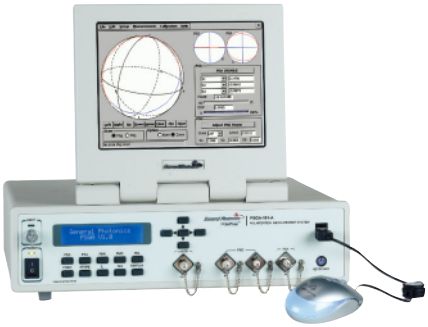
Polarization Measurement System - PolaWise™ (PSGA-101A)



PolaWise™ is an advanced polarization measurement system for accurate measurement of all polarization related properties of light sources and optical materials. Based on General Photonics' patented magneto-optic polarization generation and analysis technology, the PSGA-101-A is specially designed for fiber optic applications and can effortlessly accomplish multiple functions, including polarization state generation (PSG), polarization state analysis (PSA), polarization extinction ratio (PER) measurement, polarization dependent loss (PDL) measurement, and polarization mode dispersion (PMD) measurement, as well as birefringence measurement in spun fiber. Another attractive feature of the instrument is its large flip-top LCD graphic display design, an industry first that allows large viewing area on a compact, portable enclosure. Furthermore, a 2x20 character LCD is also included on the front panel for easy operation of the instrument for applications that do not require a graphic display. The instrument comes with an internal tunable laser for PDL and PMD measurement up to 10ps. It can also control tunable lasers from third parties via a GPIB port for measurement of larger PMD values. The instrument also comes with a VGA port for use with an external LCD graphic display of the user's choice. PolaWise™ : a wise instrument and a smart choice!

Specifications:

Operating Wavelength Range		1440 to 1620 nm	1280 to 1340 nm
SOP Generation Accuracy[1]		±1° on Poincaré Sphere	±1° on Poincaré Sphere
SOP Repeatability		±1°	±1°
Azimuth & Ellipticity Angle Accuracy[1]		< 0.25°	< 0.25°
Stokes Vector Accuracy[1]		±0.5%	±0.5%
DOP Measurement Accuracy[1,2]		±1%	±1%
PER Dynamic Range		> 40 dB (Input Power > -10 dBm)	> 40 dB (Input Power > -10 dBm)
PER Axis Accuracy[1]		±1°	±1°
PMD Measurement Range		1 fs to 10 ps (Internal tunable laser)	
		1 fs to 400 ps (External laser, 0.01 nm < λ_{step} < 10 nm)	1 fs to 400 ps (External laser, 0.01 nm < λ_{step} < 10 nm)
PDL Measurement Range		0 to 40 dB (Input power > -10 dBm)	0 to 40 dB (Input power > -10 dBm)
Accuracy:	DGD SOPMD PDL	± (1 fs + DGD * 0.5%) ± (SOPMD * 1%) ± (0.05 dB + PDL * 2%)	± (5 fs + DGD * 1%) ± (SOPMD * 2%) ± (0.05 dB + PDL * 2%)
Repeatability:	DGD[3] SOPMD[3] PDL[4]	0.03 fs 0.3 ps^2 0.04 dB	0.05 fs 0.3 ps^2 0.05 dB
Resolution:	DGD SOPMD PDL	1 fs (1550 nm, λ_{step} = 2 nm) 0.005 ps^2 (1550 nm, λ_{step} = 2 nm) 0.01 dB	1 fs (1310 nm, λ_{step} = 2 nm) 0.005 ps^2 (1310 nm, λ_{step} = 2 nm) 0.01 dB
Internal Tunable Laser		1528 to 1563 nm	Not available
Wavelength Tuning Step		50 GHz minimum for internal tunable laser	N/A
Operating Power Range		-40 dBm to + 2 dBm	-40 dBm to + 2 dBm
Optical Power Accuracy[1]		± 0.25 dB	± 0.25 dB
Optical Power Damage Threshold		300 mW	300 mW
Operating Temperature		5 °C to 40 °C	5 °C to 40 °C
Storage Temperature		-20 °C to 60 °C	-20 °C to 60 °C
Communication Interfaces		GPIB, Ethernet	GPIB, Ethernet
Displays		8" flip-top graphic LCD & 2x20 character front panel LCD	8" flip-top graphic LCD & 2x20 character front panel LCD
External Storage		USB removable storage media, such as compact flash	USB removable storage media, such as compact flash
Power Supply		100 – 240 VAC, 50 – 60 Hz	100 – 240 VAC, 50 – 60 Hz
Software		Control/display program (included)	Control/display program (included)
Dimensions		2U, 3/4 of 19" rack width 14" (L) x 14" (W) x 3.5" (H)	2U, 3/4 of 19" rack width 14" (L) x 14" (W) x 3.5" (H)

Notes:
1. At 23 ° ± 5°C.
2. DOP measurement accuracy for C and L bands or for O band, depending on version.
3. Averaged over 10 steps, with wavelength step size = 2 nm for DGD, 0.1 nm for SOPMD.
4. Measured by Mueller Matrix method.

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Features:

- Multiple operation modes
- Flip-top graphic display
- Front panel character LCD display
- External LCD monitor enabled
- USB removable data storage
- Compact and portable
- Ethernet for remote operation

Applications:

- PMD measurement
- PDL measurement
- Polarization state generation (PSG)
- PER measurement
- PM fiber connector key alignment
- Connector stress evaluation of PM fiber connector
- SOP measurement
- Source DOP measurement
- Birefringence measurement of spun fiber

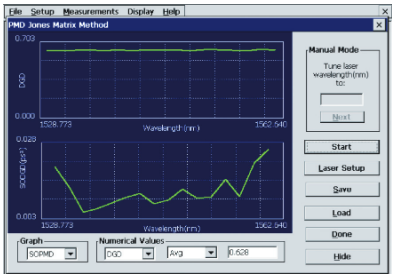
Related Products:

- PMD/PDL Calibration Standards (CS-DGD/PDL/SOPMD)
- Components
- Bare Fiber Adapter (PEZ)

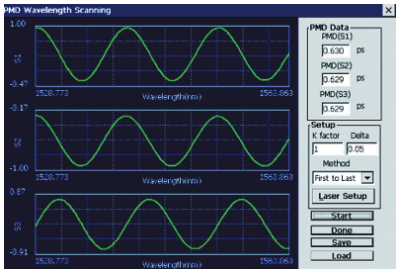
Tech Info:

- What is Polarization?
- Polarization Related Tests for Coherent Detection Systems
- High accuracy polarization measurements using binary polarization rotators
- Highly Repeatable All Solid-State Polarization State Generator
- Self-calibrating Binary Polarization Analyzer

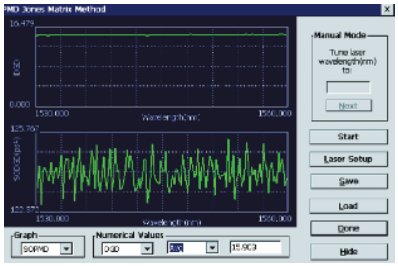
Measurement Examples:



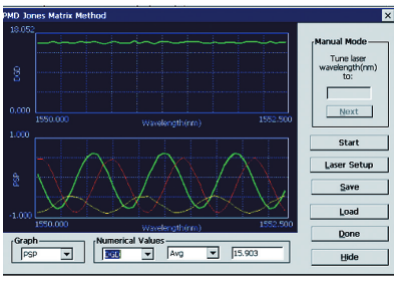
1st and 2nd order PMD measurement (Jones Matrix) of 20mm quartz crystal. Specified DGD=0.627ps, Measured DGD=0.628ps



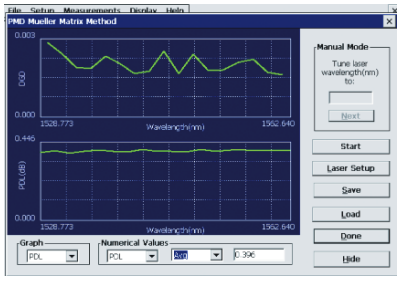
DGD measurement (Wavelength Scanning Method) of 20mm quartz crystal. Specified DGD=0.628ps, Measured DGD=0.629ps



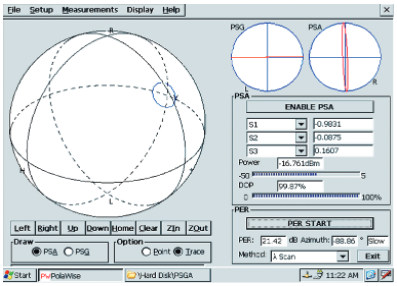
1st and 2nd order PMD measurement (Jones Matrix Eigenanalysis) of two 15.75 mm YVO_4 crystals with 45° alignment. Specified DGD=15.90ps, SOPMD=126.46ps^2, Measured DGD=15.903ps, SOPMD=124.03ps^2



DGD and PSP measurement (Jones Matrix Eigenanalysis) of two 15.75 mm YVO_4 crystals with 45° alignment. Specified DGD=15.90ps, SOPMD=126.46ps^2, Measured DGD=15.903ps



DGD and PDL measurement (Mueller Matrix Method) of PDL standard. Specified PDL=0.389dB, Measured PDL=0.396dB



PER measurement example. The PM fiber under test has a PER of 21.42 dB, and the key of the PM output connector is aligned 1.1° from the slow axis of the fiber.

Ordering Information:

PSGA — 101 — A — □□ — □ — □

Wavelength:
13 = 1310nm
15 = 1550nm

Options:
1 = with internal tunable laser
2 = without internal tunable laser

Connector Type:
(PSG input/output and laser output,if applicable)
FC/PC, FC/APC

Notes:
Please specify connector types for laser and PSG input/output when ordering.

PSA input is FC free-space adapter. Internal tunable laser available only for 1550nm version.