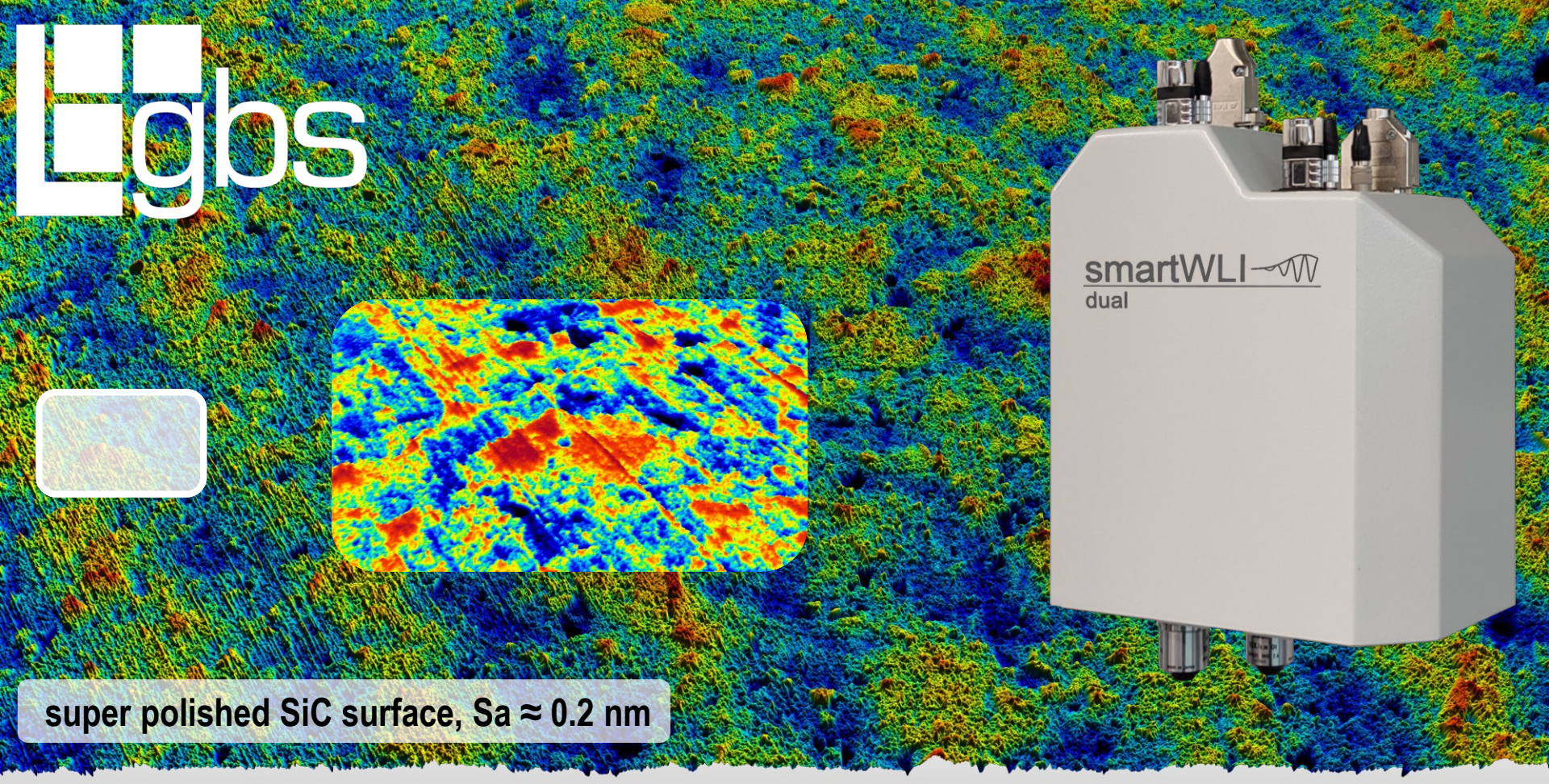


super polished SiC surface, Sa ≈ 0.2 nm

optical high performance profilers – scanning more details in surface metrology

smartWLI optical 3d sensors

	manual exchangeable single objective with magnification from 2.5x – 115x	objective turret with up to 4 objectives
piezo scanner	**smartWLI nanoscan** *upgraded* highest camera resolution and tube magnification **smartWLI compact - 5 MP camera** *upgraded* highest camera resolution **smartWLI compact - 2.3 MP camera** *upgraded* compromise between speed and resolution **smartWLI firebolt - 1.3 MP 10 GigE camera** *upgraded* extreme speed up to 935 fps	**smartWLI dual** *new* universal use combines advantages of all other sensors **smartWLI next 5 MP camera** *upgraded* highest camera resolution **smartWLI next - 2.3 MP camera** *upgraded* compromise between speed and resolution **smartWLI next – 1.3 MP 10 GigE camera** *new* extreme speed up to 935 fps **smartWLI extended – manual turret** entry level sensor - including piezo scanner and turret
mechanical scanner	**smartWLI GBScanner** *new* 2.3 MP camera / 50 mm positioning and measuring range **smartWLI extended range** *upgraded* 2.3 MP camera / 5 mm positioning and measuring range	**smartWLI GBScope motorized turret** *new* 2.3 MP camera / 50 mm positioning and measuring range **smartWLI GBScope manual turret** *new* 2.3 MP camera / 50 mm positioning and measuring range

based on coherence scanning (white-light) interferometry

smartWLI sensors classification

	item number	scanner	topography reproducibility	scanning range	linearity	objective turret	camera resolution	camera speed full resolution	robust against vibrations
smartWLI dual	DU 1001	piezo	0.03 nm	200 µm	++	motorized	5 MP / 2.3 MP	169 fps / 77 fps	++
smartWLI next	NE 1001	piezo	0.05 nm	200 µm	++	motorized	1.3 MP	935 fps	+++
smartWLI next	NE 1002	piezo	0.05 nm	200 µm	++	motorized	2.3 MP	169 fps	+
smartWLI next	NE 1003	piezo	0.05 nm	200 µm	++	motorized	5 MP	77 fps	+
smartWLI extended	SE 1001	piezo	0.15 nm	400 µm	++	manual	2.3 MP	169 fps	-
smartWLI firebolt	FB 1001	piezo	0.05 nm	400 µm	++	none	1.3 MP	935 fps	+++
smartWLI nanoscan	NA 1001	piezo	0.03 nm	400 µm	++	none	5 MP	77 fps	++
smartWLI compact	CO 1001	piezo	0.05 nm	400 µm	++	none	2.3 MP	169 fps	++
smartWLI compact	CO 1002	piezo	0.05 nm	400 µm	++	none	5 MP	77 fps	++
smartWLI GBScope	GS 1101	mechanical	0.5 nm	50 mm	+	motorized	2.3 MP	169 fps	++
smartWLI GBScope	GS 1102	mechanical	0.5 nm	50 mm	+	manual	2.3 MP	169 fps	++
smartWLI GBScanner	GS 1201	mechanical	0.5 nm	50 mm	+	none	2.3 MP	169 fps	++
smartWLI extended range	ER 1001	mechanical	0.5 nm	5 mm	-	none	2.3 MP	169 fps	++
smartWLI Cylinderinspector3D	CL 200 (1, 2, 3)	piezo	0.25 nm	200 µm	+	none	4 MP	77 fps	-

gbs Ilmenau

business activities

direct sales
components for integration partners
support of world-wide distribution partners

products

optical 3d sensors
optical profilers
portal measuring systems

technology

coherence scanning (white-light) interferometry
acceleration using GPGPUs

applications

surface metrology
- roughness measurements
- measurement of micro geometries

quality control
inline process control

branches

semiconductors
optics
precision machining

smartWLI dual

ultimate high end sensor

dual tube technology 0.5x / 1x, dual camera and LED, du, objective turret, 200 µm piezo drive

sensor for wafer measuring station

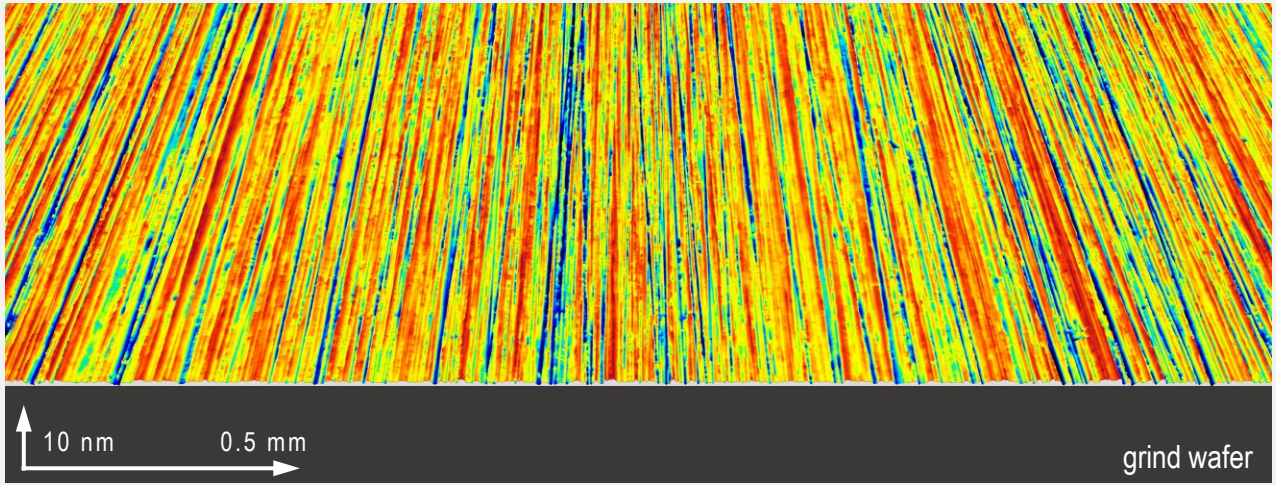
combines advantages of other sensors

- topography reproducibility 0.03 nm
- spatial sampling down to 0.03 µm
- camera up to 935 fps

high performance profilers

with extreme resolution and speed

- stands and granite portals up to 300 x 300 mm²
- motorized tip tilt optional
- control



optical 3d profiler with an excellent price performance ratio

objective turret and measuring volume of 50 x 100 x 100 mm³ (xyz)

suitable for most R&D projects

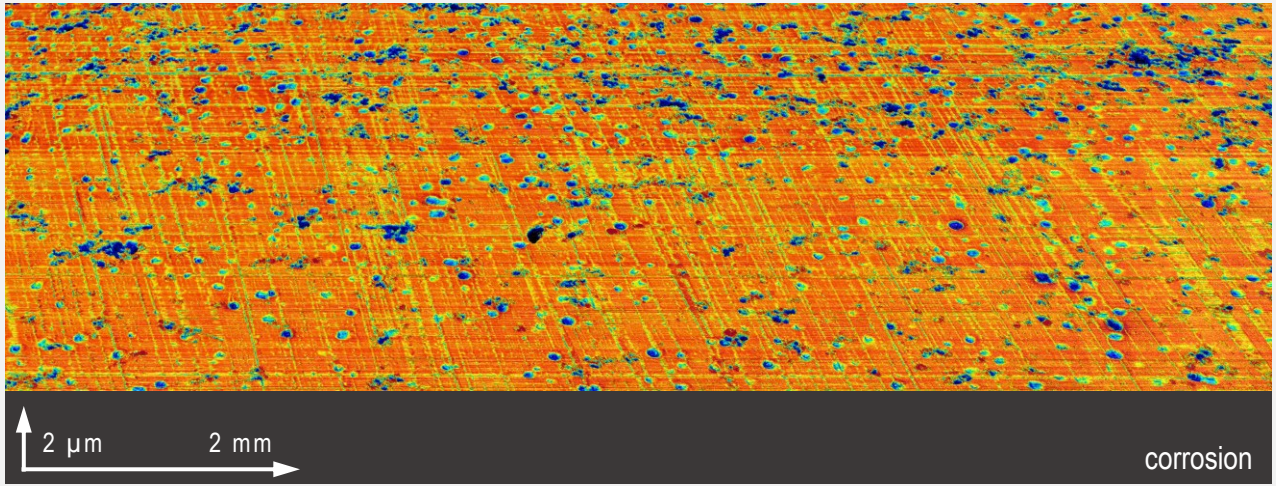
for an wide range of various tasks

- all machined surfaces
- surface roughness down to app. 1 nm
- easy localization of the area of interest

universal tool for measuring room

easy handling and reliable results

- without limitation of tactile profilers
- suitable for larger samples
- fast scanning and evaluation



simplified start in optical metrology

suitable for all tasks in surface metrology

surface metrology

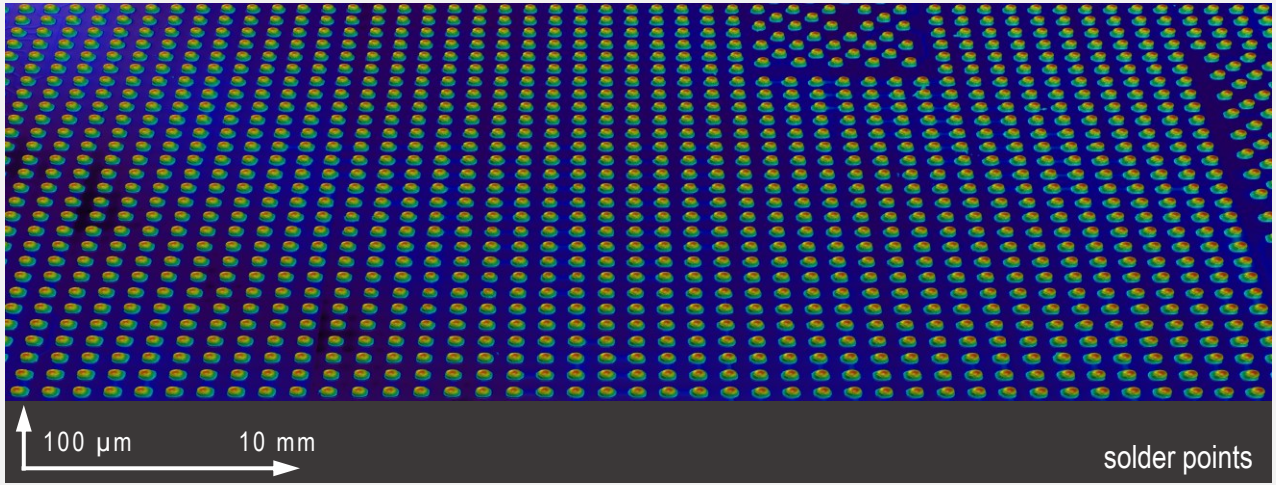
roughness measurements

- areas up to several cm²
- roughness starting from Sa 1 nm
- fast scanning of larger areas

measuring of micro geometries

with extreme resolution and speed

- suitable for larger objects
- digitizing of small objects
- comparison to CAD data for flat objects



extreme high speed sensor

with 10GigE camera and 935 fps, single exchangeable objective, 400 µm piezo drive

inline application

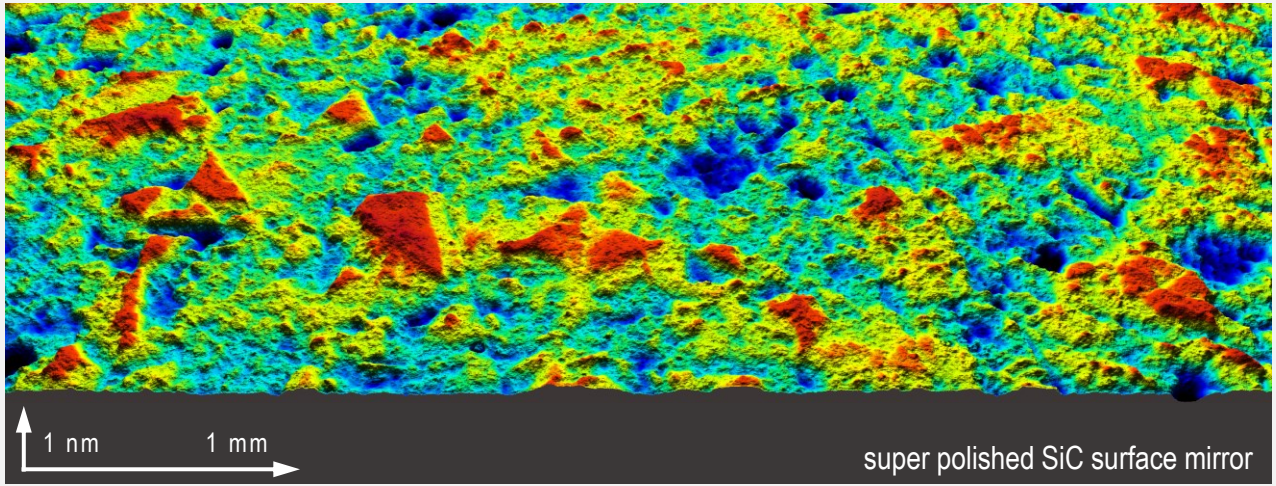
extreme data acquisition speed shortens cycle times and reduces the effect of vibration

- inline roughness measurements
- measuring of micro geometries
- without anti-vibration systems

high resolution measurements

fast image acquisition of the interference signals reduces sensor noise

- wafer roughness
- control of optical surfaces
- measurement of super polished surfaces



super polished SiC surface mirror

high end sensor with motorized objective turret

up to 4 objectives in motorized turret, 200 µm piezo drive, fully controllable via SDK

many advantages and applications

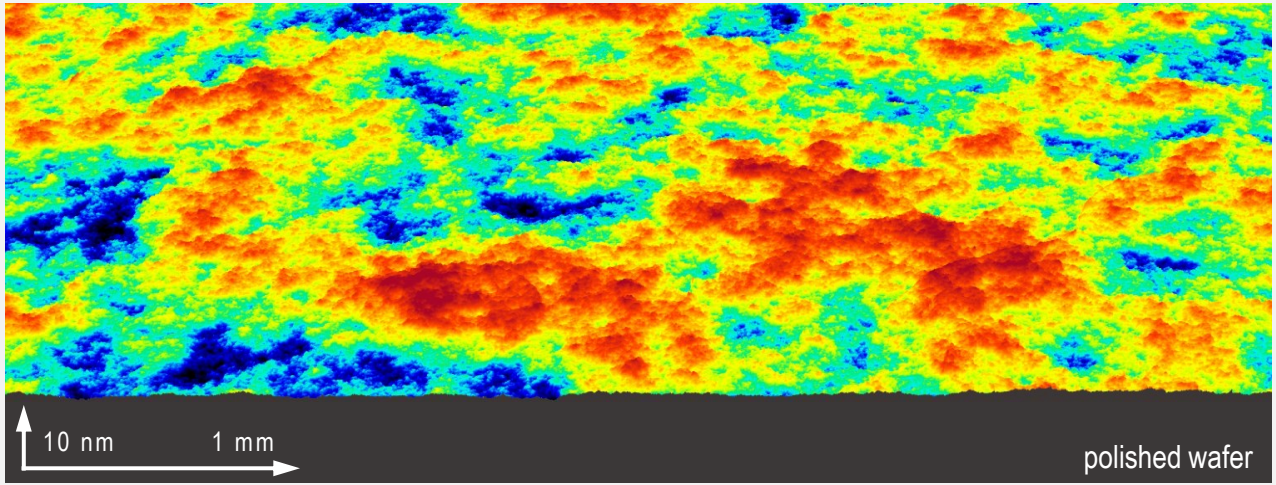
high performance sensor with easy-to-use handling
for fields where manual access is not possible

- automated measuring stations
- operation under clean room conditions
- extreme resolution with different magnifications

customized configuration

combines advantages of other sensors

- dual tube with different base magnification and 2 cameras (high speed or extreme resolution)
- illumination with up to 2 different colored LEDs



universal high performance sensor

single objective, 400 µm piezo drive, excellent price performance ratio

quality control

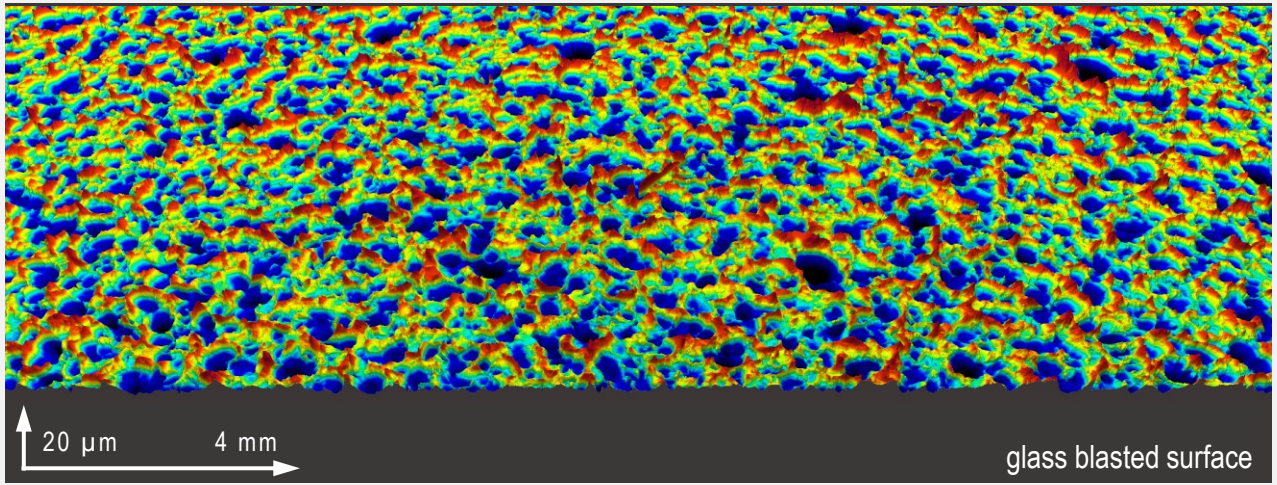
fast measurements for short cycle times with sub nano meter resolution for all surfaces

- micro and nano structures
- surface roughness
- research and development

designed for production environments

combines compact dimensions with a robust housing for rough environments

- measuring systems
- inline installation
- integration in production automats



smart WLI extended range

sensor for precision machined surfaces with an extended scanning range

single objective, mechanical 5 mm drive, excellent price performance ratio

roughness measurement

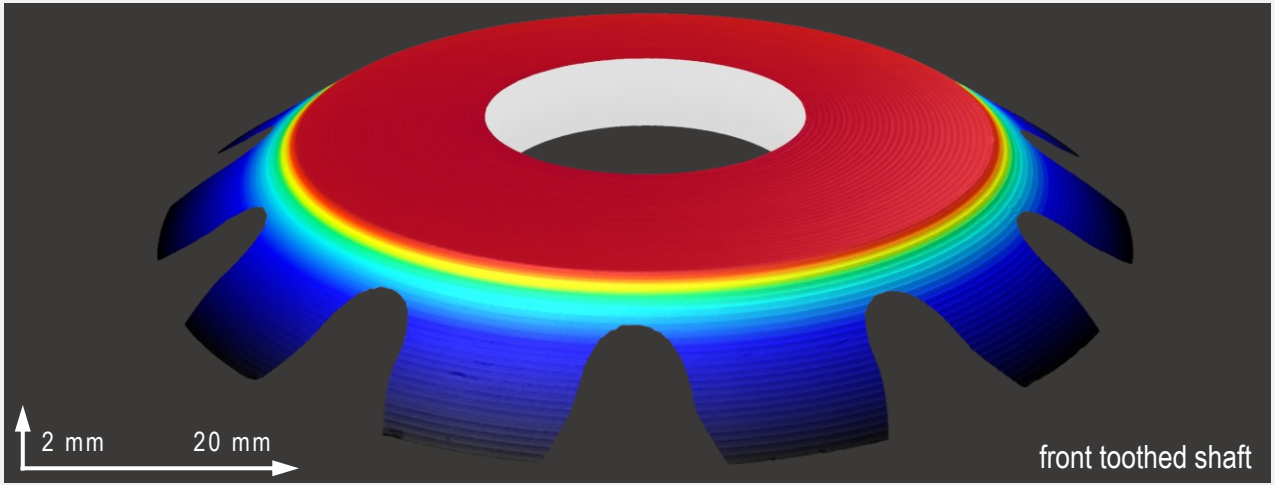
compact dimensions and a robust housing enable the operation for tough environments

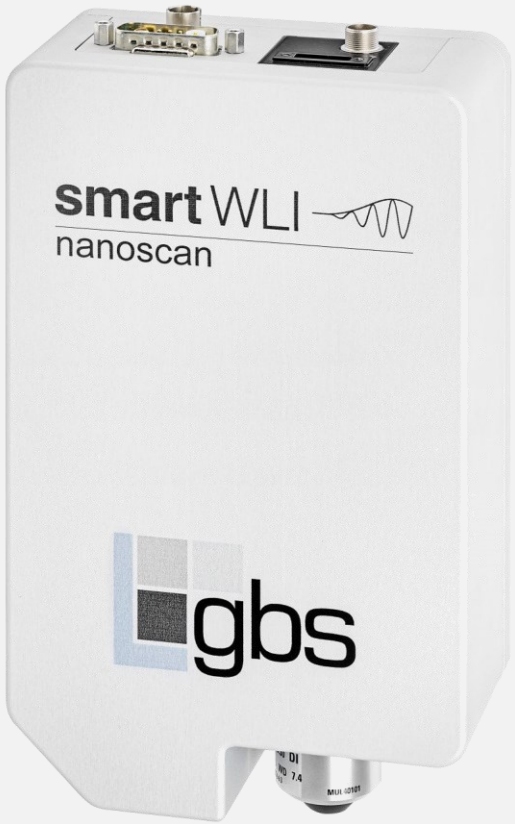
- robot mounted operation
- inline roughness measurements
- sensor for CMM's

measurement of micro geometries

extended range, high speed and ability to scan inclined surfaces

- compensation of larger positioning tolerances
- digitization of small objects
- combined form and roughness measurements





sensor with extreme resolution

single objective, 100 µm piezo drive, optimized for semiconductor applications

extreme small structures

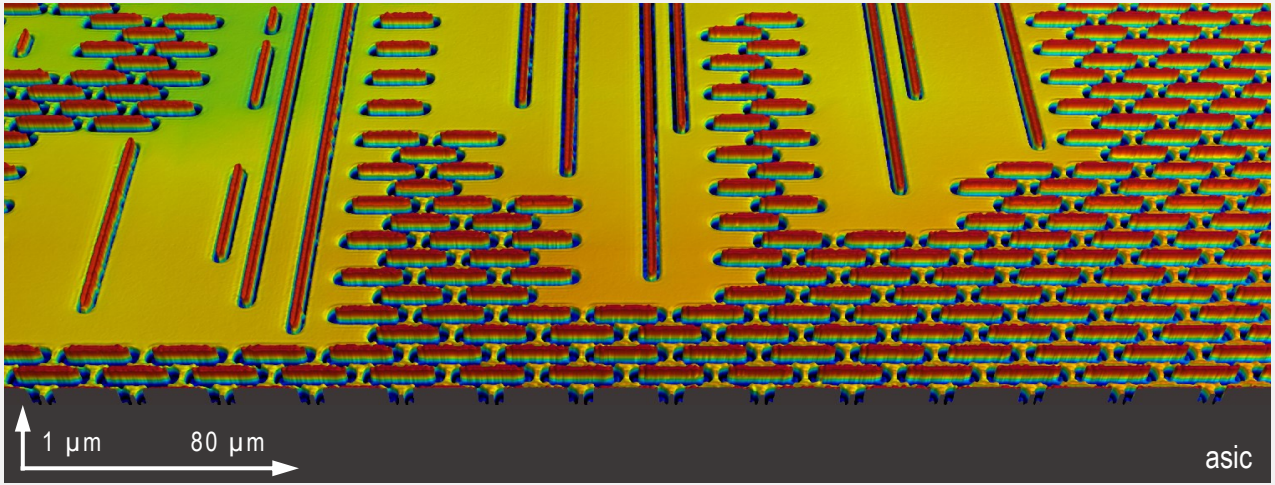
higher tube magnification combined with 5MP camera and blue LED for an excellent lateral resolution

- super polished optics
- super polished semiconductors

structures with a high aspect ratio

excellent scanning results on extreme small and deep structures

- structured wafers
- micro and nano geometries
- laser structured surfaces



universal sensors for measuring labs

manual objective turret, 400 µm piezo drive, optimized for daily scanning of various surfaces

powerful tool for your R&D

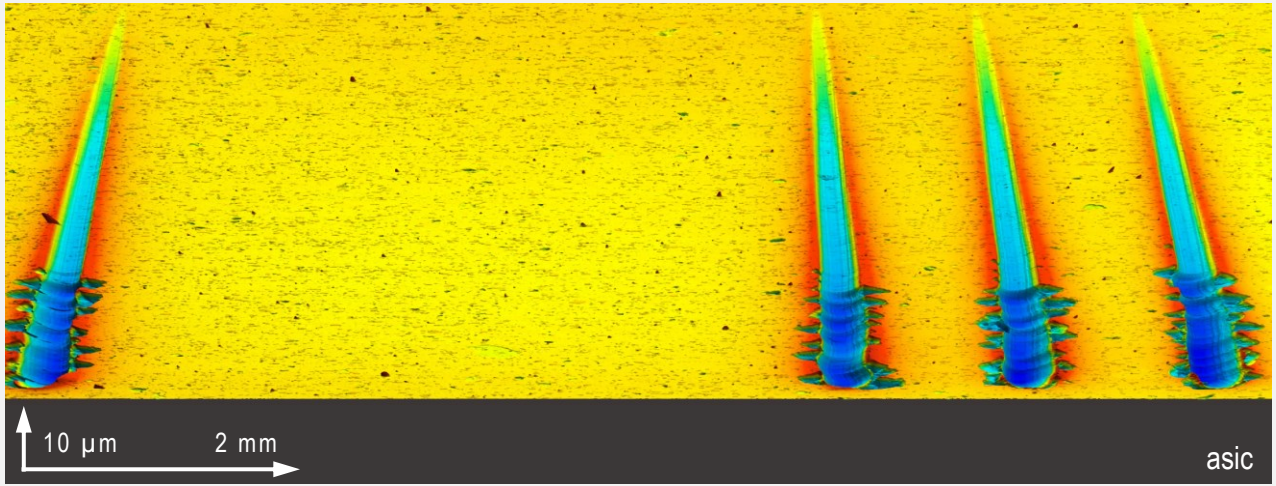
easy scanning with simple and fast selection of the objective magnification

- easy location and scan of small features
- simple operation
- flexible evaluation tools

tiny details from any object

flexible measurements of large areas with different magnifying objectives

- high reflective surfaces
- transparent surfaces
- sloped surfaces with higher inclination



Cylinderinspector3D

sensor to measure surface features inside of cylinder bores

manual exchangeable objectives, 200µm piezo drive, optional customized automated configurations

measuring of thermal spayed surfaces

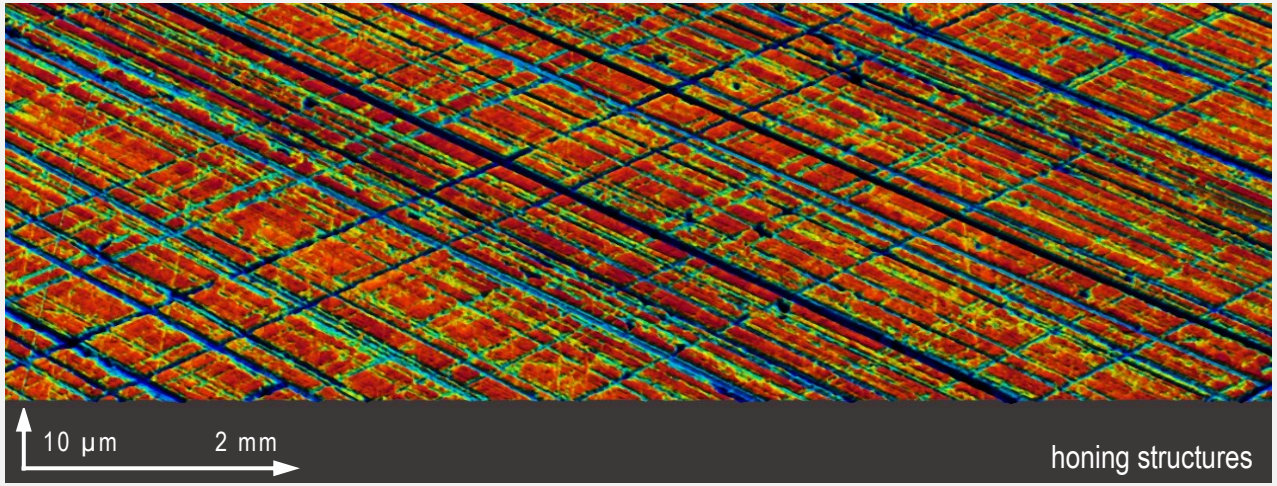
pore analysis and classification including upstanding structures

- evaluation of 3d roughness parameters
- functional surface parameters
- classification of pores

measuring of honing structures

evaluation of honing structures using GBS programmed functional parameters

- FFT based directional analysis of honing structures
- separation of rising, falling and closed structures



accessories and customized system configuration

- standard stands with manual height and tilt adjustment and various stage configurations for lab measuring systems
- portal measuring systems with extended height measuring range and motorized tip-tilts
- customized configuration of special measuring systems

SDK for simplified integration

SDK for all smartWLI sensors

The SDK enables the easy integration of the sensors into production lines, automated measuring stations or CMM's.

The documented libraries with source code implementation samples are part of the sensor delivery and free of charge.

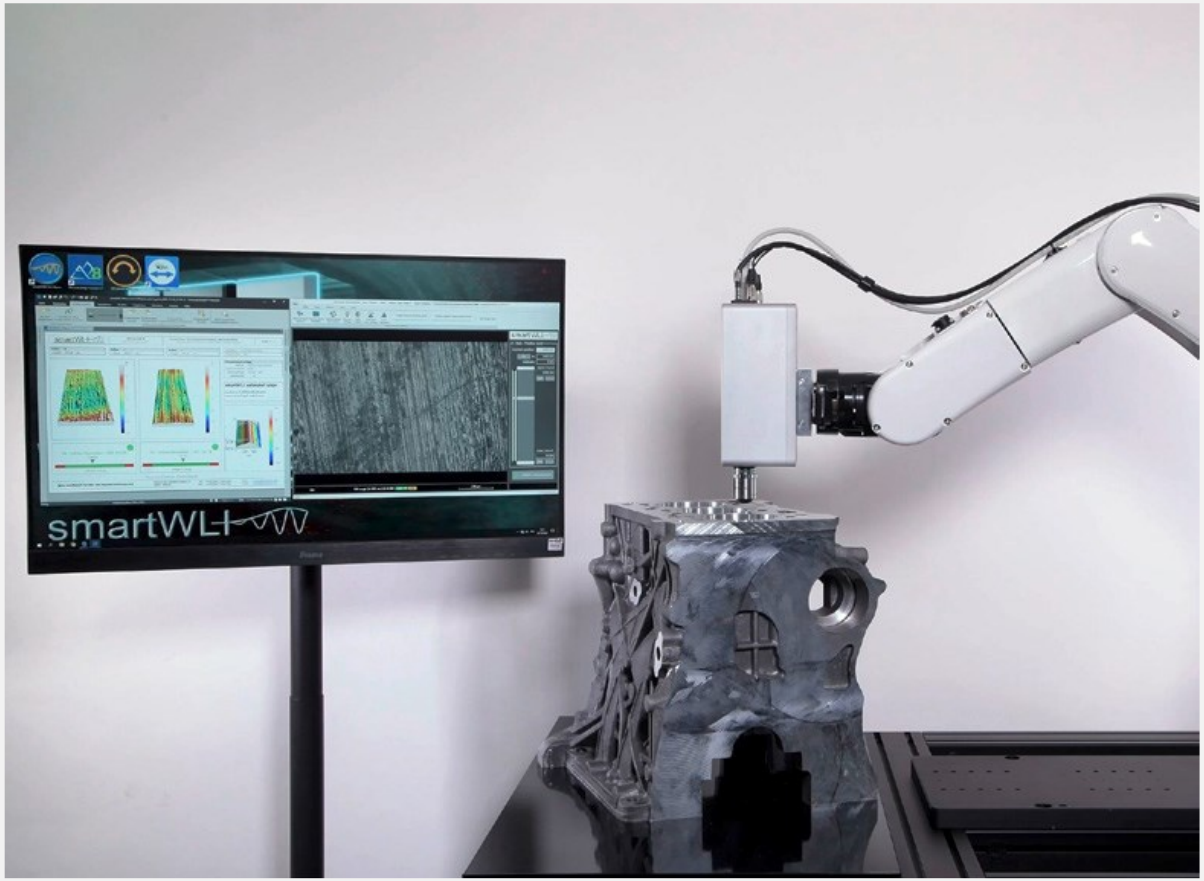
Sensors can be controlled via client server architecture from applications which are installed on a separate PC.

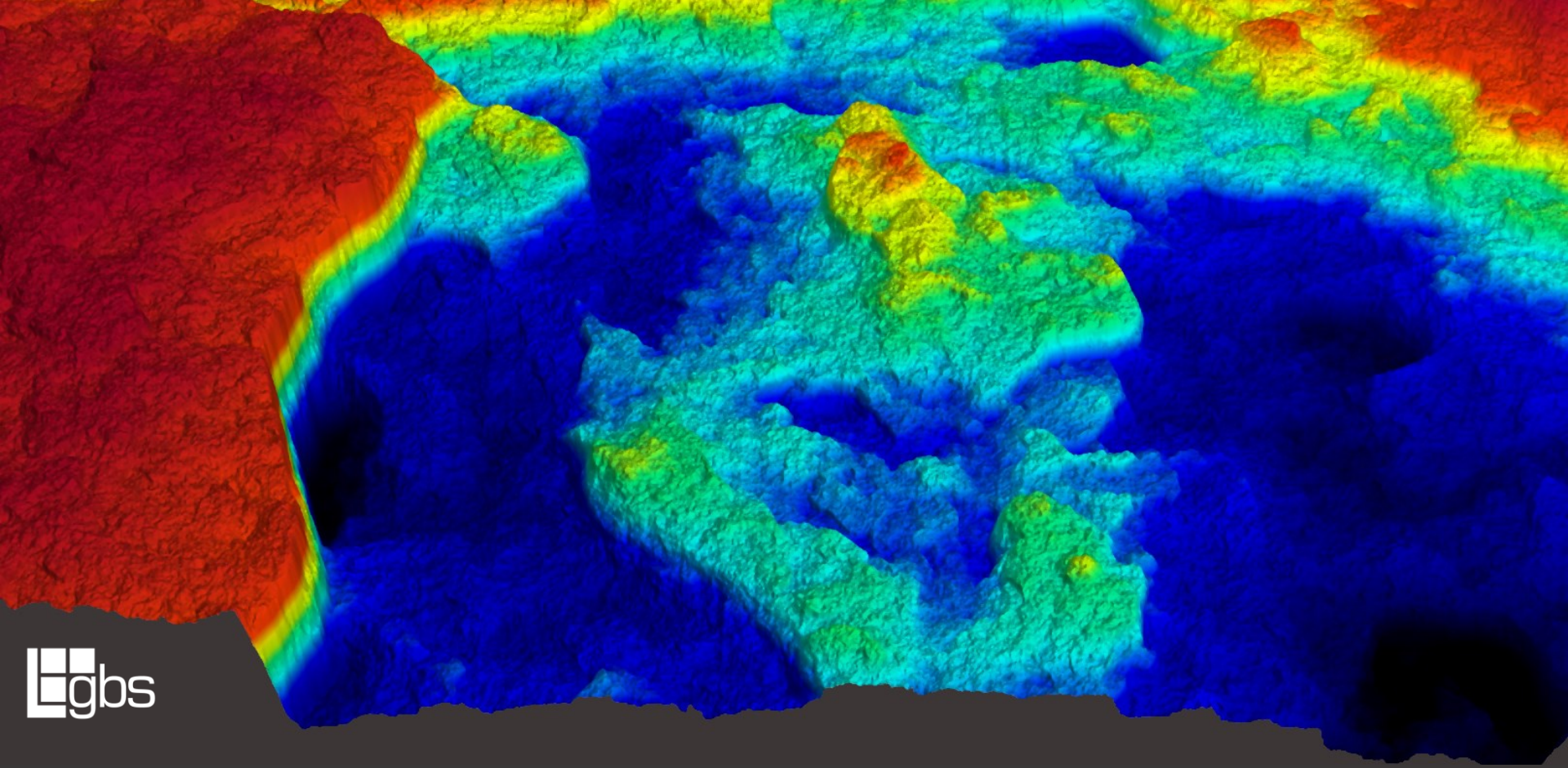
Predefined measuring and evaluation processes may be alternatively triggered using simple IO boards without programmers.

robotic roughness measurements

Inline roughness measurements are always a challenge. Production systems can cause vibrations, a higher noise level, dust, higher temperatures or temperature changes.

Compact dimensions with robust housings simplify the mechanical integration and even enable the mounting of sensors on robotic arms. Robotic solutions can realize measurements on multiple positions of heavy and big samples.





Gesellschaft für Bild und Signalverarbeitung (GBS) mbH
Robert-Bosch-Ring 8 • D-98693 Ilmenau • phone: +49 3677 83710 50 • email: info@gbs-Ilmenau.de • www.gbs-Ilmenau.de