STOKES POLARIMETER

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PRODUCT BULLETIN

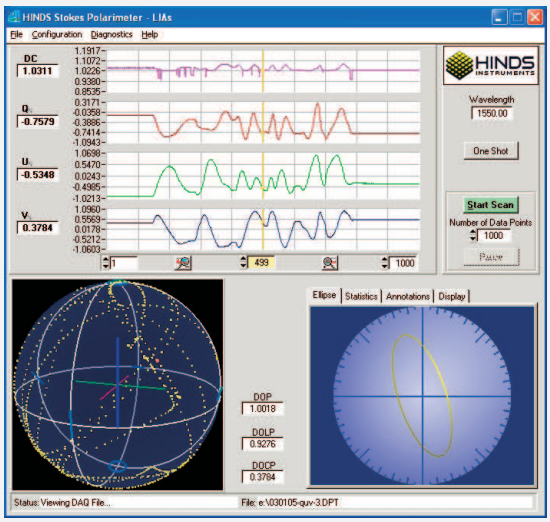
A Versatile System for Making Highly Sensitive Polarization Measurements Across a Wavelength Range

Polarization measurements have long been the expertise of Hinds Instruments and the new turnkey Dual PEM Research Stokes Polarimeter System is the next step in providing unparalleled sensitivity for quantifying the Stokes parameters of light. This system has applications in optical component characterization, Optical system beam output characterization, astronomy, fiber optic manufacturing, and light source and laser quality control.

The turnkey system includes two photoelastic modulators (PEMs) that generate all 4 Stokes parameters in a single measurement. Hinds Instruments is pleased to offer this system in a variety of options, for single wavelength, multi-wavelength or spectroscopic measurements.

Leading Edge Sensitivity and Repeatability

Using Hinds Instruments' patented Photoelastic Modulator (PEM) technology, the system provides the highest levels of polarization measurements that are available today. In addition, the PEM provides high-speed operation, modulating between 37 and 100 kHz depending on wavelengths required. Because the PEM is based on resonance modulation, the system is capable of providing complete Stokes measurements with no moving parts so accuracy and repeatability is assured.



Stokes Polarimeter. Software

Stokes Polarimeter. Front Panel

Wide Range of Options for a System that Fits Your Needs

The dual PEM polarimeter is available in several configurations. The system can be configured for a single wavelength or to make measurements across several wavelength ranges. Systems are available for the visible, the NIR, the IR, and the DUV. The software package is designed to calibrate the PEMs for changing wavelengths and a fiber optic input is also available.

The Dual PEM Stokes Polarimeter measures all four Stokes parameters of incoming light. This light can be from a laser, a fiber, or broadband sources. It is designed to measure and to instantaneously display the value of each of the normalized Stokes parameters, as well as the position on the Poincaré sphere. The DOP, DOLP, and DOCP are also displayed.

The unique design of this system eliminates moving parts, making it ideal for clean room use, as well as eliminating the time consuming collection and inaccuracies intrinsic to rotating modulation techniques. The PEMs also allows fast

Stokes Polarimeter

Stokes Polarimeter - Rear Panel

measurements at over 100 normalized Stokes parameter sets per second. The light beam is modulated by both PEMs. This dual modulation means only one detector is necessary in the optical train.

The electronic signals can be processed through either Fourier analysis of waveforms or lock-in amplifiers depending on the requirements of a specific application. A software algorithm, developed by Hinds Instruments, converts the signal levels from the electronics module into parameters from which Stokes parameters can be determined. The computer uses the first harmonic and second harmonic of both modulators to determine polarization information. The data is displayed numerically and graphically, and is also saved for archiving.

Specifications

- Wavelength Range: 400 – 700 nm (models available for extending a single system to other wavelength ranges from UV to IR)
- Stokes parameter accuracy: 0.5%
- Stokes parameter sensitivity: 0.0005
- Fiber compatible options available

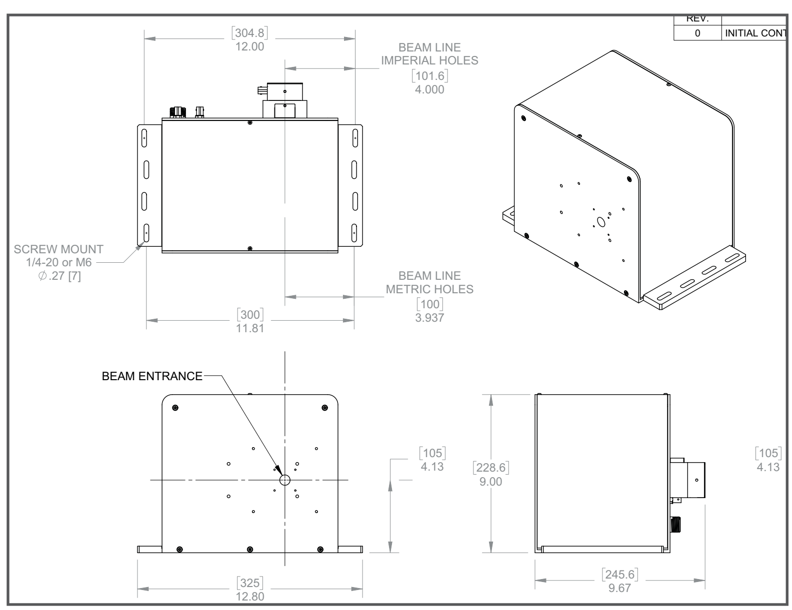
(Specifications vary some from system to system. The specifications denoted below are for the visible polarimeter. Contact Hinds Instruments for a more detailed list)

Significant Features

- Customized Configuration
- Complete Stokes Vector Characterization
- No Moving Components
- Instantaneous Change of Wavelength
- Portable and Robust
- Wavelength Range: 130 nm to 18 um
- Single Measurement Vector Characterization
- High Speed Modulation
- Extreme Sensitivity (options with signal sensitive on the order of pW)

Applications

- QC Test and Measurement
- Materials Characterization
- Pharmaceutical Development and QC
- Optical Rotation
- Telecom Device Manufacturing
- SOP and DOP determination
- Astronomical Polarization
- Spectroscopic Applications
- Free Space or Fiber Options Measurements



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