



PSG 2000

High-Speed Polarization State Generator

Luna Innovations' high-speed polarization state generator (PSG 2000) enables quick generation of up to six distinctive polarization states (LCP, RCP, Linear $\pm 22.5^\circ$, Linear $\pm 67.5^\circ$) across a Poincaré sphere in less than 50 μs between two consecutive states, with high repeatability of less than 0.1 degrees.

The PSG 2000 uses a new self-latching PSG 4-bit optical head. In addition, its predictable wavelength and temperature dependence allow for easy calibration, making it a perfect choice in swept wavelength component measurement systems.

The PSG 2000 comes with a user interface for manually adjusting and automatically sweeping any selected states from 6 distinctive polarization states.

High-speed polarization state generator for up to six distinctive polarization states. (LCP, RCP, linear $\pm 22.5^\circ$, Linear $\pm 67.5^\circ$)

KEY FEATURES

- Switches between 6 polarization states: LCP, RCP, Linear $\pm 22.5^\circ$, Linear $\pm 67.5^\circ$
- Typical Switching Time 50 μs
- SOP Repeatability 0.1°
- 4-bit Control
- Continuous control
- USB 2.0, Ethernet 100BASE-TX
- SCIP command, C/C++ API, PC GUI
- Trigger in/out

APPLICATIONS

- Polarization OTDR
- Polarization Rotation
- Mueller Matrix-based Polarization Analysis
- Swept-Frequency Measurement
- Material Birefringence
- Optical Imaging

PERFORMANCE

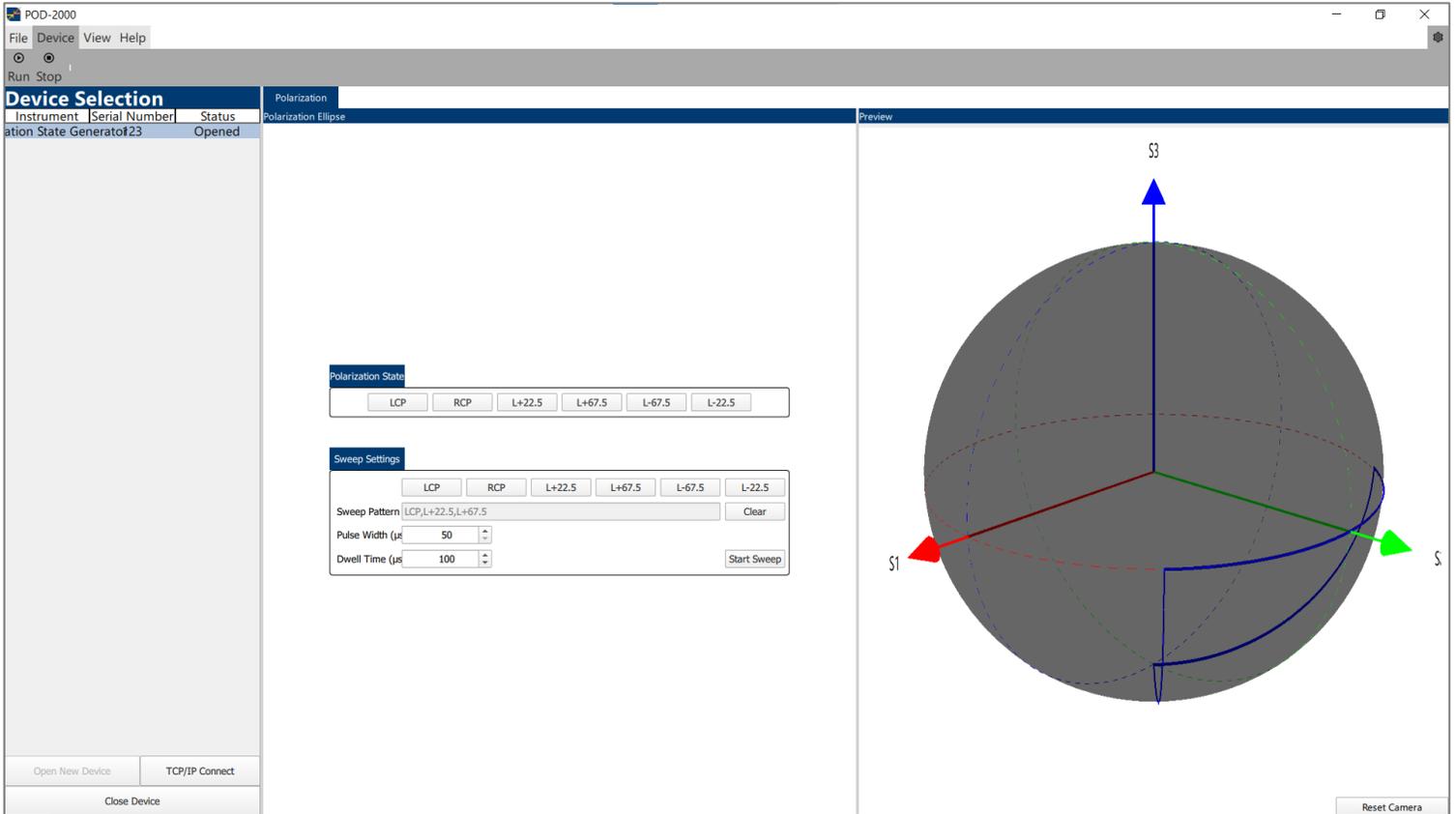
PARAMETER	SPECIFICATION			UNITS
Absolute Maximum Rating				
Optical input power ¹	300			mW
Operating Temperature	0 ~ 50			°C
Storage Temperature	-20 ~ 60			°C
Optical Characteristics				
Operation Wavelength ¹	Min.	Typical	Max.	
C band version	1480	1550	1620	nm
O band version	1260	1310	1340	nm
Insertion Loss²				
C band version			1.0	dB
O band version			1.2	dB
State Dependent Loss				
(Δ IL over all SOPs at fixed wavelength)			0.1	dB
Wavelength Dependent Loss				
(Δ IL over all wavelength at fixed SOP)			0.3	dB
Return Loss			-55	dB
Number of Distinct Polarization States	6			
SOP Relative Angle Accuracy				
(Deviation from 90° of angle between output SOPs on Poincaré Sphere) ^{3,4}	-10		10	degree
SOP Repeatability				
(On Poincaré Sphere) ³	-0.1		0.1	degree
SOP Accuracy to Target				
(On Poincaré Sphere at λ_c and 23°C) ^{1,3}	-5		5	degree
Rotation Angle Wavelength Dependence⁵				
1550nm		-0.068		Degree/nm
1310nm		-0.091		Degree/nm
Rotation Angle Temperature Dependence⁵				
1550nm		-0.084		Degree/°C
1310nm		-0.11		Degree/°C
SOP Switching Time	40	45	50	μs
SOP Dwell Time	20	50		μs

NOTES

Values are referenced without connectors

- Center wavelength $\lambda_c=1550$ or 1310 nm. For the 1550nm version, the calibrated wavelength range is 1500-1580nm, and the operating wavelength range is 1480-1620nm standard. For the 1310nm version, calibrated range = operating wavelength range (1260-1340nm). Contact Luna Innovations regarding other wavelength options.
The switch rotation angles, and output SOPs are closest to ideal values at the center wavelength and room temperature. For users to calculate the actual output SOPs at different temperatures and wavelengths, calibration parameters are provided. Measurements taken over the calibrated wavelength range are used to determine the calibration parameters for each PSG.
- With input polarization aligned to the polarizer transmission axis.
- Relative angles on the Poincaré sphere are twice the electrical field rotation angles in real space.
- Overall wavelengths and temperatures in the operational ranges.
- Wavelength and temperature dependence of the relative angle between adjacent linear SOPs, in real space. A negative sign denotes that the angle decreases with increasing wavelength or temperature. Wavelength dependence was tested at room temperature. Temperature dependence tested at λ_c .

PSG-2000 GUI



ORDERING

Catalog #	Description	Includes
PSG 2000-15-FC/APC	PSG 2000 High-speed polarization generator, 1480 nm to 1620 nm	PSG 2000 main frame for C and L bands. Power cable, USB 2.0 A to B cable, USB drive for GUI and documents.
PSG 2000-13-FC/APC	PSG 2000 High-speed polarization generator, 1260 nm to 1340 nm	PSG 2000 main frame for O band. Power cable, USB 2.0 A to B cable, USB drive for GUI and documents.



PSG 2000 V.1.0 03.03.23

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*Specifications subject to change without notice.