MODUS™ metrology software
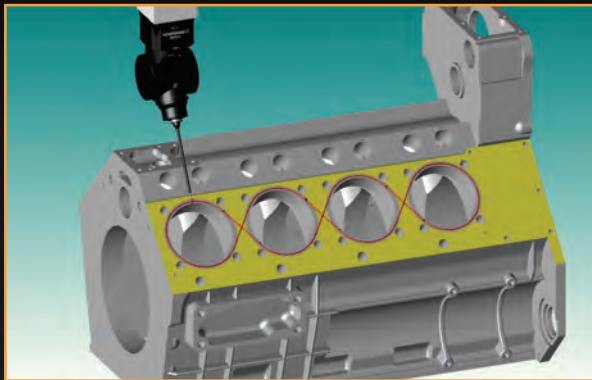

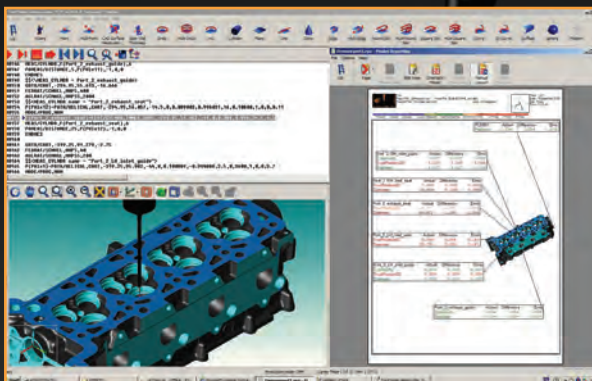

Powerful programming

CAD-driven offline programming with full simulation and collision detection

One stop shop

Part of a complete retrofit solution supplied and supported by Renishaw

Future proof

Full support for Renishaw's revolutionary REVO® 5-axis scanning technology
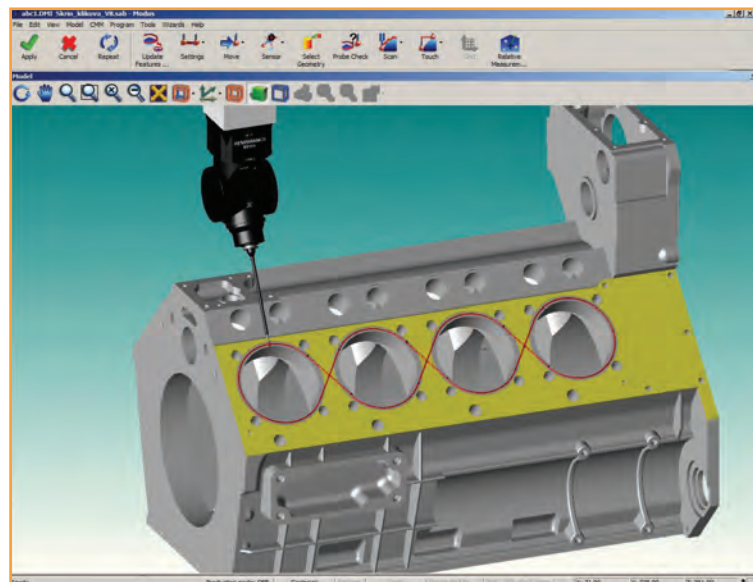
MODUS

Built on standards, delivering outstanding performance

Delivering a measurement revolution

Renishaw's new MODUS™ CMM software application enables it to offer CMM users a complete retrofit upgrade, supplied and supported by Renishaw. With full support for its entire range of sensors, including the award-winning REVO®, MODUS™ provides a powerful platform for 5-axis measurement.

MODUS™ highlights

- **Full support for I++ DME compliant metrology controllers, including Renishaw's UCC2 CMM controller.**

- **Full compatibility with REVO®**

- **Stand-alone or Integrated into enterprise metrology systems**

- **CAD-driven offline programming, with support for neutral formats of IGES, STEP, Parasolid® and VDAFS.**

- **High quality integration with the CATIA® (v5 and v4), Siemens® NX™ (previously Unigraphics®), Pro/E® and Solidworks® CAD/CAM solutions.**

- **Full simulation and collision detection of 5-axis moves**

- **Native DMIS support**

- **Certified mathematical algorithms**

- **Powerful text and graphical reporting**

- **Flexible output of results data including certified Q-DAS**

MODUS™ provides a powerful offline editor, generating measurement programs directly from CAD with on-screen probe path verification.
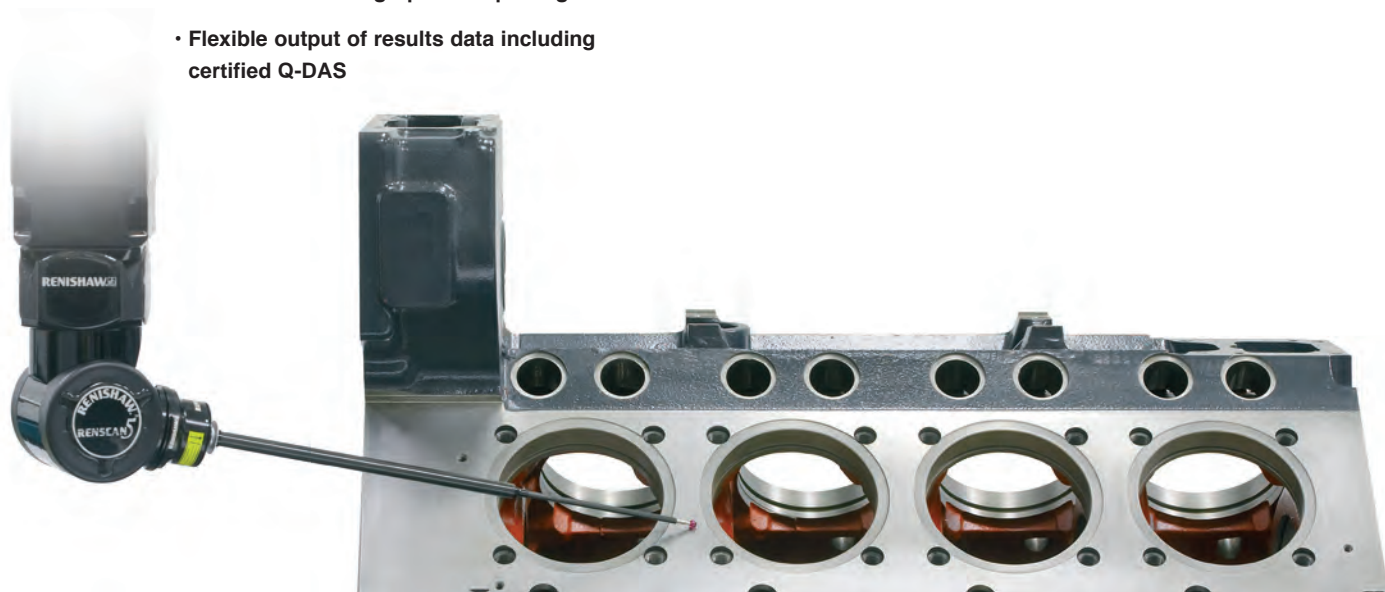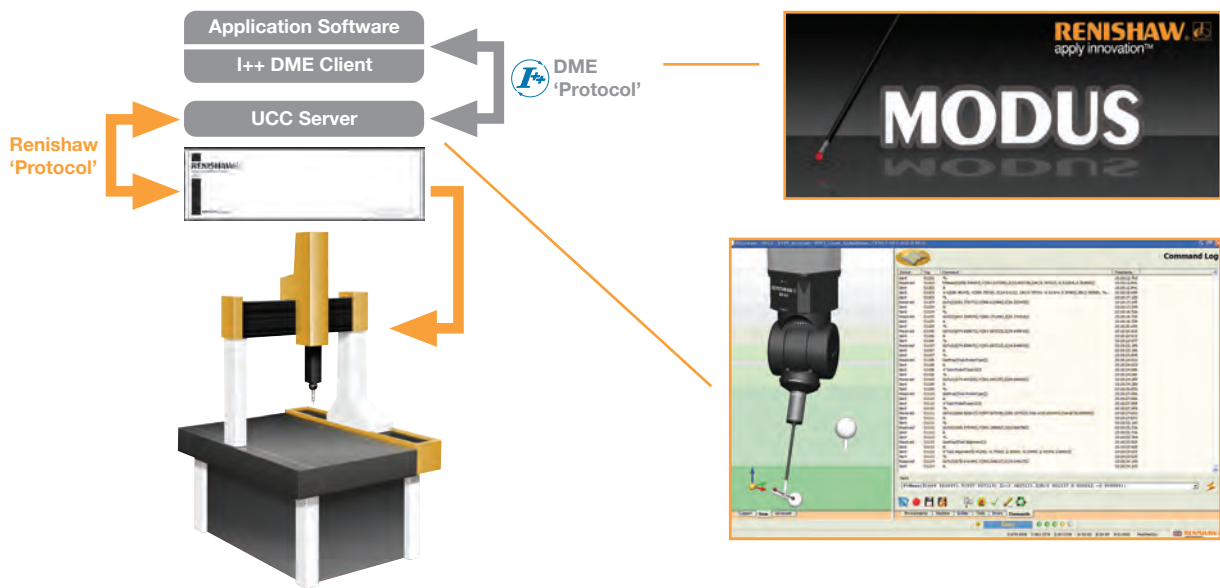
I++ DME compliant

MODUS™ interfaces with Renishaw's UCC2 universal CMM controller using the I++ DME protocol, which provides a common language for metrology commands. This leaves UCC2 users free to use other I++ DME-compliant metrology applications in the future, rather than being tied into a single proprietary solution.

Future proof

MODUS™ is a future-proof investment, ensuring guaranteed availability of the latest sensor and controller technology advancements from Renishaw, including future sensors for the REVO 5-axis scanning head.

Native DMIS

The MODUS™ program editor supports true native DMIS. This makes for quick conversion of existing programs with minimal re-writing needed, enabling MODUS™ users to take advantage of its capabilities with the minimum of delay.

The award-winning REVO® 5-axis scanning system provides unprecedented speed, accuracy and flexibility

Configurable environment
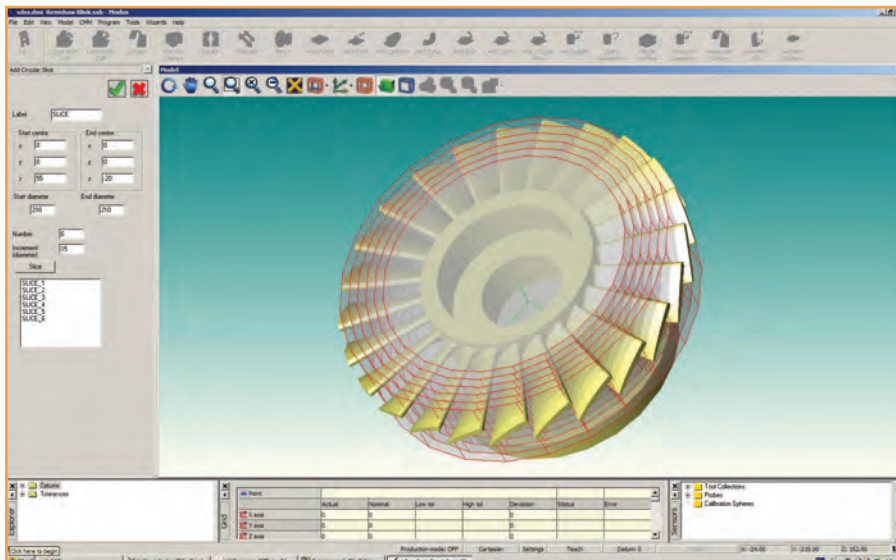
The MODUS™ user interface is highly configurable, allowing you to position activities in a series of windows that can be located and sized to suit your needs.

Tailored to suit you

MODUS™ features a user-configurable Windows® interface that comprises multiple activity-based workspaces, each in its own separate window. This provides tremendous flexibility in the layout and of the software, including the option to use two screens simultaneously.

Rapid program execution

Renishaw's engineers have optimised all aspects of the software for rapid execution, including re-drawing and refreshing graphics, execution of DMIS commands, data analysis and real-time reporting. This reduces inspection times.

Full, exact DMIS compliance

MODUS™ provides complete support for native DMIS, with both text and summary views of the measurement program. The context-sensitive editor provides high-level programming capability, including:

- Variable declaration, Integer, Real, Double, String, Booleans and Arrays

- Macros

- Modular programming with CALL

- IF, ELSE, ENDIF statements

- JUMP

- DO loops

- Intrinsic functions.

- PROMPT statement to create graphical dialog boxes with buttons, check boxes, list boxes, radio buttons and images.

Context-sensitive online help

CAD compatibility

Data direct from CAD

MODUS™ is designed to take full advantage of CAD-based inspection. It accesses geometry data directly from the native CAD model, ensuring there is no loss of accuracy when using CAD data for inspection programming.

Supported formats

Original files – CATIA® v4, CATIA v5, Pro/E®, Siemens® NX™ (previously known as Unigraphics®), Solidworks® and Parasolid®, ACIS®, HOOPS®

**Exchange protocols** – IGES, STEP, VDA-FS

CAD features

Fast loading of CAD data – using HOOPS® streaming technology (also used in CATIA®) so that the model loads in the background whilst you get on with programming.

Multiple CAD files – enables support for complex component assemblies or combinations of work-piece and fixtures for full simulation.

Product manufacturing information may be utilised from CATIA v5, Pro/E and NX models, enabling the use of embedded dimensional and tolerancing information.

Complex models can be imported in native formats with no data loss. MODUS™ supports multiple CAD layers.
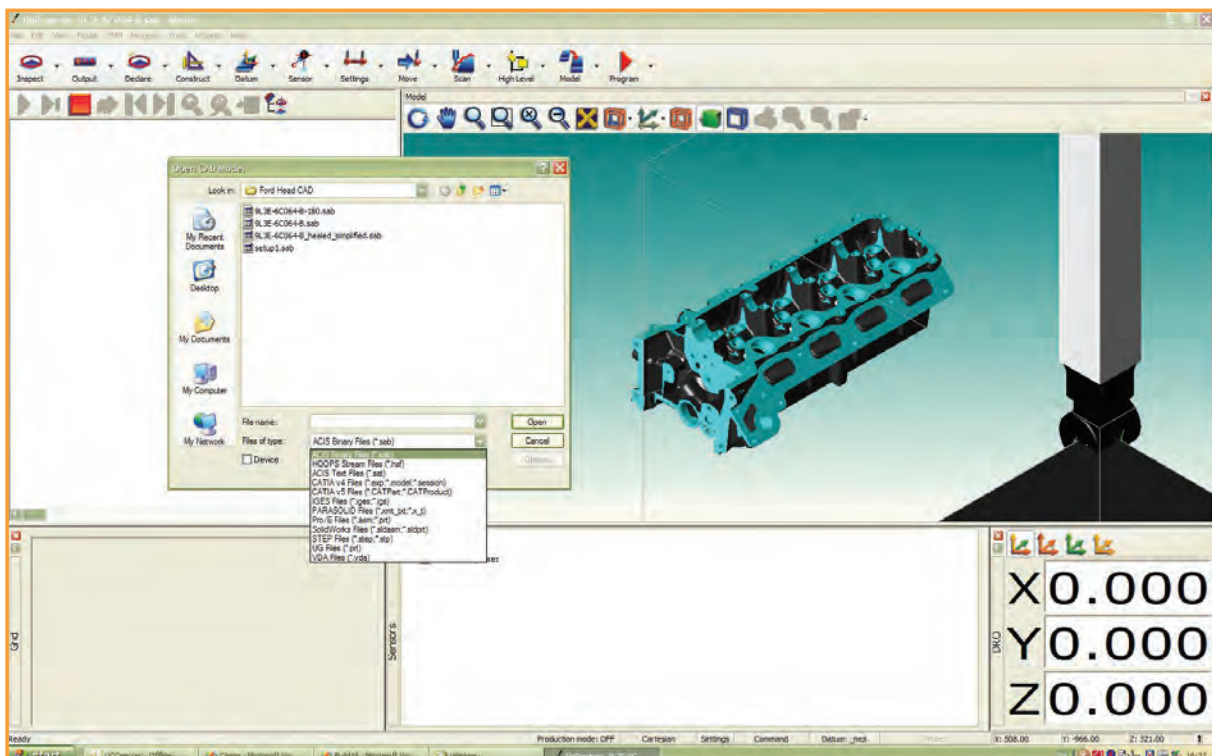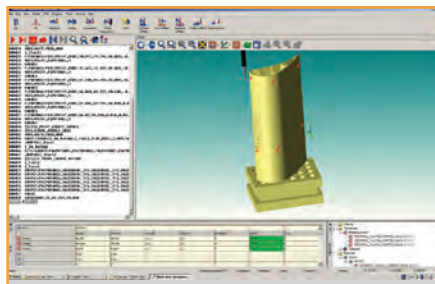
Programming overview

MODUS™ provides a comprehensive suite of 3-dimensional metrology functions, delivered via an intuitive user interface that features full graphical display of measurement routines. Wizards provide a quick and easy way to specify common measurement tasks, ensuring good practice is applied, without the need for specialist programming skills
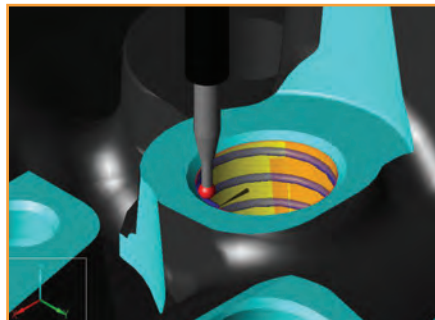
Creation of a continuous scan path for form measurement
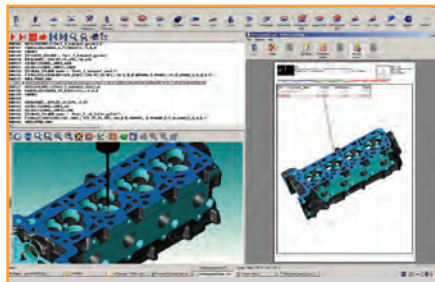
Key features

Touch-trigger, 3- and 5-axis scanning – MODUS™ enables the entire range of Renishaw sensors to be used in several measurement modes. Continuous scan paths support comprehensive analysis of feature form.

Flexible part programming – programs can be developed offline from CAD data, or in 'teach' mode using the CMM joystick.

Metrology expertise without the learning curve – wizards encapsulate measurement best practice and allow rapid programming and feature automatic error recovery logic.

Part alignments – ranging from simple 3-2-1 alignments to complex freeform alignment with optional iteration and best fitting.

Automated feature recognition from measured points and creation of labelled CAD features for all defined, measured or constructed features.

Real-time graphical reporting provides immediate on-screen results with an automated page layout.

Automated head angle calculation

Develop and run **custom Microsoft® Visual Basic scripts** to aid your inspection process.

Points measured on components with complex surfaces can be used to iteratively align the part.

Real-time graphical reporting of measured data.
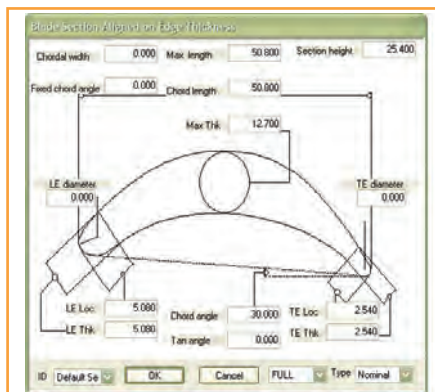
MODUS™ provides specific functions to support inspection of aerofoils

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Off-line programming and simulation

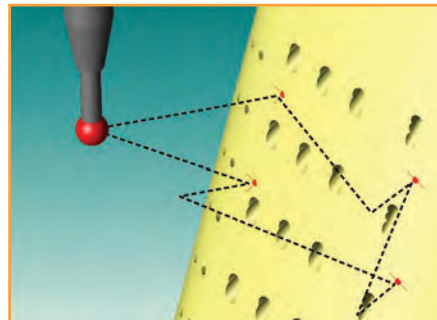**Time spent programming on a CMM is time that the machine is not measuring. MODUS™ provides a complete offline programming environment in which users can develop and simulate programs before they are ready to run by the time they reach the CMM, dramatically reducing CMM down-time.**

Simulation of measuring a series of discrete points to align a complex part.

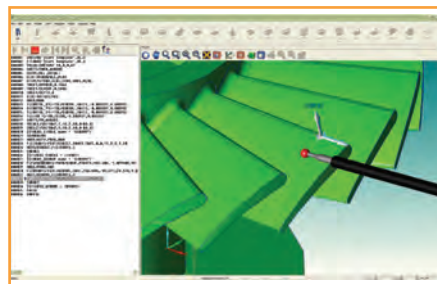## Offline programming features

Instant program generation – measurement points can be imported from a file straight into a part program and then quickly manipulated. Points can be sorted by position, snapped and orientated to the nearest CAD surface, or simply edited using the graphic user interface, reducing programming time and effort significantly.

REVO 5-axis measurement – MODUS™ provides a range of wizard-driven commands to define unique 5-axis measurements such as 'helical scans', 'scan on curve' and 'sweep scan'.

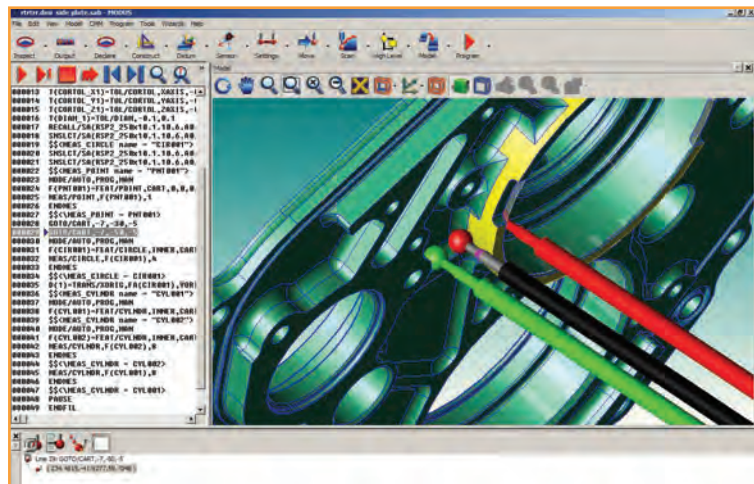**Full simulation with collision detection** – with knowledge of the part model, fixture and the CMM environment, MODUS™ can simulate all measurement strategies including 5-axis scans. Tools to search for and repair machine and workpiece collisions are provided, removing potential CMM crashes before they can occur.

Program simulation featuring 5-axis scanning.

Detecting and fixing a collision.

Reporting and analysis

MODUS™ provides 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.

Reporting features

Clear, concise graphical reporting – with fully user-configurable header, labels, text and images.

Multi-part inspection – a single report can provide a complete history of a series of components, including results tables and statistics.

Fast report creation – new reports can quickly be created from scratch or based on existing layouts, using wizards that provide assistance with page layouts.

Flexible exchange of inspection data – results data can be output for use with 3rd party applications in a range of formats including Excel (CSV), ASCII text, DMIS, internet-friendly XML or directly to the Microsoft® SQL Server database.

Statistical analysis – users of the leading Q-DAS SPC package are fully supported with a simple, user-configurable operator's interface from which type 1 & 2 studies can be launched
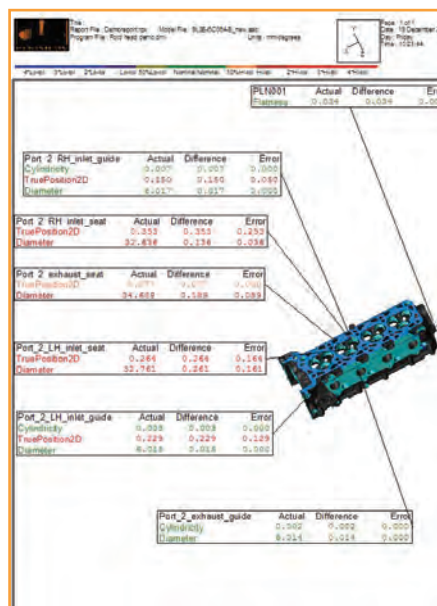
Graphical inspection report with measurement results associated with features on the CAD model.
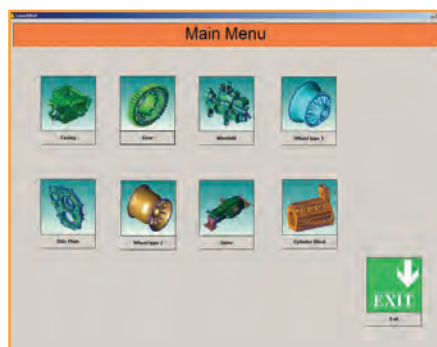
A user-configurable operator's interface makes the selection and operation of CMM programs and related tasks simple.

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Transform your CMM with a complete retrofit solution, supplied and supported by Renishaw

A complete solution direct from Renishaw

Renishaw can now provide a comprehensive CMM retrofit solution, based around the proven UCC2 universal CMM controller and its new MODUS™ CMM metrology software. Combined with an unrivalled range of touch-trigger, scanning and 5-axis sensors, as well as global support and UKAS-accredited machine calibration, Renishaw has assembled all the elements to deliver a professional, state-of-the-art CMM retrofit solution.

A solution for all brands of CMM

Although Renishaw's unique REVO® 5-axis scanning system has been available from Mitutoyo, Wenzel, Dukin and Metris for some time, until now users of other CMMs have been unable to take advantage of this revolutionary technology.

The operational benefits of increased productivity, reduced inspection lead times and greater automation of measurement tasks are now available to all CMM users.

A Renishaw retrofit gives users of all brands of CMM access to state-of-the-art technology, with the security of global service and support direct from the manufacturer.

MODUS™ software can be supplied as part of a complete retrofit solution on any brand of CMM.

"We can now offer customers of all brands of CMM, including Hexagon and Zeiss, a complete solution that features leading-edge technology in every aspect, backed up by the security of service and support direct from Renishaw."

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RENISHAW®
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Renishaw applies innovation to provide solutions to your problems

Renishaw is an established world leader in metrology, providing high performance, cost-effective solutions for measurement and increased productivity. A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Renishaw designs, develops and manufactures products which conform to ISO 9001 standards

Renishaw provides innovative solutions using the following products:

- **Probe systems for inspection on CMMs (co-ordinate measuring machines).**
- **Systems for job set-up, tool setting and inspection on machine tools.**
- **Scanning, digitising and dental systems.**
- **Laser and automated ballbar systems for performance measurement and calibration of machines.**
- **Encoder systems for high accuracy position feedback.**
- **Spectroscopy systems for non-destructive material analysis in laboratory and process environments.**
- **Styli for inspection and tool setting probes.**
- **Customised solutions for your applications.**

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Part No. H-1000-3088