

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:

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| 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 2 π 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 – 4 π each channel |
| Polarization Modulation (Each Channel) | Waveforms: Sine, Triangle, Square Frequency: 0.00 to 1000 Hz Amplitude: 0 to 3 π 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 \pm 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

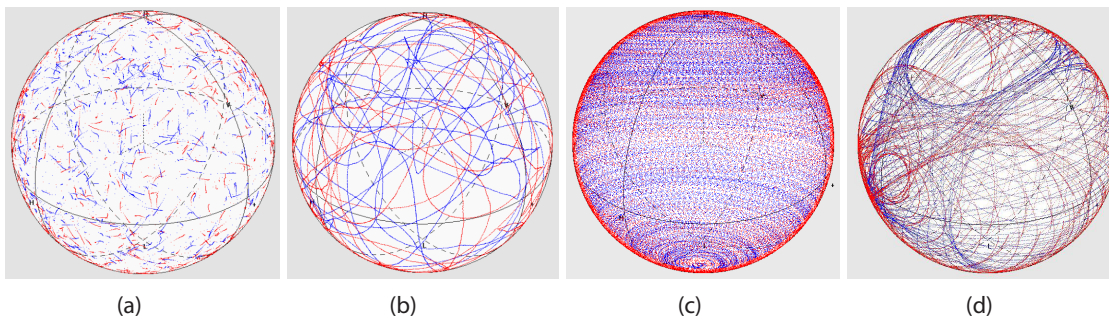


Figure 1. Poincaré sphere SOP traces for four different scrambling methods: (a) Discrete, (b) Typical Rayleigh or Triangle trace, (c) Tornado (fixed axis), and (d) Tornado (rotating axis).

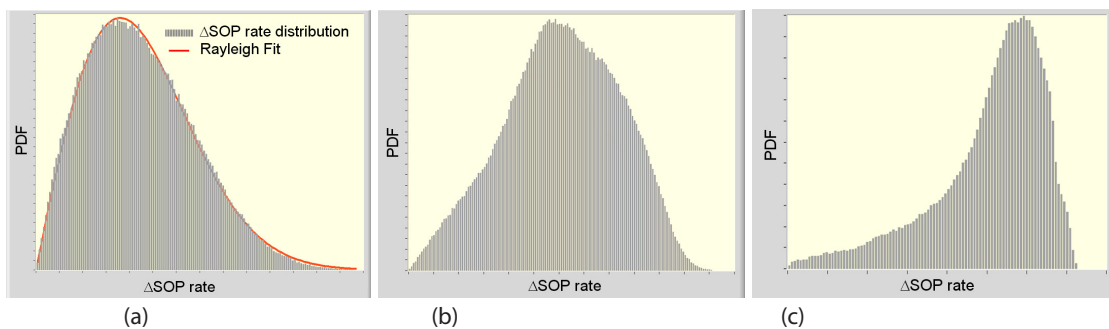


Figure 2. SOP variation rate distributions for (a) Rayleigh, (b) Triangle, and (c) Tornado scrambling methods.

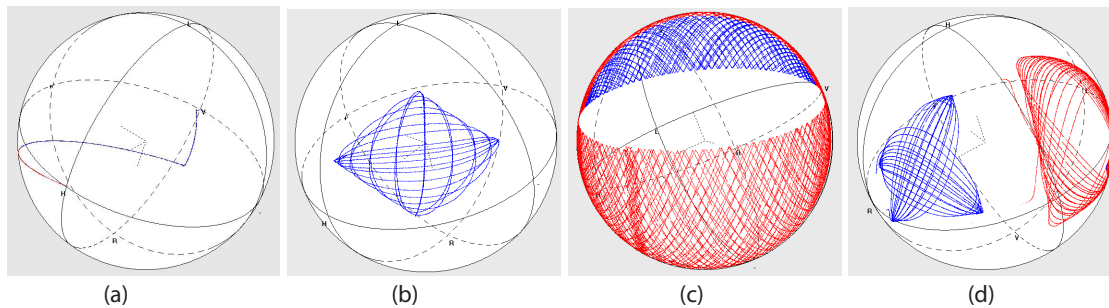
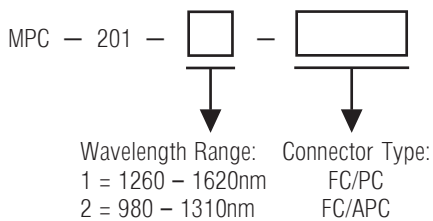


Figure 3. (a) Manual adjustment of SOP from H to V state. (b-d) SOP patterns generated in polarization modulation mode using different combinations of waveforms on different channels of the polarization controller.

Ordering Information:



Accessories:

- NoTail™ Isolator p. 91
- NoTail™ Polarizer p. 90
- NoTail™ Circulator p. 92
- NoTail™ PBC/S p. 87
- NoTail™ Faraday Mirror p. 88
- Rack Mount Kit p. 83

Tech Info: pp. 93, 95, 100
FAQ: p. 225