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**RENISHAW**   
apply innovation™

## Renishaw applies innovation to provide solutions to your problems

Renishaw is an established world leader in metrology, providing high performance, cost-effective solutions for measurement and increased productivity. A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Renishaw designs, develops and manufactures products which conform to ISO 9001 standards.

**Renishaw provides innovative solutions using the following products:**

- Probe systems for inspection on CMMs (co-ordinate measuring machines).
- Systems for job set-up, tool setting and inspection on machine tools.
- Scanning and digitising systems.
- Laser and automated ballbar systems for performance measurement and calibration of machines.
- Encoder systems for high accuracy position feedback.
- Spectroscopy systems for non-destructive material analysis in laboratory and process environments.
- Styli for inspection and tool setting probes.
- Customised solutions for your applications.

## Renishaw worldwide

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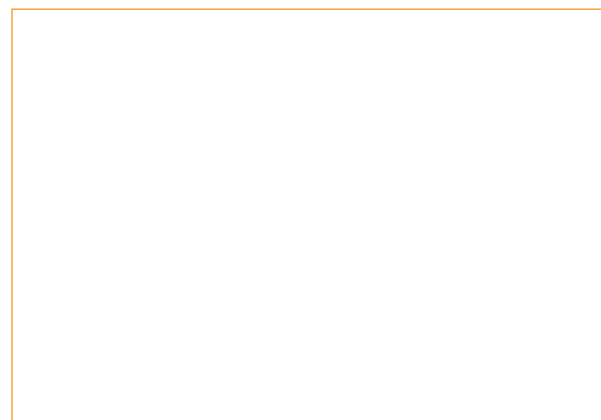
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# Scanning technology bringing precision and productivity to your processes



**Compact and affordable machines**



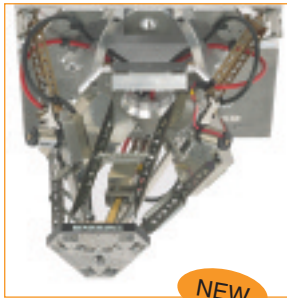
**Accurate scanned data –  
no need for manual finishing**



**Precision, automated  
scanning of prostheses**



## How are Renishaw scanning solutions helping your industry?



NEW

### TRIACT™ mechanism

- The machine is based on a novel mechanism to give high dynamic performance
- DC motors with direct friction drives control the motion to give fast, precise positioning
- High resolution optical scale encoders give accurate position feedback
- A new compact, 3 axis probe performs the scanning. Low forces and small scanning deflections give very accurate data
- High speed controller ensures the best motion control and fast data processing
- Simple USB connection to PC makes installation easy

Renishaw, the internationally recognised leader in industrial digitising, is introducing the new Triclone 90 ultra-compact scanning machine, a significant breakthrough in affordable automated digitising. Triclone 90 enables the reverse manufacture and reverse engineering of small, detailed components, including those formed from soft wax materials.

A significant application for the Triclone 90 will be the dental industry, where the low-force scanning probe provides the ability to scan inlays, onlays and bridges, with no damage caused to wax parts. Recognising the importance of this sector, an optional version of Tracecut has special application software for the dental market.

### Triclone 90 scanning machine

- High speed reverse manufacture and reverse engineering of small, detailed parts
- Rapid data capture allows faster product development lead times
- Cost effective revenue generator for dental laboratories, job shops and tool rooms
- Supplied with Tracecut – the world's leading scanning software

### Triclone 90 specification

Measuring envelope	90 mm dia x 45 mm high
Overall machine dimensions	505 mm high x 245 mm wide x 315 mm deep
Weight	14 kg
Encoder resolution	Sub micron
Probe force	Typically 0.5 N/mm at nominal stylus length
Probe resolution	Sub-micron
Power supply	18V DC @ 2.5A max
Connection	USB connection

### Triclone will revolutionise dentistry

Scans master casts and soft wax-ups to aid the production of ceramic crowns or bridges.

Avoids metal in the mouth and provides dental prostheses with better fit and appearance.

1. Master cast produced from dental impression
2. Wax-up produced on cast stump. Both are scanned
3. Scanned data is processed into cutting file
4. Crown produced, to which porcelain can be added



1.



2.



3.



4.



### Adjustable mount and setting station

- Part mount adjustment X,Y, Z +/- 20 mm; tilt +/- 20°



Scanning is the process of gathering data from an undefined 3-dimensional surface. It is used in fields such as tool and die, mould making, press tools, aerospace, jewellery, medical and confectionery, in fact anywhere there is a need to reproduce a complex, free-form shape.

During the scanning process, an analogue probe is commanded to contact and move back and forth across the unknown surface. During this process, the system records information about the surface in the form of numerical data. This data may then be used to create a CNC program to machine a replica or geometric variant of the shape.

Alternatively, the data can be exported in various formats to a CAD/CAM system for further processing.



### Tracecut software

The heart of all Renishaw scanning systems is the Tracecut software. More than just a data capture system Tracecut enables you to manipulate data and then create an CNC program or CAD output.

### Advantages of stand alone scanning systems

- Dedicated off-line scanning leaves machine tool free to cut metal
- High speed scanning reduces lead times from pattern to finished item/tool
- Very low probing forces allows scanning of delicate materials
- Ability to use extremely small styli allows the scanning of very fine detail
- Magnetic breakaway of stylus provides crash protection for workpiece/stylus
- Availability of a non-contact, laser probe (Cyclone Series 2)
- Quiet and clean in operation – allows installation in an office-like environment

### Cyclone scanning machine

Cyclone is a purpose built machine for high speed data acquisition, which can be used in conjunction with Renishaw's Tracecut digitising software for reverse manufacturing/reverse engineering.

Cyclone supports contact and non contact probes and can scan larger parts than the Triclone 90 scanning machine. The machine operates in a normal office/workshop environment for fast, unmanned scanning of unknown surfaces. Cyclone combines output from its scanning probe and axes positions using its purpose built controller.

The Tracecut software calculates the surface coordinate data point and a new target position to which the machine should move. As the machine is of lightweight construction, much faster scanning speeds can be achieved than on machine tool based systems.

### Machining

Tracecut offers a complete CAM package with a variety of powerful machining strategies, and will create gouge proof machining programs for any CNC machine tool.

#### CAD outputs available:

- IGES points/STL binary
- VDA points
- ASCII data
- IGES surfaces
- DXF polyline

System specific outputs also available for leading CAD/CAM suppliers.



### Real world scanning solutions – from head to toe!

Scanning applications include...

- spectacle lenses
- hearing aids
- teeth
- jewellery
- watches
- heart pacemakers
- hip replacements
- prosthetic limbs
- sports footwear
- .... and many, many more.