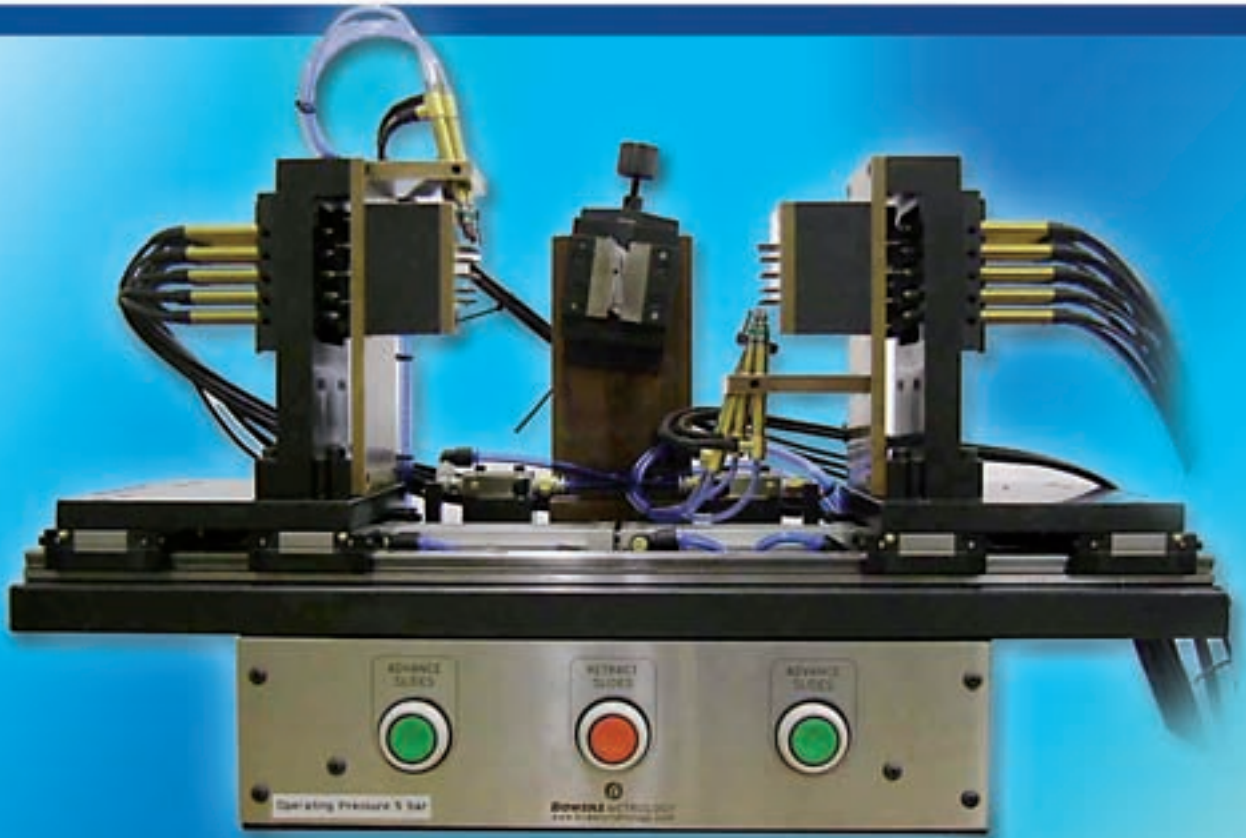




**BOWERS** METROLOGY  
SYSTEMS



*from design to manufacture*

BOWERS METROLOGY SYSTEMS METROLOGY



*Gear Measurement Machine*



*3 Axis Measuring & Weighing MIC*



*Shell Case Measuring Gauge*

Partners in Precision

## ***Design & Manufacture***

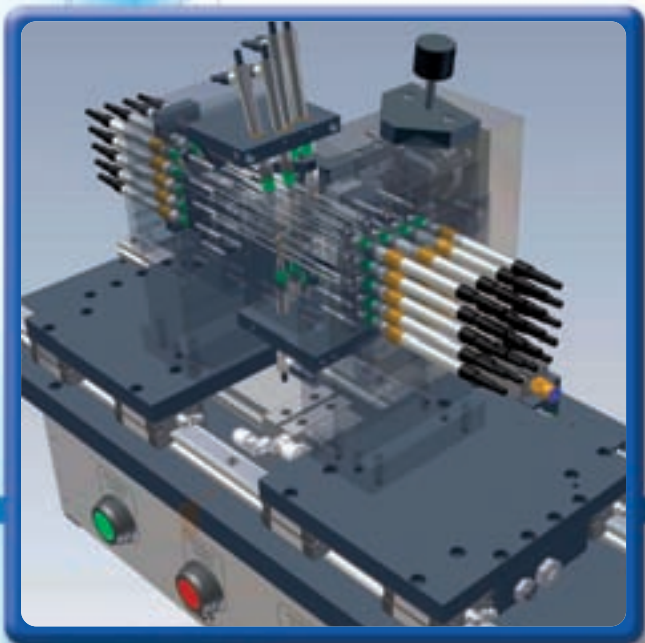
Bowers Systems offer imaginative and cost effective solutions to the rapid, accurate measurement of components of all types and sizes. Projects from a simple 6-inch fixture, to a fully automated computer driven, in-line measuring system can be designed and supplied, in-house, from our modern manufacturing facility in Bradford, West Yorkshire. Bowers Metrology Systems draw on a history of more than 50 years of excellence in measurement, within the renowned Bowers Metrology Group.

Already a preferred supplier to many companies within the Automotive, Aerospace and other equally demanding industries, Bowers Systems work in partnership with all of our customers to ensure the optimum solution to any measuring challenge is supplied, in terms of accuracy, price, speed and ease of use.

Aided by the latest CAD systems and our 'state of the art' CNC Machine Tools, the expert staff at Bowers have gained a reputation which is second to none for their innovative approach to solving industries measuring problems and for the high quality of their manufactured product. Bowers Systems give a truly comprehensive A-Z service, our in-house U.K.A.S. calibration laboratory, ensures that after manufacturing, verification and certification of a fixture or system can, if required, take place prior to delivery.

## ***Design Facilities***

Investment has been made into the latest design software, Autodesk Inventor, which is used to give a life-like representation of a design well before manufacture, allowing greater supplier/customer confidence in the project. Data can be imported into the Inventor software, allowing solid models of customer components to be used during design, reducing design time considerably. Inventor can be interfaced with various software including, Anvil, AutoCAD 2D/3D, Cadkey 2D/3D, Catia, Mechanical Desktop, Pro-Engineer, Solid Edge, and Solid Works.



## Application Examples

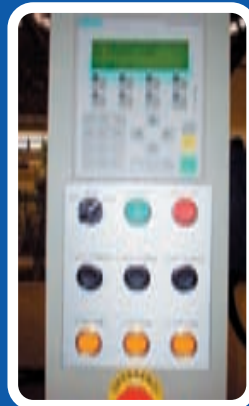
### Gear Measurement Machine

- Measures pitch diameter of gears using the over pin dimension principle
- 0 - 305mm external measurement / 50 - 355mm internal measurement
- Two-hand start
- Constant measuring force over full range



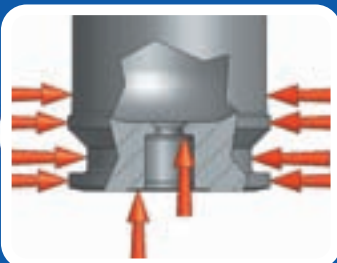
### 3 Axis Measuring & Weighing MIC

- Measures and weighs video cassettes, CD's, handsets, game consoles, etc.
- Downloads data to customers software



### Shell Case Measuring Gauge

- Measures four external diameters, step height, taper position and two c'bore depths from end face
- 12-off P5 probes running into D100S digital readout



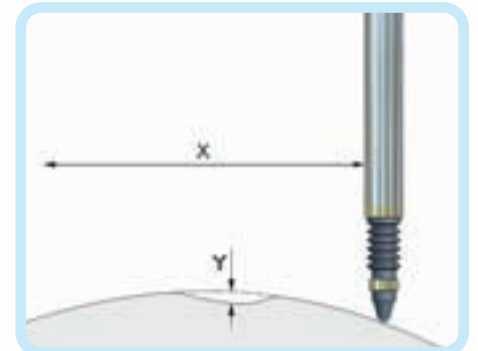
## ***Crankshaft Measurement Fixture***

- Measurement of timing slot depth, width, height and position
- Measurement of timing sprocket keyway width and position



## ***Automotive Body Panel Measurement***

- Special gauge for measuring faults in car body panels
- Feeds traces into custom software
- Plots up to 4000 points/sec



## ***Carbon Fibre Strut Length Measuring System***

- 0 - 3000mm length measurement
- 200 - 2500mm hole centre measurement
- Heidenhain electronics & Schneeberger linear bearings mounted to 3.5m long granite bed

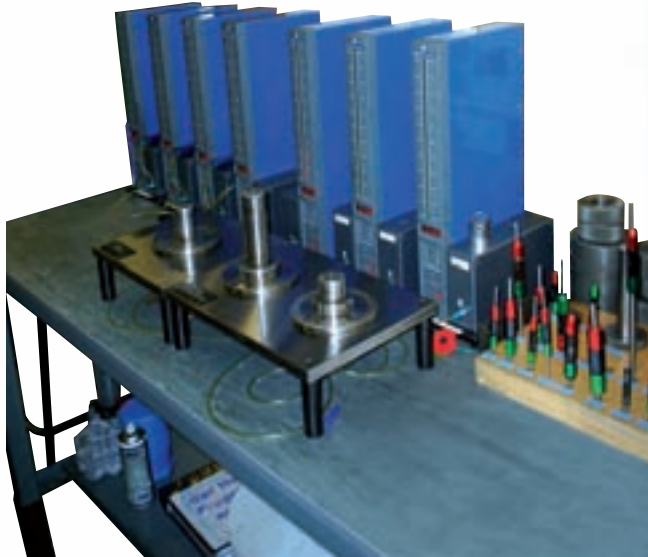


## PC 2200 Air/Electronic Column

The PC 2200 is a state of the art flexible electronic/air column capable of operating with air gauging products and measuring probes. The advanced new column contains a multitude of measuring functions including static and dynamic gauging, classification grading, probe mixing, (A+B), (A-B), etc.

### Features:

- Metric/Imperial
- 3 colour LED display
- Digital display
- Status indicator
- 2 probe input
- 4 probe input option
- Probe mixing, (A+B), (A-B), etc.
- Compatible with most electronics probes
- Air convertor option (1 or 2)
- Dynamic mode Max, Min, TIR, etc.
- Tolerance limit setting
- Approach limit setting
- Calibration, single or Max/Min
- Accuracy 0.5% full scale +/- resolution
- 6 range settings
- Resolution 0.1um (5 settings)
- Grading (1-100)
- RS-232 output
- Can be linked to PLC or Logic controller
- Dual supply voltage (220/110 volt)



## New Gagemaker Mic 360

The MIC 360 is an in-process diameter gage that measures internal and external diameters of machined parts, while they are rotating. Measurements are taken while the part rotates at speeds up to 360 SFM. Accuracies and repeatability are as precise as .0002". The range of outside diameters is unlimited. This innovative technology will eliminate the use of periphery tapes for all those large diameter parts.

The MIC 360 eliminates the need for bar gauges and setting standards. With higher accuracies, tolerance is not consumed by the gauge, as with conventional methods. Instead, the MIC 360 allows more tolerance to be used on the product being measured.

The MIC 360 also eliminates variations in critical measurements due to different operators and inconsistent gauging techniques. Since the MIC 360 requires no operator involvement during the measurements, diameter readings are consistent every time.

### Features:

- Maintains accuracies to 0.0002"
- Measures internal or external diameters upto 30ft
- Measures multiple diameters
- Inspects tapers or grooves
- Inspects parts as they are machined
- Produces consistent readings for any operator
- Requires no setting masters



Concentricity



Squareness



Runout



Ovality



Flatness



Diameter



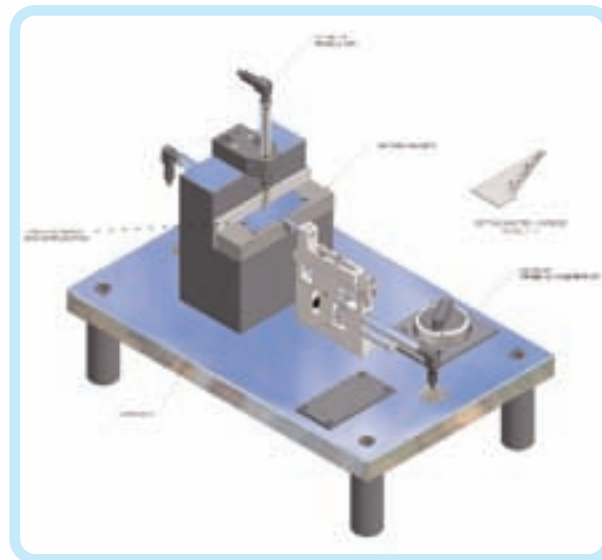
Parallelism

## Case Study

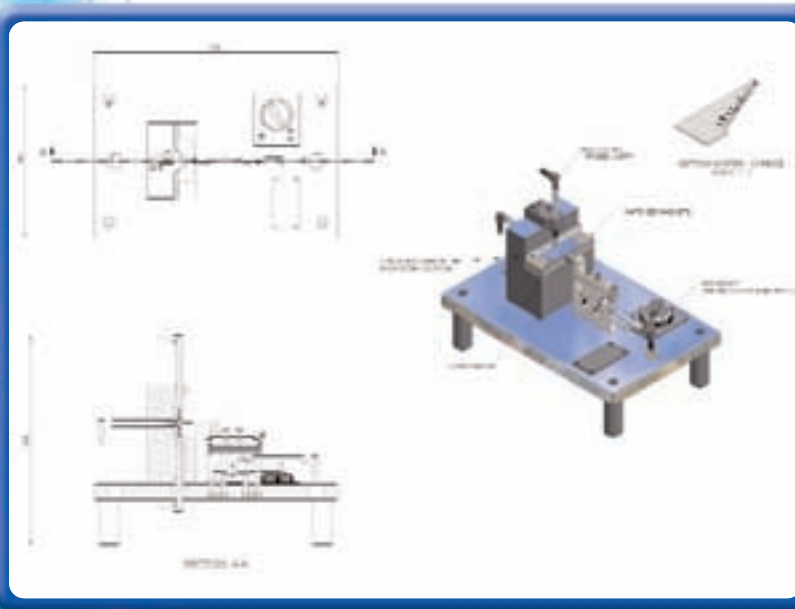
- Gauge to measure steel strip thickness & width
- Customer part range: -  
5 - 25mm width (Tol. +/-0.020mm)  
0.060 - 0.100mm thickness (Tol. +/-0.003mm)
- Both parameters measured at the same time



- Once customer details, requirements & part samples are provided a quote can be devised. This will typically include an explanation of the gauge configuration, method of operation, calibration details, concept layout, etc...



- Upon receipt of order a final design concept is issued to the customer together with a manufacturing commencement form. Manufacturing will not commence without customer approval of the design.



# Case Study

- Upon completion of manufacture the gauge is fully tested. This can include a full R&R study that will be issued to the customer.



Table 1: R&R study results showing measurement repeatability and reproducibility. The table includes columns for Part Name, Feature, and various statistical measures.

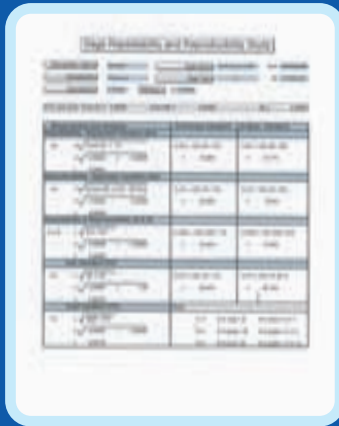


Table 2: R&R study results showing measurement repeatability and reproducibility. The table includes columns for Part Name, Feature, and various statistical measures.

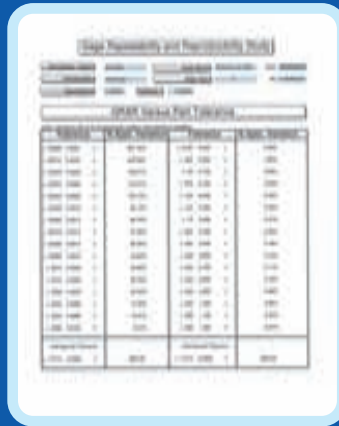
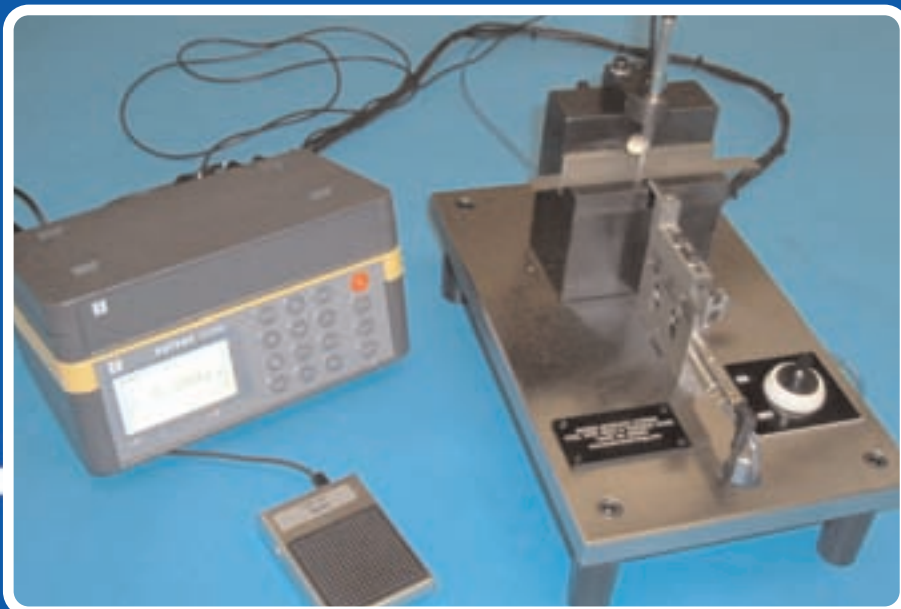
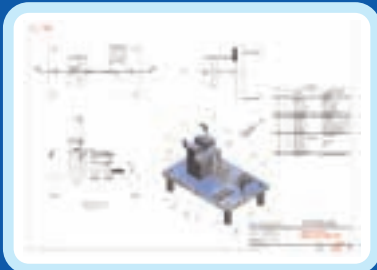


Table 3: R&R study results showing measurement repeatability and reproducibility. The table includes columns for Part Name, Feature, and various statistical measures.

- Completed gauge ready for delivery to customer. This will include the gauge and all ancillaries, setting master, setting master UKAS cert, operating instructions, assembly drawing with parts list, etc...



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