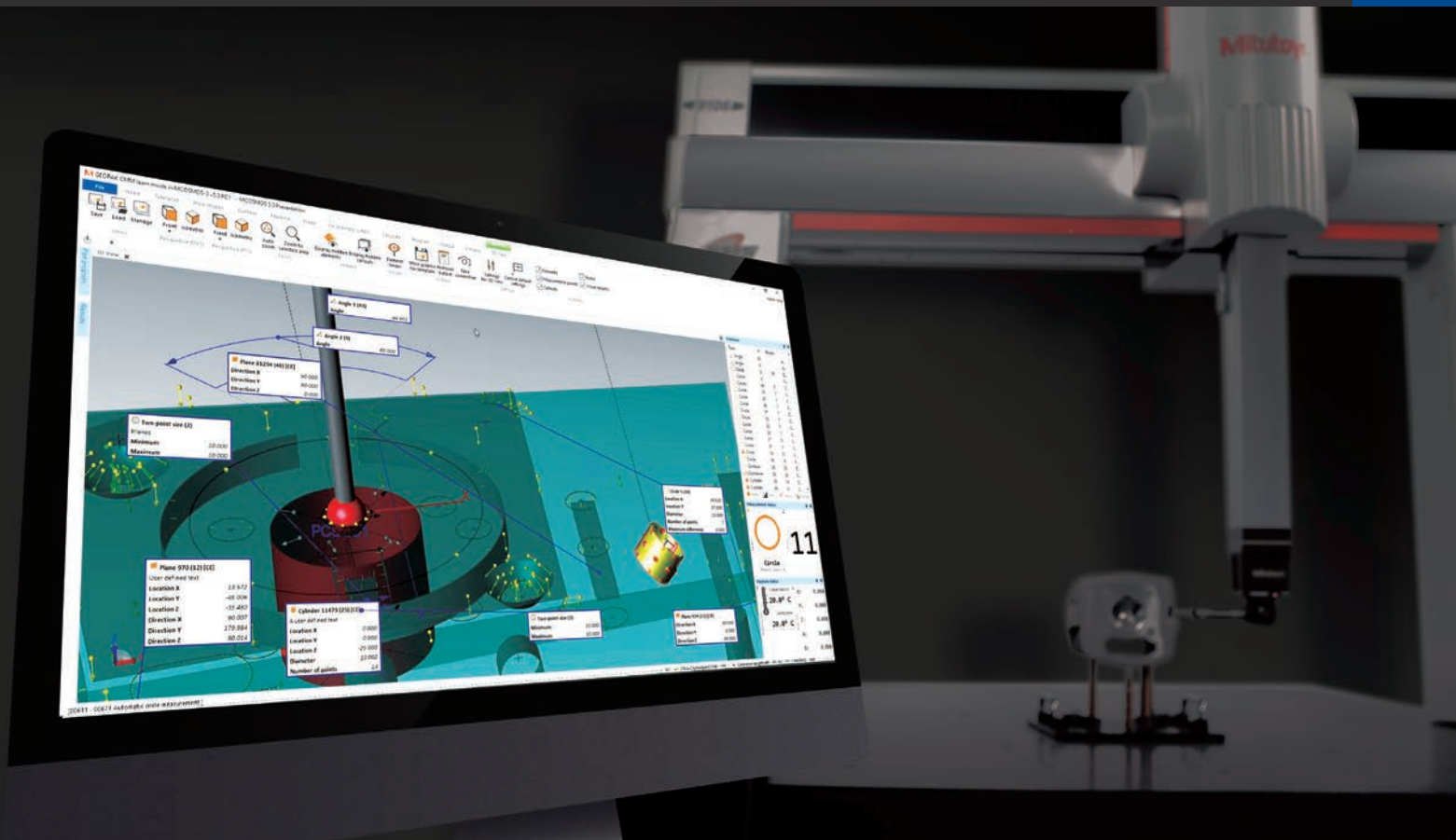




MCOSMOS v5

CMM DATA PROCESSING SOFTWARE

COORDINATE
MEASURING MACHINES



MAKE THE MOST OUT OF YOUR CMM WITH MITUTOYO MCOSMOS v5

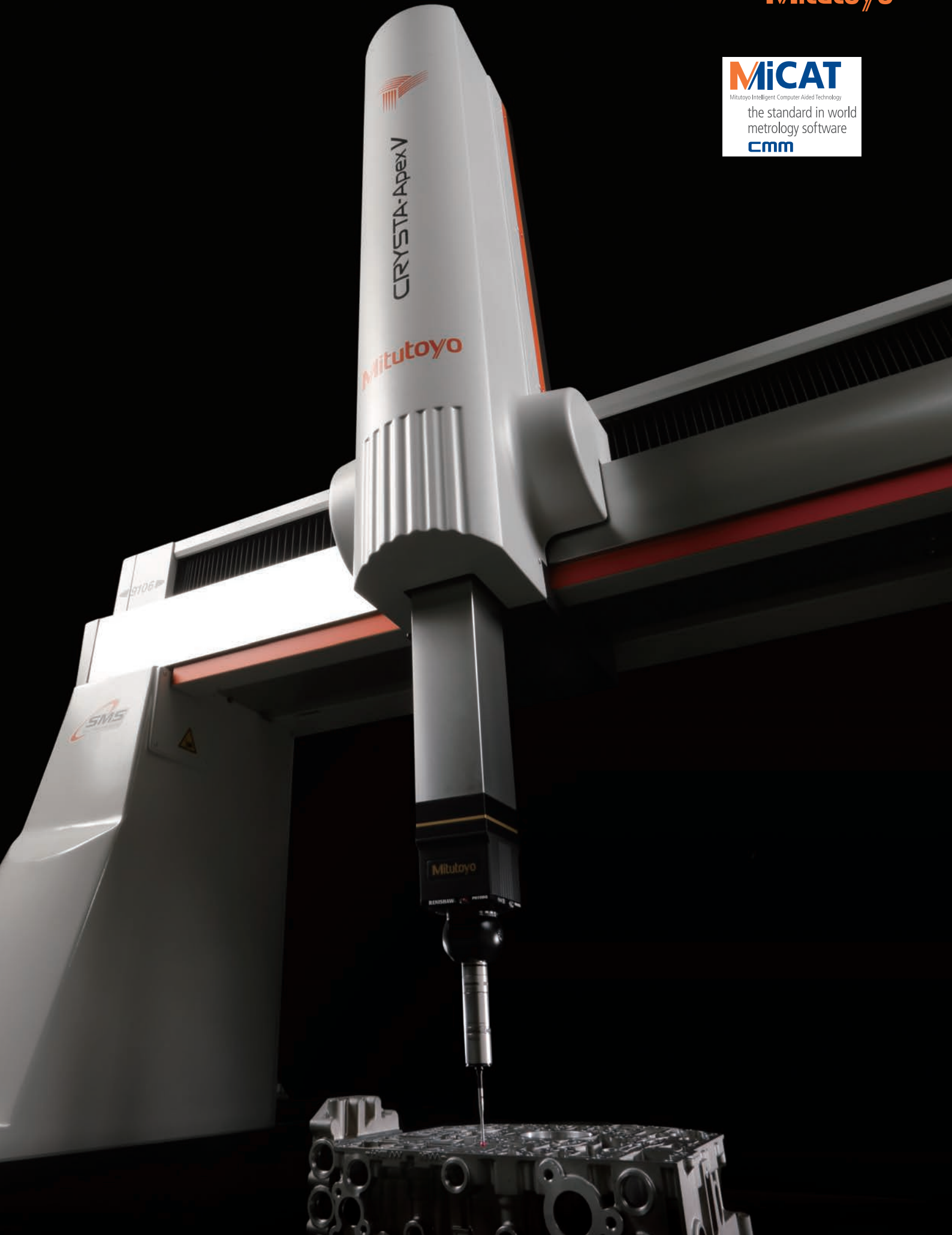
The well-known software suite, MCOSMOS, is recognized as the go-to data processor for Mitutoyo's range of top-of-the-line CMMs. Supported by an extensive lineup of optional software applications, users have full control over a wide range of probe systems ready for any kind of workpiece.

MCOSMOS helps you carry out all your measuring and test jobs at lightning speed, simply and safely. MCOSMOS handles large amounts of data with ease, making it available across all the networked areas of the production chain. This streamlines the measuring process, optimizes the flow of information, and minimizes non-conformances. The result is increased efficiency throughout the production process with significantly reduced costs.

With its specialist expansion modules, MCOSMOS can focus on your company's very specific measurement requirements. With Mitutoyo software, you are best prepared for every imaginable 3D coordinate measurement challenge, both now and in the future with maximum flexibility.

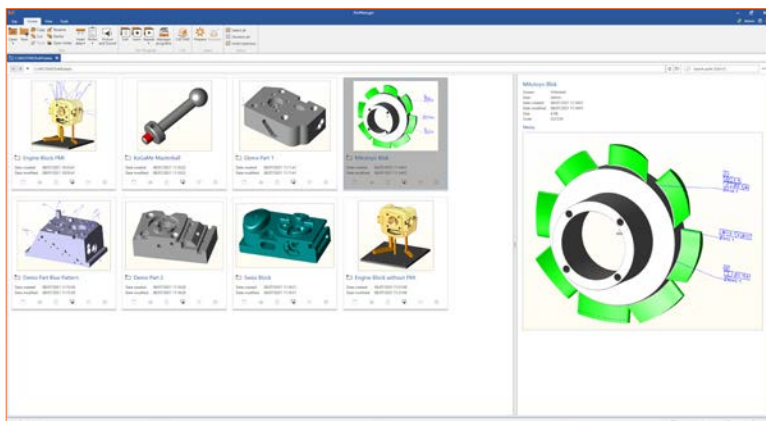
MCOSMOS is the smart software platform from Mitutoyo, setting international standards for sophisticated 3D coordinate measurement. With MCOSMOS, your coordinate measuring machines become efficient information centers - powerhouses of design, production, and quality control. Streamlined measurements, as well as convenient and reliable data, are at your fingertips throughout the production process.

MiCAT
Mitutoyo Intelligent Computer Aided Technology
the standard in world
metrology software
cmm



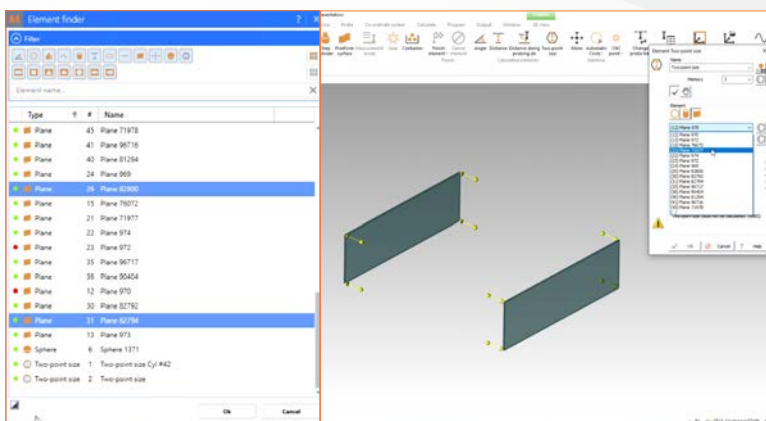
Highlights

M COSMOS 5 VERSION



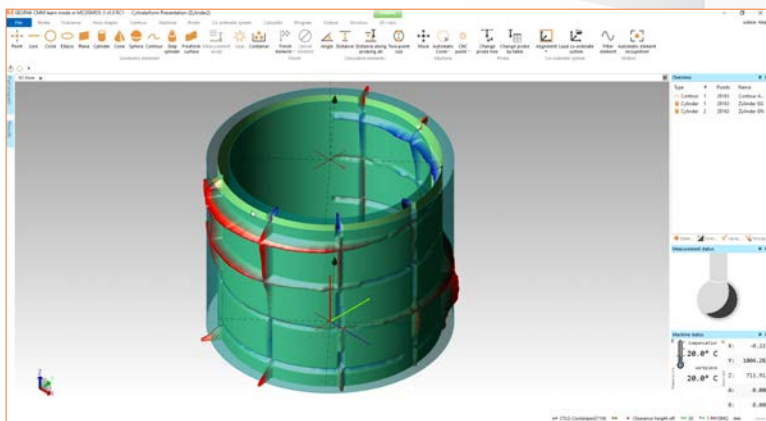
NEW GRAPHICAL USER INTERFACE

Modeled with a modern design, this new GUI improves on the previous version with a simplified and attractive module display.



IMPROVED SEARCH FUNCTION

Designed to assist the user's in their quest for specific elements of their measuring program, editing has become even easier when compared to version 4.

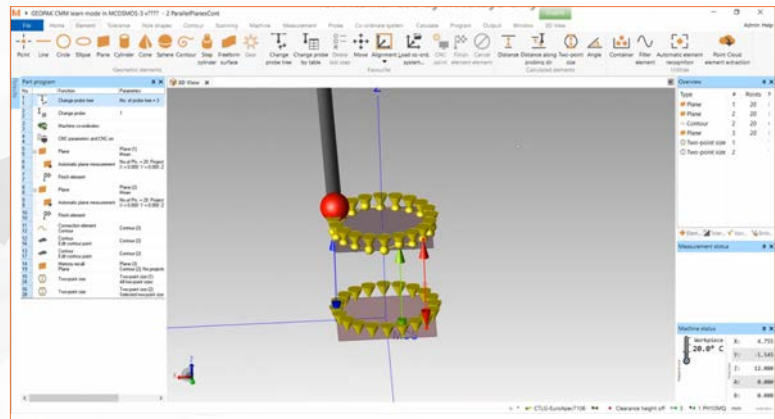


3D TOPOGRAPHICAL VIEWS

Added in this new version of M-COSMOS, is the possibility of using a 3D display of the geometry and microstructure of technical surfaces including visualized tolerance zones, providing operators with a more detailed overview of the workpiece.

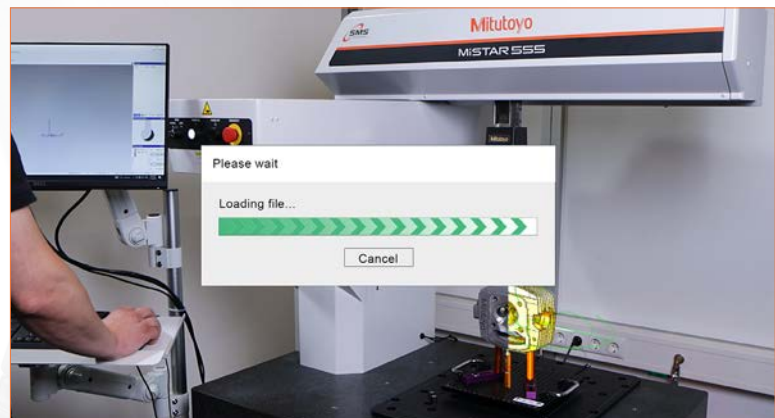
TWO-POINT SIZE OF PLANES

The function "Support of two-point size of planes according to ISO 14405-1" gives MCOSMOS the capability to evaluate the two-point size of two selected planes, which both were calculated by least squares (Gaussian) method.



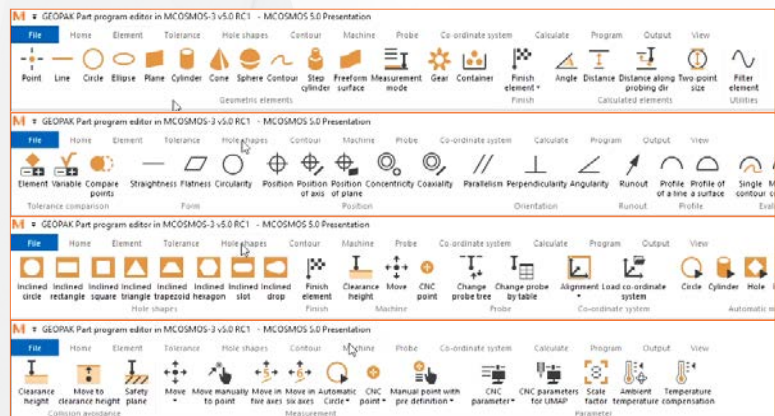
OPTIMIZED FOR LARGE CAD FILES AND SPEED

A large amount of progress has been made in Mitutoyo's optimization for large CAD files over their previous versions of software, lowering process time and improving the overall operation of MCOSMOS.



LOGICAL SORTED TABS WITH RESPONSIVE RIBBONS

Toolbars are replaced by ribbon control, including contextual tabs.

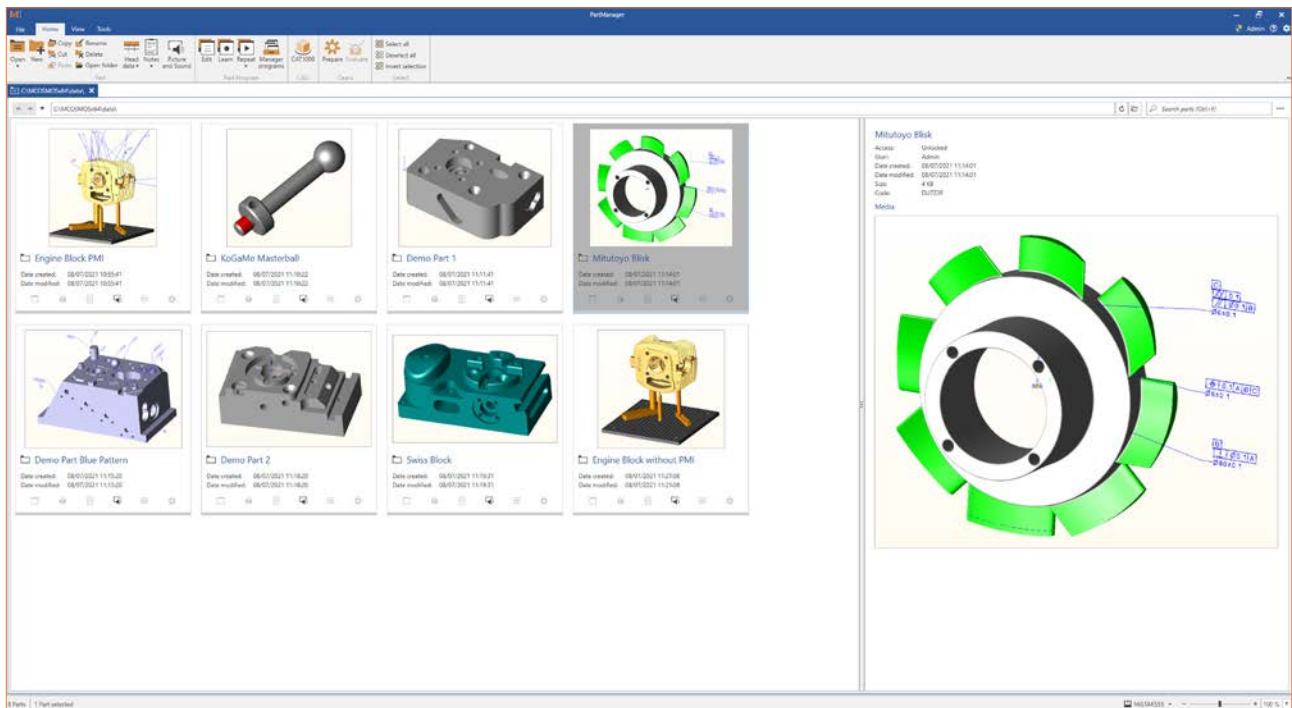


PartManager

Control & Command Center

PartManager is the versatile management center within MCOSMOS software, the control center for all measurement tasks. From PartManager, users can boot main program modules such as GEOPAK, GEARPAK, CAT1000P/S, etc., or even configuration programs.

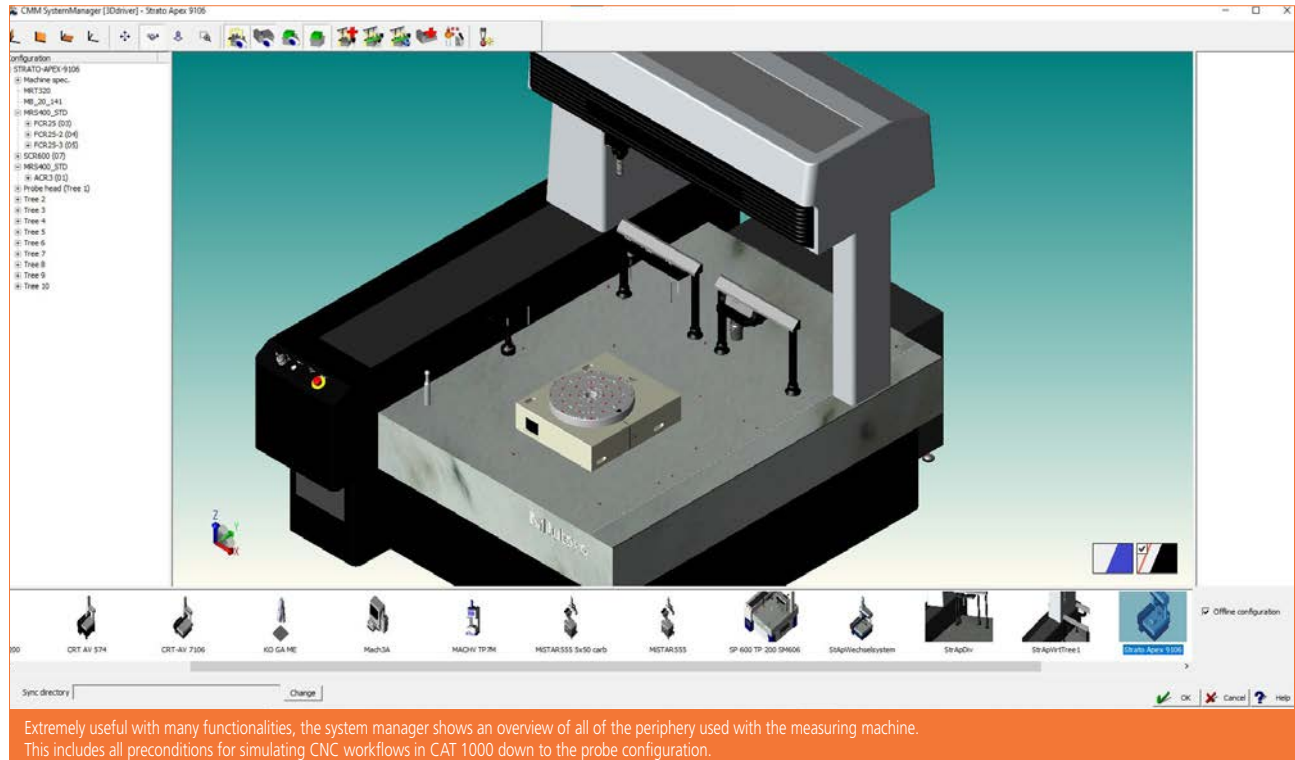
And most importantly, detailed documentation and archiving of data records are organized here in a simple, convenient, and very user-friendly way.



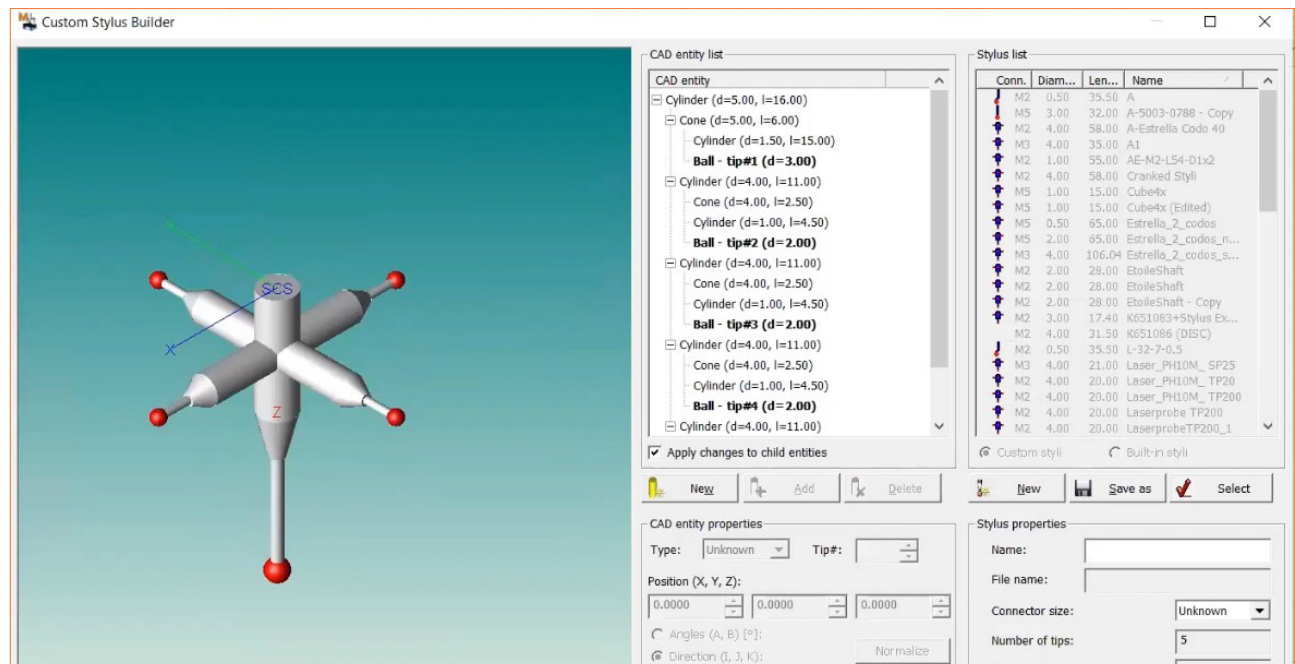
- Perfect for organizing all notes, reports, data, and images throughout the measurement process
- Visibly indicated in the parts list under the available data column
- Contains a user management system with detailed user rights and a program change history list

System Manager Builder & Configurator

System Manager



The new tool StylusBuilder enables users easily to create, modify or delete their own custom stylus.



GEOPAK

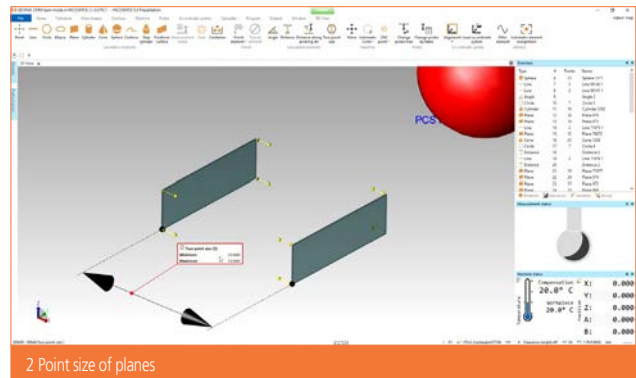
The Geometry Module

This universal geometrical measuring software delivers high-performance multidimensional measurements. With the ability to control your workpiece from design to completion, its various functions make GEOPAK one of the most powerful programs available.

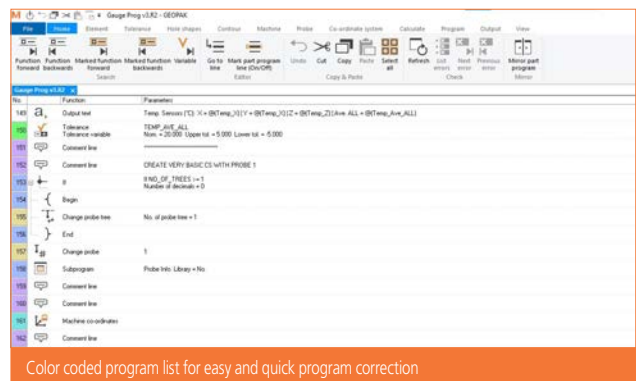
Display what needs to be done for workpiece alignment in a step-by-step format.

Features:

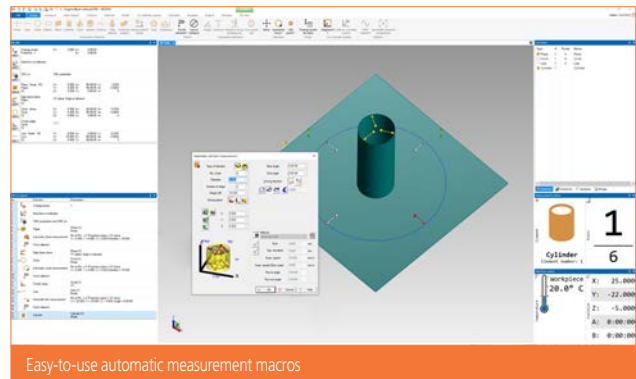
- User-friendly menus & graphics
- Online/offline programming capability
- High-speed scanning of control geometry elements
- User-definable dialogues and variables for flexible programming
- Support of 4 and 5-axis technology with additional rotary tables and probe systems
- 3D topographical view with a tolerance zone
- Automatic element recognition
- Flexible customer-specific reporting
- Pure DMISPAK format support
- Support of I++ format
- PTB-certified algorithms for geometry calculation
- FDA 21 CFR Part 11 compliant functionality:
 - User and access control
 - Revision management
 - Forgery-proofed measurement reports (PDF Format)



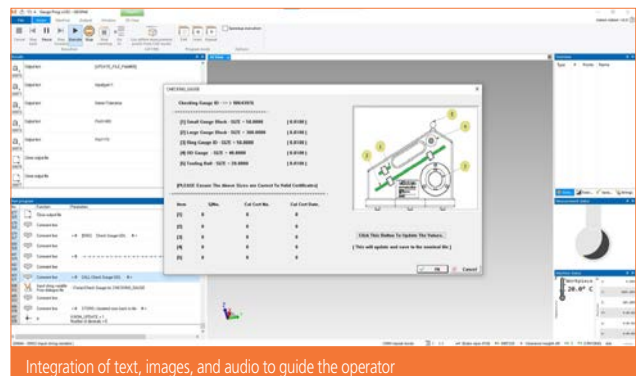
2 Point size of planes



Color coded program list for easy and quick program correction

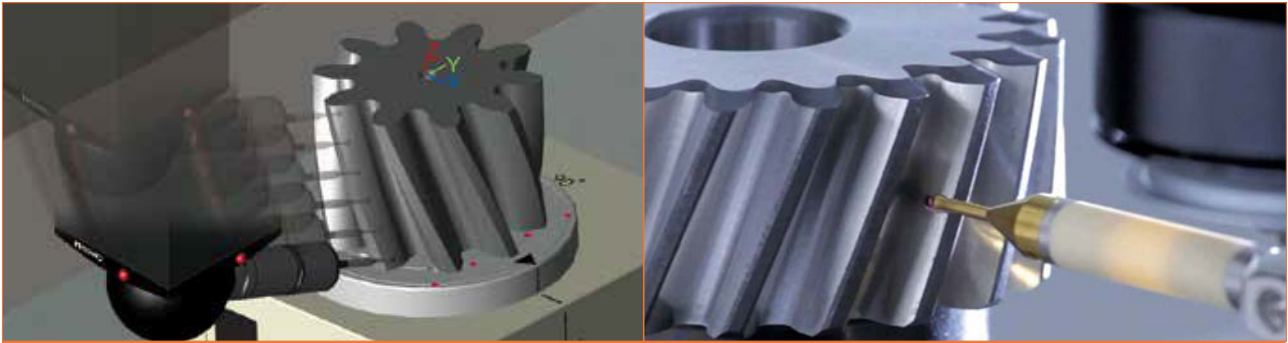


Easy-to-use automatic measurement macros



Integration of text, images, and audio to guide the operator

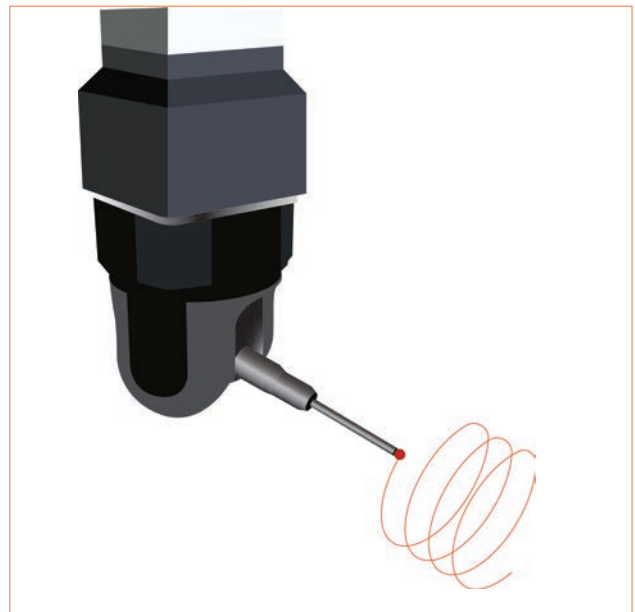




4 Axis technology supporting high-speed scanning



REVO 2
5-Axis rapid scanning at any angle



PH20
Rapid tactile measurements at any probe angle

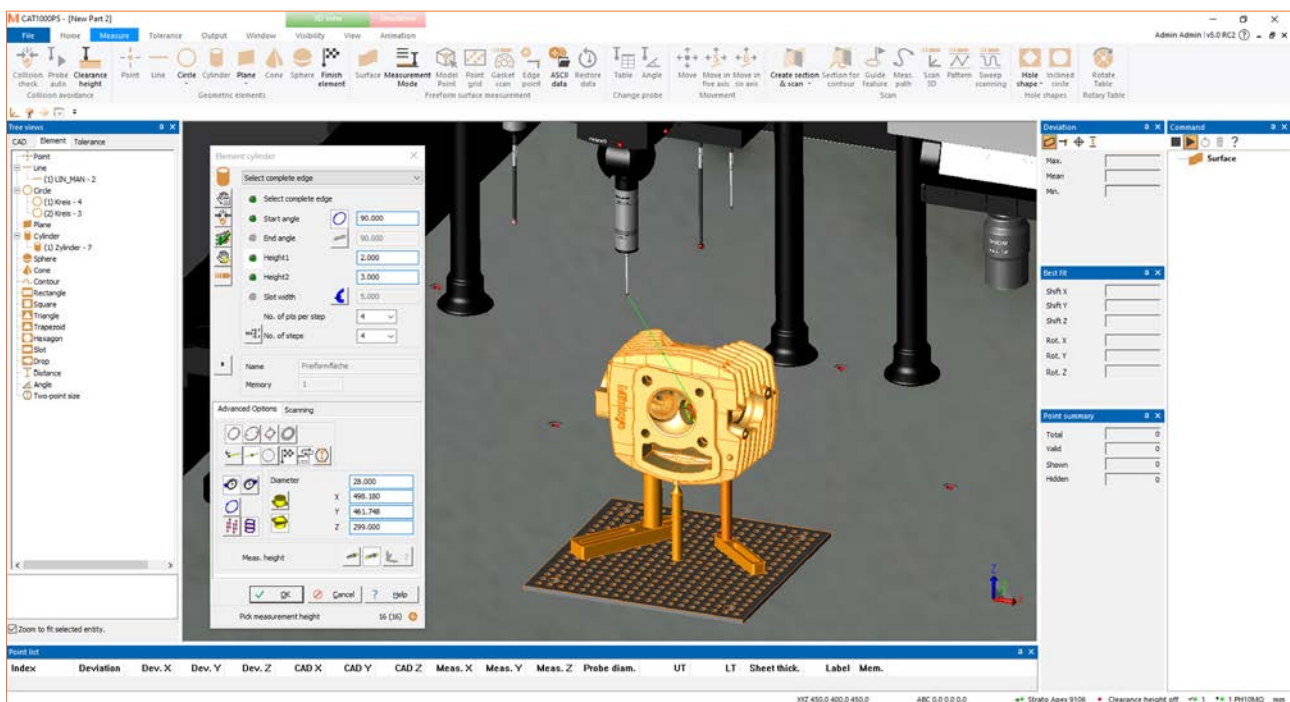


Multi-sensor support

CAT1000P

The Programming Module

CAT1000P puts an end to laborious data input, significantly reducing the difficulty of measurement task programming in GEOPAK. With just a few mouse clicks, all data for measuring parts and tolerance testing can be taken from CAD models.



Features:

- Simple measurement program creation from the CAD model
- Automatic probe change suggestions
- Automatic traverse path generation & collision avoidance
- Clear representation of the measuring points in 3D graphics
- Automatic conversion of standard surfaces in the event of CAD model errors
- Simulation of individual traversing steps & part programs
- Offline program creation for optimized machine use
- Standard interfaces: ACIS (SAT) / STEP; Non-standard interfaces: CATIA V4/ CATIA V5 / Parasolid / Pro/E / Unigraphics / SolidWorks / Inventor / IGES / VDAFS
- All interfaces for CAT1000P can also be used with CAT1000S.
- Supported hole shape elements: Solid circles, rectangles, squares, triangles, trapeziums, hexagons, elongated holes, and teardrops.

Graphical representation of point cloud

The screenshot displays the Mitutoyo software interface for graphical representation of a point cloud. The main window shows a 3D CAD model of a mechanical part with a point cloud overlay. The interface includes a toolbar with various measurement tools, a command window, a chart, and a detailed point list table.

Index	Deviation	Dev. X	Dev. Y	Dev. Z	CAD X	CAD Y	CAD Z	Meas. X	Meas. Y	Meas. Z	Probe diam.	UT	LT	Sheet thick.	Label	Mem.
1	0.411	0.411	0.000	0.000	105.000	3.207	-38.773	105.411	3.207	-38.773	2.000	0.500	-0.500	0.000	1	1
2	0.421	-0.421	0.000	0.000	105.000	-15.542	-33.307	104.579	-15.542	-33.307	2.000	0.500	-0.500	0.000	1	1
3	0.972	-0.972	0.000	0.000	105.000	21.619	-32.194	104.028	21.619	-32.194	2.000	0.500	-0.500	0.000	1	1
4	0.410	0.410	0.000	0.000	105.000	-36.326	-43.407	105.418	-36.326	-43.407	2.000	0.500	-0.500	0.000	1	1
5	0.725	0.725	0.000	0.000	105.000	24.029	-44.541	105.725	24.029	-44.541	2.000	0.500	-0.500	0.000	1	1
6	0.924	0.924	0.000	0.000	105.000	30.587	-53.425	105.924	30.587	-53.425	2.000	0.500	-0.500	0.000	1	1
7	0.899	0.899	0.000	0.000	105.000	-10.514	-40.304	105.899	-10.514	-40.304	2.000	0.500	-0.500	0.000	1	1
8	0.534	0.534	0.000	0.000	105.000	-35.666	-38.411	105.534	-35.666	-38.411	2.000	0.500	-0.500	0.000	1	1

CAD model representation with information window containing the measurement results of the geometric elements

GD & T Wizard

The CAD model-aided dimensional and positional tolerance processing assistant, for defining tolerances and simplifying analysis. Representation in accordance with ASME Y 14.41 standard

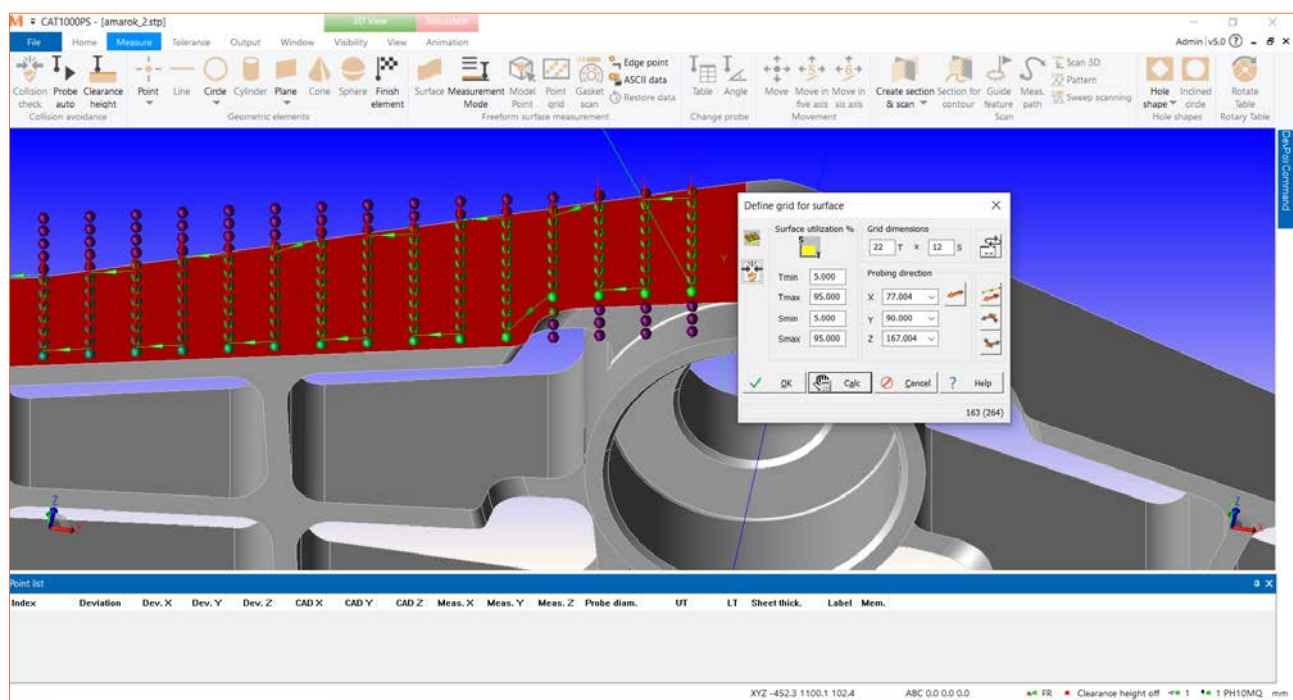
The screenshot displays the GD & T Wizard software interface. The main window shows a 3D model of a mechanical part with a tolerance wizard dialog box open. The dialog box includes fields for tolerance index, nominal element, datum, and various tolerance types.

Analysis using GD & T Wizard

CAT1000S

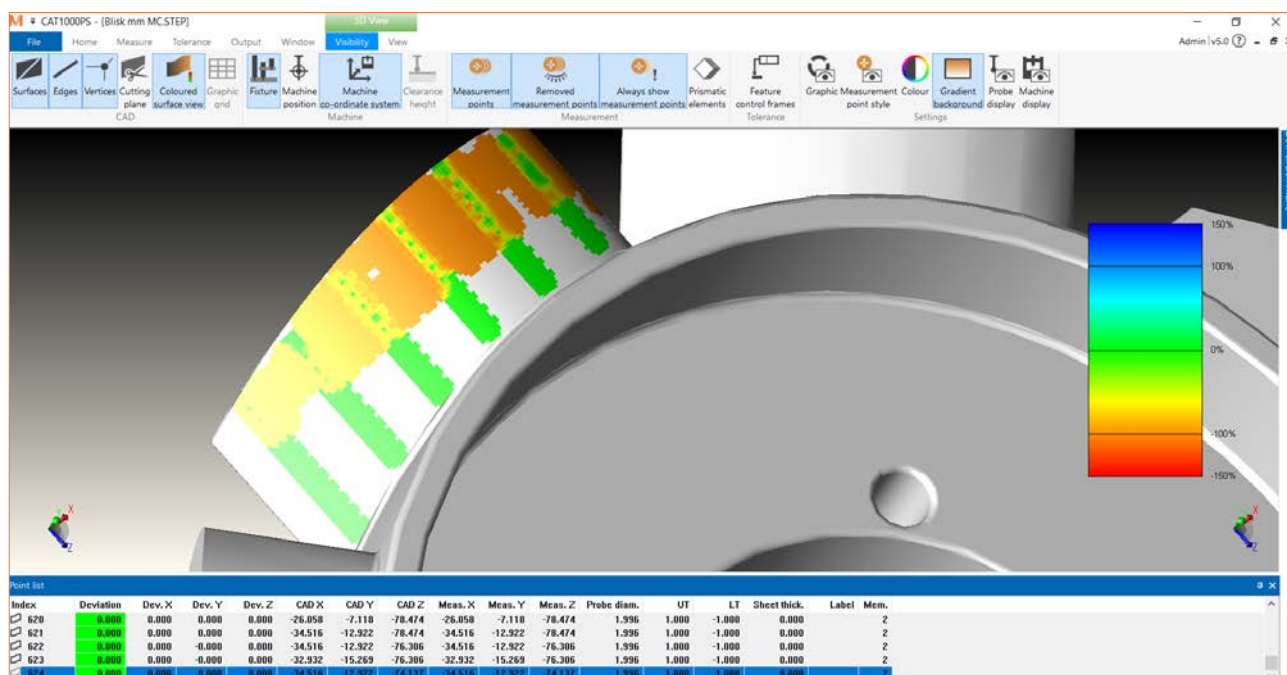
The 3D Freeform Surface Evaluation Module

CAT1000S precisely compares solid bent surfaces with their desired setpoint entries from CAD data. The measurement results are then displayed in easily interpreted graphics with sections color-coded based on non-conformances.

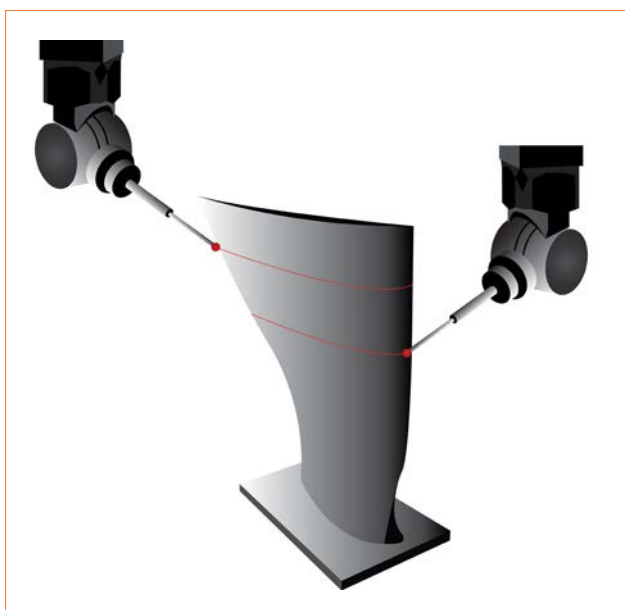


Features:

- Simple & convenient operation
- Rapid setpoint/value comparison between entry and measurement
- Rotatable and scalable 3D representation
- Representation of non-conformances with color gradations
- Flexible & customer-specific reporting



Surface quality can be represented via color shading on the surface of the CAD model.



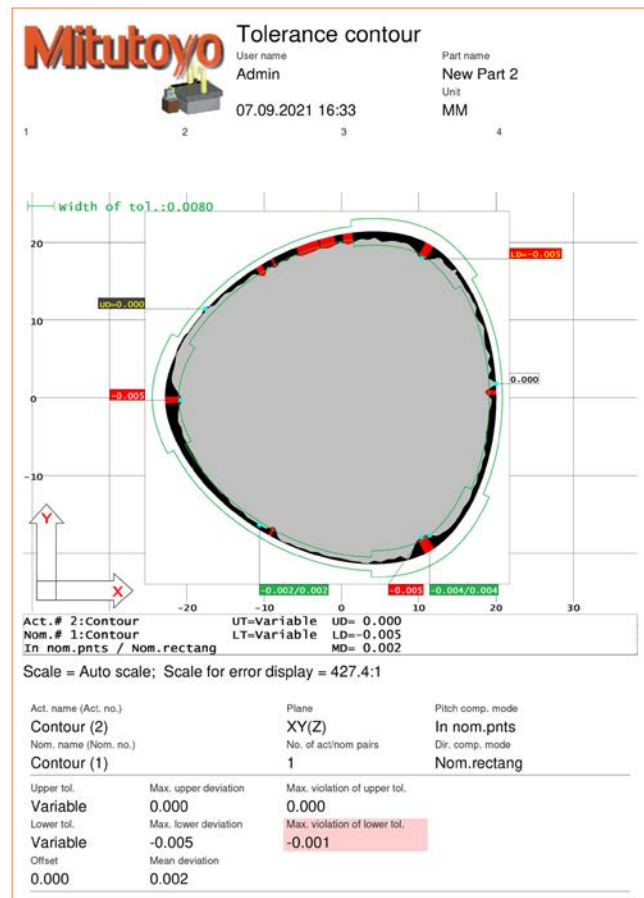
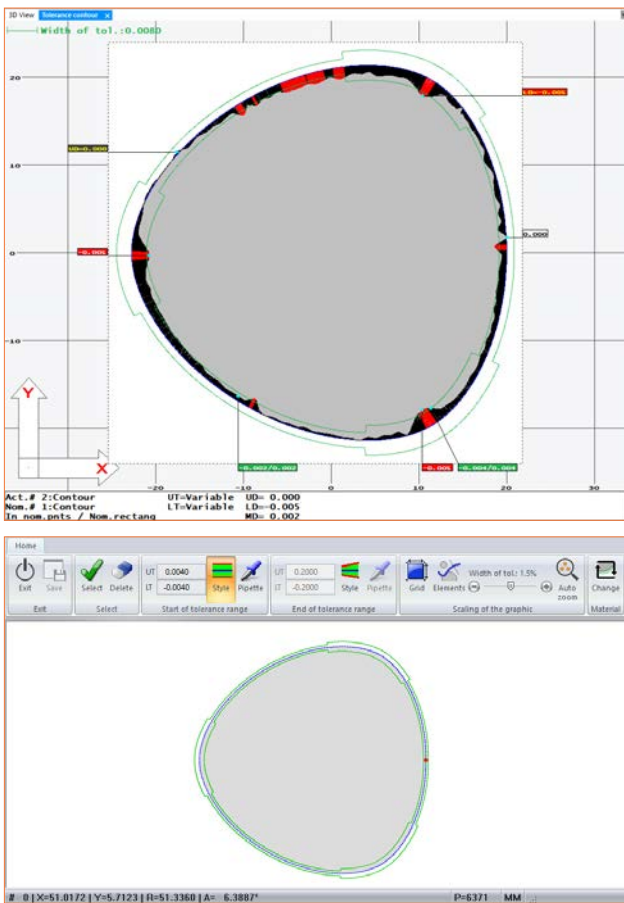
Curve scanning

Supported in CAT1000S by using a Revo 2 measuring head, users can scan workpieces by clicking on the CAD model, including the possibility of a virtual simulation of the scan path.

SCANPAK

The 2D Contour Evaluation Module

Quantitatively determine your desired contour and reflect this in the production process directly for optimizing workpieces right away thanks to SCANPAK.



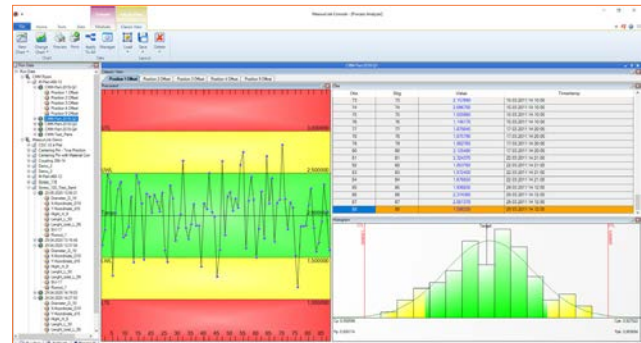
Features:

- Sophisticated contour evaluating and processing
- Direct integration of contours into geometric measurement programs
- Form scanning & data feedback into the CAD system/machine controls
- Graphical representation of tolerance comparison
- Flexible reporting functions
- Multi-sensor support
- Unknown 3D bodies on freeform surfaces can be digitized via the Patchscan function
- Possibility to add a fourth axis with the optional rotary tables

MEASURLINK®

The Statistical Evaluation Module

Automatically transfer measurement results into a SQL database directly available for monitoring, analysis, or reporting in real-time with MeasurLink. Available in several modules offering you a wide range of solutions, these can be combined for a license package best suited to your needs.



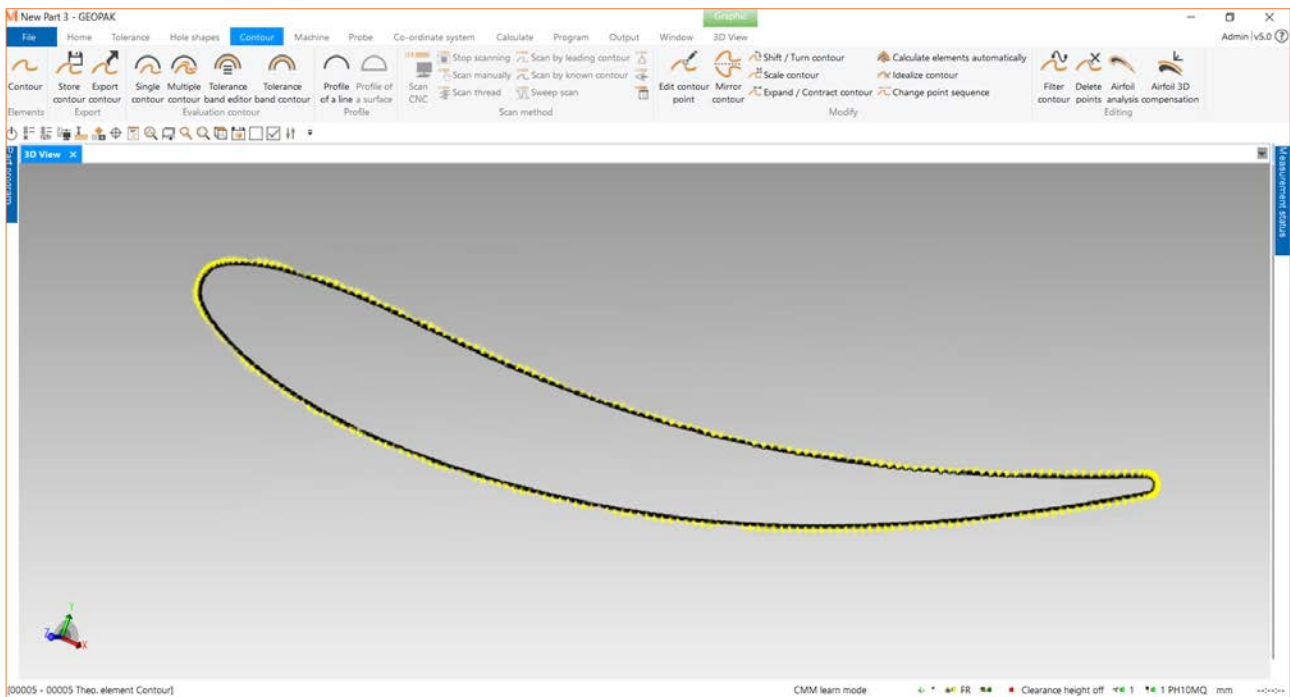
Features:

- Scalable data acquisition, management, & analysis.
- Libraries sorted by parts, routines, traceability, and many more
- Advanced analysis of inspection data
- Application of electronic signatures to data
- Navigation via self-organized tree structure
- Complete control over reporting customization
- Perform correlation studies to discover process interactions
- Large amounts of data can be quickly sorted via a filtering function
- Specification adjustments are backed up under a "revision history"

MAFIS Express

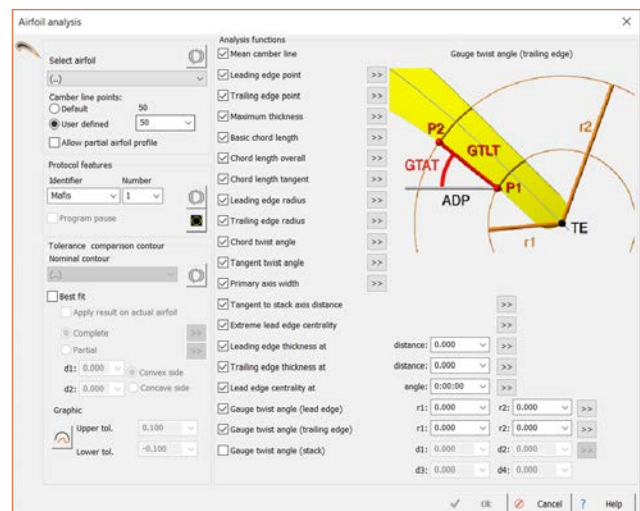
The Airfoil Inspection Module

MAFIS stands for 'Mitutoyo Airfoil Inspection Software' and enables the calculation of all significant bearing surface parameters, e.g. of turbine blades on airplane engines or even pump blades. It works in association with the MCOSMOS module SCANPAK, for the automatic scanning of workpiece forms. To begin the process, the contour is first entered with SCANPAK, after which in a separate menu the 'bearing surface analysis' can be selected for the evaluation of desired parameters. Using simple pictograms, all the necessary inputs can quickly be carried out. Outputting measured values is possible both in clear lists and graphs. All MAFIS parameters are supported by the MCOSMOS report designer, with which individualized reports can be generated with ease.



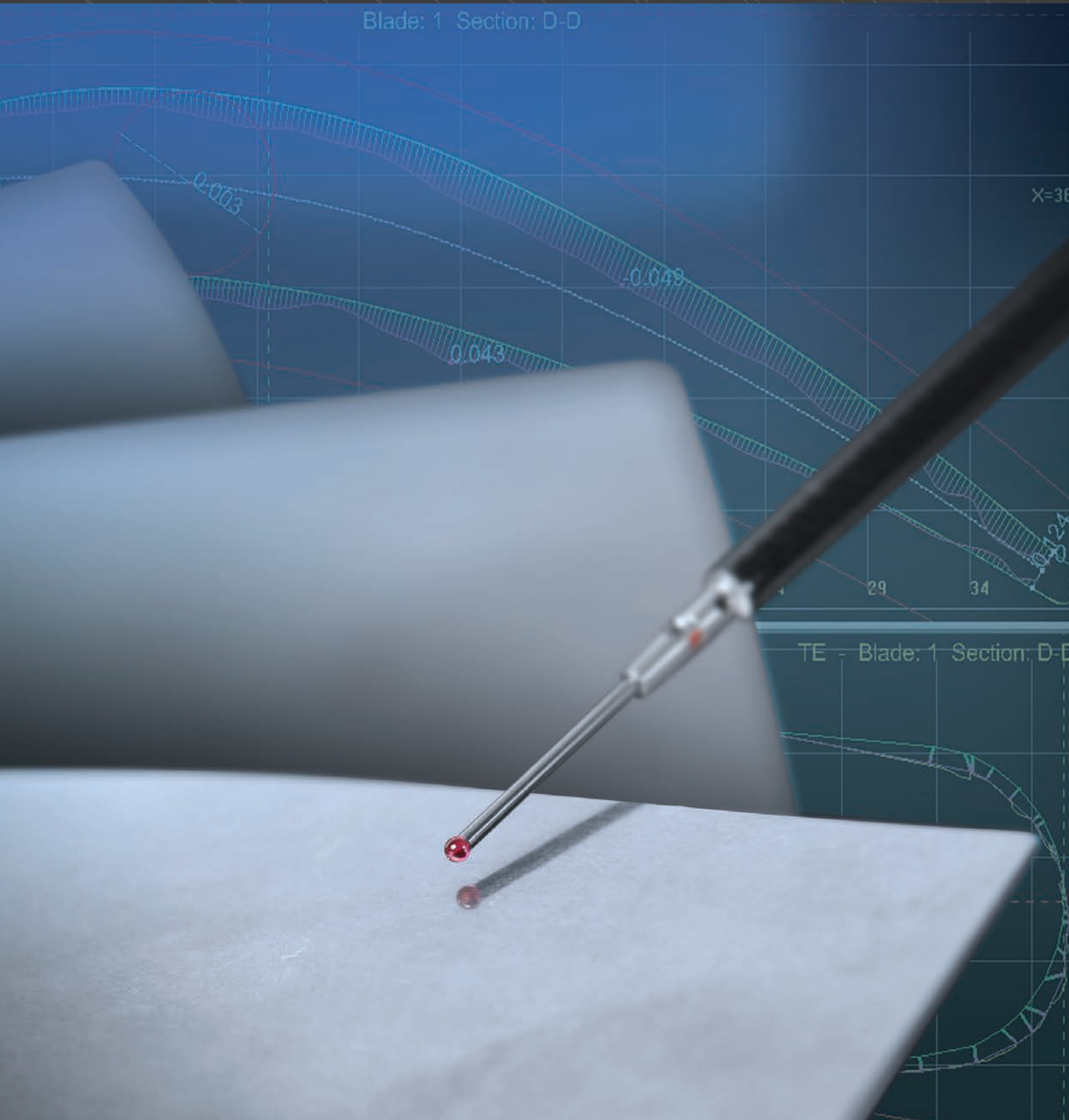
Features:

- Easy-to-use with self-explanatory pictograms
- Evaluation of all significant bearing surface parameters
- Support of all output functions of MCOSMOS*
- Contours can be entered via SCANPAK



* Output Functions: Screen output, text output, ProtocolDesigner, and MeasurLink

Blade: 1 Section: D-D



GEAR MEASUREMENT

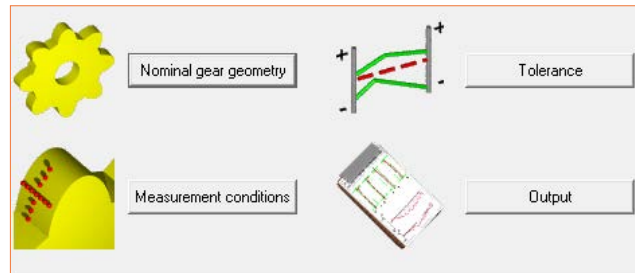
The Gear Measurement Modules

GEARPAK is the module in MCOSMOS specializing in the measurement and evaluation of involute gear profiles. It is used for the rapid generation of measurement programs of gears, evaluations, and reports.

GEARPAK Cylindrical

Gears with an involute tooth shape can be measured with GEARPAK-Cylindrical.

By inputting the gear parameters the measurement program is generated automatically. GEARPAK-Cylindrical evaluates the parameters and deviations for profile and flank line, pitch, tooth thickness, space width, dimension over one or two balls, base tangent length, radial runout, single and dual flank working test.



GEARPAK Bevel/Hypoid

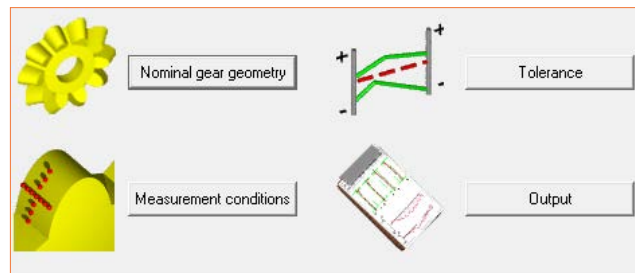
GEARPAK Bevel is currently supporting the measurement and evaluation of the following gears.

- Straight-Bevel Gear manufactured by Gleason Works Co.(Ring Gear/Pinion)
- Spiral-Bevel Gear manufactured by Gleason Works Co.(Ring Gear/Pinion)

GEARPAK Hypoid is currently supporting the measurement and evaluation of the following gear.

- Hypoid Gear generated by Gleason Works Co.(Ring Gear [Formate, Helixform]/Pinion)

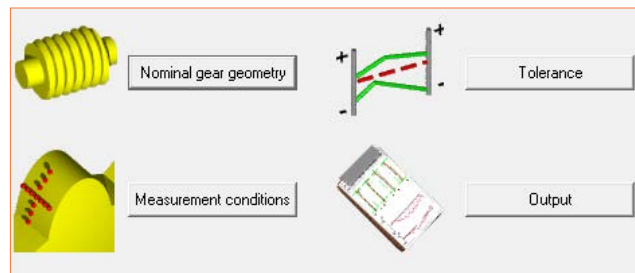
By inputting the gear parameters the measurement program is generated automatically.



GEARPAK Worm

Cylindrical worms with the following flank types can be measured with GEARPAK-Worm ZI, ZA, ZN, ZK.

By inputting the gear parameters the measurement program is generated automatically.

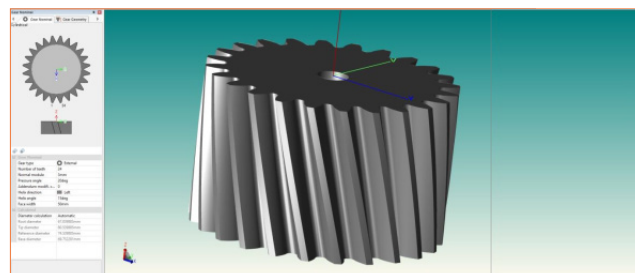


GEARPAK Express

Cylindrical gears with an involute tooth shape can be measured with GEARPAK-Express. The modern GUI based on the 3D model of the gear, makes GEARPAK Express extremely easy to use.

GEARPAK Express supports 4-axis nominal scanning which, in combination with a rotary table, can reduce the measurement time up to 50% * compared with the conventional method.

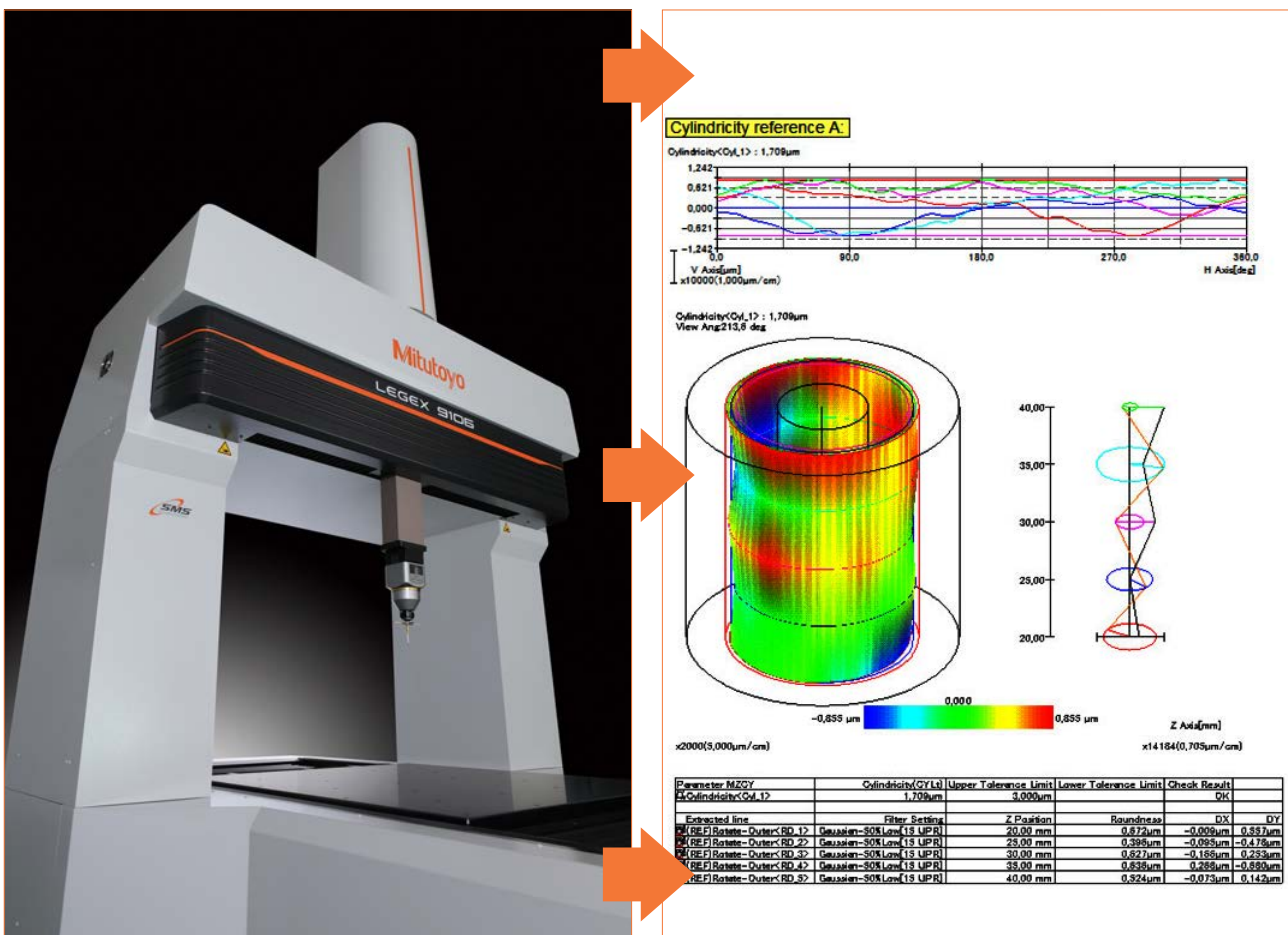
*depending on the gear size and required accuracy.



ROUNDPAK CMM

The Roundness Testing Module

ROUNDPAK CMM is the optional roundness testing module within MCOSMOS which specializes in large workpieces that won't normally fit on a conventional roundness tester. It has been designed to test roundness and cylindricity in combination with GEOPAK, perfect for evaluations and reports.



Comes with extended evaluation functions for circles, cylinders, flat surfaces, and straight lines.*

*Evaluations of the following parameters:

- Perpendicularity
- Cylindricity
- Parallelism

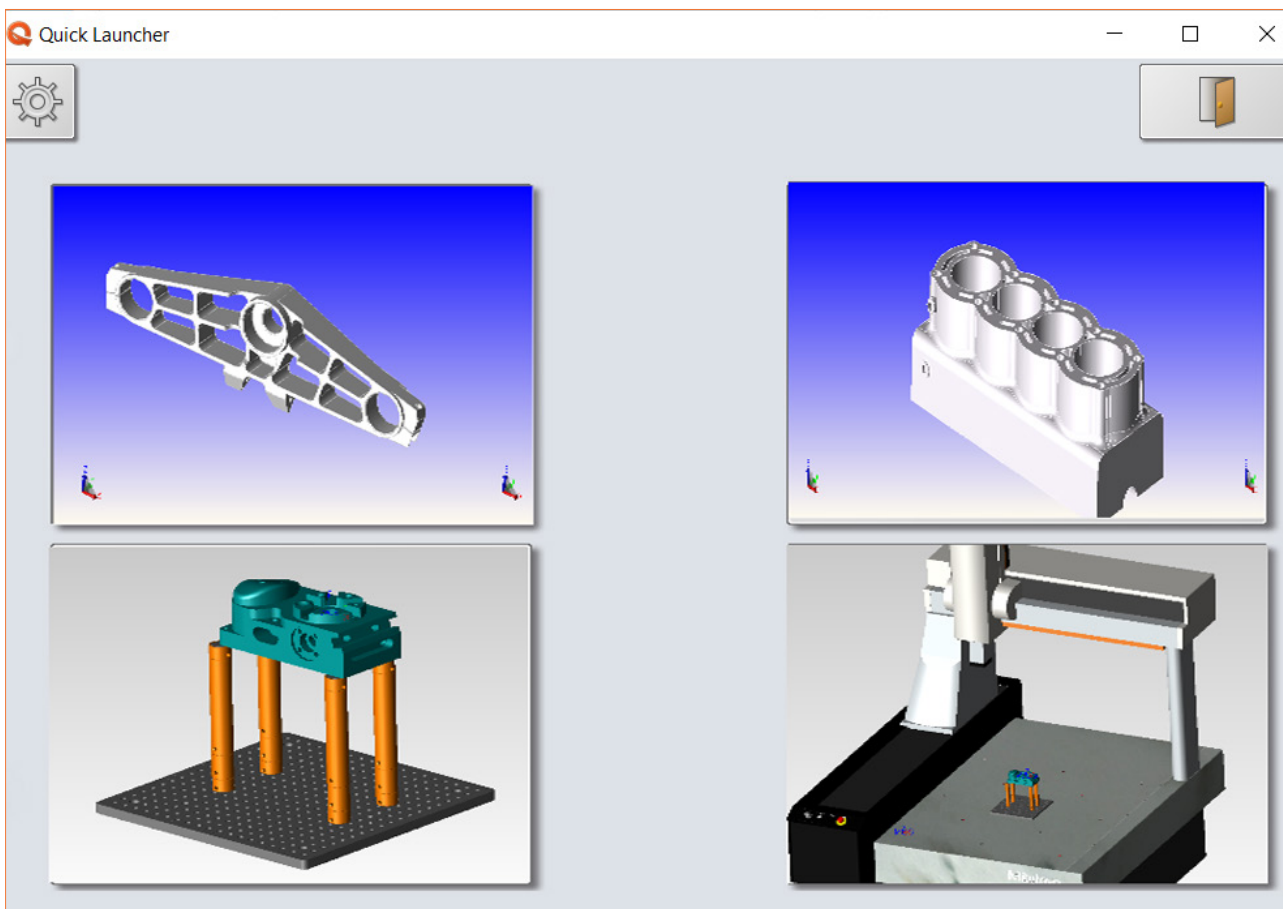
- Coaxiality and Concentricity
- Total run-out
- Run-out

- Straightness
- Flatness
- Roundness

QUICK LAUNCHER

The Sequencing Program

The QUICK LAUNCHER from Mitutoyo is an easy to operate and intelligent means of controlling measuring sequences of all upcoming workpieces in line for measurement. This program is ideal for controlling and making full use of the coordinate measuring machine without interruption.



Features:

- Simple and secure part program selection
- Controllable measuring sequence for several workpieces
- Supports barcode scanners
- Activates loading and unloading systems
- System for identifying users can be selected*
- List of last measurements displayed with color-coded statuses
- Direct access to complete test reports relating to last measurements

* Identification systems: PIN code, barcode cards, magnetic cards, chip code systems, etc.

AUTOMATION PACKAGE

Standard in MCOSMOS v5, the Remote Manager enables CMMs to be smart factory ready.

The Remote Manager in MCOSMOS handles the communication with external devices such as robots. Several digital I/O and Fieldbus cards are supported to set up all of the necessary I/O communication needed for a smooth integration of your CMM in automated systems.



Scan the QR- Code
for our demo video

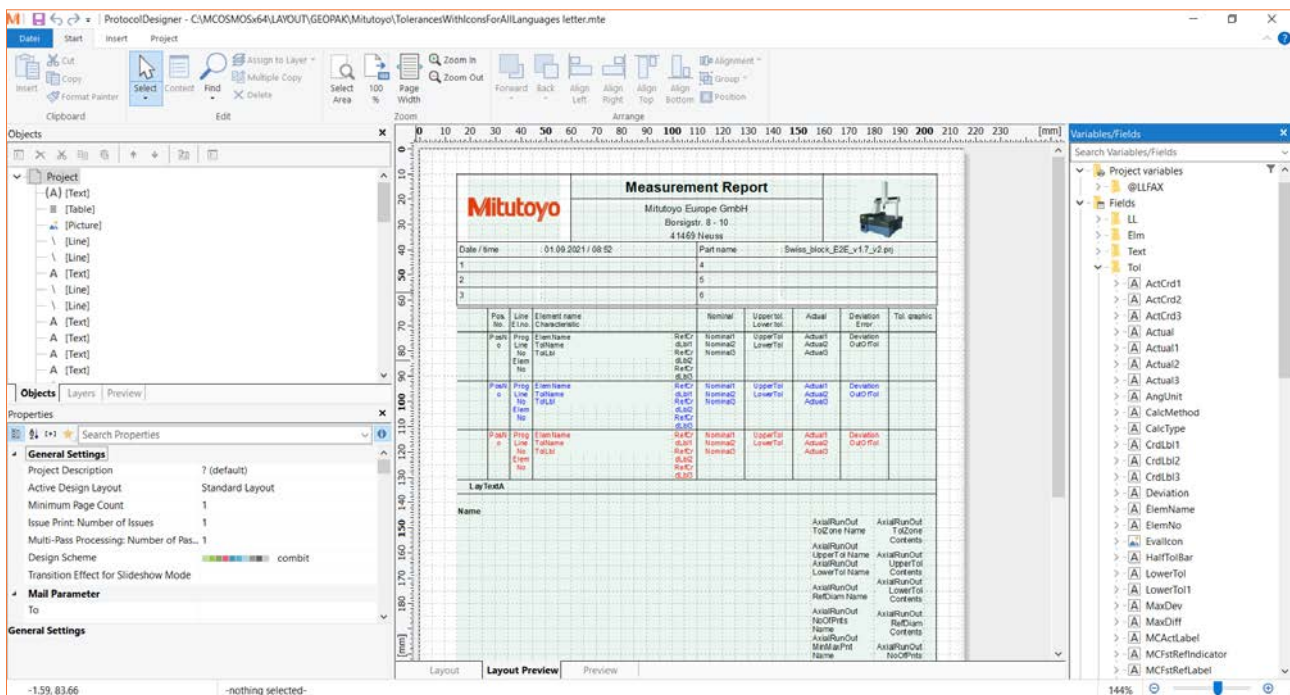
Custom Measuring Cells | How to Make Your Factory Smart



ProtocolDesigner

The Document Creation Tool

A standard tool within MCOSMOS – the ProtocolDesigner effortlessly lets you draw up new or adapt existing personalized forms for GEOPAK, CAT1000S, MAFIS, and ROUNDPAK. This includes the modification using your own ideas, to implement variables, fields, tables, logos, etc.



Features:

- Personalised form creation for GEOPAK and CAT1000S, SCANPAK, MAFIS, and ROUNDPAK CMM
- Incorporation of images including CAD models, or element graphs

Export Methods:

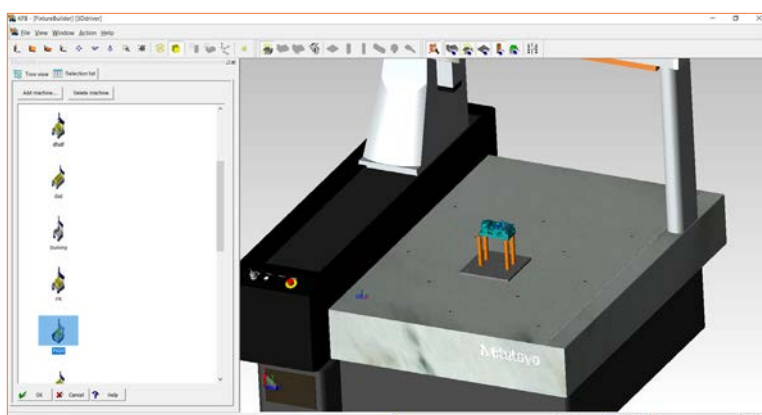
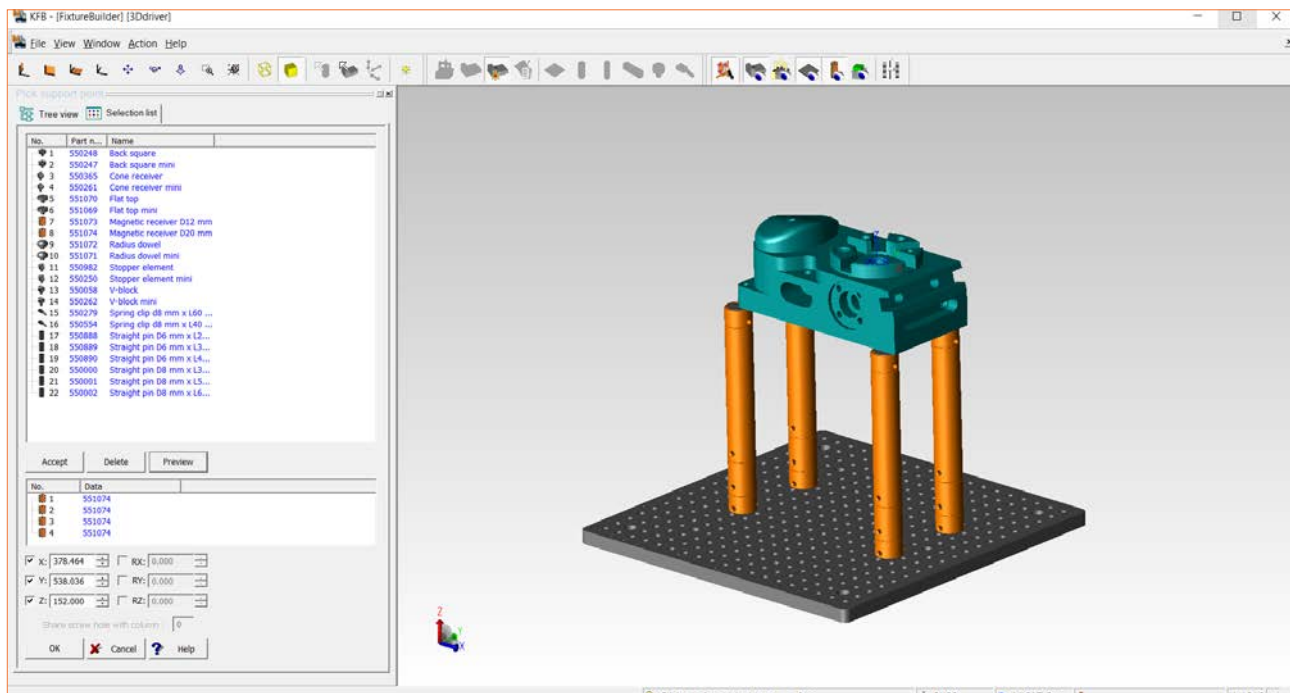
- Easy Excel exports
- Text exports into a CSV file
- TIFF and multi-TIFF export
- PDF export
- ANSI or ASCII export
- HTML/MHTML export
- JPG, BMP, and EMF export

* Identification systems: PIN code, barcode cards, magnetic cards, chip code systems, etc.

Fixture Builder

The Fixture Assembly Tool

The Fixture Builder Software from Mitutoyo allows you to quickly and easily create virtual CAD models of the clamping fixtures needed for your workpiece. This software can be operated both automatically and manually, for both speedy and specialized setups.



Features:

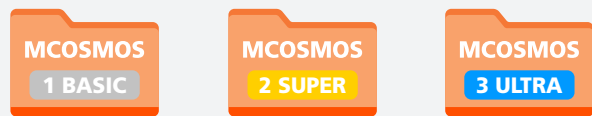
- Quick and easy compilation of tensioning elements
- Supports eco-fix elements
- Automatic listing of used components
- Provides the CAD model for CAT1000 offline programming
- Work-piece import interfaces: ACIS (*.sat), Iges (*.igs) and Step (*.stp)
- Export formats: Hoops file (*.hsf), Autodesk (*.dwf), 3-D PDF (*.pdf), and ACIS Files (*.sat)



Software packages and expansion modules to meet every requirement

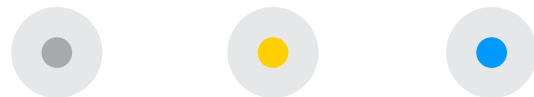
With this sophisticated modular software system developed by Mitutoyo, you have the ability to select software packages and expansion modules based on your needs.

Primary features offered in our software packages



PartManager

The command center that boots and manages the MCOSMOS software package. Includes: ProtocolDesigner, ProbeBuilder, DialogDesigner, user management, manager program (unmanned shift).



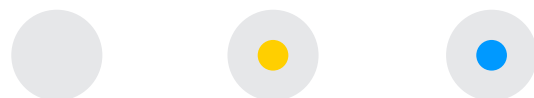
GEOPAK

For easy parts program generation (online/offline) for measuring geometrical elements. Includes: high-speed scanning of control geometries for continuous scanning, contact measuring heads, rotary tables are supported as a fourth axis, user-defined dialog support (variable program creation) and flexible reporting.



CAT1000P*

For the preparation of setpoint/actual value comparisons from CAD model free form surfaces and measuring points. Includes: MachineBuilder, automatic traverse path generation (animated), collision control and flexible reporting.



CAT1000S*

For control geometry and uncomplicated parts program generation supported by the CAD model. Includes: MachineBuilder, automatic traverse path generation (animated), collision control and simulation of complete parts programs.



SCANPAK

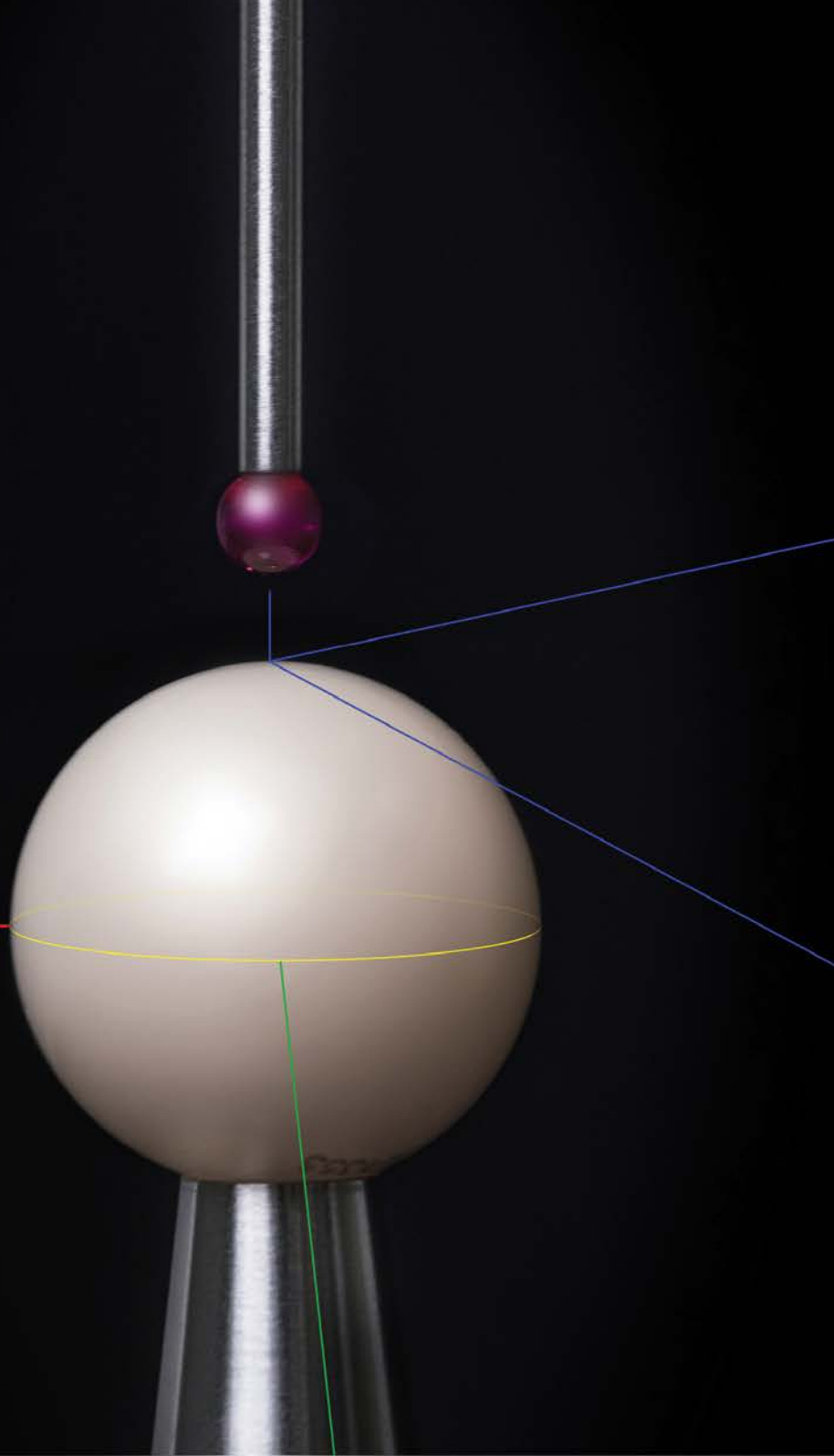
For the scanning and evaluation of workpiece contours. Includes: Supports single point and continuous scanning measuring heads, rotary tables as the fourth axis, variable contour tolerances, best fit, digitized and flexible reporting.



* Standard CAD import interfaces: ACIS, STEP

Optional CAD import interfaces: CATIA V4, CATIA V5, Pro/E, Parasolid, Unigraphics, SolidWorks, Inventor, IGES und VDAFS

Mitutoyo



NEW LOOK
NEW FEATURES

COORDINATE

MEASURING

MACHINE

SOFTWARE

MICOSMOS^{VERSION}5

MAKE THE MOST OF YOUR MEASUREMENTS



**Whatever your challenges are,
Mitutoyo supports you from start to finish.**

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



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