56 Sparta Avenue • Newton, New Jersey 07860
(973) 300-3000 Sales • (973) 300-3600 Fax
www.thorlabs.com

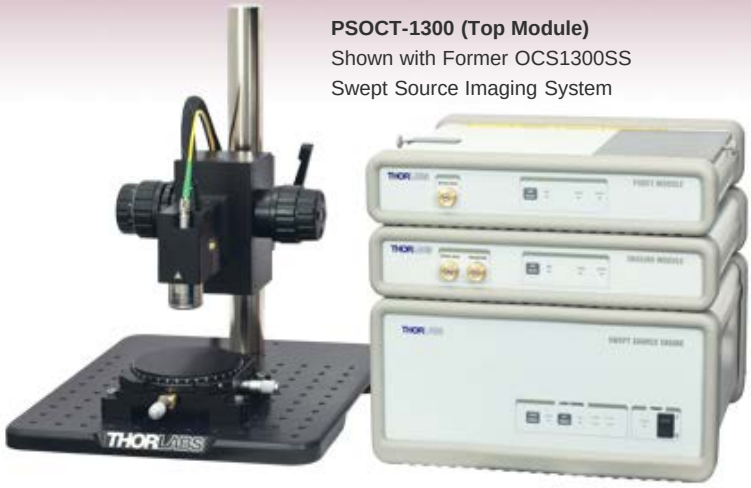
PSOCT-1300 - Feb. 22, 2016

Item # PSOCT-1300 was discontinued on Feb. 22, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

POLARIZATION SENSITIVE OCT MODULE

- **Real-Time Imaging of Birefringence Within Biological and Industrial Samples**
- **Add-On for 1300 nm SS-OCT**

PSOCT-1300



PSOCT-1300 (Top Module)
Shown with Former OCS1300SS Swept Source Imaging System

Hide Overview

OVERVIEW

Features

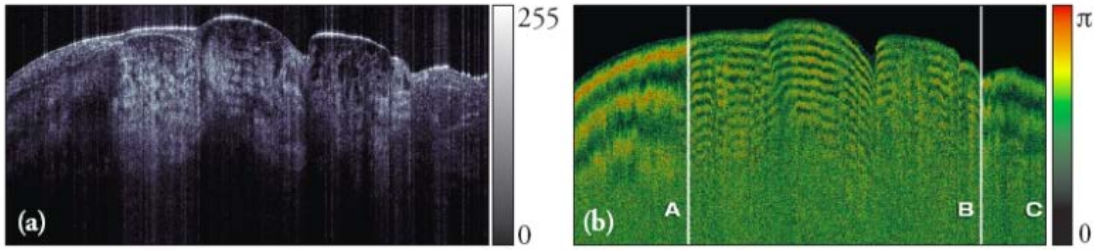
- Add-on Module for 1300 nm SS-OCT System
- Contrast Based on Birefringence of Material
- Ideal for Imaging Biological and Industrial Materials
- Real-Time Display of Phase Retardation Images

Polarization-Sensitive Optical Coherence Tomography (PS-OCT) is a cross-sectional birefringence imaging tool used to study a wide range of biological and industrial materials. An extension of OCT, PS-OCT is based on measuring the polarization properties of light collected from birefringent samples.

A material exhibits birefringence when it decomposes light into two polarization states with an optical delay being imposed on one state. This optical phenomena only occurs if the material is anisotropic. Materials that exhibit birefringence include tissues such as tendons, muscles, teeth, bones, blood vessels, and skin. In samples such as these, PS-OCT provides additional contrast compared to conventional OCT structural images. The real-time, high-resolution imaging capability of PS-OCT makes it well suited for studying glaucoma and other eye diseases, dental diseases, burn depths in the skin, and vascular imaging to guide plaque excision.

Birefringence is also created in isotropic materials that have undergone a deformation such that the isotropy is lost in one direction (i.e., stress-induced birefringence). In such cases, PS-OCT is very useful for nondestructive detection of stress birefringence in industrial materials such as plastics, thin films, semiconductors, and liquid crystals.

Thorlabs has developed a real-time, fiber-based swept source PS-OCT imaging system that provides simultaneous cross-sectional imaging of the intensity and phase retardation of light backscattered from birefringent samples. This system utilizes a standard Thorlabs 1300 nm SS-OCT Imaging System (the former OCS1300SS) with the PS-OCT add-on module. The modularity of the Thorlabs OCT system enables incorporation of PS-OCT imaging capability at any time. Thorlabs' software package enables easy display of OCT structural or PS-OCT birefringence images.

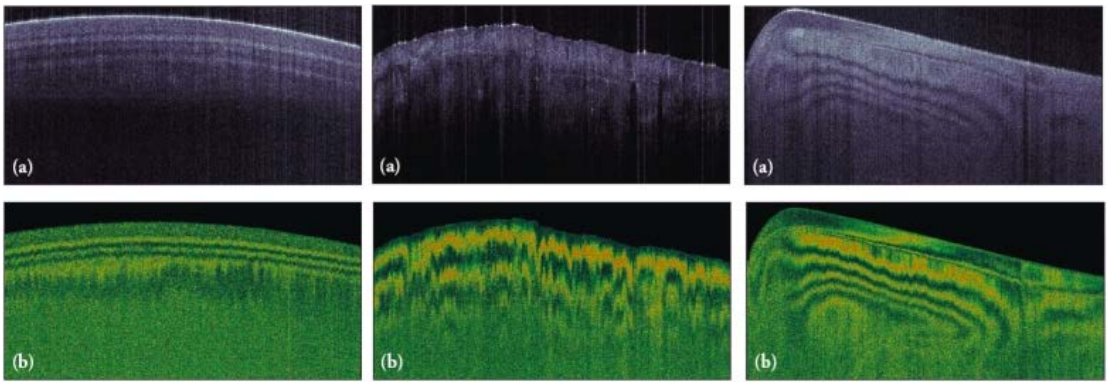


The figures above show OCT structural (a) and PS-OCT phase retardation (b) images of an oxtail sample.The strong birefringence seen in the phase retardation image indicates that highly organized structures such as collagen fibrils exist in the tissue layers. For other application ideas, please see the *Applications* tab above.

Hide Applications

APPLICATIONS

Imaging of a human fingernail bed, a chicken muscle, and a plastic component are shown below. The birefringence of the human fingernail bed and chicken muscle is due to intrinsic ordering of specific areas of biological tissue, while that of the component is induced by residual strain resulting from the manufacturing process. Note the significantly improved contrast in the phase retardation images (b) compared to the intensity-only images (a) typical of conventional OCT systems.



Left: Fingernail, Center: Chicken Muscle, Right: Plastic Components