

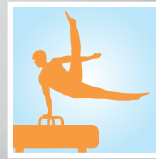
# SPRINT™ high-speed scanning system



**Revolutionary**  
high-speed measurement



**Exceptional**  
accuracy for full 3D definition



**Unique**  
capability and applications

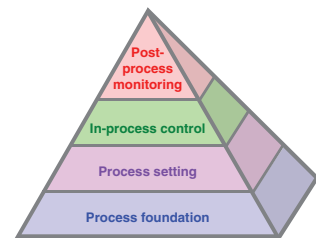
# SPRINT™ system – innovative process control

## Tackle process variation at source and reap the rewards

Innovation is the guiding principle at Renishaw. We take pride in continually leading the development of new technologies to drive improvement in modern manufacturing processes.

Next generation SPRINT on-machine probing technology enables scanning measurement strategies that deliver a step change in the benefits of process control. These strategies can be customised to meet your requirements. Speak to Renishaw for your specific solution.

Here is a selection of techniques in which the SPRINT system can deliver added value:



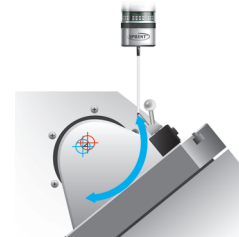
## Process foundation

Check for sources of geometric error in a machine tool.

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



Dynamic machine checking

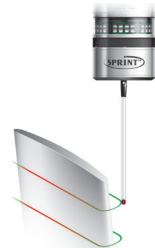


Machine rotary axis check-up

## Process setting

Automate measurement of component position and alignment. Set datums or adapt cutting code according to the real component shape.

- Measure a complex surface and process the data on the machine
- Improve setting accuracy
- Minimise capital expenditure by eliminating the need for expensive fixtures and offline setting devices
- Adaptive machining processes



Adaptive machining

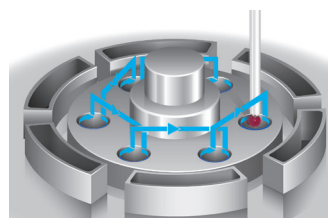


Blade section data collection

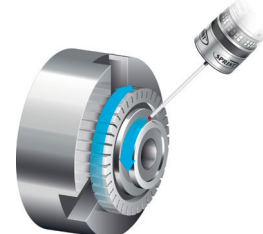
## In-process control

Automate measurement of roughed and finished features.

- Implement measure/cut cycles for very high-accuracy turned diameters
- Update machine parameters
- Verify and update tool offsets
- Optimise tool life



High-speed data collection

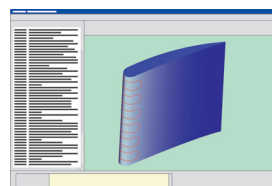


Turned diameter updates

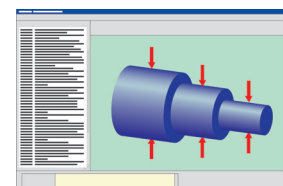
## Post-process monitoring

Automate measurement of critical features.

- On-machine measurement
- Full feature definition
- Increase traceability



Blade inspection



Turned part inspection

# SPRINT scanning technology opens the door to new possibilities

## SPRINT advanced scanning technology

The OSP60 SPRINT probe uses analogue technology to provide a continuous deflection output that is combined with the machine's position to derive the location of the part surface.

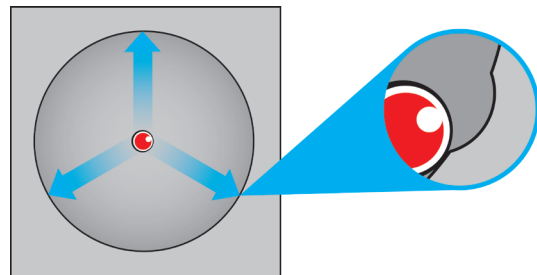
Scanning provides a fast and accurate way to capture form and profile data from both prismatic and 3D complex components.

The high density of data provides a full definition of the part's size, position and shape, enabling completely new opportunities for on-machine process control.

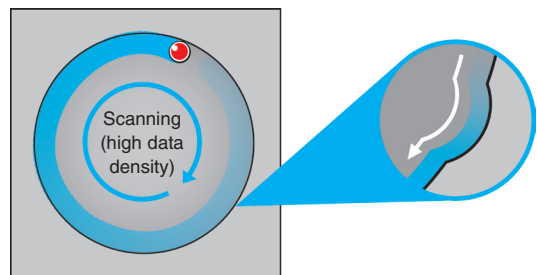
This capability is realised through specific application packages which deliver true game-changing capability.

The SPRINT system can also be used in a 'discrete point' mode for applications such as part set-up.

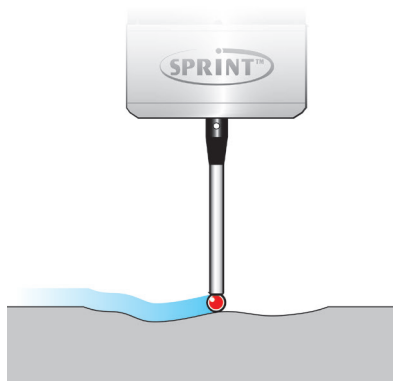
Renishaw has worked in collaboration with major machine tool builders and controller manufacturers to make the SPRINT scanning system fully integrated with CNC machine tools.



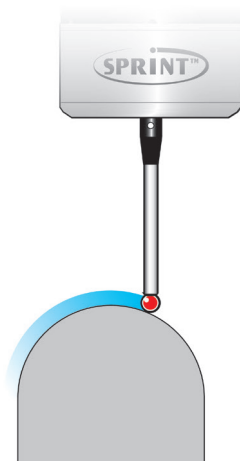
Conventional probing may not identify defects



Scanning probe identifies form accurately



Identification of surface defects



Full form feature definition

### Advantages

- Feedrate of up to 15 m/min dramatically reduces measurement cycle times
- Data capture at 1000 points per second enables better understanding of a feature's location, size and shape than ever before
- More complete part definition leads to greater confidence in measurement
- Focused measurement applications provide solutions to known industry challenges
- New capability gives the opportunity to re-think manufacturing processes

### Key benefits

- Higher levels of automation, giving greater consistency and productivity
- Increased machine capability due to greater process control, reducing scrap and rework
- Increased machine capacity due to shorter measurement cycle times

**... EQUALS SIGNIFICANTLY INCREASED PROFIT**

## SPRINT system optimised for reliable and high-speed data capture

### SPRINT probe

The OSP60 scanning probe has an analogue sensor with 0.1 µm resolution in three dimensions, to provide exceptional accuracy giving the greatest understanding of workpiece form.

Constructed from the highest grade materials, the OSP60 is robust and reliable in the harshest machine tool environments withstanding shock, vibration, temperature extremes and liquid ingress.

A range of SPRINT specific styli are available to complement the enhanced capability provided by the OSP60.

Easily identifiable by their black stylus holder engraved with the exact ball diameter, these styli include a number of design elements to offer improved metrology performance for machine tool applications in comparison with standard styli offerings.

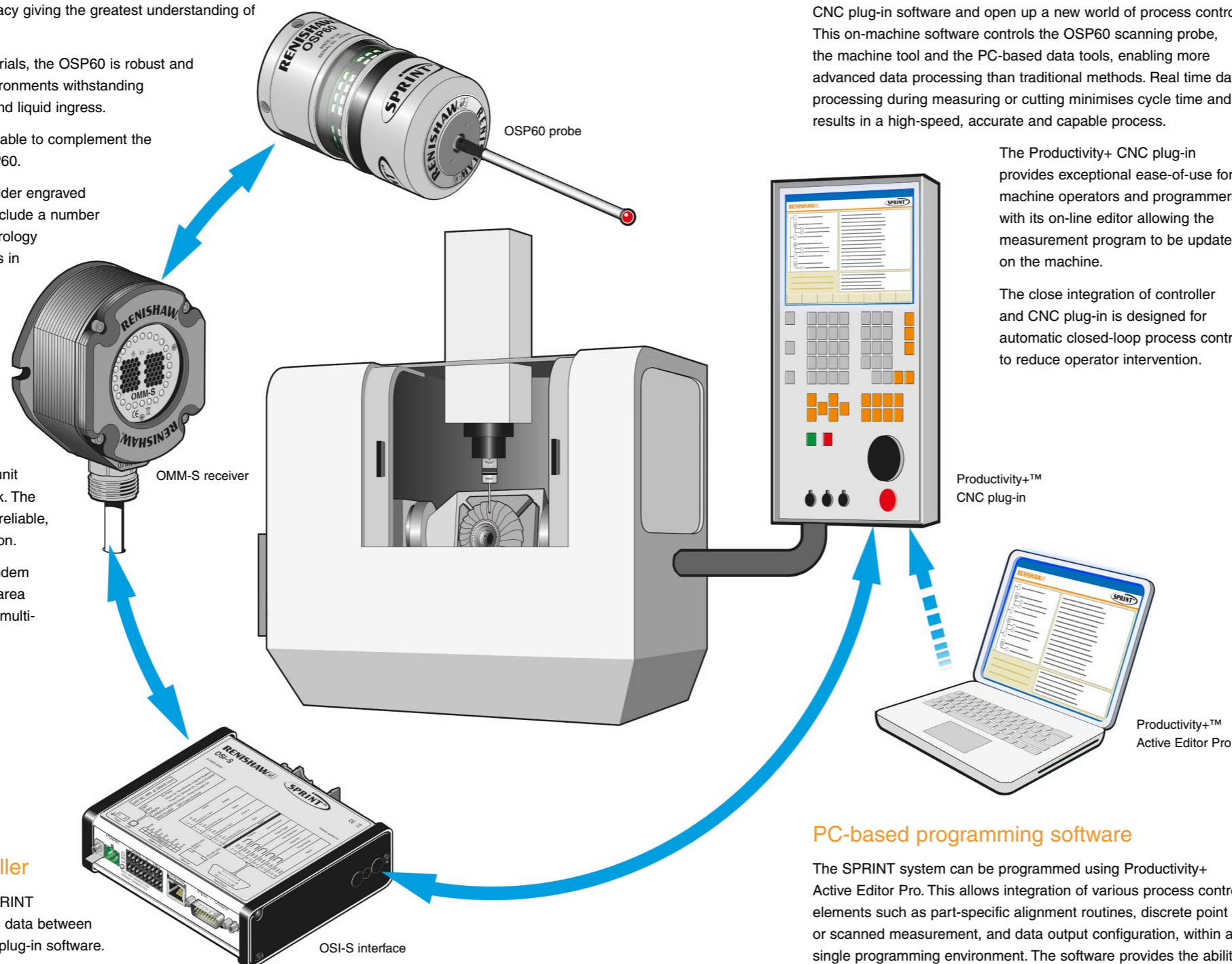
### Optical transmission – high-speed communication

The OSP60 probe and OMM-S receiver unit communicate via a high-speed optical link. The unique communication protocol provides reliable, high-speed and robust data communication.

Two OMM-S receivers can be used in tandem to increase optical range and machining area coverage; particularly useful in large and multi-axis machines.

### Data link to machine controller

The OSI-S interface synchronises the SPRINT system with the machine tool and passes data between the OSP60 and the Productivity+™ CNC plug-in software.



### On-machine software

Harness the power of on-machine scanning with Productivity+ CNC plug-in software and open up a new world of process control. This on-machine software 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.

The Productivity+ CNC plug-in provides exceptional ease-of-use for machine operators and programmers, with its on-line editor allowing the measurement program to be updated on the machine.

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

### PC-based programming software

The SPRINT system can be programmed using Productivity+ Active Editor Pro. This allows integration of various process control elements such as part-specific alignment routines, discrete point or scanned measurement, and data output configuration, within a single programming environment. The software provides the ability to program the SPRINT system to perform scanning tasks based on solid model geometry, and to use the measurement results to update the process running on the CNC controller.

### Game-changing applications

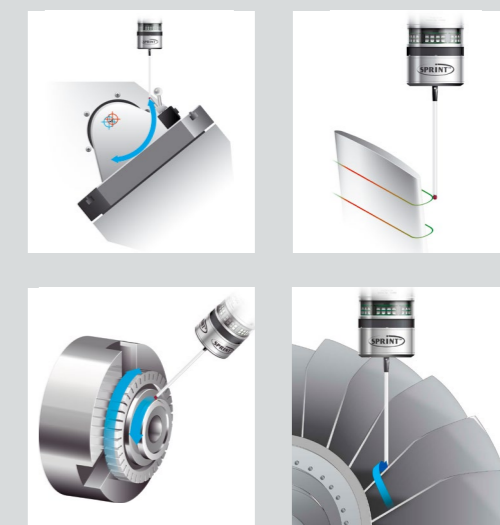
The SPRINT system incorporates ground-breaking technology which allows organisations to completely re-think the use of on-machine process control measurement in high value CNC manufacturing tasks. Working in conjunction with manufacturing organisations in key industries, Renishaw continues to develop specific application capability to improve manufacturing processes.

Based on this experience, the SPRINT system is offered in conjunction with a variety of software toolkit packages for data processing, each focussed on an individual task or industry sector.

The capabilities of each package vary by application but typically include:

- Editing and programming tools for process planners and CAM users, provided as an extension to Productivity+
- On-machine data analysis tools which run automatically in-cycle, and provide measurement feedback to a CNC machining process
- Documentation to allow programmers and users to understand the cycles and use them to their best effect

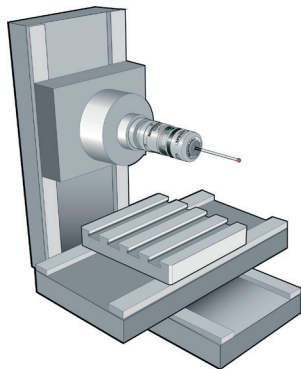
In some cases Renishaw may be able to provide programming and support capability for these applications.



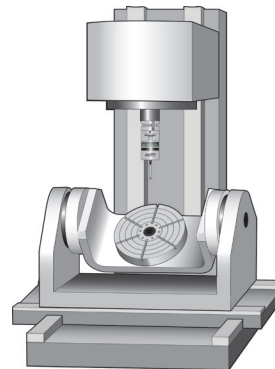
# SPRINT system controller compatibility and machining platforms

## Supported machining platforms

The SPRINT system currently supports all configurations where the probe Z axis is aligned with the machine's Z axis. This includes VMCs and HMCs with trunnion-style tables.



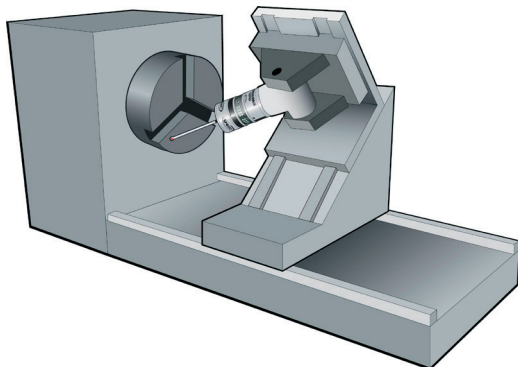
Horizontal and vertical machining centres



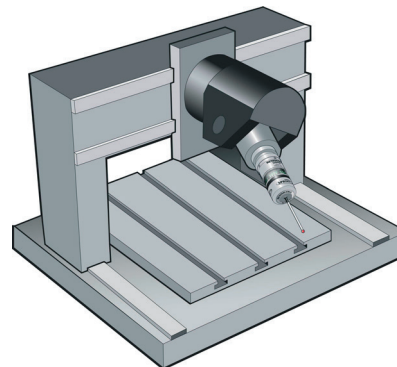
Horizontal and vertical 5-axis machining centres with trunnion-style tables

## Custom function supported machining platforms

Support for other machining platforms is currently offered using custom functions. This includes multi-tasking and nodding-head-style machines.



Multi-tasking machine



Nodding-head machine

## Supported control types

The SPRINT system currently supports the following leading controller types:

- Siemens 840D
- Fanuc Series 3*xi*
- Mazak Matrix 2
- Okuma OSP200

## Customisation

The SPRINT system enables a wide range of measurement and process control solutions which have never before been possible. Working in conjunction with manufacturing organisations in key target industries, Renishaw has developed a series of software toolkits each one focused on a specific industrial application. In addition to the out-of-the-box functionality provided by these toolkits, Renishaw can, in some cases, provide additional programming and support capability for SPRINT applications.

## Probing pays ...

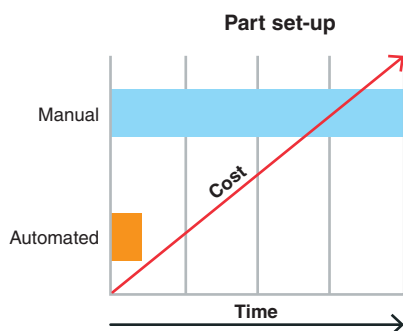
Machine tools that are optimised to cut metal more reliably and more accurately will quickly **maximise productivity, profits and your competitive edge.**



The SPRINT system brings form measurement and full process control to the machine tool for the first time.

For scanning applications, the SPRINT system delivers unprecedented measurement capability, accuracy and functionality at high speed within the machine tool environment. It helps guarantee “right first time” parts, resulting in **cost savings and reduced waste.**

Process control with the SPRINT system is **significantly faster and more accurate** than with conventional machine tool probing methods.



Ultimately, by improving the efficiency and performance of your machine tool processes, a Renishaw probe system can help to **increase your profits.**

## ... the Renishaw way

Renishaw, an established world leader in metrology solutions invented the touch-trigger probe in the 1970s.

Decades of customer focus and investment in development, coupled with our own manufacturing experience enables us to provide **innovative** and **exceptional products** that are unmatched for technical excellence and performance.



## Customer comment

*“I firmly believe in the principle of building quality in, not inspecting to achieve it. Renishaw probing is central to that manufacturing philosophy and throughout our use of CNC machines we have had a close relationship with Renishaw - the flexibility and willingness to assist has always been outstanding.”*

**Marcus Tiefenbrun, Chairman  
Castle Precision**

## About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

### Products include:

- Additive manufacturing, vacuum casting, and injection moulding technologies for design, prototyping, and production applications
- Advanced material technologies with a variety of applications in multiple fields
- Dental CAD/CAM scanning and milling systems and supply of dental structures
- Encoder systems for high accuracy linear, angle and rotary position feedback
- Fixturing for CMMs and gauging systems
- Gauging systems for comparative measurement of machined parts
- High speed laser measurement and surveying systems for use in extreme environments
- Laser and ballbar systems for performance measurement and calibration of machines
- Medical devices for neurosurgical applications
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools
- Raman spectroscopy systems for non-destructive material analysis
- Sensor systems and software for measurement on CMMs (co-ordinate measuring machines)
- Styli for CMM and machine tool probe applications

For worldwide contact details, please visit our main website at [www.renishaw.com/contact](http://www.renishaw.com/contact)



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