

SENSOFAR.

Optical Imaging Profiler

PL μ

1300

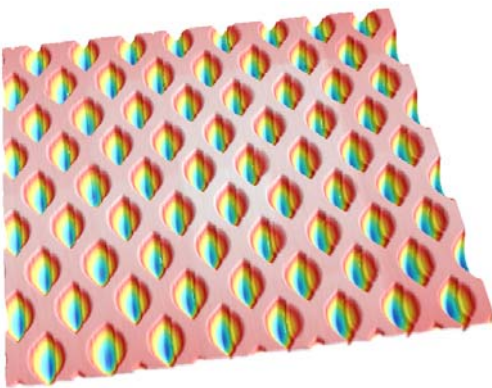


PL μ 1300 Optical Imaging Profiler

The Sensofar's PL μ 1300 is a portable Optical Imaging Profiler capable of measuring 3D information of technical surfaces with the use of Interferometric or Confocal technologies. The sensor has been designed to have all optical components sealed in order to be placed in production environments, where dust and particles can go inside. With a total weight less than 4.5 Kg and up to 5 meter long single cable, the operator handles the sensor safely and places it onto the surface under inspection. Focusing the surface is achieved manually by means of a smooth touch micrometer of 8 mm travel range. Finer focus adjustment is done with autofocus function and software virtual joystick of the Z stage. Acquisition and analysis recipes make the measurement as easy as just one button click and Pass/Fails signal.

Depending on the selected optics for a given application, the field of view can vary from 0.15 x 0.1 up to 3.4 x 2.5 mm². By default PL μ 1300 comes with interferential technology which is able to achieve the highest axial

resolution (down to 0.1 nm in PSI mode, and $\lambda/2$ step height range), and up to 400 μ m scanning range for VSI. It is also possible to do Extended PSI that keeps the PSI resolution while increasing the vertical scanning range. Confocal technology can be added optionally to measure higher local slopes and rougher surfaces. Surfaces with slopes up to 70 degrees, with 0.95NA objectives, and down to 0.1 μ m lateral sampling with high magnification objectives, can be measured.

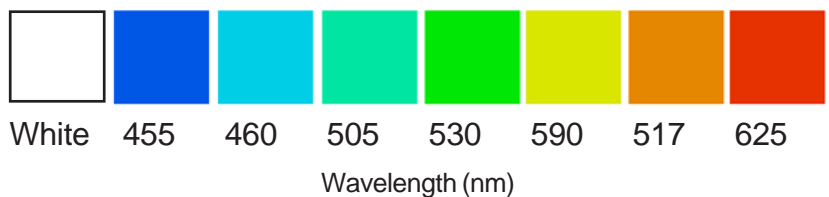


PL μ 1300 has been designed for control of production environments where the samples are big and heavy and cannot be moved or cut to be inspected by a laboratory based profiler. The optical profiler core is based on the well proven Sensofar's technology Optical Profiler Series with numerous customers worldwide from semiconductor industry, paper and printing, metal, optical and micro-optical, car, biomedical, material testing, etc.



Range of wavelength selection

Standard systems come with a blue light source that optimizes general purpose applications, including confocal, PSI and VSI. For that systems that will be used for PSI only applications, then a red light source is recommended. In contrast, for applications of VSI only, a white light source is normally used. Sometimes the colour of the surface under inspection affects the result of the measurement. Up to 8 different light sources can be selected: Deep Blue, Blue, Cyan, Green, Yellow, Amber, Red and White.



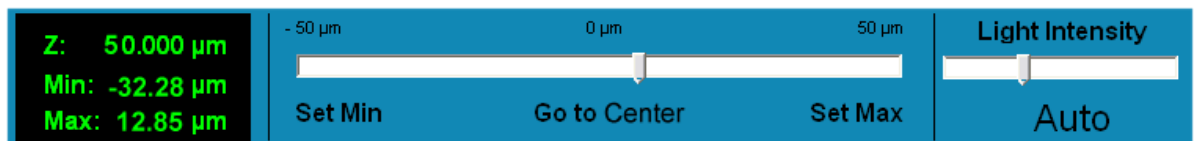
Easy objective removal

The PL μ 1300 has been designed to protect the objective. This is achieved both, from the base and the cover. To change the objective for different applications is very easy and can be done in less than one minute.



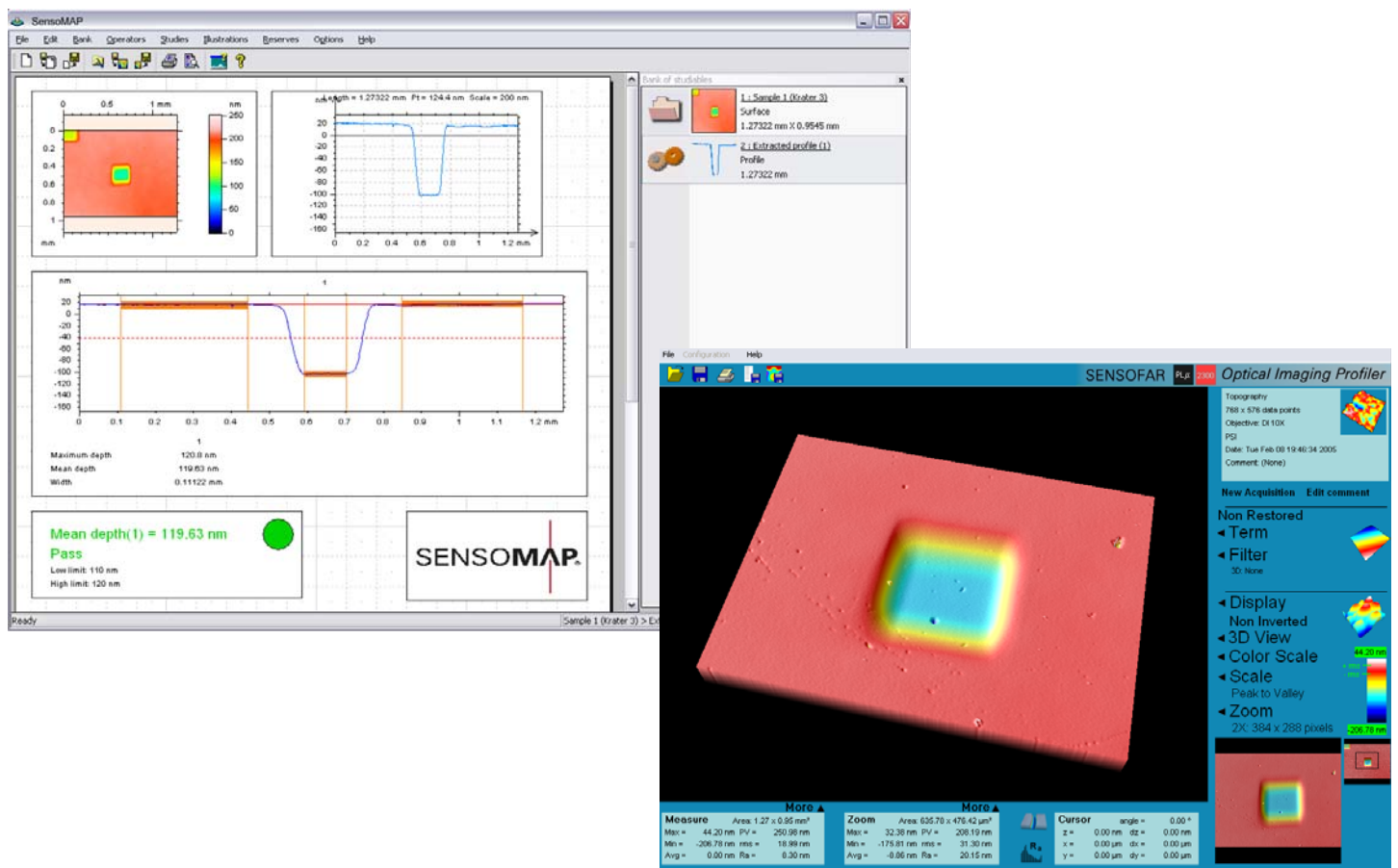
Easy surface focusing

Confocal focus can be achieved within several microns very easily with the use of slit projection or bright field illumination by turning the manual focus. In contrast, interferential fringes need to be placed in focus within one micron precision. Additionally, interferential fringes are very sensitive to vibrations between the surface under inspection and the objective, reducing the fringe contrast. The PL μ 1300 has been designed to be able to focus manually interferential fringes. To achieve that its design took into account robust mechanical construction that reduces vibration, low centre of mass for high stability and fine touch micrometer lift with 8 mm travel range that lets the user to fine focus manually the surface within one micron of sensitivity. By default the PL μ 1300 is designed to focus sample height from 2 to 10 mm. Optionally it is possible to focus on the surface where the sensor sits with ± 4 mm travel range. Additionally, fine focus adjustment and scanning settings can be done in the software.



PL μ + SensoMAP

The PL μ 1300 comes with the proven Sensofar's acquisition software that allows the user to focus the surface, and acquire 3D data very fast. When using interferential objectives 3D measurements are performed in seconds, while when using confocal objectives it is possible to measure Images, Single Profiles, Multiple Profiles, Topographies and Layer Thickness. Acquisition recipes can be created by a supervisor user, who defines the scanning parameters adjusted to the surface under inspection. Lower user levels, like production engineers, can reload the according recipe and operate the system. Sensofar's software is automatically linked to the analysis software SensoMAP. With the use of analysis templates and acquisition recipes, it is possible to use the PL μ 1300 on the Pass/Fails style with just one button click. SensoMAP software is able to do data analysis, processing and displays like levelling, zooming, roughness and waviness filtering, profile extraction, form removal, automatic step height measurement, photorealistic representation, lots of calculated parameters, etc.



PLu 1300 Specifications

Objective	Interferometric				Confocal			
	5XTI	10XDI	20XDI	50XDI	10XEPI	20XEPI	50XEPI	100XEPI
Field of View (mm ²)	3.4 x 2.5	1.7 x 1.3	0.8 x 0.6	0.3 x 0.2	1.7 x 1.3	0.8 x 0.6	0.3 x 0.2	0.15 x 0.1
Working distance (mm)	9.3	7.4	4.7	3.4	17.3	4.5	1.0	1.0
Lateral Sampling (µm)	4.4	2.2	1.0	0.44	2.2	1.0	0.44	0.22
Repeatability rms (nm)*	0.1 / 1 (PSI / VSI)				< 100	< 20	< 4	< 3
Maximum Slope **	5.6°	13.1°	15°	15°	14°	21°	42°	51°
Measuring Speed (µm/s)	3 - 15				4 - 256	2 - 128	0.4 - 25.6	0.4 - 25.6
Maximum Sample Height	2 to 10 mm sample height. Optional: from ground ± 4 mm. (8 mm travel range manual stage).							
Measuring range	100 µm Closed-Loop PZT (up to 400 µm optional)							
Number of Pixels	768 x 576							
Sensor Weight	4.3 Kg (including one objective)							
Dimensions LxWxH (mm)	200 x 125 x 245							

* RMS of the difference of 2 consecutive measurements on a flat calibration mirror. (Controlled room with stabilized temperature and vibration isolation). For PSI 30 times averaging.

** on smooth surfaces.

More objectives are available. Visit www.Sensofar.com.

Roughness and waviness filtering ISO 11562, ISO/TS 16610-22 and ISO 13565-1.

Automatic Step Height measurement ISO 5436-1 for standards type A1.

Standard Parameters:

Common ISO 4287, ISO 4288: (Pa, Pq, Pt, Pv, Pz, Psk, Pku, Psm, Pc, Pdq, Ptp, PHtp, Pmr, Pdc, Ra, Rq, Rt, Rv, Rz, Rsk, Rku, Rsm, Rc, Rdq, Rtp, RHtp, Rmr, Rdc, Wa, Wq, Wt, Wv, Wz, Wsk, Wku, Wsm, Wc, Wdq, Wtp, WHtp, Wmr, Wdc).

Amplitude ISO 4287: (Sa, Sq, St, Sp, Sv, Sz, Ssk, Sku).

Optional Parameters:

Roughness and Waviness ISO 12085 / CNOMO E00.14.015N: (R, AR, Rx, Rt, SR, SAR, Nr, Kr, W, AW, Wx, Wte, SW, SAW, Nw, Kw, Trc, HTc, HTrc, Rke, Rpk, Rvke).

Rk ISO 13565-2/DIN4776: (Rk, Rpk, Rk, MR1, MR2, A1, A2, Rpk*, Rvk*).

Straightness ISO 12780: (STRt, STRp, STRv, STRq).

Roundness ISO 12181: (RONt, RONp, RONv, RONq, LSRad).

Area and Volume: (Smr, Sdc, Smvr, Smmr, STp, SHTp).

Plastic: (PG, AF).

Hybrid: (Sdq, Ssc, Sdr).

Flatness: (FLTt, FLTp, FLTv, FLTq).

Functional: (Sk, Spk, Sv, Sr1, Sr2, Sa1, Sa2, Sbi, Sci, Svi, Vm(h), Vv(h), Vmp, Vmc, Vvc, Vvv).

PLu 1300 Dimensions

