FF-8610

Rotary State of Polarization Analyzer

The FF-8610 State of Polarization Analyzer is specially designed for measuring the polarization characteristics of spatial collimated light and optical fiber light sources. It adopts the classic rotating waveplate method with a high-bandwidth 8Hz sampling rate, enabling the real-time and intuitive display of the state of polarization on the Poincaré sphere interface. Furthermore, it can be paired with the FF-8612 Polarization State Thermal Cycling Heater. By utilizing temperature control to influence the variation and stability of the polarization state, it achieves high-precision analysis of the Polarization Extinction Ratio (PER) for narrow-band light.



Features

- Intuitive Display: The software dynamically presents the state of polarization on the Poincaré sphere in real-time, making analysis clear at a glance.

- PER Measurement: Paired with the JW8612 Thermal Cycling Heater, it utilizes thermal control technology to specifically measure the Polarization Extinction Ratio (PER) of narrow-band light.

- Comprehensive Measurement: Supports polarization analysis for both spatial collimated light and optical fiber light sources.

- Precise and Efficient: Accurately measures the Degree of Polarization (DOP) at a high-bandwidth 8Hz sampling rate.

Application

- Optical fiber sensing

- Measurement and analysis of the rotation angle of optical components

- Precise measurement of the Degree of Polarization (DOP)

- Analysis and real-time monitoring of the State of Polarization (SOP)

- Polarization Extinction Ratio (PER) testing (requires pairing with the FF-8612 Thermal Cycling Heater)

Scope of Application

- Spatial Collimated Light: Refers to parallel light beams propagating in free space (e.g., air) with little to no divergence. Ideal collimated light can be approximated as a plane wave. Light emitted by a laser and passed through a collimating lens is frequently used as spatial collimated light.

- Optical Fiber Light Source: Refers to light transmitted through an optical fiber or directly generated by a fiber laser. When light is transmitted in an optical fiber, its characteristics are affected by the physical properties of the fiber itself.

- State of Polarization (SOP): Examples include linear polarization, circular polarization, and elliptical polarization. It can be visually displayed on the Poincaré sphere by measuring Stokes parameters.

- Polarization Extinction Ratio (PER): A key indicator measuring the ability of a polarization-maintaining (PM) fiber to maintain linearly polarized light. A higher PER value indicates a stronger ability of the fiber to maintain the state of polarization.

- Degree of Polarization (DOP): Represents the proportion of the polarized component to the total light intensity in a light wave. The DOP of ideal fully polarized light is 100%, while the DOP of unpolarized light (such as natural light) is 0%.

- Polarization Dependent Loss (PDL): The difference in transmittance of optical components or devices for light with different polarization states.

PER Function Test

The product under test undergoes thermal cycling through the FF-8612 heater. The Stokes parameters of the optical field output from the fiber are monitored and decomposed in real-time, thereby completely and quantitatively describing the evolutionary process of the state of polarization over temperature and time.

Core Functions

- Full-Vector Polarization Analysis: Achieves a complete, quantitative description of the polarization state based on the real-time measurement of Stokes parameters.

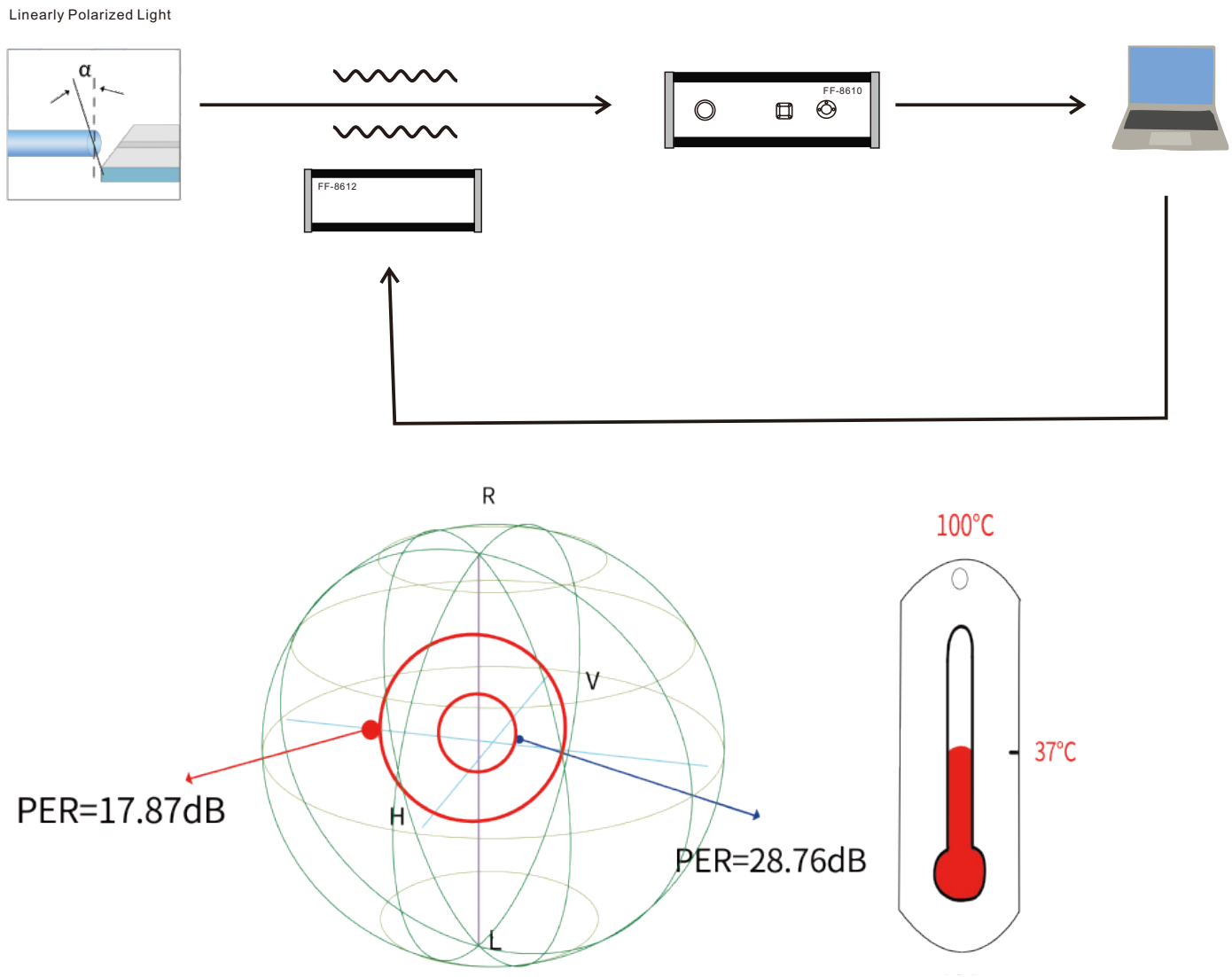
- Dynamic Process Tracking: Accurately captures the evolutionary trajectory of the polarization state over temperature and time.

- In-Depth Reliability Diagnosis: Evaluates thermomechanical stability and birefringence characteristics by analyzing the trajectory on the Poincaré sphere, accurately identifying failure modes.

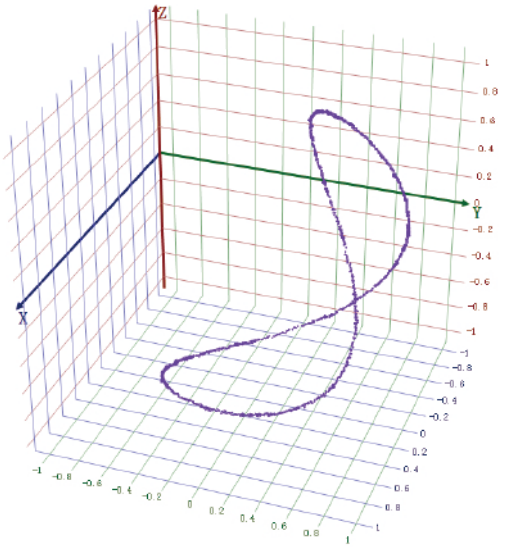
- Eliminates input polarization state interference.

- Isolates the influence of subsequent optical fibers at the output end.

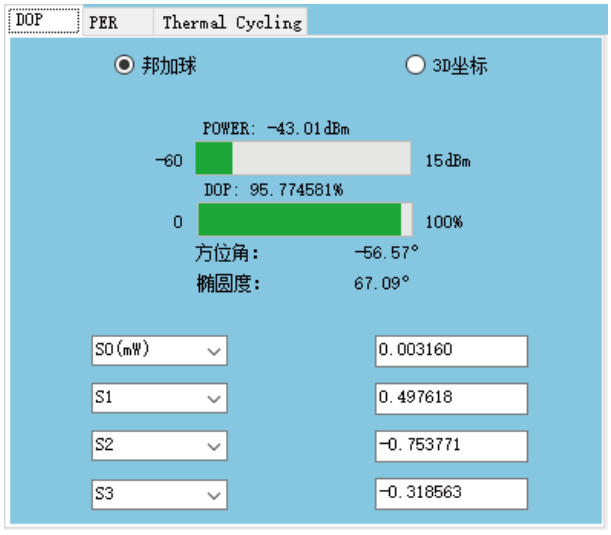
- Precisely locates angular deviations at connection points.



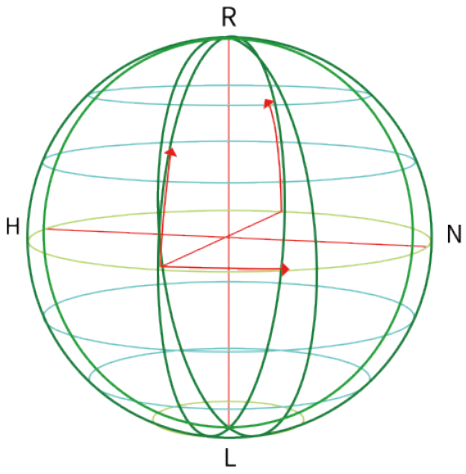
Real-time testing of narrow line width Polarization Extinction Ratio (PER) paired with a heater



3D Coordinate Test View



DOP Data Interface



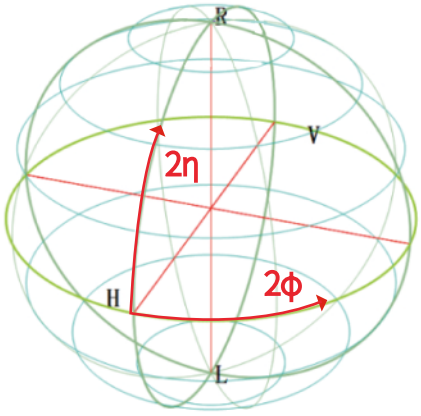
R : Right

V : Vertical

L : Left

H: Horizontal

Ellipticity to Linear Mapping



Azimuth (φ), Tilt (η), and DOP Circular Mapping

Specification

Model#	FF-8610
Wavelength (nm)	1270 - 1650 nm
SOP Accuracy	0.25°
DOP Accuracy	1%
PER Measurement Range	0 - 40 dB
PER Resolution	0.1 dB
Input Optical Power Range	-40 - +25 dB
Sampling Rate	8 Hz
Connector	FC
Clear Aperture	3 mm
Max Collimated Beam Deviation Angle	2°
Chassis Dimensions	235 * 104 * 300 mm