Application Note

Coarse Wavelength Division Multiplexing (CWDM) -- an introduction

Keywords

CWDM, Fiber-optics, WDM

Summary

CWDM is a technique for combining multiple "wavelengths" onto a single fiber. CWDM also refers to the filter device, which is used for multiplexing separate wavelengths, onto the single fiber.

Scenario

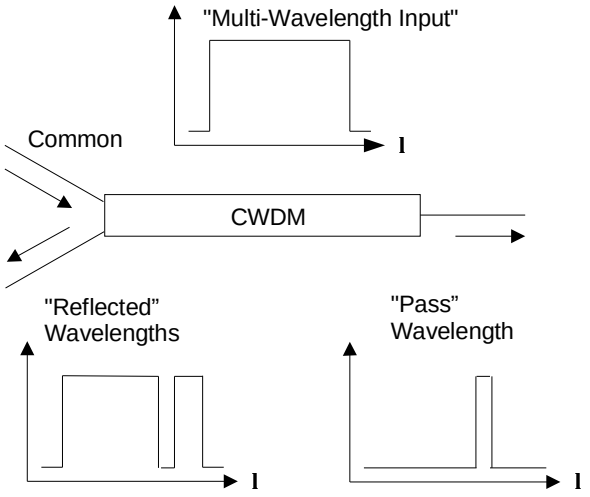
CWDM Modules are a new product.

Question

What are CWDMs (Coarse Wavelength Division Multiplexers) and how are they used?

Notes/Answer

CWDMs are *filters*, which are identified by their center wavelength. CWDMs *add* a wavelength as a multiplexer, or they *drop* a wavelength as a demultiplexer. They are 30 mm long and 5 mm wide. Their three fibers are labeled: **Common**, **Reflected** and **Pass**.



The figure shows a CWDM as a *demultiplexer*. Multiple wavelengths enter the *Common* fiber. One *wavelength* exits the *Pass* fiber, and all other wavelengths exit the *Reflected* fiber. As a multiplexer, the directions are reversed; one wavelength is added, and all exit the Common.

The wavelengths are specified by the International Telecommunications Union (ITU) G.694.2 standard. It lists 18 wavelengths, ranging from 1270 nm to 1610 nm. For the near future, however, the most commonly used wavelengths will include eight wavelengths, from 1470 to 1610. The center of each pass band is spaced at 20 nm intervals (e.g. 1530, 1550, 1570, etc.).

The main benefit, of CWDM systems, is cost. The transmitters do not require special power and temperature controls. The transmitters are compact and are easily incorporated into existing circuitry, like media converters and switches. The tradeoff is fewer wavelengths than DWDMs. For most local/metro area networks, however, CWDMs offer a sufficient number of wavelengths per fiber.

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