Polarization Mode Dispersion Compensator-PMDBuster™

PMDBuster™ is a multi-stage PMD compensation module that can effectively eliminate impairments caused by all-order (1st, 2nd, and higher) PMD in 40Gbps or 100Gbps systems. The multi-stage approach has clear performance advantages over its single- or 1.5-stage counterparts. This OEM module is designed to be placed directly in front of a receiver to extend system PMD tolerance range and reduce PMD-induced system outage probability. With an ultra-low insertion loss of less than 2.5 dB, it can neutralize the effects of 1st order PMD up to 50 ps (17 ps mean) and 2nd order PMD up to 600 ps^2. With General Photonics' proprietary reset-free tracking algorithm, the module can track random SOP variations up to 40 π/s, and PMD variation of up to 150ps/s. RS-232 or I2C interface options are available for communication with network management equipment. PMDBuster™ eliminates the threat of PMD drift or bursts in fiber optic networks.

Specifications:

Operating Wavelength Range	C band or L band (Specify)
SOP Recovery Time [1]	7 ms max., 1.7 ms typical
PMD Recovery Time [2]	10 ms max., 2 ms typical
Initial Response Time [3]	30 ms max.
Random SOP Tracking Speed [4]	40 π/s
PMD Tracking Speed	150 ps/s
PMD Compensation Range [5]	0 – 50 ps instantaneous DGD (17 ps PMD)
Signal Bandwidth	< 0.35nm
Insertion loss	2.5 dB typical, 3 dB max. (excluding connector loss)
Return loss	> 45 dB
PDL	< 0.5 dB
Optical Power Range	-15 dBm to 5 dBm
Optical Power Damage Threshold	300 mW
Input/Output Fiber Type	SM
Connector Type	LC/PC standard, others specify
Operating Temperature	-5 to 65 °C
Storage Temperature	-40 to 85 °C
Power Supply	+12 VDC / 2A -12 VDC / 0.5A
Communications Interface	RS-232 or I2C
Dimensions	19 (H) x 160 (W) x 200 (L) mm

Notes:

1. Time required for recovery from tracking loss caused by a discontinuous SOP change. Tested for input DGD = 20 ps, with SOP variation before the DGD element..
2. Time required for recovery from tracking loss caused by a discontinuous PMD change. Tested by switching input DGD from 0 to 20 ps.
3. Time required for effective PMD compensation after the compensator is enabled.
4. Maximum speed of random SOP variation for which the PMD compensation can be maintained. Tested for input DGD = 20 ps, with SOP variation before the DGD element.
5. Values given in table are standard range specs. Contact General Photonics for custom requests.

Features:

- Neutralize 1st order PMD up to 50 ps
- Neutralize 2nd order PMD up to 600 ps^2
- Reset free operation
- Fast tracking speed
- Low insertion loss

Applications:

- PMD compensation
- PMD tolerance range extension
- PMD outage reduction
- Elimination of need for repeaters in long-haul systems

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Typical Performance Data:

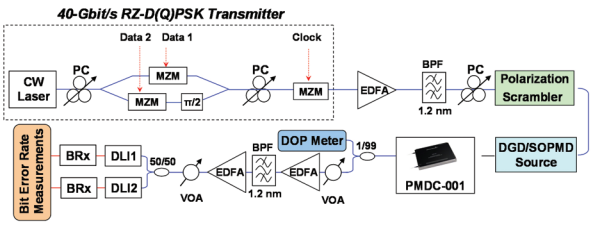

Figure 1. Experimental setup for PMDC performance test, using PMDPro™ as a PMD source to add DGD and SOPMD to the signal.

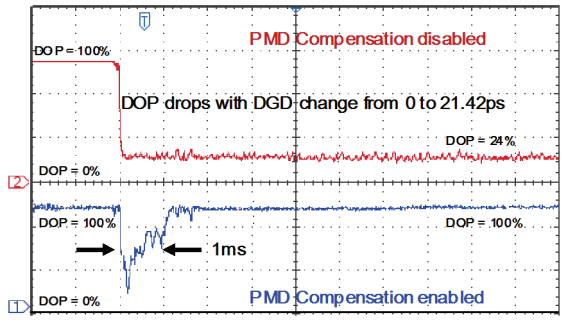

Figure 2. PMDC recovery time. Red: PMDC disabled. Output DOP drops from 100% to 24% in response to a DGD change of 21.42 ps. Blue: PMDC enabled. DOP returns to 100% within 2 ms.

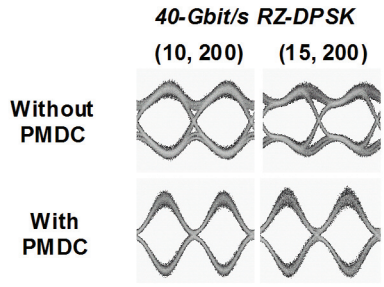

Figure 3. Captured eye diagrams of 40-Gbit/s RZ-DPSK signals with and without PMDC. (15, 200) represents 15 ps DGD and 200 ps^2 SOPMD.

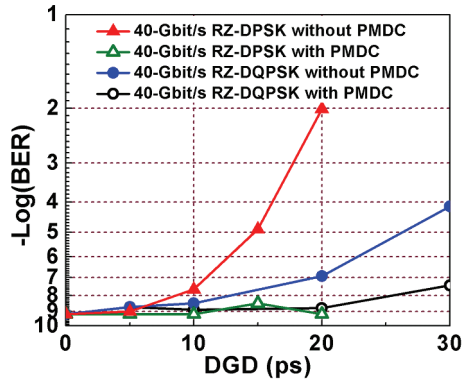

Figure 4. BER improvement with PMDC module for 40-Gbit/s RZ-DPSK and RZ-DQPSK signals in the presence of different DGD values.

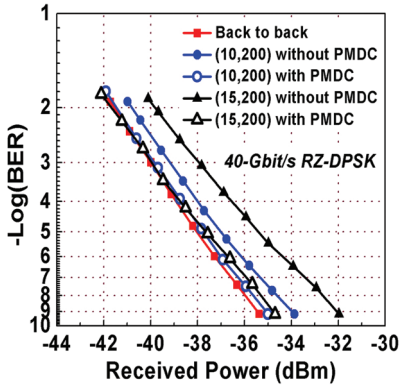

Figure 5. BER measurements of 40-Gbit/s RZ-DPSK signals with different DGD and SOPMD values. For both PMD test conditions, the PMDC module returns the BER levels to close to the control (back to back) condition.

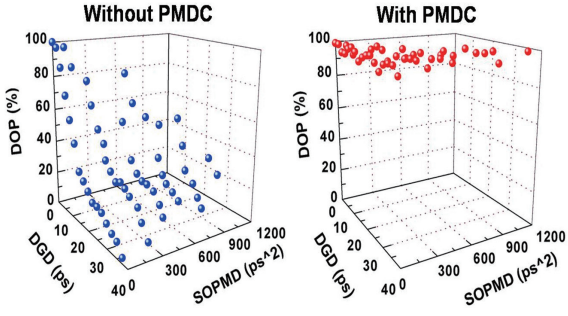

Figure 6. Measured DOP (without PMDC and with PMDC) of a 40-Gbit/s RZ-DQPSK signal versus different DGD and SOPMD values.

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Ordering Information:

PMDC — 001 — □ — □ — □□ — □□□

- Wavelength Range: C = C band, L = L band
- Communication: RS = RS-232, I = I2C
- PMDC Range: 50: Standard, Others: Custom
- Connector Type: LC/PC, Others specify

Evaluation Kit Option:

The PMDC-001 is designed for use as an OEM module. To facilitate evaluation and laboratory testing, a 1U, rack-mountable instrument version is available. The PMDC-102 contains up to two independently controllable PMDC-001 modules. It includes buttons and indicator LEDs for front panel control, analog voltage DOP monitoring outputs to monitor the PMDC performance of each module, and a DC power adapter so that the instrument can be powered from a wall power supply.

Specifications:

Optical Specifications	See table above
Number of PMDC Modules	One or two (Specify)
DOP Analog Output	0 – 2.82 V
Power Supply [1]	+48 VDC or -48 VDC
Power Consumption	30 W
Remote Control Interface	RS-232 or I2C
Dimensions	1U 19” rack mountable enclosure, 12” depth

Notes:
1. +48 V DC power adapter supplied with instrument.

Ordering Information:

PMDC — 102 — □ — □ — □ — □□ — □□□

- Wavelength (channel 1): C = C band, L = L band
- Wavelength (channel 2): 0 = no second module, C = C band, L = L band
- Communication: RS = RS-232, I = I2C
- PMDC Range: 50: Standard, Others: Custom
- Connector Type: LC/PC, Others specify