

# Optical Attenuators

OA5002 • OA5012 • OA5022 • OA5032



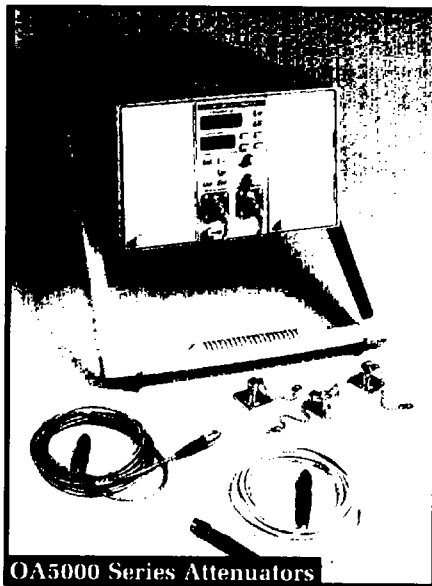
## Features

- Broad Wavelength Range
  - 750 to 1600 nm
- Supports Multiple Fiber Sizes
  - OA5002 10  $\mu\text{m}$  (Single-mode)
  - OA5012 50  $\mu\text{m}$  (Multimode)
  - OA5022 62.5  $\mu\text{m}$  (Multimode)
  - OA5032 100  $\mu\text{m}$  (Multimode)
- Support Multiple Connector Styles (FC, ST, SC and DIN)
- GPIB, IEEE-488.2 Controllable



## Applications

- Evaluate Receiver Sensitivity as a Function of Optical Power
- General Development of Fiber Optic Equipment
- SDH/SONET, Fibre Channel and Ethernet Standards Testing
- OTDR Attenuation Measurement Calibration
- Optical Power Meter Linearity Calibration
- Manufacturing Test of Fiber Optic Equipment



OA5000 Series Attenuators

## A Vital Link in Optical Systems Analysis

Tektronix Programmable Optical Attenuators provide a convenient, accurate and cost-effective means of controlling optical power levels in fiber optic media.

The OA5000 Series instruments provide variable attenuation of single and multimode fiber optic signals commonly used in communications equipment. Attenuation levels can be varied manually, using the front-panel controls or automatically via programmable, IEEE-488.2 interface.

The single filter design eliminates measurement dark spots caused by "range changes" and an internal mechanical motion algorithm provides outstanding repeatability.

### TYPICAL APPLICATIONS

Communication standards using optical components typically require that the receiver operate over a given optical power range. This specification is tested by monitoring the bit error rate (BER) as a function of optical power.

For your local Tektronix representative see the list in the back of this catalog or outside the U.S. call: 1-503-627-1933, inside the U.S. call: 1-800-426-2200.



The OA5000 Series complies with IEEE Standard 488.2, and with Tektronix Standard Codes and formats.



See Tektronix on the World Wide Web: <http://www.tek.com>



Tektronix Measurement products are manufactured in ISO registered facilities.

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## TRANSMISSION SYSTEM DESIGN

Using the OA5000 Series Optical Attenuators with either the CSA803, 11800 or TDS700C/500C oscilloscopes, network equipment designers can characterize, with repeatable results, the system performance over the specified optical power range.

## SDH/SONET COMPLIANCE TESTING

SDH/SONET compliant signal levels may be as high as +2 dBm to as low as -34 dBm. To verify the performance of SONET equipment over these signal levels, it is necessary to have calibrated attenuators with at least this much range. The OA5002 is the attenuator of choice for SDH/SONET testing.

## MANUFACTURING AND OTHER

### AUTOMATED TEST APPLICATIONS

Because the OA5000 Series Optical Attenuators are GPIB Programmable, these units can be operated in a completely automated environment. With the step size of 0.01 dB and a calibrated attenuation range of 0 to 60 dB (continuous), measuring parameters, such as receiver linearity, is quickly and reliably accomplished. Also, with their storable attenuation levels, the OA5000 Series Optical Attenuators are very useful for repeat measurements in manufacturing environments.

## CHARACTERISTICS

Wavelength Range	750 to 1600 nm
Fiber	OA5002 Single Mode fiber
Size	OA5012 50 $\mu$ m Multimode fiber
	OA5022 62.5 $\mu$ m Multimode fiber
	OA5032 100 $\mu$ m Multimode fiber
Insertion Loss	$\leq$ 2.0 dB
Return Loss	$<$ -45 dB <sup>*1</sup> $\leq$ -25 dB <sup>*2</sup>
Attenuation Range	$\geq$ 60 dB <sup>*3</sup> $\geq$ 50 dB <sup>*4</sup>
Disable	$\geq$ 100 dB <sup>*5</sup> $\geq$ 90 dB <sup>*5</sup>
Accuracy	$\pm$ 0.15 dB ( $\pm$ 0.05 dB typ.)
Repeatability	$\pm$ 0.05 dB ( $\pm$ 0.02 dB typ.)
Linearity	$\pm$ 0.05 dB
Max. Input Power	+3 dBm (2 $\mu$ W)
Max. Non-destruct Power	+20 dBm (100 $\mu$ W) Ave +23 dBm (200 $\mu$ W) Peak

<sup>\*1</sup> OA5002. <sup>\*2</sup> 1350-1600 nm.

<sup>\*3</sup> OA5012/OA5022/OA5032. <sup>\*4</sup> OA5032.

<sup>\*5</sup> 750-1350 nm.

Note: <sup>††</sup>For further technical information request Product Data Sheet #3TW-8032-1. <sup>†††</sup>For information on OA5000 Series compatibility with other fiber sizes, contact your local Tektronix sales office.

## ORDERING INFORMATION

For price information: Outside the U.S. contact your local Tektronix representative; inside the U.S. see the price list in the back of this catalog.

### OA5002

Optical Attenuator.

**Includes:** Single Mode Input and Output.

### OA5012

Optical Attenuator.

**Includes:** 50 Micron Multimode Input and Output.

### OA5022

Optical Attenuator.

**Includes:** 62.5 Micron Multimode Input and Output.

### OA5032

Optical Attenuator.

**Includes:** 100 Micron Multimode Input and Output.

**All include:** OCP5502 Mainframe (PN 620-0057-00)

Two Blank Plug-in Panels (PN 016-0195-05).

Universal Optical Input and Output Connector Kit (020-1885-00); Instruction Manual (070-7612-0)

### MEASUREMENT SERVICE OPTIONS OA5022 ONLY

**Opt. R3** – Repair warranty extended to cover three years.

**Opt. R5** – Repair warranty extended to cover five years.

See page 581 for further information.

### OPTIONAL ACCESSORIES

Fiber Optic Cables– Refer to page 339 for complete list.

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