



Video Measuring Machine for precision 3-axis measurement

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



Range of system configurations and options, including CNC control



FM 557119

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

3-axis video measuring machine

CNC control
system available



Vision Engineering's Falcon incorporates over 50 years of proven optical experience in a powerful 3-axis non-contact video measuring machine. Falcon provides fast and accurate measurement of both routine and complex precision parts, suitable for shop-floor and manufacturing inspection applications.

Vision Engineering has packed massive technical capabilities into a small and **compact system**, yet Falcon is still one of the most **intuitive**, easy to use video measuring machines available.

From simple, single-feature operation to multi-point **video edge detection**, Falcon delivers accurate and repeatable results in 3-axis of small, intricate parts, **quickly** and **simply**.

- High repeatable accuracy 3-axis measuring machines, with advanced capabilities as standard
- Powerful and intuitive, delivering accurate results with confidence
- High resolution indexed zoom optics offer precision and flexibility
- Large field of view for easy sample orientation
- Factory-completed NLEC* and SLEC** calibration

*Non-linear Error Correction

**Segmented Linear Error Correction

Featuring

touch2measure 
technology

Falcon features 'next generation' multi-touch measurement software, featuring 'touch-to-measure' technology, making Falcon exceptionally **intuitive, easy to operate** and **easy to learn**.

'Touch-to-measure' means that in addition to conventional mouse control, you can 'pinch' to zoom, 'swipe' to pan across an image and 'touch' to take a measurement. You can even trace your finger around a shape to 'see' the feature.

Icon-based touch-screen control provides users with smartphone familiarity, displaying graphic-rich measurement data to visually guide you through the measurement process, with a Windows 7 operating system for simple integration with applications such as Microsoft Excel (not included), or connection with network printers etc.

With **simplicity** at its core, 'touch-to-measure' software can be used by shift workers or advanced users alike, simplifying work steps, **reducing operator errors**, while minimising training requirements.



System options

Precision measuring stages

Choice between three stages

Falcon, complete with Vision Engineering's proven 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.

NLEC calibration is an accurate method of calibration available, ensuring accuracy and repeatability of results.

See www.visioneng.com/nlec for more information.

Manual measuring stages



150mm x 100mm x 114mm (X,Y,Z)



150mm x 150mm x 115mm (X,Y,Z)

CNC fully automated measuring stage



150mm x 150mm x 115mm (X,Y,Z)

Touch probe option

For CNC automated systems only



A touch probe option provides non-contact and contact measurement in a single system, allowing fast and repeatable measurements in the Z-axis.

- Renishaw TP20 touch probe with ruby stylus
- Fast and accurate height measurement
- 2.5D geometry, with 3µm Z-axis repeatability

Powerful, yet simple software

Choice of PC-based measurement software, suitable for both multi-user shop-floor use or advanced manufacturing inspection applications.

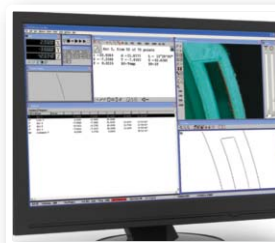
Next generation 'touch-to-measure' software



'Next generation' measurement software coupled with a high resolution video camera enables Falcon to measure a wide variety of simple and complex features, quickly and simply. Essential measurement data, with graphics-based "part view" construction is displayed alongside the high resolution video image.

Flexible reporting capability supports a range of application requirements, from simple to advanced. Custom report headers, footers, and print out graphics can all be included as part of easily generated programme playback routines, or simply printed, or exported as data files.

Advanced software option, for power users



An advanced software option provides ultimate capability for power users, who require advanced software features such as custom formulas, conditional programming, Statistical Process Control (SPC) or RUNS databases (for long-term tracking of component performance).

With an intuitive interface, including drag-and-drop data fields, macros and database templates, the software features an array of tools to simplify complex work steps and reduce repetitive measurements, with advanced reporting features as standard.



A partial view of the Falcon non-contact measurement machine, showing its black, industrial-grade body and a horizontal probe arm.

Small footprint, big impact

Companies across the globe choose Falcon to help improve production quality, reduce costs, and improve productivity. High resolution optics, a precision measuring stage and industry-leading software make Falcon the ideal solution for measuring small, intricate parts, quickly and accurately. With space at a premium, Falcon doesn't take up much room, yet can make a big difference to your quality.

Fast, accurate, simple

Simplicity is the key. Speed and accuracy is of no use if a system is difficult to use.

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

Wide range of applications

Customers around the world use Falcon for a wide range of non-contact measurement applications, including: plastic parts (e.g. connectors, tubing, moulding), medical device implants (e.g. stents, hearing aids), machined parts for aerospace, automotive and military use, general precision engineering, watchmaking, plus many more applications.

Advanced features as standard

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



Quality & design

Vision Engineering non-contact measurement systems represent the very best in industry-proven solutions and leading-edge technologies. Falcon incorporates over 50 years of proven optical experience in a powerful 3-axis non-contact video measuring machine. Precision manufactured in the EU, it 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 hand and body movement and resulting fatigue.

Technical details

Measurement uncertainty

(X,Y), 150mm x 100mm measuring stage

- Uncertainty formula $U_{95}2D = 7 + (6.5L/1000)\mu\text{m}$, where L = length in mm, using controlled conditions

(X,Y), 150mm x 150mm measuring stage

- Uncertainty formula $U_{95}2D = 4 + (5.5L/1000)\mu\text{m}$, where L = length in mm, using controlled conditions

(Z)

- Z-axis accuracy 10 μm , using highest available magnification under controlled conditions

Video camera

1.3MP colour CMOS camera with 5-position indexed zoom (5:1 ratio) 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 |

Camera/optics

| | |
|---------------|---|
| Camera Iris | 5-position indexed camera iris allowing increased Z-axis accuracy and enhanced component edge definition. |
| Zoom Indexing | Repeatable 5-position indexed zoom |

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 stages

| | 150mm x 100mm | 150mm x 150mm | 150mm x 150mm (motorised CNC) |
|---------------------------|--|---------------|--|
| NLEC* Stage Calibration | ✓ | ✓ | ✓ |
| SLEC** Z-Axis Calibration | ✓ | ✓ | ✓ |
| Z-Axis Control | Progressive motorised Z-axis for fine and rapid movement | | Fully automated CNC control with autofocus |

* Non Linear Error Correction

** Segmented Linear Error Correction

Encoder resolution

X = 1 μm Y = 1 μm Z = 1 μm

Power

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

System weight

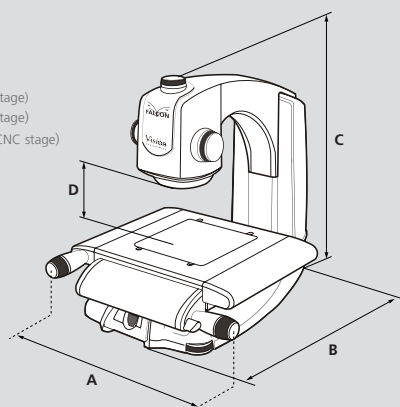
- Falcon with 150mm x 100mm stage 19.0kg
- Falcon with 150mm x 150mm stage 24.5kg
- Falcon with 150mm x 150mm CNC stage 25.0kg

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. |

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 = 114mm max. capacity (150mm x 100mm stage)
- 115mm max. capacity (150mm x 150mm stage)
- 115mm max. capacity (150mm x 150mm CNC stage)



Quality, calibration & support

Worldwide training, service & support

Vision Engineering has a network of international offices throughout Europe, Asia, South and North America, supported by fully trained distributor partners. Full user training, application development, service, calibration and support is available, ensuring the highest levels of accuracy and productivity are maintained.

A dedicated applications development facility is also available to help problem-solve technical or application queries. Systems can be serviced at your premises or returned to a Vision Engineering main service centre.

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 an accurate correction method available and uses software algorithm to calculate and correct any errors across the measuring stage. All measuring stages are factory-set 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.

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.



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