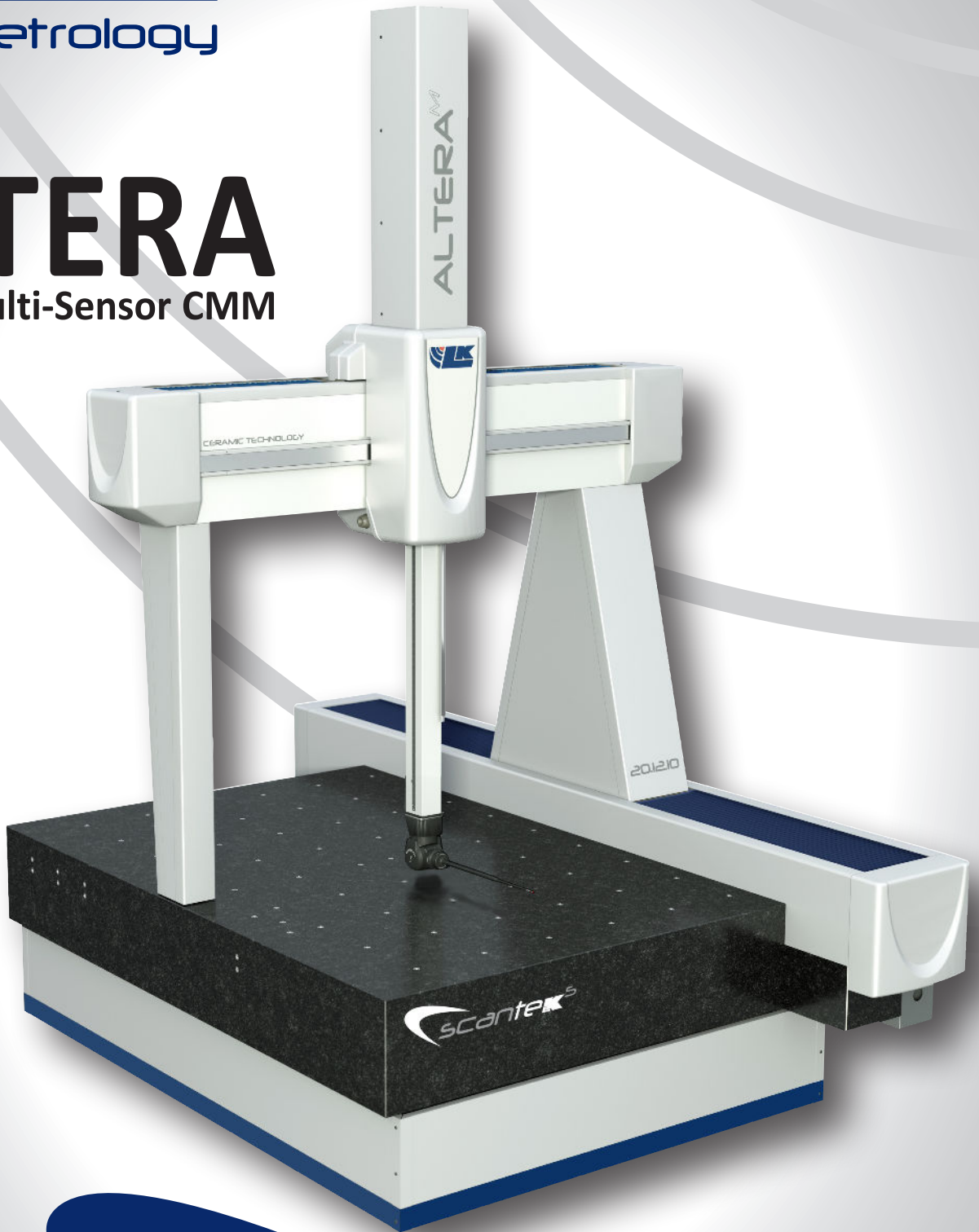




ALTERA

5-Axis Multi-Sensor CMM



...we are metrology

ALTERA

EXCELLENCE NOW

Coordinate Measuring Machines

LK Metrology's range of premium quality ALTERA CMMs meet the varying needs of manufacturers, both today and in the future.

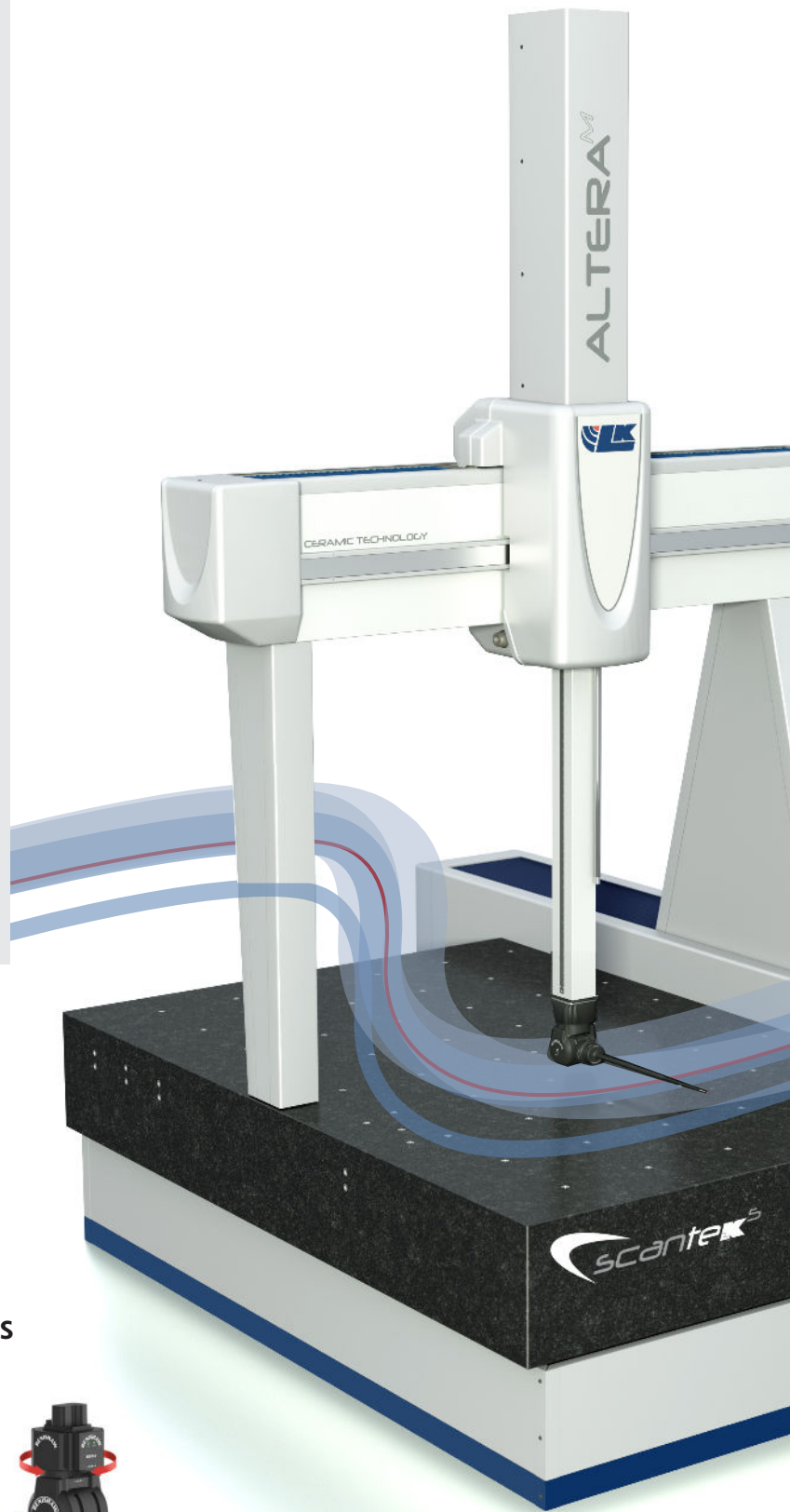
The superior ceramic design, with near perfect stiffness-to-weight ratio and greater resistance to temperature shifts, provides consistent performance across all manufacturing environments. Advanced multi-sensor ready technology optimizes CMM throughput and provides the opportunity to broaden the application scope to new materials and components as needs change. Innovative work-flows and intuitive software features facilitate complex inspection tasks and boost productivity.

Unique accuracy guarantee

LK Metrology is the only manufacturer to guarantee the accuracy of its CMMs for 10 years.



Conditions apply, see LK Metrology website for full details.



Measurement Techniques



AND IN THE FUTURE...



SCANtek 5-axis technology is a measurement revolution for manufacturers of precision components. Unprecedented measuring speed, the flexibility of multi-sensor technology and improved metrology have boosted measurement throughput, shortened production lead times and provided a more complete awareness of product conformance.



REVO[®]-2

REVOLUTIONARY 5-AXIS MULTI

With advanced probe and controller technology the ALTERA SCANtek 5-axis CMM combines 3-axis CMM motion with an articulating head that moves in 2-axis as it measures.

The resulting 5-axis motion delivers unprecedented measuring speed, accuracy and flexibility, whilst avoiding the compromises inherent to conventional CMM probing techniques.

Infinite head positioning further aids access to difficult to measure features and increases the effective measuring volume of the CMM by minimising the space required for head orientations.

Ultra fast scanning

SCANtek technology allows the stylus to follow a continuous path around complex components without leaving the surface.

- Continuous scanning with 'on-the-fly' data collection.
- Dynamic 'in-scan' head orientations while measuring.
- Real-time head-to-part alignment to prevent probing errors.
- Optimised scan path for improved metrology and minimised dynamic errors.
- 'Head touches' for faster measurement compared with 3-axis methods.
- Rapid probe qualification with inferred positions for improved set-up times.

Non-contact inspection

Measure small and delicate features unsuitable for tactile measurement.

- Two vision modules provide inspection capability for different applications.
- Thousands of features measured in a fraction of the time taken using tactile methods.
- Accurate data correlation between tactile and non-contact measurements.

Surface finish analysis

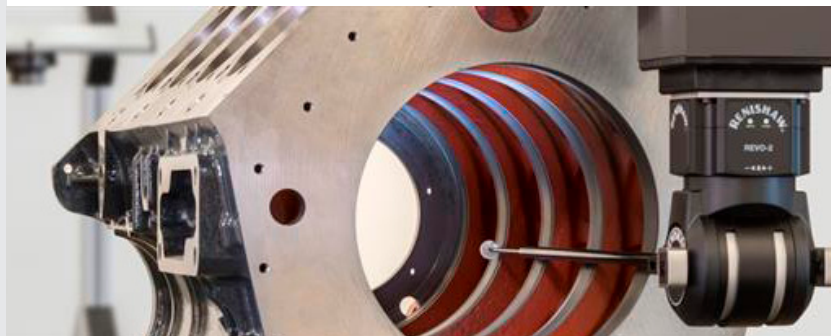
Combine surface finish analysis with other CMM measurements in a single operation.

- Integral motorised C-axis provides access to features at all orientations around the part.
- Output of RA, RMS and raw data for detailed surface finish / surface roughness reporting
- Variety of tip arrangements and knuckle joints to suit any application, including bores as small as 5mm (0.2 inch) in diameter.

REVO[®]-2 Specification

Scanning Speed (max.)	500mm (19.7 inch) per second
Measured Points (max.)	4,000 points per second
Probe Length (max.)	Straight stylus*: 800mm (31.5 inch) Cranked stylus**: 600mm (23.6 inch)
Angular Resolution	0.02 arc sec (0.01 µm per 100 mm)
Tilt Angle (A-axis)	-5° to +120° (RSP2 and RVP measurement) -100° to +120° (RSP3 and SFP2 measurement)
Rotation Angle (B-axis)	Continuous
Movement Speed (max.)	3 revolutions per second
Operating Temperature	+10 °C to +40 °C (+50 °F to +104 °F)

* From center of head rotation
** RSP3-6 probe

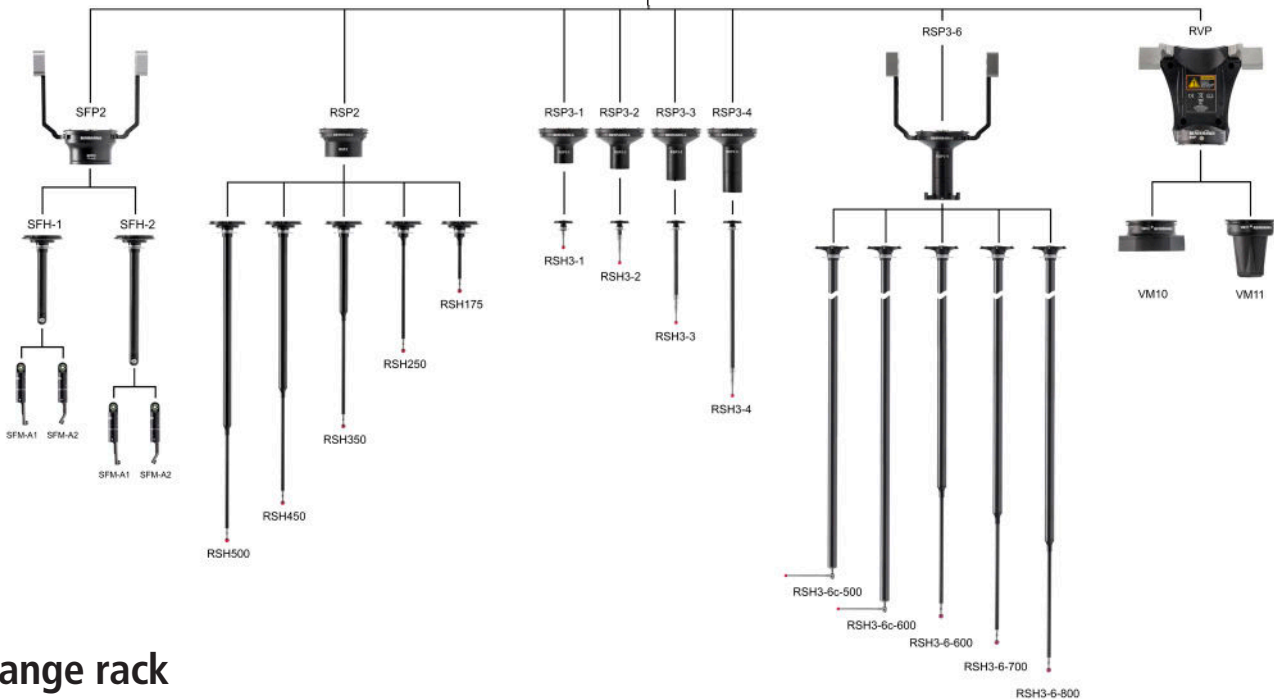


SENSOR

Multi sensor inspection

High performance scanning, non-contact inspection and surface finish analysis on a single CMM.

- Accurate correlation of data from different sensor types.
- Reduce part handling and operator dependency.
- Optimal feature access with minimal stylus changes.
- Extremely low scanning forces and minimal stylus wear.



Change rack

The MRS2 modular rack system is a versatile auto change and storage system for all REVO[®]-2 sensors, probes and styli.

- Automatic sensor, probe and stylus changing.
- Choice of rack lengths to suit any application.
- Options for long probes and complex clusters.
- Multi-tier racks for maximum storage capacity.



Rack dimensions

	400 mm rail (15.75 inch)	600 mm rail (23.62 inch)	1000 mm rail (39.37 inch)
200 mm leg (7.87 inch)	408 x 208 x 244 (16.06 x 8.19 x 9.61)	608 x 208 x 244 (23.94 x 8.19 x 9.61)	608 x 208 x 244 (39.69 x 8.19 x 9.61)
400 mm leg (15.75 inch)	408 x 208 x 244 (16.06 x 8.19 x 17.48)	608 x 208 x 244 (23.94 x 8.19 x 17.48)	608 x 208 x 244 (39.69 x 8.19 x 17.48)
600 mm leg (23.62 inch)	408 x 208 x 244 (16.06 x 8.19 x 25.35)	408 x 208 x 244 (23.94 x 8.19 x 25.35)	408 x 208 x 244 (39.69 x 8.19 x 25.35)
800 mm leg (31.50 inch)	408 x 208 x 244 (16.06 x 8.19 x 33.23)	408 x 208 x 244 (16.06 x 8.19 x 33.23)	408 x 208 x 244 (16.06 x 8.19 x 33.23)
Maximum usable rail	320 mm (12.59 inch)	520 mm (20.47 inch)	920 mm (36.22 inch)
Rail required per RCP TC-2/3	92 mm (3.63 inch)	92 mm (3.63 inch)	92 mm (3.63 inch)



RCP TC-2 and RCP TC-3 heated rack ports maintain the probes at operating temperature while stored in the rack, this maintains metrology for the system after a probe change.

MODUS™

MAKES SOPHISTICATED MEAS

MODUS™ software provides a powerful platform to create and run inspection programs, including full support for the revolutionary SCANtek 5-axis measurement technology.

The configurable user interface allows native DMIS programs to be developed online, with drawing geometry, embedded dimensions and tolerance data from CAD, and using full simulation with collision detection offline. The software includes certified algorithms for feature measurement, feature construction and part alignment.

For maximum interoperability with existing programs, reports and enterprise systems, MODUS™ is built on industry standards including the I++ DME protocol, native DMIS and a Microsoft SQL server database.



Dimensional Measuring Equipment



Dimensional Measuring Interface Standard



Microsoft SQL Server

Program creation

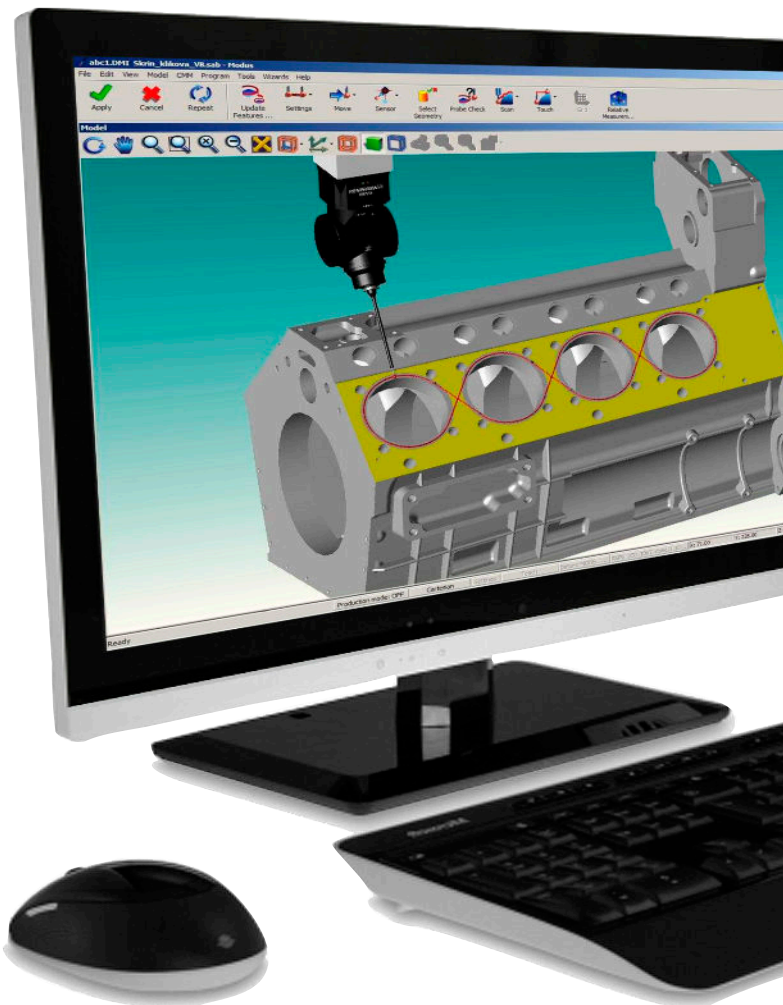
MODUS™ provides a complete suite of software functions supported by an intuitive user interface with graphical tools and routines.

- Online programming using the CMM joystick 'teach-mode' or offline programming using a CAD model with full simulation.
- Comprehensive reference frame tools from simple 3-2-1 datums to complex freeform alignment and best fitting.
- Automated GD&T labelling of all measured or constructed features with tolerance reporting.
- Graphical programming with easy to use drag and drop functionality including 'helical scans', 'scan on curve' and 'sweep scan'.
- Software 'Wizards' ensure best practice metrology is applied without specialist programming skills.
- Automatic feature recognition from measured points.

DMIS protocol

MODUS™ fully supports the industry standard DMIS (Dimensional Measuring Interface Standard) programming language for a futureproof investment in CMM programs.

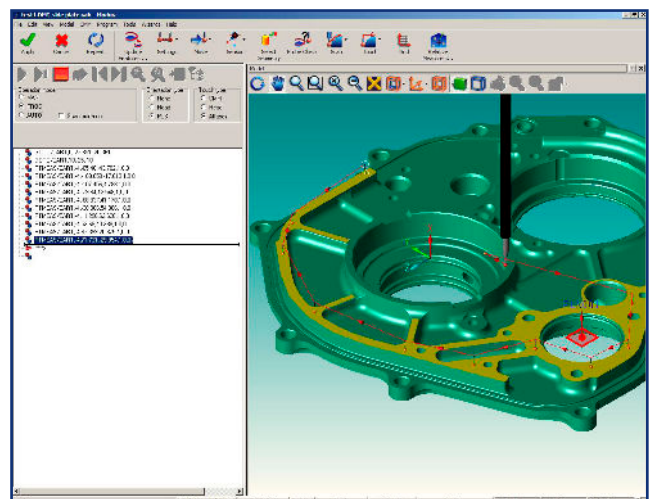
- Comprehensive support for native DMIS language.
- Context sensitive DMIS program editor with summary view.
- High-level support for conditional execution of commands using variables, macros, external programs and VB scripts.
- Powerful Windows style user prompt with user define input fields for operator data and program options.
- CMM program interoperability with other devices capable of supporting DMIS input/output files.



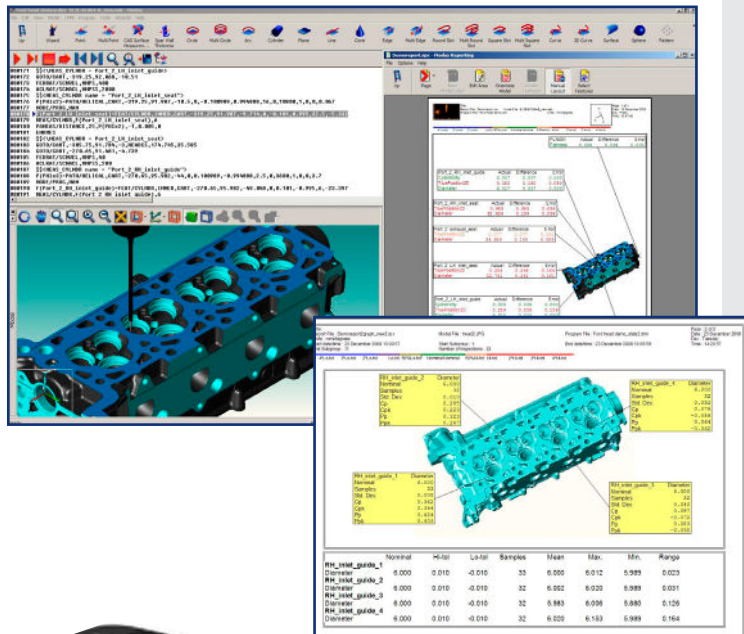
Configurable workspace

The MODUS™ interface is highly user-configurable, allowing you to tailor the screen layout to suit the programming, measuring or reporting activity at the time.

- Multiple activity-based workspaces each in its own separate window.
- Simultaneously dual screen operation of the user interface.
- Optimised program execution, reporting and screen refresh for reduced cycle times.



UREMENT SIMPLE



Graphical reporting

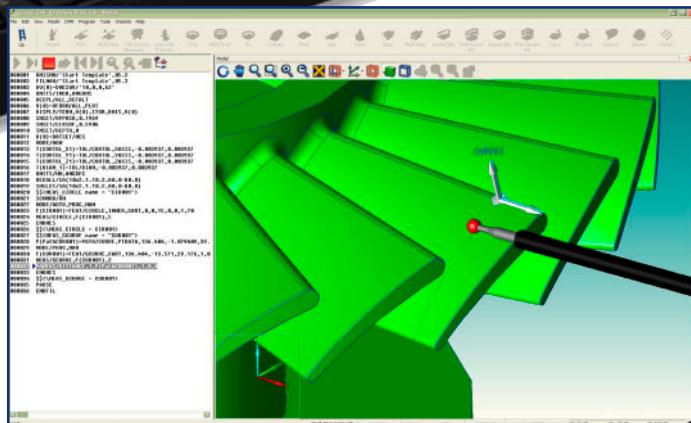
MODUS™ includes traditional text reports, whilst its graphical reporting delivers a wide range of full-colour pictorial inspection reports using the CAD model or representation of the component. Inspection results can also be output in a range of formats for further analysis.

- Graphical Reporting - for concise and fully user-configurable header, quality information, call-out labels, text and images.
- Multi-part inspection - a complete history of series production with results tables and statistics.
- Real-time reporting - create an on-screen graphical report during program execution with automated page layout.
- Report templates - quickly created new reports using existing templates while report Wizards assist with layouts.
- Data exchange - output inspection results to 3rd party applications including Excel (CSV), ASCII text, DMIS, XML or SQL.
- Statistical analysis - seamless interface to Q-DAS SPC package with user-configurable interface for type 1 & 2 studies.

Offline simulation

MODUS™ provides a complete offline programming environment in which users can develop and simulate programs, dramatically reducing CMM down-time when proving out programs.

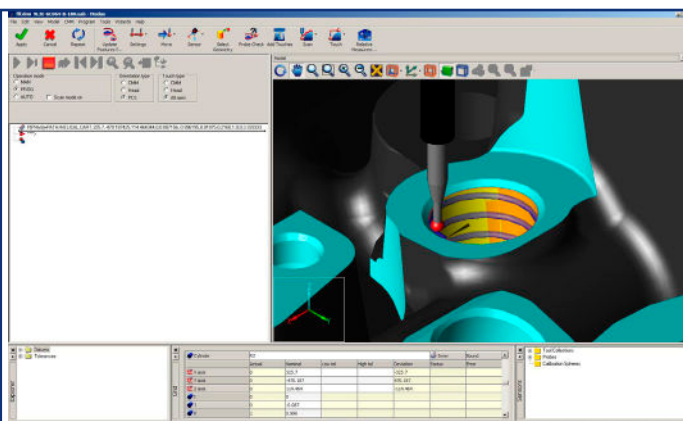
- Display multiple CAD files simultaneously.
- Probe-to-part collision detection with search and repair tools to remove potential crashes before they can occur.
- Complete library of Renishaw probes and accessories.
- Import measurement coordinates straight into the program from a text file for instant programming.



CAD interface

MODUS™ allows you to take full advantage of CAD-based inspection and reporting with support for native and exchange formats to ensure no loss of data integrity.

- SAT import/export
- STEP import/export
- IGES import/export
- VDA -FS import/export
- CATIA V4 import/export
- CATIA V5 import/export/PMI
- Siemens NX (Unigraphics) import/PMI
- Parasolid import/export
- PTC Creo (Pro/E) import/PMI
- Solidworks import



SPECIFICATIONS

Measuring Volume

ALTERA^M

8.7.6	10.10.8	<i>10.12.10</i>	<i>15.15.10</i>	20.15.12	20.15.15	25.20.15
10.7.6	15.10.8	15.12.10	20.15.10	25.15.12	25.15.15	30.20.15
<i>15.7.6</i>	20.10.8	20.12.10	25.15.10	30.15.12	30.15.15	35.20.15
	25.10.8	25.12.10	30.15.10	35.15.12	35.15.15	40.20.15
	<i>30.10.8</i>	30.12.10	35.15.10	<i>40.15.12</i>	40.15.15	<i>45.20.15</i>
	<i>35.10.8</i>	<i>35.12.10</i>	<i>40.15.10</i>	<i>45.15.12</i>	<i>45.15.15</i>	50.20.15
	<i>40.10.8</i>	<i>40.12.10</i>	<i>45.15.10</i>	<i>50.15.12</i>	<i>50.15.15</i>	60.20.15
	<i>45.10.8</i>	<i>50.12.10</i>	<i>50.15.10</i>	<i>60.15.12</i>	<i>60.15.15</i>	<i>65.20.15</i>
		<i>60.12.10</i>	<i>60.15.10</i>	<i>70.15.12</i>	<i>70.15.15</i>	<i>70.20.15</i>
		<i>70.12.10</i>	<i>70.15.10</i>			

ALTERA^{SL}

8.7.6	10.10.8	15.12.10	25.15.10	20.15.15	25.20.15
10.7.6	15.10.8	20.12.10		25.15.15	
15.7.6	20.10.8	25.12.10			
	25.10.8				



Performance

	ALTERA ^M	ALTERA ^{SL}
Volumetric accuracy	from 1.5 µm + L/375	from 1.5 µm+L/400
Repeatability	from 1.5 µm	from 0.7 µm
Velocity	up to 833 mm/s	up to 318 mm/s
Acceleration	up to 1,676 mm/s ²	up to 566 mm/s ²

Full CMM specifications available on request, contact LK Metrology for more information.
CMM sizes printed in **bold** font are standard sizes. CMM sizes in italic font are available on request.

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LK METROLOGY Ltd.
Argosy Road, East Midlands Airport,
Castle Donington, Derby,
DE74 2SA United Kingdom
Tel: +44 (0)1332 811138
Email: Sales.UK@LKmetrology.com

LK METROLOGY Inc.
29550 W. K. Smith Drive, Unit B
New Hudson, MI 48165
United States
Tel: +1 (810) 263 6100
Email: Sales.US@LKmetrology.com

LK METROLOGY China Co. Ltd.
Room 401, HuaTeng Building, No. A302,
Jinsong 3rd Zone, Chaoyang District, Beijing,
P.R. of China.
Tel: +86 10 87768860
Email: Sales.China@LKmetrology.com

LK METROLOGY Europe S.r.l.
Corso Orbassano, 402/16
10137 Torino, Italy
Tel: +39 011 0743945
Email: Sales.Italy@LKmetrology.com

LK METROLOGY Benelux
Technologielaan 11,
3001 Leuven, Belgium
Tel: +32 (0)16 387550
Email: Sales.Belgium@LKmetrology.com

LK METROLOGY GmbH
Siemensstrasse 24,
D-63755 Alzenau, Germany
Tel: +49 6023 9292617
Email: Sales.Germany@LKmetrology.com

LK METROLOGY SAS
1 Rue Guynemer - Bâtiment B6/B8
78114 Magny Les Hameaux (Paris)
Tel: +33 (0)1 77048480
Email: Sales.France@LKmetrology.com

www.LKmetrology.com