

PLu 4300

High-end 3D
Optical Profiler

High Resolution Thin Film Metrology

SENSOFAR®



PLu 4300 3D Optical Profiler

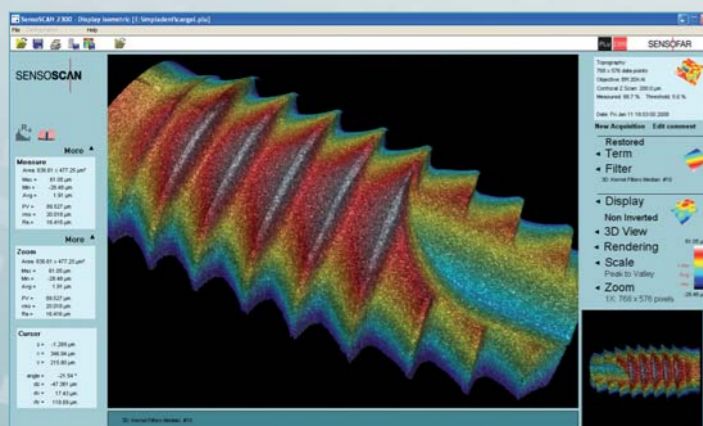
The PLu 4300 is an optical profiler for the 3D measurement of surfaces and thin films. The unique combination of Interferometric optical profiling and spectroscopic reflectometry on the same sensor head makes the PLu 4300 the only system on the market that can measure the 3D profiles, roughness and thickness of opaque and transparent materials with subnanometer resolution.

Dual vertical scanner

The dual vertical scanner consists of a motorized stage with a long travel range and an on-axis piezo. The motorized stage allows scanning of up to several mm, with subnanometer resolution. Very large samples can be analyzed. The on-axis PZT is a capacitive closed-loop piezo that moves the objective nosepiece. Thus, the device has the highest linearity and accuracy on the market, as well as extremely high repeatability.

Dual LED

The use of blue LED provides high lateral resolution and proper illumination for PSI, while a white LED is used for white-light interferometry, bright field imaging and thin-film measurement.

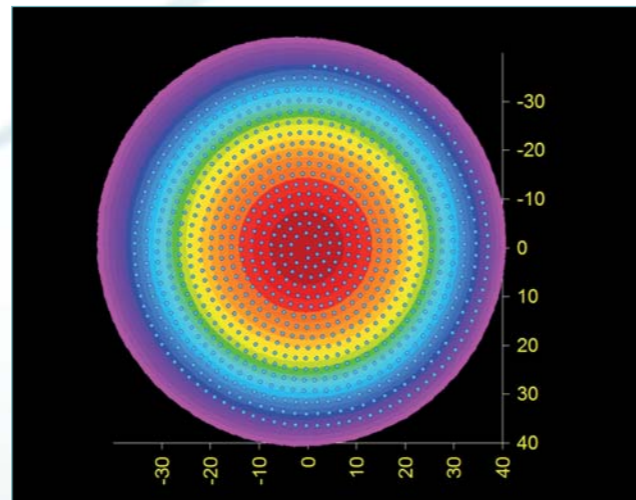


PLu 4300 is a unique non-contact surface metrology system with subnanometer resolution for advanced applications in energy, semiconductor, medical, optics and materials fields.

- Optical profiler and integrated spectroscopic reflectometer
- High power dual-LED technology
- High lateral resolution (0.15 μm)
- Thickness with unprecedented resolution (0.1 nm)
- Fully integrated and easy-to-use with the same software

Thickness with unprecedented resolution

The PLu 4300 is also unique as it combines an optical profiler and thin film measurement technology in a single instrument. White light interferometry is limited to measuring thicknesses greater than 500 nm. In contrast, the integrated spectroscopic reflectometer can measure thicknesses from 10 nm with 0.1 nm of resolution in a tenth of a second.



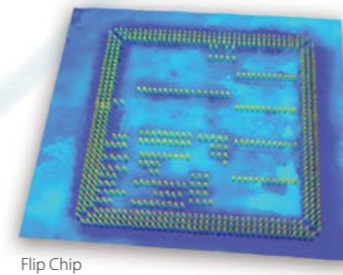
SiO₂ thickness mapping on a silicon wafer

Thin membranes or thin films are becoming more and more important and have many applications. Thin films can be used in passivation, as hard coatings for scratch and wear resistance, as transparent conductive layers in flat and photovoltaic panels, as coatings in hemodynamic medical devices and as insulating layers and diffusion barriers, among many other applications.

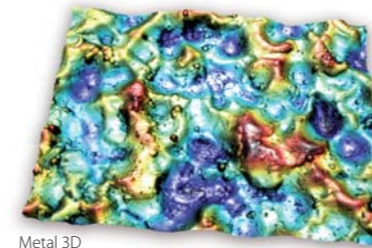
To perform the functions for which they were designed, thin films must have the proper thickness and texture. These characteristics need to be measured frequently with high lateral resolution, both during and after membrane fabrication or thin-film deposition.

Optical techniques are the preferred method for measuring membranes and thin films as they are accurate, non-destructive, very fast and do not require any special sample preparation. A spectroscopic reflectometer measures the amount of light reflected from a layer or a film over a range of wavelengths. This measurement is carried out by a calibrated spectrometer. The amplitude and periodicity of the reflectance of thin films are determined by the film thickness, optical constants and the interface roughness. As a result, the thickness of membranes and thin films are obtained in a very short time with subnanometer accuracy.

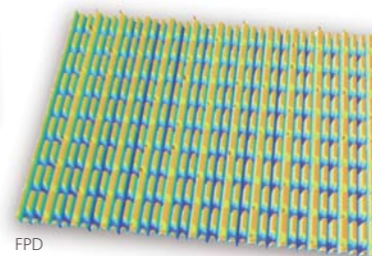
Solutions



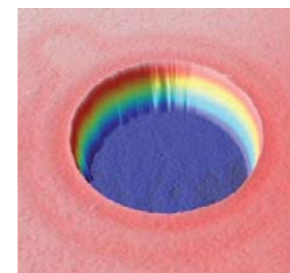
Flip Chip



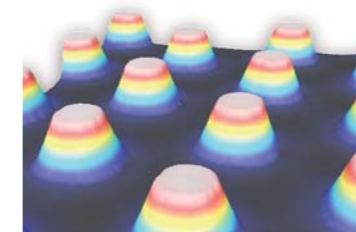
Metal 3D



FPD



Via

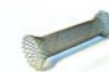


Si Structures

Applications



Energy: Thin film and silicon solar cells, power cells, ceramics.



Medical: passivation, drug and hygiene coatings, catheter, balloon, stents.



Semiconductor: photoresists for masks, thickness of Si thin membranes, insulation, MEMS.



Optics: Transmission, roughness, anti-fog, hardness coatings, profile of aspherics.



Flat Panel Display: RGB cells, photo spacers, coatings, defect analysis.

Software

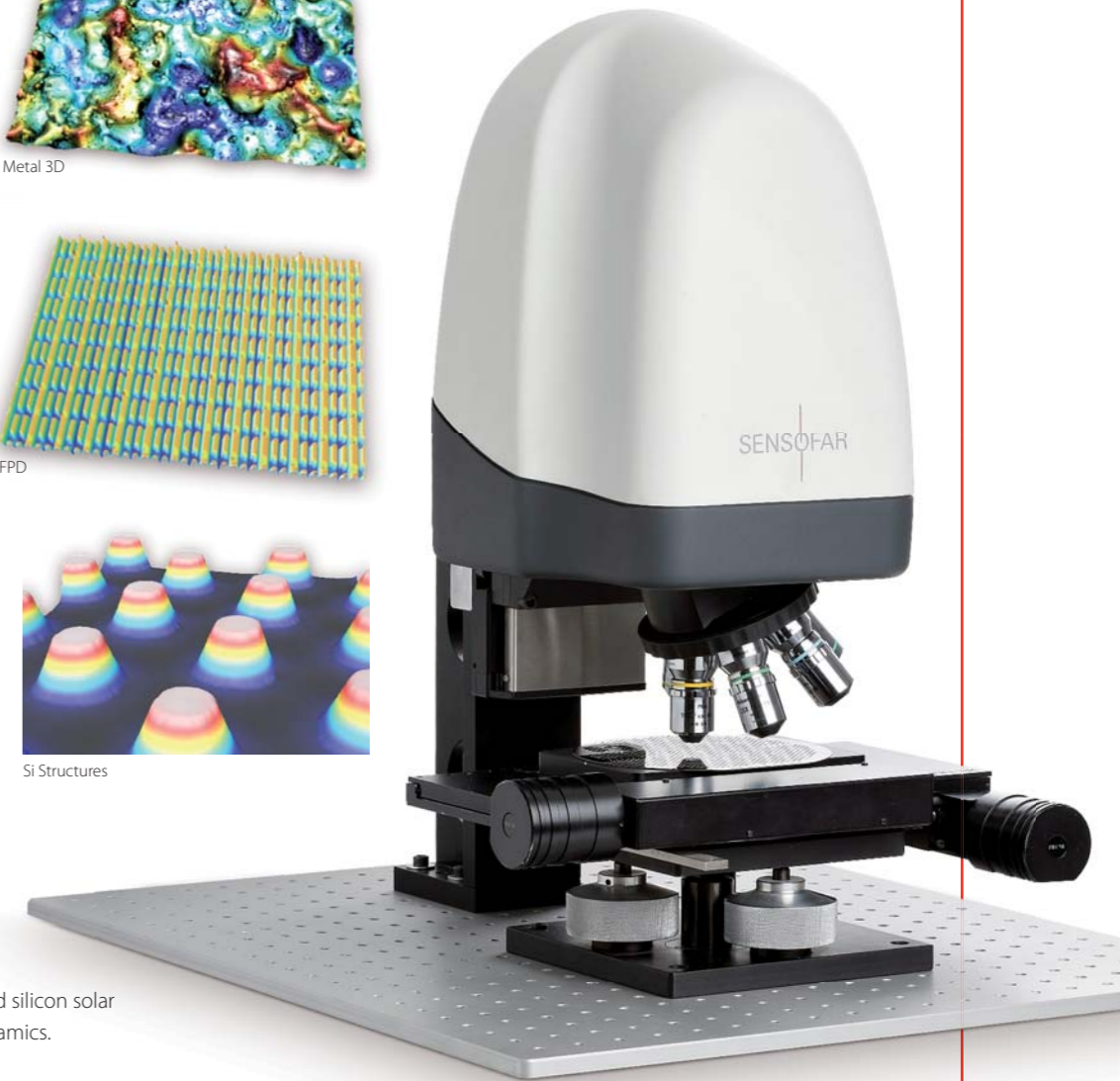
PLu 4300 software is adapted to meet the requirements of any application from R&D to production applications.

SENSOSCAN

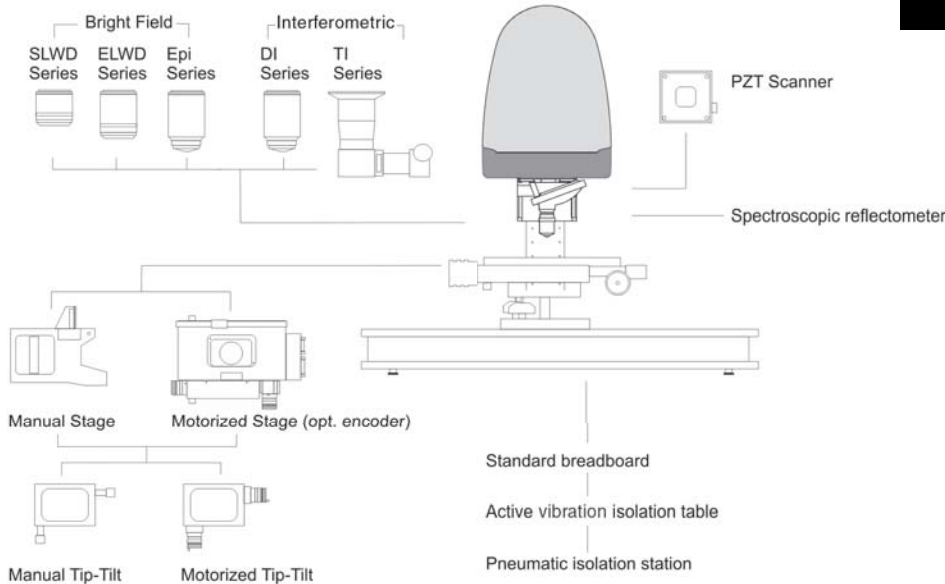
SensoSCAN software provides an interface with which any measurement can easily be taken, as well as a basic set of tools for displaying and analyzing data. The OpenGL technology used in SensosCAN provides complete 3D surface visibility at any angle.

SENSOMAP

SensoMAP is based on Mountains technology and is state-of-the-art surface analysis software. R&D departments and laboratories use Mountains for off-line 2D/3D surface characterization. Production facilities use it for near-line, usually 2D, control. SensomAP software is completely modular. Four different levels (basic, FFT, Plus and Turbo) and five modules (4F Series, Contour, Grains & Particles, Statistics and Stitching) are available.



System Configuration



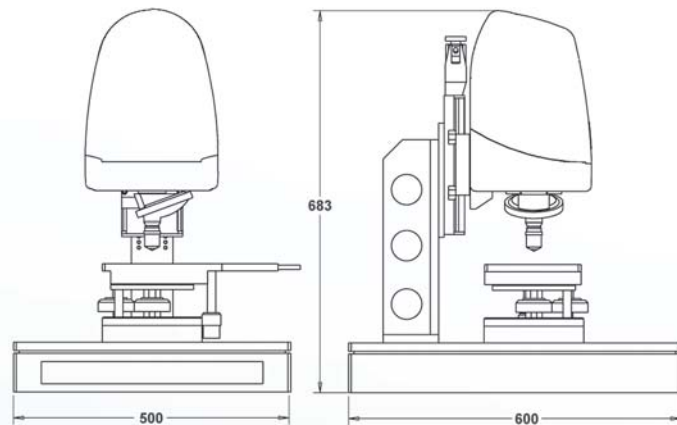
Performance

3D Profiling Techniques: PSI, ePSI and VSI
Objectives: 2.5X, 5X, 10X, 20X, 50X and 100X
Field of View: from 5.0 x 3.8 mm to 0.06 x 0.045 mm
Field Lens: fixed 0.5X or 1X lens
Measurement Array: 768 x 576
Light Source: Blue LED (460 nm) and White LED
Z Axis Measuring Range: up to 10 mm
Z Axis Range: 50 mm
Height Repeatability: 0.1 nm (0.03 nm with optional Piezo)
Scan Speed: from 3 to 15 $\mu\text{m/s}$
Step Height Accuracy: <0.8%
Step Height Repeatability: <0.1%
Thin Film Thickness Resolution: 0.1 nm
Thin Film Thickness Repeatability: 0.3 nm
Smallest Spot Size for Thin Film Thickness: 7 μm

System

XY Stages: 100x75, 150x150, 250x200 and 300x300 mm
Computer System: Latest Intel-based computer
Software: SensoSCAN, SensoMAP and SensoPRO optional
Vibration Isolation: Optional

Dimensions (unit: mm)



Power Requirements

Input Voltage: 110/220Vac, single phase 50/60Hz

Environment

Temperature Range: 20 +/- 2 degree $^{\circ}\text{C}$
Humidity Range: 50 +/- 5% RH

SENSOFAR is a leading-edge technology company that has the highest quality standards within the field of non-contact surface metrology. We provide high-accuracy optical profilers based on interferometry and confocal techniques. From standard setups for R&D and quality inspection laboratories to complete non-contact metrology solutions for online production processes, Sensofar offers technology that enables our customers to achieve breakthroughs, particularly in the semiconductor, precision optics, data storage, display devices, thick and thin films and material testing technologies fields. SENSOFAR is represented in over 15 countries through Channel Partners and has its own office in Japan.

SENSOFAR®

Headquarters and sales office
SENSOFAR-TECH, SL. IPCT - Mòdul TR20
Ctra. N 150, km 14,5 - 08227 TERRASSA (SPAIN)
Tel. (+34) 93 739 89 45 - Fax (+34) 93 786 01 16
info@sensofar.com - www.sensofar.com

Sales office
SENSOFAR Japan Ltd.
Ichikawa Business Plaza 405, 4-2-5 Minami-Yawata
ICHIKAWA-SHI, CHIBA, 272-0023 (JAPAN)
Tel. (+81) 47 370 8600 - Fax (+81) 47 370 8623
info@sensofar.co.jp - www.sensofar.co.jp