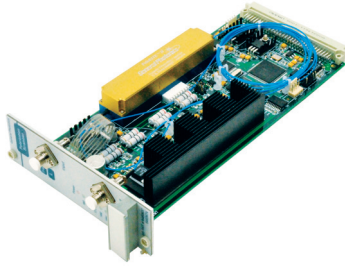


Polarization Scrambler Module with Microprocessor Controller



General Photonics' Polarization Scrambler module uses a breakthrough all-fiber technology to effectively randomize polarization states. This module is designed to be easily plugged into sensor equipment or measurement instruments with minimal development effort. Its advanced digital circuitry delivers uniform SOP distribution over a wide operation temperature range, making it a good choice for sensor field applications. The PCD-005 can be remote controlled via RS-232 to set the operation wavelength or enable/disable the scrambling operation. The PCD-005 delivers superior performance with extremely low insertion loss, back reflection, and residual phase and amplitude modulation.

Specifications:

Insertion Loss ¹	< 0.05 dB (without connectors) < 0.6 dB (with connectors)
Center Operating Wavelength ²	λ range 1: 1310, 1480, 1550, 1600nm λ range 2: 980, 1060, 1310nm
Operating Wavelength Range ³	> 100 nm
Output Degree of Polarization ^{4,5}	< 5%
Average PMD	< 0.05 ps
Intrinsic PDL	< 0.05 dB, 0.01dB typical
Return Loss	> 65 dB (without connectors)
Optical Power Handling	> 1000 mW
Residual Amplitude Modulation	< ± 0.01 dB
Residual Phase Modulation	< 0.1π
Power Supply	± 12 VDC / 1A to ± 15 VDC / 1A, +5 VDC / 0.2A
Power Consumption	12 W typical
Scrambling Frequencies	Factory set 4 fixed frequencies, distributed between DC to > 700 kHz
Operating Temperature	Standard: 10 to 45°C Extended: -5 to 65°C
Storage Temperature	-20 to 75 °C
Board Dimensions	220 × 100 × 30 mm (L × W × H)

Notes:

1. For SMF-28 compatible fiber. Other fibers may have higher loss, especially with connectors.
2. Please note that the fiber used determines the operating wavelength range. The standard fiber covers wavelengths in the 1260-1620nm range. The PCD-005 can also be configured to cover the 980-1310nm range using a different fiber. This fiber can handle wavelengths up to 1650nm, but if it is coupled to SMF-28 fiber, the performance may not be quite as good as normal due to mode mismatch. Please contact General Photonics for details.
3. Center Wavelength ± 50 nm
4. At 500 Hz detection bandwidth
5. Measured from a photodetector at PCD-005 output using a spectrum analyzer. A polarizer is placed in front of the photodetector to convert polarization modulation to amplitude modulation.

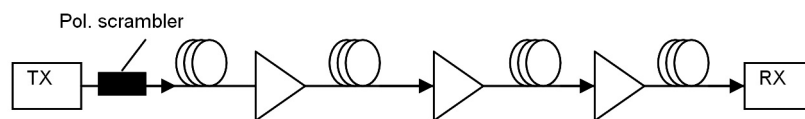
Features:

- Minimal insertion loss and back reflection
- Low residual phase and amplitude modulation
- RS-232 control option
- Remote operation wavelength control

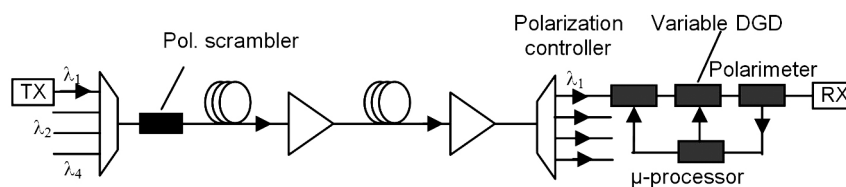
Tech Info: pp. 104, 223
FAQ: p. 229

Polarization Scrambler Module with Microprocessor Controller

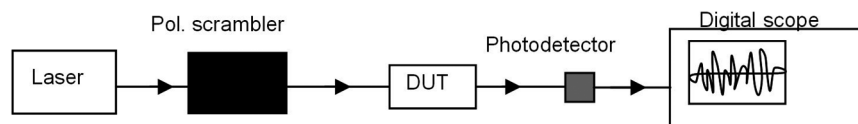
Applications:



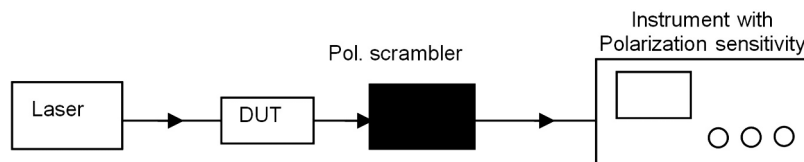
PDG (polarization dependent gain) mitigation



Facilitating PMD compensation



Facilitating PDL measurement



Polarization sensitivity elimination
in fiber sensor systems and in measurement systems

Polarization Scrambler Module with Microprocessor Controller

Typical Performance Data:

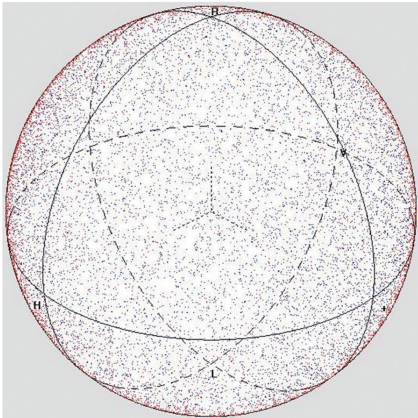


Figure 1. PCD-005 SOP distribution measured by a POD-101D polarimeter using a sampling rate of 625 kS/s over a measurement period of 1 second.

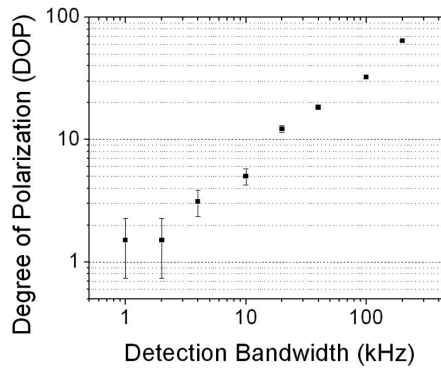


Figure 2. Degree of Polarization (DOP) as a function of detection bandwidth.

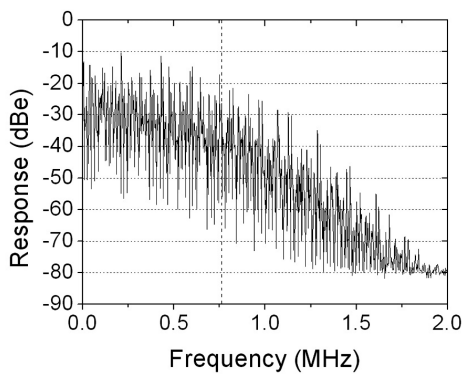
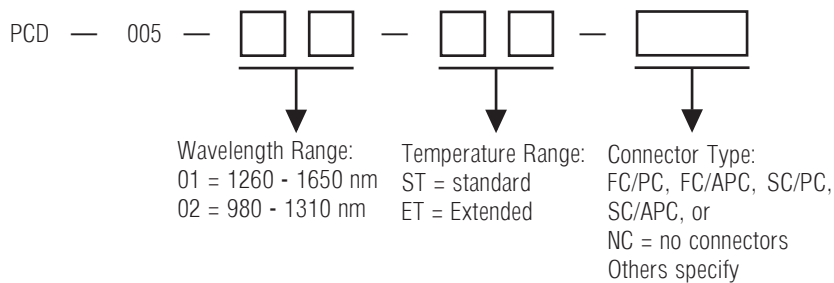


Figure 3. Effective scrambling bandwidth.

Ordering Information:



See pages 44, 46 for miniature scrambler, page 77 for passive depolarizer

Accessories:

ADB — 001 (RS-232 adapter board)

