# SPRINT™ technology: one probe, unlimited capabilities
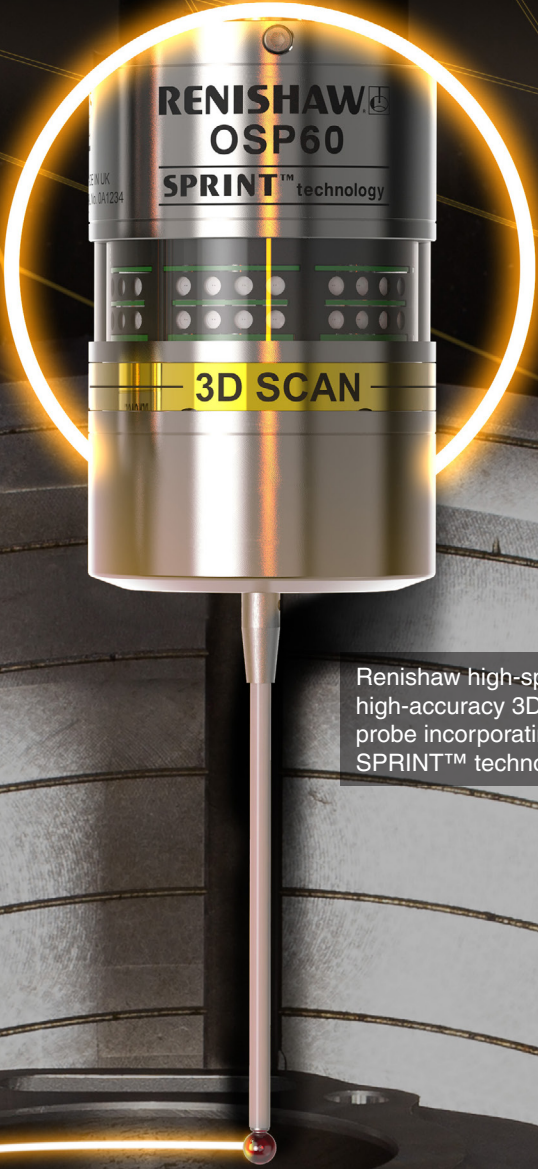
RENISHAW®
apply innovation™

**On-machine scanning solutions**

Renishaw
standard-accuracy
kinematic probes

Renishaw high-accuracy
strain gauge probes
incorporating patented
RENGAGE™ technology

Renishaw high-speed,
high-accuracy 3D scanning
probe incorporating
SPRINT™ technology

# Evolution of Renishaw probing technology

The world's first touch-trigger probe was designed by Renishaw co-founder Sir David McMurtry over 50 years ago. Since then, Renishaw has designed and developed increasingly intelligent probing solutions including machine tool probes for workpiece set-up, in-process control, and part verification.

The first commercially available touch-trigger probes incorporated a spring-loaded kinematic mounting arrangement of rods and balls to position the stylus holder. This ground-breaking technology is still widely used in our range of standard-accuracy machine tool probes for touch-trigger measurement.

The next generation of Renishaw machine tool probes incorporate our RENGAGE™ technology. These touch-trigger probes retain the kinematic mounting arrangement of earlier designs but incorporate a series of strain gauges to measure the contact force on the stylus. Probes with RENGAGE technology offer superior accuracy and 3D touch-trigger measurement.

Renishaw now brings the proven benefits of scanning probe technology to machine tool users in our latest generation of probes incorporating SPRINT™ technology. This provides highly accurate 3D touch-trigger measurement capability coupled with high-speed, high-density 3D scan data. You can therefore optimise overall cycle times and increase the throughput of existing machine tools.

SPRINT technology gives you the ability to capture more detailed information than ever before. This information can be used to intelligently adapt to in-process variation. Incorporating it into your machine tools is the next step in your productivity journey.

# OSP60 scanning probe with SPRINT™ technology

Incorporating a unique sensor design, the OSP60 probe with SPRINT™ technology provides an exceptionally high-speed, high-accuracy probing system for CNC machine tools.

Incredibly responsive to surface variation and capable of detecting sub-micron movement at the probe stylus tip, the OSP60 captures 1,000 true 3D data points every second. Industry leading performance and system flexibility delivers precision scanning and point measurement capability at unparalleled feedrates without compromising measurement accuracy.

# Powerful and customisable

SPRINT technology provides rapid data collection and feature measurement. This can be incorporated into the latest Industry 4.0 monitoring systems, including Renishaw Central, for data traceability. This improves your manufacturing capability and increases profitability.

A diverse range of software packages enables the use of the OSP60 in many applications. These can be tailored to suit individual requirements. Customisations for use with third-party solution providers and integration into machine tool builder solutions are also possible.
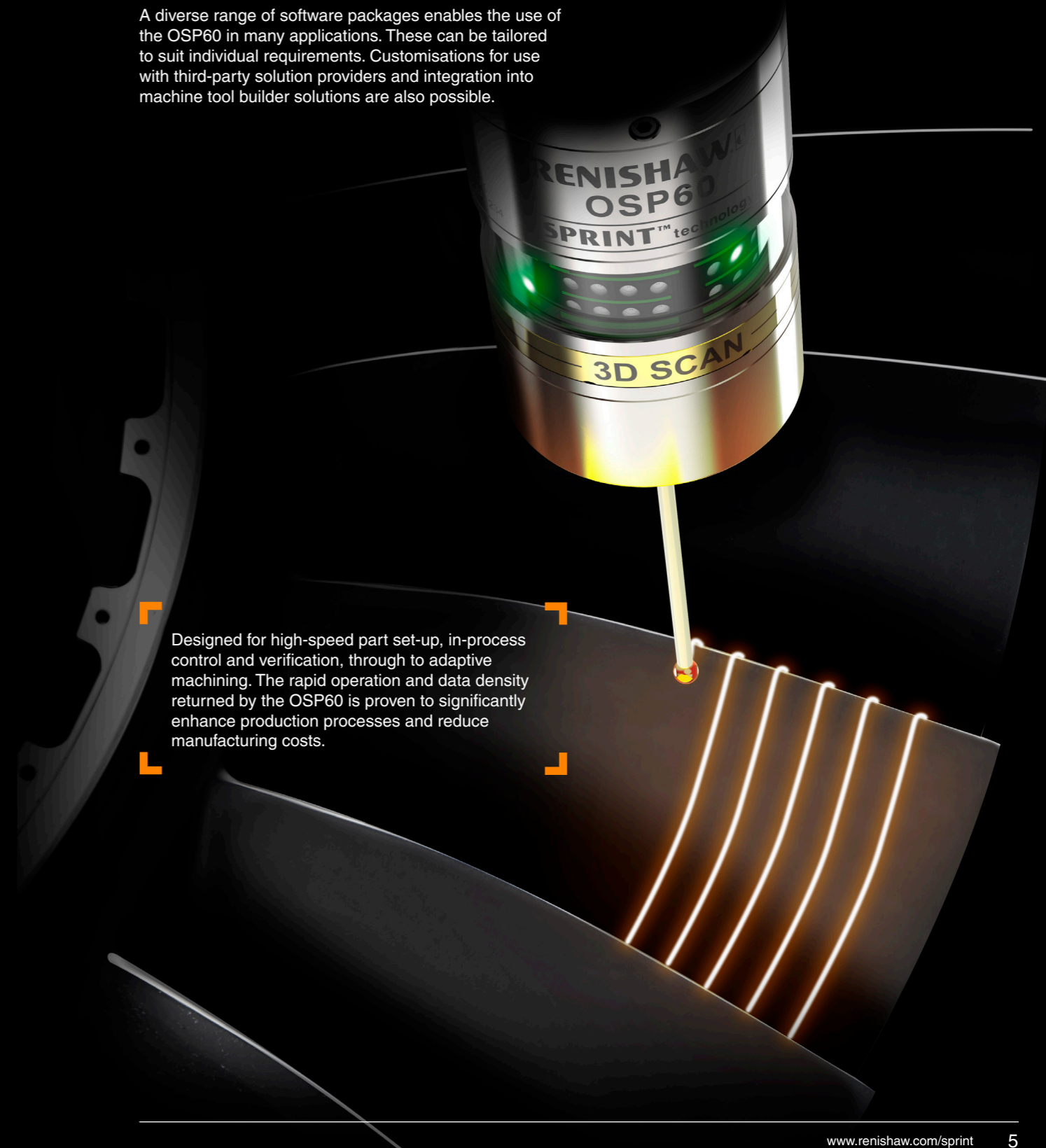
Designed for high-speed part set-up, in-process control and verification, through to adaptive machining. The rapid operation and data density returned by the OSP60 is proven to significantly enhance production processes and reduce manufacturing costs.

# Advanced data collection

The OSP60 returns 1,000 3D data points every second at unparalleled feedrates without compromising accuracy. This high-speed, data-dense output reduces the probing cycle time required for both part set-up and component verification.

Workpiece information including feature size and position, form, surface data (XYZIJK and material condition), and surface condition can all be determined and reported on.

This wealth and variety of data across multiple applications, at truly exceptional speeds, is delivered from a single probe.

## Intelligent in-process control

As an intelligent in-process control solution, SPRINT™ technology allows any necessary corrective actions or re-machining operations to be performed while a component is still in the fixture.

On-machine verification significantly reduces rework and scrap, reduces reliance on offline inspection processes, and can eliminate the bottlenecks they sometimes incur.

The OSP60 can also be used to automatically generate adaptive, component-specific cutting toolpaths for applications such as edge breaking, deburring, copy cutting of mating parts, and surface engraving.
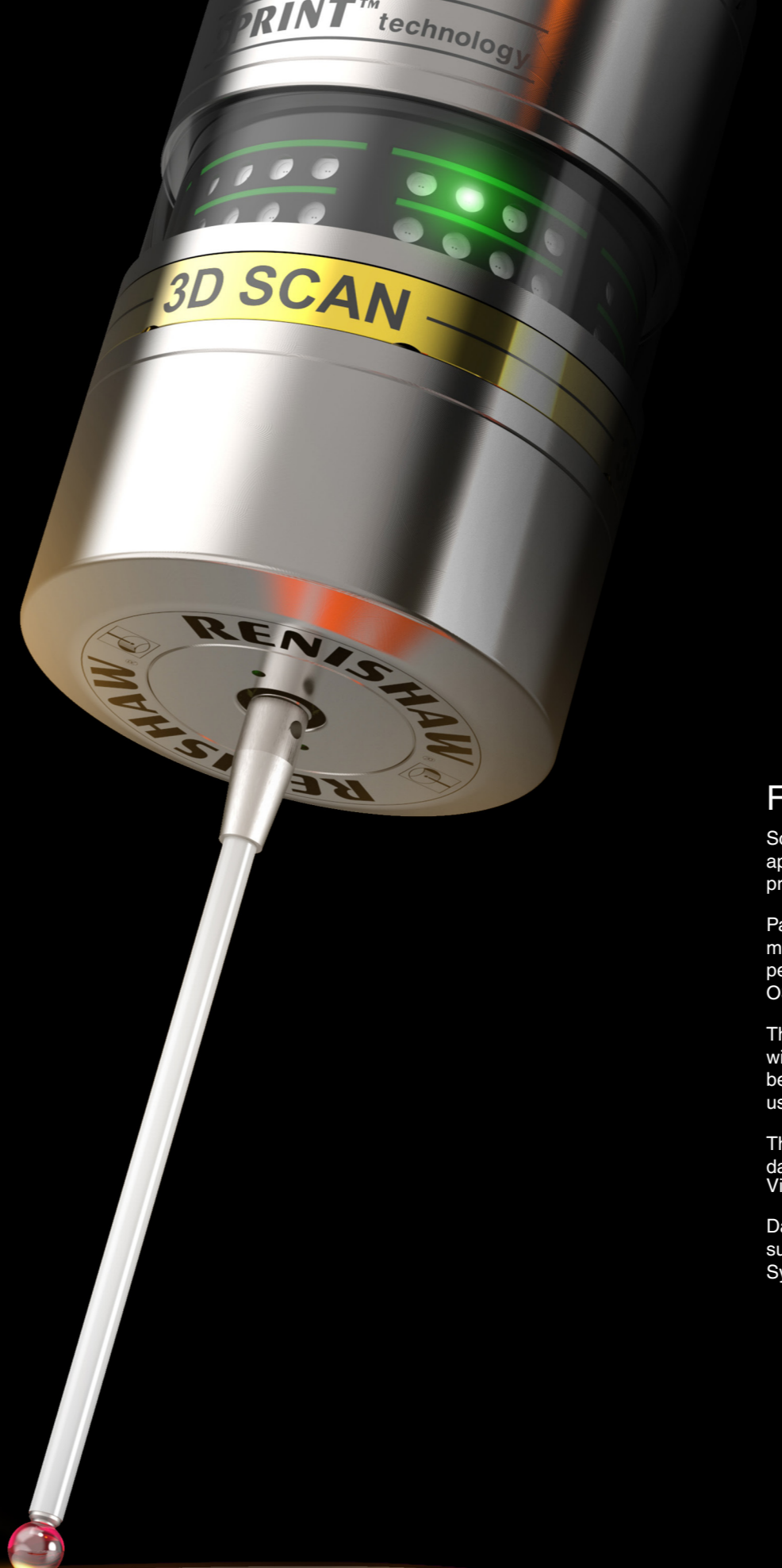
## Flexible and versatile functionality

Scanning allows adoption to on-machine probing applications that were previously impossible or cycle-time prohibitive.

Part set-up, in-process verification, 3D fitting, adaptive machining and surface condition monitoring are all performed using the same stylus configuration, making the OSP60 an incredibly flexible and versatile solution.

The system offers multiple output options and empowers you with data recording, analysis, and display options. Data can be written to machine variables, saved to file, or exported for use in other software applications.

The following Renishaw products are able to import scan data for display or further analysis: Reporter, Scan Data Viewer and MODUS™ CHART.

Data can also be used with other metrology applications such as: CappsNC, the Gear Production Suite from Dontyne Systems, OmniSurf and PolyWorks|Inspector™.

# One probe, unlimited capabilities

Applying the capability provided by the OSP60 is limited only by your imagination. Key areas where SPRINT™ technology will significantly enhance your manufacturing processes include:

## High-speed part set-up

Use touch points or scanning cycles to rapidly set up your workpiece and use the results to set or update work co-ordinate systems.

Critical for high-volume manufacturing environments such as automotive, medical and mass-market electronics.
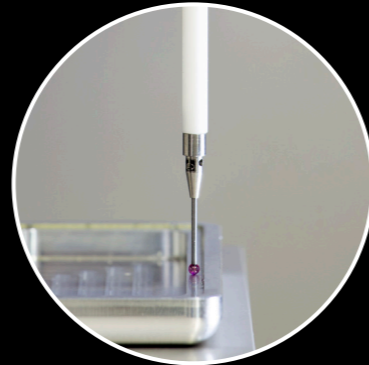
## 3D feature fitting

Measure 3D features such as cones, cylinders, spheres, or circular sections using multiple scan paths, and use the data for a fitting operation before machining.

## 3D surface capture

Perform rapid inspection of complex, free-form component geometry that is common in power, oil and gas, aerospace and medical industries. For example blade leading and trailing edges, impellers, tibial trays and femoral joints.

## Surface condition monitoring

Dedicated measurement macros determine component surface condition. Use to detect excessive waviness, surface peaks, and steps (caused by chipped, damaged or worn tooling, cutter mismatch and step-over errors).

Essential for sealing and mating faces in applications such as automotive, aerospace, medical, and hydraulic and pneumatic systems where leak protection is critical.
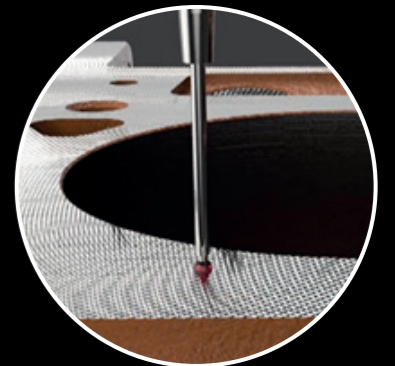
## Machine health check

Verify machine tool performance in less than one minute.

Integrate machine health check routines into CNC machining programs to provide confidence in machine condition and performance capability.

The go/no-go check of linear axes and kinematic centre points is invaluable in high-volume applications, and those using high-value parts and raw materials.
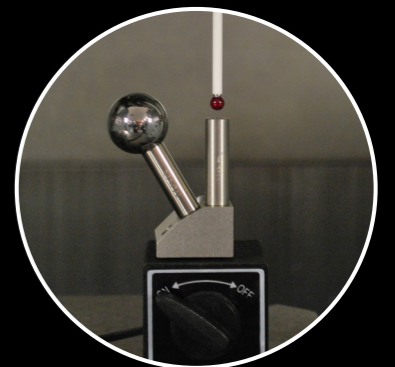
## Adaptive machining

Generate component-specific cutting toolpaths for near-net parts such as castings. Nominal toolpath points are adjusted to match the true shape of the scanned component, intelligently adapting your machining process based on the inspection data obtained.

Ideal for deburring and chamfer-cutting operations and dramatically simplifies copy-cut applications.
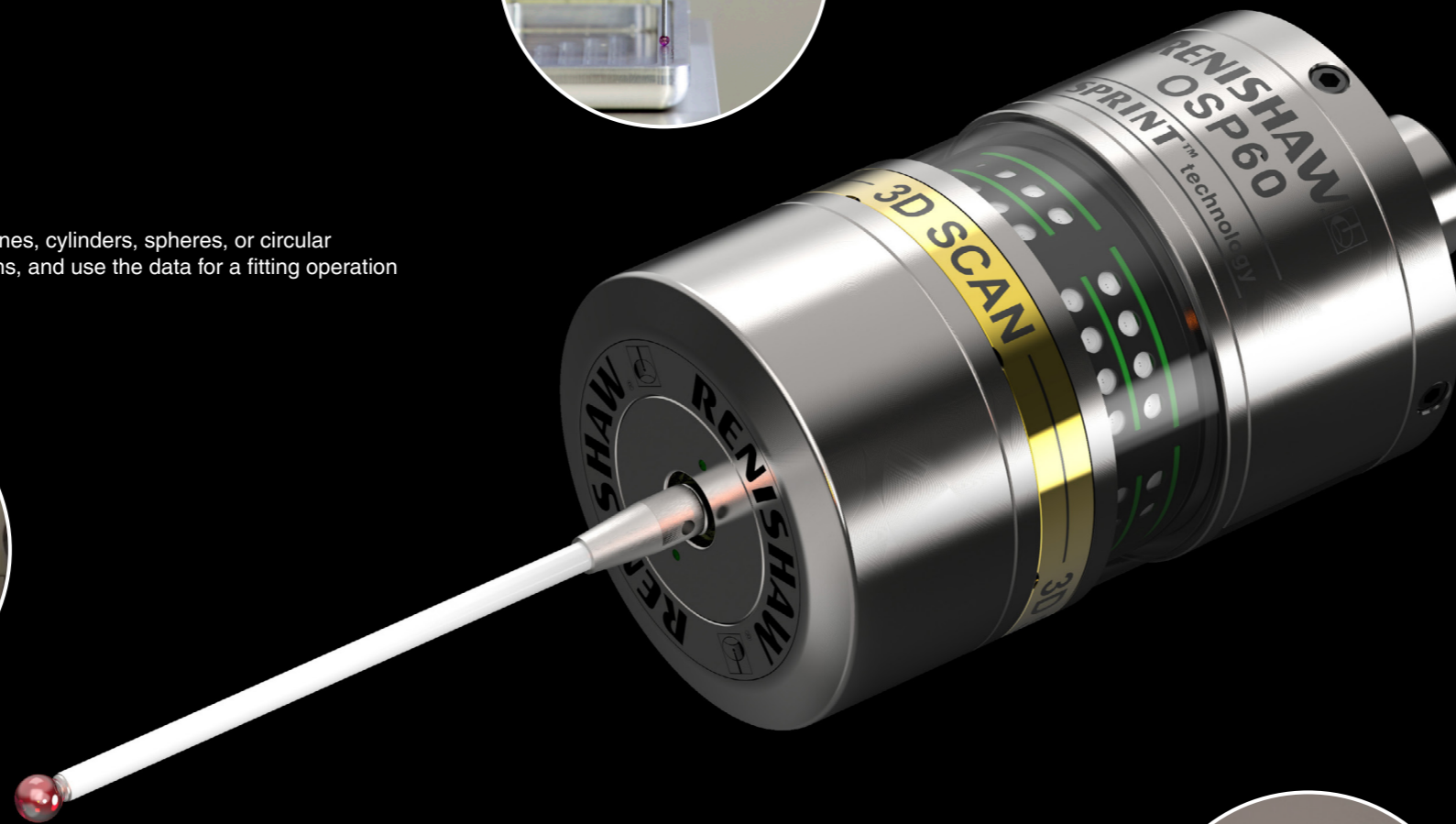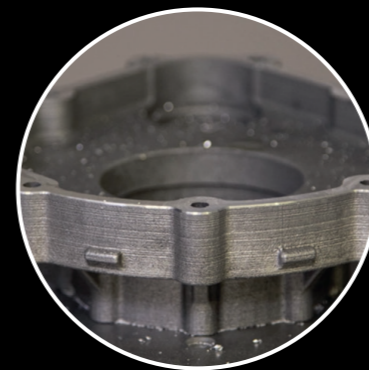
# Powerful scanning software

The comprehensive range of software applications offers diverse programming, analysis, and reporting options.

From traditional macro-based solutions to graphical CAD/CAM-style applications, the choice of programming, analysis, and reporting options makes on-machine scanning an accessible solution irrespective of your experience level.

## SupaScan

SupaScan G-code macros allow ultra-fast measurement of prismatic features (points, lines, circles, and planes) for workpiece set-up and inspection, surface condition monitoring and form indication.

Feature properties such as diameter, position and material condition are saved to blocks of machine variables or to a file location on the DPU data processor for further analysis.

## Productivity+™ Scanning Suite

The Productivity+ Scanning Suite is a collection of software packages that record absolute XYZ surface position data with exceptional accuracy.

At its core is the Productivity+ CNC plug-in. Programmed through its integrated editor or via the CAD/CAM-style environment of Productivity+ Active Editor Pro, it provides prismatic measurement as standard. Optional cycles and toolkits further enhance functionality.

## Inspection Plus for OSP60

Inspection Plus for OSP60 allows existing Renishaw touch-trigger probe users to introduce the OSP60 as a drop-in replacement and realise immediate cycle time savings. This eliminates the need to write and prove out new set-up and inspection routines.

The package also provides compatibility with the simplified programming capability offered by Set and Inspect and the GoProbe app.

## Set and Inspect

Set and Inspect is a simple, intuitive, on-machine probing app for machine tool users who require an easy-to-use probing solution. Use the app to easily create probing and tool setting routines. These routines can be manually run, run as single cycles or executed as fully automated probing routines. Set and Inspect can upload probing routines to the CNC controller automatically.

## GoProbe app

The GoProbe smartphone app creates a probing or tool setting 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.

Download on the App Store

GET IT ON Google Play
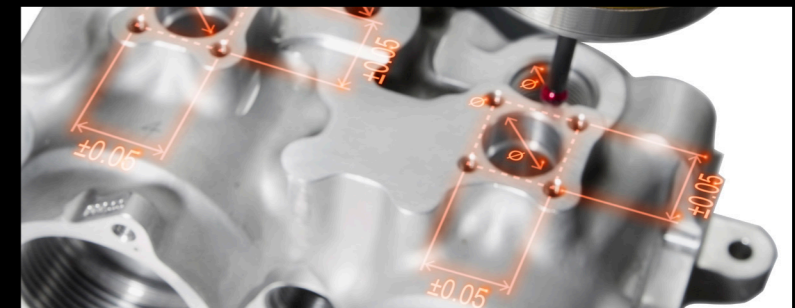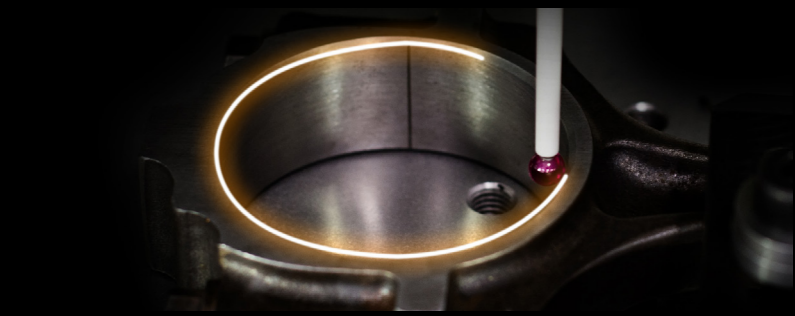
## Reporter

Reporter is an on-machine app designed to display measurement data and production trends in a quick and easy way. View live and historical measurement results as well as non-contact tool setting macro routines. The app is installed onto a Windows®-based CNC controller or a Windows tablet connected to the controller via Ethernet.
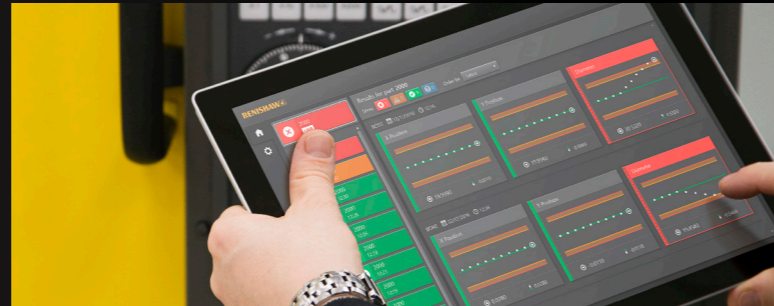
## Scan Data Viewer

Scan Data Viewer aids the set-up of scanning measurement processes. It supports the import of component solid model geometry, multiple scan data files and associated co-ordinate systems. By viewing probe deflection values on the solid model, users can quickly identify areas of probe under or over deflection and adjust the scan path or part set-up accordingly. Users can also view a heat map of the scan surface compared to the nominal solid model.
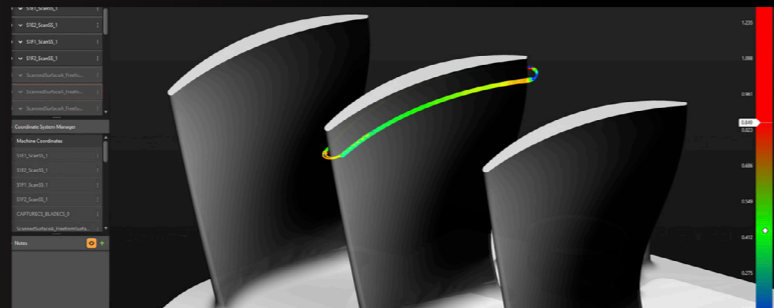
## MODUS™ CHART

MODUS CHART software generates reports displaying graphical information on the true location on the part using QIF XML files and the component CAD model.

Reporting functionality includes: on-CAD reports with flexible callout positioning and configuration; heatmaps and tables displaying feature tolerances; and an errors-only report to quickly identify features that are out of tolerance.
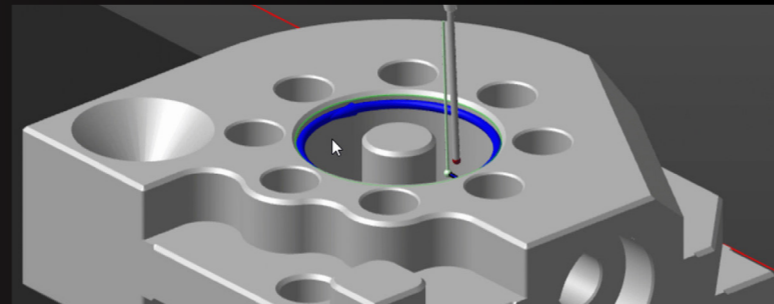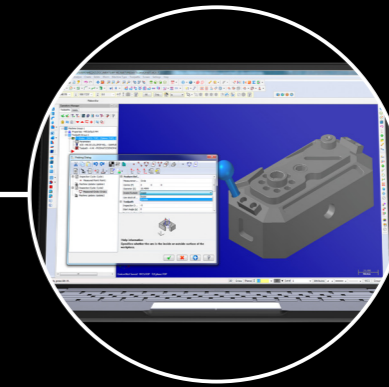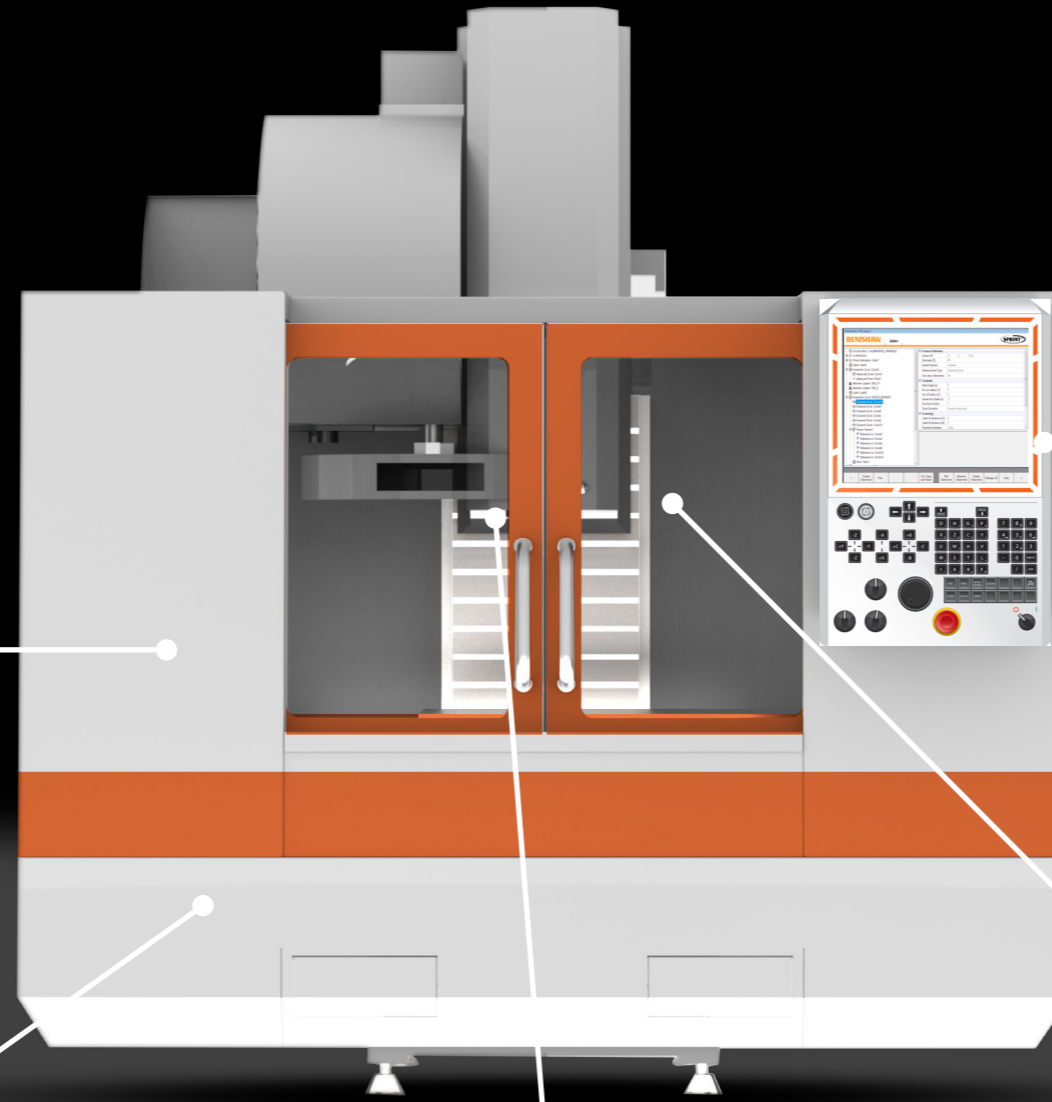
# System components



## DPU data processor

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

## Software

Core software (SupaScan and Productivity+™ CNC plug-in) is supported by a range of optional programming, reporting and analysis tools.
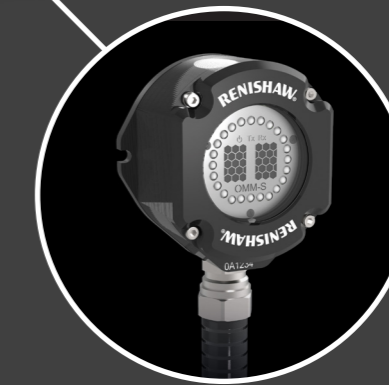
## OSI-S interface

An optical interface providing input/output communication with the machine tool controller and the data processing unit.

## OSP60 probe

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

## OMM-S receiver

An optical receiver specific to the OSP60 inspection probe.

# The Productive Process Pyramid™

## Tackle process variation at source, and reap the rewards

The higher the degree of human involvement in the manufacturing process, the higher the risk of error. Automated part setting, in-process measurement and part verification using the Renishaw OSP60 probe can help eliminate the risk and can facilitate the following measures for enhanced management of your production, leading to an increase in your profits.

For further details regarding the benefits of all levels of process control within the Productive Process Pyramid™, visit **www.renishaw.com/processcontrol.**

### Post-process monitoring

Analyse and report on measurement data obtained.

- Determine surface condition characteristics
- Rapid, traceable reporting of part conformance to specification
- Reduce off-machine inspection time and costs

### In-process control

Automated, on-machine component verification.

- Improve process capability and traceability
- Compensate for environmental and machine conditions
- Implement adaptive machining processes
- Update machine parameters to adjust processes
- Reduce non-productive time and scrap
- Increase productivity and profits

### Process setting

Automated on-machine part setting eliminates manual setting operations.

- Eliminate costly fixtures and manual setting errors
- Automatically update machine offsets for accurate positioning and alignment
- Introduce new processes quickly and respond to new customer needs
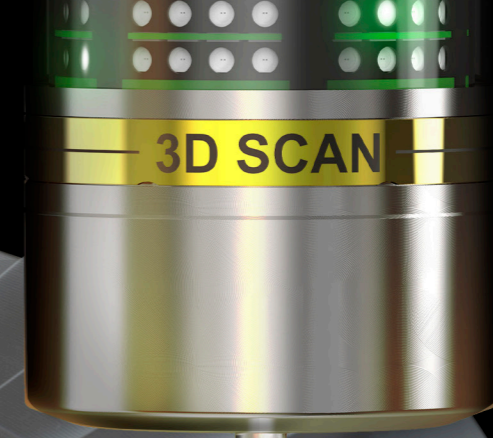- Faster set-up, improved quality, and reduced scrap
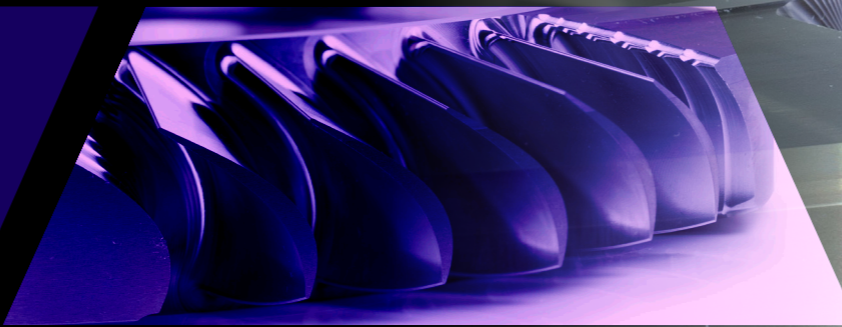
### Process foundation
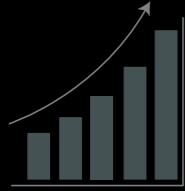
Determine machine capability before manufacturing.

- Benchmark machine performance
- Schedule in-cycle checks as part of the production process
- Reduce machine downtime

# Probing pays with Renishaw

### Optimise your cutting process

Ensure parts are machined "right first time".

### Reduce scrap and rework

Set tools up to ten times faster than when using manual methods.

### Save time and money

Produce more parts reliably and accurately.

## The Renishaw advantage

*At Renishaw, we enjoy an excellent reputation for offering strong support to our customers through a network of over 70 service and support offices worldwide.*

### Technical assistance

**We supply technical assistance to all our global customers.**

### Support and upgrades

**We provide a variety of support agreements bespoke to your individual needs.**

### Training

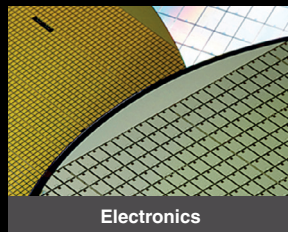**We offer standard and bespoke training courses to meet your requirements.**

### Spares and accessories

**Buy spares and accessories online or obtain quotes for Renishaw parts 24/7.**

**3D SCAN**

## 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**

**www.renishaw.com/sprint**

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📞 **+44 (0) 1453 524524**   ✉ **uk@renishaw.com**

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