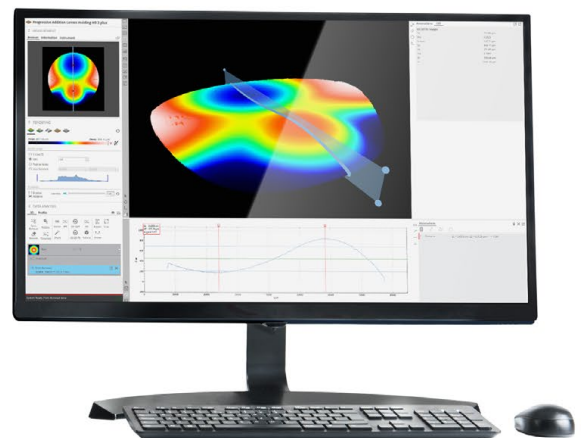




# Product Guide



## Basic Features



### ■ Description

The S wide is a large area 3D optical metrology system that measures and characterizes 3D surfaces using fringe projection technology.

The S wide is a dedicated solution designed to rapidly measure large sample areas up to 300 x 300 mm (11.8 x 11.8 in). It integrates the benefits of a digital microscope into a high-resolution measuring instrument. The system is extremely easy-to-use with one button data acquisition.

### ■ Technology

#### FRINGE PROJECTION

Fringe projection technology is an optical measuring technique based on the triangulation principle. It uses a structured light projection and observation camera at a certain angle in respect to the surface under inspection. A series of parallel stripes are projected and adapted to the three-dimensional shape of the object, appearing as distorted stripes in the camera image.

With a telecentric observation camera, every pixel records the distorted stripes corresponding to a single location of the surface. The stripe images are swept over the object until all the pixels have recorded the three-dimensional shape of the surface.

### ■ Configuration

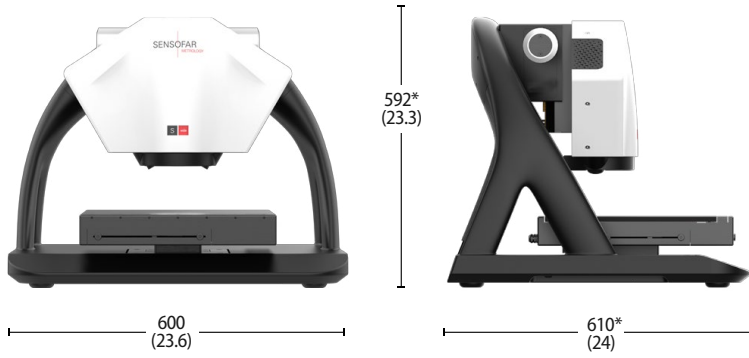
The S wide is composed of a system unit, an electronic controller and a main controller. The system comes with several parts.

#### HARDWARE OPTIONS

The sensorhead is mounted on an adjustable column supported by a bridge-shaped base. The sample is placed on the XY stage and under the objective lens. Ring light is integrated to the objective.

### MECHANICAL DIMENSIONS

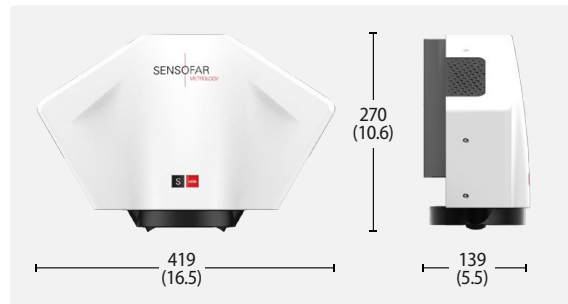
#### STANDARD



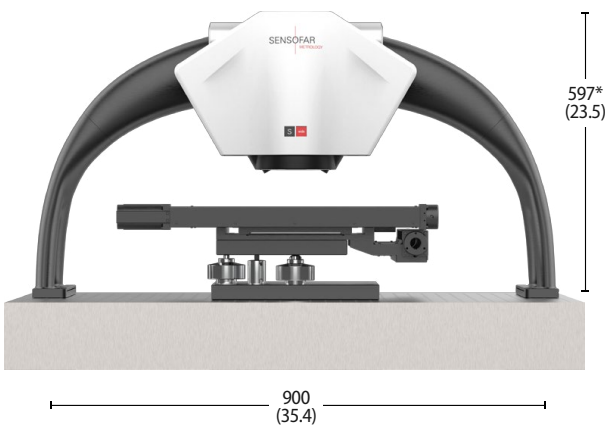
#### HIGH



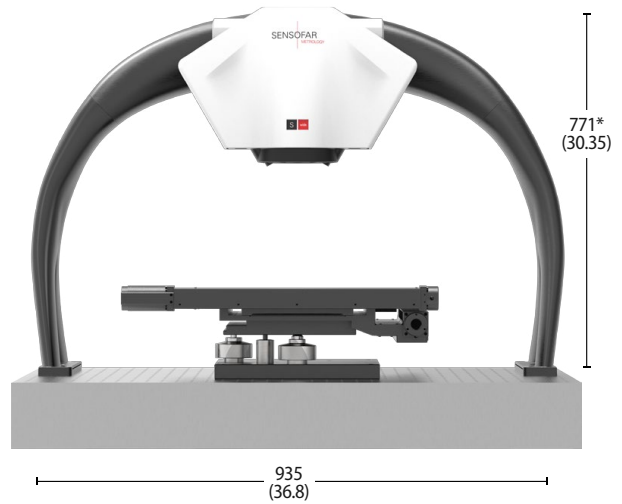
#### INTEGRABLE SENSORHEAD



#### WIDE



#### HIGH+WIDE



S wide	Dimensions						Weight**	
	L		H*		W*		kg	lbs
	mm	in	mm	in	mm	in		
<b>STANDARD</b>	600	23.6	592	23.3	610	24	55	122
<b>HIGH</b>	635	25	831	32.7	610	24	60	133
<b>WIDE</b>	900	35.4	597	23.5	560	22	53	117
<b>HIGH+WIDE</b>	935	36.8	771	30.3	560	22	58	128
<b>OEM</b>	419	16.5	270	10.6	139	5.5	7.5	16.5

\*Height & Width refer to maximum values due to different settings and configurations.

\*\*Weight refers to the system only.

## SYSTEM SPECIFICATIONS

<b>Measuring principle</b>	Fringe Projection (Gray code & Slit, Gray code & Phase Shift)
<b>Observation types</b>	Bi-telecentric lens with 0.243X magnification and 0.015 NA
<b>Color camera</b>	5Mpx: 2448x2048 pixels (60 fps)
<b>Total magnification (27")</b>	11X
<b>Display resolution</b>	0.001 $\mu$ m
<b>Max. extended measurement area</b>	300x300 mm with 10x12 stitched fields (max. resolution 450 Mpx)
<b>Vertical measuring range</b>	40 mm
<b>XY stage range</b>	Manual: 150x100 mm; Motorized: 154x154 mm, 302x302 mm
<b>LED light sources</b>	Green (530 nm) and blue (460 nm)
<b>Ring light illumination</b>	White
<b>Sample weight</b>	up to 25 Kg
<b>Sample height</b>	105 mm (standard); 280 mm (optional)
<b>User management rights</b>	Administrator, advanced operator, operator
<b>Advanced software analysis</b>	Included: SensoVIEW; Optional: SensoPRO, SensoMAP, Geomagic®
<b>Power</b>	Line Voltage 100-240 V AC; frequency 50/60 Hz single phase
<b>Computer</b>	Latest INTEL processor; 3840x2160 pixels resolution (4K) (27")
<b>Operating system</b>	Microsoft Windows 10, 64 bit
<b>Weight</b>	See table above
<b>Environment</b>	Temperature 10 °C to 35 °C; Humidity <80 % RH; Altitude <2000 m

## ACCURACY AND REPEATABILITY

Standard	U, $\sigma$
<b>Step height</b>	U = 2.5 $\mu\text{m}$ $\sigma$ = 0.05 $\mu\text{m}$
<b>Areal roughness (Sa)</b>	U = 1 $\mu\text{m}$ $\sigma$ = 0.01 $\mu\text{m}$
<b>Profile roughness (Ra)</b>	U = 1 $\mu\text{m}$ $\sigma$ = 0.05 $\mu\text{m}$

## OBJECTIVE LENSES

Standard	FRINGE PROJECTION
<b>MAG</b>	0.243X
<b>NA</b>	0.015
<b>WD(mm)</b>	80
<b>FOV<sup>1</sup> (mm)</b>	34.7 x 29.1
<b>Spatial sampling<sup>2</sup> (<math>\mu\text{m}</math>)</b>	14.2
<b>Optical resolution<sup>3</sup> (<math>\mu\text{m}</math>)</b>	9.35

<sup>1</sup> Maximum field of view with 3/2" camera. <sup>2</sup> Pixel size on the surface. <sup>3</sup> L&S: Line and Space. Values for blue LED.

# Hardware Components

## ■ Table-top system

The S wide large area 3D optical metrology system measures and characterizes 3D surfaces using fringe projection technology. It includes:



- **Sensorhead.** Main features are:
  - A bi-telecentric lens with 0.243X magnification and 0.015 NA
  - Multispectral wavelength LEDs integrated into the light source: green (530 nm) and blue (460 nm)
  - A hi-res 5 Mpx camera with 2442 x 2048 pixels
  - A manual adjustable Z position
  - A ring light
  - An integrated controller
  
- **Main controller:** controls a Windows 10 64-bit computer (with latest INTEL processor) and a high res (3840 x 2160 pixels) 27" monitor, keyboard and mouse.
  
- **XY stage:** Stages are optimized for 2D and 3D measurement. The user can center the sample with the manual stage or use the mouse (included) or the virtual joystick with the motorized stages. Travel range depends on stage model.
  
- **Stands:** Different stands are available for different sample dimensions.

Title	Dim.(mm)	Dim. (in)	Accuracy (µm/mm)	Repeatability (µm)	Max. load (Kg)	Max. load (lbs)
<b>Manual 150x100mm (5.9x3.9") XY stage</b>	150x100	5.9x3.9	-	-	10	22
<b>Motorized 154x154 mm (6x6") XY stage</b>	154x154	6x6	0.15	±5	10	22
<b>Motorized 302x302 mm (12x12") XY stage</b>	302x302	12x12	0.15	±5	25	55

Stands range from standard to high to wide, and a combination of high & wide. The max. sample height is from 0 to 105 mm for standard and from 175 to 280 mm for high stands.

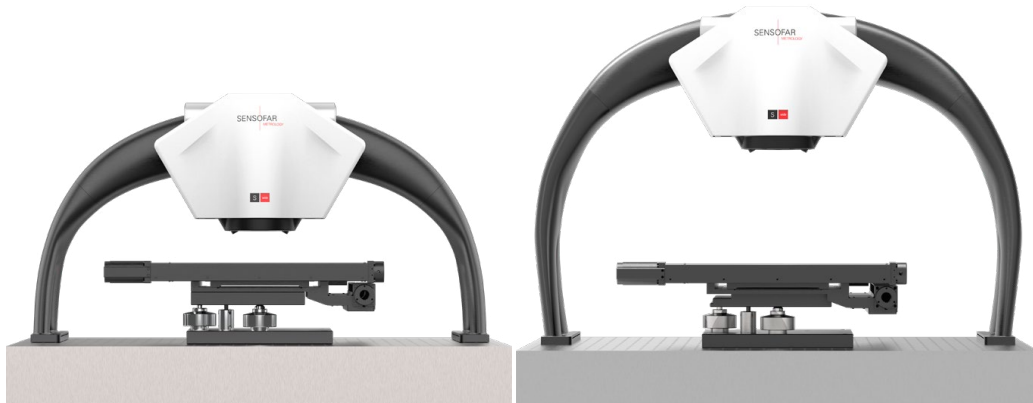


- **Calibration specimen:** A sample part with three verified step heights. The height from the lower to higher step is 5 mm.

## PRODUCT NUMBERS



Stage	STANDARD PN	HIGH PN
Manual	SSW010XYM00	--
Motorized - H105	SSW010XYH10500	SSW010HXYH10500



Stage	WIDE PN	HIGH+WIDE PN
Motorized - H112	SSW010XYH11200	SSW010HXYH11200

*\*Minimum and maximum sample heights*

## ■ Integrable Sensorhead

S wide sensorhead is large area 3D optical metrology integrable system. It measures and characterizes 3D surfaces using fringe projection technology. It includes:

- **Sensorhead.** Main features are:
  - A bi-telecentric lens with 0.243X magnification and 0.015 NA
  - Multispectral wavelength LEDs integrated into the light source: green (530 nm) and blue (460 nm)
  - A hi-res 5 Mpx camera with 2442 x 2048 pixels
  - A manual adjustable Z position
  - A ring light
  - An integrated controller



- **Main controller:** controls a Windows 10 64-bit computer (with latest INTEL processor) and a high res (3840 x 2160 pixels) 27" monitor, keyboard and mouse.
- **Calibration specimen:** A sample part with three verified step heights. The height from the lower to higher step is 5 mm.

**PRODUCT NUMBERS**

<b>PN</b>	
<b>Sensorhead</b>	<b>SSW0100EM00</b>
<b>Sensorhead + Main Controller</b>	<b>SSW0100EMPC00</b>





# Configurable & Optional Parts

## ■ Stage Accessories OPTION

There are two accessories that help to hold and place the sample where needed: the Flat and Rotary plate.

### FLAT PLATE

**PN** PCH105 | Flat plate for 154x154 mm XY stage

**PN** PCH112 | Flat plate for 302x302 mm XY stage

### ROTARY PLATE

**PN** RPH105 | Rotary plate for 154x154 mm XY stage

**PN** RPH112 | Rotary plate for 302x302 mm XY stage



## ■ Basemounts OPTION

### RIGID SUPPORT FRAME AND BREADBOARD

The non-isolating frame is designed to provide a cost effective solution for supporting the optical breadboard. It is ideal where vibration isolation is not a critical factor. It is finished with medium texture black powder coat frame and stainless steel top with a grid of M6/25 tapped holes.

**PN** TAB26 | Rigid support frame & breadboard 750x1200

## ■ EMO OPTION

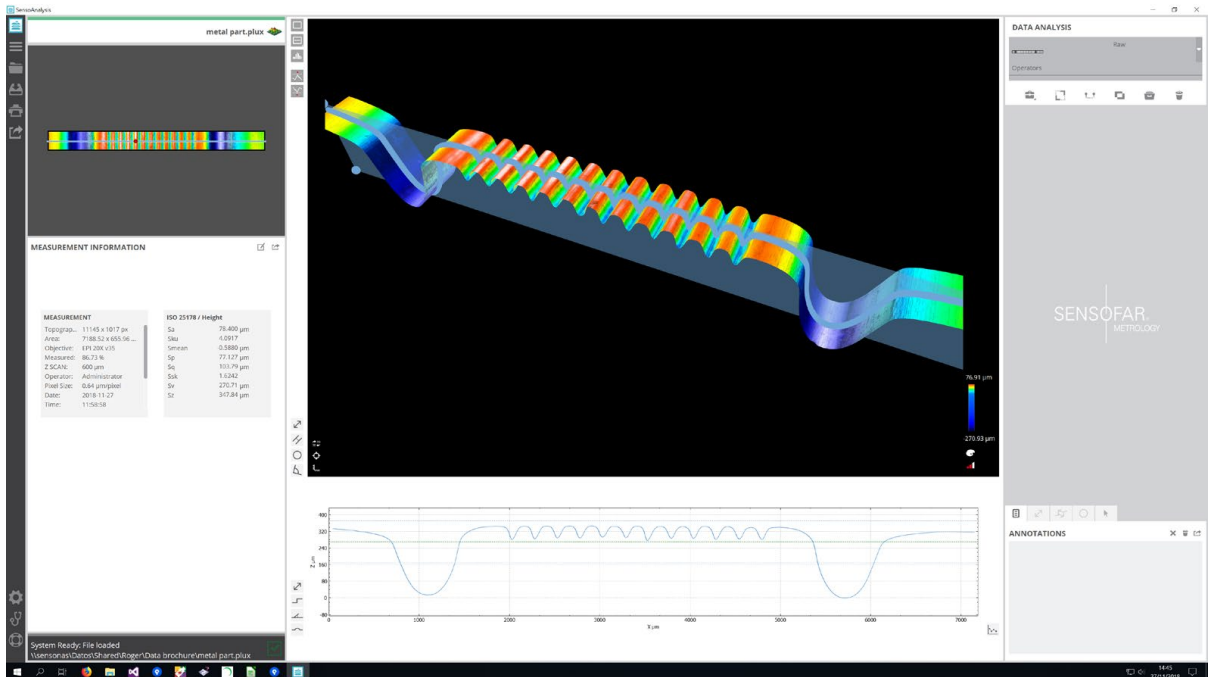
Emergency stop and emergency switch off function button.

**PN** PR001300 | Emergency Stop



# Software

## ■ SensoSCAN S wide



SensoSCAN S wide 64-bit software drives the system with its clear and intuitive user-friendly interface. The user is guided through the 3D environment, delivering a unique user experience.

SensoSCAN S wide software provides an interface with which any measurement can easily be taken, as well as a comprehensive set of tools for displaying and analyzing data. The main features are:

- Type of measurement: Image and 3D.
- Sample viewing is very accessible and flexible with all live image options.

The system comes with a fully functional license of SensoSCAN S wide and can be installed in as many computers as you want to review, measure and report.

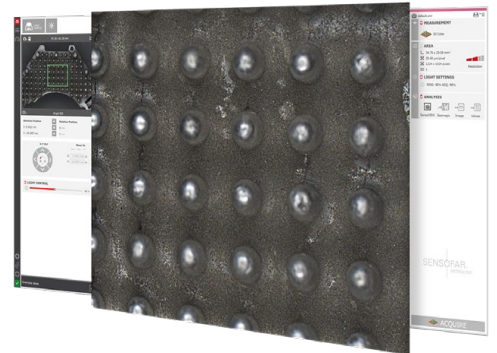
## OPTIONAL MODULES

SensoSCAN's extended measurements module allows the user to easily define the measurement layout on the surface by means of the overview image. The area can be automatically cropped to rectangular, circular or ring-shaped areas of interest. Wide areas up to 450 million pixels are possible. Several scanning strategies such as autofocusing on each field, or sample tracking to minimize vertical scanning range are also available.

### **PN** EMM | SensoSCAN Extended measurement module

Automated measurements are obtained using the Recipes tool, an easily customizable way to create quality control procedures. It is ideal for Quality Control inspection, defining procedures for automating measurements with the profile manager tool, sample identification, data exportation and 'pass or fail' criteria.

### **PN** APM | SensoSCAN Automated procedures module



## ■ SensoVIEW

SensoVIEW is an ideal software for a broad range of analysis tasks.

Main tasks are:

- ❑ 3D (isometric) and 2D (contour, profile, histogram & bearing curve) interactive views providing multiple scaling, display & render options.
- ❑ A comprehensive suite of operators and filters to retouch data points, restore non-measurable data, form removal (plane, sphere or polynomial), apply a range of filters (thresholding, smart, kernel, ISO, FFT and rescale) and/or generate alternative layer by cropping, subtracting or extracting profile for examination and analysis.
- ❑ Calculation of shape and roughness parameters. A complete selection of ISO 25178 3D areal surface texture parameters: height, spatial, hybrid, functional and volumetric.
- ❑ 3D measurement of distance, parallel, circle and angle.
- ❑ 2D measurements of distance, step height, radius and angle.
- ❑ Analysis templates and customized reports.
- ❑ Compliance with Mountains Map and other analysis softwares.

- ❑ Multiple Results Analysis in Inspection Drives Knowledge.
- ❑ Export JPG, TXT, TIFF, STL...

The system comes with a fully functional license of SensoVIEW and can be installed in as many computers as you want to review, measure and report.

### ■ **SensoPRO** OPTION

SensoPRO is the 64-bit data analysis solution from Sensofar. It provides an environment for quality assurance (QA) engineers and technicians to quickly and easily analyze production parameters. When combined with SensoSCAN acquisition program, SensoPRO provides a one-click solution for data acquisition through data analysis. Included three default plugins:

- ❑ Surface texture: Analyze surface texture in accordance with the surface texture parameters defined by the ISO 25178.
- ❑ Surface texture profile: Analyze amplitude parameters to center profile of the surface (X cut) in accordance with ISO 4287
- ❑ Step height: Analyze a single step height with any shape in the given FOV.

**PN** SENSOPRO | SensoPRO analysis software

### OPTIONAL MODULES

Plugin	Description	<b>PN</b>
<b>Bump</b>	Analyze bumps across a surface	SENSOPROBUMP
<b>Circle PAD</b>	Analyze conductive circular pads present on the surface of a printed circuit board (PCB)	SENSOPROCIRCLEPAD
<b>Cross kerf</b>	Analyze kerf marks in the form of a cross present on a wafer	SENSOPROCROSSKERF
<b>Double step height</b>	Analyze a double step height in the given FOV	SENSOPRODOUBLES
<b>Dual hole</b>	Analyze dual round hole structures (also known as vias), either individually or in any pattern	SENSOPRODUALHOLE
<b>Edge</b>	Analyze cutting edges	SENSOPROEDGE
<b>F traces</b>	Analyze all kind of trace marks across a surface, including diagonally oriented traces	SENSOPROFTRACE
<b>Hole</b>	Analyze round hole structures (aka vias), either individually or in any pattern	SENSOPROHOLE
<b>Laser cut</b>	Analyze laser cut across a surface	SENSOPROILASERCUT

<b>Laser hole</b>	Analyze laser holes structures (aka vias), either individually or in any given pattern	SENSOPROLASERHOLE
<b>Pad</b>	Analyze the pad structures found on PCBs, either individually or in any given pattern	SENSOPROPAD
<b>Rectangular hole</b>	Analyze rectangular hole structures (also known as vias), either individually or in any given pattern	SENSOPRORHOLE
<b>Solder mask</b>	Analyze Solder Mask traces. Solder Mask layers are usually applied to printed circuit boards (PCB) as protective layers	SENSOPROSOLDERMASK
<b>Spacer</b>	Analyze spacers across a surface	SENSOPROSPACER
<b>Trace</b>	Analyze trace marks across a surface	SENSOPROTRACE
<b>Trench</b>	Analyze trenches across a surface	SENSOPROTRENCH

## ■ SDK OPTION

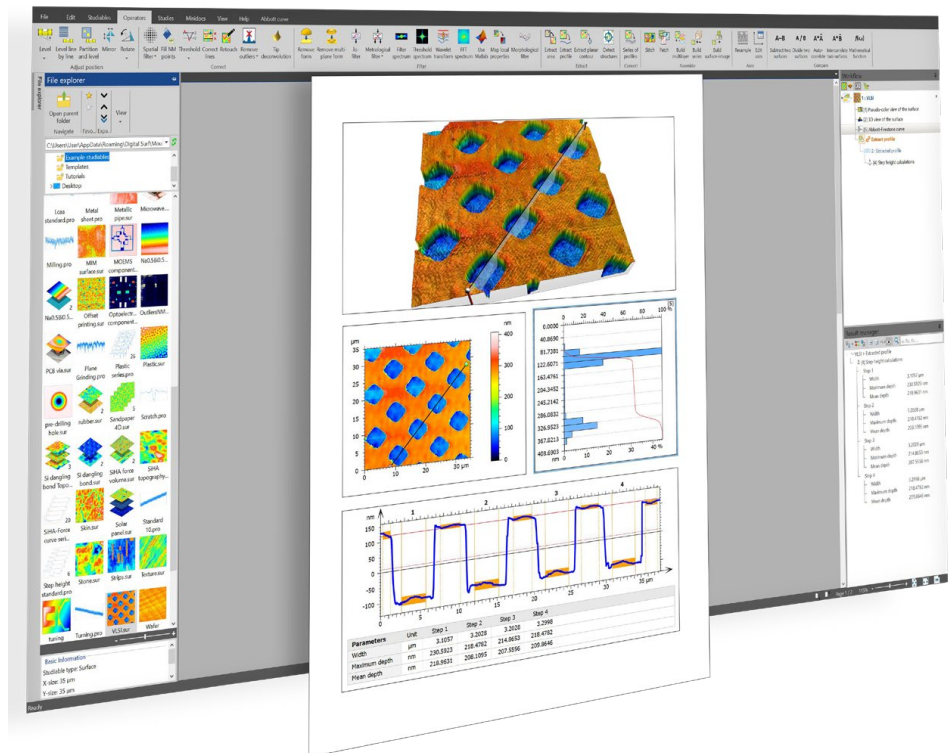
The SensoSCAN software development kit (SDK) offers the tools and protocols needed to create proprietary applications able to communicate and manage SensoSCAN. The developers can choose between DLL and XML for development of their applications. SensoSCAN SDK commands and events provide a means to remotely inspect a sample and perform measurements based on acquisition recipes. Once a proprietary application has been developed using the SensoSCAN SDK, it can be used with multiple systems.

**PN** SDK10 | SDK license

## ■ SensoMAP OPTION

Designed for use with the broadest range of research and industrial applications, SensoMAP software is the perfect surface imaging, analysis and metrology solution that is fully integrated with Sensofar 3D optical profilers. It includes:

- ❑ Imaging – visualization of surface data using cutting-edge imaging technology and intelligent filters.
- ❑ Metrology – analytical studies in accordance with the latest standards and methods.
- ❑ Report Creation – creation of detailed, accurate, multi-page surface analysis reports in a smart desktop publishing environment with powerful automation features to speed up analysis.



SensoMAP is a powerful 3D analysis, documentation and reporting tool. It contains a complete and comprehensive set of tools, surface transformations and measurements focused on obtaining 3D data for your sample. These include:

- Position adjustment (level, mirror, rotate...)
- Surface correction (spatial filtering, fill non-measured points...)
- Filtering (form, roughness, outliers...)
- Surface extraction (profile, contour, area, layers...)
- Surface comparison and stitching
- 2D and 3D advanced visualization modes
- Geometrical analysis (distance, step height, contour...)
- Structural Analysis (fractal, volume...)
- Roughness Analysis (2D and 3D roughness parameters)
- Frequency Analysis (Fourier, wavelet decomposition...)
- Functional analysis (Abbot curve, Rk parameters, histograms...)

SensoMAP is an scalable software available on two product levels:

**SensoMAP Standard** provides the features required for standard surface imaging and analysis. It ships with numerous optional modules that can be added at any time for advanced and specialized applications.

**PN** SENSOMAPV8 STD | SensoMAP Standard analysis software v8

**SensoMAP Premium** is a much more powerful solution in terms of features and includes all modules except: *Advance contour*, *Shell extension*, *Lead (Twist) analysis* and *Scale-sensitive fractal analysis*. Other highly-specialized modules can be added if required.

**PN** SENSOMAPV8 PRE | SensoMAP Premium analysis software v8

**SensoMAP Software Network License** allows the software to be used on several computers on a network. The number of computers that can use the software simultaneously depends on the number of “seats” purchased with the network license.

**PN** SENSOMAPV8 NET | SensoMAP Software network license v8

## OPTIONAL MODULES

Module	Description	PN
<b>4D Series</b>	Analyze surface evolution with respect to time, temperature, magnetic field or another dimension	SENSOMAPV8 M 4D
<b>Contour</b>	Basic geometric dimensioning & tolerancing of contour profiles and horizontal contours extracted from images	SENSOMAPV8 M CONT
<b>Advanced contour</b>	Advanced dimensioning and tolerancing, DXF CAD compare, Gothic arch	SENSOMAPV8 M ADVCONT
<b>Advanced profile</b>	Advanced profile filtering, fractal and Fourier analysis, statistical analysis of series of profiles	SENSOMAPV8 M ADVPROF
<b>Advanced topography</b>	Advanced studies, parameters & filters for 3D (“areal”) surface texture analysis	SENSOMAPV8 M ADVTOPO
<b>Automotive</b>	Assess functional performance with a full set of 2D parameters developed by the automotive industry	SENSOMAPV8 M AUTO
<b>Fourier &amp; Wavelets</b>	FFT-based texture analysis, advanced FFT filtering, multi-scale analysis by wavelets	SENSOMAPV8 M FFTWAVE
<b>Particle Analysis</b>	A comprehensive toolset for detecting and analyzing particles, pores, grains, islands etc. on structured surfaces	SENSOMAPV8 M PART
<b>Shell Extension</b>	Freeform surface management, complex shape analysis, high quality 3D visualization	SENSOMAPV8 M SHELL
<b>Scale-sensitive fractal analysis</b>	Implements a multi-scale analysis based on length-scale or area-scale analyses (formerly in Sfrax software)	SENSOMAPV8 M SSFA
<b>Statistics</b>	Automated statistics for multiple data populations, process capability	SENSOMAPV8 M STATS



<b>Surface stitching</b>	Increase profilometer range. Use stitching to expand range of all axes (including Z) and overcome instrument limitations.	SENSOMAPV8 M STITCH
<b>Lead (Twist) Analysis</b>	2nd generation lead (twist) analysis for the automotive industry	SENSOMAPV8 M TWIST

### ■ Geomagic® Wrap OPTION

Geomagic Wrap delivers the most easy-to-use, affordable, fast and accurate path from point clouds to 3D polygonal and surface models that can be used instantly in downstream engineering, manufacturing, engineering, art, industrial design and more. As part of your 3D digital package, Geomagic Wrap provides the digital bridge to allow you to create perfect data to use directly in 3D printing, milling, archiving and multiple other 3D uses. Features:

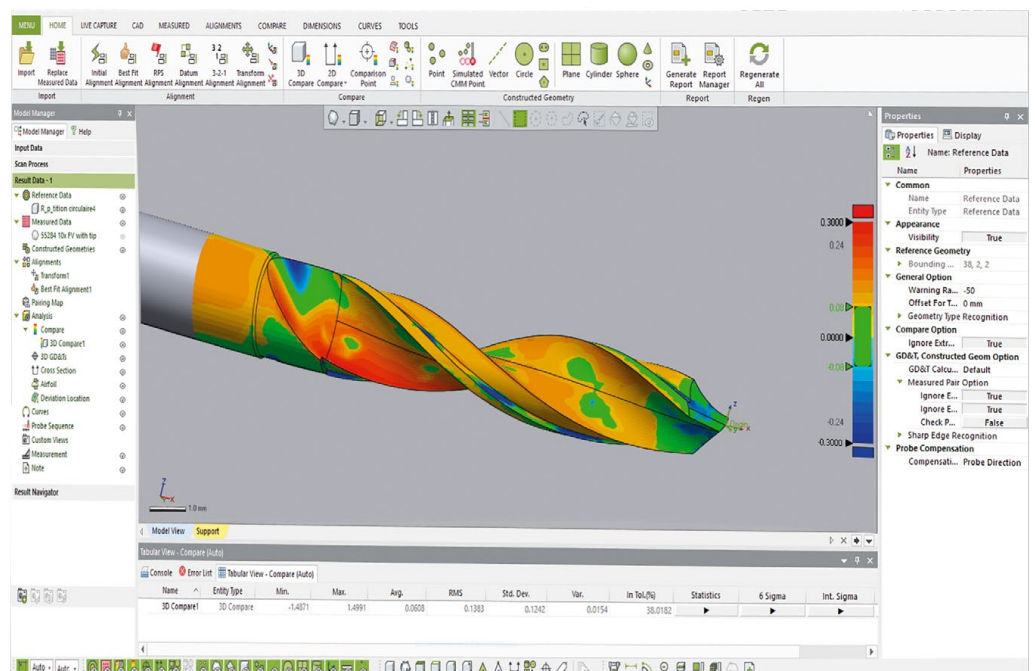
- Unroll geometry: Complex cylindrically-wrapped geometry can now be flattened for better analysis.
- Dimension tools: fundamental measuring tools to improve fast analysis of scanned parts.

**PN** GEOMAGICWRAP00 | Geomagic Wrap w/ 1st Year Maintenance

After the first year maintenance is optionally renewed yearly. This gives the customer access to updates, new versions and technical support.

**PN** GEOMAGICWRAPREN | Geomagic Wrap Maintenance Renewal

### ■ Geomagic® Control X OPTION





Geomagic Control X is a comprehensive metrology software platform that delivers the industry's most powerful tools within straightforward workflows. Features:

- ❑ Scan Processing Automation: scan registration, merging, clean-up, and other pre-inspection processes can now be designed and automated within Geomagic Control X.
- ❑ Deviation Location: with Geomagic Control X 2018 you can analyze the size, shape and location of deviation groups.
- ❑ Airfoil Analysis: whether you are working on turbines, blisks, blings or blades, Geomagic Control X 2018 provides a fast and intuitive way to gather profile measurements.
- ❑ Multi-Alignment Inspection: the new Multi-Alignment Inspection capability allows you to create repeatable inspection routines that require measurement in different alignment environments.
- ❑ Custom Reporting.
- ❑ Enhanced UI/UX.
- ❑ Enhanced Scanning and Import Capabilities.

**PN** GEOMAGICCONTROLX00 | Geomagic Control X w/ 1st Year Maintenance

Software maintenance renewal option after first year, including updates & support.

**PN** GEOMAGICCONTROLXREN | Geomagic Control X Maintenance Renewal



SENSOFAR is a leading-edge technology company that has the highest quality standards within the field of surface metrology

Sensofar Metrology provides high-accuracy optical profilers based on confocal, interferometry and focus variation techniques, from standard setups for R&D and quality inspection laboratories to complete non-contact metrology solutions for in-line production processes. The Sensofar Group has its headquarters in Barcelona, also known as a technology and innovation hub in Europe. The Group is represented in over 30 countries through a global network of partners and has its own offices in Asia, Germany and the United States.

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