Hawk Systems with QC-5000 PC Software

System Summary

Designed for users who demand the highest performance from their measuring and quality control routine, Hawk systems with QC-5000 PC software allow accurate 3-D measurement of complex manufactured components, from simple manual measurement to multi-feature modelling with advanced data import, export and analysis features.

Hawk with QC-5000 utilises Vision Engineering's patented Dynascope™ optical image projection technology to provide intricate views with enhanced surface definition of even the most difficult-to-view components.

- High repeatable accuracy, fully geometric 3-axis (X, Y, Z) measurements
- Patented optical image clearly defines edges, offering superb resolution and contrast
- Powerful and intuitive PC-based software with advanced data handling capabilities
- High precision and large capacity measuring stage options
- Worldwide training, service & support

See It – Measure It …

Black component? White or transparent plastics? No problem. Hawk's patented optics provides high contrast views of complex components of all materials – something not always possible with other measuring devices. Images are viewed through an ergonomic, high resolution optical projection head enabling accurate and repeatable measurements. Critical parts can be measured in complete confidence.

Powerful PC-Based Software

Hawk's QC-5000 PC software provides a powerful, yet intuitive interface with measurement, document & analysis and reporting features to simplify complex measurement routines and processes. Whether performing intricate, pre-programmed measurement routines, or simple point-to-point measurements, QC-5000 integrates familiar interface conventions with powerful data processing & analysis tools, including Statistical Process Control (SPC) with CAD input/output.

High Precision Measuring Stages

Hawk systems are available with a range of high specification, high performance measuring stage options, all manufactured to the highest tolerances 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 national 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.*

Hawk with QC-5000
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).

QC-5000 metrology software is the premier system for the measurement and inspection of 2-D and 3-D geometric components, featuring an array of tools to simplify complex work steps and reduce repetitive measurements. With an intuitive interface, including drag-and-drop data fields, macros and database templates, QC-5000 provides a complete solution to both complex and simple measurement tasks.

Programming & Sequencing

Simplify difficult or repetitive measurement sequences with an easy-to-use and robust programming interface. 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.

Turn on the Record function to enable the software to 'learn' measuring sequences, tolerances and reporting functions for subsequent parts.

Advanced Calculations

Results fields can be customised for special measurement needs and complex calculations by embedding formulas (e.g. automatically calculate area or circumference dimensions with each circle measurement).

Tolerance Displays

QC-5000 translates data-intensive reports into informative graphics so operators can quickly see the results of tolerances applied to geometric features. Colour-coded results show green/red for pass/fail.

Part Image Archive

Record and store graphic measurement results of parts, along with dimensions and other information for up-to-date records for convenient, ongoing quality control and archival reference.

Data Management

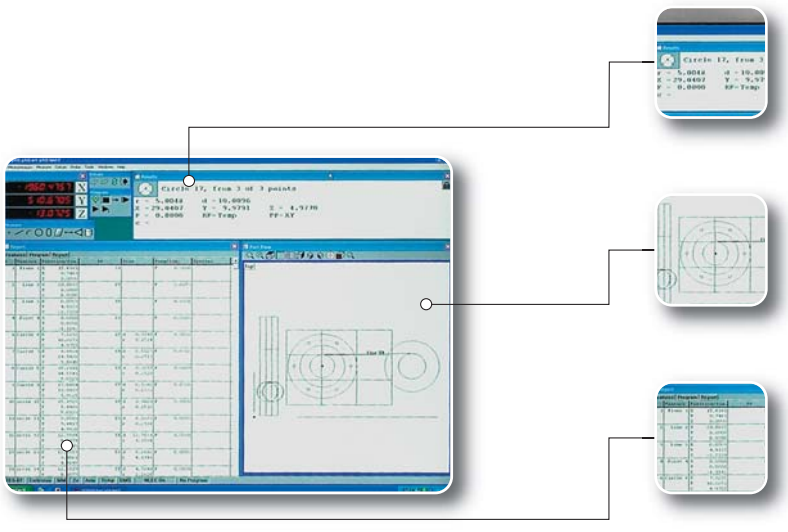
Integrated tools allow capture, archive and retrieval of data in a variety of formats and incorporate custom spreadsheets to simplify the management of complex or non-standard calculations, including full Statistical Process Control (SPC).

Customised reports can be sent to a variety of applications, printers or databases with CAD input/output for simplified part programming or reverse engineering applications.

Software Training & Support

Full on-site or off-site training is offered with every installation, which can be tailored to individual requirements. Additional application support is also available for the development of custom routines and processes.

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			



Results Window
Displays the measurements of a single feature and can be configured to include all or selected data.

Parts View Window
Allows the features being measured to be viewed as a complete 3-D model.

Multi Results Window
This tabbed display for multi-feature results enables simple report generation and can be as simple or as complex as required. It can also be used to display/edit programmes and generate database information for multi-part runs.

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

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-300 VED				Hawk Systems with QC-5000			
150mm x 150mm	200mm x 150mm	300mm x 225mm	400mm x 300mm	150mm x 150mm	200mm x 150mm	300mm x 225mm	400mm x 300mm
202mm - 255mm	202mm - 255mm	40mm - 89mm*	40mm - 89mm*	202mm - 255mm	202mm - 255mm	40mm - 89mm*	40mm - 89mm*
U_{95}2D = 4+(5.5L/1000)µm†	U_{95}2D = 2+(4.5L/1000)µm†	U_{95}2D = 15+(6.5L/1000)µm†	U_{95}2D = 15+(8.5L/1000)µm†	U_{95}2D = 4+(5.5L/1000)µm†	U_{95}2D = 2+(4.5L/1000)µm†	U_{95}2D = 15+(6.5L/1000)µm†	U_{95}2D = 15+(8.5L/1000)µm†
0.004mm 0.004mm 0.004mm‡	0.002mm 0.002mm 0.004mm‡	0.010mm 0.010mm 0.010mm	0.010mm 0.010mm 0.010mm	0.004mm 0.004mm 0.004mm‡	0.002mm 0.002mm 0.004mm‡	0.010mm 0.010mm 0.010mm	0.010mm 0.010mm 0.010mm
15 kg	20 kg	25 kg	25 kg	15 kg	20 kg	25 kg	25 kg
0.001mm 0.001mm 0.0005mm	0.0005mm 0.0005mm 0.0005mm	0.001mm 0.001mm 0.001mm	0.001mm 0.001mm 0.001mm	0.001mm 0.001mm 0.0005mm	0.0005mm 0.0005mm 0.0005mm	0.001mm 0.001mm 0.001mm	0.001mm 0.001mm 0.001mm
x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical/Video	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical/Video	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical/Video	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical/Video	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical	x10, x20, x50, x100 x50, x100, x200, x500, x1000 Optical
●	●	●	●	●	●	●	●
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QC-300 2-D and Z	QC-300 2-D and Z	QC-300 2-D and Z	QC-300 2-D and Z	QC-5000 3-D	QC-5000 3-D	QC-5000 3-D	QC-5000 3-D
Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot	Point Line Circle/Arc Distance Angle Slot
●	●	●	●	●	●	●	●
Serial Port USB Port	Serial Port USB Port	Serial Port USB Port	Serial Port USB Port	USB Port Ethernet	USB Port Ethernet	USB Port Ethernet	USB Port Ethernet
-	-	-	-	●	●	●	●
-	-	-	-	●	●	●	●
-	-	-	-	●	●	●	●
Simple Colour	Simple Colour	Simple Colour	Simple Colour	Colour Coded	Colour Coded	Colour Coded	Colour Coded
-	-	-	-	●	●	●	●
Single	Single	Single	Single	Multi	Multi	Multi	Multi
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
◊	○	□	□	◊	○	□	□
-	○	□	□	-	-	-	-
Touchscreen	Touchscreen	Touchscreen	Touchscreen	Windows Format	Windows Format	Windows Format	Windows Format
Colour	Colour	Colour	Colour	PC Monitor	PC Monitor	PC Monitor	PC Monitor
1 Feature	1 Feature	1 Feature	1 Feature	All Features	All Features	All Features	All Features
2-D	2-D	2-D	2-D	3-D (rotate)	3-D (rotate)	3-D (rotate)	3-D (rotate)
●	●	●	●	-	-	-	-
-	-	-	-	From DXF File	From DXF File	From DXF File	From DXF File
-	-	-	-	●	●	●	●
●	●	●	●	●	●	●	●