



**28554A** 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. 28554A is an Advanced Fiber Optic designed to learn the communication techniques in Fiber Optics. The 28554A 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 Tesca Digital Communication. Study of Eye pattern and experiment of BER measurement can be perform in conjunction with addon module.

### Features

01. Full Duplex Analog & Digital Trans-receiver
02. Single module covering large number of experiments including experiments with Optical Power Meter
03. 660 nm & 950 nm Fiber Optic LED channel with Transmitter & Receiver
04. LASER Source (optional) in lieu of LED Source
05. AM-FM-PWM modulation / demodulation
06. PC-PC comm. with USB ports & software
07. On board Function Generator
08. Crystal controlled Clock
09. Functional blocks indicated on-board
10. Input-output & test points provided
11. On board voice link
12. Built in DC Power Supply
13. Numerical Aperture measurement jig and mandrel for bending loss measurement
14. Data Generator with selectable clock (64/ 128/ 256 KHz)
15. Noise Generator with variable gain
16. Eye pattern observation and Bit Error Rate measurement
17. Four digits Bit Error Counter
18. Switched faults on Transmitter & Receiver

### Experiments

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

### Experiments with Eye pattern and BER measurement module

11. Measurement of Bit Error Rate
12. Study of Eye pattern

Note: Specifications are subject to change.

**Tesca Technologies Pvt. Ltd.**

IT-2013, Ramchandrapura Industrial Area, Sitapura Extension, Jaipur-302022, Rajasthan, India,  
Mob./Whatsapp: +91-9829132777; Email: info@tesca.in, Website: www.tescaglobal.com

**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	:	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, $\pm 10\%$ , 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.

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