

OPTICAL MICRO COORDINATE MEASUREMENT AND SURFACE FINISH MEASUREMENT IN ONE SYSTEM

## THE SYSTEM

Fastest optical form- and roughness measurement system in its class

InfiniteFocus is a highly accurate, extremely fast and highly flexible optical 3D measurement system. Users benefit from a 3D micro coordinate measurement machine and surface roughness measurement device in only one system. The range of measurable surfaces is almost unlimited, enabled by the use of coaxial lighting and an optimized LED ring light. In addition, all axes of InfiniteFocus are equipped with highly accurate encoders ensuring highly precise stage movement. Users achieve traceable measurements that combine high resolution, high repeatability and high accuracy.

## THE BENEFITS

Easy to use, flexible and efficiently automated

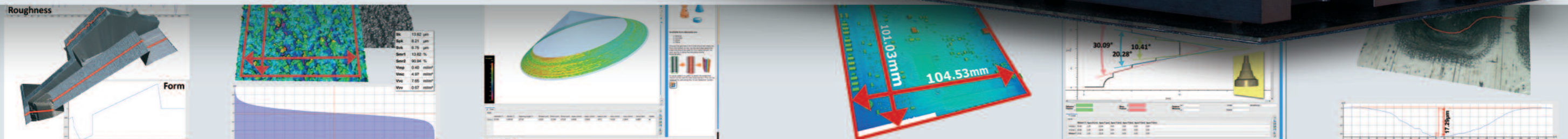
All relevant surface features are measured with only one multi-functional measurement sensor. Mostly, the optimal setting of measurement parameters is provided automatically. This allows multiple users in different groups or departments with different materials to use the system with ease and confidence. InfiniteFocus is almost maintenance free, easy to install and does not require controlled environments to operate.

## THE APPLICATIONS

Micro- and precision components as well as microstructured surfaces

In tool- and mold making, quality assurance with InfiniteFocus is a worldwide standard. Quality assurance and in-production measurement include cutting edge measurement as well as full form and roughness measurement of drills, millers, inserts etc. With InfiniteFocus in both material and process optimization manufacturer maximize turn over in micro manufacturing, automotive industry, medical device development and pharmaceutical industry, injection molding, aerospace industry, electronics and forensics.

Only one sensor for all measurements	InfiniteFocus combines all functionalities of a 3D micro coordinate measurement system and a surface roughness measurement device.
Universal and highly efficient	The range of measurable surfaces is nearly unlimited, supported by the use of a LED ring light.
High resolution, high repeatability and traceable	Users achieve a vertical resolution of up to 10 nm even at complex forms and surfaces.
High measurement speed	InfiniteFocus processes 1.7 mio measure points per second.
Modular and expandable	New functionalities are easy to integrate via additional measurement modules.
Efficiently automatable	Measurements including change of objectives are easy to automate.
Optimized performance against recent system generation	<ul style="list-style-type: none"> <li>» up to 20 times faster</li> <li>» automated settings</li> <li>» extended range of measurable surfaces and material</li> <li>» more robust, more dense measurements</li> <li>» more accurate measurements, particularly when measuring large measurement fields</li> </ul>



# TECHNICAL SPECIFICATION

## INFINITEFOCUS

### GENERAL SPECIFICATION

Measurement principle	non-contact, optical, 3 dimensional, based on Focus-Variation
Measurement result	3.3-500 mio 3D points in registered true color information (maximum is dependent on the used measurement module)
Maintenance	maintenance free
Coaxial illumination	white LED coaxial light, high power, electronically controllable
Ring light illumination (optional)	white LED high power ring light, 24 segments, wireless, snap-on system
Objectives	2.5x – 100x on motorized nose piece
Temperature range	possible: 5° - 40°C, calibrated for: 18° - 22°C (other temperature ranges can be calibrated)
Temperature gradient	less than 1° per hour
System monitoring	automatic self-diagnosis via 8x temperature sensor, vibration sensor internal current - and voltage monitoring
Travel range X/Y/Z	100 mm x 100 mm x 100 mm
Weight	105-120 kg, depending on set up
Dimensions WxDxH	810 mm x 640 mm x 700 mm (up to 945 mm)

### CONTROL SERVER

Power supply	100-230V-; 50-60Hz
Power consumption	950 W
CPU	12-Core, 3.1 GHz
RAM	32 GB
HDD memory	1 TB
Dimensions WxDxH	190 mm x 500 mm x 450 mm
Weight	20 kg
Operating system	Windows 7 Ultimate 64 bit
Monitor	27" Full HD LED Monitor with integrated USB Hub

### OBJECT

Surface texture	Surface topography Ra above 9 nm with Lc 2 µm, dependent on surface structure
Max. height	100 mm to 345 mm
Max. weight	30 kg, more on request
Sample preparation	none

### OBJECTIVES

		2.5x	5x	10x	20x	50x	100x
Lateral sampling distance	µm	3.52	1.76	0.88	0.44	0.18	0.09
Finest lateral resolution	µm	7.04	3.52	1.76	0.88	0.64	0.44
Best repeatability (vertical)	nm	800	120	30	10	3	1
Best vertical resolution	nm	2300	410	100	50	20	10
Vertical dynamic		3400	55000	165000	360000	500000	400000
Max. scan height (approx.)	mm	8	22.5	16.5	18	10	4
Working distance	mm	8.8	23.5	17.5	19.0	11	4.5
Measurement field X x Y	mm	5.63 x 5.63	2.82 x 2.82	1.62 x 1.62	0.81 x 0.81	0.32 x 0.32	0.16 x 0.16
Max. extended field of view	mm²	10000	10000	10000	10000	3940	985
Max. uni-directional scan extension	mm	100	100	100	100	100	100

### MEASUREMENT SPEED

		2.5x	5x	10x	20x	50x	100x
Vertical scan speed	µm/s	3000	3000	1000-3000	500-3000	200-2000	100-1000
Measurement speed		1.7 mio measure points/seconds					

### RESOLUTION AND APPLICATION LIMITS

		2.5x	5x	10x	20x	50x	100x
Min. measurable height	µm	2.3	0.41	0.1	0.05	0.02	0.01
Max. measurable height (approx.)	mm	8	22.5	16.5	18	10	4
Height step accuracy (1mm height step)	%	-	0.05	0.05	0.05	0.05	0.05
Max. measurable area	mm²	10000	10000	10000	10000	3940	985
Max. measurable profile length	mm	100	100	100	100	100	100
Min. repeatability	µm	0.8	0.12	0.03	0.01	0.003	0.001
Min. measurable roughness (Ra)	µm	7	1.2	0.3	0.15	0.06	0.03
Min. measurable roughness (Sa)	µm	3.5	0.6	0.15	0.075	0.03	0.015
Min. measurable radius	µm	20	10	8	5	2	1
Min. measurable vertical angle	°	20	20	20	20	20	20
Max. measurable slope angle	°	up to 87					

### ACCURACY

Profile roughness	Ra = 100 nm	U = 25 nm, σ = 2 nm
	Ra = 500 nm	U = 40 nm, σ = 2 nm
Areal roughness	Sa = 100 nm	U = 20 nm, σ = 2 nm
	Sa = 500 nm	U = 30 nm, σ = 2 nm
Flatness	1 mm x 1 mm with 10x objective	U = 0.1 µm
Height measurement	z = 10000 µm	E <sub>Uni:St:ODS,MPE</sub> = 800 nm, σ = 0.4 µm
	z = 1000 µm	E <sub>Uni:St:ODS,MPE</sub> = 500 nm, σ = 0.1 µm
	z = 100 µm	E <sub>Uni:St:ODS,MPE</sub> = 400 nm, σ = 0.05 µm
	z = 10 µm	E <sub>Uni:St:ODS,MPE</sub> = 300 nm, σ = 0.025 µm
	z = 1 µm	E <sub>Uni:St:ODS,MPE</sub> = 150 nm, σ = 0.01 µm
Distance measurement	xy up to 1 mm	E <sub>Bi:Tr:ODS,MPE</sub> = 0.7 µm
	xy up to 10 mm	E <sub>Bi:Tr:ODS,MPE</sub> = 1.0 µm
	xy up to 20 mm	E <sub>Bi:Tr:ODS,MPE</sub> = 2.0 µm
Edge angle	β = 70...110°	U = 0.15°, σ = 0.02°
Edge radius	R = 5 µm – 20 µm	U = 1.5 µm, σ = 0.15 µm
	R > 20 µm	U = 2 µm, σ = 0.3 µm

E<sub>Uni:St:ODS,MPE</sub> & E<sub>Bi:Tr:ODS,MPE</sub> conform to ISO 10360-8

### SOFTWARE

Measurement modules	Standard: 3D data capturing, profile form, profile roughness (Ra, Rq, Rz...), surface texture (Sa, Sq, Sz...), volume, 2D, automation, AliconaInspect (3D inspection including GD&T)
	Optional: Automatic multi-measurement; fusion; form/contour/difference; various application specific measurement modules; Edge Measurement Package (edge radius/form/contour; edge break measurement; chipping/roughness; difference measurement; flash measurement); AliconaInspectProfessional (macros for GD&T)
Automation	Integrated 3D Script Editor, Labview Framework und Remoting
Visualization	High resolution 3D visualization
Database	Intuitive, graphical database
Import/Export	Standard: 3D data sets (e.g. AL3D, STL, G3D, IGES, STP); common image formats (e.g. BMP, JPG, PNG); simple export of results (CSV, 2D, 3D, QDAS export) and reporting functionalities
	Optional: AliconaInspectProfessional (CATIA, UG, Pro/E)
Languages	German, English, French, Japanese, Chinese

### OPTIONS

Grips & Accessories	Ring light; IF-ToolGrip, IF-InsertGrip, IF-AdvancedInsertGrip, IF-NanoGrip, IF-ClampingSet, IF-Guide, IF-RotationGrip, IF-VacuumPlate, IF-RotationTable; SpacerPlate; IF-Real3DRotationUnit, IF-AdvancedReal3DRotationUnit;
Calibration Standards	IF-CalibrationTool, IF-RoughnessTool, IF-VerificationTool, IF-RightAngleTool, IF-EdgeCalibrationTool

All given data are provable and traceable.