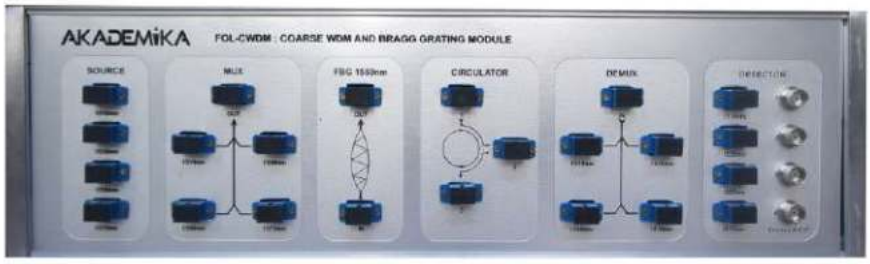
FOL-CWDM : Course WDM and Bragg Grating Module

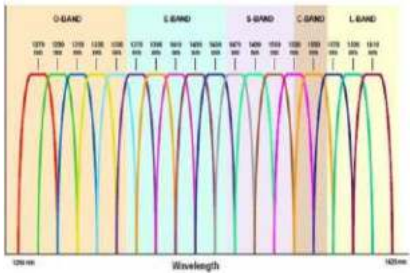


FEATURES

- Course Wavelength Division Multiplexing system covers practical aspect of implementing the design by study of optical component parameters and verifying their performance.
- De multiplexing of wavelengths is demonstrated along with the recovery of the transmitted signal. Channel addition and deletion (dropping) is implemented using Bragg grating and three port optical circulator.
- This training system is a bench top model capable of demonstrating CWDM with Add-Drop functionality. This system operates in PC control mode

CWDM CHANNELS

- ITU-T have specified range of wavelengths which can be used for CWDM with 20nm spacing between two multiplexed wavelengths
- Following diagram shows the CWDM channels defined by ITU-T in optical transmission band



- CWDM uses 18 channel in the wavelength range 1270~1610nm spaced 20nm (guard Band) apart

SPECIFICATIONS

LASERS

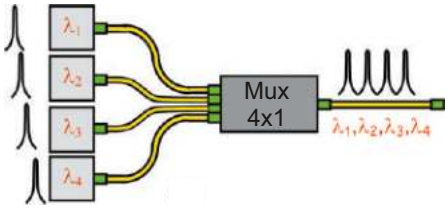
- 1.25Gbps CWDM Laser Diode Modules at wavelengths of 1510nm,1530nm,1550nm,1570nm
- In built Isolator
- Channel Spacing : 20 nm
- Threshold Current I_{th} : 10 mA Typical
- Output Power : @ Ith + 30 mA -> 0.7mW
  @ ~ 58 mA -> 1.4 mW
- Operating Voltage : 1.1V Typical
- Modulation : Digital modulation with maximum modulation frequency 5MHz

DETECTORS

- 1.5 GHz InGaAs PIN Photo diode Module
- Responsivity : Typical 0.9 A/W in 9/125µm fiber
- Spectral Range : 1250nm to 1600nm
- Reverse Voltage : 30V max

4-CHANNEL CWDM MUX AND DEMUX

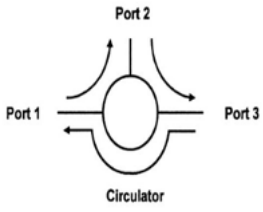
- Mux combines two or more wavelengths together and send them over a single fiber
- De-mux receives the combined wavelengths and separates them



- Center Wavelength : 1510nm,1530nm, 1550nm,1570nm
- Channel Spacing : 20nm
- Pass band @ 0.5dB : ITU+/- 6.5 nm
- Insertion Loss @ MUX / DEMUX Port :<= 2.9 dB
- Adjacent Channel Isolation : >= 30 dB
- Non Adjacent Channel Isolation :>= 40 dB
- Max Optical Power : 300 mW

3- PORT CIRCULATOR

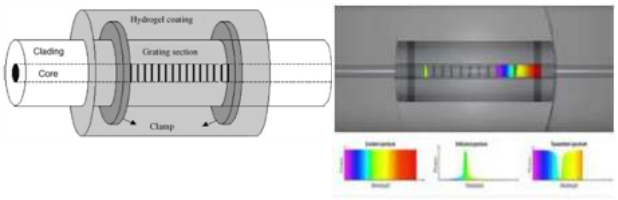
- Optical Circulator are micro optic devices and can be made with any number of ports but 3 and 4 port versions are most common



- It comprises three single mode fibers (SMFs), single-fiber ferrules, lenses and a non-reciprocal section using a uniaxial birefringent crystal.
- Polarization Independent Optical Circulator
- Band : C+L
- Wavelength Range : 1525nm to 1610nm
- Transmission Direction : 1 ->2 , 2 -> 3
- Channel Isolation : > 40dB
- Insertion Loss : <= 0.9 dB

FIBER BRAGG GRATING

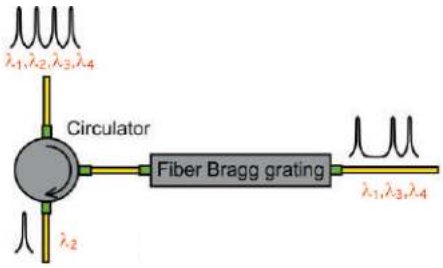
- A Fiber Bragg grating (FBG) is a type of distributed Bragg reflector constructed in a short segment of optical fiber that reflects particular wavelength of light and transmits all others.



- This is achieved by creating a periodic variation in the refractive index of the fiber core, which generates a wavelength-specific dielectric mirror
- Central Wavelength : 1550 ± 0.5nm
- Bandwidth @ 3 dB : 0.02 – 5 nm
- SLSR : > 15 dB
- Reflectivity : >90%

FACILITY FOR ADD-DROP

- It is possible to ADD-DROP channel using combination of Bragg grating and Circulator.

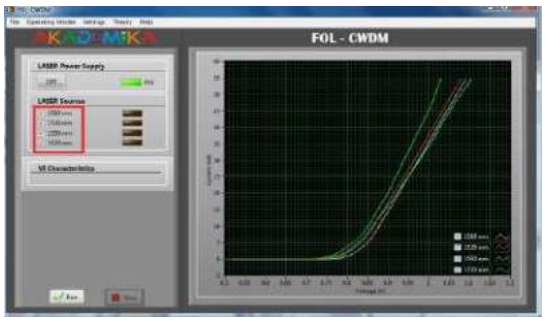


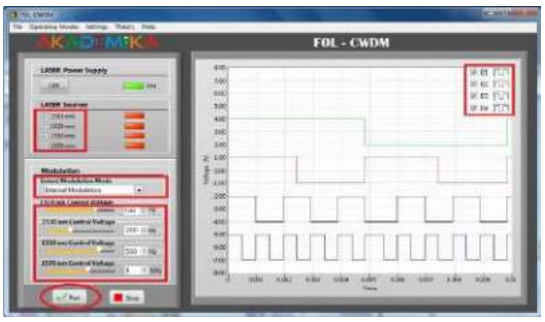
SOFTWARE

- User friendly GUI for monitoring, controlling of CWDM system
- Operating modes support CW mode, VI characteristics mode, Internal & External Modulation
- LASER control allows Supply ON/OFF, wavelength selection and driving current
- Real time signal level monitoring of Photo-detector.
- Graphical representation : XY plot of VI characteristics and Internal Modulation
- COM Settings : USB 2.0
- Operating System : Windows 8 & 10
- Interface : USB interface

SOFTWARE INTERFACE

- VI Characteristics of each LASER are displayed on graph





- Four LASER outputs can be seen simultaneously and their input voltage is manually controlled using slider in software

ACCESSORIES

- Shielded USB A-B cable : 01 No.
- Power Cable : 01 No.
- SC/PC –SC/PC Single Mode Fiber Optic Patch Chords : 12 No.
- BNC to BNC coaxial cable : 04 No.
- Software on CD : 01 No.
- FTDI Drivers included on CD
- Experimental Manual : 01 No.