User Guide
2 or 3-Axis Manual Non-Contact Measuring System with Large Format Stage
Vision Engineering and its products conform to the requirements of the EC Directives on Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS).
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General care
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ACCESSORIES & OPTIONS

OTHER SOLUTIONS FROM VISION ENGINEERING

Stereo inspection systems
Non-contact measuring systems

SERVICE & CALIBRATION RECORD

WARRANTY
See packing list to clarify contents of delivery.

**Head pack**

**Stand pack**

**Stage pack**

1. 300mm x 400mm

2. 300mm x 225mm (not shown)
PACKING CONTENTS

Accessories packs

1. Photographic adaptor
2. Illuminator
3. Power supply

Illumination and objectives pack

1. Macro EPI
2. Ringlight, Converging Lens and Control box
3. Micro EPI/Turret Assembly
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<tr>
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<td>x2</td>
<td>x10</td>
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<td>x5</td>
<td>x20</td>
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<td>x50</td>
<td></td>
</tr>
<tr>
<td>x100</td>
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</table>

www.visioneng.com/support
QC-200/300 microprocessor pack

**QC-200 items included:**
- Power lead
- Instruction manual
- QC Quickie Test Slide

**QC-300 items included:**
- Power lead
- Instruction manual
- QC Quickie Test Slide

QC-5000 microprocessor pack

**QC-5000 items included**

<table>
<thead>
<tr>
<th>Item</th>
<th>Included Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>Optional Manual VED</td>
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<tr>
<td>Instruction Manual</td>
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<tr>
<td>Encoder Cable</td>
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<td>RS232 Comms Cable</td>
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<td>2 x Power Leads</td>
<td>2 x Power Leads</td>
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<td>QC-5000 Software</td>
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<tr>
<td>Graphics Card</td>
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<tr>
<td>Drivers Disc</td>
<td></td>
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<tr>
<td>Additional Monitor</td>
<td></td>
</tr>
<tr>
<td>S-Video Cable</td>
<td></td>
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ASSEMBLY

The following paragraphs provide instructions on how to assemble the Hawk Measuring System. In most instances the illustrations are self explanatory; where necessary the illustrations are supported by text.

Stage assembly

To attach the Stage proceed as follows:

- Lift the Stage 1 into position (see arrow 1) and secure it with the bolts provided.
- Slide the arm 2 into position and lock it securely with the Locking Handle 3.
- Place the condenser lens 4 in the hole and screw in front spring loaded plunger. Centre the condenser lens using two remaining grub screws.

Note: Micro condensers should only be used with micro lenses when viewing a subject at stage glass level.
Ringlight attachment

Macro EPI attachment

Note: The same procedure is used to fit either the Macro EPI (illustrated) or the Micro EPI. The Micro EPI cannot have an Objective Holder or Ringlight fitted.
Macro EPI and ringlight attachment

Micro EPI and lens turret attachment
Attaching the head only

Mounting camera to side for image capture
Mounting camera to rear

- Position photographic attachment between the viewing head and its arm.
- Secure with the grub screws.
- Attach the adapter to the camera and tighten 3 x grub screws if not already fitted.
- Locate camera and adapter to locking plate (the locking plate must not be overtight, but enough to hold).
- See Camera setup on page 19 for further details.

Attaching the anti-glare shield

CAUTION: The Anti-Glare Shield is made of plastic and must not be over tightened.
Inserting the illuminator lamp

- Press down the lamp/fan assembly release button ①.
- Lift out the lamp/fan assembly ②.
- Insert the lamp as shown ③.
- Check that it is fully pushed into the lamp holder.
Inserting the stage glass

*Note:* The stage glass must be handled with care to avoid any fingerprint marks.

- Align the glass with its bevelled edges against the springs.
- Check that the stage glass is in contact with all four supports.
- To level the stage glass, refer to page 19.

<table>
<thead>
<tr>
<th>Stage size</th>
<th>Spring location</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 x 225mm</td>
<td>Right &amp; Back</td>
</tr>
<tr>
<td>400 x 300mm</td>
<td>Right &amp; Back</td>
</tr>
</tbody>
</table>
Connecting the fibre optic cable to the illuminator

- Unscrew the locking collar.
- Remove the locking collar and ferrule.
- Insert the fibre-optic cable through the locking collar and ferrule. Align the grub screw with the indent on the cable and tighten the screw with the hexagonal/Allen key provided.

**Note:** *The hexagonal/Allen key is taped to the base of the illuminator.*

- Insert the cable and ferrule into the illuminator.
- Tighten the locking collar.
QC-200/QC-300 microprocessor assembly

Cable connection points are shown on page 13.

NOTE:
Do Not Over-tighten

Microprocessor

Shoulder Bolt

Stand

Microprocessor

Standard Bolt

Locking Washer

Spacer

Microprocessor

Stand

Microprocessor

Stand

Hawk 2 or 3-Axis Manual Non-Contact Measuring System

www.visioneng.com/support
Cable connection points for the manual QC-200/QC-300 system

Refer to pages 14 and 15 for detailed connections.

**Note:** Ensure that the voltage selector is turned to the correct setting.
Interconnection diagram for manual Hawk system with QC-200

ASSEMBLY
Interconnection diagram for manual Hawk system with QC-300
Interconnection diagram for Hawk system with manual QC-5000
Interconnection diagram for Hawk system with QC-5000 VED
**Manual system controls**

Turn on the illuminator power supplies and check that the LED at the centre of the head is illuminated.

The manual system controls are identified below.

---

**Align head to stage**

- Ensure that an objective lens is fitted.
- Ensure the head is switched on and then loosen it using an hexagonal/Allen key.
- Align the front edge of the gauge block with the front edge of the stage glass.
- Rotate the head until the horizontal cross line is parallel with the rear edge of the gauge block.
- Lock the head in position with the hexagonal/allen key.
Stand levelling

- Adjust the levelling foot until the stand is stable.

Stage glass levelling

- Adjust the X and Y axis controls to bring the rear left-hand corner of the stage glass (fixed corner) into view.
- Adjust the coarse/fine focus control to bring the glass surface into sharp focus.
- Adjust the X and Y axis controls to bring the front left-hand corner into view.
- Use the relevant adjustable glass support to bring the surface of the glass into sharp focus.
- Repeat the above procedure for the remaining two corners.

Camera Setup

- Loosen hexagonal headed screws 1 on locking plate 2 and continue to turn camera 3 until it is in the correct position.
- Connect the camera from its video connector 4 to the Quadra-Chek system using S-Video cable.
- Attach power lead to camera’s power socket 5 and switch on.
- Bring the target/slip into focus within the head, as centrally aligned to crosshair as possible.
- Match the view on the monitor with that in the head - move the camera by using the thumbscrews 6.
- Tighten the hexagonal headed screws on the locking plate to hold camera in position.
To achieve the optimum results from the Hawk Measuring System, the illumination and optics need to be adjusted to provide the best possible image to the operator. Certain lighting options are better for some applications than others.

Illumination and focus should be adjusted until the image is clear and bright, with good contrast. Maximum contrast gives the best image resolution and allows for the highest level of accuracy and repeatability.

Contact the nearest Vision Engineering branch/distributor for further advice.

**Objective lens**

**Iris control**

Each Macro objective lens has an adjustable iris which restricts the aperture of the lens. By rotating the control ring on the bottom of the objective lens, the iris opens and closes. Adjusting the objective lens aperture slightly increases or decreases the depth of field. This feature is useful for subjects where greater surface definition is required. The same results can be achieved with a Micro objective lens by adjusting the iris wheel in the Episcopic illuminator.

Closing the Substage Iris improves ability to locate an edge on a cylindrical component/raised profile.

**Magnification tables**

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<th>Macro Lenses</th>
<th>Part No.</th>
<th>Objective Lens</th>
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<th>Working Distance</th>
<th>Field of View (diameter)</th>
<th>Depth of Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-007 x1</td>
<td>10x</td>
<td>84mm</td>
<td>14.2mm</td>
<td>270µm</td>
<td></td>
<td></td>
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<tr>
<td>H-008 x2</td>
<td>20x</td>
<td>81mm</td>
<td>7.1mm</td>
<td>67µm</td>
<td></td>
<td></td>
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<tr>
<td>H-009 x5</td>
<td>50x</td>
<td>61mm</td>
<td>2.8mm</td>
<td>10µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-0010 x10</td>
<td>100x</td>
<td>32mm</td>
<td>1.4mm</td>
<td>6µm</td>
<td></td>
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<table>
<thead>
<tr>
<th>Standard Working Distance Micro Lenses</th>
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<th>Objective Lens</th>
<th>Total Magnification</th>
<th>Working Distance</th>
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<th>Depth of Field</th>
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<tr>
<td>H-110 x5</td>
<td>50x</td>
<td>20.0mm</td>
<td>4.4mm</td>
<td>12.22µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-100 x10</td>
<td>100x</td>
<td>10.1mm</td>
<td>2.2mm</td>
<td>3.06µm</td>
<td></td>
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<tr>
<td>H-101 x20</td>
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<td>1.1mm</td>
<td>1.3µm</td>
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<tr>
<td>H-103 x50</td>
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<td>0.66mm</td>
<td>0.44mm</td>
<td>0.3µm</td>
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<td>H-104 x10</td>
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</tr>
<tr>
<td>H-105 x20</td>
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<td>1.1mm</td>
<td>1.72µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-106 x50</td>
<td>500x</td>
<td>10.6mm</td>
<td>0.44mm</td>
<td>1.10µm</td>
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<tr>
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<td>3.4mm</td>
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<td>0.43µm</td>
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<th>Working Distance</th>
<th>Field of View (diameter)</th>
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Episcopic illuminator

The Episcopic illuminator provides through the lens illumination for measuring deep surface features, holes and blind bores. The light follows the optical path through the objective lens. The following adjustment can be made:

- Adjust the surface lighting to suit the component by using the thumbwheel and the beam split mirror.
- Adjust light intensity by rotating the dial control on the light power supply unit.
- Adjust the depth of field of the objective lens by rotating the iris control thumbwheel (a smaller iris increases the depth of field).
- To change the image contrast fully engage the beam split mirror control lever.

![Macro EPI and Control Lever]

LED Ringlight

The Ringlight illuminator is used as follows:

- To illuminate optically difficult surfaces/surface features.
- For use with Macro objective lenses.
- The Ringlight gives a shadow free image.
- Can be used with Episcopic and Substage illumination.

To adjust the light intensity rotate the dial control on the control box (see page 22).
Control box

Icons

The icons on the front panel of the control box symbolise the following:

- On/Off switch
- Power on indicator
- Illuminator intensity control
- Ringlight connection point
- Refer to manual

HEAD  Power for viewing unit (boom mount only)

Controls

The LED ringlight, which can be used with substage illumination, provides above stage illumination and is used for illuminating surface features, blind holes, etc.

- Switch the unit on 1 and adjust intensity by rotating the dimmer control 2.
- The LED illuminator is provided with a temperature protection system 3 to ensure long term LED performance is not compromised by overheating.
- If the temperature protection indicator illuminates, the power to the LED’s will gradually reduce until the temperature stabilises. If the indicator remains illuminated, remove the illuminator and ensure neither the air inlet around the objective, nor the fan outlet are obstructed.

LED illuminator specification

The LED illuminator unit has an integral power supply with the following specification:

- **Input voltage:** 110 to 240v ~ 50/60Hz 0.9A max
- **Fuse rating:** 110v 1.0A anti-surge
  230v 0.5A anti-surge

The fuse is located in the IEC mains connector on the rear of the control box (see page 13).
Substage

The Substage illumination is used for the accurate measurement of through holes, profiles and edge features etc.

The illumination can be used with spotlight, ringlight and EPI illumination systems.

Adjust light intensity by rotating the dial control on the illumination power supply unit.

Taking a measurement (QC-200)

Select the correct lens for the component being measured, based on the size of the component and field of view requirements (refer to magnification tables on page 20).

Focus on the component or feature being measured, firstly use the Z axis coarse control and then the fine control until the component or feature is in focus.

A measurement is made by moving the stage and subject under the cross-line graticule, visible through the dynascopic viewing head.

Features and dimensions are measured by aligning the cross-line with the desired feature and entering the preset number of points evenly distributed around the feature.*

A point is measured by aligning the cross-line on a single point.

Lines can be measured by aligning the cross-line at a minimum of two points.

Circles can be measured by aligning the cross-line at a minimum of 3 points on its circumference.

The software will calculate the result based on the points entered and display in the results window. Distances are calculated by selecting relevant features and selecting the distance function.

The accuracy of the stage movement is achieved by the application of NLEC (Non Linear Error Correction) which compensates for any mechanical stage errors across the calibrated stage area. The unique NLEC file, relating to the relevant stage is stored in the Quadra-Chek.

*Further Details on taking measurements can be found in the relevant Quadra-Chek user guide.
Taking a measurement (QC-300/QC-5000 VED)

Select the correct lens for the component being measured, based on the size of the component and field of view requirements (refer to magnification tables on page 20).

Focus on the component or feature being measured. Use the Z axis control until the component or feature is in focus.

A measurement is made by moving the stage so that subject or the start of the subject is within the field of view, dependent on the feature being measured.*

A point is measured by aligning the simple tool on a single point. Lines can be measured by aligning the simple tool on two points (minimum) on the line. Circles can be measured by aligning the simple tool on three points (minimum) around the circle. A point can also be measured by selecting the single or multipoint tool on the QC-300 and probing single or multiple points on selected features.

Features and dimensions are measured by selecting the appropriate QC-5000 video tool, from the toolbar, aligning the tool over the feature being measured. After performing a simple tool teach the tool is fired and the predetermined number of points will scan across the tool area and find the edge of the feature.

The software will calculate the result based on the points entered and display in the results window. Distances are calculated by selecting relevant features and selecting the distance function.

*Further Details on taking measurements can be found in the relevant Quadra-Chek user guide.

Good working practices

When selecting points on features the point should always be approached in the same fashion, e.g. always work towards a point in the X axis first, moving from left to right and then move towards a point in the Y axis, moving from top to bottom.

This procedure will increase repeatability. If looking to measure the form of a feature, it is best to take at least eight points to achieve the most repeatable result.

Note: Contact your local Vision Engineering representative for full details of available training programs.
Routine maintenance is important for the longstanding of the Hawk Measuring System. For more complex maintenance contact the local Vision Engineering representative.

### Graticule adjustment

- Undo the securing clip at the base of the front cover and lift the cover off.

- To focus and centralize each graticule, loosen the appropriate retaining knob and move the graticule up or down to focus. Re-tighten the retaining knob.

- To adjust the graticules, place a known 90° gauge (slip gauge or crossline) on the stage and focus the image. Close one eye and locate the crossline on the corner of the gauge by unlocking and adjusting the grubscrews. Once the image is located, lock the grubscrews with the locking nuts.

- Repeat the procedure using the other eye. Make the adjustment so that the graticules overlay each other.

*Note:* *If the image is uncomfortable to the eyes, repeat the above procedure.*

---

**WARNING**

DISCONNECT THE MAINS POWER SUPPLY BEFORE PERFORMING ANY MAINTENANCE ROUTINE
Changing the illuminator lamp

**WARNING**

REMOVE POWER FROM THE SYSTEM BEFORE OPENING THE CASE.

**CAUTION: Allow the illuminator to cool down before carrying out this task.**

- Press down the lamp/fan assembly release button 1.
- Lift out the lamp/fan assembly 2.
- Remove the lamp as shown 3.
- Insert the replacement lamp and check that it is fully pushed into the lamp holder.

**Note:** *DO NOT touch the base, pins or filament assembly of the new bulb during installation. Oil from hands can cause premature bulb failure. The bulb should only be held by its reflector.*

- Periodically inspect the cooling fan and its vents for debris build-up. The front and rear vents must be clean to allow adequate airflow. Inadequate airflow will result in increased operating temperatures and reduced bulb life. The fan should be running whenever power is supplied to the illuminator.
Changing the substage illuminator bulb

- Remove the release nuts 1, pull out the bulb holder and replace the bulb 2.

Substage illumination set-up

After the substage illuminator bulb has been changed the following set-up procedure must be carried out:

- Place a piece of paper on the stage and switch on the substage illuminator.

- Adjust the diffuser control 1 until the bulb filaments are in focus and use the substage axial 2 and vertical 3 alignment controls to obtain a filament image as shown in inset.

- Adjust the diffuser control until the image is diffuse and uniform.
General care

- Cover the Hawk with a dust cover when not in use.
- Remove dust with a soft brush or cleaning cloth.
- The viewing screen and lenses should be cleaned with a lens cleaning cloth.
- Keep accessories in a dust-free environment when not in use.

Consumable and replacement parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Quantity in Pack</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substage/Episopic Bulb (Illuminator Bulb)</td>
<td>100w/12v Halogen Lamp</td>
<td>1</td>
<td>LAM-1770</td>
</tr>
<tr>
<td>Spotlight Bulb</td>
<td>20w/12v Lamp</td>
<td>1</td>
<td>LAM-1300</td>
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<tr>
<td>Stage Glass</td>
<td>150x150mm</td>
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<td>201-80686</td>
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<td>Stage Glass</td>
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<td>Stage Glass</td>
<td>400x300mm</td>
<td>1</td>
<td>159-80452</td>
</tr>
<tr>
<td>Anti-Glare shield</td>
<td>Hinged Anti-Glare shield</td>
<td>1</td>
<td>188-A1001/A</td>
</tr>
<tr>
<td>100W PSU Fuse</td>
<td>1.6 amp Anti-Surge</td>
<td>1</td>
<td>FUS-0243</td>
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<td>100W PSU Fuse</td>
<td>800 ma Anti-Surge</td>
<td>1</td>
<td>FUS-0255</td>
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<td>150W PSU Fuse</td>
<td>2.5 amp Anti-Surge</td>
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<td>FUS-0395</td>
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<td>1.5 amp Anti-Surge</td>
<td>1</td>
<td>FUS-2367</td>
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</tbody>
</table>

Environmental conditions

Hawk is an accurate, industrial gauging instrument. To achieve the optimum accuracy and repeatability, the following considerations should be taken into account:

- Position the Hawk on a firm, rigid table.
- Do not position the instrument near any source of vibration.
- Ensure that the illuminator power supplies have sufficient ventilation.
- Do not position the instrument close to a radiator or similar heating system.
- Do not position the instrument in direct sunlight, or where bright reflections will prevent a comfortable viewing position.
 Hawk 2 or 3-Axis Manual Non-Contact Measuring System

**ACCESSORIES & OPTIONS**

- **LED Ringlight** H-078
- **LED Control Box**
- **60W Transformer**
  - 110V
  - 240V
  - H-034
- **100W/12V Transformer (EPI)**
  - 100V
  - 220V
  - 240V
  - H-043
- **Fibre Optic** H-017
- **ER & 100W Illuminator & PSU**
- **225mm x 300mm Manual** - H-083
- **300mm x 400mm Manual** - H-085
- **Micro Lenses**
  - 100x H-100
  - 200x H-101
  - 400x H-102
  - 500x H-103
- **100W/12V Transformer (EPI)**
  - 100V
  - 115V
  - 220V
  - 240V
  - H-015
- **Spot Illuminator** H-013
- **Head Assembly** H-001
- **Large Capacity Stand** H-004
- **Macro Lenses**
  - 10x H-007
  - 20x H-008
  - 50x H-009
  - 100x H-010
- **Micro Lenses**
  - 100x H-100
  - 200x H-101
  - 400x H-102
  - 500x H103
- **Spot Illuminator** H-013
- **Fibre Optic** H-017
- **Z-Axis Encoder** H-005
- **Remote Lighting Controller (RLC)** H-091
- **Floor Tower Unit** H-090
- **Photographic Attachment** H-011
- **Photographic Attachment** H-070
- **Photographic Attachment** H-004
- **Digital Camera/CC TV Camera** H-072
- **35mm Digital Camera** H-075
- **Note for Floor Tower Unit Option:**
  - Ringlight (plus 2.6 M Fibre Optic cable) - H-094
  - 2.6 M fibre Optic cable for EPI/Substage - H-095
  - 150W Power Supply - H-097
  - 75W Power Supply - H-098
- **3 axis** - H-063
- **2 axis** - H-062
- **225mm x 300mm Manual** - H-083
- **300mm x 400mm Manual** - H-085
- **Photographic Attachment** H-011
- **H-025**
- **H-026**
  - (300 x 225 Stage only)
- **H-054**
- **H-053**
- **VED Card** - H-057
- **Auto Focus** - H-058
- **Light Control Software** - H-092
- **H-026**
  - Substage Illuminator Condensers
- **H-091**
- **H-018**

**Note for Floor Tower Unit Option:**
- Ringlight (plus 2.6 M Fibre Optic cable) - H-094
- 2.6 M fibre Optic cable for EPI/Substage - H-095
- 150W Power Supply - H-097
- 75W Power Supply - H-098
Vision Engineering manufactures a wide range of stereo inspection and non-contact measuring systems. The following tables provide a summary of the products utilising Vision’s technology. For more information on any of these products either visit the website or contact the nearest Vision Engineering branch/distributor.

### Stereo inspection systems

<table>
<thead>
<tr>
<th>Product</th>
<th>Picture</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
</table>
| Lentis  | ![Lentis](image1) | - 2.5 dioptres  
- Multi layered anti reflective coated lens | A state of the art bench magnifier for inspection, manipulation and material rework. |
| Mantis  | ![Mantis](image2) | - x2 - x20 Magnification  
- Shadow-free LED cold illumination, both surface and substage  
- Long working distances, large depth of field | The Mantis family is a unique range of optical systems without eyepieces, for intricate tasks requiring superb quality viewing over long periods of use. Available with universal arm or rigid bench stand option. |
| Lynx    | ![Lynx](image3) | - X2.1 - X120 magnification  
- Camera option  
- Optical viewing head (replaces conventional eyepieces) | Advanced optical system (without eyepieces) stereo zoom microscope. Available in boom and rigid stand configuration with a wide range of optional accessories (e.g. lighting, cameras). |
| Alpha   | ![Alpha](image4) | - x2.1 – x160 magnification  
- Camera option  
- Expanded Pupil eyepieces | Expanded Pupil eyepiece stereo zoom microscope. Available in boom and bench stand configuration with a wide range of optional accessories (e.g. lighting, cameras) |
| Beta    | ![Beta](image5) | - x2.1 – x160 magnification  
- Camera option  
- Conventional eyepieces | Conventional eyepiece stereo zoom microscope. Available in boom and bench stand configuration with a wide range of optional accessories (e.g. lighting, cameras) |
## Non-contact measuring systems

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
</table>
| Merlin           | • 150mm x 100mm stage  
• x10 - x50 mag options  
• QC-300 Microprocessor  
• Manual/Automatic Video Edge Detection | 2-axis video measuring system with touch screen video processor. Powerful yet simple to use, ideal for a wide range of gauging applications. |
| Peregrine        | • 150mm x 100mm stage  
• x10 - x50 mag options  
• QC-300 Microprocessor  
• Automated video edge detection | 2-axis video measuring system with optical and video measurement capability. Simple to use, allowing for quick results every time. |
| Kestrel          | • 150mm x 100mm stage  
• x10 - x50 mag options  
• QC200 Microprocessor  
• Optical viewing head (replaces conventional eyepiece) | Entry level, 2-axis measuring system. Ideal for shop floor gauging applications. |
| Hawk automatic   | • 200mm x 150mm stage  
• x10 - x100 mag options  
• Video Edge Detection  
• Motorised stage movement  
• 2 or 3 axis capability | Automated measuring system combining optical viewing head with PC based Video Edge Detection. 2 and 3 axis motorised stage movement controlled by QC5000 PC software. |
Hawk serial number ________________
Stage serial number ________________

<table>
<thead>
<tr>
<th>Service type</th>
<th>Comments</th>
<th>Date of service</th>
<th>Date of next service</th>
<th>Company</th>
<th>Signature</th>
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<tbody>
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</table>
This product is warranted to be free from defects in material and workmanship for a period of one year from the date of invoice to the original purchaser.

If during the warranty period the product is found to be defective, it will be repaired or replaced at facilities of Vision Engineering or elsewhere, all at the option of Vision Engineering. Shipment costs for warranty repairs, to and from Vision Engineering facilities will not, normally, be borne by Vision Engineering. However, Vision Engineering reserves the right to refund the purchase price if it is unable to provide replacement, and repair is not commercially practicable or cannot be timely made. Parts not of Vision Engineering manufacture carry only the warranty of their manufacturer. Expendable components such as fuses carry no warranty.

This warranty does not cover damage in transit, damage caused by misuse, neglect, or carelessness, or damage resulting from either improper servicing or modification by other than Vision Engineering approved service personnel. Further, this warranty does not cover any routine maintenance work on the product described in the user guide or any minor maintenance work which is reasonably expected to be performed by the purchaser.

No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage, or other conditions beyond the control of Vision Engineering.

Except as stated herein, Vision Engineering makes no other warranties, expressed or implied by law, whether for resale, fitness for a particular purpose or otherwise. Further, Vision Engineering shall not under any circumstances be liable for incidental, consequential or other damages.
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.