

Integrated Analysis Software

ALL in the Document!
ACCTee

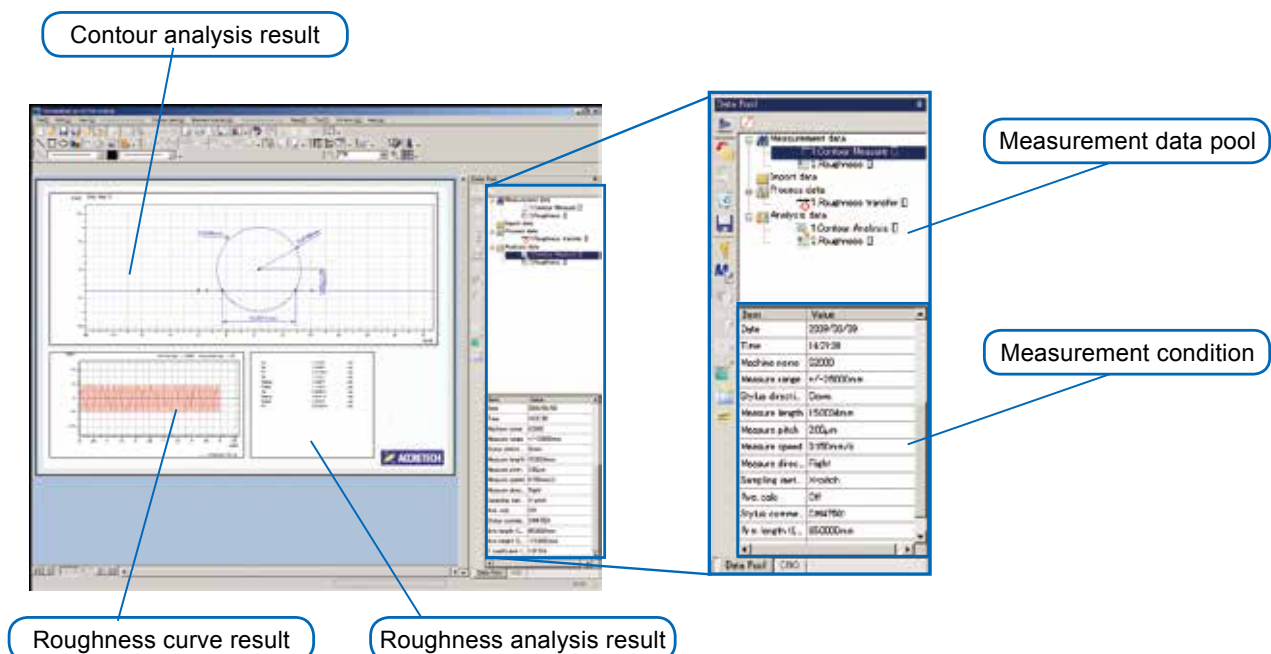
- New Measurement Style with New Concept
- All Measurements and Analyses Available in a Document

ACCTee, the next generation of the integrated software system TIMS, is newly developed for calling for measurement style with new concept. Enabling the measurement and analysis based on documents offers outstanding and smooth operability, as in allowing for whole operations on the document (measurement result sheet) basis and providing the relational database capability to all data/information.

This is the all in the document next generation integrated software system ACCTee.

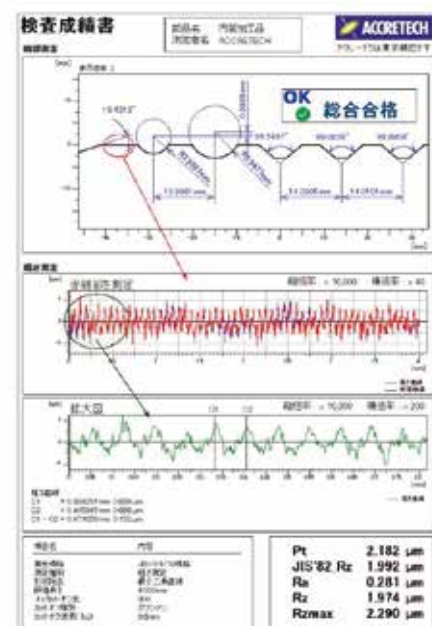
ACCTee has been keeping on polishing by customers' voices. Please check the advanced operability at showroom.

Outstanding high operability



ACCTee is based on Windows user interface for easy operation to anyone.

Intuitive operations (measurement, analysis, result printing) with comprehensible icons heighten the operability.



Example of printing data sheet

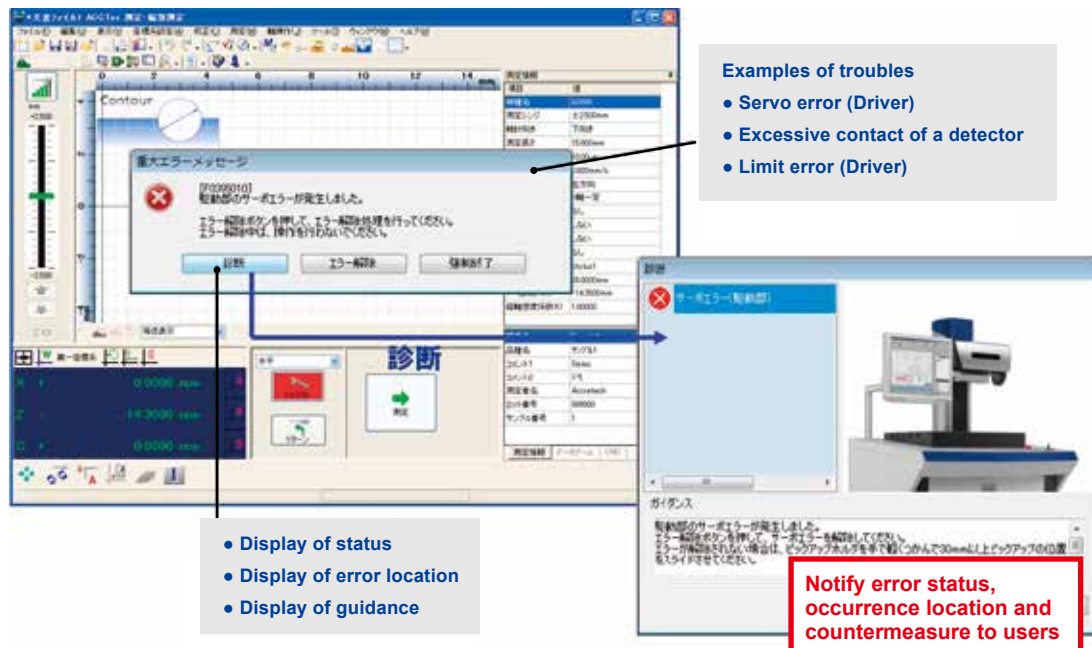
Data processing software

Self-diagnosis function (standard function)

Self-diagnosis function is a resident program to provide against emergency.

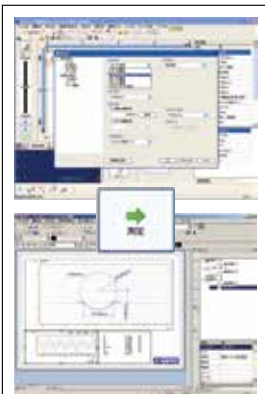
The function outputs messages to identify the fault or error locations in measuring instrument on screen for assisting actions against errors.

The messages prompt actions to solve problems quickly.

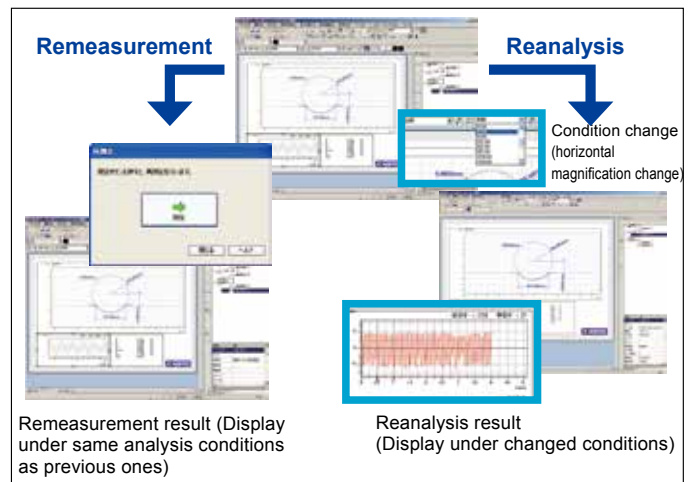


Reanalysis/remasurement with easy operation heightens efficiency

ACCTee holds whole information including layouts, measurement conditions, analysis conditions, measurement data, and part program. This enables the data edit, the addition of analysis contents, the reanalysis and the remeasurement, at will. Unnecessity of window switching improves the operability over 40% compared to conventional manner. In addition to the reanalysis, the repetition of measurement and analysis is easily carried out, by selecting measurement data in data pool and clicking the remeasurement button, for obtaining similar measurement result to previous one.



Automatic document generation at the first measurement

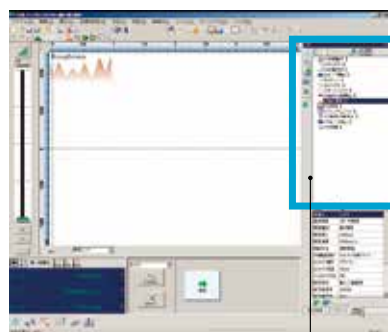


CNC function

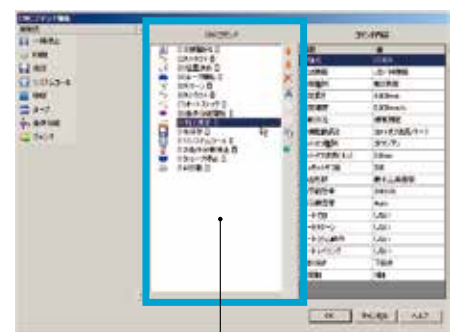
Automatization of a set of operations from measurement to inspection result output achieves high-efficient measurement work.

Operations of "jump, pause, break, continue" based on conditional branching by measurement results and calculation errors are selectable. Prompting confirmation of certainty using system call command function prevents simple operational mistakes.

Typical example of confirmation of certainty is to display pictures for the workpiece setting posture before CNC execution, and pictures of detector/stylus profiles.



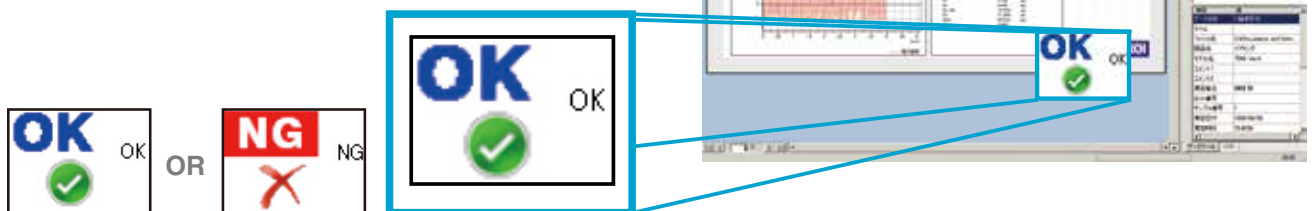
Icon display



Command edit screen

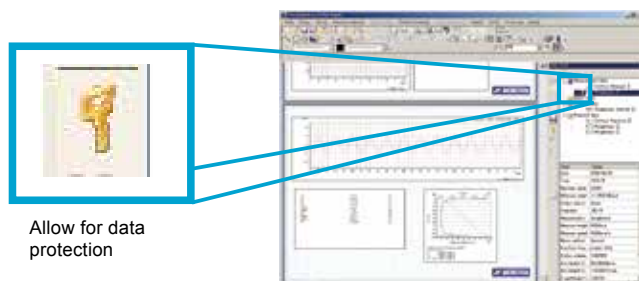
Document Comprehensive Judgment Display

ACCTee can provide judgment concerning the 16% rule and the design value for individual parameters. It can also display OK/NG in the graphic image for comprehensive judgment relating to the whole document. As a preset master page is registered, your logo and desired background will appear on all pages of the final inspection sheet output.



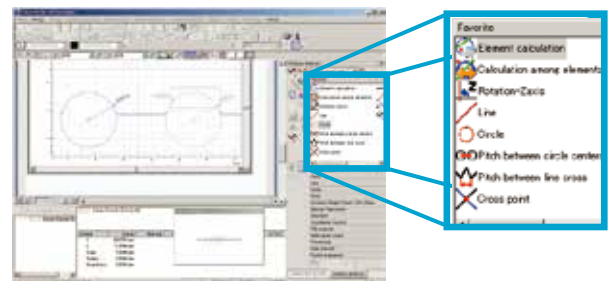
Software Data Protection

Data measured by ACCTee can be locked to prevent accidental deletion, copying, or moving.



Favorite

Frequently used commands can be stored in "Favorite" and re-organized for easy use.



Multi Language Support

ACCTee can be used overseas and supports several languages including Japanese, Chinese, Korean, English, German, French, Italian, Spanish, Czech and Polish.

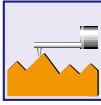


Language select screen

Help System

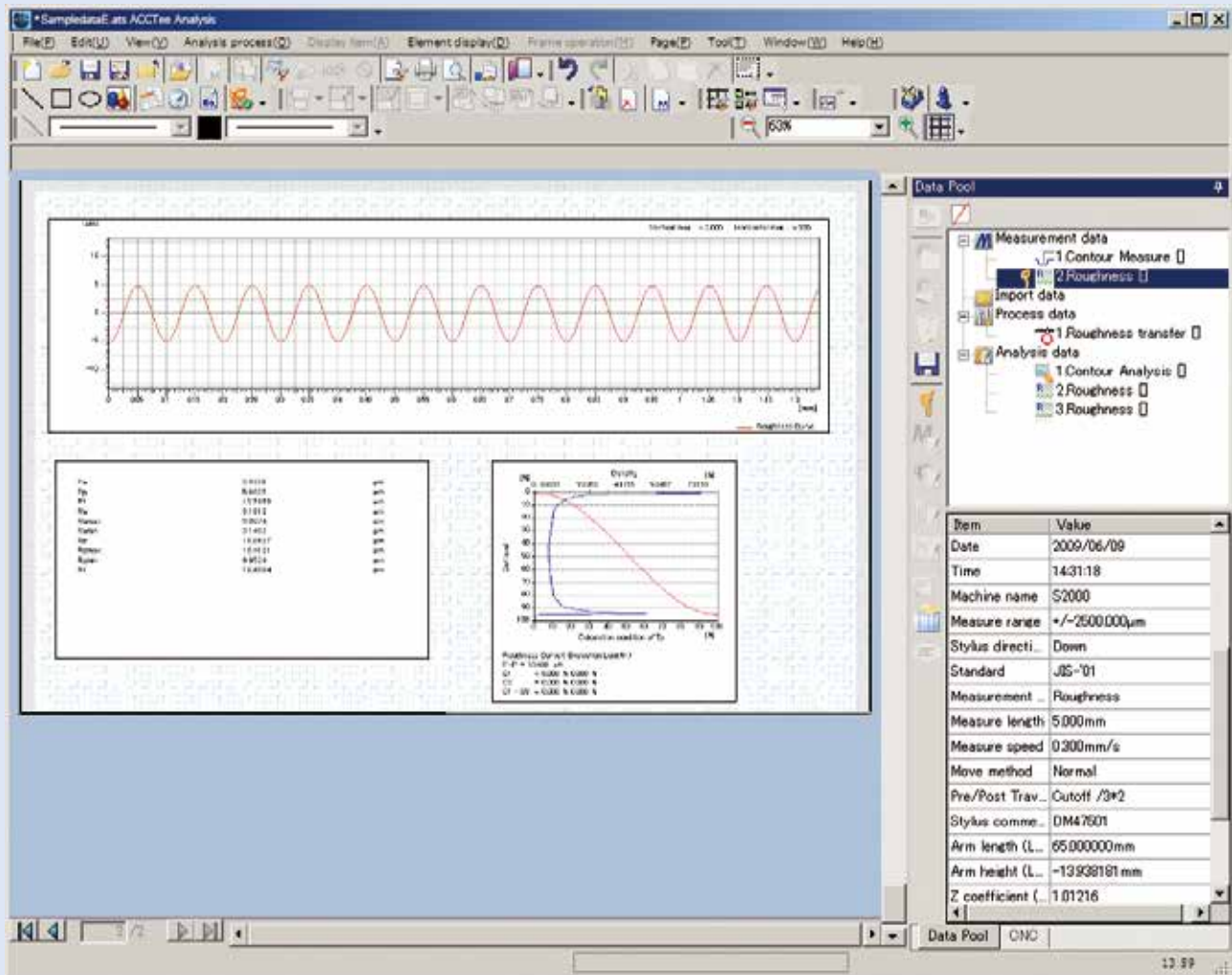
Help is always available whenever ACCTee is on. ACCTee features an on-line manual system so that an appropriate help message can be displayed by clicking the soft help key. Help can also be obtained by browsing the index or searching with keywords.





Roughness Measurement and Analysis System

ACCTee, the standard software associated with the SURFCOM DX3 and SD3 series roughness measurement system, is based on a new concept in roughness measurement that combines document-based measurement and analysis with leading-edge operability and an intuitive work environment. Setting wizards simplify instrument setup and configuration, making it possible for anyone to easily perform a variety of measurement and analysis tasks, optimizing throughput and performance.



Display of analysis result after roughness measurement

Versatile Measured Data Analysis

Once imported into ACCTee, measurement data can be displayed on a preview screen where you can adjust various measurement conditions (tilt, cut-off filter, etc). This allows you to optimize measurement conditions and re-analyze as many times as necessary.

Simple Operation

A Wizard mode guides users through any measurement operation with easy-to-follow step-by-step instructions. "Favorite box" collects frequently used commands to enhance operability.

Functions that Meet Your Needs

Functions such as level difference, area measurement (to measure PC board thickness), and superimposition (to compare wear assessments) are included.

Fully Automatic Operation Enhances Operability

Measuring procedures including column up-and-down and tracing driver movement are automatically registered by just clicking re-measurement icon.

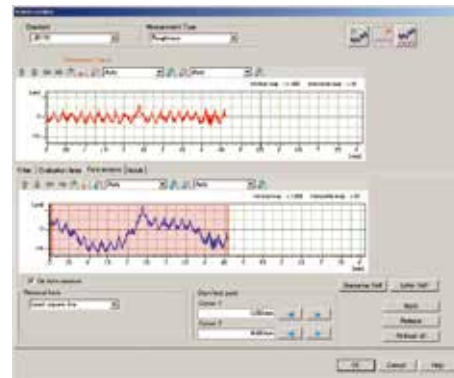
Rich measurement/analysis functions Beginner friendly Wide variety of guidance function

Outstanding high operability

Analysis condition change function of ACCTe allows for setting/changing the surface texture parameter calculation standard, or the cut-off filter, the notch level, the deletion length and so on. Additionally this allows for setting a freely selected value to the range of waviness data employed for the surface texture parameter calculation. Preview function implemented in the selection of form removal (tilt correction) allows for selection of the most appropriate form removal condition. The function implemented allows for clearing the setting ranges and conditions easily.



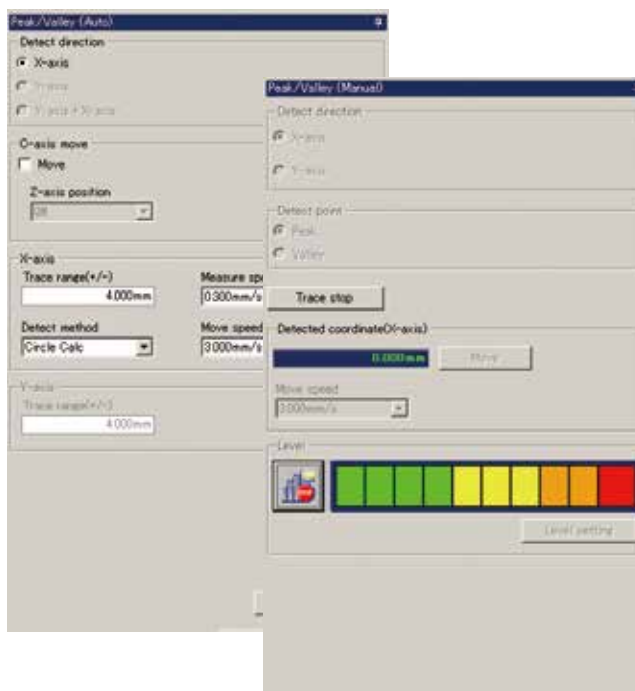
Analysis condition display



Preview display of changed analysis condition

Roughness Peak and Valley Detection Function

ACCTee detects the maximum point (minimum point) and automatically shifts the stylus to the maximum point (minimum point) as the peak and valley function traces the cylindrical profile, convex, concave, and spherical profile using the stylus. In manual operation, the position is reported by an alarm.



Roughness Curve Trace Display

As the profile traced by the roughness stylus is displayed, the measurement area can be set on the screen.

Level Difference Parameter

Level differences can be measured on the concave and convex profile. The measurement, average height, maximum height, minimum height, and area can be calculated from the data.

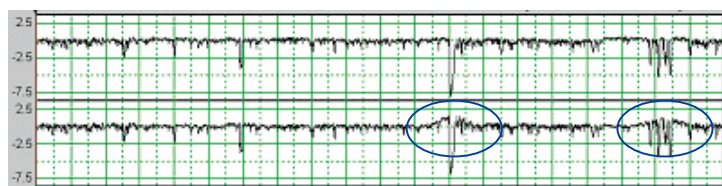
Wear-out Analysis for Roughness Curve Data

The degree of wear can be calculated by overlapping and displaying two roughness curves and calculating the differences between the data.

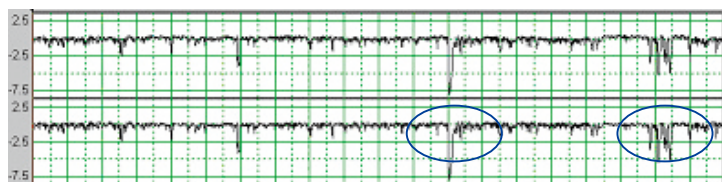
Rich wizard functions assist operators.

Robust Spline Filter

The roughness measurement/analysis allows for selecting a filter from various filters including the robust spline filter. The robust spline filter is not yet standardized. However, the phase compensation filter generates the distortion phenomenon, if the roughness waveform contains noticeable peaks or valleys,. The robust spline filter resolves this distortion phenomenon.



◀ Upper:
Profile curve without cut-off filter
◀ Lower:
Roughness curve, Gaussian filter



◀ Upper:
Profile curve without cut-off filter
◀ Lower:
Roughness curve, Robust spline filter

Automatic Pass/Fail Judgment under 16% Rule (JIS2001 Standard)

The 16% rule and the max-rule are standardized for the allowable tolerance decision criteria to the surface texture evaluation parameters.

The 16% rule makes the decision to pass, if the ratio of number of reference length measurements exceeding the allowable tolerance to total number of measurements, is 16% or less.

The max-rule makes the decision to pass, if all reference length measurements are under the allowable tolerance.

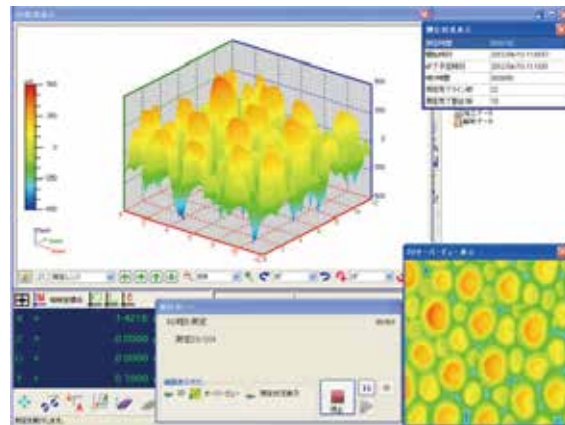
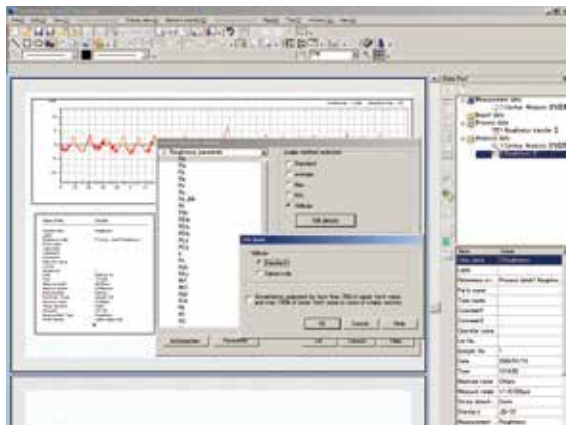
ACCTee provides the automatic decision function to pass or fail.

3D Roughness Measurement and Analysis (option)

Functions support 3D roughness analysis. (Optional expanded hardware required).

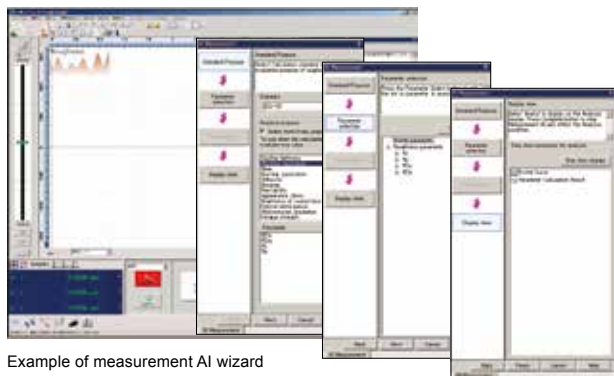
The function allows for dealing huge amount of data to obtain maximum 4,000 scanning lines and 80 million data.

SURFCOM MAP (option), 3D roughness analysis software to enable the over 20 type visual displays and analysis, is available. Selection from three options, "Premium" "Expert" and "Standard", is applicable.



Measurement AI Wizard

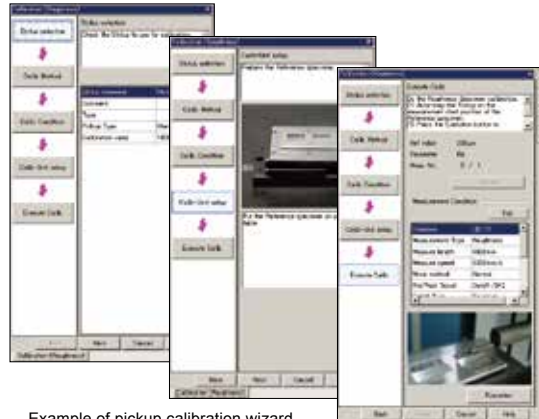
Parameters and analysis conditions appropriate for the roughness standard and evaluation purpose can be specified for ACCTee's measurement AI function. In addition, the optimum measurement condition can be specified by executing trial measurement. Analysis items for the measurement data selected on the document can be displayed by selecting the display items at the end.



Example of measurement AI wizard

Pickup Calibration Wizard

Sensitivity calibration is executed by selecting any of the following three options: depth specimen; magnification calibration unit; and reference specimen. Next, the calibration condition is specified (inputting reference value), the installation method for the calibration unit and the measurement start position are confirmed, then calibration is executed.



Example of pickup calibration wizard

Calibration Alarm and Historical Management

ACCTee can accept any time as the time of calibration. In addition to the probe replacement time, a calibration alert based on measurement frequencies or lapsed days is displayed, helping maintain accurate and stable measurement by ensuring periodical calibration.

Stylus check wizard

Abrasion or crack on stylus tip is likely to happen in long-term use of measurement. Periodic check is essential for precise measurement. The guidance allows anyone to easily check a stylus tip.

Parameter Figure and Symbol Input Wizard

The same symbols used in the design diagram can be input into the design values of the analysis condition and parameter pass/fail judgment.



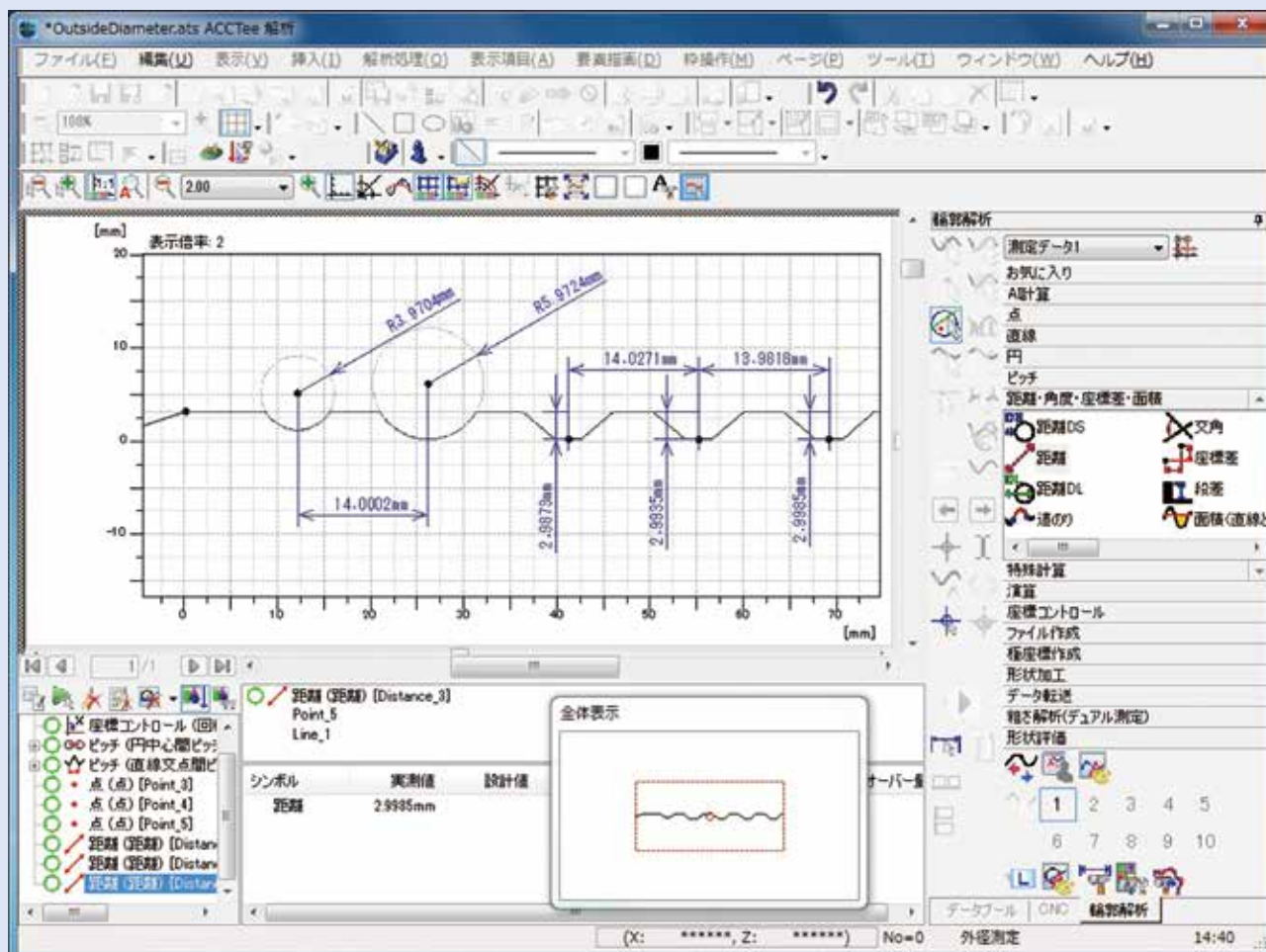
Example of parameter figure and symbols wizard

Specifications	ACCTee roughness measurement and analysis program
Standard	Complies with JIS2013, JIS2001, JIS1994, JIS1982, ISO2009, ISO1997, ISO1984, DIN1990, ASME2002/1995, CNOMO
Parameter	Ra, Rq, Ry, Rp, Rv, Rc, Rz, Rmax, Rt, Rz.J, R3z, Sm, S, RΔa, RΔq, RΔa, RΔq, TILT A, Ir, Pc, Rsk, Rku, Rk, Rpk, Rvk, Mr1, Mr2, VO, K, tp, Rmr, Rmr2, Rrc, AVH, Hmax, Hmin, AREA, NCRX, R, Rx,a AR, NR, CPM, SR, SAR, etc
Parameter judgment	The judgment result can be displayed by standard, average value, the maximum value, minimum value, and 16% rule
Evaluation curve	Profile curve, roughness curve, filtered waviness curve, filtered center line waviness curve, rolling circle center line waviness curve, ISO13565-1(DIN4776) roughness curve, roughness motif curve, waviness motif curve, envelope waviness curve
Surface characteristic display	Bearing area curve, power spectrum curve, amplitude distribution graph, ISO13565-2 Bearing area curve, ISO13565-3 Bearing area curve, peak height distribution graph/list, auto correlation graph, wear-out amount analysis (two arbitrary curves), overlapping analysis (ten curves or less)
Form remove (tilt correction)	Least square straight line correction, n-dimension polynomial (n=2 to 9) correction, both ends correction, least square circle correction, least square oval correction, spline correction, robust (spline) correction (arbitrary or first or latter half of the setting range can be specified for all the options)
Filter type	Gaussian phase compensation filter, phase uncompensation type 2RC filters, phase compensation 2RC filters, spline filter, robust (spline) filter
Filter	Cutoff wavelength (λc): 0.008, 0.025, 0.08, 0.25, 0.8, 2.5, 8, 25, 50 mm (9 levels), arbitrary (from 0.001 mm) Cutoff ratio (λs): 1/30, 1/100, 1/300, 1/1000, arbitrary (from 1/10) Cutoff wavelength (λs): 0.08, 0.25, 0.8, 2.5, 8, 25, 80 μm (7 levels), arbitrary (from 0.05)
Stylus calibration	Can be selected from depth specimen (JIS standard), magnification calibration unit, and reference specimen. Maximum 20 units of stylus calibration information can be registered (deadline for the calibration time can be specified)
Number of data points	300000 max.
Vertical magnification display	Arbitrary value (unit: 0.01), automatic and 50, 100, 200, 500, 1 k, 2 k, 5 k, 10 k, 20 k, 50 k, 100 k, 200 k, 500 k, 1000 k, 2000 k, 5000 k, 10000 k times
Horizontal magnification display	Arbitrary value (unit: 0.01), automatic and 1, 2, 5, 10, 50, 100, 200, 500, 1 k, 2 k, 5 k, 10 k, 20 k, 50 k, 100 k, 200 k, 500 k, 1000 k times



Contour Profile Measurement and Analysis System

ACCTee, the standard software used with Contourecord DX3 and SD3 series contour measurement system, is based on a new concept in contour profile measurement that combines document-based measurement and analysis with leading-edge operability and an intuitive work environment. Setting wizards simplify instrument setup and configuration, making it possible for anyone to easily perform a variety of measurement and analysis tasks, optimizing throughput and performance.



Display of contour analysis result

Flexible Analysis of Measurement Data

Once imported into ACCTee, measurement data can be displayed on a preview screen where you can adjust various measurement conditions and re-analyze as many times as necessary. This allows you to display a hypothetical result and to optimize measurement conditions.

Simple Operation

A Wizard mode guides users through any measurement operation with easy-to-follow step-by-step instructions. "Favorite box" stores frequently used commands to enhance operability.

Functions to Meet Customer's Needs

A comprehensive suite of basic, easy-to-use functions essential to profile analysis enable you quickly and efficiently measure various workpieces with high precision.

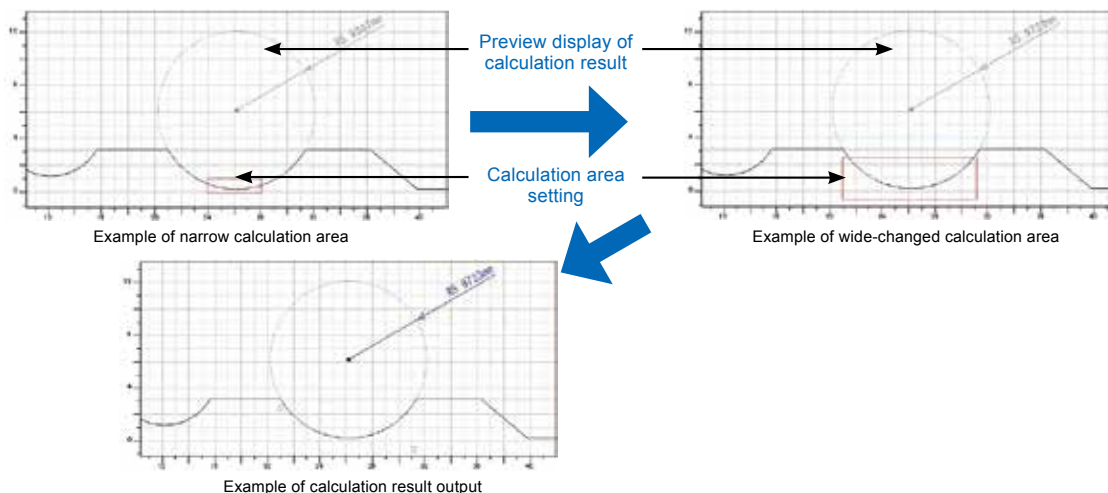
Fully Automatic Operation Enhances Operability

Measuring procedures including column up-and-down and tracing driver movement are automatically registered just by clicking the re-measurement icon.

Calculation Result Preview Function

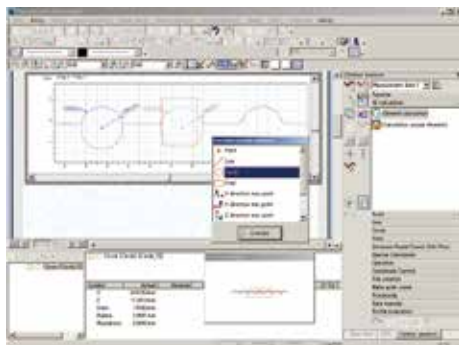
Result can be displayed before output.

As the calculation area changes, you can preview the result in real time.



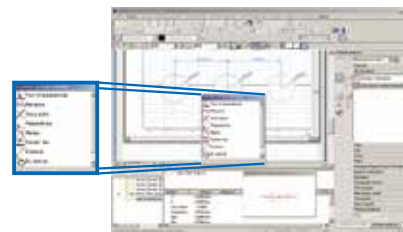
AI Function (Automatic Element Judgment)

The points, straight lines, and circles of the basic elements are automatically extracted by turning on the AI function and by selecting the specified area of the measurement data. This eliminates the specification of the menu and icon in each case, which significantly reduces time required to perform the procedure.



Elements Calculation with Icon Guidance

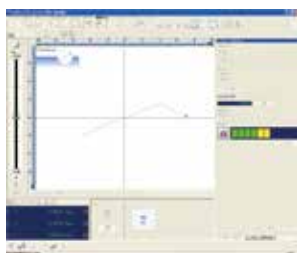
When making a new calculation from any of the multiple elements already created, all possible choices are displayed. Multiple inter element calculations can also be selected to suit your requirements.



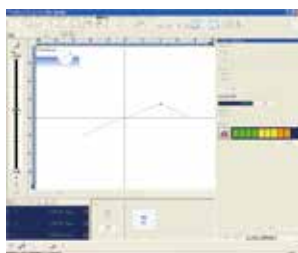
Elements calculation: Circle-circle calculation candidate screen

Peak and Valley Function

There are two modes in this function: Auto mode, in which the minimum point is automatically detected; and Manual mode, in which you turn the knob of the adjustment platform or the tracing driver and changes in color and sound alert you when the level mark on the screen.



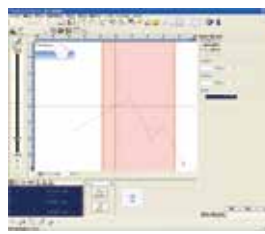
Manual mode detection start



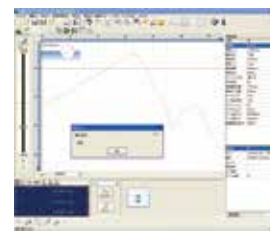
Manual mode maximum point detection

Work Trace Function

As this function displays a manually traced profile, it is ideal for determining the measurement limit point when measuring to the edges of a wall or valley with reference to the trace start or end points. It is also useful in situations where a visual check is difficult, such as the inside of a hole. As the start point and the end point can be specified in the profile traced on the screen, the measurement will never fail. The screen changes to show the real-time status of the profile being measured when measurement starts.



Work trace measurement area setting

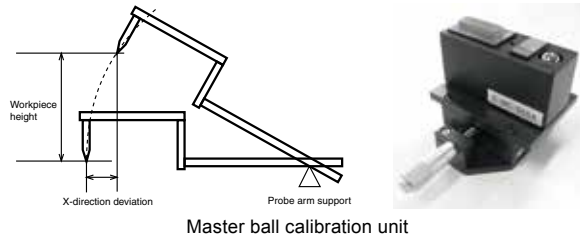


Real-time display

Masterball calibration function

Circle Correction Calculation

Since the probe moves in a circular motion vertically around the support on the contour measuring instrument's probe arm, error will be produced in the X-axis data because the probe tip position also moves in the X-axis direction. These error elements must be corrected in order to achieve high measuring accuracy. The ACCRETECH contour measuring system performs calibration using a master ball calibration unit which enables simple circle error as well as tip R error calibration.



Master ball calibration unit

Tip R-Correction

Although the contour measuring instrument's probe tip is R-shaped, tip R-correction is indispensable for high measuring accuracy. Measurements are taken from the center of probe tip R and correction is performed by offsetting in the normal direction at 11 dividing points on the tip. Though there is no problem with fixed quantity correction when probe tip R is near maximal generalized roundness zero, large errors can occur in the correction amount due to tip R processing tolerance error or wear after long term use.

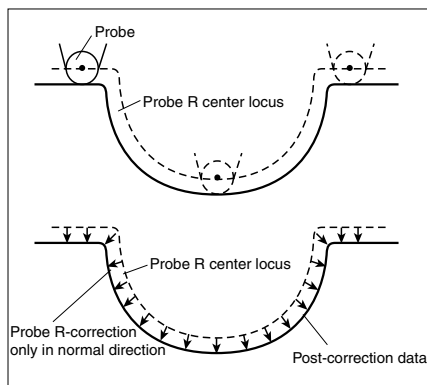


Figure a

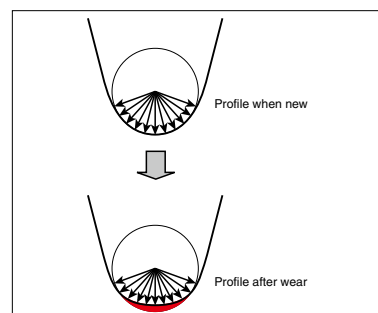
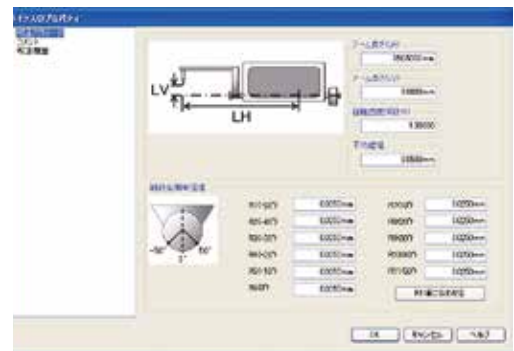


Figure b



Master ball correction screen

Stylus Calibration Wizard

Stylus calibration is performed by the masterball calibration unit. During masterball measurement and level difference measurement, tip R correction and arc error correction can be executed automatically or manually. The wizard takes you through all necessary steps in the following order: calibration condition (inputting reference value) setting, placement of the calibration unit, confirmation of measurement start point, and execution of calibration.



Calibration Alert

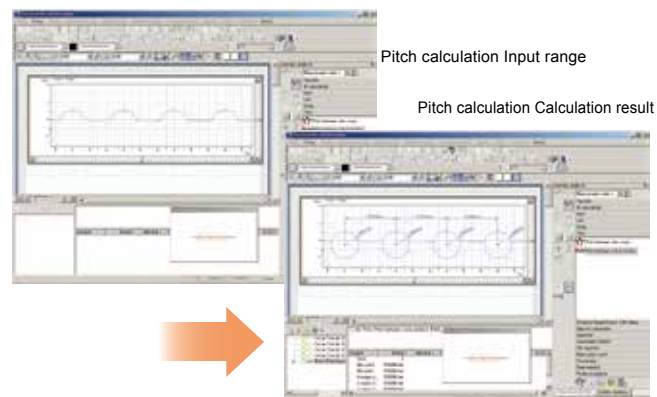
Calibration can be specified at any time.. In addition to the stylus replacement time, a calibration alert based on measurement frequencies or elapsed time is displayed periodically, ensuring accurate, stable measurement on a continuous basis.

Calculation Point Manual Input

When analyzing the same profile repeatedly, it is possible to switch from manual operation to targeted analysis during CNC execution by setting the condition for recalculation, enabling detailed analysis.

Pitch Calculation Function

For the same multiple profiles composed of circles and straight lines, the pitch between line intersections or the pitch between circle centers can be automatically output just by specifying the arc with the mouse. Analysis efficiency can be improved by using the dimension line auto output function at the same time.



Pitch calculation Input range

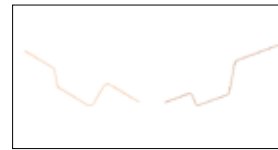
Pitch calculation Calculation result

Profile Synthesis Function

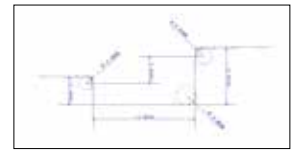
Even when multiple measurements are required due to stylus angle limitation, analysis can be facilitated by combining the data using the profile synthesis function.



Profile



Measurement



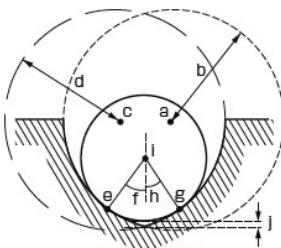
Analysis

Edge Detection Measurement (Patented)

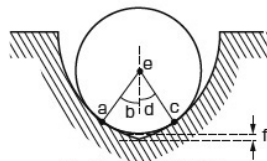
You can set the instrument to detect edges during measurement and automatically complete measurement. This is useful when you want to measure the far end of the edge.

Ball Screw Calculation Function (Option)

Two calculation methods are supported: approximation for a round ball screw groove part, and a method that calculates the groove profile as-is. A lead angle projection function makes it possible to analyze and project data measured in the edge direction in groove and line directions.



Ball circle calculation



Ball-screw profile calculation

Import External Data

CAD IGES/DXF data and Calypso Curve measurement data* are read and evaluated with contour analysis.

* Nominal value data output by Calypso optional Form data ASCII input/output program.

Best fit function (Option)

The best fit function calculates a symmetrical points to measured data with aspherical curve profile, and shifts the origin with the assumption that the points are vertices. Schemes of X-axis parallel shift, Z-axis parallel shift and rotation are selectable independently or in combination, for the origin shift.

Aspherical nominal data creation function (Option)

The aspherical surface calculation formula with parameters of the conic constant, the circle radius, the polynomial term number, the aspherical coefficient, and others, allows for generation of the nominal value point data for aspherical surface profile.

Contour Profile Measurement and Analysis Program		
AI function		Automatic distinction of elements including points, Lines, circles and ovals
		Auto Distinction of executable combination between two elements (point-point, point-line, point-circle, point-oval, line-line, circle-line, circle-circle, line-oval, circle-oval, oval-oval)
Arithmetic processing	Point	Cross point, Mid-point, Contact point, Peak, Valley
	Line	Perpendicular, Median, Contact line, Parallel line, Bisector, Virtual line
	Circle	Partial Circle, Oval, Contact circle, Virtual circle
	Pitch	Pitch between line cross, Pitch between circle centers
	Distance	Distance, Curve length
	Angle	Angle, Intersection Angle (complementary angle, supplementary angle)
	coordinate	X coordinate difference, Z coordinate difference, angle difference, moving radius difference, Polar coordinate difference
	Step Difference	Average step difference, Maximum step difference, Minimum step difference
	Area	Area
	Arithmetic	Addition, Subtraction, Multiplication, Division, Power operation, Surplus, Absolute value, Square root
	Statistics	Average value, Maximum value, Minimum value, Standard Deviation, Summation
	Special Calculation	Over pin calculation, Dimension line display function, Calculation result nominal collation, Mirror inverse, Smoothing, Profile composition (Whole composition, Partial composition) Calculation point repeat function, Work trace function, Peak/Valley function, CNC function, Nominal collation, Best fit (Parallel move, Rotary move), Nominal value preparation function
Coordinate Control		Origin setting, Various axis setting, Parallel move, Rotary move
Measurement support function		Re-measurement function, AI function, Various wizard function, Self-diagnosis function, CNC function, Peak/Valley function, Tracing function, Dimension line display function, Profile composition function, Nominal collation function, Coordinate system auto set function
Calculation support function		Infinite cursor, Cursor profile vertical/horizontal switch, One point micro motion, Setting of error band
Data file input and output		Point sequence, Text, CSV, DXF data, Calypso data
Stylus calibration		Automatic and manual calibration by master ball calibration unit. Maximum 20 units of stylus calibration information can be registered (deadline for the calibration time can be specified)
Measurement pitch		0.01 μm to 1000 μm
Number of data points		Maximum 300000 points
Display Magnification	Vertical magnification display	Arbitrary value (unit:0.01), automatic and 0.01 to 10000000 times
	Horizontal magnification display	Arbitrary value (unit:0.01), automatic and 0.01 to 10000000 times