Vision ENGINEERING

User Guide

Swift, Swift Duo & Kestrel Elite

2-axis Non Contact Measurement Systems

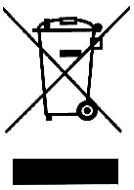
2-axis Non Contact Measurement Systems

This Vision Engineering system is a compact 2-axis non-contact optical measurement system, designed to give cost-effective accurate results.

The optics provide the user with a high resolution clear image of intricate parts. Accurate repeatable results are achieved in X and Y, by the NLEC calibrated stage.

The system can also output high resolution images to a computer.

Health & Safety



Vision Engineering and its products conforms to the requirements of the EC Directives on Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS).

EN61326-1:2006
FCC Part 15
IEC 61010-1:2001

WARNING: ALL EQUIPMENT PLUGGED INTO THIS UNIT MUST BE APPROVED TO EN60950-1:2001 AND CHECK CURRENT RATING OF OUTPUT SOCKET IF USED.

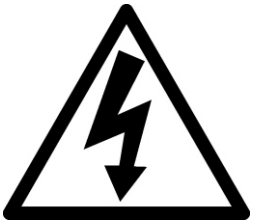
The equipment is connected to protective earth via the mains cable provided.

If the equipment is used in a manner not specified by Vision Engineering Ltd in this user guide, the protection provided by the equipment may be impaired.

Warning symbols

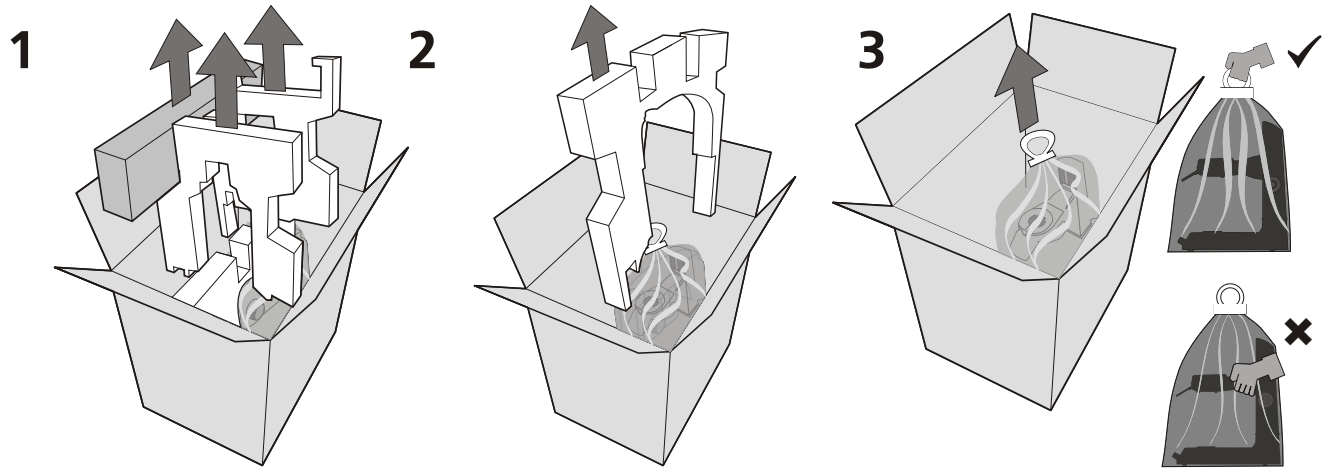
This symbol, when used alone or in conjunction with the following symbol, indicates the need to consult the operating instructions provided with the product.

WARNING: A potential risk of danger exists if the operating instructions are not followed.



This symbol indicates the presence of electric shock hazards. Consult the operating instructions provided with the product wherever this symbol is found.

Unpacking the stand (all systems)



Systems with Tablet PC microprocessor, by box content

Box 1 Stand, objectives

Box 2 Tablet PC

Box 3 Optical head

Box 4 Manual stage (150mm x 100mm)

Box 5 Tablet mount

Box 6 Illuminator

Systems with ND-122 microprocessor, by box content

Box 1 Stand, objectives

Box 2 ND-122 microprocessor

Box 3 Optical head

Box 4 Manual stage (150mm x 100mm)

Box 5 ND-122 mount

Box 6 Illuminator

Systems with PC, by box content

Box 1 Stand, objectives

Box 2 PC, keyboard, mouse

Box 3 Monitor

Box 4 Manual stage (150mm x 100mm)

Box 5 Optical head (for optical systems only)

Box 6 Illuminator

CONTENTS

Stand & objectives

1 Stand

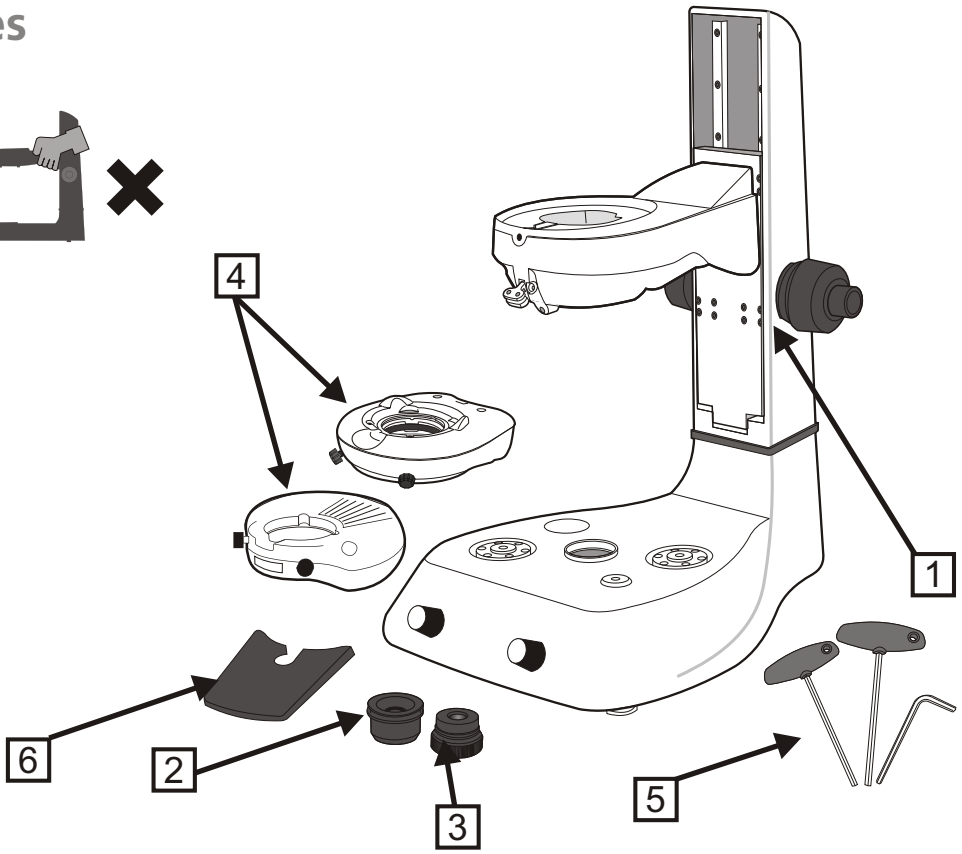
2 Lens mount

3 Lens option

4 Illuminator option

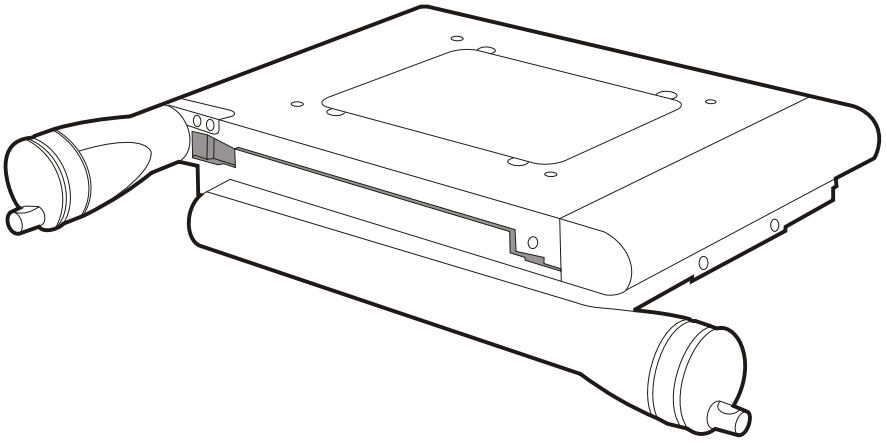
5 Toolkit

6 Anti-glare shield

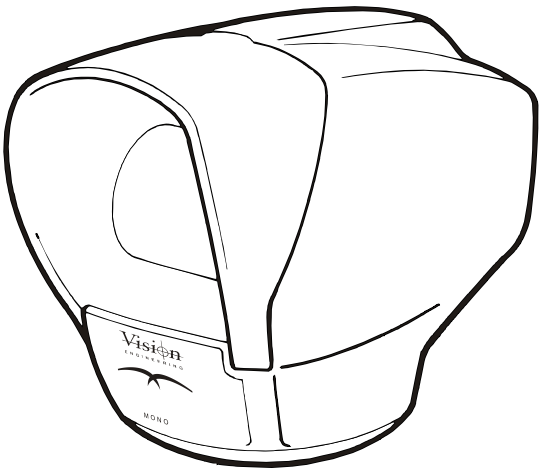


Stage

150mm x 100mm manual stage



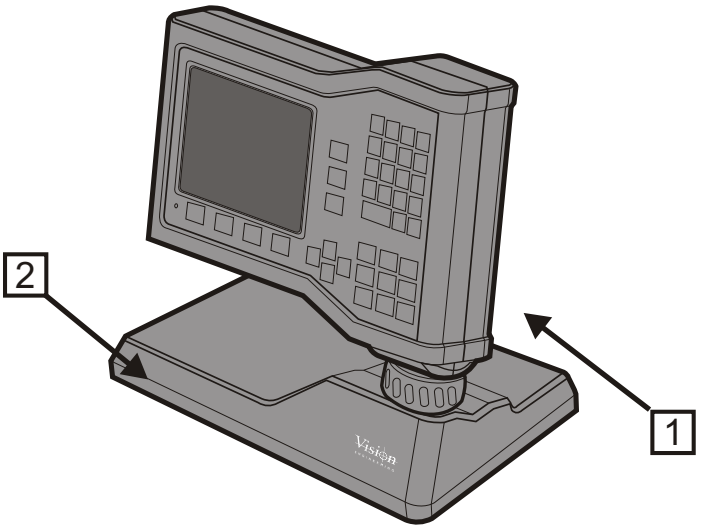
Head



ND-122 microprocessor

1 ND-122 microprocessor

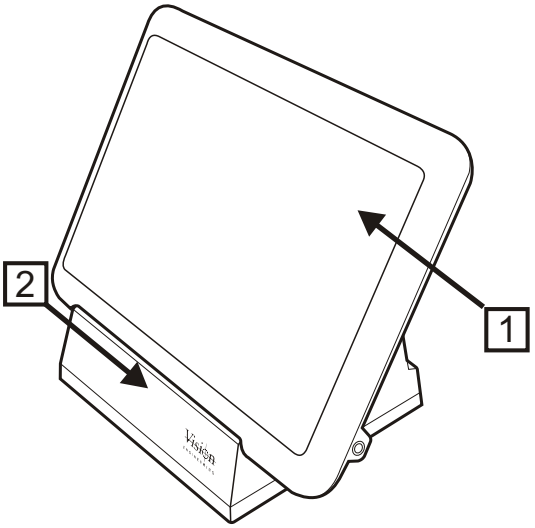
2 Microprocessor stand



Tablet PC and mount

1 Tablet PC

2 Mount

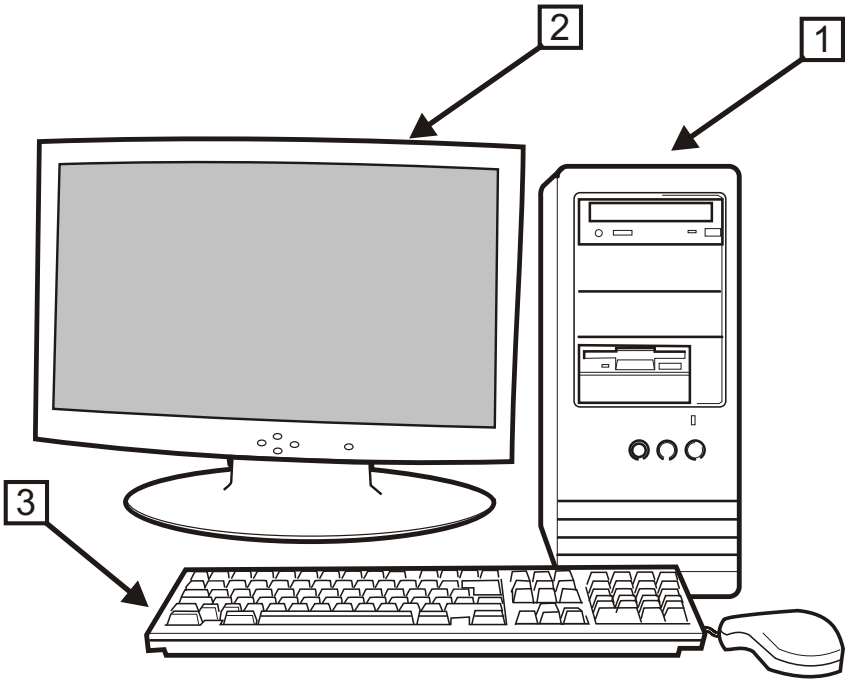


PC

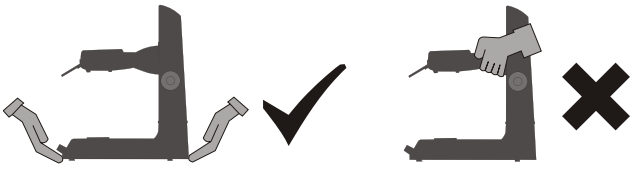
1 PC

2 Monitor

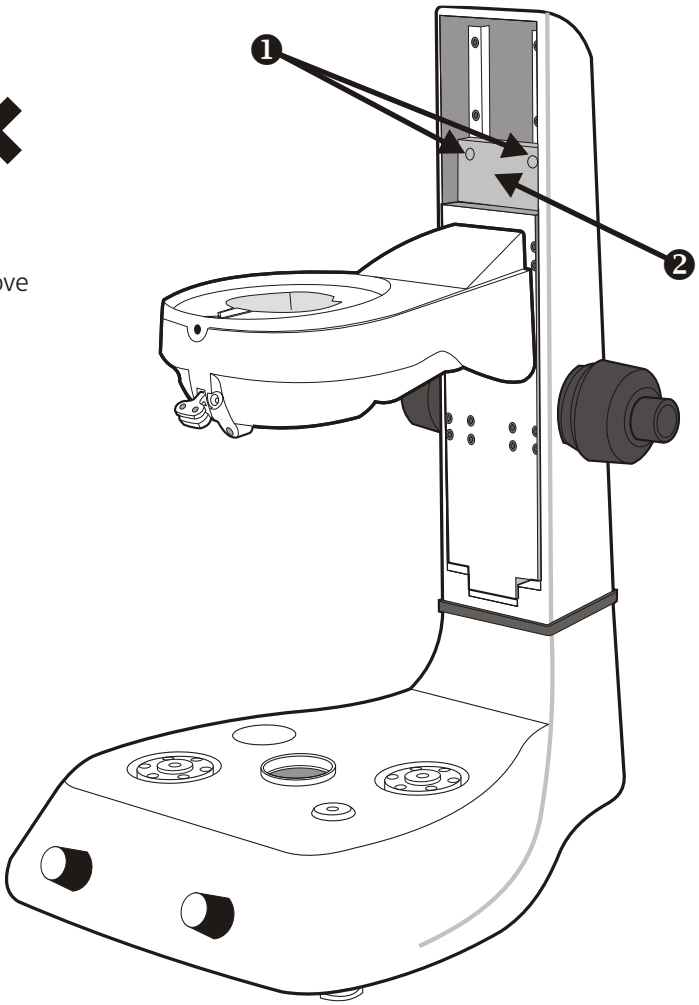
3 Keyboard and mouse



Removing the transit protection



▶ Remove the 2 securing screws ❶ and then remove the transit plate ❷.

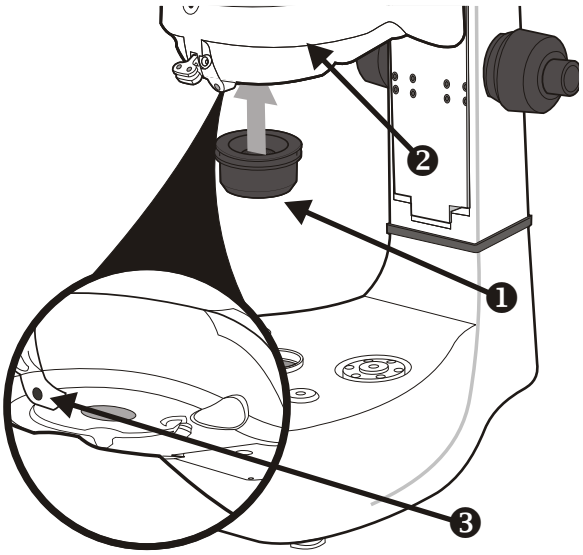


Note: **Keep the transit protection for future transport of your system.**

It is highly recommended that you refit the transit protection whenever you transport your system.

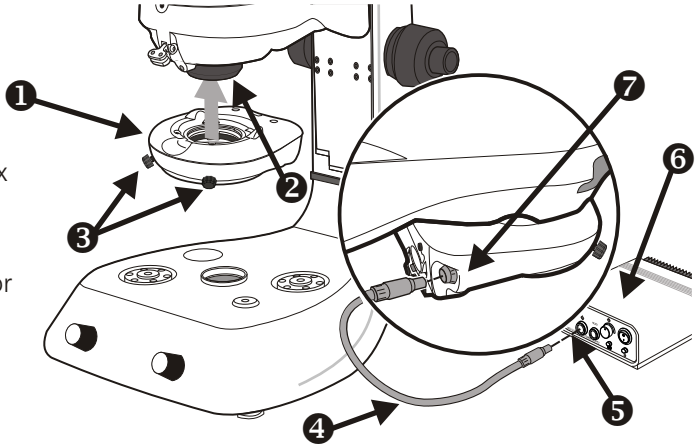
Attaching the lens mount

▶ Insert the lens mount ❶ up into the focus assembly ❷ and secure it with the securing grub screw ❸.



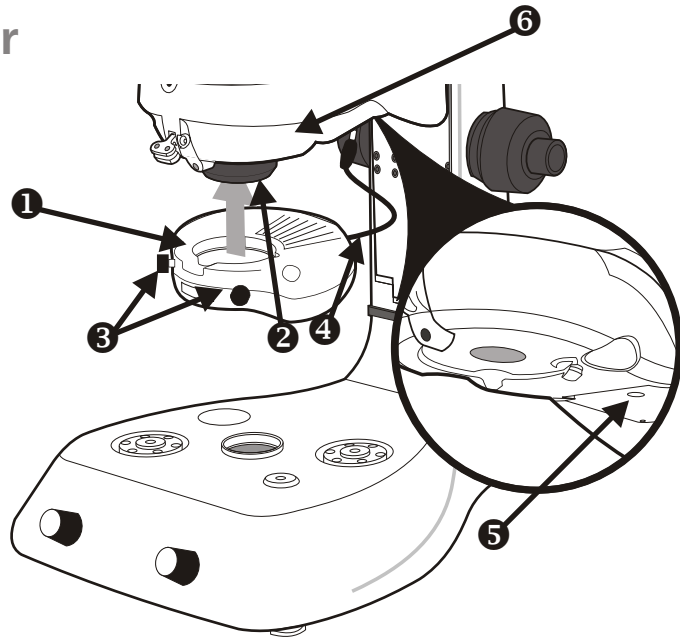
Attaching the LED ringlight

- Locate the LED ringlight ❶ into position over the lens mount ❷ and tighten the securing screws ❸.
- Connect the LED ringlight cable ❹ to the illuminator socket ❺ on the front of the control box ❻.
- Connect the other end of the cable to the connector ❼ on the rear of the LED ringlight.

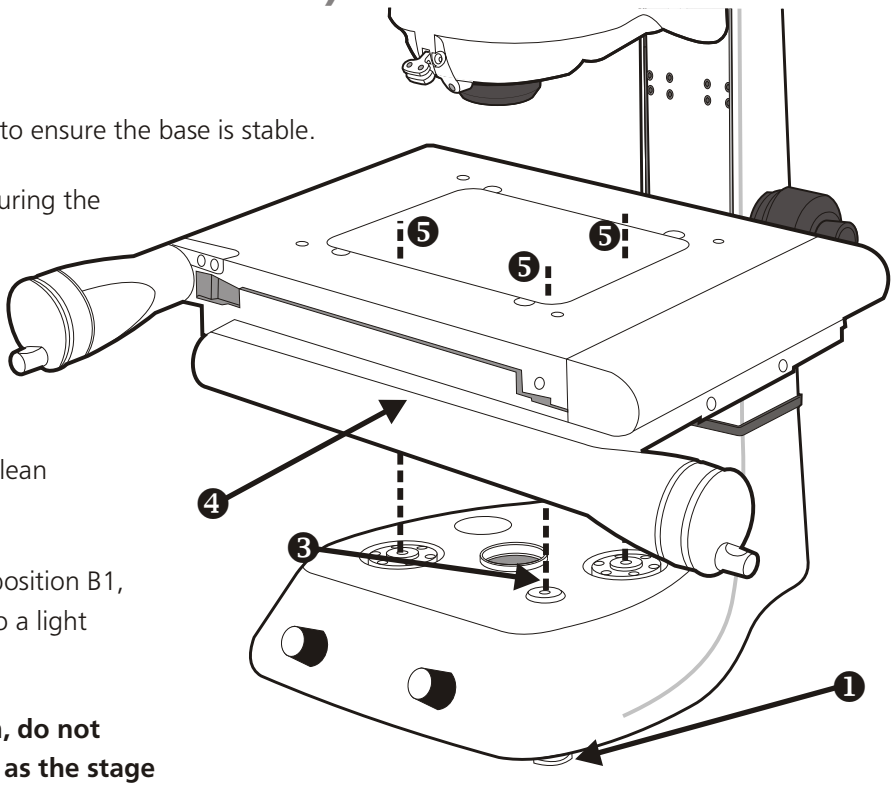


Attaching the Spot Illuminator

- Locate the spot illuminator ❶ into position over the lens mount ❷ and tighten the securing screws ❸.
- Connect the spot illuminator cable ❹ to the illuminator socket ❺ on the underside of the focus assembly ❻.



Stage assembly (150mm x 100mm) - manual

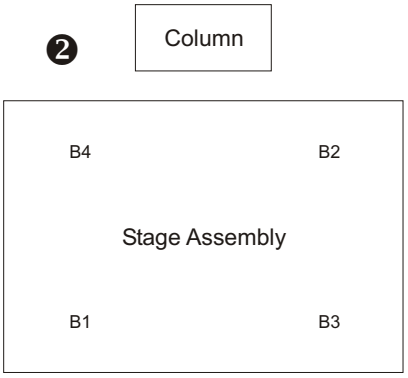


- Use the stand's levelling foot ❶ to ensure the base is stable.
- Place the stage on the stand ensuring the retractable foot (position B4 in diagram ❷ below) is fully retracted.
- Check the stand stage mount feet ❸ and the underside of the 150mm x 100mm stage ❹ are clean and free of any debris.
- Loosely fit the stage bolts ❺ in position B1, B2 and B3 (also in diagram ❷) to a light (finger tight) tension.

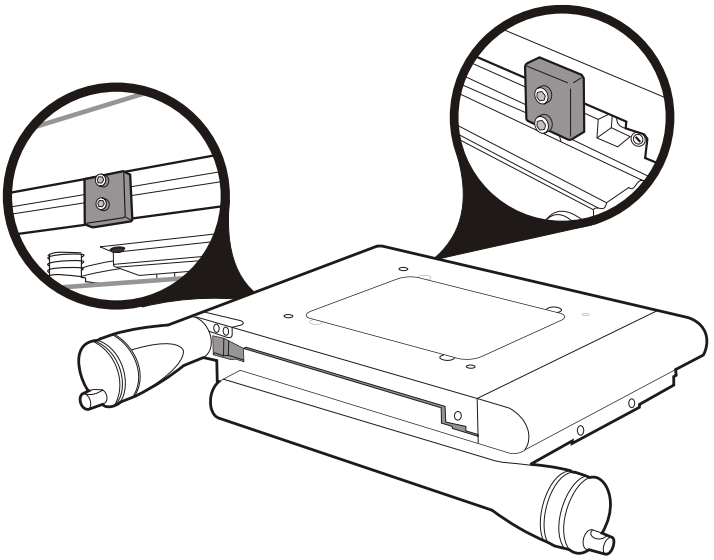
Note: **If this is a video system, do not tighten the stage bolts as the stage will need to be aligned (see page 8).**

For systems with an optical head only (no video camera), tighten the stage bolts in the sequence shown in ❷ to a torque of 2.8Nm.

❷

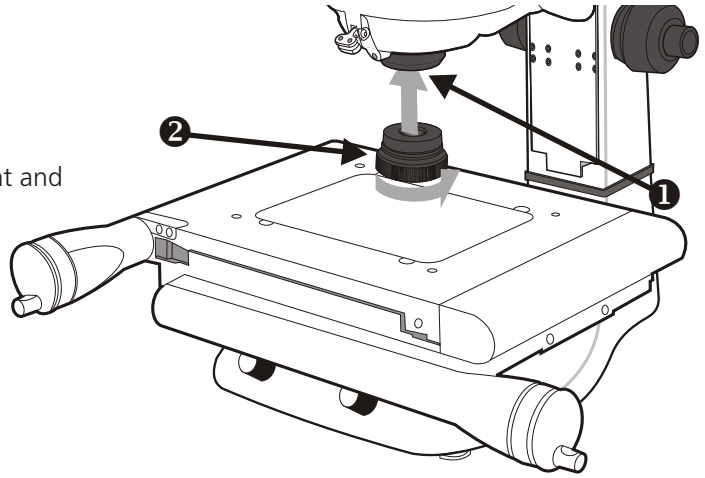


- Remove all red transit clamps from the stage.

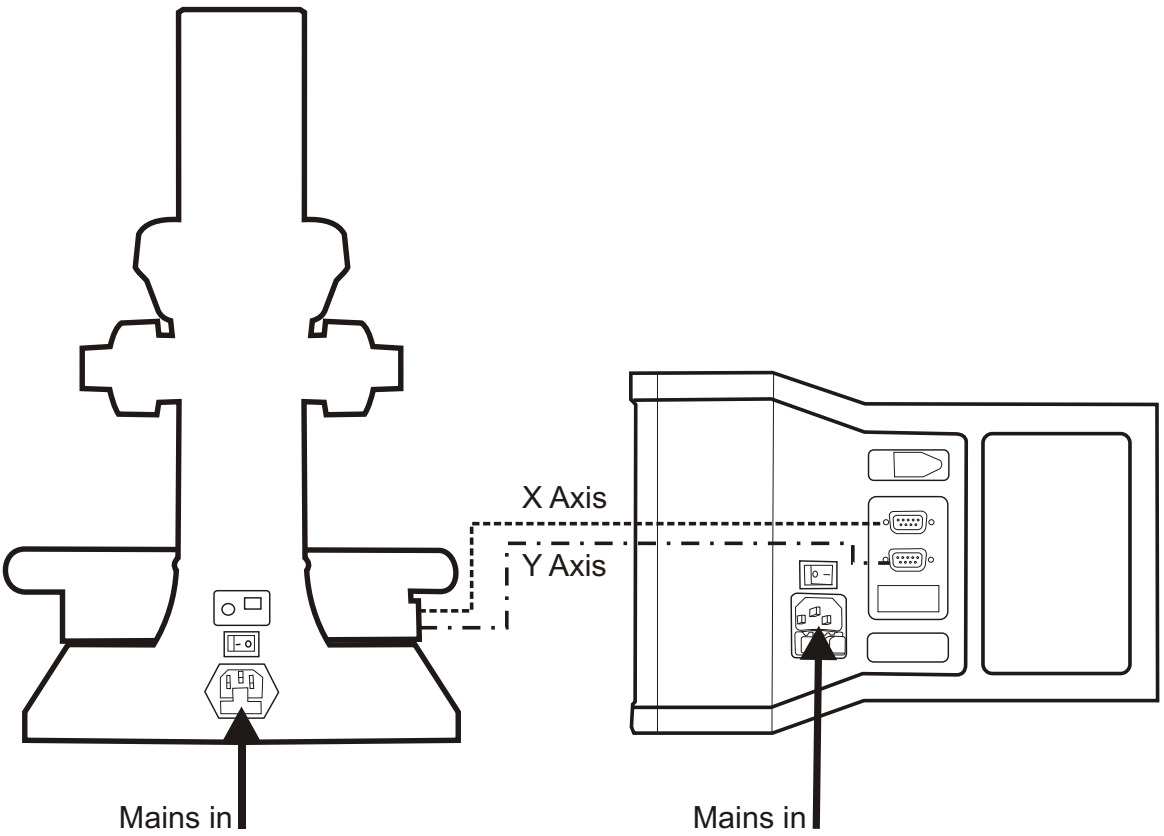


Objective lens attachment

- With the lens mount ❶ in place (see page 3).
- Place the objective lens ❷ up into the lens mount and screw it into position.



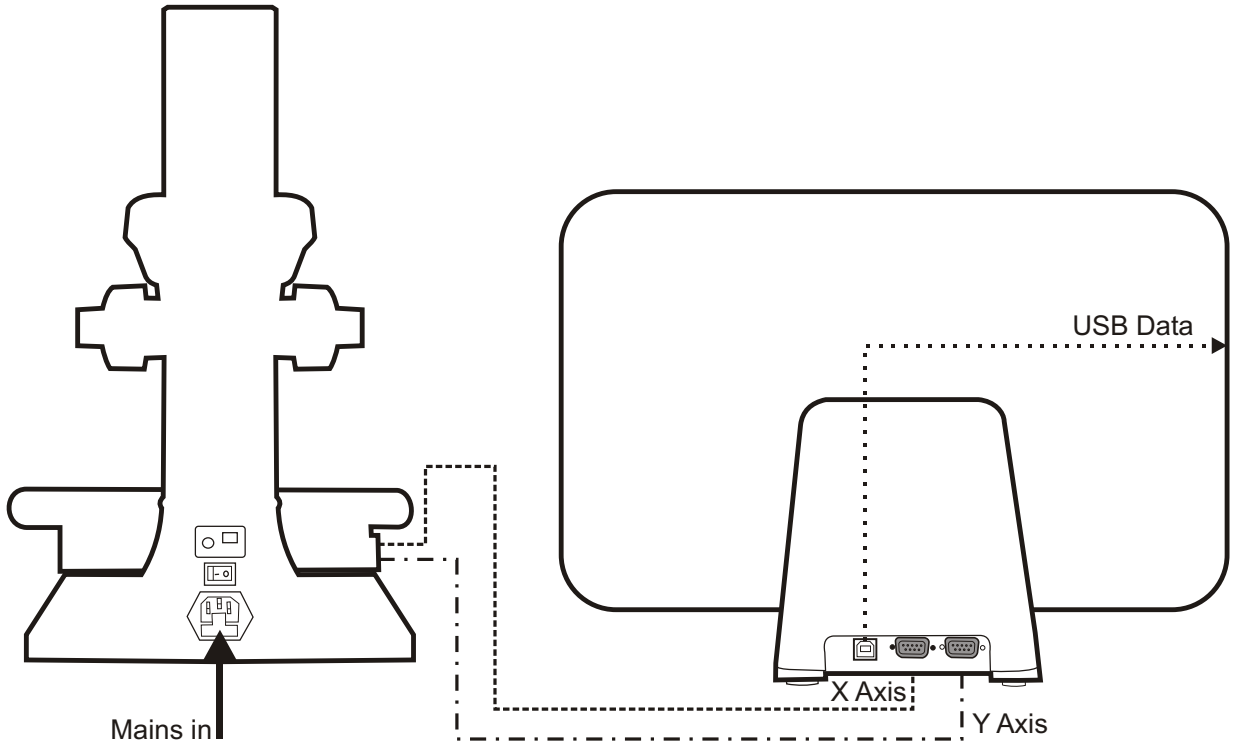
ND-122 microprocessor cable connection



All connectors must be engaged fully and secured with the screws.

WARNING:To comply with safety regulations, easy access to the mains socket must be maintained.

Tablet PC cable connection

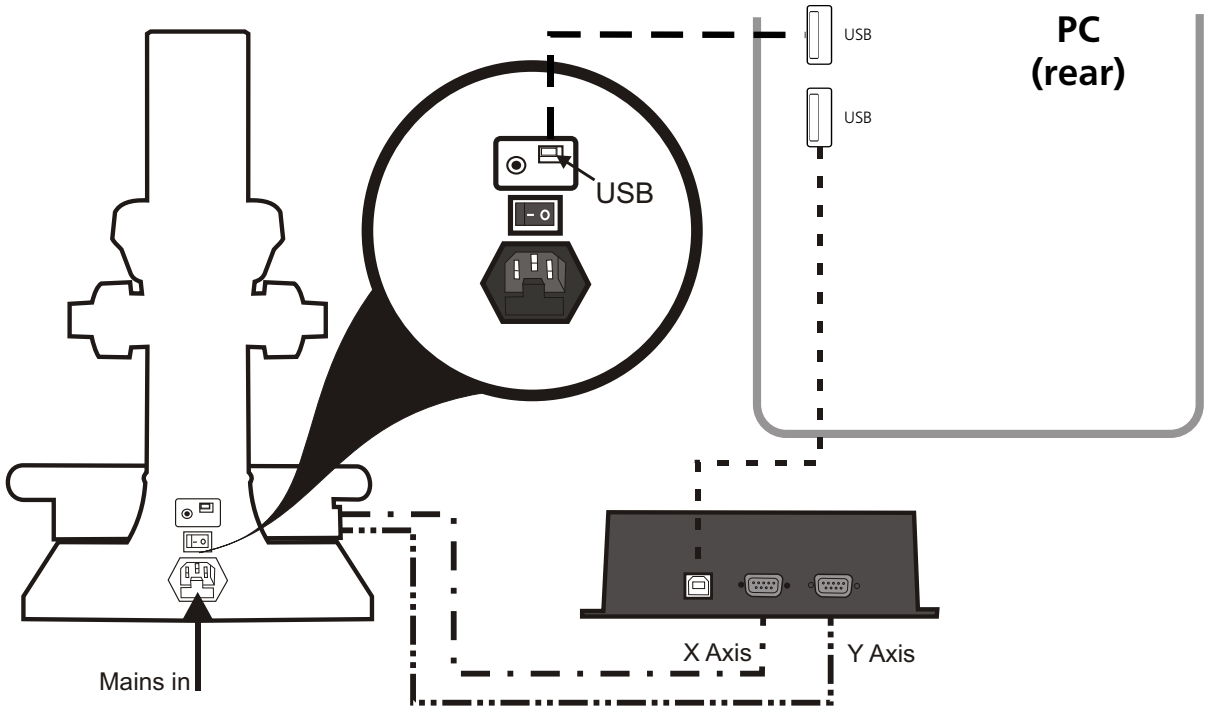


All connectors must be engaged fully and secured with the screws.

WARNING:To comply with safety regulations, easy access to the mains socket must be maintained.

PC system cable connection

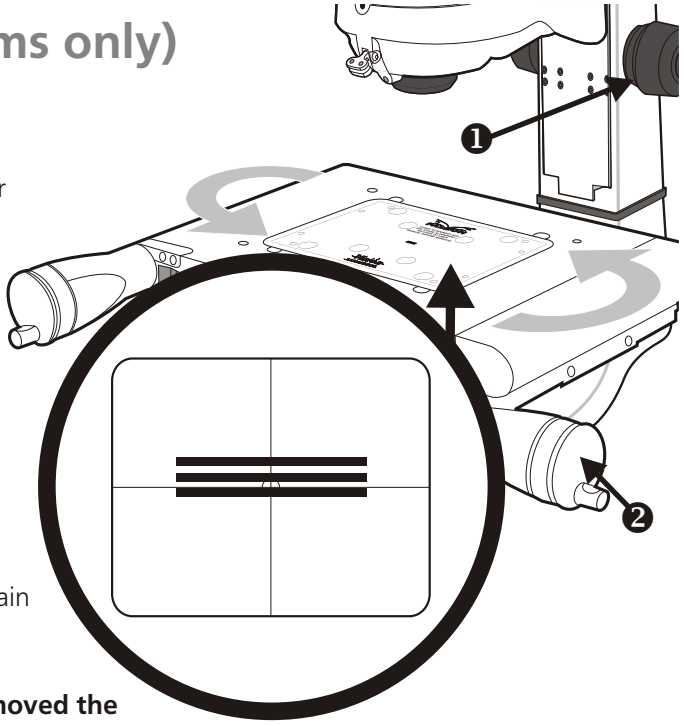
▶



All connectors must be engaged fully and secured with the screws.

WARNING:To comply with safety regulations, easy access to the mains socket must be maintained.

Stage alignment (video systems only)

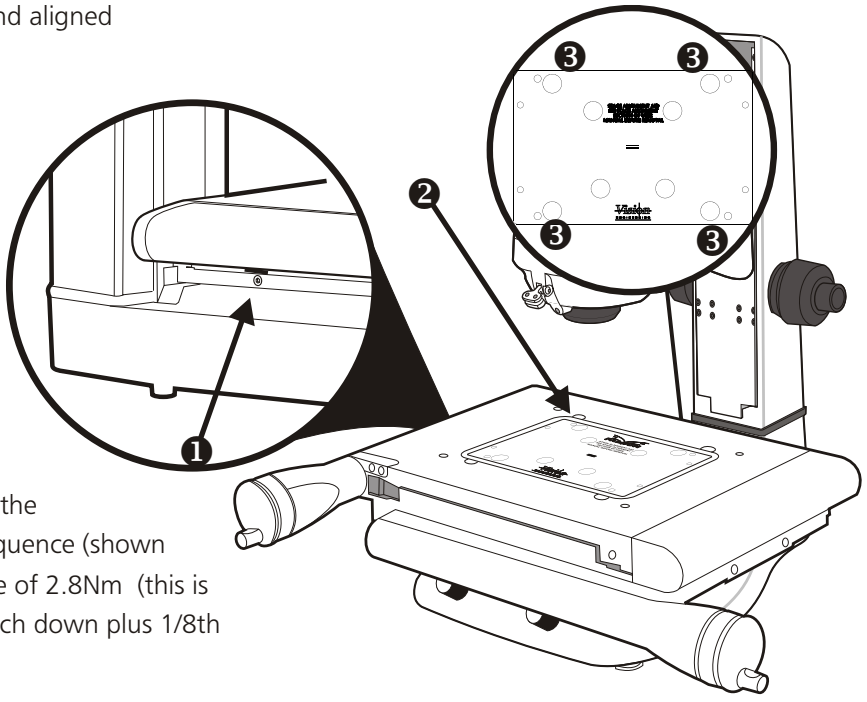


- Turn on the system.
- Switch on the PC and follow on screen instructions for crossing reference marks.
- Using the Focus control ❶, focus on the three horizontal lines in the centre of the alignment plate attached to the stage.
- Rotate the stage by hand until the horizontal lines are parallel to the horizontal crosshair on the PC's screen.
- Use the X axis control ❷ to check reference lines remain parallel with the crosshair.

IMPORTANT: Before the alignment plate can be removed the relevant stage securing procedure should be carried out.

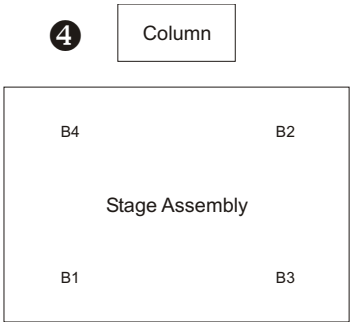
Securing the stage (150mm x 100mm)

With the stage assembled (see page 5) and aligned (see above), secure the stage as follows:



- Being careful not to move the stage, loosen the floating stage foot securing screw ❶.
- Insert and screw in the last stage bolt ❷ and tighten until finger tight.
- Use the Allen key supplied to progressively tighten all 4 screws through the appropriate holes ❸ in the alignment plate in the numbered sequence (shown in the diagram ❹ below) to a torque of 2.8Nm (this is approximately equivalent to bolt touch down plus 1/8th turn).
- Lightly tighten the floating stage foot securing screw.

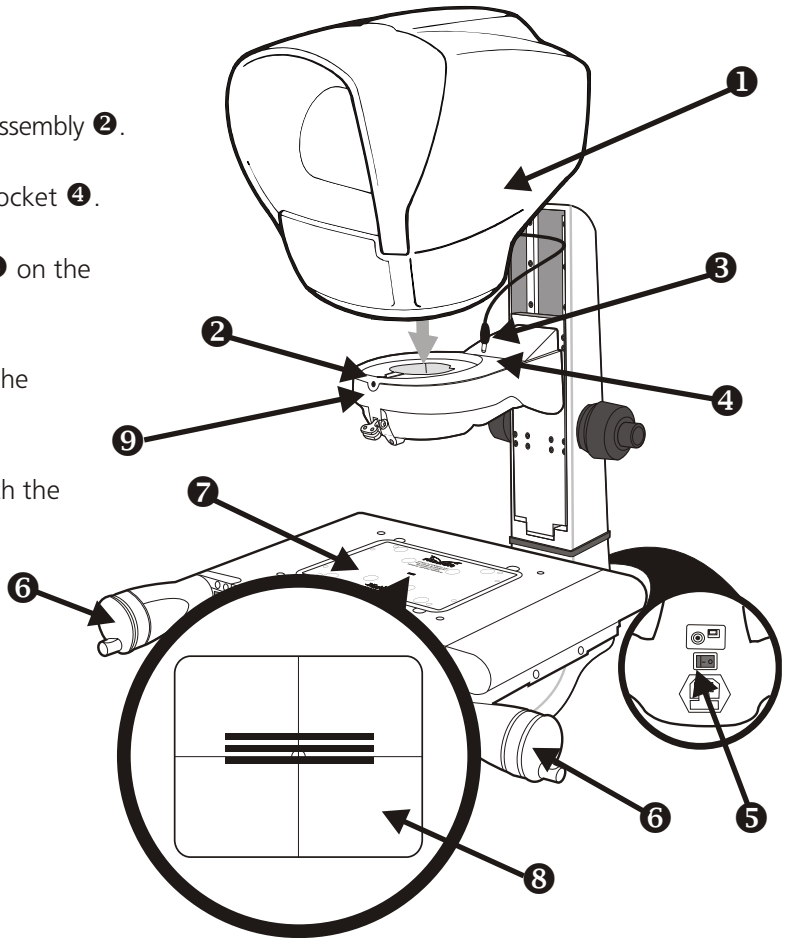
❹



Head attachment

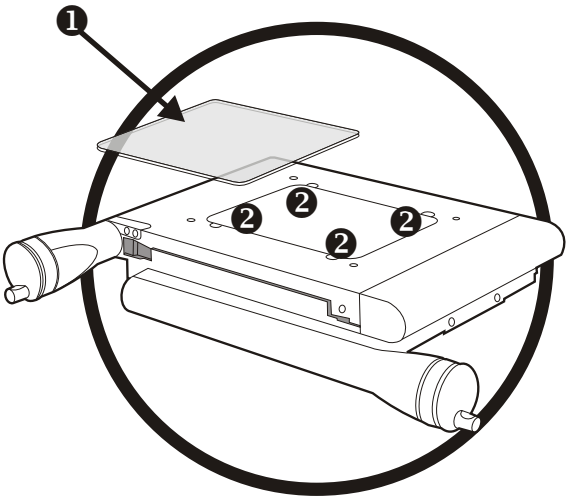
- ▶ Lower the head ❶ into position on the focus assembly ❷.
- ▶ Insert the head connector ❸ into the head socket ❹.
- ▶ Turn the system on using the mains switch ❺ on the rear of the stand.
- ▶ Use the X and Y stage controls ❻ to centre the alignment plate ❼ in the viewing screen.
- ▶ Turn the head to align the head crosshair with the alignment plate (see inset ❽).
- ▶ Tighten the securing screw ❾.
- ▶ Remove the alignment plate.

Note: **If you need to remove the stage for any reason, re-attach the alignment plate and ensure the horizontal lines are parallel to the horizontal crosshair before removing the stage.**

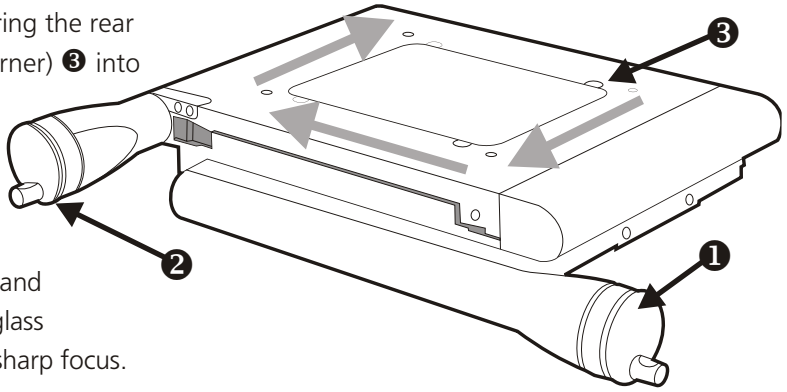


Fitting the stage glass

- ▶ Fit the stage glass ❶ into its recess, taking care to locate it against the location springs and on to the supports ❷.

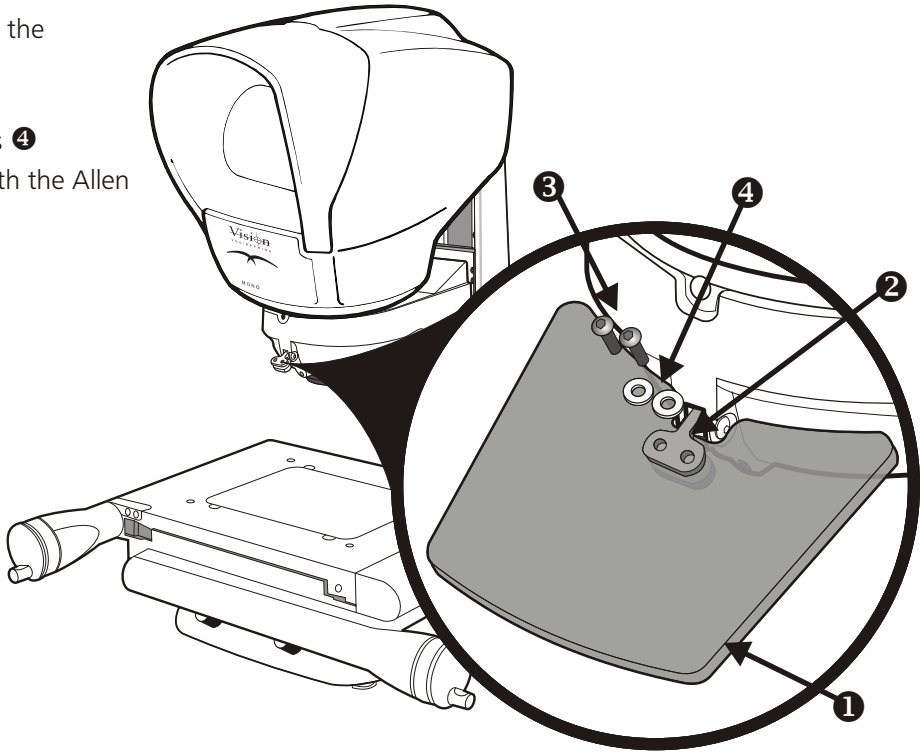


Stage glass levelling



- Use the X axis ❶ and Y axis ❷ controls to bring the rear right-hand corner of the stage glass (fixed corner) ❸ into view.
- Use the focus control to bring the glass surface into sharp focus.
- Use the axis controls to bring the front right-hand corner into view. Use the relevant adjustable glass support to bring the surface of the glass into sharp focus.
- Repeat for the remaining 2 corners.
- Repeat the above steps if necessary until all 4 corners are in focus.

Anti-glare shield attachment



- Slide the anti-glare shield ❶ into the mounting bracket ❷.
- Using the screws ❸ and washers ❹ provided, secure into position with the Allen key (also provided).

Main system controls

1 Y axis control

2 X axis control

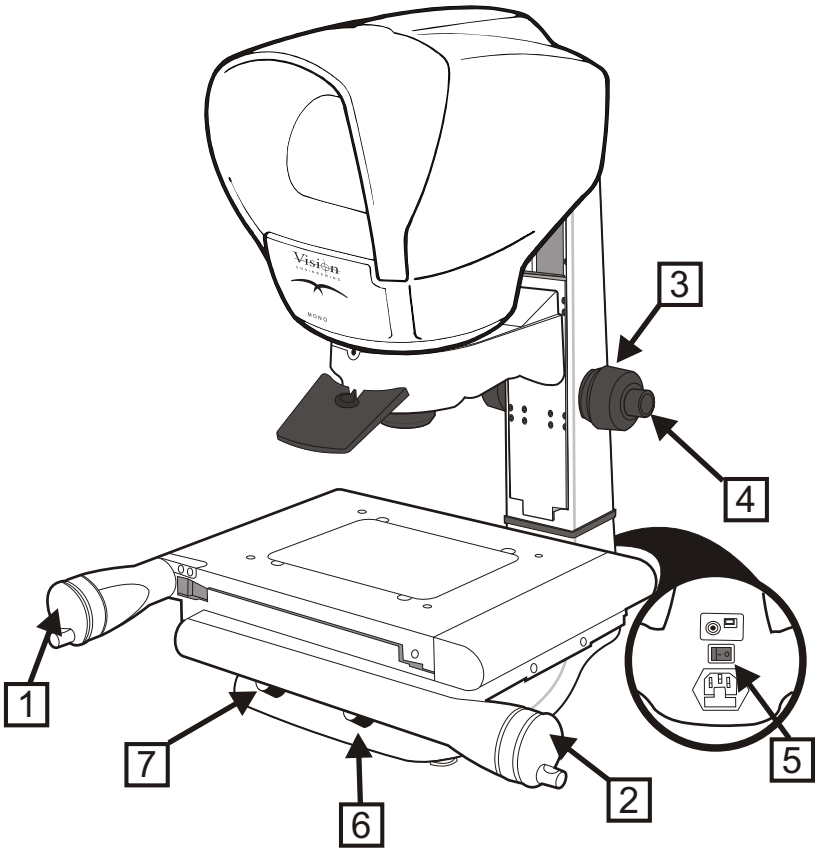
3 Coarse focus control

4 Fine focus control

5 On/off switch

6 Surface spot lamp dimmer

7 Substage dimmer



Note: **All desktop PC and Tablet PC systems configured by Vision Engineering for this product are set with the following password;**

Vision

Getting the most from your system

Routine maintenance

- The outside of the instrument should be wiped down with a damp cloth to remove dirt and dust.
- The instrument and accessories should be checked for loose or damaged components.
- When not in use, protect your system with the dust cover.
- Always dis-assemble the system prior to moving.

Environmental considerations

This equipment is designed for indoor use in the following conditions;

- up to 2000m altitude
- between 5° and 40°C ambient temperature (10° to 35° recommended limits)
- Power supply; 100-120V/ 220-240V, 50/60Hz with voltage fluctuations up to 10% of the nominal voltage
- Transient over voltages typically present on the Mains supply
- Maximum relative humidity of 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

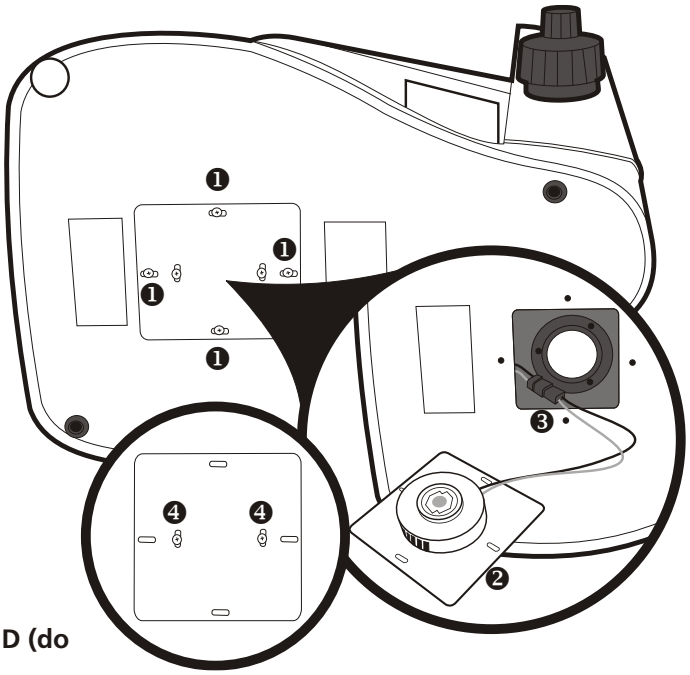
This system is an accurate, industrial gauging instrument. To achieve the optimum accuracy and repeatability, the following considerations should be taken into account

- Position the system on a firm, rigid and level table.
- Avoid locating the instrument near to a source of vibration.
- Do not place the instrument close to a radiator or similar heat source.
- Do not place the instrument close to a cold temperature source such as an air conditioning unit.
- Do not position the instrument in direct sunlight, or where bright reflections will affect the image.
- The equipment should be positioned so that access to the mains input connector is always available.

Note: **If the system you purchased is a Video product and you purchased your own PC or Tablet, Vision Engineering recommend the use of a powered USB hub for the camera signal.**

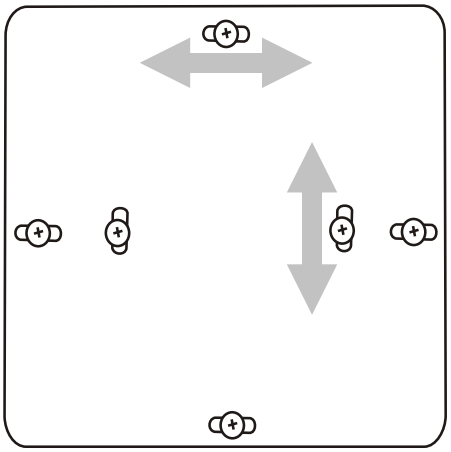
Substage illumination LED replacement (all models)

- Disconnect the system's power supply
- Remove the head, stage and illuminators, carefully place the unit on its side and remove the 4 LED base plate securing screws ❶.
- Remove the LED base plate ❷ and disconnect it ❸ from the unit.
- Remove the LED from the base plate by undoing the 2 LED mounting screws ❹.
- Secure the replacement LED (supplied mounted to heat sink) to the base plate, re-connect the supply and then re-attach the LED assembly to the base of the stand.



Note: Ensure the cable is not in front of the LED (do not fully tighten the 6 screws yet).

- Position the stand on a raised platform to provide access to the LED mount screws.
- Mount the head and turn the substage LED on.
- With the LED on, look in the head and slide the LED by hand in X and Y directions to achieve the optimum illumination.
- Tighten the 6 securing screws.



SERVICE & CALIBRATION RECORD

System Serial Number _____

Stage Serial Number _____

Service Type	Comments	Date of Service	Date of Next Service	Company	Signature

WARRANTY

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. 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, express 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.

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