Hawk Systems with QC-200 Microprocessor

System Summary

Available in a wide range of configurations, Hawk systems with QC-200 offer high accuracy measurement in 3-axis of both complex and routine manufactured components. The intuitive QC-200 microprocessor can be used by shift workers or advanced users alike and provides powerful yet simple data processing for routine measurement and reporting requirements.

Hawk with QC-200 utilises Vision Engineering's patented Dynascope™ optical image projection technology to simplify the measurement of complex manufactured component parts of all materials.

- High repeatable accuracy, 3-axis (X, Y, Z) measurements
- Patented optical image clearly defines edges, offering superb resolution and contrast
- Powerful and intuitive microprocessor delivers simple, fast results
- High precision and large capacity measuring stage options
- Image capture and archive option
- Modular and flexible system for future upgrade
- Worldwide training, service & support

See It – Measure It …

Difficult-to-view features such as low contrast black or white plastics, materials of different colours and textures, or transparent parts may all be viewed in intricate detail – something not always possible with other measuring devices, ensuring the highest levels of accuracy are achieved. Critical parts can be measured in complete confidence.

Precision Measuring Stage

Hawk with QC-200 is available with a range of high specification, high performance measuring stage options, providing a measuring range from 150mm x 150mm (6" x 6") up to 400mm x 300mm (16" x 12"). Every measuring stage has factory-completed non-linear error correction (NLEC) calibration to ensure optimum accuracy, which is traceable to international standards for the purposes of ISO9000. Combined with 0.5µm resolution measuring encoders, this provides a system repeatability of up to 2µm for complete confidence in your results.*

Intuitive Microprocessor

Data processing is performed by the QC-200 multi-function microprocessor. QC-200 is ideal for measuring common component features, such as circles, angles, lines, arcs and distances and has been designed with ease of operation in mind, featuring an intuitive interface with meaningful visual displays. X, Y and Z measurements are represented in both numerical and graphical form with connectivity through USB and serial ports.

Hawk with QC-200 Microprocessor and 200 x 150mm measuring stage illustrated

Patented Technology

The Hawk family of non-contact measuring systems draw on over 50 years of optical manufacturing experience to combine Vision Engineering's patented Dynascope™ technology with high precision measuring stages and powerful data processing.

Dynascope™ image projection technology provides unrivalled optical clarity for accurate and efficient measurement.

* 200mm x 150mm measuring stage (x200 system magnification, using controlled conditions).

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The **QC-200** digital microprocessor is the ideal control interface for all routine 2-D measurement and reporting functions with the Hawk non-contact measuring system, providing a powerful combination to empower operators along every step of the measurement process. Patented features reduce repetitive measurements and simplify complex work steps.

Intuitive User Interface

A consistent, intuitive interface ensures operator accuracy and reduces training time.

Part Programming

Programme a measurement sequence once and run it back as often as you need. Measure the same number of points per feature, in the identical sequence, part after part.

Intersections and Constructions

Obtain essential intersection and construction results by selecting from the list of previously measured features, complete with graphics.

Measure Magic™

To measure, simply probe points and click. QC-200 detects, without the operator's intervention, the feature type being measured.

Context-Sensitive Help

QC-200 decreases training time and costs with graphics-rich, context sensitive help that guides shop-floor personnel through Quadra Chek interface conventions.

Options

Get the right tools for the job. Optional remote keypads, footswitches and printers help operators capture the precise measurement data more conveniently while streamlining the work process.

Languages

As standard, QC-200 includes English, French, German, Italian, Portuguese, Spanish, Swedish, Czech, Polish, Turkish, Chinese and Japanese languages.

Connectivity

Data output via USB and RS-232 ports.

Geometric Tolerancing

QC-200's unique graphical representation instantly displays pass/fail performance details for critical part dimensions. Results and important measurement data are displayed in an uncluttered and comprehensive LCD display.

System Variations			
Stage Sizes			
150 x 150mm	200 x 150mm	300 x 225mm	400 x 300mm
Magnification (System Total)			
x10, x20, x50, x100, x200, x500, x1000			

Measurement results

Intersections and constructions

Data cloud
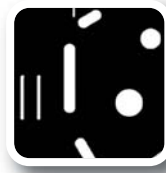
Patented Eyepieceless Technology

Surface Illumination

Bright white, multi-point ringlight provides uniform and shadow-free surface illumination of the subject.

Suitable for all routine measuring applications.

Substage Illumination

Substage illumination provides a sharp edge profile, plus can be used to view through-holes in components, or highlight features in translucent parts.

A thumbwheel iris adjusts the substage light to provide clearly defined edges.

Episcopic Illumination

Episcopic illumination projects the light through the objective lens, following the same optical path as the image.

Used particularly for higher magnifications where the subject is flat and reflective or to illuminate blind bores or deep surface features.**

Using a thumbwheel, the amount of light can be adjusted for illumination precision.

Episcopic and Surface Illumination

Combine both surface and episcopic illumination to provide complete flexibility.

Modular design provides full compatibility between surface and episcopic illumination units.

High Precision Measuring Stage
200 x 150mm

Precision Measuring Stage
150 x 150mm

Other Options Available

- Custom designed pre-centred graticule
- Coloured filters for enhanced profile viewing

Options and Accessories

Patented Eyepieceless Technology

Options and Accessories

Objective Lenses

A wide range of objective lenses options are available:

Single, quick change high numerical aperture, macro objectives and 4-turret array, quick change micro objectives. Macro objectives include an iris to adjust depth of field.

Macro Lenses

Objective Lens	Total Magnification	Working Distance	Field of View (mm Ø)	Depth of Field (µm)
x1	10x	84mm	14.2mm	270µm
x2	20x	81mm	7.1mm	67µm
x5	50x	61mm	2.8mm	10µm
x10	100x	32mm	1.4mm	6µm

Micro Lenses (Standard Working Distance)

Objective Lens	Total Magnification	Working Distance	Field of View (mm Ø)	Depth of Field (µm)
x5	50x	20mm	4.4mm	12.22µm
x10	100x	10.1mm	2.2mm	3.06µm
x20	200x	3.1mm	1.1mm	1.3µm
x50	500x	0.66mm	0.44mm	0.43µm

Micro Lenses (Long Working Distance)

Objective Lens	Total Magnification	Working Distance	Field of View (mm Ø)	Depth of Field (µm)
x10	100x	21mm	2.2mm	4.4µm
x20	200x	12mm	1.1mm	1.72µm
x50	500x	10.6mm	0.44mm	1.10µm
x100	1000x	3.4mm	0.22mm	0.43µm

Micro Lenses (Super Long Working Distance)

Objective Lens	Total Magnification	Working Distance	Field of View (mm Ø)	Depth of Field (µm)
x20	200x	21mm	1.1mm	2.24µm
x50	500x	15mm	0.44mm	1.36µm

Measuring Stages

A range of measuring stages is available to cater for a wide variety of measuring requirements.

All stages are manufactured to the highest tolerances with factory-completed NLEC calibration. When choosing the correct stage size, take into account the component dimensions as well as desired accuracy.*

Image Capture and Archive

A range of multimedia solutions are available to make light work of acquisition, processing and archiving of your captured images. It's never been easier to share information. Images of non-conforming parts can be marked up and emailed to staff for discussion in no time at all.

Large Capacity Measuring Stage available in two sizes:
- 300 x 225mm
- 400 x 300mm

* See page 16 for full details.
** Micro objective lenses require episcopic illumination only.

Technical Specifications

Hawk Systems with QC-200

Measurement					
Measuring Range (X,Y)		150mm x 150mm	200mm x 150mm	300mm x 225mm	400mm x 300mm
Measuring Range (Z)♦		202mm - 255mm	202mm - 255mm	40mm - 89mm*	40mm - 89mm*
Measuring Uncertainty		$U_{95}2D = 4+(5.5L/1000)\mu m^\dagger$	$U_{95}2D = 2+(4.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(6.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(8.5L/1000)\mu m^\dagger$
Stage Repeatability	(X)	0.004mm	0.002mm	0.010mm	0.010mm
	(Y)	0.004mm	0.002mm	0.010mm	0.010mm
	(Z)	0.004mm‡	0.004mm‡	0.010mm	0.010mm
Maximum Load (glass plate)		15 kg	20 kg	25 kg	25 kg
Encoder Resolution	(X)	0.001mm	0.0005mm	0.001mm	0.001mm
	(Y)	0.001mm	0.0005mm	0.001mm	0.001mm
	(Z)	0.0005mm	0.0005mm	0.001mm	0.001mm
Optics					
Magnification Options (Macro)		x10, x20, x50, x100	x10, x20, x50, x100	x10, x20, x50, x100	x10, x20, x50, x100
Magnification Options (Micro)		x50, x100, x200, x500, x1000	x50, x100, x200, x500, x1000	x50, x100, x200, x500, x1000	x50, x100, x200, x500, x1000
Measuring Sensor		Optical	Optical	Optical	Optical
Illumination Type					
Surface Illumination		●	●	●	●
Episcopic Illumination		○	○	○	○
Sub-Stage Illumination		●	●	●	●
Illumination Control					
Manual		●	●	●	●
Programmable Control		-	-	-	-
Imaging					
Image Capture		○	○	○	○
Data Processor					
Data Processor		QC-200	QC-200	QC-200	QC-200
Geometry		2-D and Z	2-D and Z	2-D and Z	2-D and Z
Measurement Functions		Point Line Circle/Arc Distance Angle	Point Line Circle/Arc Distance Angle	Point Line Circle/Arc Distance Angle	Point Line Circle/Arc Distance Angle
Tolerance		●	●	●	●
Data Export & Connectivity		Serial Port USB Port	Serial Port USB Port	Serial Port USB Port	Serial Port USB Port
Drag and Drop		-	-	-	-
Import File		-	-	-	-
Database		-	-	-	-
Data Cloud		Simple	Simple	Simple	Simple
Custom Formula		-	-	-	-
Datum		Two	Two	Two	Two
Datum Plane		-	-	-	-
Settings Back-Up		●	●	●	●
Automation					
Motorised		◊	○	□	□
Fully Automated		-	-	-	-
Software Capability					
Data Input		Button	Button	Button	Button
Display		B&W LCD	B&W LCD	B&W LCD	B&W LCD
Graphic Display		1 Feature	1 Feature	1 Feature	1 Feature
Graphics		2-D	2-D	2-D	2-D
Point Filtration		-	-	-	-
Auto Program		-	-	-	-
Runs Database		-	-	-	-
NLEC Calibration		●	●	●	●

Key:

● Standard

○ Optional

□ Optional (X & Y axis only)

◊ Optional (Z axis only)

♦ Configuration dependent.

* Distance can be increased with the addition of a stand extension.

† Where L = measured length in mm (x200 system magnification, using controlled conditions).

‡ Based on using 10x macro lens (x100 system magnification).

Note: Although we aim to provide you with the most up to date information, Vision Engineering reserves the right to change Technical Data without notice and cannot be held responsible for the accuracy, completeness, and/or reliability of the contents of the information provided herein.