Polarization Instruments for Manufacturing and Laboratories

Multifunction Polarization Controller—PolaMight™

Controlling the state of polarization (SOP) of an optical signal has never been easier: This multifunction polarization controller has four operational modes for complete polarization control: variable rate polarization scrambling, manual polarization adjustment, polarization modulation, and externally triggered random SOP generation. Four different polarization scrambling methods enable the SOP to a) trace out a spiral pattern about a static or rotating axis with a nearly uniform SOP variation rate for system stress tests (Tornado scrambling); b) generate a continuous trace with a Rayleigh distribution of SOP variation rate, for emulation of the SOP variation in a fiber link (Rayleigh scrambling); c) generate a continuous trace with uniform sphere coverage for PDL measurement (Triangle scrambling); or d) evenly cover the Poincaré sphere with discrete, random points at a uniform rate (Discrete scrambling). In the SOP modulation mode, each polarization control axis can be selectively controlled with a sine, square, or triangle wave of user defined frequency and amplitude. Each polarization control axis can also be controlled manually, by setting the input voltage either from the front panel controls or through a remote control interface. In externally triggered scrambling mode, discrete, random SOPs are generated in response to a trigger input, a feature desirable for recirculating loop applications or other applications requiring synchronization with other devices. Finally, the MPC-201 can emulate the Agilent 11896A polarization scrambler function, allowing it to act as a plug-in replacement for this popular but discontinued device, while offering many more advanced features. PolaMight puts the user in control.

Specifications:

Operating Wavelength Range	1260 to 1620 nm (standard) or 980 to 1310 nm
Polarization Scrambling	Discrete random states: 0.00 to 20,000 points/s Triangle: 0.00 to 2000 x 2π rad/s Rayleigh rate distribution: 0.00 to 2000 rad/s (mean) Tornado (quasi-uniform rate distribution): 0.00 to 2000 revolutions/s.
Agilent 11896A Scrambling Emulation	Speed settings 1 – 8, matched to Agilent 11896A settings
Manual Polarization Control	# of channels: 4 Range: 0 – 4π each channel
Polarization Modulation (Each Channel)	Waveforms: Sine, Triangle, Square Frequency: 0.00 to 1000 Hz Amplitude: 0 to 3π peak-to-peak
External Trigger Mode	Random SOP per TTL trigger pulse, up to 20,000 points/s
Insertion Loss	< 0.5 dB with connectors (< 0.1 dB intrinsic)
PDL[1]	< 0.05 dB with connectors
Activation Loss[1]	< 0.05 dB with connectors
Return Loss	> 50 dB with connectors (> 65 dB intrinsic)
PMD	< 0.1 ps with connectors
Optical Power Handling	1000 mW
Operating Temperature	0 °C to 50 °C
Storage Temperature	-20 °C to 70 °C
Communication Interfaces	USB, Ethernet, RS-232, and GPIB
Electrical Triggers	Connectors: BNC Output trigger: TTL pulse per SOP generated in discrete scrambling mode Input trigger: One random SOP generated per TTL pulse received in trigger mode
Front Panel Display	OLED graphic display
Power Supply	100 – 240 VAC, 50 – 60 Hz
Dimensions	2U, 19" half rack width 14" (L) x 8.5" (W) x 3.5" (H)

Notes:

Specifications in this table apply for the standard 1260 to 1620nm version over a temperature range of 23 ± 5 °C.

1. A low PDL/activation loss version (0.01 dB intrinsic) is available upon request for PDL measurement applications.

Features:

- Multiple polarization control modes
- Tornado scrambling (quasi-uniform rate distribution)
- Real fiber SOP variation emulation (Rayleigh rate distribution)
- Discrete SOP scrambling
- Agilent 11896A scrambling emulation
- SOP modulation
- Low IL, PDL, PMD, and AL
- Bright OLED display

Applications

- SOP variation emulation
- PMD emulation
- Polarization scrambling
- System polarization studies
- PDL/DOP measurement
- Recirculating loop studies

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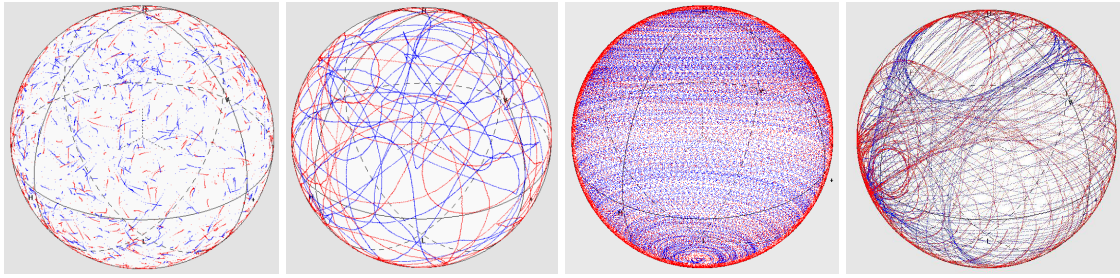

Figure 1. Poincaré sphere SOP traces for four different scrambling methods: (a) Discrete, (b) Typical Rayleigh or Triangle trace, (c) Tornado (fixed axis), and (d) Tornado (rotating axis).

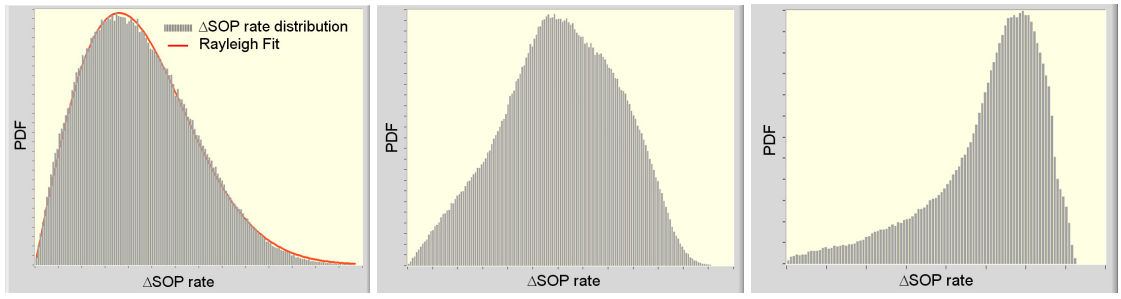

Figure 2. SOP variation rate distributions for (a) Rayleigh, (b) Triangle, and (c) Tornado scrambling methods.

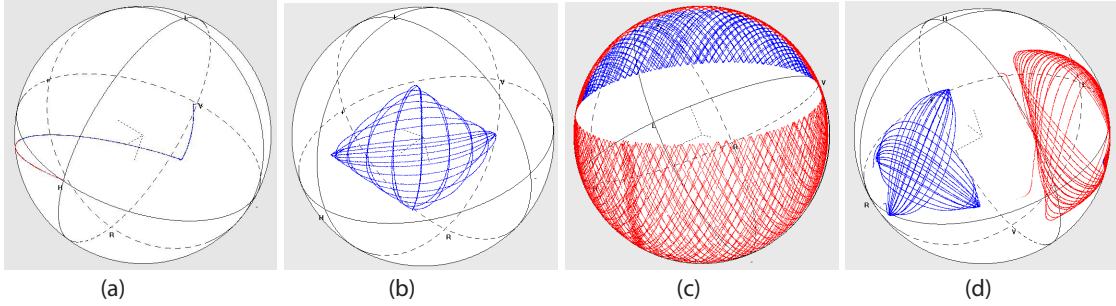

Figure 3. (a) Manual adjustment of SOP from H to V state. (b-d) SOP patterns generated in polarization modulation mode using different combinations of waveforms on different channels of the polarization controller.

Ordering Information:

MPC — 201 — ☐ — ▭

Wavelength Range:	Connector Type:
1 = 1260 – 1620nm	FC/PC
2 = 980 – 1310nm	FC/APC

Accessories:

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