

## It's about time - measurement revolution continues at MACH 2006 (Hall 5 Stand 5572)

**Renishaw is focusing on time and throughput issues at MACH 2006, with products that will significantly reduce inspection times on both machine tools and co-ordinate measuring machines, and allow machines to run unmanned under full process control. Other breakthrough products include a new angle encoder and high accuracy linear encoder for precision position feedback, and new software for motion system analysis.**

The new **TRS1** tool breakage detection system allows manufacturers to run machine tools unmanned, with complete confidence that cutting tools damaged during a machining cycle will be quickly detected, eliminating the risk of scrapped parts. This innovative new unit projects a beam of laser light at a tool and monitors the scattered light that is reflected, to determine if the tool has been broken. It uses tool recognition technology that distinguishes between the tool and coolant or swarf/metal chips, and is also fast and reliable under real machining conditions.



More reliable than conventional non-contact systems, the TRS1 comprises a single unit containing the laser source and detection electronics, enabling it to be mounted outside of the working envelope, safe from collision and saving valuable space on the table.

The most significant advance in co-ordinate measuring machine (CMM) technology for 20 years, **Renscan5™** is a new enabling technology that will allow highly accurate, ultra high speed five-axis scanning measurement on CMMs. This new technology allows the development of a range of breakthrough five-axis scanning products that will measure at speeds of up to 500 mm/second, and virtually eliminates the measurement errors normally associated with existing three-axis scanning systems.

The first product to take advantage of the new Renscan5™ technology is **REVO™**, a revolutionary measuring head and probe system that will maximise inspection throughput, whilst maintaining a high-level of system accuracy. REVO™ uses synchronised motion when scanning to quickly follow changes in part geometry, without introducing its own dynamic errors. This allows the CMM to move at a constant velocity along a constant vector whilst measurements are being taken, removing the inertial errors that result from acceleration of the machine during conventional 3-axis scanning.

At MACH, Renishaw is also showing two new PC-based software products that offer significant time savings for users of machine tool probe systems. **Productivity+™** **Active Editor Pro** is part of Renishaw's new generation of easy-to-use probing and process control software, which targets the entire spectrum of probe users. The CAD front-end allows features to be identified

with a single click, and the drag-and-drop interface uses the measured data to update machine parameters. The result is a fully integrated metal cutting and probing program, which allows a machine tool to make intelligent decisions on the fly.

**Renishaw OMV** is a verification package that gives machine tool users powerful CMM-style 3D verification against a CAD model. The software is targeted at manufacturers of complex and large parts, such as mould tools, and combines freeform and geometric features. A straightforward point-and-click approach means that the user can see the inspection path as it is generated, and make changes if required. In combination with Renishaw's non-lobing, high accuracy spindle touch probes, such as the MP700 and new **OMP400** ultra-compact touch probe, Renishaw OMV provides unrivalled accuracy of part verification on machine tools.

Renishaw's new **SIGNUM™** family of rotary and linear position feedback encoders offer ruggedness and precision to deliver levels of performance previously possible only from fine-pitch systems too delicate for many industrial roles. All encoders feature comprehensive SiGNUM™ software that enables optimum set-up and real-time system diagnostics via a PC's USB port

The SiGNUM™ RESM angular encoder is a one-piece stainless steel ring with 20 micron scale marked directly on the periphery. It features the *IN-TRAC™* optical reference mark, which repeats, regardless of direction, at operational speeds of over 4,500 rev/min (52 mm diameter) and up to 85° C.

The SiGNUM™ RELM high accuracy linear encoder comprises the SR readhead, Si interface and 20 micron RELM scale, which is offered in defined lengths. Initially available in Invar, which provides a low thermal expansion of 1.4 micron/m/°C, the RELM scale is offered with a choice of *IN-TRAC™* reference mark positions and dual optical limits. Together with the robust, yet highly precise 20 micron spars, this enables the RELM to offer accuracy to ±1 micron and resolution to 20 nm, satisfying the most demanding precision motion requirements.

For precision motion system analysis, **QuickView™** is a unique software package from Renishaw designed to make their ML10 laser an even more flexible and powerful analysis tool. For years, electronic engineers have relied on oscilloscopes to study high-speed variations in voltage or current. Now, QuickView™ software provides mechanical engineers with a similar capability, allowing them to study minute variations in linear or angular displacement, velocity or acceleration. With a simple graphical interface QuickView™ allows very flexible operation, avoiding the need for predefined measurement targets and sequences - just point and measure, ideal for ad-hoc system investigations.