

# alicon

---

## InfiniteFocusSL

Version b

Technical Specifications EN

March 22, 2017



Alicona Imaging GmbH • [info@alicon.com](mailto:info@alicon.com)  
[www.alicon.com](http://www.alicon.com) • Dr.-Auner-Straße 21a • A-8074 Raaba/Graz  
Tel: +43 (316) 403010 700 • Fax: +43 (316) 403010 711

# Contents

<b>1</b>	<b>Technical specifications</b>	<b>1</b>
1.1	General specifications . . . . .	2
1.1.1	Dimensions and environmental conditions . . . . .	2
1.1.2	ControlServerHP . . . . .	2
1.1.3	Measurement object . . . . .	2
1.2	Objective specific features . . . . .	2
1.2.1	Extended measurement range . . . . .	3
1.2.2	Resolution and application limits . . . . .	3
1.2.3	Accuracy . . . . .	3
1.3	Software . . . . .	3
1.4	Application specific features . . . . .	4
1.4.1	Grips, accessories and calibration standards . . . . .	4
<b>2</b>	<b>Technical drawings</b>	<b>5</b>
2.1	Working area InfiniteFocusSL . . . . .	5
2.2	X/Y Stage . . . . .	7
<b>3</b>	<b>Warranty and copyrights</b>	<b>8</b>
3.1	Warranty . . . . .	8
3.2	Copyrights . . . . .	8
3.3	EU Declaration of Conformity . . . . .	9

# Chapter 1

## Technical specifications

The following specifications conform to the guidelines of the *Initiative Fair Datasheet*. Specifications in blue mark Alicona specific values.



# 1.1 General specifications

Measurement principle	non-contact, optical, three-dimensional, based on Focus-Variation
Max. number of measurement points in a single measurement	X: 2040, Y: 2040, X x Y: 4.16 million
Max. number of measurement points	X: 62500 , Y: 62500; X x Y: 500 million
Positioning volume (X x Y x Z)	RL objectives: mot.: 50 mm x 50 mm x 155 mm (Z: 25 mm mot., 130 mm man.) = 387500 mm <sup>3</sup> SXRL/AXRL objectives: mot. 50 x 50 x 120 mm (Z: 25 mm mot., 95 mm man.) = 300000 mm <sup>3</sup>
Maintenance	maintenance free
Ring light illumination	white LED high-power ring light, 24 segments
Positioning help	coaxial laser beam

## 1.1.1 Dimensions and environmental conditions

Dimensions (W x D x H)	measurement instrument: 195 x 340 x 485 mm; ControlServerHP: 200 x 490 x 440 mm
Mass	measurement instrument: 15 kg, depending on set-up; ControlServerHP: 16.9 kg
Ambient temperature range	measurement instrument: possible: 18-28 °C; calibrated for: 18-22 °C (can be calibrated for other temperature ranges); ControlServerHP: possible: 0-30 °C
Permissible temperature gradient	less than 1 °C/h
Permissible relative humidity	recommended: 45 % (+/-5 %), possible: 45 % (+/-15 %)
Supply voltage and current	ControlServerHP: 100-240 VAC, 50-60 Hz; measurement instrument: 24 VDC
Electric power	ControlServerHP: 700 W; measurement instrument: 250 W

## 1.1.2 ControlServerHP

CPU	4 Core, 3.4 GHz
RAM	32 GB DDR4
HDD memory	2 TB
Operating system	Windows 10 IoT Enterprise, 64bit
Monitor	24" Full HD LED monitor with integrated USB hub

## 1.1.3 Measurement object

Surface	surface topography Ra above 0.009 μm with λc 2 μm; depending on surface structure
Max. height	155 mm
Max. weight	4 kg; more on request

# 1.2 Objective specific features

Objective magnification (*)		10x	20x	50x	2xSX	5xAX	10xAX	20xAX	50xSX
Numerical aperture		0.3	0.4	0.6	0.055	0.14	0.28	0.42	0.55
Working distance	mm	17.5	16	10.1	34	34	33.5	20	13
Lateral measurement area (X, Y)	mm	2	1	0.4	10	3.61	2	1	0.4
(X x Y)	mm <sup>2</sup>	4	1	0.16	100	13.03	4	1	0.16
Measurement point distance	μm	1	0.5	0.2	5	2	1	0.5	0.2
Calculated lateral optical limiting resolution	μm	1.09	0.82	0.54	5.93	2.33	1.17	0.78	0.59
Finest lateral topographic resolution	μm	2	1	0.64	10	4	2	1	0.64
Measurement noise	nm	40	20	10	1240	165	45	25	15
Vertical resolution	nm	100	50	20	3500	460	130	70	45
Vertical measurement range	mm	16	15	9	25	25	25	19	12
Measurement speed	≤ 1.7 million measurement points/sec.								
Accessibility	°	31	29	19	40	51	51	39	26

(\*) Objectives with longer working distance available upon request

## 1.2.1 Extended measurement range

Objective magnification		10x	20x	50x	2xSX	5xAX	10xAX	20xAX	50xSX
Extended lateral measurement range (X, Y) (*) (X x Y) (**)	mm	50	50	50	50	50	50	50	50
	mm <sup>2</sup>	500	125	20	2500	2000	500	125	20
Extended lateral measurement range with data reduction (X, Y) (*) (X x Y) (**)	mm	50	50	50	50	50	50	50	50
	mm <sup>2</sup>	2500	2500	2500	2500	2500	2500	2500	2500

(\*) Maximum unidirectional measurement area along the X- and Y-axis

(\*\*) Maximum X/Y-measurement area

## 1.2.2 Resolution and application limits

Objective magnification		10x	20x	50x	2xSX	5xAX	10xAX	20xAX	50SX
Min. measurable height	nm	100	50	20	3500	460	130	70	45
Max. measurable height	mm	16	15	9	25	25	25	19	12
Height step accuracy (1 mm)	%	0.1							
Max. measurable area	mm <sup>2</sup>	2500							
Max. measurable profile length	mm	50							
Min. measurable roughness (Ra)	μm	0.3	0.15	0.08	n.a.	n.a.	0.45	0.25	0.15
Min. measurable roughness (Sa)	μm	0.15	0.075	0.05	n.a.	n.a.	0.25	0.1	0.08
Min. measurable radius	μm	5	3	2	20	10	5	3	2
Min. measurable wedge angle	°	20							
Max. measurable slope angle	°	87							

## 1.2.3 Accuracy

Flatness deviation	2 mm x 2 mm with 10x objective	U = 0.1 μm
Max. deviation of a height step measurement	height step 1000 μm	$E_{Uni:St:ODS,MPE} = 1 \mu m, \sigma = 0.1 \mu m$
	height step 100 μm	$E_{Uni:St:ODS,MPE} = 0.4 \mu m, \sigma = 0.05 \mu m$
	height step 10 μm	$E_{Uni:St:ODS,MPE} = 0.3 \mu m, \sigma = 0.025 \mu m$
	height step 1 μm	$E_{Uni:St:ODS,MPE} = 0.15 \mu m, \sigma = 0.01 \mu m$
Profile roughness	Ra = 0.5 μm	U = 0.04 μm, σ = 0.002 μm
Area roughness	Sa = 0.5 μm	U = 0.03 μm, σ = 0.002 μm
Distance measurement	XY up to 2 mm	$E_{Bi:Tr:ODS,MPE} = 0.8 \mu m$
Wedge 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

$E_{Uni:St:ODS,MPE}$  &  $E_{Bi:Tr:ODS,MPE}$  conform to ISO 10360-8

## 1.3 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 incl. GD&T) Optional: automatic multi measurement; fusion; form/contour/difference; various application specific measurement modules; Edge Measurement Package (edge radius/form/contour, edge break, chipping/roughness, difference measurement, flash measurement, MultiEdgeMeasurement); AliconaInspect-Professional
Automation	integrated scripting language; LabVIEW framework; .NET Remoting interface; AliconaInspectProfessional (enables GD&T measurement)
Database	intuitive, graphical database
Languages	German, English, French, Korean, Japanese, Chinese
Export formats	3D data sets (e.g.: AL3D, STL, G3D, Open GPS, CSV, QDAS); image formats (e.g.: BMP, JPG, PNG)
Import formats	Standard: 3D data sets (e.g.: AL3D, STL, G3D, IGES, STEP); image formats (e.g.: BMP, JPG, PNG) Optional: AliconaInspectProfessional (SolidWorks; CATIA V4, V5, V6; Pro/E)

## 1.4 Application specific features

### 1.4.1 Grips, accessories and calibration standards



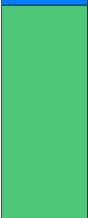
Grips and accessories	ToolGrip, InsertGrip G2, NanoGrip, RotationGrip, 45DegreeMirror, Real3DRotationUnit G2
Calibration standards	CalibrationTool, RoughnessTool, VerificationTool, EdgeCalibrationTool

# Chapter 2

## Technical drawings

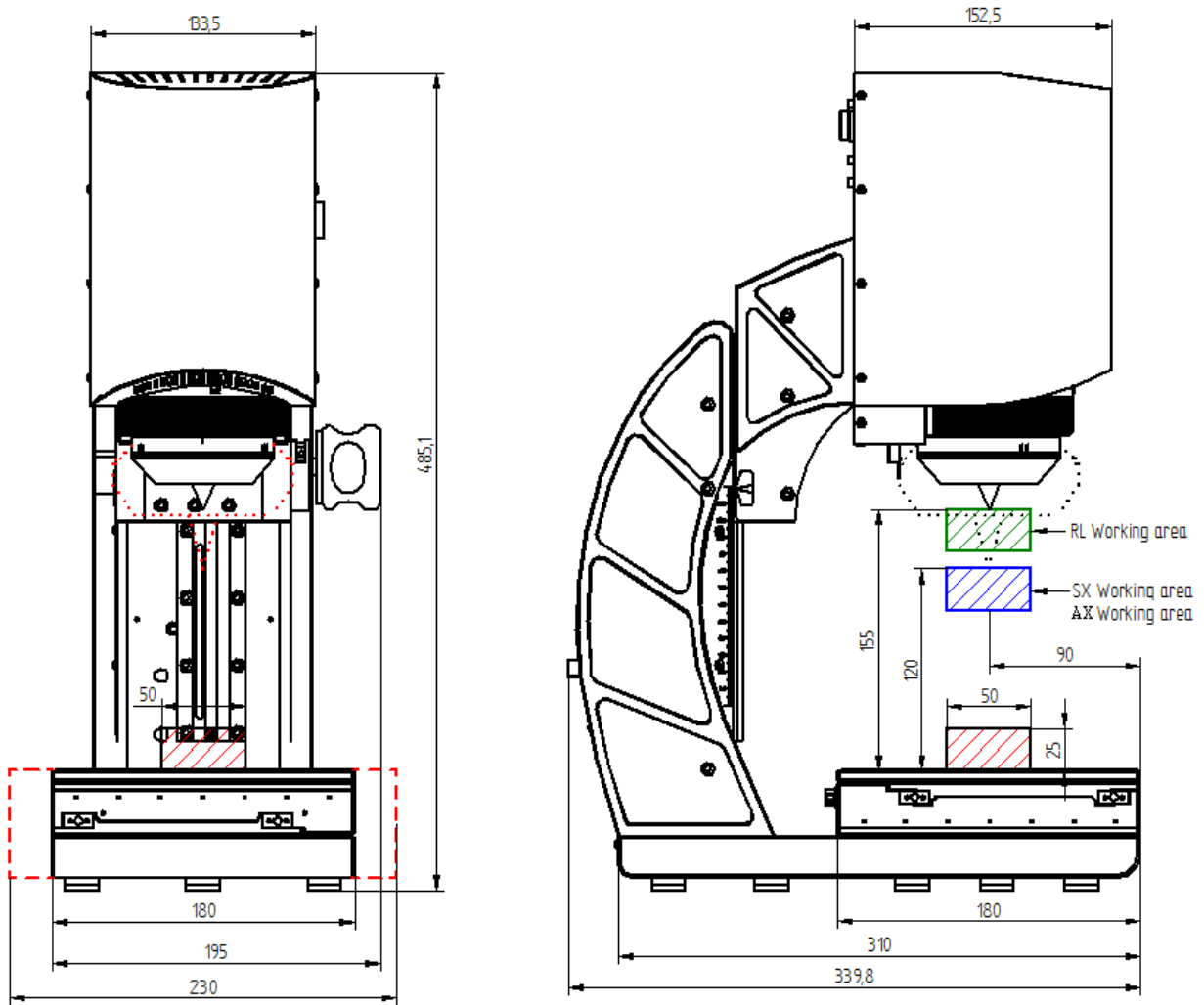
### 2.1 Working area InfiniteFocusSL

**Note:** The following technical drawings visualize the working area of the InfiniteFocusSL. The sensor is in the top position in all drawings. The shaded areas visualize possible working areas.

Description figure <i>Working Area</i>		
	Red	The area shaded in red visualizes the working area when the sensor head is in its lowest position. <ul style="list-style-type: none"><li>• Max. specimen height: 25 mm</li></ul>
	Blue	The area shaded in blue visualizes the working area when using an SXRL/AXRL objective with the sensor head in its top position. <ul style="list-style-type: none"><li>• Max. specimen height: 120 mm</li></ul>
	Green	The area shaded in green visualizes the working area when using an RL objective with the sensor head in its top position. <ul style="list-style-type: none"><li>• Max. specimen height: 155 mm</li></ul>



The working area is the area, where fine focus, automatic positioning and measurement are possible. The sample has to be inside this working area - use the coarse adjustment knob to move the working area up or down.



*Working area InfiniteFocusSL - front and side view*  
 The dimensions are indicated in mm.



The maximum working distance differs for RL- and SXRL/AXRL objectives (see figure above).

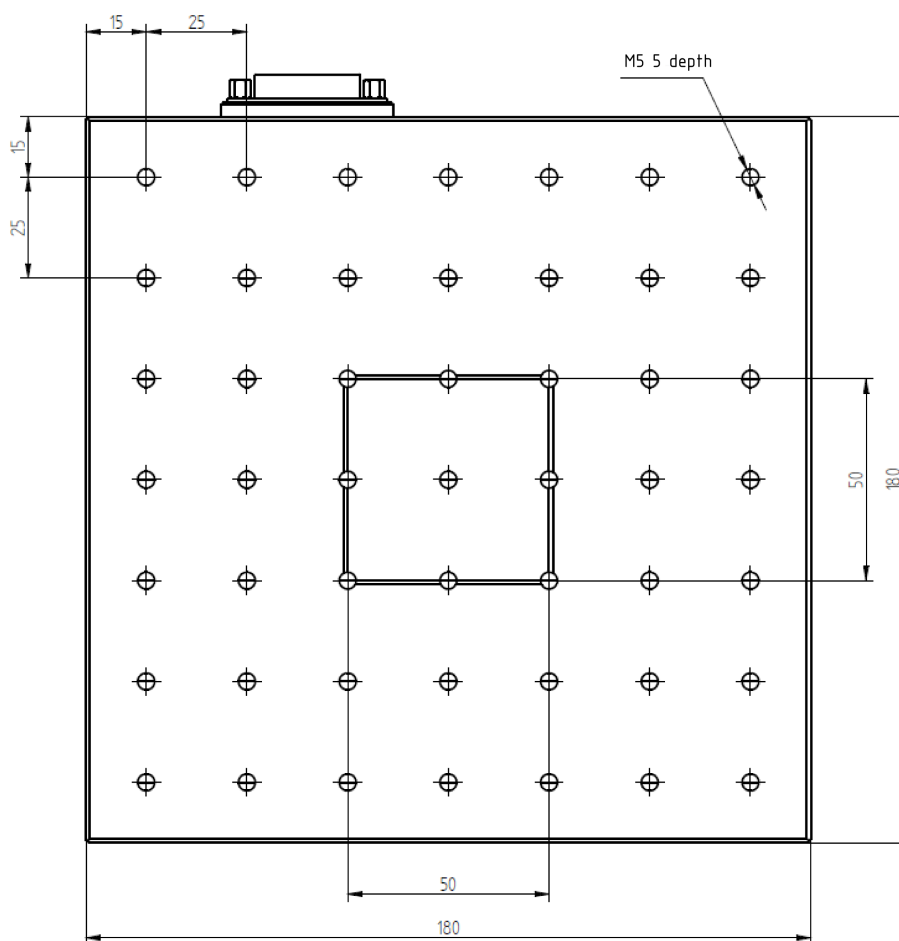
ObjectiveRL: 10x, 20x, 50x

ObjectiveSXRL: 2x, 50x

ObjectiveAXRL: 5x, 10x, 20x



## 2.2 X/Y Stage



*motorized X/Y stage*

The dimensions are indicated in mm.

Dimensions	180 mm x 180 mm
Travel range	50 mm x 50 mm (mot.)
Weight limit	4 kg; more on request
Thread hole	M5x5

# Chapter 3

## Warranty and copyrights

### 3.1 Warranty

**ALICONA IMAGING GMBH AND ITS SUPPLIERS ACCEPT NO LIABILITY FOR ANY PROBLEMS THAT OCCUR AS A RESULT OF ANY OPERATIONS CARRIED OUT OTHER THAN THOSE STATED IN THE MANUAL THAT COMES WITH THIS PRODUCT. FURTHERMORE WE TAKE NO WARRANTY AT ALL HARDWARE DAMAGES ON UPGRADED MEASUREMENT SYSTEMS THAT RESULT FROM IMPROPER OPTICS, WRONG OR INCOMPLETE CALIBRATION, NOT SUITABLE SPECIMEN OR INCOMPATIBLE HARDWARE COMPONENTS.**

#### **Compatibility with other Products**

Alicona Imaging GmbH does not guarantee that this product is compatible with any software or hardware product that was not obtained from Alicona Imaging GmbH.

### 3.2 Copyrights

This document contains know-how, ideas and development achievements of Alicona Imaging GmbH and its subcontractors. You are not allowed to copy or modify this document without given permission of Alicona Imaging GmbH.

### 3.3 EU Declaration of Conformity



In compliance with EU directive

- Machinery Directive 2006 / 42 / EC (Appendix II A)
- Measuring Instruments Directive 2014 / 32 / EU
- Low Voltage Directive 2014 / 35 / EU
- Electromagnetic Compatibility 2014 / 30 / EU

Following harmonized standards were applied:

- EN 61010-1:2010

The Manufacturer

**Alicona Imaging GmbH**

Dr. Auner-Straße 21a

A-8074 Raaba / Graz

hereby declares that the following machine:

**Type:** InfiniteFocusSL Version b

complies with the above listed directives and fulfills the national and international standards and statutory provisions that implement the directives.

A technical documentation is available and is present in the original version. The technical documentation is part of this declaration.

This declaration loses its validity as soon as modifications are made to the machine.

**alicona**  
imaging  
**Alicona Imaging GmbH**  
Dr. Auner-Straße 21a, A - 8074 Raaba  
Tel.: +43 (316) 40 30 10 - 700  
Fax: +43 (316) 40 30 10 - 711

A handwritten signature in blue ink, appearing to read 'Jde', is written over the company logo.

Raaba, March 22, 2017

Place, Date

Seal

Dr Stefan Scherer, CEO