

Measurement Data Management

Convenient data collection tool and quality control software

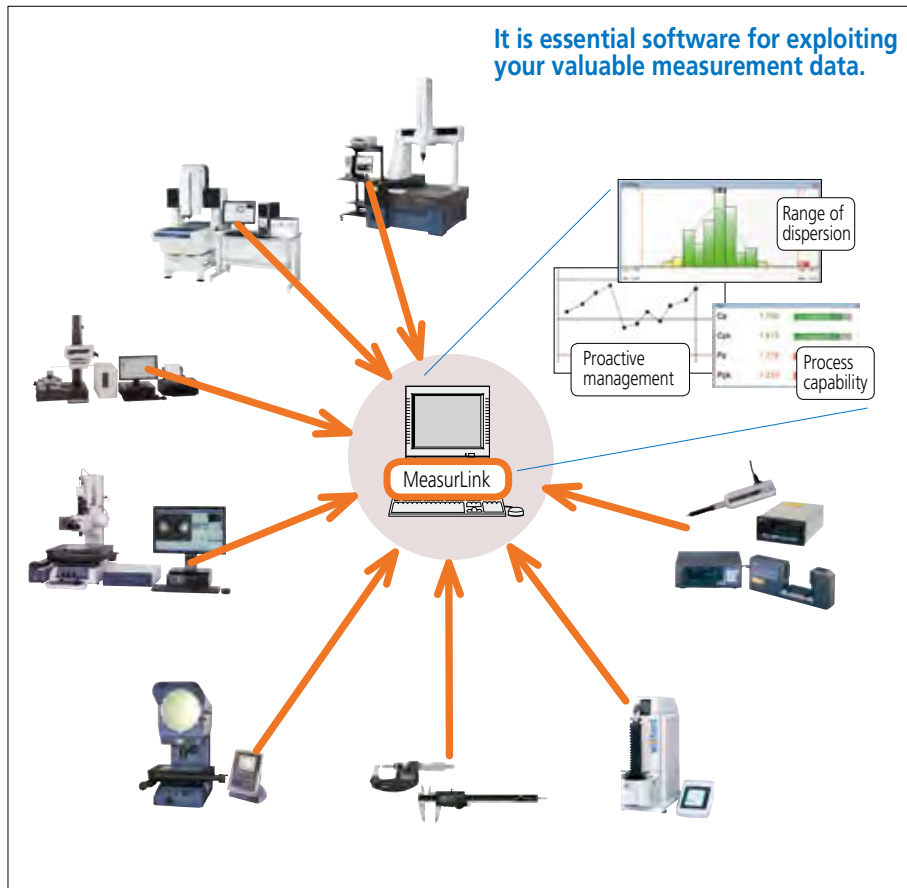
Measurement Data Network System MeasurLink

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- MeasurLink is a data management modular software system that enables collecting data from a wide range of Mitutoyo measuring tools and systems including Coordinate Measuring Machines.

Measurement data storage can be centralized by implementing a network system using a company LAN. Quality information such as checking, monitoring, analysis of the measurement results and creating inspection reports can be shared among separate offices to maximize efficiency.

Data from Mitutoyo measuring instruments are visually displayed in real-time in the inspection room or line side



MiCAT

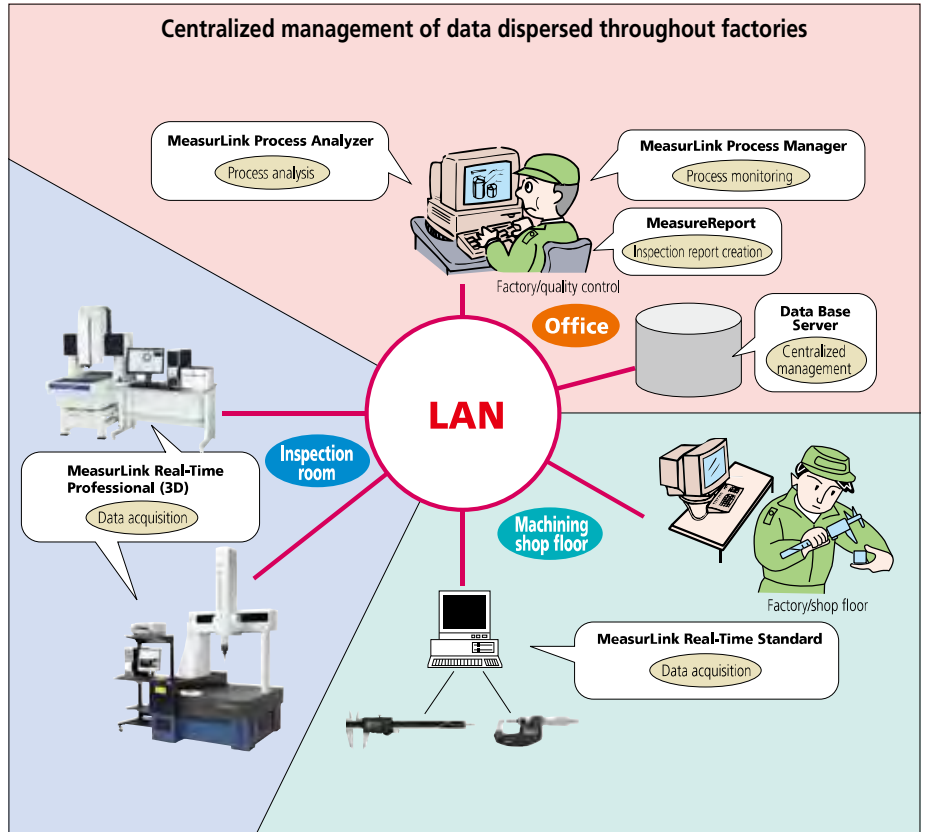
Mitutoyo Intelligent Computer Aided Technology
the standard in world metrology software
MeasurLink



Refer to the MeasurLink leaflet (E12028) for more details.

- MeasurLink supports anything from stand-alone, small-scale systems to large-scale systems utilizing a PC network environment. Expansion from a stand-alone installation to a network system can easily be performed, allowing a gradual upgrade from a single-test operation in one section to a full-scale operation.

Centralized measurement data management by networking



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MeasurLink V7 Data Collection/Analysis Software

Real-Time Standard (RT Std)

Real-Time Professional (RT Pro)

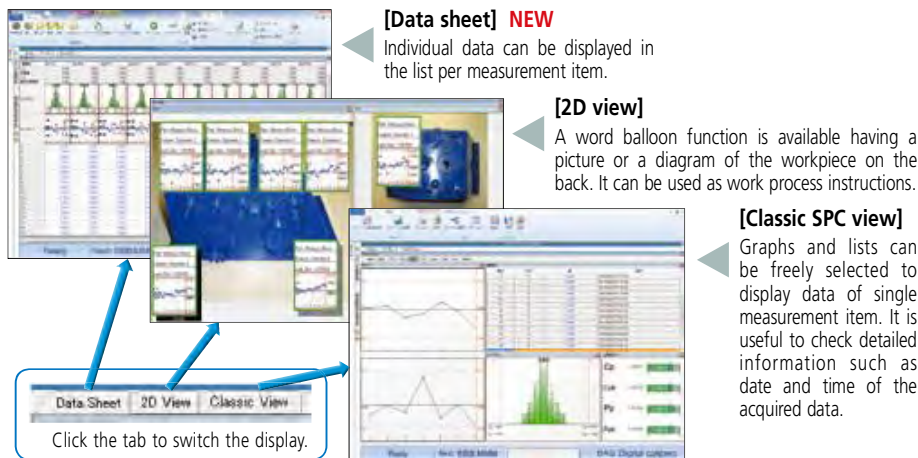
Real-Time Professional 3D (RT Pro 3D)

MeasurLink Real-time is the Statistical Process Control (SPC) MeasurLink module that collects data from Mitutoyo and third-party measuring devices and systems to provide analysis functionality in real-time by displaying control charts or process capability indexes. Three versions are offered so that a customer can choose the version that best suits the requirements, from a standard version providing basic functionality through to the full-spec version offering data handling using Hoops 3D graphics. (Refer to Table 1 on the next page.)

MeasurLink Real-Time common functions

• Various data views

The measurement results are displayed in various views, including statistical analysis result, data list, and work process imaging. The display can be switched instantly according to the needs of the operator.



• Adding traceability information

Traceability information for each workpiece can be added, for example, serial no., rod no., inspector name, machine no., or cause of problems and remedies.

This information can be used as search criteria when extracting data using the filtering function (RT Pro/RT Pro 3D) when a problem occurred.

• Alarm function

The operator is notified when "Out of Tolerance" or "Out of Control Limit" occurs.

The method of notification can be selected from a pop-up window, e-mail (Fig.1), or log file recording.

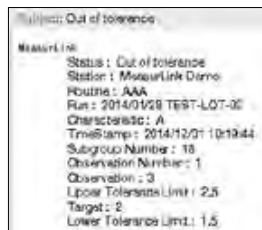


Fig.1 Alarm notification by E-mail

• Exporting data to an Excel file

Measurement data can be exported to an Excel file. This function is useful if the data needs to be used in a department that does not have MeasurLink.

(Fig.2)



Fig.2 Export to Excel

RT Std/Pro/Pro 3D common functions

- Connectable measuring instruments
 - Measuring tool with digitmatic output (equipped with PC data processing unit)
- [Supported interfaces]
 - Wireless (USB) U-WAVE (VCP)
 - Wired (USB) IT-016/USB-ITN VCP or HID IT-012U (HID)
 - Wireless (D-sub 9 pin) IT-007R MUX-10F, DP-1VR, and others
- Screen display mode when collecting data
 - Classic SPC view
 - Data sheet
 - 2D view
 - Parts data sheet, etc.
- Statistical Analysis result [Chart]
 - Xbar-R, Xbar-S, X-Rs control charts, Histogram, Run chart, Pre-normal chart, Tear chart, Meta chart, Indicator bar, multivariate data control chart, etc.
- [Statistics]
 - Maximum value, Minimum value, Standard deviation, Average $\pm 3/4/6$, Process capability indexes (Cp, Cpk, Pp, Ppk), Defect ratio
- Alarm function [Target items]
 - Out of tolerance
 - 1 point exceeds control limit line (following are related to management chart)
 - Consecutive 9 points in one side from center line
 - 6 points successively increasing or decreasing
 - Others including 8 judgment criteria for Shewhart control chart
- Adding traceability information
 - Measurement date (automatically added)
 - Serial No. (Keyboard entry)
 - Special causes and remedies
 - Selection from comment list registered as an option
 - Enter from keyboard when measuring classified title registered as an option (e.g. Lot No. LOT 001)
- Report print out function
 - MMeasurement values, analysis calculation results and various charts can be arranged to output according to requirements.
- Export function of measuring result
 - Excel format
 - CSV format
- Security function
 - Once the access authorization is set, it requires "User name" and "Password" input before the program will start. Data editing actions such as reference, entry and changes require authorization according to the user's role in order to preserve data reliability.
- Operation languages
 - 10 languages are supported.
 - Japanese, English, French, German, Dutch, Spanish, Swedish, Polish, Italian, Turkish- Japanese, English, French, German, Dutch, Spanish, Swedish, Polish, Italian, Turkish

MeasurLink V7 common functions

- Operating environments
[Operating System]
· Windows7 (32bit/64bit)
- [Data base]
· Microsoft SQL Server 2005
Standard / Workgroup Edition
· Microsoft SQL Server 2008
Standard / Enterprise Edition
· Sybase and Oracle are not supported.

RT Pro/Pro 3D Common functions

- Connectable measuring instrument
· Mitutoyo Measurement Data Management System
(equipped with PC data processing unit)
- [Supported data processing software]
· CMM: MCOSMOS V3.2 or later
· Vision System: QVPAK V10.0 or later/QSPAK V10.2 or later/
QSPAK MSE V3.1 or later/QIPAK V4.1 or later
· Vision Unit: QSPAK VUE V4.1 or later
· Surface Roughness / Contour instruments:
Formtracepak V5.3 or later
· Roundness instruments: ROUNDPAK V5.6 or later
- Filter function
- Keyword items for data extraction
· Measurement data (year, month, day, time, week, etc.)
· Serial No.
· Traceability information
(e.g. Inspectors, Machine No., etc.)
· Alarm item
- Import function for text data
· Default format files (mbf, dfq, etc.)
· Customize function
A template can be created according to ASCII file to be imported.

RT Pro 3D Common functions

- Screen display mode when collecting data
· 3D view

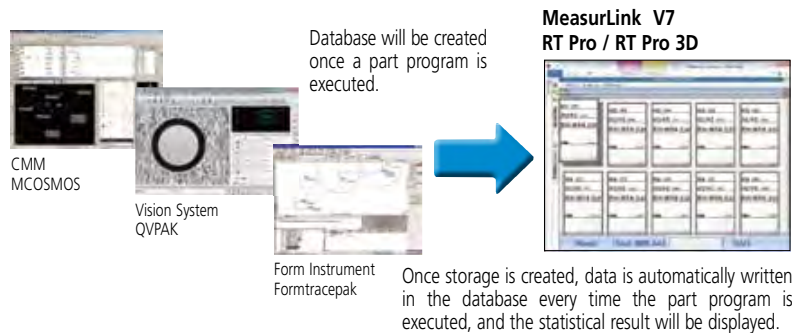
Table 1 Data collection/analysis software Real-Time functional comparison

Functions		Data collection software		
		Real-Time Standard	Real-Time Professional	Real-Time Professional 3D
Collected data display	Classic SPC view	●	●	●
	Data sheet	●	●	●
	2D view	●	●	●
	3D view (HOOPS)			●
Data extract	Filter		●	●
Input from tools and devices	Measuring tools (RS-232C, USB)	●	●	●
	Measuring instruments (DDE)		●	●
Text input	Import (ASCII)		●	●

- Real-time Professional 3D is a full-spec package. The feature to be measured can be displayed in detail using 3D CAD data.

• Automatic linking with part programs

Linking with part programs created in CMM or Vision Measuring Systems, data such as part no.; measurement item; nominal size; tolerance value and more can be loaded from a part program. A database to store all of the data is automatically configured when a part program is run.



• Filtering function

Required data can be easily extracted based on the date and time of the measurement, added comments, or alarms.

• Import function

Measurement data saved in ASCII files can be loaded. Also, a feature to customize a template for loading according to the format is provided.

MeasurLink Real-Time Professional 3D functions

• Real-time Professional 3D is a full-spec package

The feature to be measured can be displayed in detail using 3D CAD data.



[3D view]

3D graphics library HOOPS displays real view of the workpiece using an hsf file created from 3D CAD data. The displayed workpiece image can be freely turned, translated, or scaled so that you can get a clear view of the feature to be measured. The word balloons and lead lines that display the measurement result and measured feature will move following the CAD data translation.

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MeasurLink V7 Optional Process Analysis Software for Administrators

Process Analyzer Lite (PA Lite)

Process Analyzer Professional (PA Pro)

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Process Analyzer is an optional software package provided for administrators who are authorized to access the database created by MeasurLink Real-time for the purpose of checking and analyzing measurement results. Two types of packages are made available: Process Analyzer Lite, the basic version; and the full-spec Process Analyzer Professional version. (see Table 1)

- **PA Lite is base version for viewing the measurement database.**

Data stored in the MeasurLink database can be checked from a selected list.



The same data displayable by data collection software can be displayed, including measurement results, charts, and statistical calculation results with the look and feel of the Windows Explorer.

- **PA Pro is a full-spec package that provides additional data check and analysis capability.**

Can also perform various analyses by filtering, data processing, etc., in addition to data checking.

- **Filtering function that allows data extraction and grouping**

Data can be extracted or grouped by selecting the date and time and other traceability information as keywords.

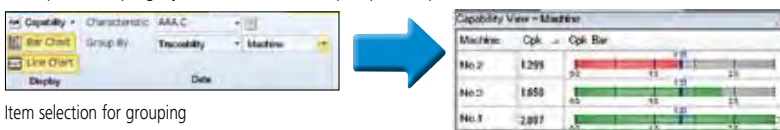
Example) Filtering data by an operator name Displays statistical analysis result in charts (Xbar-R, for example).



Filtering item selection menu

Result of filtering in the chart

Example) Grouping by Machine No. Cp, Cpk comparison



Item selection for grouping

Cpk value and bar graph per machine

Table 1 Process Analyzer functional comparison (an option available for administrators)

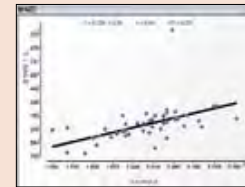
Function	Process analysis software	
	Process Analyzer Lite	Process Analyzer Professional
Result display	Classic SPC view	●
	Data sheet	●
	2D view	●
Data extract	Filter	●
Data processing	Data file merging, Copying, Editing	●
Masking	Archive data	●

PA Lite/PA Pro common functions

- Statistical Analysis result [Chart]
 - Xbar-R, Xbar-S, X-Rs control charts, Histogram, Run chart, Pre-control chart, Tear chart, Meta chart, Indicator bar, multivariate data control chart, etc.
- [Statistics]
 - Maximum value, Minimum value, Standard deviation, Average $\pm 3/4/6$, Process capability indexes (Cp, Cpk, Pp, Ppk), Defect ratio
- Report print out function
 - Measurement values, analysis calculation results and various charts can be arranged to output according to requirements.
- Exporting function of measurement result
 - Excel format
 - CSV format

PA Pro functions

- Statistical analysis result [Chart]
 - Scatter plots: The relationship between two items can be plotted.



- Data processing capability
 - Files can be managed by merging, copying, and editing. Also, the data archive function allows inclusion of the archived data in the Real-Time list.