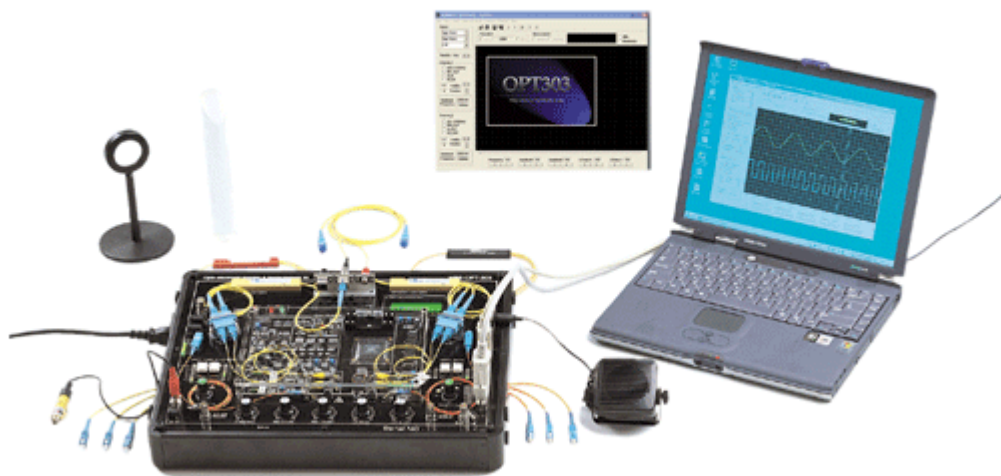


Optical Communication Trainer

HBE-OPT-303

HBE-OPT-303



■ FEATURE

Optical communication practice education equipment HBE-OPT-303 is optical communication practice equipment of domestic highest level that all specialists can use from a student from basis of optic to application of optical communication system.

This equipment can have digital oscilloscope of 2 channels and optical power meter function that can test physical special quality and reaction principle, refraction and total reflection, noise and damage etc. of optical communication element and confirm all results without expensive storehouse measure equipment.

Also, can utilize to data of specification program because because exclusive use software that maximize interface with PC can control HBE-OPT-303 to software and have function of digital oscilloscope, input/output signal analysis is available and confirmation, save and output is available by mA, dB, data values of several form such as mW.
HBE-OPT-303 applied specially 20 kind of optical device.

Can applied 1310nm, 1550nm source of light that basis source of lights as well as basis optic parts of lens and so on is used 650nm of thorn area and optical communication spot and experiment MUX/DEMUX characteristic and that bend optical fiber that use diminution special quality, Visual Attenuator that use Attenuator that is storehouse power diminution element damage and special quality by optical fiber kind etc. that is wave length multiplex (WDM) element.

Also, there is informative and multi-function sex equipment that consider user free usage together improving greatly extensity by outside analog and digital I/O Port's multiplex design that consider user beside basis outside variation module.

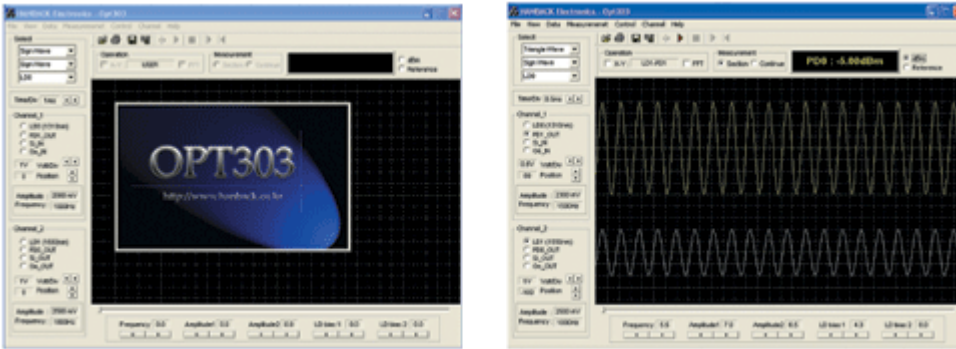
■ SPECIFICATION

Light Source	
FP-LD (1310, 1550nm) – SM	MQW-FP laser diode module, Wavelength : 1310/1550nm, Built-in optical isolator, InGaAsP monitor PIN photo diode 10/125um single-mode fiber pigtail with SC-PC connector Wave length 650 nm, Package cable length : 25cm
FP-LD (650nm) – MM	Optical output power : 10mW (max) 650nm wavelength (Visual LD) , Light output power : more than 6dBm Uncooled operation without TEC (Operation Room Temperature.)
Optical detector	
InGaAs PIN PD – SM @1.55um wavelength	Operation at 1.0~1.6um, Low dark current (0.1nA), Low capacitance, High responsiveness (0.9 A/W)
InGaAs PIN PD – MM	
Diode	Si, Ge
Digital Control	
	FPGA : EP1K100QC208-3 (ALTERA) 100,000 logic gate, Low-speed ADC : 8-channel, 12-bit 200kSPS ADC High-speed ADC : 1-channel, 12-bit 20MSPS ADC Parallel Interface using ECP Mode, SRAM : 256K * 16 15ns, Serial DAC : 8-channel 12-bit 1uS DAC
Signal input	
INTERNAL EXTERNAL	Function Generator : Frequency range : 10Hz~50kHz, Amplitude : 0V~5Vpp Wave Type : Sinusoidal, Triangle, Square, User Digital, User Analog 0V~5Vpp Analog & Digital Port, MIC Input
Signal output terminal	BNC, RCA, RS232C, Parallel, Mini Jack
Power Supply	
Input : 85~264Vac 50/60Hz, Output : 5Vdc (3/0.3A), +12Vdc (0.7A), +3.3Vdc, +2.5Vdc	
Optical Devices	
Basic devices provided	Visual Attenuator, Fixed attenuator (5dB/10dB), WDM Set (MUX, DeMUX-1310/1550nm), V-groove, Hybrid Adapter Set, Optical testing instrument, Single-mode Fiber, Optical Test Equipment set, etc. 650nm Visual LD & PD, Multi-mode Fiber, Multi-mode Coupler ±5 Vdc, 1.25W (Average)
Additional Options	Modulation kit HBE-OPT-A (AM/FM modulation set)

■ Experiment Theme

1. Measurement of the features of Si, Ge diodes
2. Measurement of the features of 1310nm wavelength of FP-LD (Light Source function)
3. Measurement of the features of 1550nm wavelength of FP-LD (Light Source function)
4. Measurement of the features of 650nm (Visible range) wavelength of FP-LD (Light Source function)
5. Measurement of the features of PD, an optical-electric conversion device (Optical power meter function)
6. Circuit arrangement by various driving systems of photo diode (Optical Detector)
7. Measurement of the critical angle of total reflection
8. Measurement of the features of optics reflection and refraction using lenses
9. Measurement of the loss due to the curvature radius of optical fiber
10. Measurement of the features of optical attenuation by use of Fixed Attenuator & Visual Attenuator
11. Measurement of the optical-coupler principles and coupling ratio
12. Measurement of connection of various optical connectors by use of a Hybrid Adapter
13. Comparison of the features of single-mode and multi-mode optical cables
14. Transmission of random digital and analog signals (1310nm/1550nm)
15. Understanding of the optical-talk principle by use of a voice signal (Optical Talk Set)
16. Measurement of WDM (Wavelength Division Multi-plexer) system by use of 1550/1310/650nm LD module
17. Measurement of attenuation due to the length of optical fiber.
18. Experiment of the features based on the modulation method of fiber-optic communications (Analog-AM/FM)
19. Experiment of the features by the modulation method of fiber-optic communications II (Digital-PCM)
20. Measurement of the features of RS-232C radio transmission by use of Infrared LED and photo-transistor
21. Experiment of the features of optical-cable splice using the V-groove

■ Software



The program is the software for observing a phenomenon occurred from the main board, and output characteristics are as follows.

- Optical power (dBm) display resulting from PD0 (1310nm) and PD1 (1550nm) through the Mini LCD window (the function of optical power meter)
 - References of optical power meter
 - Display of optical power value of monitor LD detected from Monitor PD
 - Display of output data from light source (1310/1550nm)
 - Display of PD0 and PD1 output waveforms (1310/1550nm)
 - X-Y output of input-output waveform (measurement of I-V curve)
 - The FFT of each input/output waveform (the function of spectrum analyzer)
 - Saving all measured data
 - Selection of the continuous and section mode of data measurement.
- * The measurement mode by section. It samples every section of output waveform, making a comparison and analysis of them.
- * Data analysis in the form of becoming real-time processing by receiving and making a continuous arrangement.



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