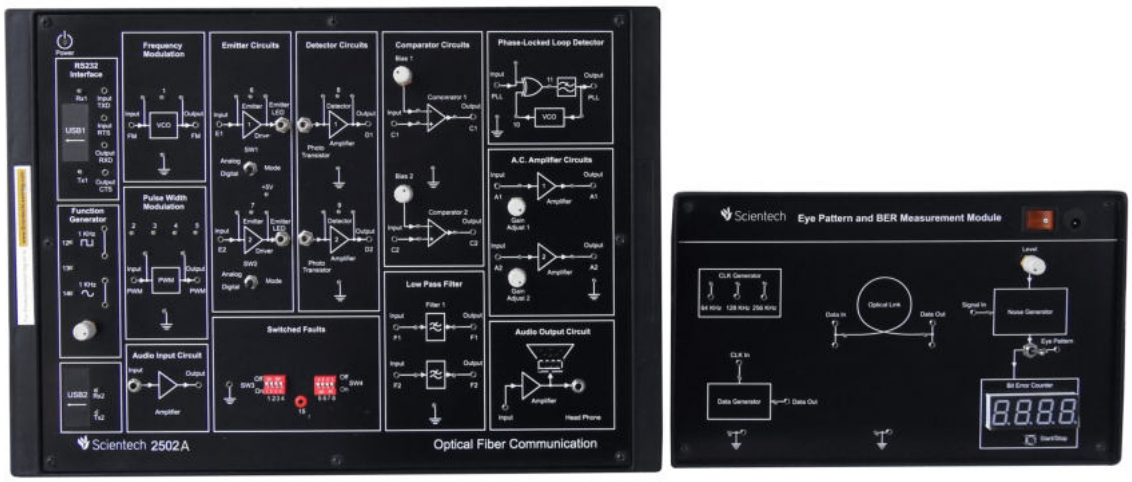
Advanced Optical Fiber Communication

Scientech 2502A



Scientech 2502A Advance Fiber Optic Communication 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. Scientech 2502A is an Advanced Fiber Optic designed to learn the communication techniques in Fiber Optics. The 2502A 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 USB interface. It can also be used to demonstrate various Digital Communication Techniques via Fiber Optic link using Scientech Digital Communication. Study of Eye pattern and experiment of BER measurement can be perform in conjuction with addon 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 USB 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

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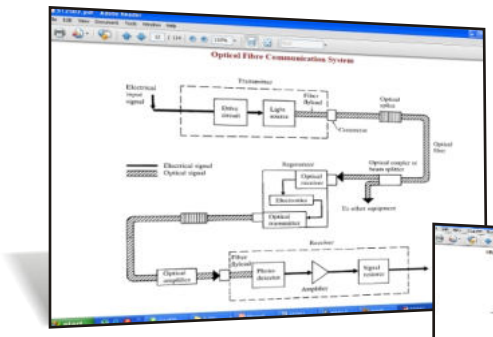
Scope of Learning

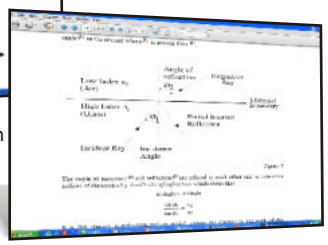
- Setting up Fiber Optic Analog & Digital link
- AM system using Analog & Digital input signals
- Frequency Modulation system and Pulse Width Modulation system
- Study of Propagation Loss, Bending Loss & measurement of Numerical Aperture
- Characteristics of Fiber Optic communication link
- Setting of 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

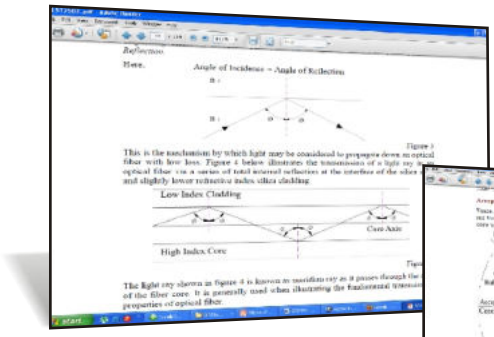
- Measurement of Bit Error Rate
- Study of Eye pattern



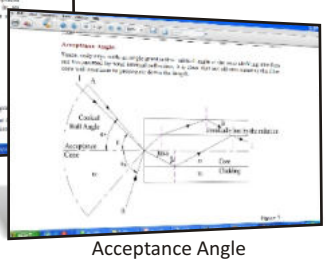
Optical Fibre Communication System



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. 4^{th} 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	: USB
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
Package contains	: Numerical Aperture measurement jig, Mandrel, Fiber Cables, Microphone, Headphone, Set of Patch Cords, PC-PC communication Software, Eye pattern and BER measurement module, Power Supply & USB to serial converter (2nos)
Optional	: Optical Power Meter, 5 meter fiber cable, 10 meter fiber cable, LASER Source.

Subject to Change

Designed and Manufactured in India by -

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