



## Video Measuring Microscopes for precision 3-axis measurement

- 50 years of proven optical experience, packed into a powerful 3-axis non-contact video measuring system
- High accuracy, value-for-money system
- Powerful and intuitive with amazing simplicity
- Compact, robust system with small footprint



Range of system configurations and options, including fully automated CNC control



Vision Engineering's Falcon incorporates over 50 years of proven optical experience in a powerful 3-axis non-contact video measuring system. Falcon delivers cost-effective, accurate results, with amazing simplicity.

Vision Engineering has packed massive technical capabilities into a small and compact system, yet Falcon is suitable for both shop-floor quality control and manufacturing inspection applications.

From simple, single-feature operation to multi-point video edge detection, Falcon delivers accurate and repeatable results in 3-axis for a wide range of precision measuring applications.

- High repeatable accuracy 3-axis video measuring systems
- 'Best-in-class' performance, with advanced capabilities as standard
- Powerful, intuitive and affordable, delivering accurate results with confidence
- High resolution indexed zoom optics offer precision and flexibility
- Large field of view for easy sample orientation
- Progressive motorised Z-axis control
- Factory-completed NLEC\* and SLEC† calibration

## Powerful but simple

Choice of PC-based measurement software, or powerful and intuitive touch-screen video microprocessor, making Falcon suitable for both multi-user shop-floor use and advanced manufacturing inspection applications.



## High Spec but affordable

From the start, Falcon was designed to fit your budget without compromising quality. Expect to pay more for other comparable accuracy and specification systems.

## Fast but accurate

A high precision NLEC-calibrated\* measuring stage ensures accurate results in X & Y axes, with unique camera iris control and SLEC† calibration ensuring accuracy and repeatability of Z-axis results.

A fully automated CNC motorised control option is also available.

# Key features

Camera/Optics	
Camera	Colour CCD camera with 5:1 zoom ratio
Camera Iris	5-position indexed camera iris allowing increased Z-axis accuracy and enhanced component edge definition.
Standard Magnification	10x - 50x      20x - 100x
Field of View	13.5mm (max.)      6.75mm (max.)
Zoom Indexing	Repeatable 5-position indexed zoom

Measurement			
Measuring Stage	150mm x 100mm	150mm x 150mm	150mm x 150mm (motorised CNC)
NLEC* Stage Calibration	Standard	Standard	Standard
X/Y Quick Release	-	Standard	-
Maximum Stage Load	10kg	15kg	15kg
SLEC† Z-Axis Calibration	Standard	Standard	Standard
Z-Axis Capacity	125mm	115mm	115mm
Z-Axis Control	Progressive motorised Z-axis for fine and rapid movement		Fully automated CNC control with autofocus

Illumination	
Surface	Controllable quadrant LED illumination for detection of low-contrast edges with high precision. <ul style="list-style-type: none"> <li>▪ Long-life LED illumination</li> </ul>
Substage	Controllable LED illumination with 5-position indexed iris, for accurate profile measurement. <ul style="list-style-type: none"> <li>▪ Long-life LED illumination</li> </ul>

Data Processing	
Part Programming	Programme a measurement sequence to measure the same points per feature, in the identical sequence, part after part.
Geometric Tolerancing	Easy-to-view graphical representation instantly views pass / fail performance details for critical part dimensions.
Image Capture	Video image capture with graphical reporting capabilities.

Accessories	
Footswitch	'Plug & play' footswitch option for hands-free data entry.
Substage Colour Filter	Standard 40.5mm colour filters to enhance edge definition of profiled or turned parts.

\* Non Linear Error Correction  
 † Segmented Linear Error Correction

# 5 reasons to choose Falcon

## 'Best-in-class' performance

Compact with a small footprint, Falcon incorporates many advanced features designed to increase accuracy and simplify operation, delivering performance normally to be found with more expensive systems.

Falcon includes both surface and substage iris aperture control, motorised Z-axis movement, controllable quadrant LED illumination and both high and low magnification lens options as standard.

## Advanced zoom optics

Falcon employs high resolution zoom optics (up to 100x magnification) to provide enhanced component edge definition, with a unique indexed camera iris control allowing depth of field to be reduced, increasing accuracy and repeatability of Z-axis results. A large field of view (13.5mm max.) simplifies component location and orientation.

## Precision measuring stages

Falcon, complete with Vision Engineering's renowned precision measuring stages, includes factory-completed Non-Linear Error Correction (NLEC) calibration as standard to ensure optimum accuracy, traceable to international standards for the purposes of ISO9000.

Fully automated CNC motorised control option is also available.

## Controllable quadrant LED illumination

Controllable quadrant LED surface illumination optimises lighting conditions, enhancing edge definition, inclusions and fine scratches, with an indexed substage iris aperture allowing precise edge contrast of profiled and turned parts.

Fully controllable surface and substage illumination is programmed as part of a measurement routine, ensuring accurate and repeatable measurements.

## Construction and ergonomics



Falcon's robust, dynamically engineered design reduces stress points to optimise accuracy. Rugged in construction, the sealed unit has been designed to cope with the demands of a busy production environment.

All controls feature a soft-touch silicone finish, ergonomically positioned to reduce head, hand and body movement and resulting fatigue.



## Falcon systems at a glance

System Configuration	Core Components			Measurement	Data Analysis			Typical Usage	
	Manual / Automated	Processor	Measuring Range	Programming	Export to Excel	Advanced Reporting	Advanced Export	Shop Floor	Quality Department
1	Manual	QC-300	150mm x 100mm	Standard	✓			✓	✓
2	Manual	QC-300	150mm x 150mm	Standard	✓			✓	✓
3	Manual	QC-5000	150mm x 100mm	Advanced	✓	✓	✓	✓	✓
4	Manual	QC-5000	150mm x 150mm	Advanced	✓	✓	✓	✓	✓
5	Automated	QC-300	150mm x 150mm CNC	Standard	✓			✓	✓
6	Automated	QC-5000	150mm x 150mm CNC	Advanced	✓	✓	✓	✓	✓

Key:  
 Touch-screen video microprocessor  
 PC-based measurement software

## Touch-screen microprocessor

An advanced touch-screen colour video microprocessor provides an array of powerful video edge detection tools to speed up and simplify the measurement process.

### Intuitive user interface

The intuitive touch-screen interface can be used by shift workers or advanced users alike, ensuring operator accuracy whilst minimising 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.

### Tolerance displays

Displays colour-coded pass/fail performance details for critical part dimensions. Results and important measurement data are displayed in an uncluttered and comprehensive display.

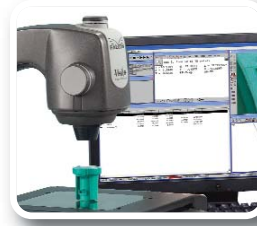
### Image capture

Captured images (JPEG format) can be edited or appended with text and measurement data.



## PC measurement software

Powerful PC-based metrology software is available, ideal for more advanced applications, with powerful data processing to simplify complex routines, plus extensive reporting and analysis tools, including part programming, Statistical Process Control (SPC), CAD input/output and image capture/archive.



### Simplify difficult or repetitive sequences

An array of video measurement tools simplifies difficult or repetitive sequences with an easy to use and robust programming interface.

### Tolerance displays

Transform data-intensive reports into informative colour-coded pass/fail results.

### Part image archive

Record and store graphic measurement results of parts, along with dimensions and other information for on-going quality and archival reference.

### Data management

Reports can be sent to a variety of applications, with a CAD input/output utility for simplified part programming or reverse engineering applications.

### Software training & support

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

Data processing & reporting

## Measuring stages



### 150mm x 100mm (X,Y)

Precision measuring stage, with factory-completed Non-Linear Error Correction (NLEC) calibration as standard.

### 150mm x 150mm (X,Y)

Precision measuring stage, with factory-completed Non-Linear Error Correction (NLEC) calibration as standard.



Fully automated CNC control option available

Find out more at: [www.visioneng.com/falconcnc](http://www.visioneng.com/falconcnc)

### Measurement Uncertainty

Repeatable accuracy in X and Y axes, 4µm or better

- Uncertainty formula  $U_{95}2D = 3+(6L/1000)\mu\text{m}$ , where L = length in mm, using controlled conditions
- Z-axis accuracy 10µm, using highest available magnification under controlled conditions

### Video Camera

Colour CCD camera with 5:1 ratio, 5-position indexed zoom and iris aperture control

### Optical Data

Zoom Magnification Range	10 - 50x	20 - 100x
Maximum field of view	13.5mm	6.75mm
Minimum field of view	2.7mm	1.35mm
Working distance	91mm	61mm

### Illumination

- Quadrant controllable surface illumination provided by 20 (4 banks of 5) x high intensity long-life LEDs
- Controllable substage illumination provided by 1 x high intensity long-life LED

### Measuring Range (X, Y, Z)

- 150mm x 100mm x 125mm (10kg maximum load)
- 150mm x 150mm x 115mm (15kg maximum load)

### Encoder Resolution

X = 1µm Y = 1µm Z = 1µm

### Power

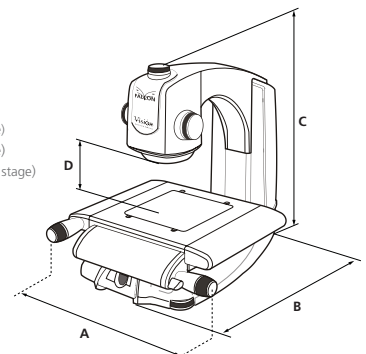
Power supply: 100 - 240V AC 50/60Hz

### System Weight

- Falcon with 150mm x 100mm stage 19.0kg
- Falcon with 150mm x 150mm stage 24.5kg
- Falcon with 150mm x 150mm CNC stage 25.0kg

### Dimensions

- A = 410mm (150mm x 100mm stage)  
415mm (150mm x 150mm stage)
- B = 530mm (150mm x 100mm stage)  
535mm (150mm x 150mm stage)
- C = 530mm max.
- D = 125mm max. capacity (150mm x 100mm stage)  
115mm max. capacity (150mm x 150mm stage)  
115mm max. capacity (150mm x 150mm CNC stage)



Precision manufactured in the EU

# Quality, Calibration & Support

## Worldwide Training, Service & Support

Vision Engineering has a network of international offices throughout Europe, Asia and North America, supported by more than 120 fully trained distributor partners. Full user training, application development, service, calibration and support is available for every Falcon system, ensuring the highest levels of accuracy and productivity are maintained at all times. A dedicated applications development facility is also available to help problem-solve technical or application queries.

Systems can be serviced at your premises to minimise any loss of production or returned to a Vision Engineering main service centre if more complex works are required.

## Measuring Stage Calibration, with NLEC

Measuring stages of all types will naturally display minute mechanical differences due to normal variations in component and manufacturing tolerances. Non-Linear Error Correction (NLEC) is the most accurate correction method available and uses a software algorithm to calculate and correct any errors across the measuring stage. All Falcon measuring stages are factory calibrated with NLEC prior to installation.

The NLEC algorithm can be periodically re-calibrated to ensure conformity with any required quality standards, plus ensure the highest possible levels of accuracy are maintained. Vision Engineering has a network of trained engineers to assist with your service and calibration needs.

## Traceability to International Standards

Vision Engineering's measuring stage calibrations are internationally traceable to National Measurement Standards (NMS) through the Mutual Recognition Agreement (MRA), ensuring full compliance with quality standards, including ISO9000.



FM 557119

Vision Engineering Ltd has been certificated for the quality management system ISO 9001:2008.





Vision Engineering manufacture a comprehensive range of ergonomic stereo microscopes as well as a complete line of optical and video non-contact measuring systems.

### For more information...

Vision Engineering has a network of offices and technical distributors around the world. For more information, please contact your Vision Engineering branch, local authorised distributor, or visit our website.

Vision Engineering Ltd.  
**(Manufacturing)**  
Send Road, Send,  
Woking, Surrey, GU23 7ER, England  
Tel: +44 (0) 1483 248300  
Email: [generalinfo@visioneng.com](mailto:generalinfo@visioneng.com)

Vision Engineering Ltd.  
**(Commercial)**  
Monument House, Monument Way West,  
Woking, Surrey, GU21 5EN, England  
Tel: +44 (0) 1483 248300  
Email: [generalinfo@visioneng.com](mailto:generalinfo@visioneng.com)

Vision Engineering Inc.  
**(Manufacturing & Commercial)**  
570 Danbury Road, New Milford,  
CT 06776 USA  
Tel: +1 (860) 355 3776  
Email: [info@visioneng.com](mailto:info@visioneng.com)

Vision Engineering Inc.  
**(West Coast Commercial)**  
745 West Taft Avenue, Orange,  
CA 92865 USA  
Tel: +1 (714) 974 6966  
Email: [info@visioneng.com](mailto:info@visioneng.com)

Vision Engineering Ltd.  
**(Central Europe)**  
Anton-Pendele-Str. 3,  
82275 Emmering, Deutschland  
Tel: +49 (0) 8141 40167-0  
Email: [info@visioneng.de](mailto:info@visioneng.de)

Vision Engineering Ltd.  
**(France)**  
ZAC de la Tremblaie, Av. de la Tremblaie  
91220 Le Plessis Paté, France  
Tel: +33 (0) 160 76 60 00  
Email: [info@visioneng.fr](mailto:info@visioneng.fr)

Vision Engineering Ltd.  
**(Italia)**  
Via Cesare Cantù, 9  
20092 Cinisello Balsamo MI, Italia  
Tel: +39 02 6129 3518  
Email: [info@visioneng.it](mailto:info@visioneng.it)

Nippon Vision Engineering  
**(Japan)**  
272-2 Saedo-cho, Tsuduki-ku,  
Yokohama-shi, 224-0054, Japan  
Tel: +81 (0) 45 935 1117  
Email: [info@visioneng.jp](mailto:info@visioneng.jp)

Vision Engineering Ltd  
**(China)**  
11J, International Ocean Building,  
720 Pudong Avenue, Shanghai,  
200120, P.R. China  
Tel: +86 (0) 21 5036 7556  
Email: [info@visioneng.com.cn](mailto:info@visioneng.com.cn)

Vision Engineering  
**(S.E. Asia)**  
Tel: +603 80700908  
Email: [info@visioneng.asia](mailto:info@visioneng.asia)

Vision Engineering  
**(India)**  
Email: [info@visioneng.co.in](mailto:info@visioneng.co.in)

Distributor



Visit our multi-lingual website:

[www.visioneng.com](http://www.visioneng.com)