



# Hawk Systems with QC-300 Video Microprocessor

## System Summary

Hawk systems with QC-300 are the first measuring microscopes to offer the options of both optical and video measurement, providing users with unrivalled flexibility with the ability to perform both higher volume batch video measurement routines, or high accuracy optical measurements for difficult-to-view, one-off or critical parts.

Hawk with QC-300 utilises Vision Engineering's patented Dynascope™ technology together with an advanced touch-screen video microprocessor to provide optimised measurement, whatever the component, making it ideal for high accuracy quality control routines with a wide variety of component features.

- High repeatable accuracy, 3-axis (X, Y, Z) measurements
- Patented optical image clearly defines edges, offering superb resolution and contrast
- Integrated video camera enables both video and optical measurement, for complete flexibility
- High precision and large capacity measuring stage options
- Intuitive yet powerful touch-screen video microprocessor minimises training requirements



Fully automated (CNC VED) option available in all 3 axis

## Optimised Measurement Routines

From manual, single-feature operation to higher throughput video edge detection measurements, Hawk with QC-300 optimises measurement routines to deliver accuracy and simplicity for a wide range of measuring applications. Users even have the ability to switch between video and optical measurement within the same measuring routine.

## Touch-Screen Video Microprocessor

In addition to optical measurement techniques, the QC-300 video microprocessor includes an array of video measurement tools, including simple crosshair measurement; offset crosshair for difficult-to-find edges; manual or automatic single point detection and multi-point video edge detection. QC-300 features a high resolution colour video touch-screen with intuitive interface and is ideal for measuring common component features, such as circles, angles, lines, slots, arcs and distances.

## Precision Measuring Stage

Hawk with QC-300 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 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-300 Microprocessor and 150 x 150mm measuring stage illustrated

### Optical Measurement?

- Optical measurement for highest levels of accuracy, difficult-to-view/one-off features, or critical measurements
- Patented high resolution optical images ideal for low contrast, difficult-to-view components, complex features, or simultaneous visual inspection

### Video Measurement?

- Video Edge Detection (VED) for fast, enhanced throughput measurements
- Ideal for high contrast components, batch routines, measurement of form features, or features both inside and outside the field of view

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



The **QC-300** video microprocessor provides a powerful and flexible option for the Hawk non-contact measuring system, empowering operators along every step of the measurement process. Ideal for both optical and video 3-axis measurements, QC-300 combines advanced measurement tools with amazing simplicity to simplify complex work steps and reduce operator error.

### Intuitive User Interface

QC-300 features a powerful and intuitive interface which can easily be used by shift workers or advanced users alike. The high resolution touch-screen colour display is exceptionally easy to use and ensures operator accuracy with minimal training time.

### Video Measurement Tools

Switch from simple crosshair measurement to automatic video edge detection for form measurement both inside and outside the field of view. QC-300 provides the user with an array of powerful and flexible video measurement tools to speed up and simplify the measurement process.

### 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.

### Geometric Tolerancing

QC-300's unique graphical representation instantly displays colour coded pass/fail performance details for critical part dimensions. Results and important measurement data are displayed in an uncluttered and comprehensive display.

### Image Capture and Analysis

QC-300 captures images (in JPEG format) to either internal memory or external memory via the USB port. The image can then be edited or appended with text and measurement data.

### Measure Magic™

To measure, simply probe points and click. QC-300 detects, without the operator's intervention, the feature type being measured. With the patented Measure Magic feature, operators can inspect multiple features without taking their eyes off the part, increasing throughput, improving accuracy and reducing user fatigue.

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

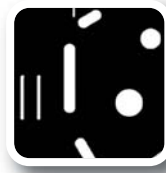




### Surface Illumination

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.



Precision Measuring Stage  
150 x 150mm

High Precision Measuring Stage  
200 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 202mm - 255mm	200mm x 150mm 202mm - 255mm	300mm x 225mm 40mm - 89mm*	400mm x 300mm 40mm - 89mm*	150mm x 150mm 202mm - 255mm	200mm x 150mm 202mm - 255mm	300mm x 225mm 40mm - 89mm*	400mm x 300mm 40mm - 89mm*
$U_{95}2D = 4+(5.5L/1000)\mu m^\dagger$	$U_{95}2D = 2+(4.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(6.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(8.5L/1000)\mu m^\dagger$	$U_{95}2D = 4+(5.5L/1000)\mu m^\dagger$	$U_{95}2D = 2+(4.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(6.5L/1000)\mu m^\dagger$	$U_{95}2D = 15+(8.5L/1000)\mu m^\dagger$
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	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000	x10, x20, x50, x100 x50, x100, x200, x500, x1000
Optical/Video	Optical/Video	Optical/Video	Optical/Video	Optical	Optical	Optical	Optical
● ○ ●	● ○ ●	● ○ ●	● ○ ●	● ○ ●	● ○ ●	● ○ ●	● ○ ●
● ○	● ○	● ○	● ○	● ○	● ○	● ○	● ○
● ○	● ○	● ○	● ○	○ ○	○ ○	○ ○	○ ○
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
-	-	-	-	●	●	●	●
●	●	●	●	●	●	●	●