



Sciencetech TechBooks are compact and user friendly learning platforms to provide a modern, portable, comprehensive and practical way to learn Technology. Each TechBook is provided with detailed Multimedia learning material which covers basic theory, step by step procedure to conduct the experiment and other useful information.

Sciencetech 2502A Advance Fiber Optic Communication TechBook demonstrates Full Duplex method of transmitting information from one place to another by sending pulses of light through an Optical fiber. The light forms electromagnetic wave that is modulated to carry information. Sciencetech 2502A is an Advanced Fiber Optic TechBook designed to learn the communication techniques in Fiber Optics. The TechBook demonstrates properties of Fiber Optics Transmitter & Receiver, characteristics of Fiber Optics Cable, different types of Modulation / Demodulation techniques and PC to PC communication via fiber link using RS232 interface. It can also be used to demonstrate various Digital Communication Techniques via Fiber Optic link using Sciencetech Digital Communication TechBooks. Study of Eye pattern and experiment of BER measurement can be performed in conjunction with add-on module.

Features

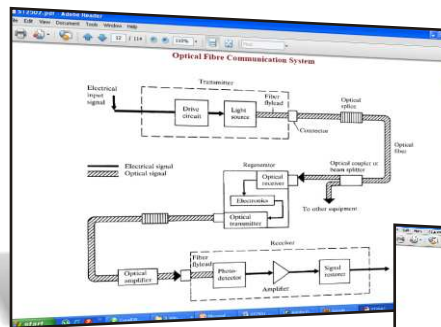
- Full Duplex Analog & Digital Trans-receiver
- Single module covering large number of experiments including experiments with Optical Power Meter
- 660 nm & 950 nm Fiber Optic LED channel with Transmitter & Receiver
- LASER Source (optional) in lieu of LED Source
- AM-FM-PWM modulation / demodulation
- PC-PC comm. with RS232 ports & software
- On board Function Generator
- Crystal controlled Clock
- Functional blocks indicated on-board
- Input-output & test points provided
- On board voice link
- Built in DC Power Supply
- Numerical Aperture measurement jig and mandrel for bending loss measurement
- Data Generator with selectable clock (64/ 128/ 256 KHz)
- Noise Generator with variable gain
- Eye pattern observation and Bit Error Rate measurement
- Four digits Bit Error Counter
- Switched faults on Transmitter & Receiver

Scope of Learning

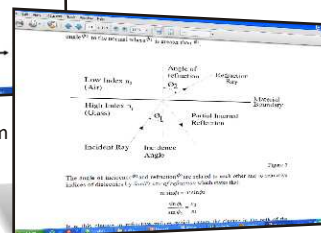
- Setting up Fiber Optic Analog & Digital link
- AM system using Analog & Digital input signals
- Frequency Modulation system and Pulse Width Modulation system
- Study of Propagation Loss, Bending Loss & measurement of Numerical Aperture
- Characteristics of Fiber Optic communication link
- Setting of Fiber Optic voice link using Amplitude, Frequency & PWM Modulation
- Study of Switched Faults in AM, FM & PWM system
- Full Duplex Computer Communication using RS232 ports and software
- V-I characteristics of LED (E - O converter)
- Characteristics of Photo Detector

Experiments with Eye pattern and BER measurement module

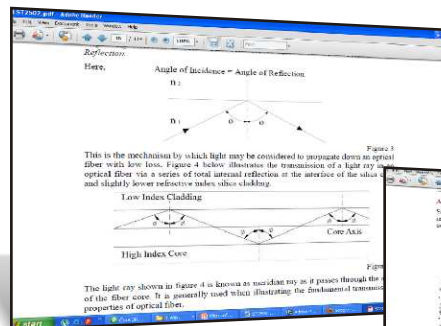
- Measurement of Bit Error Rate
- Study of Eye pattern



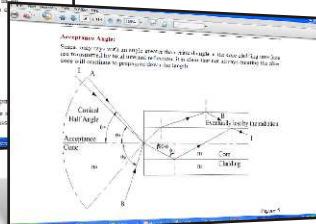
Optical Fibre Communication System



Principle of operation of Optical Fibre



Total Internal Reflection



Acceptance Angle

Technical Specifications

- Transmitter** : 2 nos., Fiber Optic LED having peak wavelength of emission 660 nm & 950 nm (Optional LASER source)
- Receiver** : 2 nos., Fiber Optic Photodetector
- Modulation Techniques:** AM, FM, PWM.
- Drivers** : 1 no. with Analog & Digital modes
- AC Amplifier** : 2 nos.
- Clock** : Crystal controlled Clock 4.096 MHz
- PLL detector** : 1 no.
- Comparator** : 2 nos.
- Filters** : 2 nos. 4th order Butterworth, 3.4 KHz cut-off frequency
- Analog Band Width** : 350 KHz
- Digital Band Width** : 2.5 MHz
- Function Generator** : 1 KHz Sine wave (Amplitude adjustable) 1 KHz Square wave (TTL)
- Voice Link** : Fiber Optic voice link using microphone & speaker (built in)
- PC-PC Communication** : Using 2 channel RS232
- Port** : RS232 (9 Pin)
- Baud Rate** : 19200
- Switched Faults** : 4 in Transmitter & 4 in Receiver
- Fiber Optic Cable** : Connector type standard SMA
- Cable Type** : Step indexed multimode PMMA plastic
- Core Refractive Index** : 1.492
- Clad Refractive Index** : 1.406
- Numerical Aperture** : Better than 0.5
- Acceptance Angle** : Better than 60 deg.
- Fiber Diameter** : 1000 microns
- Outer Diameter** : 2.2 mm
- Fiber Length** : 0.5m & 1m
- Test Points** : 50 nos.
- Inter connections** : 2 mm sockets
- Dimensions (mm)** : W 326 × D 252 × H 52
- Weight** : 2.4 Kg approximately
- Power Supply** : 110-220 V, ± 10%, 50 / 60 Hz
- Power Consumption** : 4.5 VA approximately
- Operating Condition** : 0-40°C, 80% RH
- Product Tutorial** : Online (Theory, procedure, reference results, etc).
- Included Accessories** : Numerical Aperture measurement jig, Mandrel, Fiber Cables, Microphone, Headphone, Set of Patch Cords, PC-PC communication Software, Eye pattern and BER measurement module, TechBook Power Supply.
- Optional** : Optical Power Meter, 5 meter fiber cable, 10 meter fiber cable, LASER Source.