

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI

Tender Notification No.13/2007

Item No. 4 Modules/Kits for Fiber Optic Communication Lab.

**Specifications for purchase of Optical Fiber Laboratory System**

Optical fiber Lab System requires the following modules with specification as given against each.

All the modules/kits should have Block diagram printed on the top with test points for easy access to blocks by the students.

**1. LED module with Power Supply:** LED Peak Wavelength – 880/1300nm, Spectral Bandwidth: 30nm, Max Optical Power Coupled into Plastic Fiber about -20dBm, ----- 1 No.

**2. PD Module with Power supply :** Photo detector - Silicon PIN Diode, Responsivity at 880/1300 nm nearly  $-0.4 \mu\text{A}/\mu\text{W}$  -60nA, provision for measuring Forward, Reverse & Zero Bias, Leakage characteristics.

----- 1 No.

**3. LASER DIODE module with power supply for Characteristics & Free Space set-up :** Wavelength - 660nm (typ.), Max O/P power - 3mW (Typical value), Threshold current - 30mA(typ.), Forward Bias, Collimating lens for adjustable spot size. **LD Modulator:** Max data rate – upto 34Mbps for NRZ. **Optical Receiver :** Modulated Optical I/P - 4Mbps for NRZ. ----- 1 No.

**4. APD Module with power supply:** Photo detector - Silicon Avalanche Photo Diode, Max Reverse Current - 100 $\mu\text{A}$ , Responsivity at 850 nm ( At M=1) -  $0.45 \mu\text{A}/\mu\text{W}$ , Multiplication factor – 100 (typ), ST type optical connector interface. ----- 1 No.

**5. Experimental OTDR :** i) Directional Coupler 1x2, 50/125micron – 1No., ii) XY positioner, mounting post for LD unit with Rail, iii) LD & APD module as specified above to be used , iv) Pulse Generator unit – less than 150ns ON time with RS422 interface, v) 1m ST-ST patch cord – 2Nos., vi). Min 500m of MM GF in different lengths with Events to study the OTDR concepts. ----- 1 No.

**6. Analog Link with power supply:**

**Transmitter module:** DC coupled with intensity modulation, Max I/P - Analog 2MHz, 1.25Vp-p. LED Wavelength - 880 nm , Max Optical Power: about -20 dBm. **Receiver module:** Data O/p - Analog 1.25Vp-p, wavelength - 880 nm. Plastic fiber 1000 micron – different lengths. Accessories like Headset with mic & Audio cable for Audio Transmission required.

----- 1 No.

Preferably supply discrete sources & detectors for Plastic Fibre, components & PCB's to build Plastic Fiber optical transmitters and receivers.

**7. Digital Link with power supply:**

Transmitter module: DC Coupled with intensity modulation, Data Rate(TTL) - 2Mbit/sec for NRZ, LED wavelength - 880nm, Max.Optical Power > -20dBm. Receiver module: AC coupled, PIN silicon Photo Diode wavelength - 880 nm, Sensitivity:-35dBm, Link Length - 100m MM Glass Fibre. ----- 1 No.

Preferably supply discrete sources & detectors for Glass Fibre, components & PCB's to build Glass Fiber optical transmitters and receivers.

**8. Optical Power Source:** Hand held Optical Source Type – LED, Wavelength - 880nm, Spectral Width - 100nm, Max optical o/p: -20dBm, Output Stability: <0.3dB, Optical Connector - ST type, Attenuation by Coarse & Fine Adjustments. Modulation: i) Continuous Wave (CW), ii) Internal – Programmable bit rates from 64 to 2048 Kbps, PRBS, iii) External Modulation – TTL 0 to 2Mbps. ----- 3 No.

**9. Supporting components:** Microscope, ST-ST 1m patch cord MM GF , ST-ST 1m MM GF Reference patch cord , Loose jacketed MM Glass fibre with fixed mandrel for 500m Length, Mandrels with different diameter for MM GF Bending loss measurement & Clad mode stripping study etc., LD Pointer ST-ST Adapters and Mechanical Splice – 10Nos.

**10. Single Mode Fiber Characteristics Study Add-on Setup:** consisting of 1.650nm LD Driver, LD Unit, XY Rail – 1No. (the above specified units should be used here). 2. Power Meter with remote PD -1No., XY Rail with mechanical assembly for modes observation & mode Field diameter- 1No., SM GFs' with different V Numbers and accessories.

**11. Wavelength Division Multiplexing Demo Set-up:** consisting of 1300nm Digital Transmitter & Receiver at 34Mbps, Directional Optical Couplers – 1No. ST-ST MM Glass Fiber Patch cords – 4Nos., ( Use the above mentioned 880nm Digital Transmitter & Receiver at 2Mbps with 100m MM GF with ST connectors – 1No., & , Directional Optical Couplers – 1No. for this setup)

**Note:** Each module is to be provided with its technical manual.