Powerful and intuitive machine tool probing software

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Machine tool software functionality

Renishaw provides a range of macro, PC, and smartphone software solutions designed to complement its range of measurement and process control hardware.

Comparison chart

Software packages	Page	Inspection Plus	Contact tool setting	Non-contact tool setting	SupaScan[1]	Productivity+™ Active Editor Pro	Productivity+™ CNC plug-in	Reporter[1]	AxiSet™ Check-Up
Functionality	Page	3	6	7	8	10	12	16	26
Spindle probing									
Part mis-load		●							
Part set-up (WCS)		●			●	●	●		
Part and feature measurement		●			●	●	●		
Support for scanning probes					●	●	●		
Machine tool calibration and qualification							●		●
Programming from CAD models						●			
Tool setting									
Tool set-up and monitoring			●	●					
General									
On-machine programming		●	●	●	●		●		●
Office-based programming						●			
In-process control		●	●	●	●	●	●		
Text based reporting of measurement results		●			●	●	●		
Graphical reporting of measurement results								●	
Add-on packages available for advanced functionality		●		●			●		

Inspection Plus

Inspection Plus is the industry standard macro package for machine tools, offering solutions for part setting, inspection and in-process measurement.

Compatible with all major machine tool controller platforms, this machine-resident package is simple to program.

Experienced users can create and execute cycles using traditional G-code techniques. New or less experienced users can use one of the available programming tools, for example the GoProbe smartphone app or a graphical user interface (GUI) such as Set and Inspect or GoProbe iHMI.

Key features and benefits:

- Comprehensive range of standard measurement cycles, enhanced vector cycles and a range of calibration cycles
- A range of user-friendly programming options including GoProbe, Set and Inspect and other GUIs
- SupaTouch optimisation that reduces cycle time, improves metrology and automatically selects a one-touch or two-touch measurement strategy
- Statistical process control (SPC) feedback based on trend analysis and average results
- Offers a simple migration path from manual part setting cycles through to automated inspection cycles and then on to more complex inspection cycles
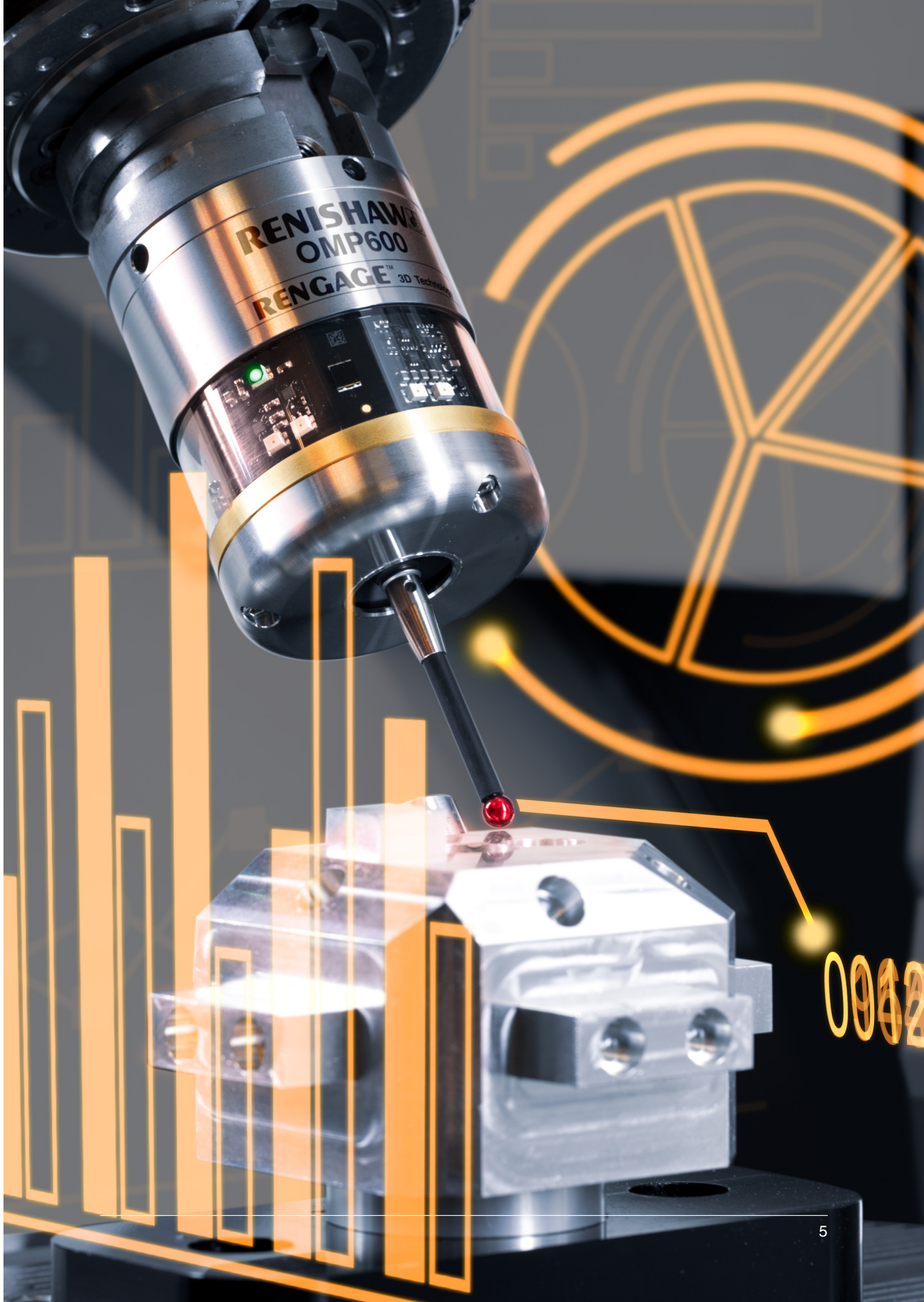- Advanced cycles add-on package to extend functionality further

Inspection Plus - continued

GoProbe cycles are included as standard in most Inspection Plus packages. Requiring only simple single-line commands, GoProbe eliminates the need for extensive knowledge of G-codes. The GoProbe smartphone app allows users to create this single-line command with just a few quick taps ready for input to the machine tool controller. Where required, further assistance is available in the form of animations, help images and associated text.

Inspection Plus uses SupaTouch technology to optimise the performance of each machine tool. SupaTouch intelligently minimises cycle times, increases productivity and delivers significant improvements in metrology. Inspection Plus is the foundation for many other Renishaw applications and is often a prerequisite for that application; for example Set and Inspect, Reporter and AxiSet™ Check-Up.

Completed probing cycle

Inspection Plus with SupaTouch

Completed probing cycle

Standard probing cycles (touch-trigger)

Measurement cycle time

Standard probing cycles

Inspection Plus with SupaTouch

Measurement variation

Boss cycle   Angled web cycle   3D vector cycle
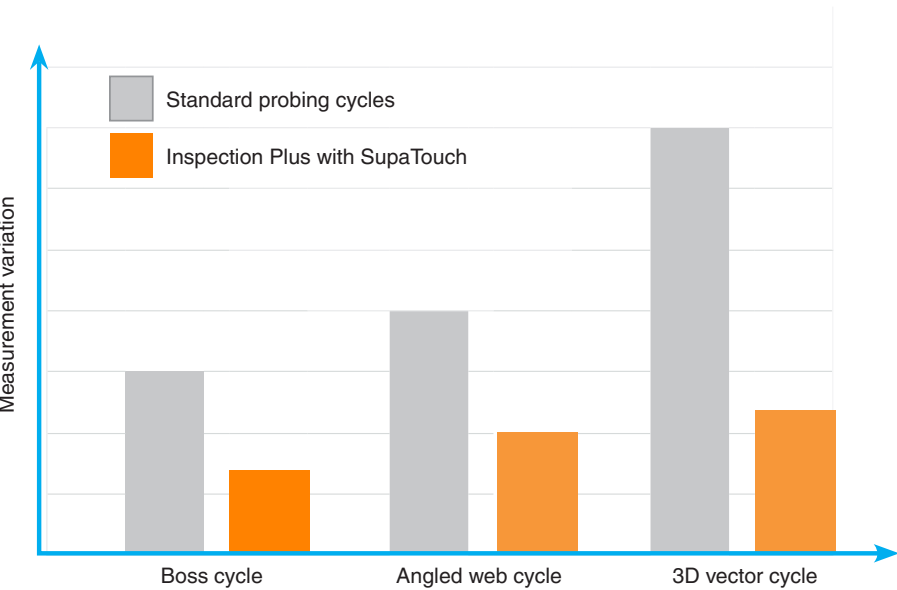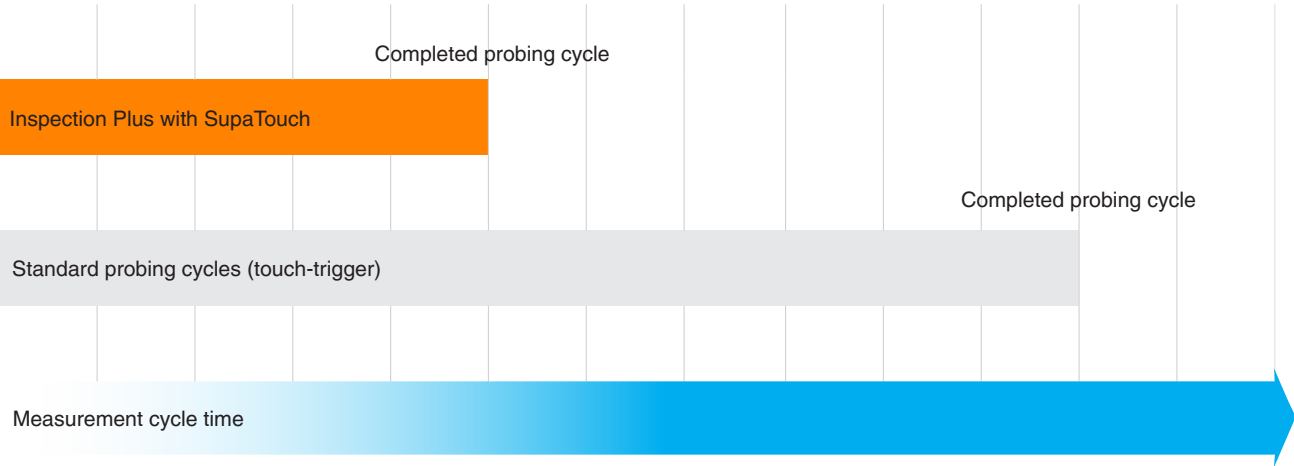
Contact tool setting software

Contact tool setting macro software allows users to accurately set the length and diameter of cutting tools on CNC machining centres prior to machining and to check for broken tools and thermal drift during the machining process.

Experienced users can create and execute cycles using traditional G-code techniques. New or less experienced users can use Renishaw's range of user-friendly GUIs (including Set and Inspect) or the GoProbe smartphone app.

Key features and benefits:

- Significant time savings with reduced machine downtime
- Accurate tool length and diameter measurement
- Automatic tool offset calculation and correction
- Elimination of manual setting errors
- In-cycle tool breakage detection
- Reduced scrap
- Compatible with the GoProbe smartphone app, Set and Inspect and the range of GUIs

Non-contact tool setting software

Renishaw non-contact tool setting macro software is capable of radial and linear profile checking as well as length and diameter, cutting edge condition monitoring, fast cycle times and advanced functionality. Additional cycles are available for advanced users.

Experienced users can create and execute cycles using traditional G-code techniques. Renishaw's range of user-friendly GUIs (including Set and Inspect) and the GoProbe smartphone app support new and less experienced users.

Key features and benefits:

- Significant time savings with reduced machine downtime
- Elimination of manual setting errors
- Accurate tool length and diameter measurement
- Radial and linear profile checking
- Cutting edge condition monitoring
- Thermal compensation tracking
- In-cycle tool breakage detection
- Automatic tool offset calculation and correction

SupaScan

SupaScan is an easy-to-use, on-machine probing system designed for exceptionally fast workpiece set-up using either scanning or point measurement techniques.

Utilising the OSP60 probe incorporating SPRINT™ technology, SupaScan can also be used to determine form information and to monitor surface condition. Defects including excessive waviness, surface peaks and steps can be detected, allowing corrections to be made whilst the component is still mounted in the machine tool, greatly enhancing your on-machine inspection capability.

The DPU-1 data processing unit, supplied as part of the SupaScan system, generates all the required programming and configuration macros, meaning that no separate programming interface is required.

SupaScan is also compatible with the Renishaw Inspection Plus macro suite. Inspection Plus for OSP60 can be used to program touch-trigger probe routines, and also allows existing Renishaw probe users to switch to SupaScan and achieve cycle time savings using their current, proven inspection programs. This compatibility also means that new or inexperienced programmers can take advantage of the simplified programming techniques provided by Set and Inspect or the GoProbe smartphone app.

Scan data is analysed by the DPU-1. Results are saved to blocks of machine tool variables, and optionally to a .csv file on the DPU-1.

Key features and benefits:

- Fastest available on-machine probing solution for workpiece set-up and prismatic feature measurement
- Surface condition monitoring and form indication
- Stand-alone, macro-based solution – no separate programming interface required
- DPU-1 data processing unit provides all necessary programming and configuration macros
- Optional Surface Reporter app to view surface condition data in real time

OSI-S interface

An optical interface providing input/output communication with the machine tool.

OMM-S receiver

An optical receiver specific to the OSP60 probe.

OSP60 probe

An analogue scanning probe for machine tools, capable of scanning and touch measurements.

DPU-1 data processing unit

Processes and stores scanned measurement data. Saves results into machine variables (via the CNC API) for use in downstream processes.

SupaScan macros

G-code macro specific to the OSP60 probe. Provides compatibility with the Renishaw Inspection Plus macro suite and existing touch-probe routines.

Inspection Plus for OSP60

G-code macros specific to the OSP60 probe.

Surface Reporter app

An app displaying surface condition trace, part pass/fail and W_t value. Resides on a device running Microsoft® Windows™ connected to the machine tool.

Productivity+™ software

Productivity+™ is the collective name for a family of closely integrated software packages for use with Renishaw touch-trigger probes and the OSP60 scanning probe.

Productivity+™ Active Editor Pro

Productivity+ Active Editor Pro provides users with a simple-to-use environment for incorporating in-cycle measurement and inspection probe routines into machining cycles, with no requirement for G-code programming experience.

Simply import a component solid model and select the required feature geometry to generate a probe path. Manual programming options are available where no solid model exists.

Measurements, logic and updates may be added to existing CNC machining code and then post processed to provide a single comprehensive NC program containing metal cutting and component inspection operations.
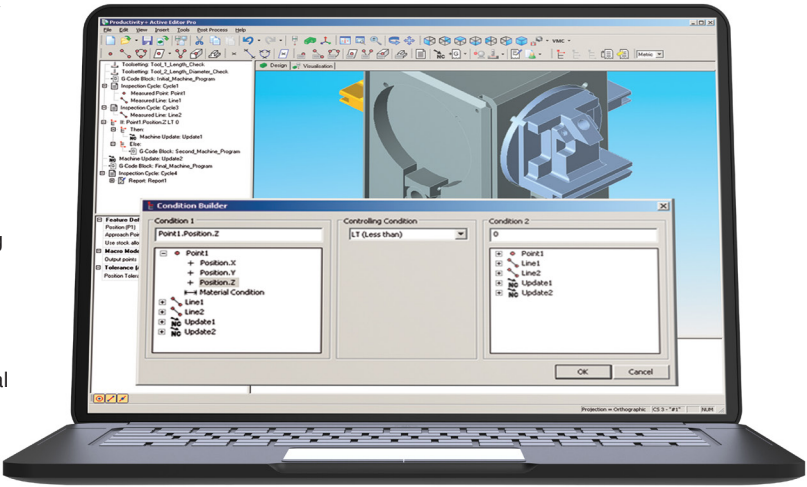
Key features and benefits:

- Automatic adaptation of cutting programs in real time based on inspection results

- Programming using component solid models (or manually where no model exists)

- Creation of constructed elements from previously inspected component geometry

- Probe cycle visualisation, including crash detection

- Multi-axis support for a wide range of machine tool controller platforms

> We looked at the whole production cycle time and in some cases were able to reduce it by up to 50%. Productivity+ software and Renishaw part setting probes have made this possible. Productivity+ makes it much easier to prove out the process before going on the machine.
>
> Alp Aviation (Turkey)
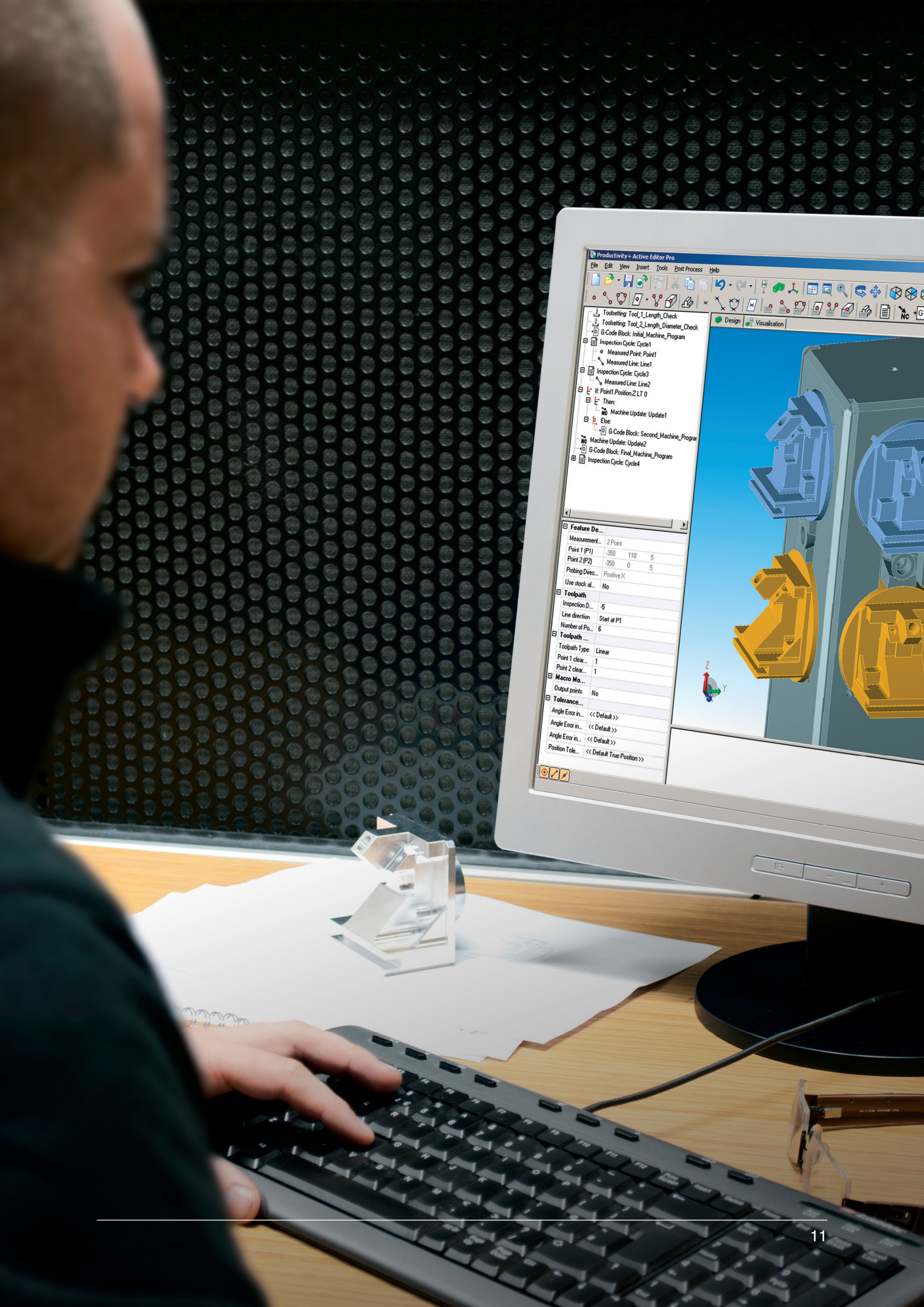
Productivity+™ Scanning Suite

The Productivity+™ Scanning Suite is a collection of software packages that uses the OSP60 probe with SPRINT™ technology to record absolute XYZ surface position data with exceptional accuracy.

A core element of the Scanning Suite is the Productivity+™ CNC plug-in. This on-machine software controls the OSP60 probe and the machine tool providing significantly enhanced data processing and analysis capability in comparison with traditional methods.

The software provides exceptional ease-of-use for machine operators and programmers, with its online editor allowing the measurement program to be updated on the machine.

Close integration of the controller and the CNC plug-in is designed for automatic closed-loop process control to reduce operator intervention.

Optionally, programs can be created off-line using Productivity+™ Active Editor Pro. This PC-based application allows programs to be generated directly from the component solid model within an intuitive, icon driven, 'point-and-click' programming environment.

The Scanning Suite also comprises a variety of optional application-specific toolkits and stand-alone cycles, each focused on an individual task or industry sector.

Key features and benefits:

Productivity+ Scanning Suite

- Real time machine data processing during measurement and cutting
- Significantly enhanced data handling capacity and analytical capacity
- Closed-loop process control for reduced operator intervention
- On-machine program generation and editing
- Includes toolkits and cycles focused on individual tasks and industry sectors

Productivity+ Toolkits

- Developed in conjunction with market leaders
- Bespoke software solutions engineered for specific applications
- On-machine data analysis tools providing feedback directly to the CNC machining process

OSI-S interface

An optical interface providing input/output communication with the machine tool.

DPU-2 data processing unit

The DPU-2 data processing unit optionally hosts the Productivity+™ CNC plug-in software and any associated application toolkits.

OMM-S receiver

An optical receiver specific to the OSP60 probe.

Productivity+™ CNC plug-in

The Productivity+™ CNC plug-in controls the OSP60 scanning probe, the machine tool, and the PC-based data tools, enabling more advanced data processing than traditional methods. Real-time data processing during measuring or cutting minimises cycle time and results in a high-speed, accurate, and capable process.

OSP60 probe

An analogue scanning probe for machine tools, capable of scanning and touch measurements.

Productivity+™ Active Editor Pro

Productivity+™ Active Editor Pro provides a simple-to-use environment for incorporating measurement and inspection probe routines and in-process decision making into machining cycles.

Set and Inspect

Set and Inspect is a simple, on-machine probing app for use on a Microsoft® Windows®-based controller – or on a Windows®-based tablet connected to the controller via Ethernet.

An intuitive interface guides the user through the process of creating a probing cycle, automatically generates the required machine code for the probing cycle and loads it to the controller, eliminating data entry errors while reducing programming times.

'Single cycle' allows users to manually position the probe and quickly program and run individual cycles. 'Program builder' allows users to program multiple probing cycles in a single program that can be automatically run as part of the manufacturing process.

Key features and benefits:

- User-friendly interface for use with Inspection Plus and tool setting macro software

- No probing experience or machine code knowledge required

- Embedded help text and images

- Immediately view results data for single measurements

- Compatible with a wide range of machine tools and controllers

- Supplied with Reporter (installed automatically)

Reporter

Reporter is an easy-to-use, real-time process monitoring app for customers who wish to view component and tool measurement data. Measurement data can be viewed on the machine tool or exported externally for analysis by using the Data export option. The app is installed onto a Windows®-based controller or a Windows® tablet connected to the controller via Ethernet.

Data export option (licensed)

Measurement data can be exported from Reporter by purchasing and activating the Data export option. This option provides users with the following functionality:

- Export measurement data to a .csv file
- Generate a measurement data report as a .pdf file
- Automatically stream measurement data via MTConnect (requires MTConnect connection from the machine tool builder)

Exported data can be stored as part records for traceability, or imported into the user's in-house quality analysis software, providing manufacturers with valuable insights into their machining processes.
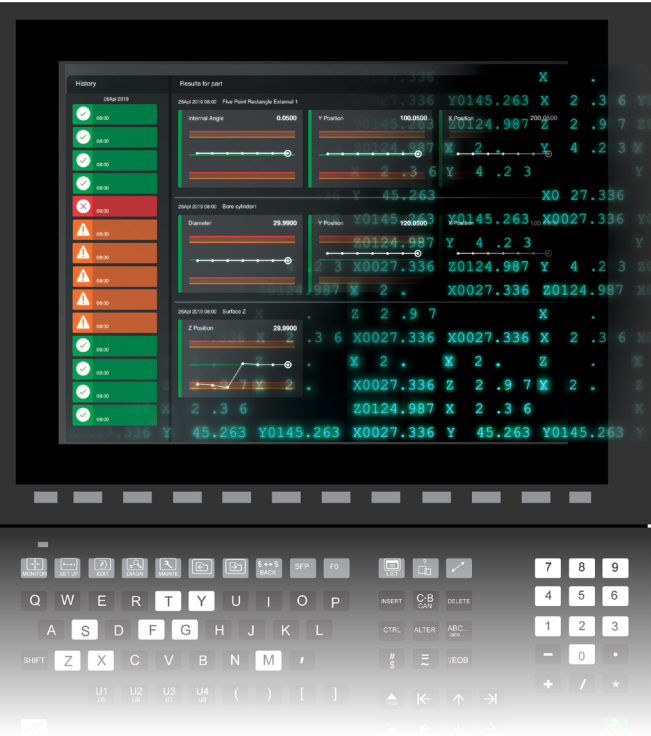
Key features and benefits:

- Quickly view pass and fail measurement data at the machine
- Displays measurement trends for every probed part
- Results can be viewed live, as parts and tools are measured
- Collect and share on-machine measurement data using the Data export option
- Compatibility with Inspection Plus, contact and non-contact tool setting macro software means that this single app can be used across a wide range of machine tools and controllers
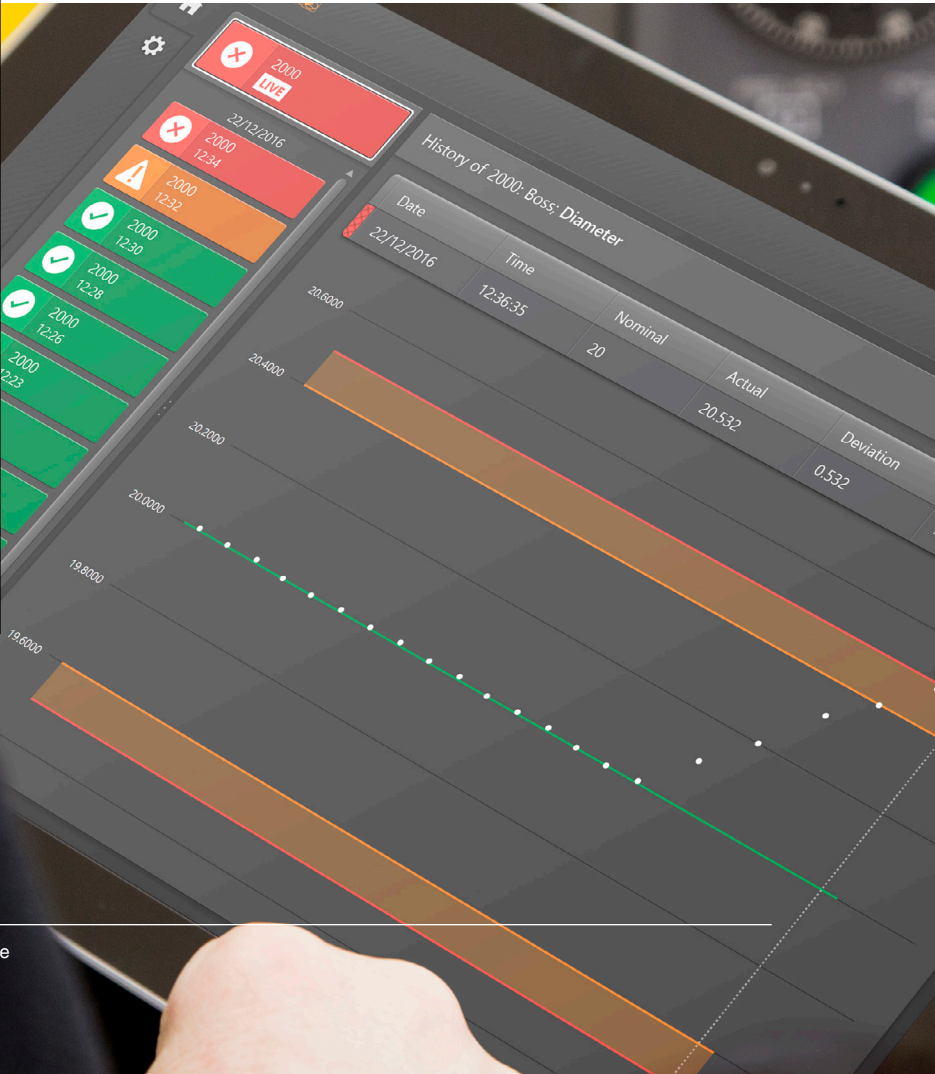
Smartphone apps

Smartphone apps are available to almost every user with a smartphone and provide information in a simple, convenient format. Available globally in a wide range of languages, Renishaw's free-of-charge apps are ideal for both new and experienced users.

Renishaw smartphone apps are available globally on the App Store™ and on Google Play.

[Download on the App Store] [GET IT ON Google Play]

Also available in China via Tencent and Huawei.

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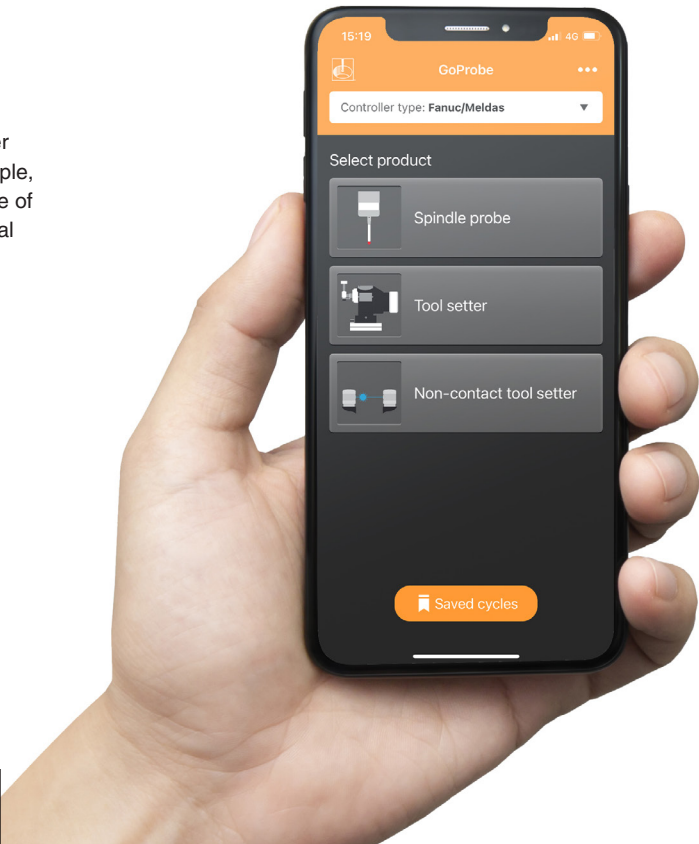
Key features and benefits:

- Provides information at a user's fingertips in a simple, convenient format
- Available globally in a wide range of languages
- Help text, images and animations provide further assistance
- Free of charge
- Perfect for new and less experienced users

GoProbe app

The GoProbe app creates a probing routine with just a few quick taps. Simply select the required cycle and populate the data entry fields. The result is a single-line command that is entered into the CNC controller.

NC4 app

The NC4 app makes configuring and supporting the range of NC4 non-contact tool setters simple. Engineers have a single point of reference for configuration, maintenance and troubleshooting tasks at their fingertips.
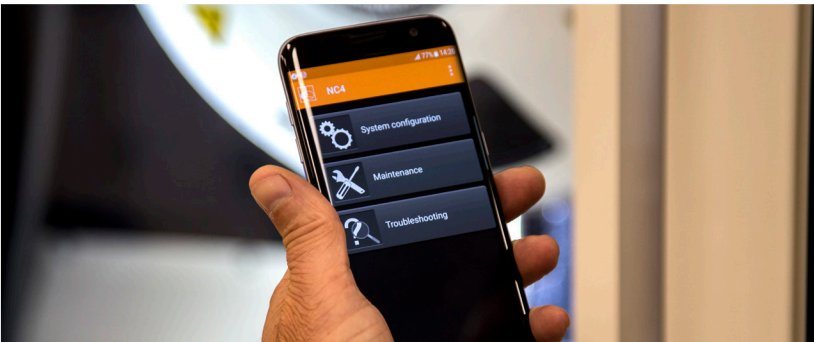
Trigger Logic™ app

The Trigger Logic™ app provides users with a simplified method of customising their Renishaw probe settings that is faster and easier than following traditional printed instructions.

All machine tool touch-trigger spindle probes that support Trigger Logic are supported by the app.

HP arms app

The HP arms app provides engineers with an interactive support app for the range of Renishaw high-precision tool setting arms. The app makes system configuration, maintenance and troubleshooting tasks simple with easy-to-follow animations and step-by-step instructions.

Renishaw HPMA, HPPA and HPRA tool setting arms are supported by the app.

GUIs

In addition to Set and Inspect, Renishaw supports the widest range of CNCs with dedicated user-friendly GUIs to guide users through the process of part setting, inspection and tool setting.

Each GUI is adapted to be familiar to users of that machine tool controller. It provides an intuitive, user-friendly environment designed to assist users in generating a probing cycle which eliminates the difficulty associated with traditional machine tool programming. This allows cycles to be produced and selected with minimal user input.

Key features and benefits:

- User-friendly interface
- Supports probe calibration, part setting, inspection, contact and non-contact tool setting
- Adapted to be familiar to frequent users of each CNC type
- Intuitive environment minimises training needs
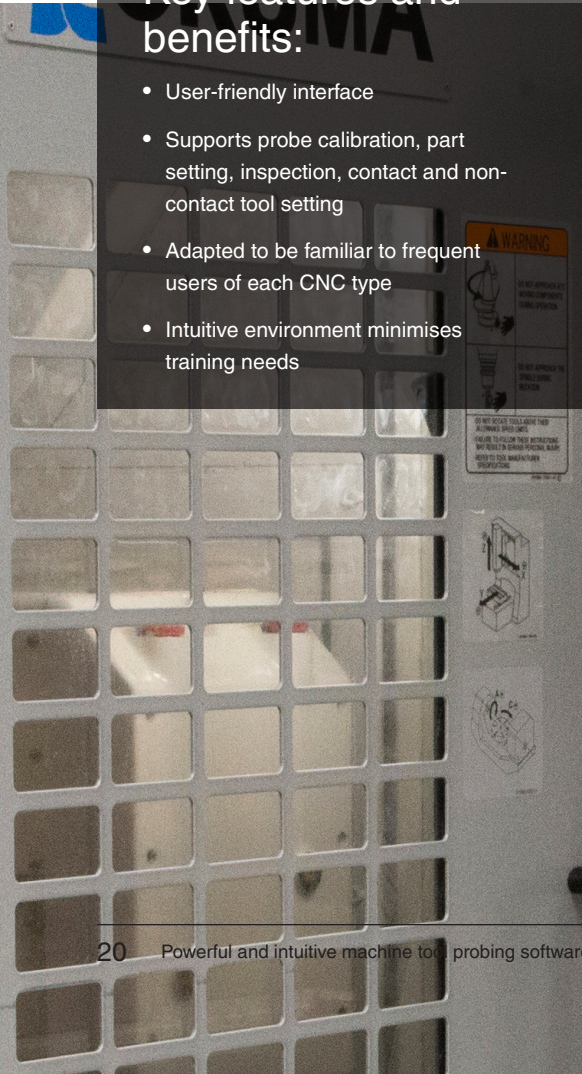
GoProbe iHMI for Fanuc

GoProbe iHMI utilises the embedded Windows O/S, Fanuc Picture Technology and touch-screen interface of the Fanuc iHMI to deliver a simple-to-use probing solution that is perfect for users with no or limited probing experience.

GoProbe iHMI can either be factory fitted by the machine tool builder or retrofitted.

Key supported controllers

• Fanuc PLUS CNCs

• Fanuc Robodrill machines

Non-contact tool setting GUIs

Non-contact tool setting GUIs provide a user-friendly interface to a wide range of non-contact tool setting cycles, making the on-machine tool measurement process quick and easy.

Key supported controllers

• Fanuc

• Siemens

• Heidenhain

GoProbe GUI (for Mitsubishi M80/M800S)

GoProbe GUI (for Mitsubishi M80/M800S) is simple to use – users are guided with easy-to-follow menus and instructions. The GUI is available on Mitsubishi M80/M800S controllers that are not supported by Set and Inspect. This kit is for OEM, dealer and Mitsubishi installation only.

Key supported controllers

• Mitsubishi M80 / M800S
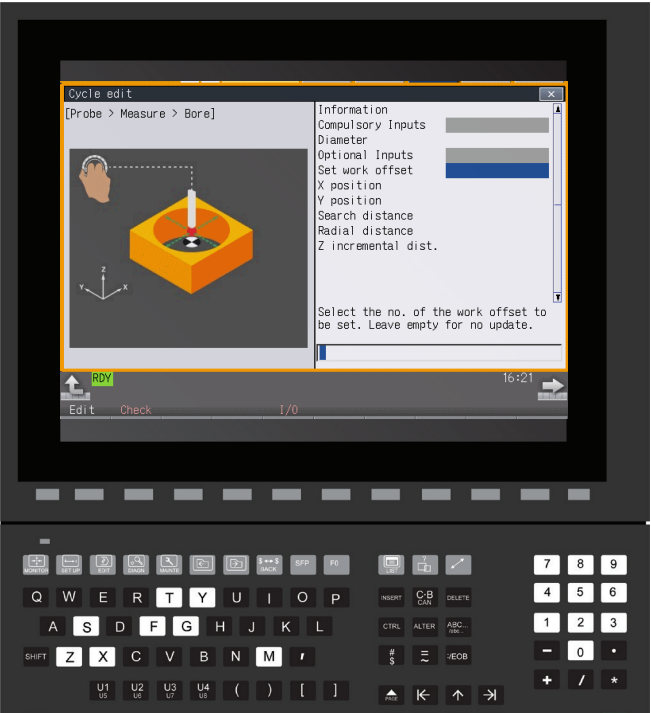
Siemens HMI

The Siemens HMI provides a user-friendly on-machine programming interface that simplifies the process of creating inspection and non-contact tool setting routines for multi-tasking machines.

Key supported controllers

• Siemens
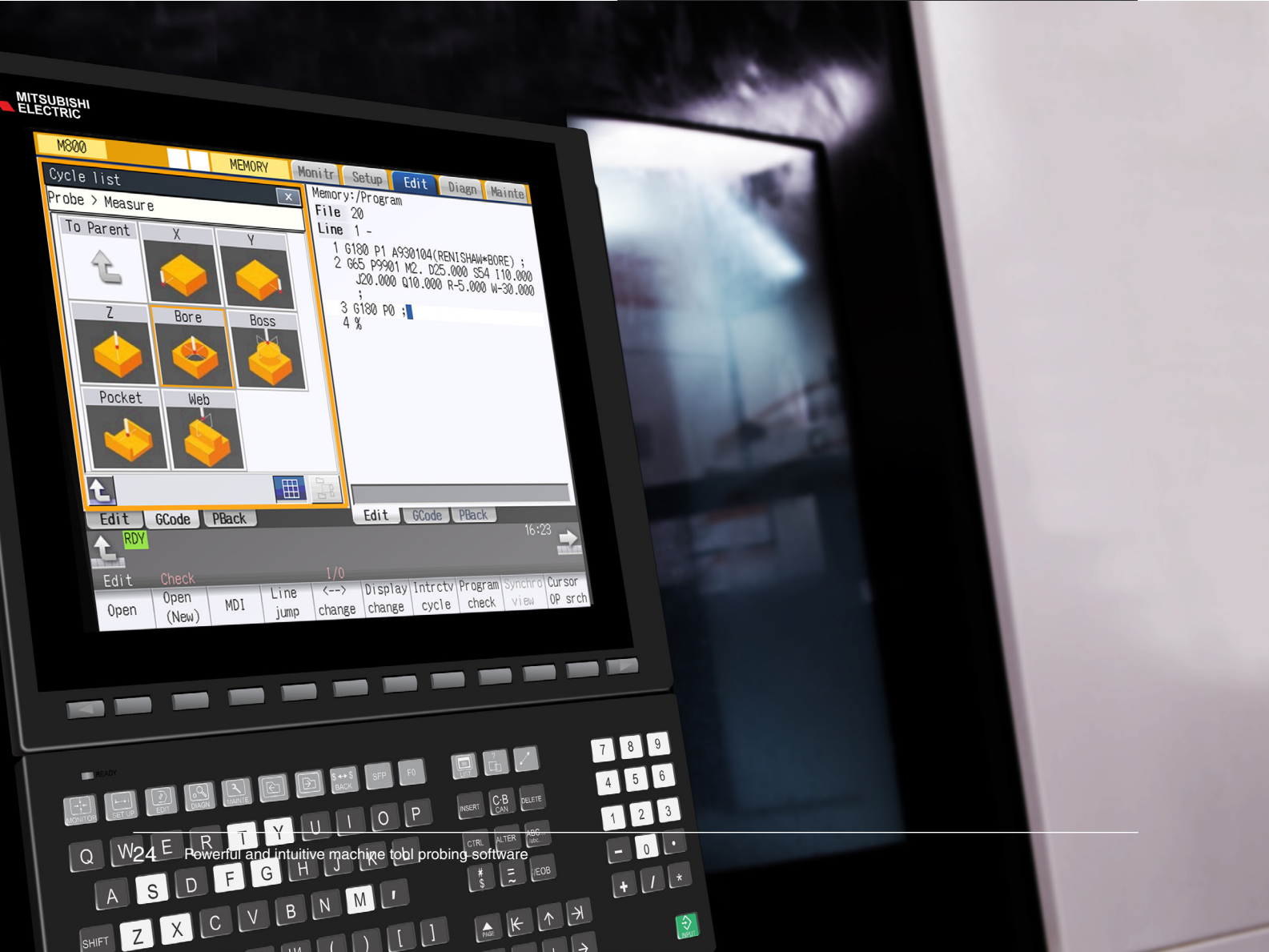
AxiSet™ Check-Up

A cost-effective solution for checking the alignment and positioning performance of rotary axes. In just a few minutes, users of multi-axis machining centres and multi-tasking mill-turn machines can identify poor machine alignments and geometry that can cause extended process setting times and non-conforming parts.

By providing machine users with a fast and accurate health check of rotary axis pivot points, AxiSet™ Check-Up assists in maximising the stability of the environment and machine. When used alongside Renishaw's QC20-W ballbar system and laser interferometers, AxiSet Check-Up gives an unparalleled machine diagnosis solution.
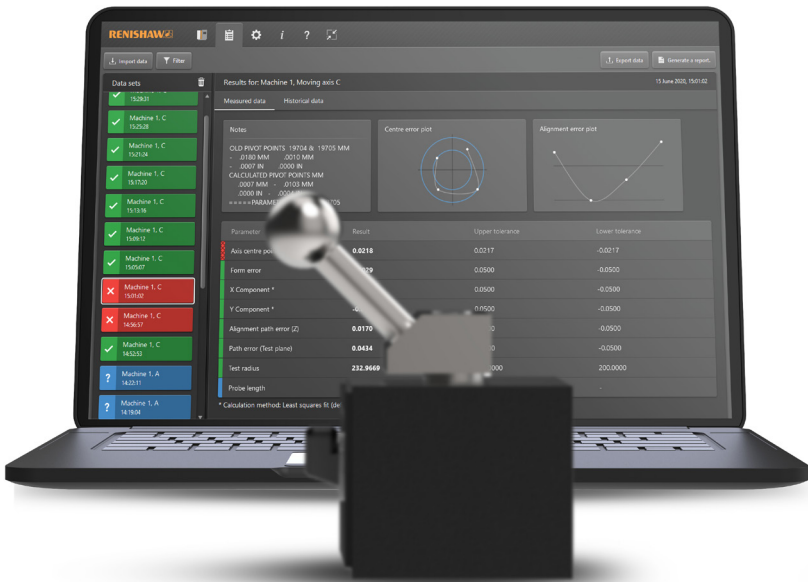
Key features and benefits:

- Report pivot point and lathe centre-line errors along linear axes (as commonly defined in CNCs)

- Measure and report or automatically update critical errors quickly

- AxiSet Check-Up app for PC provides a graphical interface to view the results data and to reliably store and print machine performance trends

- Increase confidence before critical features are machined

- Compatible with a wide range of multi-axis machines
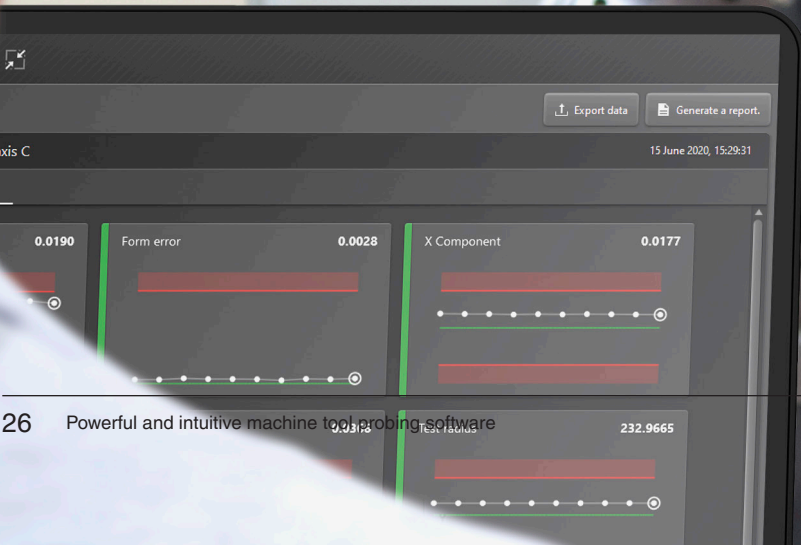
Macros

Written for a range of CNC controllers, these probing macros are machine-specific and available for a range of machines with rotary axes including 5-axis machining centres and multi-tasking machines. These macros drive the machine to collect and update measurement data which can be accessed through the dedicated AxiSet™ Check-Up app.
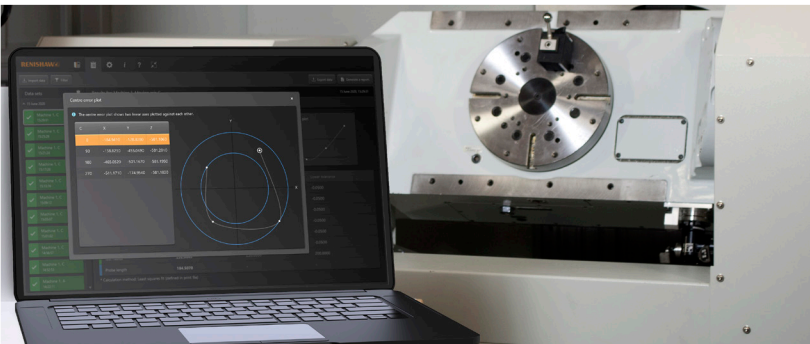
Hardware

A single calibration sphere, conveniently mounted on a magnetic base, is used as a reference feature for measurements.

This simple-to-use artefact ensures that set-up time is kept to a minimum and, in most cases, does not require fixtures or parts to be removed.

Recommended for use with AxiSet Check-Up:

- Strain gauge probe – for ultimate accuracy, Renishaw recommends the use of strain gauge probes with RENGAGE™ technology.

- Calibrated test bar – ensures that AxiSet Check-Up measurements are traceable and comparable to the settings made by machine tool builders.
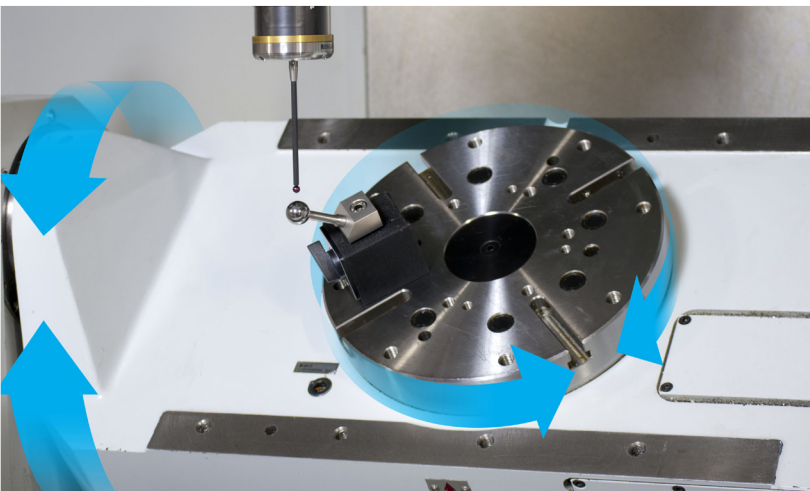
Renishaw Central

The Renishaw Central manufacturing data platform provides a consistent method of connecting your Renishaw measurement and manufacturing devices, to make it easy for a variety of systems and processes to access Renishaw device data.

The right information, in the right place, at the right time.

- Metrology data
- Utilisation data
- Alert data

Key features and benefits:

- Store and visualise your data
- Consume data into your digital systems
- Use standards-based connections

Ballbar 20

Testing with the QC20 ballbar system provides a simple, rapid check of a CNC machine tool's positioning performance to recognised international standards (e.g. ISO, ANSI/ASME, etc).

Ballbar 20 software allows users to benchmark and track the performance of their machines, and to quickly diagnose problems that may require maintenance. It also identifies the error sources that produce them.
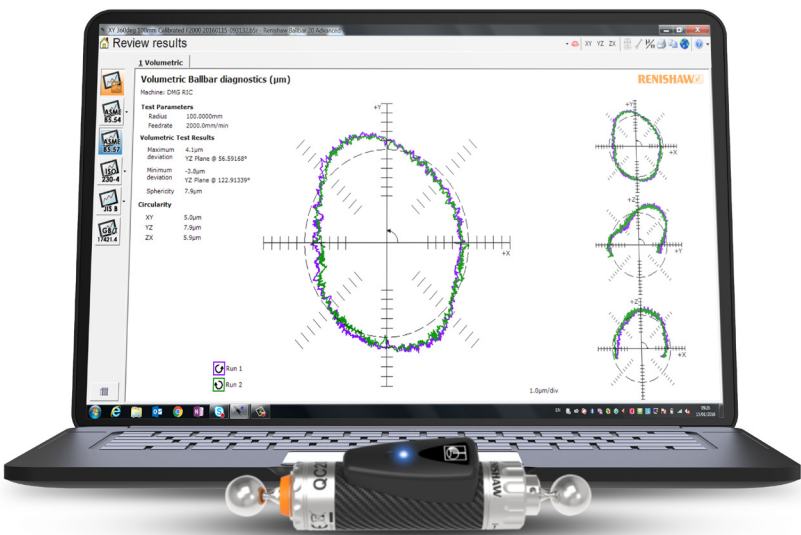
CARTO software suite

CARTO software suite provides data capture, analysis and compensation applications, simplifying the process for monitoring and improving a machine tool's positioning performance.

Compatibility with all laser Renishaw calibration products and accessories means that your test methods and results are stored together within the CARTO database. Multiple reporting and error correction preferences can be configured easily in the software.
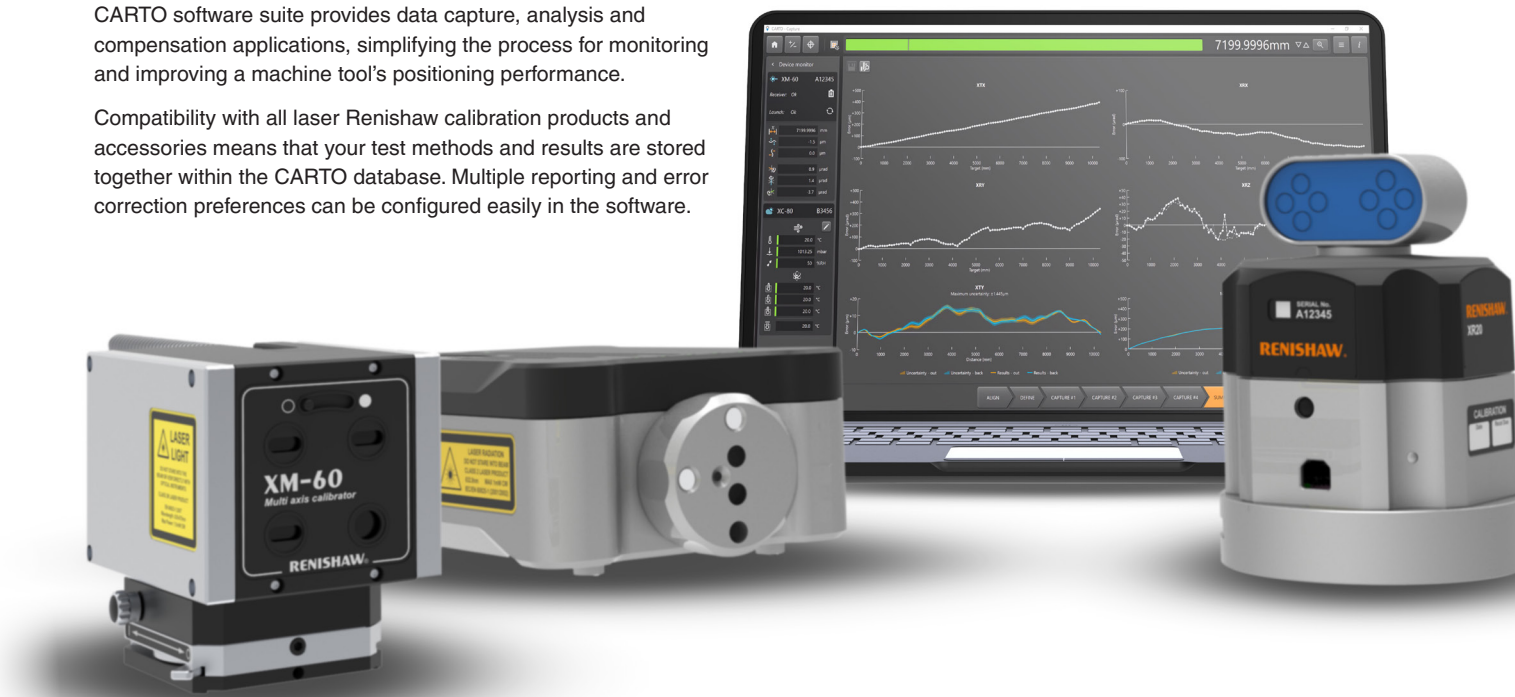
Applying innovation since 1973

Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare.

Our worldwide network of subsidiary companies and distributors provides dedicated global customer support, wherever you are.

Our principal markets include:

Aerospace

Automotive
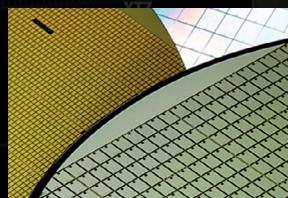
Electronics

Energy

Heavy industry

Medical and healthcare

Precision manufacturing

Scientific