Making Light Work Lighter
General Photonics

LASER COMPONENTS®

IMPAIRMENT EMULATION AND POLARIZATION CONTROL

Polarization Optimized PMD Source - PMDPro™ (PMD-1000)

The PMD-1000 (PMDPro™) is a breakthrough PMD source that can deterministically generate precise 1st order PMD up to 180 ps and 2nd order PMD up to 8100 ps^2. Its quasi-continuous operation mode enables independent generation of first order and wavelength independent second order PMD for uniform coverage of the PMD space. It contains an automatic polarization controller and two polarimeters that monitor the state of polarization (SOP) and degree of polarization (DOP) before and after the PMD generating elements. The polarization controller can be used with the front polarimeter to automatically align and maintain the input SOP at 45° from the principal axis of the DGD element to obtain the worst-case first order PMD effect. Alternatively, the controller can automatically adjust and maintain the input SOP using the feedback from the rear polarimeter to either minimize or maximize the output DOP for each PMD setting. Minimizing the output DOP enables testing of the worst-case total PMD effect, while maximizing the DOP turns the PMDPro™ into a PMD compensator, allowing the user to obtain optimized PMD values for PMD compensation. PMDPro™ can also perform PMD emulation by generating statistical PMD distributions. Finally, the polarization controller and polarimeters enable variable rate scrambling and deterministic polarization control functions, including trace generation and polarization stabilization at any SOP. PMDPro™ makes your PMD related systems testing simple, fast, and professional.

Specifications:

Operating Wavelength Range[1]	C band or L band		
Insertion Loss	5.0 dB (90 ps version) 5.5 dB (180 ps version)		
Input Power Range	-10 to 10 dBm		
Return Loss	50 dB		
PDL	0.45 dB typical (90 ps version) 0.5 dB typical (180 ps version)		
1st Order PMD Range	0 to 91 ps or 0.36 to 182.4 ps		
1st Order PMD Resolution		90 ps range	180 ps range
	Discrete mode	0.357 ps	0.714 ps
	Quasi-continuous mode	0.1 ps	0.2 ps
2nd Order PMD Range	2000 ps^2 (90 ps range) or 8100 ps^2 (180 ps range)		
PMD Variation Time	1 ms min.		
SOP Alignment Accuracy[2]	± 2°		
SOP Tracking Speed	10 π/s		
DOP Accuracy[2]	± 2%		
Optical Power Handling	300 mW min.		
Operating Temperature	10 to 50 °C		
Storage Temperature	-20 to 60 °C		
Communications Interfaces	USB, RS-232, Ethernet, and GPIB		
Front Panel Display	2 x 20 character LCD		
Power Supply	100 – 240 VAC, 50 – 60 Hz		
Dimensions	2U, 3/4 of 19" rack width 14" (L) x 14" (W) x 3.5" (H)		

Notes:
1. Standard option: C band.
2. At 23 ± 5°C.

Features:

- 1st & 2nd order PMD source
- 1st & 2nd order PMD emulator
- Automatic polarization alignment
- Polarization scrambling
- PMD compensation
- Rapid PMD switching: 1 ms

Applications:

- System PMD tolerance test
- PMD compensator evaluation
- System PMD emulation
- Optimizing PMD values for PMDC
- PMD measurement instrument calibration

Related Products:

- PDL Source (PDLE-101)
- DGD and SOP Calibration Artifacts (CS-DGD/SOPMD)
- Polarization Measurement System (PSGA-101)
- Multifunction Polarization Controller (MPC-203, MPC-202, MPC-201)
- Polarimeter (PSY-201, POD-201)
- Fixed DGD (FDE-002)
- Rack Mount Kit (RCK-001)

Tech Info:

- Polarization Related Tests for Coherent Detection Systems
- In-service light path PMD (polarization mode dispersion) monitoring by PMD compensation
- Polarization Optimized PMD Source Applications
- Why Coherent Detection Systems May Fail at Compensating for Polarization Mode Dispersion

Ordering Information:

PMD — 1000 — ☐☐ **—** ☐ **—** ☐

DGD Range:
90 = 90 ps
18 = 180 ps

Wavelength:
C = C band
L = L band

Connector Type:
FC/PC, FC/APC
SC/PC, or SC/APC

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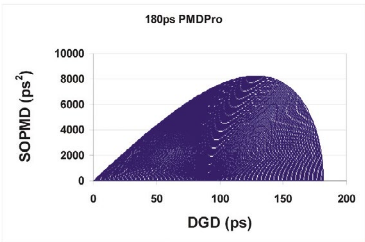

Figure 1. DGD and wavelength independent SOPMD range (180 ps PMDPro™)

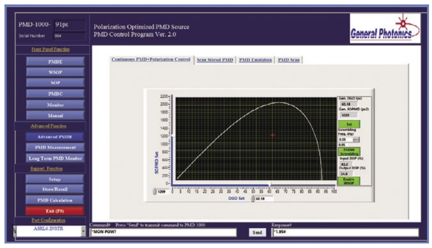

Figure 2. Quasi-continuous PMD control

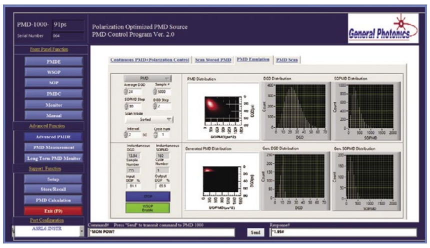

Figure 3. Maxwellian PMD emulation

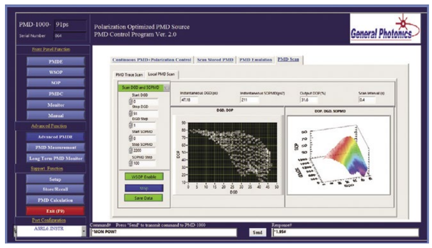

Figure 4. 3D graph display of a DGD/SOPMD scan

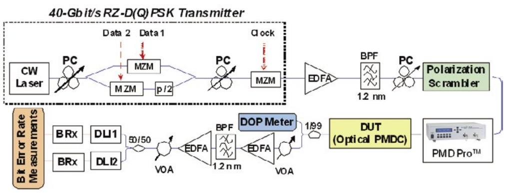

Figure 5. Experimental setup for PMD compensator performance test, using PMDPro™ as a PMD source to add DGD and SOPMD to the signal.

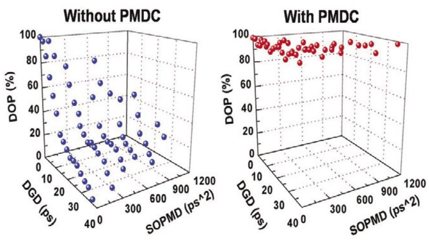

Figure 6. Measured DOP (without PMDC and with PMDC) of a 40-Gbit/s RZ-DQPSK signal versus DGD and SOPMD.

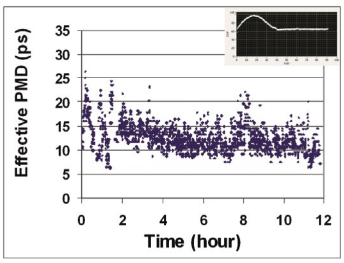

Figure 7. Long-term monitoring of PMD in an in-service link by PMDC. Instantaneous PMD vs. time.
Inset: DOP vs. DGD plot for a single measurement.

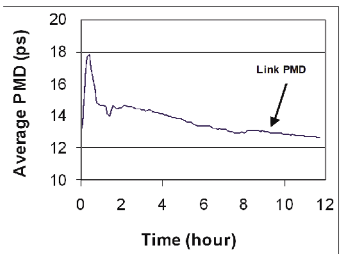

Figure 8. Long-term monitoring of PMD in an in-service link by PMDC. Average PMD vs. time.

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