SALES & SERVICE:

A Tech Authority, Inc.
13745 Stockton Ave.
Chino CA 91710
909-614-4522
sales@atechauthority.com

RENISHAW
apply innovation™

Quickly diagnose the performance of your machine tools

Reduces down-time

Reduces both machine down-time and maintenance costs

Compliance

Reports comply with ISO, ASME and JIS standards

Predictive maintenance

Forms the basis of predictive maintenance programs

Quickly diagnose the performance of your machine tools

SALES & SERVICE:

A Tech Authority, Inc.
13745 Stockton Ave.
Chino CA 91710
909-614-4522
sales@atechauthority.com

Get a Renishaw QC10 ballbar, get control!

The problems

- **Inspection failures**
- **Scrapped components**
- **Wasted time**
- **Reduced productivity**
- **Quality crisis**

Before you blame . . .

- **The tooling**
- **The drawing**
- **The inspection**
- **The part program**
- **The machine operator**

. . . maybe your machines are at fault!

The quality of every component produced on a CNC machine is highly dependent on the machine's performance. Problems with a machine inevitably result in inspection failures, scrapped components and unexpected down-time.

All too frequently, quality and inspection procedures identify problems after components have been produced. However, this is often too late to rectify any of the incurred scrap and down-time costs.

For this reason, it is ESSENTIAL that your machine performance is checked before component manufacture.

QC10 ballbar kit with Zerodur® calibrator

The solution

Renishaw's QC10 ballbar offers you the perfect solution. A quick 10 minute test* is all that is required to assess the performance of your machine.

The Ballbar 5 HPS software guides you through the dynamic circular test, analysing your machine's performance in accordance with ISO, JIS and ASME standards, as well as Renishaw's own reports. In addition, advanced mathematical techniques are used to identify the specific error sources on your machines.

Take the guesswork out of your machine's performance. The QC10 ballbar system provides you with a quick and effective solution to evaluate machine performance, and actually helps you to improve it through targeted maintenance.

- **Verify machine performance**
- **Achieve manufacturing tolerances**
- **Grade and compare machines**
- **Test and monitor machine condition**
- **Predict maintenance requirements**
- **Check new machines at commissioning**

QC10 ballbar kit

The quickest, easiest and most effective way to monitor machine tool condition. The ballbar kit provides a complete, powerful and portable solution – just add a PC and go!

*Based on typical feedrates and test radius

Accurate

When used with the Zerodur® calibrator, the QC10 ballbar measures the absolute radius of a tool path. The ballbar can be used to diagnose pitch errors, thermal distortion, scaling errors and radial deviation (ISO230-4 and B5.57). In addition the software will automatically calculate the positional tolerance of the machine.

Zerodur is a registered name of Schott Glass Technologies Inc.

Who can benefit?

- **End users**
- **Distributors**
- **OEMs**
- **Service companies**

Where can you benefit?

- **Production**
- **Maintenance**
- **Engineering**
- **Management**
- **Quality**
- **Sales and Marketing**

SALES & SERVICE:

A Tech Authority, Inc.
13745 Stockton Ave.
Chino CA 91710
909-614-4522
sales@atechauthority.com

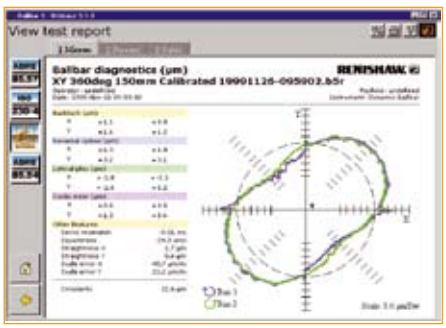
With a QC10 Ballbar system it only takes 10 minutes to diagnose the fault

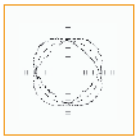
1. Setup

- Setup is quick and easy with Windows® based software guiding the operator through each step
- Test templates can be set up for standardised testing
- The QC10 ballbar is mounted between two repeatable magnetic joints
- A simple G02 and G03 command program is all that's required for the test
- The HPS software includes an automatic part program generator

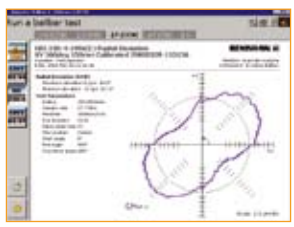
2. Capture

- The machine performs two consecutive circular arcs, one test in the clockwise direction, the other in the counter-clockwise direction
- The QC10 ballbar accurately measures any deviations in the circle radius during the test





Servo Mismatch, Stick-slip, Reversal spikes, Cyclic error, Scale, Straightness, Lateral play, Backlash, Squareness.



3. Analyse

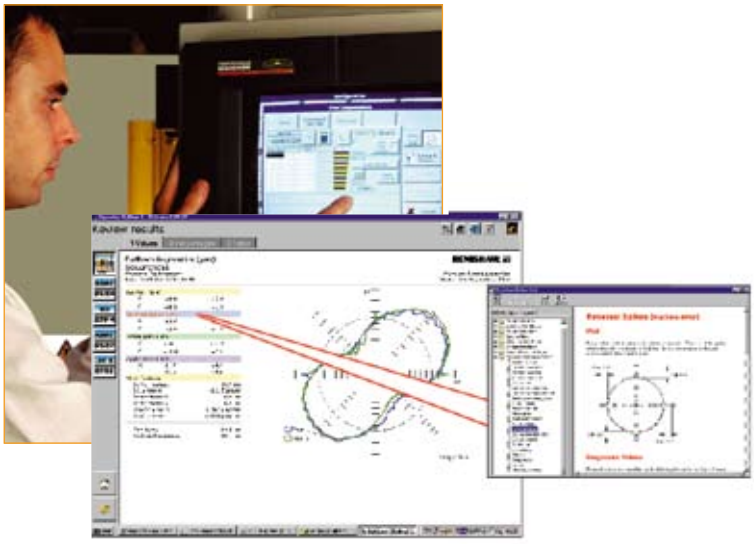
- Ballbar data is sent directly to a PC via a standard RS232 link
- Renishaw's Ballbar 5 HPS software then analyses the data in accordance with ISO230-4, ASME B5.54 – B5.57, JIS B6194 or GB/T17421.4 machine performance standards
- The shape of the ballbar plot indicates the major sources of machine error

SALES & SERVICE:
A Tech Authority, Inc.
13745 Stockton Ave. Chino CA 91710
909-614-4522
sales@atechauthority.com

RENISHAW
apply innovation™

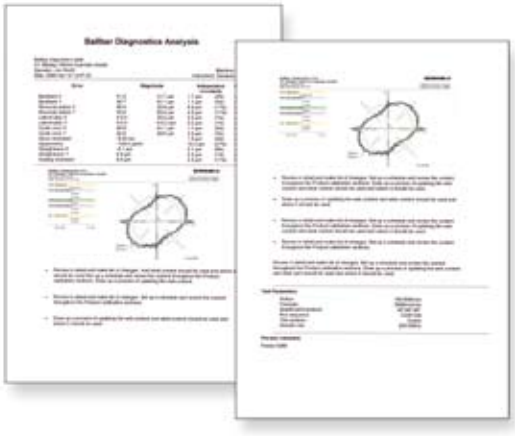
4. Diagnose

- Powerful software gives automatic analysis and diagnosis of specific machine error characteristics
- Each error is ranked according to its significance to overall machine accuracy
- Overall machine accuracy is graded with a value for circularity and positional tolerance
- Machine history - Review machine performance over time in graphical format
- Set automatic warning/alert signals



5. Fix

- Pinpointing the specific machine faults enables efficient, targeted machine maintenance, minimising downtime
- 'Hotlinks' take you directly to the relevant section of the on-line user manual
- The manual explains the possible causes for each type of machine error and offers advice on how best to fix them
- The software includes a machine error simulator to help predict effect of maintenance in advance



6. Report

- On screen reports can be printed or archived for future reference and also cut and paste into other applications
- Switch between supported languages for reports*
- Plan predictive maintenance programs by tracking machine performance

*English, French, German, Italian, Spanish, Czech, Chinese, Japanese and Korean.

RENISHAW
apply innovation™

Test a wide range of machines

Flexible and easily adaptable

The QC10 ballbar is an extremely versatile tool designed to be used on a large variety of machines. The standard system can be used to test 3-axis CNC machines such as horizontal and vertical machining centres. With the addition of other accessories detailed below, the QC10 ballbar can also be used to test a much wider range of machines.

For 2-axis CNC applications, a special retractable centre mount, the **VTL adaptor**, is used. This enables typical 2-axis machines such as pick and place machines, laser cutting machines and vertical turning lathes etc. to benefit from QC10 ballbar diagnosis.

The **360° lathe adaptor** enables the QC10 ballbar to be used on a wide range of CNC lathes. As with machining centres, it also allows a full diagnosis of lathe capabilities to be performed.

To address smaller machines, the **small circle accessory kit** allows testing of CNC machines with shorter axis travel. Additionally, it can help to give an enhanced analysis of servo control systems on most types of machines.

System specification

Resolution	0.1 µm (4 microinches)	
Ballbar sensor accuracy	± 0.5µm (at 20°C) ± 20 microinches (at 68°F)	
Maximum sample rate	250 values per second	
Extension bars	50 mm, 150 mm, 300 mm	
Operating range	0 – 40°C (32 – 104°F)	
Calibrator accuracies (at 20°C)	±1 µm ±1 µm ±1 µm ±1.5 µm	(50 mm) (100 mm) (150 mm) (300 mm)

Minimum PC specification

Windows® 95, 98, 2000, XP, ME or NT4, Internet Explorer 5.5 or higher, at least 200MHz, 32MB RAM, min screen resolution 800 x 600 pixels, CD-ROM drive, at least one RS232 port (USB to RS232 adaptor required for USB only PCs).

QC10 ballbar

VTL adaptor

360° lathe adaptor

Small circle accessory kit