

# ACCTee

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

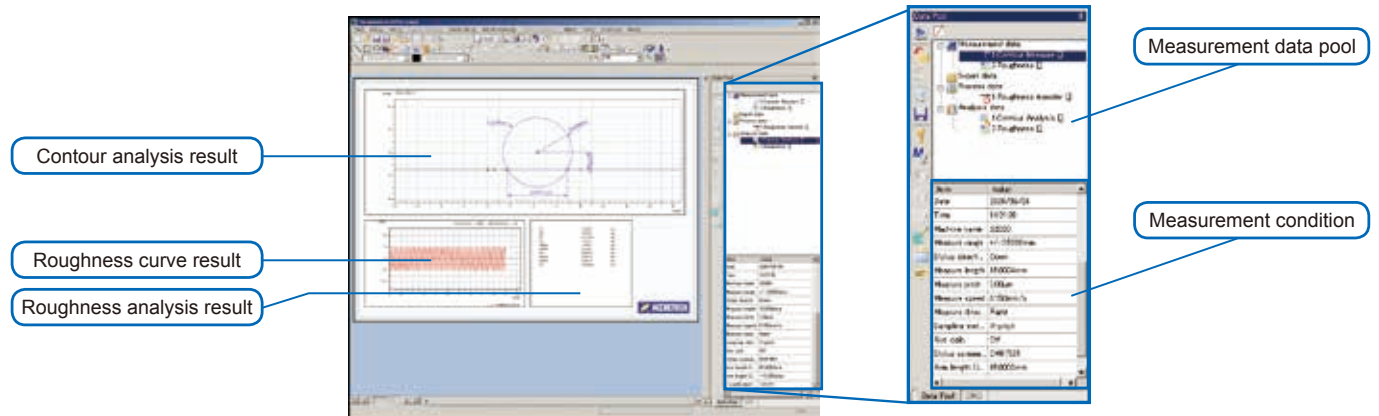


## Integrated Analysis Software ACCTee

Our newly developed ACCTee software represents the next generation of integrated TiMS software. Based on a new concept in measurement that combines document-based measurement and analysis with leading-edge operability and an integrated user interface, ACCTee makes all operations available in the document (measurement result sheet), and enables all data and information to be stored in a single document. This is the "All in the Document", next generation integrated software, ACCTee.

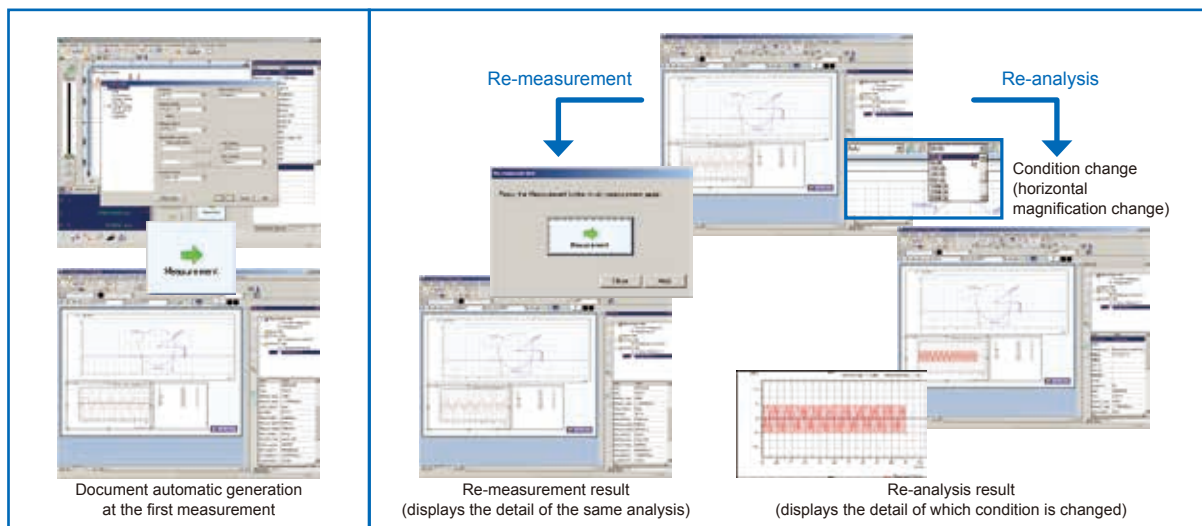
### Easy-to-Use Interface for Leading-Edge Operability

ACCTee is equipped with a Windows style user interface that is easy for anyone to understand and use. The software guides you through a series of operations from measurement to the printing of analysis results.



### More Efficient Re-Analysis and Re-Measurement with Easy Operation

All data including layout, measurement condition, analysis condition, measurement data, and part program is available in the document window, enabling you to easily execute data editing, addition, re-analysis, and re-measurement. Since there's no need to switch between windows, operational efficiency is improved by 40% or more compared to conventional software. In addition to executing re-analysis, ACCTee allows you to quickly obtain measurement results when executing the same measurement and analysis as done previously by selecting the measurement data from the data pool and clicking the re-measurement data.



## Self-Diagnosis Function

In preparation for an emergency, the self-diagnosis function is always in operation. Whenever there is a problem, a message indicating the location and nature of the problem - such as a failure or error with the measurement instrument screen - is displayed, enabling the operator to take appropriate action in to resolve the problem as soon as possible.



Error message display



The problem location is indicated by a picture

## 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.



## Macro Function

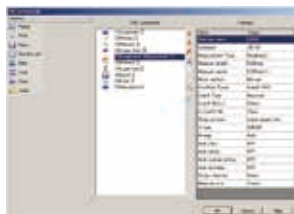
Once repetitive procedures (except axial movement) have been registered, this function lets you easily execute a series of operations at the touch of a button.

## CNC Function

This provides a highly efficient measurement work environment, as a series of tasks, from measurement to output of the test result, can be executed automatically. For the case and calculation errors in the measurement result, such operations as "Jump", "Pause", "Stop" and "Continue" can be chosen. Thanks to the system call command, you can display any type of image file during CNC operation, and can check the part setup and stylus configuration with photos so that you can avoid accidental errors in advance.



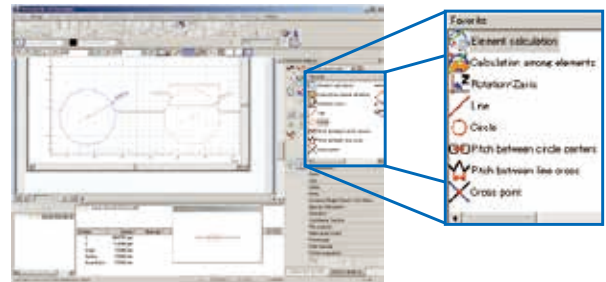
CNC part program



CNC command editing screen

## Favorite

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



## Software Data Protection

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



## 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.



## 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



## 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.

### 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

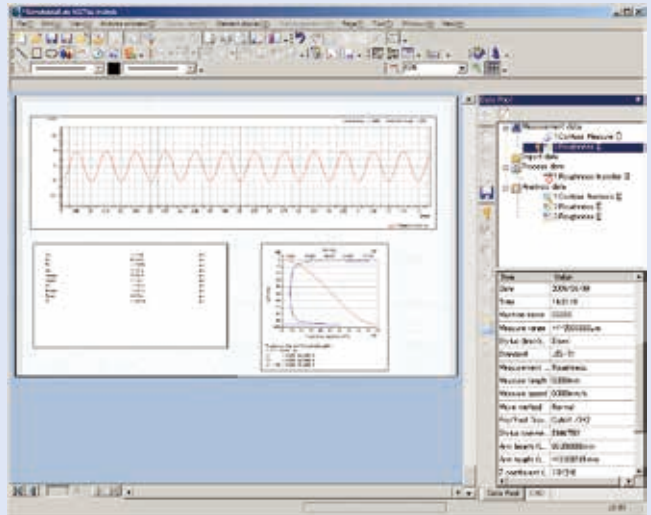
A Wizard mode guides users through any measurement operation with easy-to-follow step-by-step instructions. "Favorite box" collects frequently used commands to enhance operability.

### 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

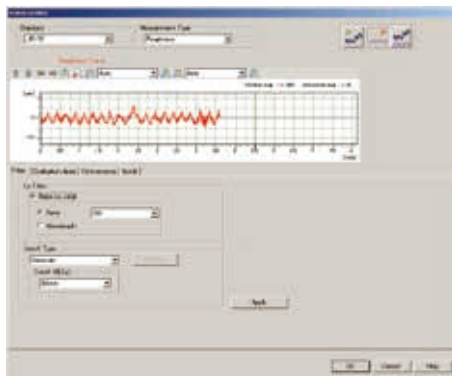
Measuring procedures including column up-and-down and tracing driver movement are automatically registered by just clicking re-measurement icon.



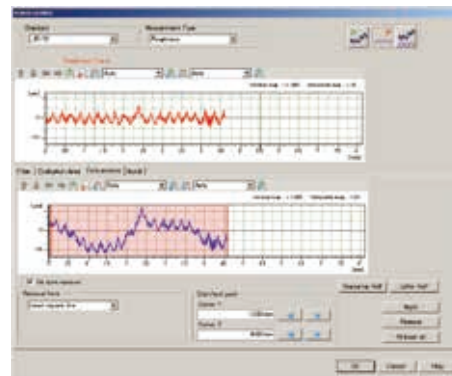
Display of analysis result after roughness measurement

### Change Analysis Conditions with Preview Function

- With ACCTee, you can set and change the roughness parameter calculation standard, cutoff filter, notch level, deletion length and other conditions. The range of the waveform data used for the roughness parameter calculation can be set to any value. The preview function also allows you to optimum form remove (tilt correction) can also be selected. The specified area and conditions can be cleared and changed quickly and easily.



Analysis condition display



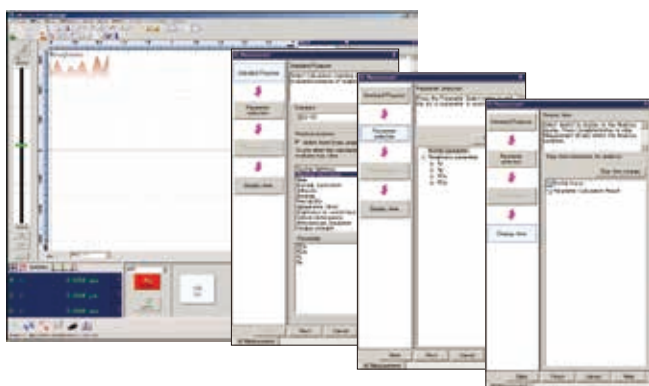
Preview display of changed analysis condition

## ▶ Wizards make operation easy

Setting wizards are provided to guide you through instrument setup and configuration, making it easy to conduct different types of measurements, as well as calibration, checking styli and selecting parameters.

### Measurement AI Wizard

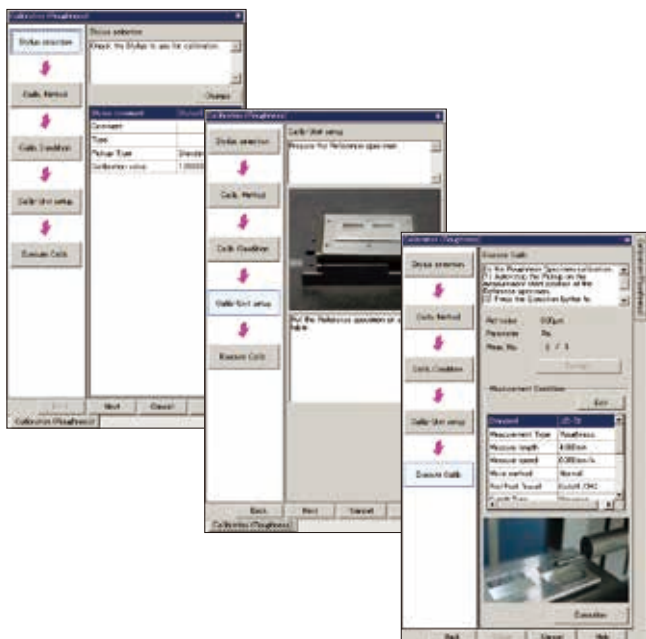
Parameters and analysis conditions appropriate for the roughness standard and evaluation purpose can be specified for ACCTee's measurement AI function. In addition, the optimum measurement condition can be specified by executing trial measurement. Analysis items for the measurement data selected on the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



Example of measurement AI wizard

### Pickup Calibration Wizard

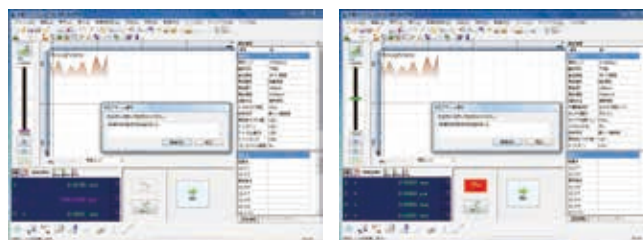
Sensitivity calibration is executed by selecting any of the following three options: depth specimen; magnification calibration unit; and reference specimen. Next, the calibration condition is specified (inputting reference value), the installation method for the calibration unit and the measurement start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



Calibration alarm

Roughness calibration alarm

### Stylus Tip Check Wizard

ACCTee can use a depth specimen or reference specimen for the stylus tip check. The tip of the stylus is subject to increasing wear so a regular check is necessary to maintain accurate measurement. With the wizard's guidance, anyone can easily check the 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.



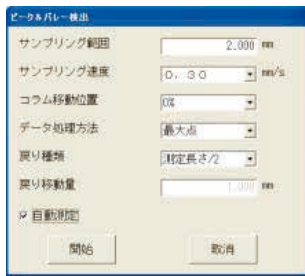
Example of parameter figure and symbols wizard



## ▶ ACCTee supports roughness measurement and analysis with a host of versatile functions

### 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.

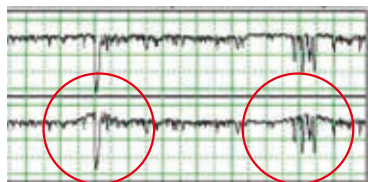
### Wear-out Analysis for Roughness Curve Data

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

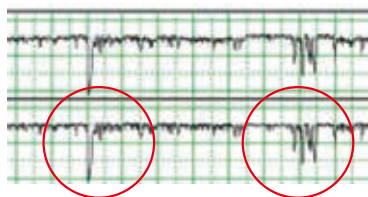
### Robust Spline Filter

Various filters are available for roughness measurement and analysis, including robust spline filter. The robust spline filter dissolves distortion caused by the phase-compensated type filter with distinguished peak and valley on roughness waviness.

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



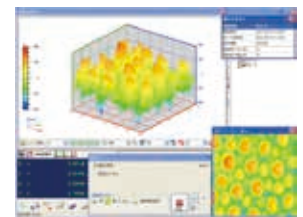
### Automatic Pass/Fail Judgment under 16% Rule (JIS2001 Standard)

In the ACCTee analysis process, the 16% rule and the max rule are standardized for the tolerance criteria of the roughness evaluation parameters. With the 16% rule, if the measurement value for the multiple standard length that exceeds the tolerance is below 16%, it is assumed to pass. With the Max rule, all multiple standard length measurement values must not exceed the allowable tolerance.



### 3D Roughness Measurement and Analysis

Functions support 3D roughness analysis. (Optional expanded hardware required) It is possible to obtain up to 4000 scanning lines and 80 million data. 3D analysis can be conducted by SURFCOM Map (Option) with various visual displays.

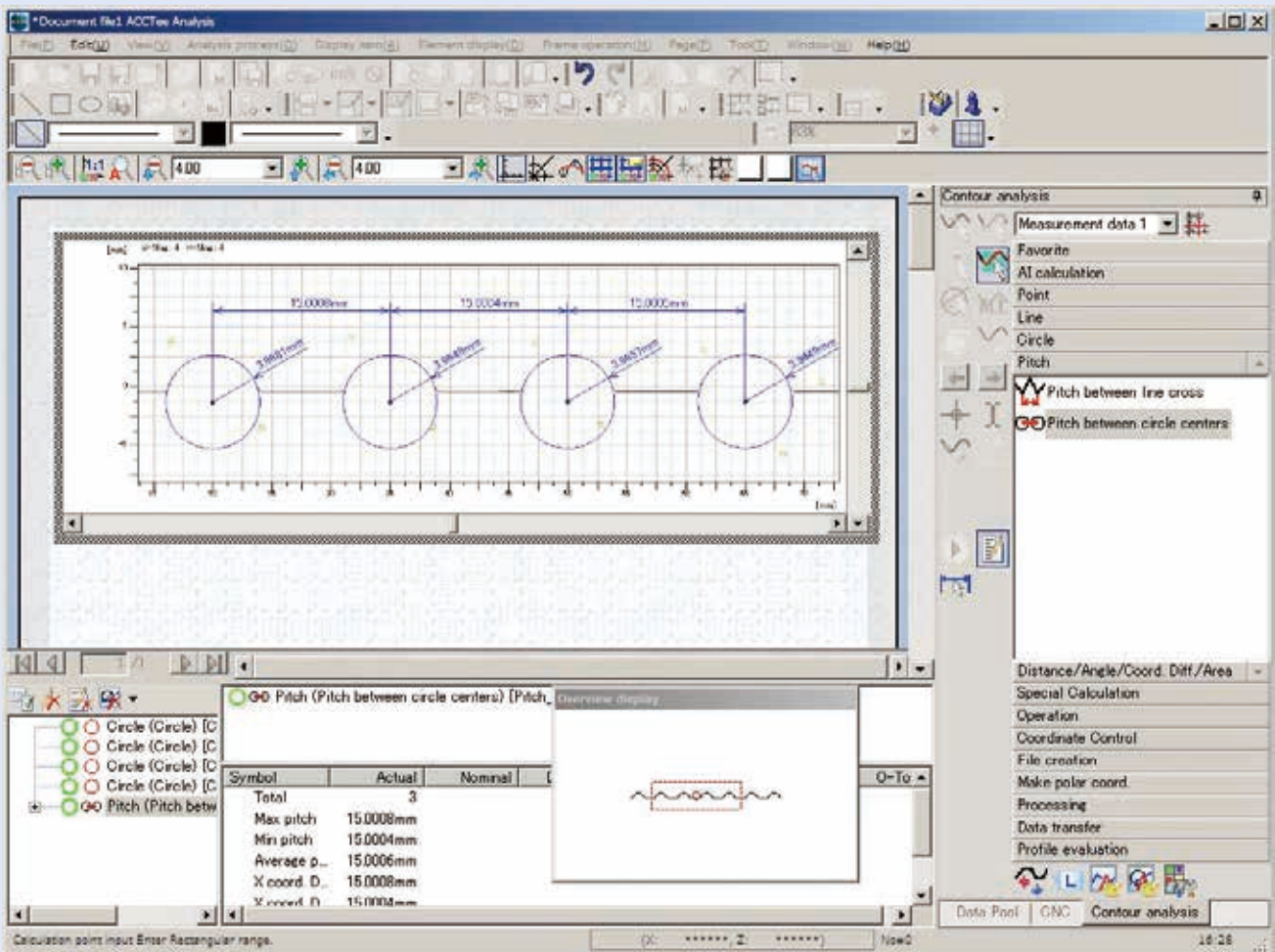


Specifications	ACCTee roughness measurement and analysis program
Standard	Complies with JIS2001, JIS1994, JIS1982, ISO1997, ISO1984, DIN1990, ASME2002/1995, CNOMO
Parameter	Ra, Rq, Ry, Rp, Rv, Rc, Rz, Rmax, Rt, Rz.J, R3z, Sm, S, RΔa, RΔq, RΔa, RΔq, TILTA, Ir, Pc, Rsk, Rku, Rk, Rpk, Rvk, Mr1, Mr2, VO, K, tp, Rmr, Rmr2, Roc, 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 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.

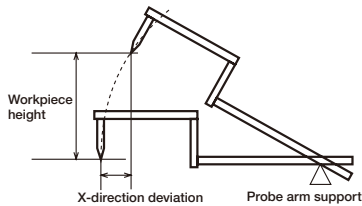
## Fully Automatic Operation Enhances Operability

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

## ► 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

X-direction deviation

Probe arm support

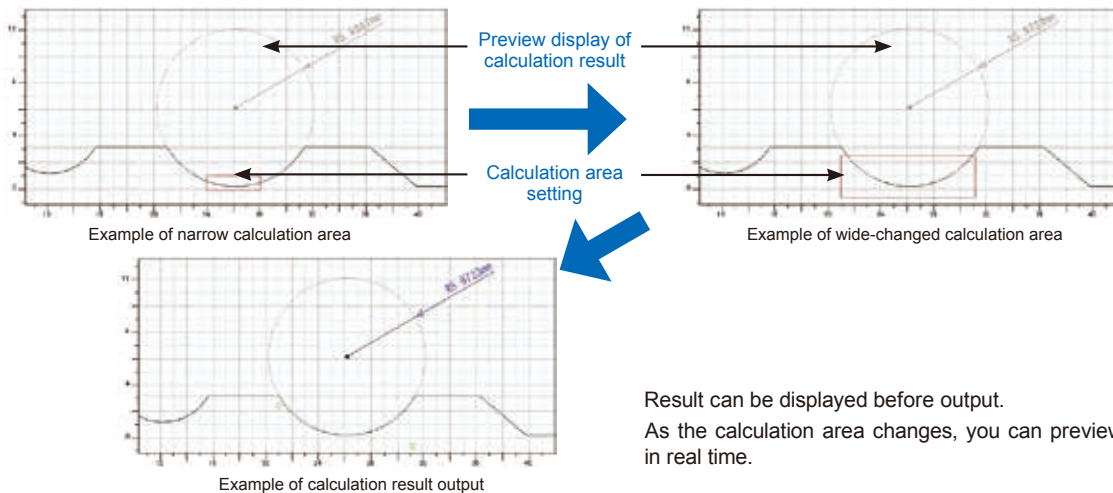
### Tip R-Correction

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.



Master ball correction screen

## Calculation Result Preview Function



Result can be displayed before output.

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

## ► Simple operation supports state-of-the-art technology

### 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.

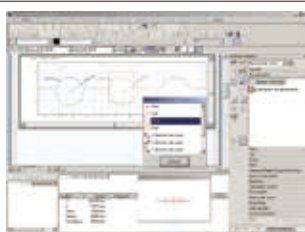


### Calibration Alert

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.

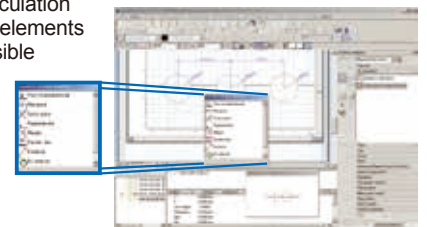
### AI Function (Automatic Element Judgment)

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.

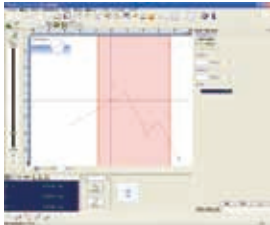


Elements calculation: Circle-circle calculation candidate screen

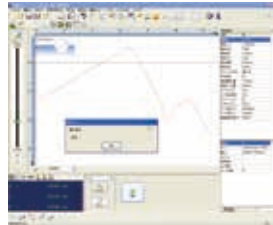


## Work Trace Function

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



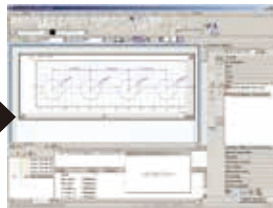
Real-time display

## 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

## Import External Data

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

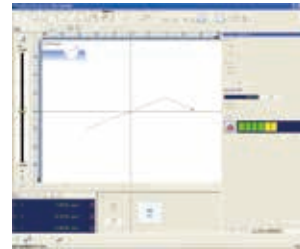
\* Nominal value data output by Calypso optional Form data ASCII input/output program.

## Non-Spherical Surface Nominal Value Generation Function and Best Fit Function (Option)

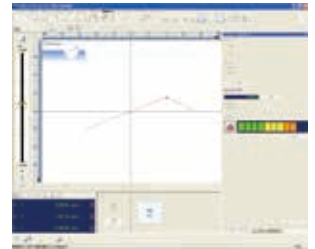
ACCTee generates non-spherical surface nominal values using a non-spherical surface calculation formula. After inputting the conic constant, circle radius, number of expression terms, non-spherical surface coefficient value, and other parameters as calculation expression variables, the software generates nominal value point data for a non-spherical surface profile. The Best fit function calculates points that are symmetrical to the curve, providing measured data for a non-spherical surface and shifting the origin so these points are the vertices. The origin shift can be configured so X and Z rotation are performed independently, or in combination.

## 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

## 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.

## 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.

## 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.

## Ball Screw Calculation Function (Option)

Two calculation methods are supported: approximation for a round ball screw 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 screw projection angle

Lead angle projection is performed on actual data obtained by measuring ball screw in axial direction. This enables pitch evaluation as data measured at right angle to the groove can be obtained in terms of calculation.

## Bearing Groove Analysis Function

Operability of trace surface analysis procedure has been improved.

Specifications	ACCTee Contour Profile Measurement and Analysis Program
AI function	Automatic distinction of elements including points, straight lines, circles and ovals Automatic distinction of the combination executable of calculation between two elements (point-point, point-straight line, point-circle, point-oval, straight line-straight line, circle-straight line, circle-circle, straight 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, curve length, angle, inter angle (compl. angle, suppl. angle), Coord. Diff (X coord. difference, Z coord. difference, dliff. angle, radius difference), polar coord difference, level difference (average level, max. level, min. level), area, calculation (addition, subtraction, multiplication, division, power operation, surplus, absolute value, square root), statistics (average, max., min., std. dev., total sum), over-pin calculation, dimension line display function, calculation result design value collation, mirror inverse, smoothing, form combining (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
Data file input and output	Input of point sequence, text, CSV, IGES, DXF data and Calypso data
Coordinate control	Origin setting, each axis setting, parallel move, and rotary move
Calculation support function	Infinite cursor, cursor form vertical/horizontal switch, one point micro motion, setting or error band
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)
Measure pitch	0.01 μm to 1000 μm
Number of data points	Maximum 300000 points
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