OZ OPTICS LTD.

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ELECTRICALLY CONTROLLED VARIABLE FIBER OPTIC ATTENUATOR

FEATURES:

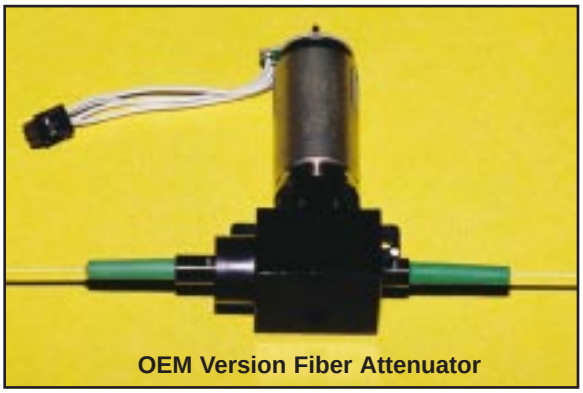
- Stepper motor driven
- Calibratable
- Latching operation
- Homing sensor for calibration and reference
- Source to fiber and fiber to fiber versions
- Fiber types: multimode, singlemode and polarization maintaining
- Custom designs available
- Polarization insensitive
- Flat wavelength response
- Wide attenuation range
- Wide wavelength range
- High power handling
- High resolution
- High speed
- Low insertion loss
- Low backreflection
- **LOW COST!**

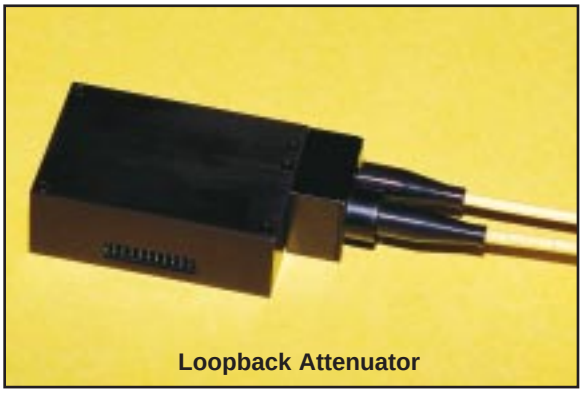
APPLICATIONS:

- Active gain equalization DWDM systems
- Bit error rate testing
- Trouble shooting receivers and other active fiber optic components
- Simulating long distance fiber transmission
- Design of fiber optic transmitter/receiver circuitry
- Power meter linearity checks
- Power setting

SPECIFICATIONS:

• **Insertion losses:**	Typically less than1.5dB for singlemode fibers, 2.0dB for multimode fibers 0.6dB versions are available upon request
•**Backreflection:**	25, 40, 50, and 60dB for SMF 25 and 35dB for MMF 70dB versions available on request
• **Relative Attenuation:**	0 to 50dB for singlemode, 0 to 30dB for multimode fibers
• **Power Handling**	Up to 2 watts
• **Wavelength dependence:**	0.3dB change from 1300 to 1550nm 0.1dB change from 1480 to 1570nm
• **Polarization Sensitivity:**	Less than 0.01dB
• **Available wavelengths:**	400-1625nm
• **Weight:**	< 250grams
• **Speed:**	0dB to 30dB within 1 second. 3dB attenuation change in less than 100msec. Faster versions are available on request. See the application note on our website
• **Computer interface:**	RS-232 / SPI / I^2C port
• **Power requirements:**	5 or 12V DC, 2 Watts nominal
• **Repeatability:**	±0.05dB
• **Accuracy:**	0 - 20dB: up to ±0.3dB 20-40dB: up to ±0.5dB
• **Polarization Extinction Ratio:**	20dB, 25dB, 30dB





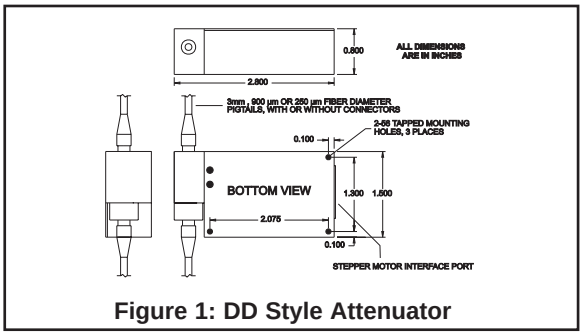


Figure 1: DD Style Attenuator

PRODUCT DESCRIPTION:

OZ Optics offers a complete line of low cost, compact PC board mountable motor driven variable attenuators with low backreflection. These attenuators offer excellent speed, repeatability, and accuracy. Single mode attenuators utilize a novel blocking style attenuation technique, while multimode attenuators use a variable neutral density filter to minimize mode dependent losses. Both types feature a homing sensor to calibrate the attenuator, removing the need to use external taps, and a jam-proof tuning mechanism.

The attenuator uses a reliable stepper motor that is controlled by an external IC driver. The base model provides the user direct access to the stepper motor, as well as a logic level output for HOME position information. The -DR option adds a high speed driver circuit that accepts four logic level inputs to control the stepper motor. Finally, the -MC option features an embedded microcontroller with a programmed calibration curve. These units are addressable and support RS232, SPI, or I^2C communication protocols.

The calibrated attenuators are calibrated at the wavelength specified in the part number. If required, the attenuators can be calibrated for a range of wavelengths. Just specify the range in the part number.

The standard models utilize a stepper motor with a 485:1 antibacklash gear train. Other gear ratios are available to increase either the speed or resolution of the device. Keep in mind that choosing lower gear ratios to improve the speed will reduce the resolution of the device. An electronically controlled version, with no moving parts, as well as a loopback model are under development.

Finally, Source to Fiber versions of the attenuator are available. This is useful when one wants to control laser diode output intensity while maintaining the line width and most stable operation.

OZ Optics can also customize the design to fit your needs. We have smaller and faster versions if 0.1dB resolution is acceptable.

Please read our application notes in our website. Contact OZ Optics for detailed specifications.

ORDERING INFORMATION:

DD-100-11-*W*-*a/b*-*F*-*LB*-*XY*-*JD*-*L*-*G*-*V*

Wavelength: Specify in nanometers
(Example: 1550 for 1550nm)

Fiber core/cladding sizes, in microns
9/125 for 1300/1550nm SM fiber.
See Tables 1 to 5 for other standard fiber sizes

Fiber type: M = Multimode
S = Singlemode
P = Polarization maintaining

Backreflection level: 25, 40, 50, or 60dB.
60dB is available for 1300nm and 1550nm wavelengths only

Stepper motor voltage : 6 or 12 Volt.

Gear ratio: 485:1 for normal speed, 76:1 for fast speed. Other gear ratios are 141:1, 262:1, 900:1

Fiber length, in meters, on each side of the device
Example: To order 1 meter of fiber at the input and 7 meters at the output, replace L with 1,7

Fiber jacket type: 1 = 900 Micron OD hytrel jacket
3 = 3mm OD Kevlar reinforced PVC cable
See Table 7 for other jacket sizes

Connector Code: 3S = Super NTT-FC/PC
3U = Ultra NTT-FC/PC
3A = Angled NTT-FC/PC
8 = AT&T-ST
SC = SC
SCA = Angled SC
See Table 6 for other connectors

Add - "PC" to the part number for an OEM assembly without interface port
- **"DR" to the part number to include built in stepper motor drive electronics**
- **"MC/SPI" to the part number to include intelligent SPI interface**
- **"MC/IIC" to the part number to include intelligent I^2C**
- **"MC/RS232" to part number to include intelligent RS-232 interface**
- **"LL" to the part number for 0.6dB typical insertion losses**

Example: DD-100-11-1300/1550-9/125-S-60-3A3A-3-1-76:1-6-MC/RS232-LL. A singlemode motorized attenuator for 1300 and 1550nm wavelengths, with -60dB return losses, 76:1 Gear Ratio, 6V stepper motor, complete with driver electronics microcontroller and serial RS232 port interface. The input and output fibers are one meter long, 3mm OD cabled, and terminated with angled FC connectors. Insertion loss is typically 0.6dB.

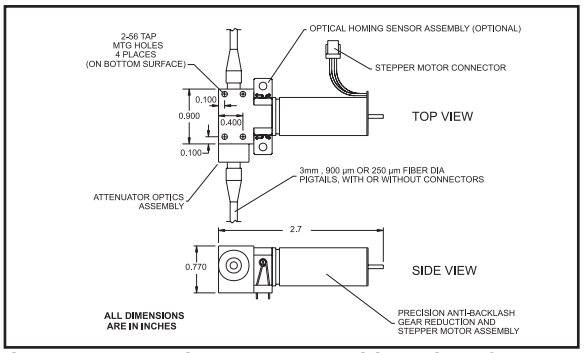


Figure 2: DD Style Attenuator without interface port

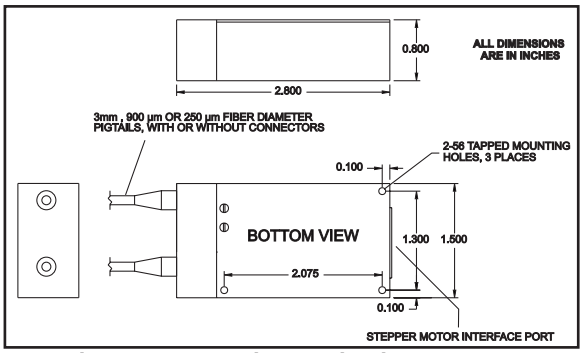


Figure 3: DD Style Loopback Attenuator