

Data Processing System for Manual/CNC CMM MCOSMOS



From coordinate measurement,
linkage to CAD data, through to smart factory –
MCOSMOS supports your entire journey.

New User Interface

With simple, clear icons and 3D graphic displays, the system has been updated for greater usability.

Supporting Manual and CNC Measurement

Two programs are available (manual Coordinate Measuring Machines and CNC Coordinate Measuring Machines). Because the operation screen is the same, stress-free use is possible even when switching from manual to CNC or when using both.

Linkage to CAD Data

Functions using CAD are employed to enhance measurement efficiency and quality. Proposals are available for software suited to customer needs, such as jig setting (Fixture Builder), online/offline teaching in CAD (CAT1000P), comparison with design value data (CAT1000S), and autogeneration of measurement programs (MiCAT Planner).

Comprehensive Software Line-up

A wide range of optional software applications are available to meet various customer needs, including measurement applications such as "SCANPAK" for evaluating contour data, "GEARPAK Express" for measuring gears, and "MAFIS Express" for evaluating blade airfoil shapes, as well as other applications for enabling smart factory, etc.

Full Hardware Support

For fully automatic measurement of any kind of object, MCOSMOS supports rotary tables and various types of probe systems including touch probe, scanning probe, vision probe, surface roughness probe, rotary head, and auto-probe changer.



System performance from every viewpoint

Performance Features of Standard Software Packages

The optimum program for your particular application can be selected from the software packages listed below.

Software packages

MCOSMOS 1 MCOSMOS 2 MCOSMOS 3

Manual

CNC

PartManager

The control center from which the software package is initialized, and individual part programs are managed.



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GEOPAK

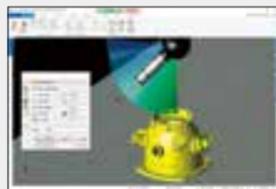
This universal measurement program conducts 3D measurement. It covers all the functions needed for universal measurement, such as measurement, evaluation, reporting, measurement program generation, and so on.



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CAT1000P

This online/offline teaching program uses CAD data to create measurement programs. Because programming is possible even without an actual measurement target, measurement programs can be created before the target is complete, helping reduce overall lead time.



● ●

CAT1000S

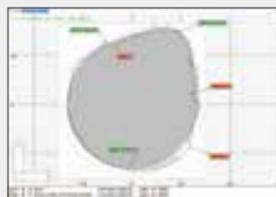
CAD model-based generation of surface measurement points, and comparison of actual/nominal data, with graphical output.



● ●

SCANPAK

SCANPAK is a program for measuring/evaluating contours for profile requirements. Graphical display for reporting & output back to m/c tool and many other operations are possible.



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SMART FACTORY

From status management to preventive maintenance. Kickstart your smart factory through visualization.

Mitutoyo has developed new features that use a network to centrally manage manufacturing process information. The MeasurLink® software package helps prevent defective parts by collecting and analyzing measurement data in real time. The status monitor (SMS: Smart Measuring System), which indicates the operational status of the measuring machine; and the condition monitor, which indicates the physical condition of the machine itself, help maintain measurement accuracy, increase productivity, and improve maintenance management.



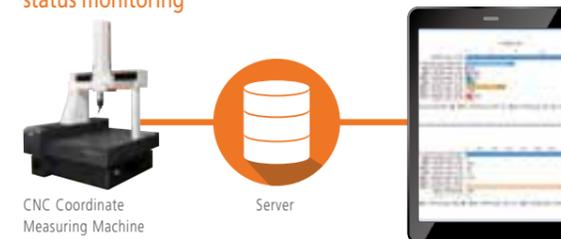
Status Monitor

Can remotely monitor measuring machines



Condition Monitor

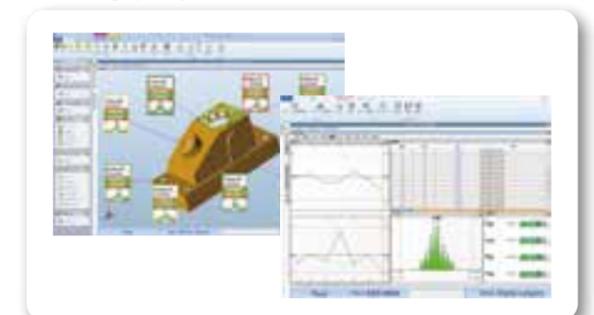
Conduct preventive maintenance through CMM status monitoring



- Output information**
- Slideway distance travelled
 - Temperature log
 - Number of probe inputs
 - Other selectable information
- **Preventive maintenance through status monitoring**
- Note: Please contact the nearest Mitutoyo sales office for adaptable countries and regions.

MeasurLink®

Reduces defective products by visualizing quality

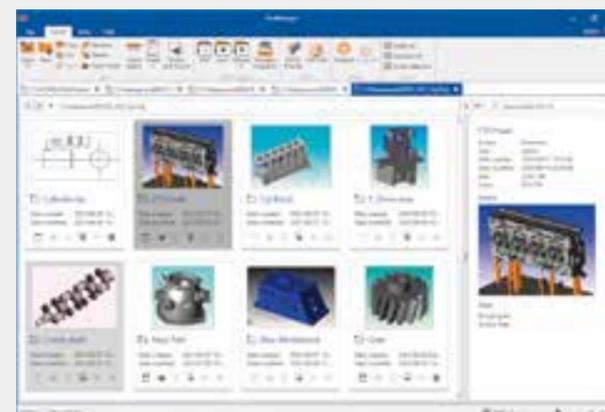


Note: MeasurLink® is a registered trademark of Mitutoyo Corporation in Japan and Mitutoyo America Corporation in the United States.

PartManager/GEOPAK



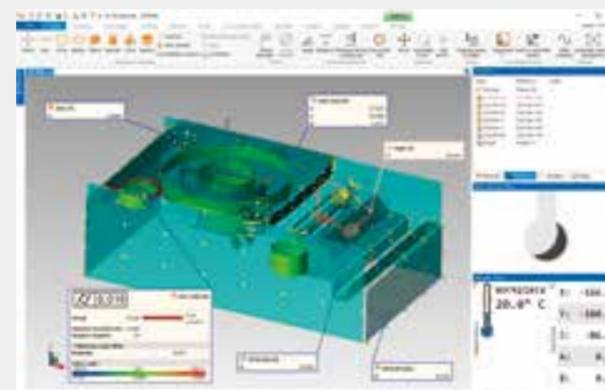
PartManager/GEOPAK



Intuitive user interface

The user interface facilitates parts management with easy-to-identify illustrations and quick access to ribbon menu items, providing you with Windows-like usability for measurement.

See video from here ▶



Graphical display

Measured components are displayed with 3D graphics. In GD&T evaluation, the trend of deviations of the components is simply visualized in the form of a color distribution.

See video from here ▶



Various report formats

GEOPAK includes a range of report templates as standard. There is also support for the display of GD&T icons and graphic display of deviations. In addition, GEOPAK supports inspection reports conforming to the aerospace industry's quality management standard AS 9102 (SIAC9102).

CAT1000P/CAT1000S



CAT1000P/CAT1000S

Creating a program using 3D CAD (CAT1000P)

The software imports 3D CAD to create a GEOPAK measurement program. 3D CAD are used for advanced interference checks, automatic change of probe orientation, and simulation. You can use CAT1000P to create a highly efficient measurement program in a shorter time than before.

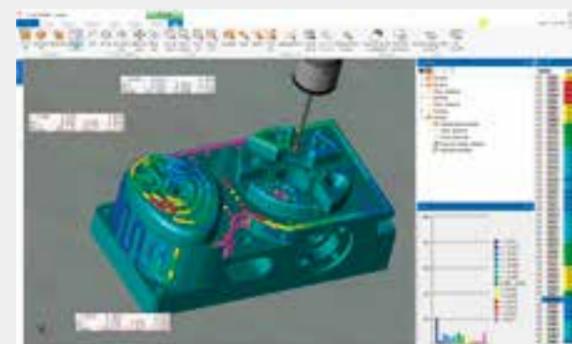


See video from here ▶



3D error verification (CAT1000S)

The software loads a 3D CAD, compares the measured points with the design data, and calculates errors between them.

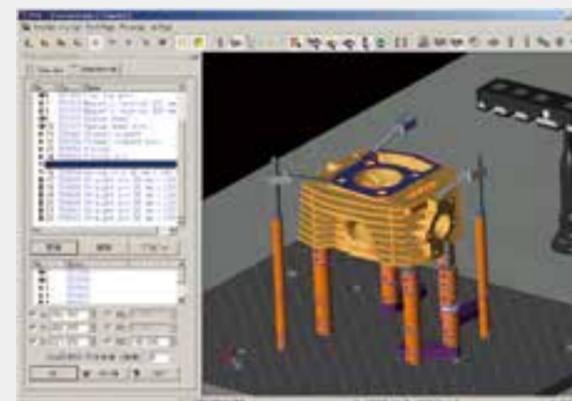


FixtureBuilder

The function semi-automatically creates a clamping jig* structure from the CAD data of a workpiece. You can output a report that contains the types of necessary parts and a graphic image of the clamping position, which is very useful for sharing jig information. Model data including jig information helps to ensure a more effective interference check and simulation.

The function is included in both CAT1000P and CAT1000S as standard.

* Only Mitutoyo's Eco-fix clamping tools are supported.



See video from here ▶



SCANPAK



SCANPAK

Design value scanning

Even if there are significant errors between the design values and the actual workpiece shape, the active main unit control can perform high-speed and highly accurate scanning measurement on a 3D shape.

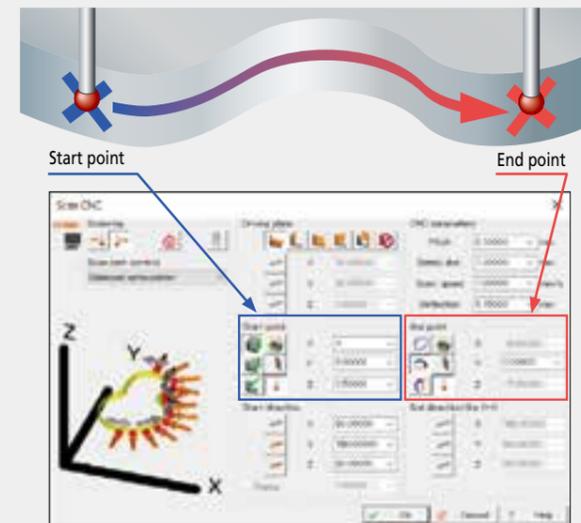


See video from here ▶



Autonomous profiling measurement

Even without the design values, you can easily obtain 2D contour data by simply inputting only essential information such as a start point, end point, and scanning direction.

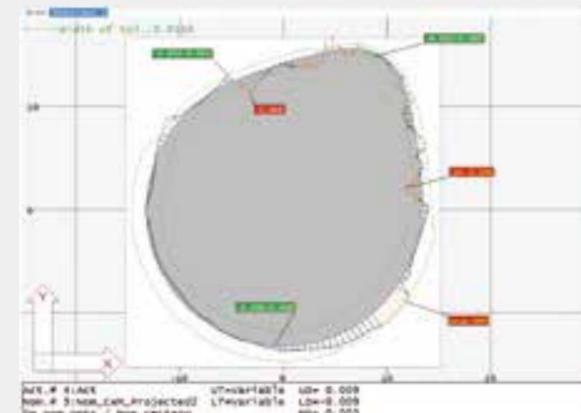


See video from here ▶



2D error verification

The function compares two pieces of contour data and calculates errors between them. You can apply different tolerance width requirements to each contour section.



OPTIONAL SOFTWARE

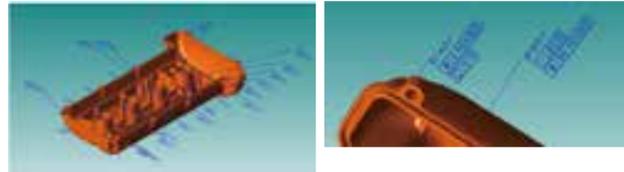
Automatic measurement program generation software for CMMs

MiCAT Planner

Software for automatically creating an MCOSMOS measurement program

•Creating a program in a much shorter time

The software can automatically create an optimum measurement program using the PMI (tolerance information) of a 3D CAD model. Even without existing PMI, you can add new PMI in MiCAT Planner.



•Improved efficiency with streamlined measurement processes

MiCAT Planner determines the shortest measurement path and optimum probe orientation to create a program that can be completed in the shortest time.

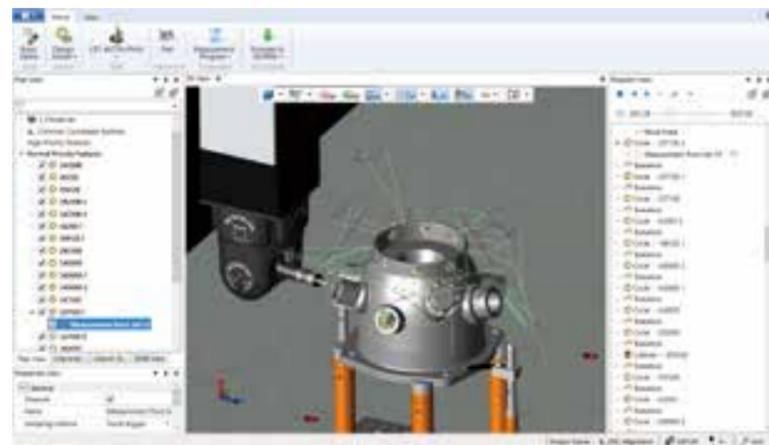
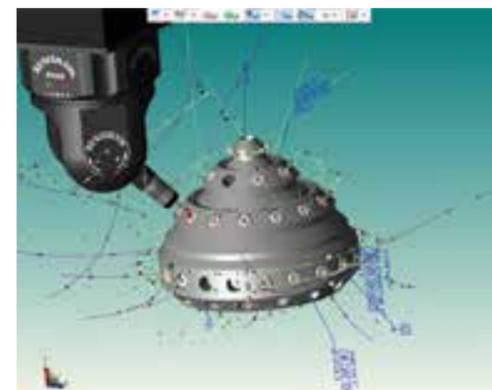
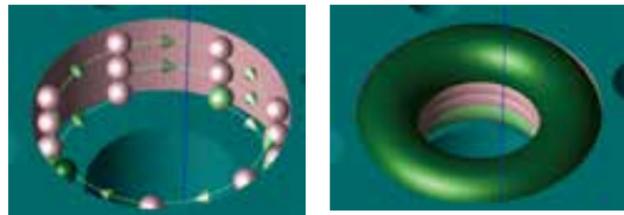


•Maintaining, improving, and transferring the measurement quality

You can configure measurement rules to prevent variation of the measurement quality from programmer to programmer. You can also accumulate measurement know-how to maintain, improve, and transfer the measurement quality.

Example of sampling method: touch-trigger measurement

Example of sampling method: scanning measurement



Gear measurement evaluation software

GEARPAK Express

For more effective and reliable gear measurement

•Intuitive operation

- A 3D model created from the provided gear specifications enables you to visually and easily check whether measurement will be performed as intended.
- Automatic program creation and on-screen measurement guidance help quick and easy setting of the coordinate system.

•High-speed scanning measurement

- "4-Axis nominal scanning"*1 can make scanning even faster. The measurement time can be reduced up to 50%*2 compared with the conventional method.

*1 A rotary table (optional) is necessary.

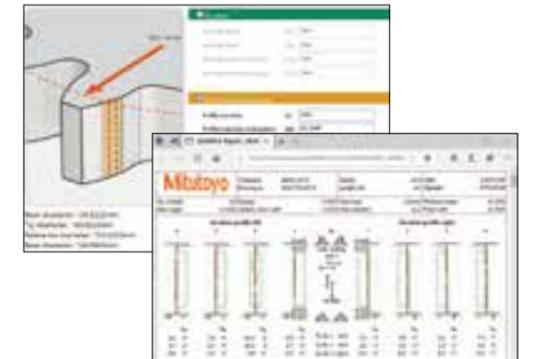
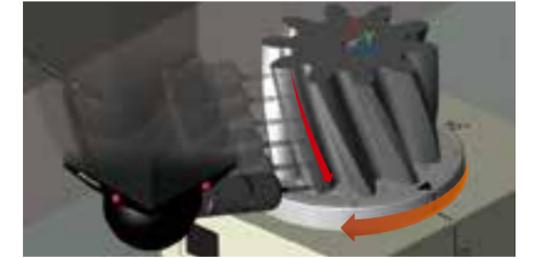
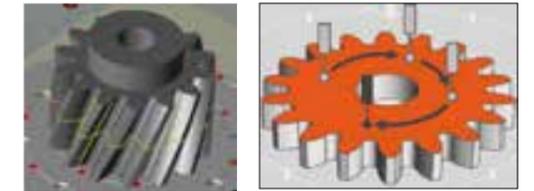
*2 The value depends on the gear size and required accuracy.

Watch a video of high-speed scanning measurement▶



•Quick feedback

- The real-time display of the measurement result and tolerance judgment result enables early detection of non-conforming product.
- You can perform dimensional measurement and geometrical tolerance evaluation without changing the setup during gear evaluation.



Gear measurement evaluation software

GEARPAK-Worm

Worm gear tooth shapes and thread helices can be evaluated.

•Creates a simplified part program from gear specification data

Part programs are automatically generated by entering the specification and measurement method. With no need for teaching, measurement is more efficient.

•Automatic tolerance setting compatible with various standards

Various gear standards are supported, with tolerance setting enabled simply by entering the specification, standard type, and class. (Supported standards: DIN 3974-1, AGMA 2111-A98) Tolerance key input and editing are also possible, enabling evaluation at the desired tolerance.

Gear measurement evaluation software

GEARPAK-Bevel/Hypoid

Bevel and hypoid gear tooth plane shapes and pitch error can be evaluated.

•Creates a simplified part program from gear specification data

Part programs are automatically generated by entering the specification and measurement method. With no need for teaching, measurement is more efficient.

•Determines specification data for corrected gear cutting by a unique algorithm

Based on the gear cutting specifications used with the gear cutting plate (initial values) and the measurement results obtained with Coordinate Measuring Machines, specifications indicating good tooth contact (estimated values) can be calculated.

•Supporting gears manufactured on a Gleason Corporation's gear-cutting machine

GEARPAK-Bevel/Hypoid supports ring gears and pinion gears manufactured by the Formate or Helixform methods.



Result Drawing

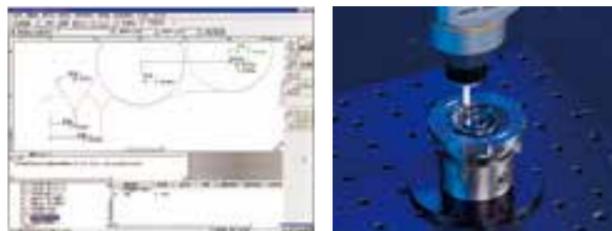
FORMTRACEPAK-AP

FORMTRACEPAK-AP analyzes 2-dimensional cross-section profiles.

Profile analysis

- FORMTRACEPAK-AP performs calculations by specifying an arbitrary range with the mouse.
- It can print a drawing, measurement conditions, measurement results, comments, etc., as a report after they are laid out in a freely-definable format.

Note: This software requires SCANPAK.

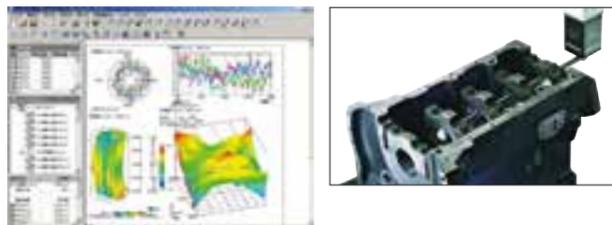


ROUNDPAK-CMM

This software can analyze not only cylindricity and roundness in detail, but also create excellent visual results.

Elements that can be output from GEOPAK to ROUNDPAK-CMM

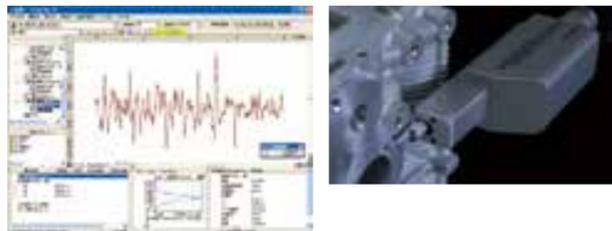
Lines, circles, cylinders, and surfaces
Note: This software requires a scanning probe.



SURFPAK-SP

Software for analysing surface roughness

SURFPAK-SP is a specialized software package for analyzing surface roughness in conjunction with the SURFTEST PROBE, which is a surface roughness measuring probe for use on CNC CMMs. SURFPAK-SP analyzes surface roughness in conformance with ISO, JIS, ANSI and VDA standards. In combination with MCOSMOS, it enables fully automatic dimensional and surface roughness measurements.



MAFIS Express

This software enables measurement program creation, measurement instruction and analysis for blades/blisks.

Pure DMISPAK

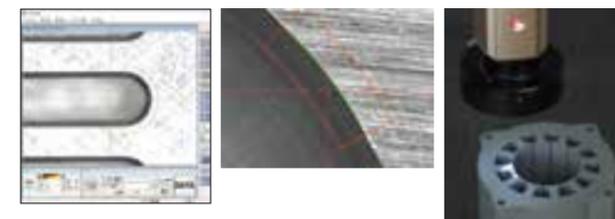
Pure DMISPAK converts a DMIS file created by an external system to an ASCII-format part program for GEOPAK.



VISIONPAK-PRO

This image measurement software supports CNC Coordinate Measuring Machines.

This software for image probe QVP enables image measurement with CNC Coordinate Measuring Machines. An advanced algorithm developed from Vision measuring system enables faster, more accurate edge detection to take place automatically, the wide-ranging image filter function enables more accurate non-contact measurement ignoring abnormal points such as burrs and dust.

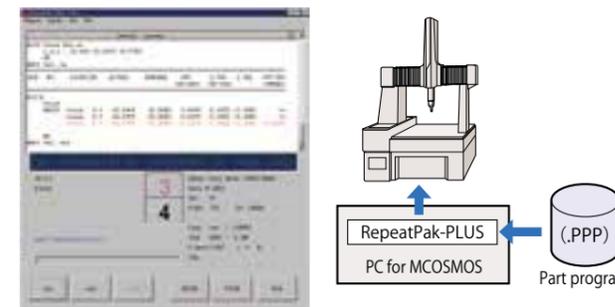


RepeatPak-PLUS

This software is used for executing, within the Windows environment, part programs (.PPP files) created by an older data-processing system.

Supported older data processing systems

- GEOPAK2300
- GEOPAK2600
- GEOPAK2700
- GEOPAK2900
- GEOPAK2900/2



MeasureReport

MeasureReport generates an inspection table in free format using data measured or acquired by GEOPAK.

• **MeasureReport can perform tolerance judgment on workpiece data and calculate mean, minimum, maximum, and range for measurement results.**

• **An inspection table is generated in combination with discrete measurement results.**

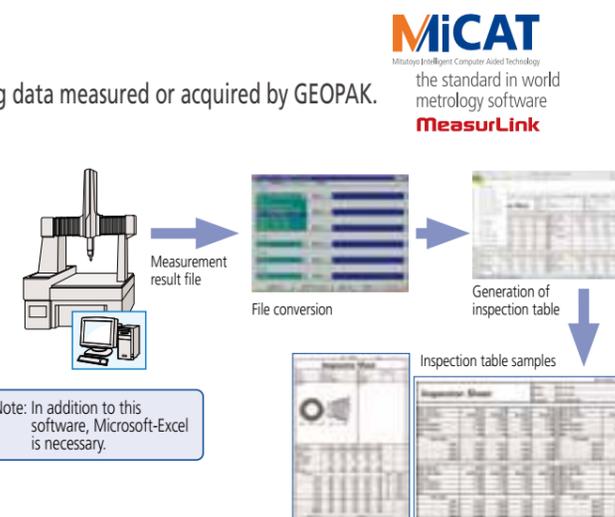
A maximum of 6 files can be combined.
Up to 200 inspection items or up to 10,000 workpieces can be combined.

• **A graphic (part drawing) and text (work instruction) can be added to a table.**

A maximum of 10 graphics and texts can be appended.
The software supports BMP-format files.

• **MeasureReport allows macro (operation) setting of inspection table generation.**

Preliminary macro settings such as auto-print, auto-termination, format specification, and calculation specification can greatly reduce inspection table generating operations.



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

MeasurLink®

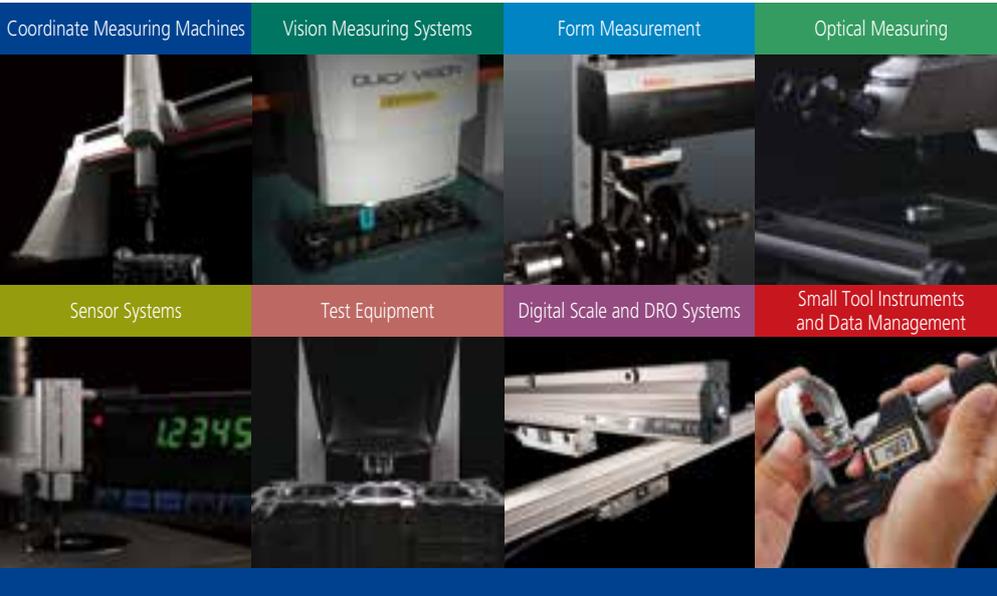
This software performs statistical processing and process management for measuring instruments. Information from various measuring instruments, not just Coordinate Measuring Machines, can be managed.

MeasurLink® allows statistical processing of measurement data. Also, real-time display of control charts can promptly recognize fault conditions caused by cutting tool abrasion or damage. This allows you to implement effective countermeasures (such as change of cutting tool or machining conditions). Moreover, with this software as a terminal, it is possible to build a central control system by connecting to a higher-level network environment.



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Note: MeasurLink® is a registered trademark of Mitutoyo Corporation in Japan and Mitutoyo America Corporation in the United States.



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 measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



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