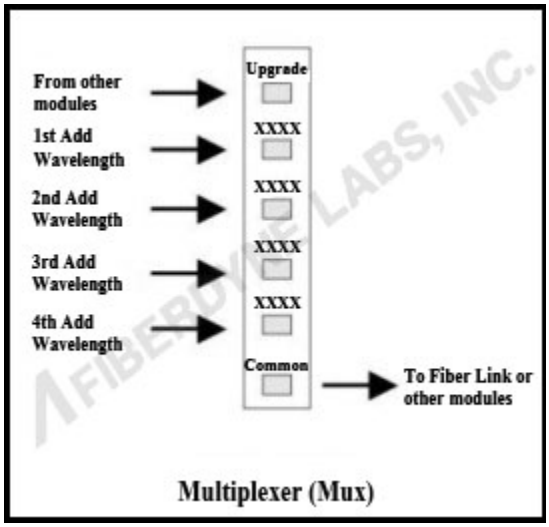

Figure 2: (A) Using a Multiplexer (Mux)

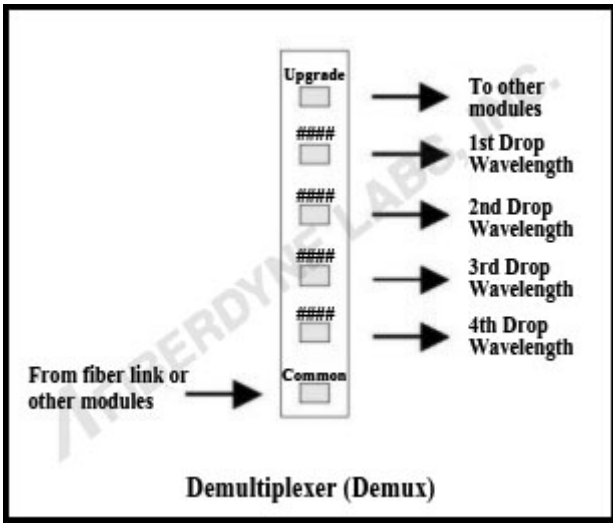

Figure 2: (B) Using a Demultiplexer (Demux)

In a **hybrid configuration** (mux/demux), multiple transmit and receive signals can be combined onto a single fiber. Each signal is assigned a different wavelength. At each end, transmit signals are muxed, while receive signals are demuxed. For example, in a simple full-duplex link, the transmit is assigned the 1530-nm wavelength, while the receive signal is assigned the 1550-nm wavelength. Additionally, individual signals can be delivered at points along a link. A receive signal is demuxed (i.e. dropped) from the link, and a new transmit signal is muxed (i.e. added) onto the link. This application is called an Add/Drop module
(See Figure 3).

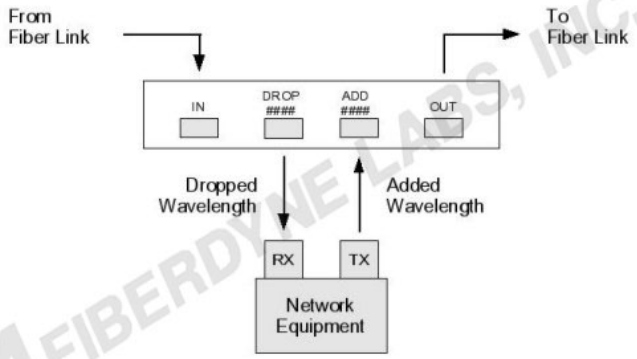

Figure 3: Using an Add/Drop CWDM Module

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Generally, a CWDM network takes two forms. A point-to-point system connects two locations, muxing and demuxing multiple signals on a single fiber **(See Figure 4)**. A loop or multi-point system connects multiple locations, typically using Add/Drop modules **(See Figure 5).**

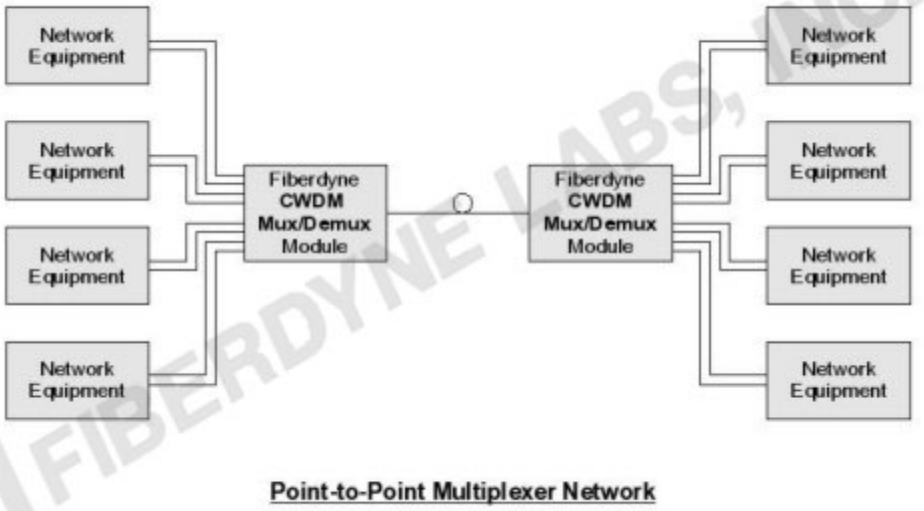

Figure 4: Point to Point Multiplexer Network

Using Fiberdyne equipment, you can use two implementations. In one approach **(See Figure 6)**, Fiberdyne CWDM GBICs (Gigabit Interface Converters) are added to existing Ethernet switch equipment. The GBIC outputs feed Fiberdyne, CWDM modules. The other approach **(see Figure 7)** adds the Fiberdyne 3001 CWDM Optical Multiplexer System to the existing outputs of existing Ethernet switch equipment.

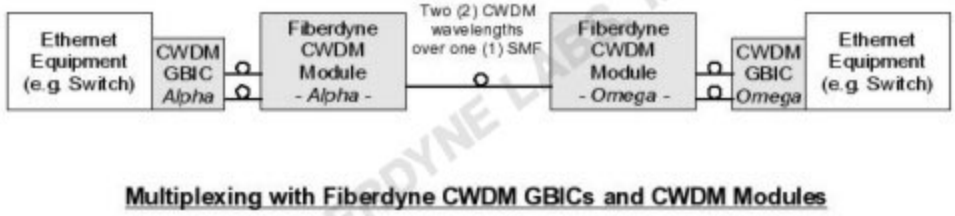

Figure 5: Multiplexing with Fiberdyne CWDM GBICs and CWDM Modules

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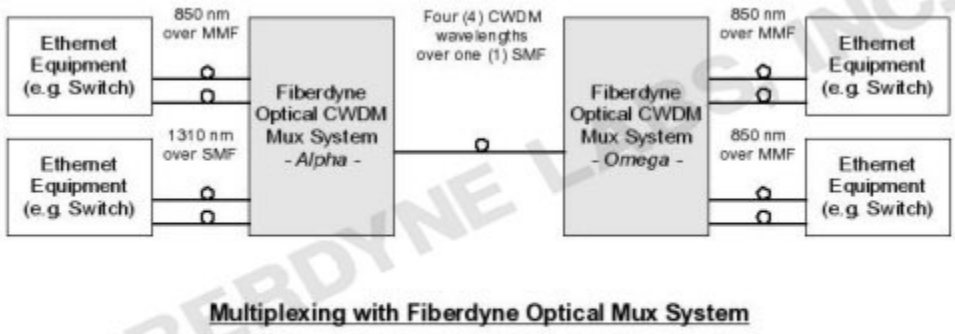

Multiplexing with Fiberdyne Optical Mux System

Figure 6: Multiplexing with Fiberdyne 3001 CWDM Optical Mux System Modules