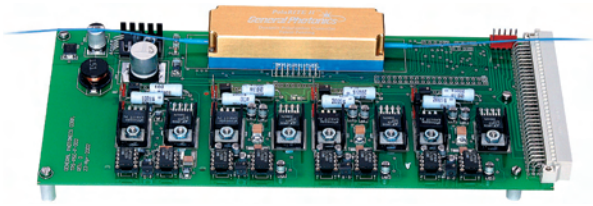
POLARIZATION MANAGEMENT MODULES

Polarization Scrambler Module



General Photonics' 4-axis Polarization Scrambler Module uses a breakthrough all-fiber technology to effectively randomize polarization states. Depolarizing by polarization scrambling has many important applications: Scrambling the input polarization can remove measurement uncertainties caused by the polarization sensitivity of the device under test. Performance degradation due to polarization-dependent-gain (PDG) induced in optical amplifiers can be suppressed by scrambling the State of Polarization (SOP). Polarization scrambling can also be used in systems to facilitate and simplify PMD monitoring. Based on a patented, award-winning all-fiber technology, the PCD-003 delivers superior performance with extremely low insertion loss, back reflection and residual phase and amplitude modulation. In addition, the total power consumption is typically less than 10W.

Specifications:

Insertion Loss	< 0.05 dB
Center Operating Wavelength	980 nm, 1310 nm, or 1550 nm, other specify
Operating Wavelength Range[1]	> 100 nm
Output Degree of Polarization[2,3]	< 5%
Average PMD	< 0.05 ps
Intrinsic PDL	< 0.05 dB, 0.01 dB typical
Return Loss	> 65 dB
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
Power Consumption	10 W typical
Scrambling Frequencies	Factory set 4 fixed frequencies, distributed between DC to > 700 kHz
Operating Temperature	10 ~ 40 °C
Storage Temperature	-10 ~ 50 °C
Board Dimensions	220 × 100 × 30 mm (L × W × H)

Notes: Values are referenced without connectors
1. Center Wavelength ± 50 nm
2. At 500 Hz detection bandwidth
3. Measured from a photodetector at PCD-003 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
- Low power consumption

Applications:

- PDG (polarization dependent gain) mitigation
- Polarization sensitivity elimination
- Facilitating PMD emulation
- Facilitating PMD compensation
- Facilitating PDL measurement

Tech Info: pp. 103, 152
FAQ: p. 171

Polarization Scrambler Module

Typical Performance Data:

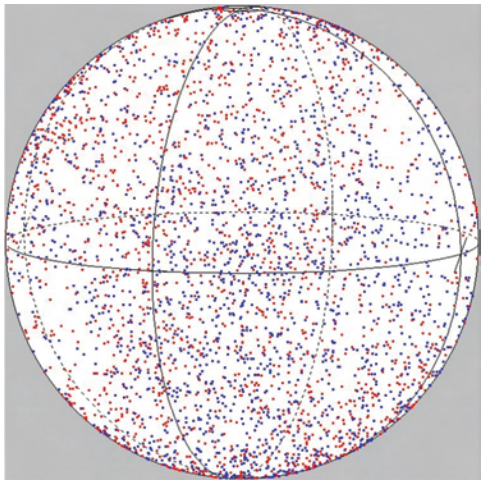


Figure 1. 1 second (3500 points) SOP display at PCD-003 output measured by Agilent 8509C.

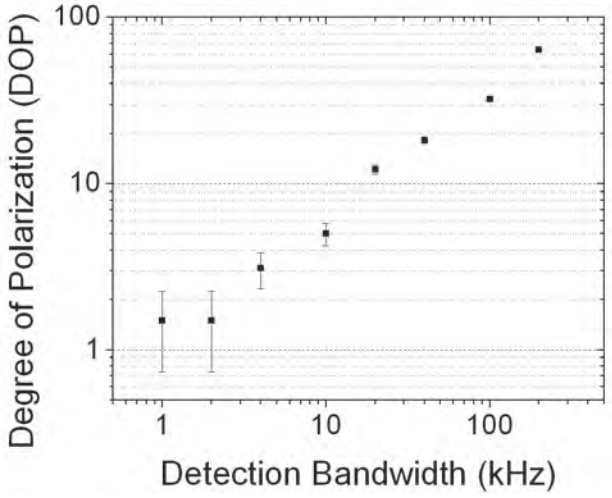


Figure 2. Degree of Polarization (DOP) as a function of detection bandwidth.

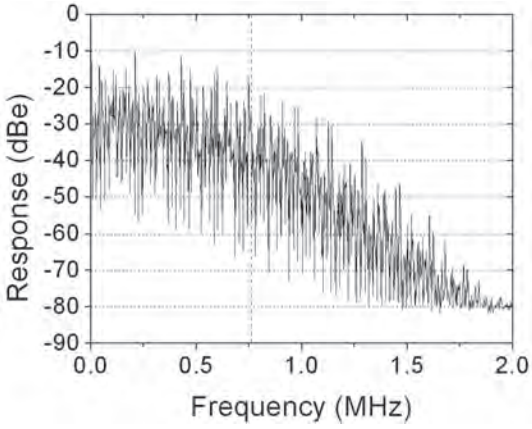


Figure 3. Effective scrambling bandwidth.

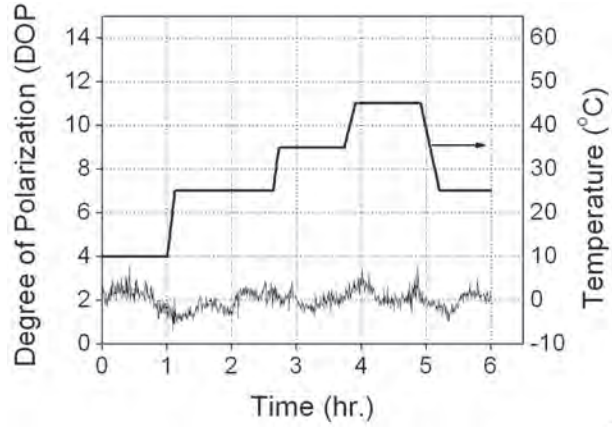


Figure 4. DOP vs. temperature

Ordering Information:

PCD – 003 – □□ – □□□

13 = 1310 nm
15 = 1550 nm
98 = 980 nm

Connector type:
FC/PC, FC/APC
SC/PC, SC/APC or
NC = no connectors
Others specify

See page 42 for micro-processor option, page 44 for tunable mini-scrambler, page 66 for passive depolarizer