



FM 557119

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

# User Guide

## EVO Cam II digital microscope

# NAVIGATION INSTRUCTIONS

The symbols in the left-hand margin of each page of the manual will enable you to carry out the following functions:

 The buttons in text below do not function. They are for illustrative purposes only.

 Click on this button to display the Contents page.

 Back one page.

 Forward one page.

 Back button.

 Forward button.

 Click this button to print some or all of the document (specific pages can be chosen).

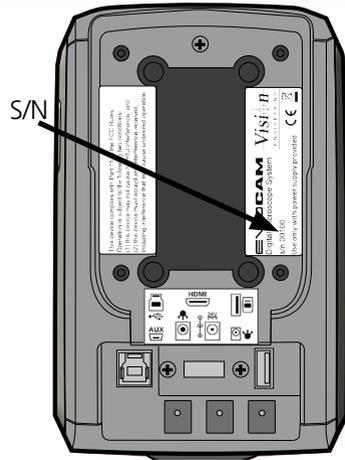
 Click this button to exit the user guide.

 Press the Esc key to display normal Acrobat® Controls.

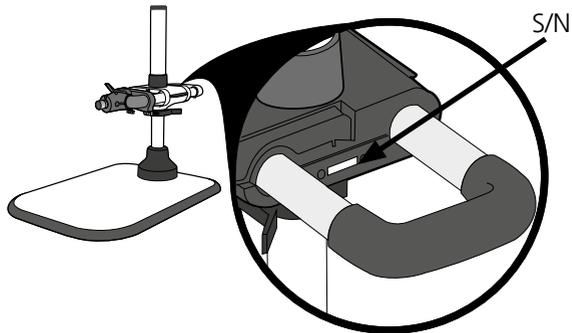
# System serial numbers

Unit type	Serial number
EVO Cam II	
Multi-axis stand	
Ergo stand	
Focus assembly	
Transmitted substage illumination module (option)	

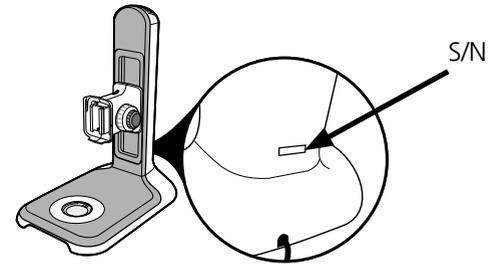
EVO Cam II  
On the rear of the unit.



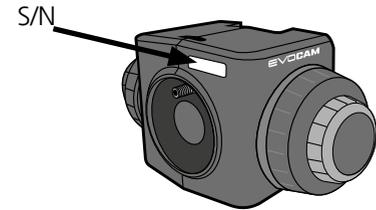
Multi-axis stand  
On the rear of the stand mechanism.



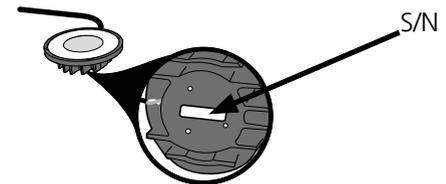
Ergo stand  
At the base of the column at the back.



Focus assembly  
On the rear of the unit.



Transmitted substage illumination module (option)  
On the underside of the module.



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We have compiled the texts and illustrations as accurately as possible. However, Vision Engineering Ltd. will not be responsible for the accuracy of the information contained in this document, which is used at your own risk and should not be relied upon. The information included in this manual may be changed without prior notice.

<b>PREFACE</b>	<b>3</b>	<b>ASSEMBLY</b>	<b>10</b>	<b>MAINTENANCE</b>	<b>28</b>
System serial numbers	3	Transmitted substage illuminator (option)	10	Troubleshooting	29
EVO Cam II	3	Stand mounts	11	Taking care of your EVO Cam II	29
Multi-axis stand	3	Ergo stand	11		
Ergo stand	3	Polarisation filter (option)	11	<b>FIRMWARE UPGRADE</b>	<b>29</b>
Focus assembly	3	Multi-axis stand	11	Firmware upgrade	29
Transmitted substage illumination module (option)	3	Objective lens	12		
Copyright	4	Cabling	12	<b>SPECIFICATION</b>	<b>30</b>
Disclaimer	4	<b>OPERATION</b>	<b>13</b>		
General	6	Quick start	13	<b>SERVICING</b>	<b>31</b>
Safety	6	Control functions	14	Service record	31
Cleaning	6	Power on/off	14		
Servicing	6	Illumination control	14	<b>WARRANTY</b>	<b>32</b>
Symbols used	6	Image capture	14		
 <b>Warning!</b>	6	Magnification	15		
 <b>Warning of electrical shock hazard</b>	6	Magnification level OSD (On Screen Display)	15		
 <b>Important information</b>	6	Overview	15		
Health & safety	6	Main menu options	16		
Electrical safety	6	Exposure options	16		
Illumination safety	6	Focus options	18		
Environmental considerations	6	Calibration	19		
Operator wellbeing	6	Presets and hotkeys	21		
Compliance statements	6	Settings	22		
<b>SYSTEM DIAGRAM</b>	<b>7</b>	Using the remote keypad (optional)	28		
Sub-assemblies	7	Auto/Manual exposure switch	28		
Optical data	8	Front Panel Lock	28		
Stand options	9	Auto/Manual focus switch	28		
		Quick Auto White Balance	28		
		Changing the camera objective lens	28		
		Using the Video Out via USB 3.	28		

## General

### Safety

Before using your system for the first time, please read the Health & safety section of the user guide.

Ensure that:

- Your system and accessories are operated, maintained and repaired by authorised and trained personnel only.
- All operators have read, understood and observe the user manual, in particular the safety regulations.

### Cleaning

- Disconnect your system from the electrical source before cleaning.
- Do not use any unsuitable cleaning agents, chemicals or techniques for cleaning.
- Never use chemicals to clean coloured surfaces or accessories with rubberised parts.
- Use a specialist lens cloth to clean optical surfaces.

### Servicing

Repairs may only be carried out by Vision Engineering-trained service personnel. Only original Vision Engineering spare parts may be used.

## Symbols used

### **Warning!**

A potential risk of danger exists. Failure to comply can cause i) a hazard to personnel; ii) instrument malfunction and damage. Please consult the operating instructions provided with the product.

### **Warning of electrical shock hazard**

This symbol indicates the presence of electric shock hazards. Please consult the operating instructions provided with the product.

### **Important information**

This symbol indicates important information. Please carefully follow the instructions or guidelines.

## Health & safety

### **Unauthorised alterations to the instrument or non-compliant use shall invalidate all rights to any warranty claims.**

### Electrical safety

- Disconnect your system from the electrical source before undertaking any maintenance.
- Avoid using any form of liquid near the system.
- Do not operate your system with wet hands.

### Illumination safety

- Do not look directly at the illuminated LED's. This may cause damage to the eyesight.

### Environmental considerations

- Avoid large temperature fluctuations, direct sunlight and vibrations.
- Ensure electrical components are at least 10cm from walls and combustible materials.
- Position the system on a firm, rigid and level table.
- The equipment should be positioned so that access to the electrical input connector is always available.
- Avoid positioning your system where bright reflections may affect the image.

## Operator wellbeing

- The advanced ergonomic design and construction of Vision Engineering products are intended to deliver superior ergonomic performance, reducing the exertion of the user to a minimum. Depending on the duration of uninterrupted work, appropriate measures should be taken to sustain optimal operator performance. This could include: Optimal arrangement of workplace; Variation in task activity; Training of personnel on workplace ergonomics and general health and safety principles.
- It is important to set-up and optimise your working environment correctly in order to obtain maximum benefit from the advanced ergonomic design of your system. For more information visit: [www.visioneng.com/ergonomics](http://www.visioneng.com/ergonomics)

## Compliance statements

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). All Vision Engineering products conform to the CE mark,



demonstrating that each product meets the requirements of the applicable EC directives. Where applicable, other characteristics of the CE directive are implied such as essential health and safety requirements from all the directives that applies to its product, including low voltage directive and the EMC directive.

## Sub-assemblies



Standard box contents:

- EVO Cam II camera unit
- Power supply unit
- Plug cord
- HDMI cable
- USB3 cable
- Lens cloth
- 2mm HEX key

## Optical data

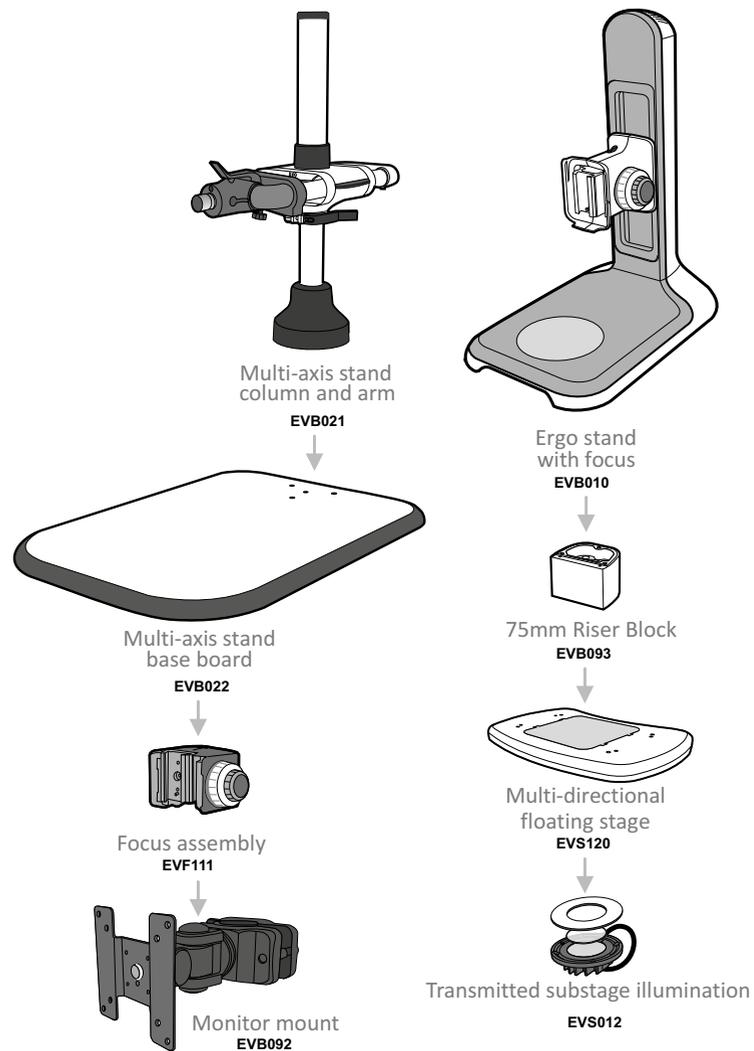
Objective lens	Part number	Magnification zoom range*	Working distance	Field of view at min. zoom (width / height)	Field of view at max. zoom (width / height)
0.45x	ECL001	Full field: 2.27x – 68.04x	160mm	241.0mm / 134.0mm	7.8mm / 4.2mm
		Optimal: 3.78x – 68.04x		142.6mm / 82.6mm	7.8mm / 4.2mm
0.62x	ECL002	Full field: 3.12x – 93.74x	106mm	173.1mm / 96.8mm	5.5mm / 3.1mm
1.0x	ECL003	Full field: 5.04x – 151.2x	85mm	88.0mm / 57.0mm	3.5mm / 2.0mm
		Optimal: 12.56x – 151.2x		40.2mm / 23.1mm	3.5mm / 2.0mm
1.5x	ECL150	Full field: 7.56x – 226.8x	43mm	45.0mm / 36.0mm	2.3mm / 1.2mm
		Optimal: 16.38x – 226.8x		28.5mm / 17.0mm	2.3mm / 1.2mm
2.0x	ECL200	Full field: 10.08x – 302.4x	29mm	37.0mm / 27.0mm	1.5mm / 1.0mm
		Optimal: 23.18x – 302.4x		20.5mm / 12.5mm	1.5mm / 1.0mm

\* with 24" monitor

Objective lens	Part number	Magnification zoom range*	Working distance	Field of view at min. zoom (width / height)	Field of view at max. zoom (width / height)
4 dioptre	ECL040	Full field: 1.71x – 51.41x	245mm	293mm / 171mm	10mm / 5.5mm
5 dioptre	ECL050	Full field: 2.12x – 65.5x	197mm	232mm / 135mm	8mm / 4.5mm

\* with 24" monitor

## Stand options



Other stands are also available.

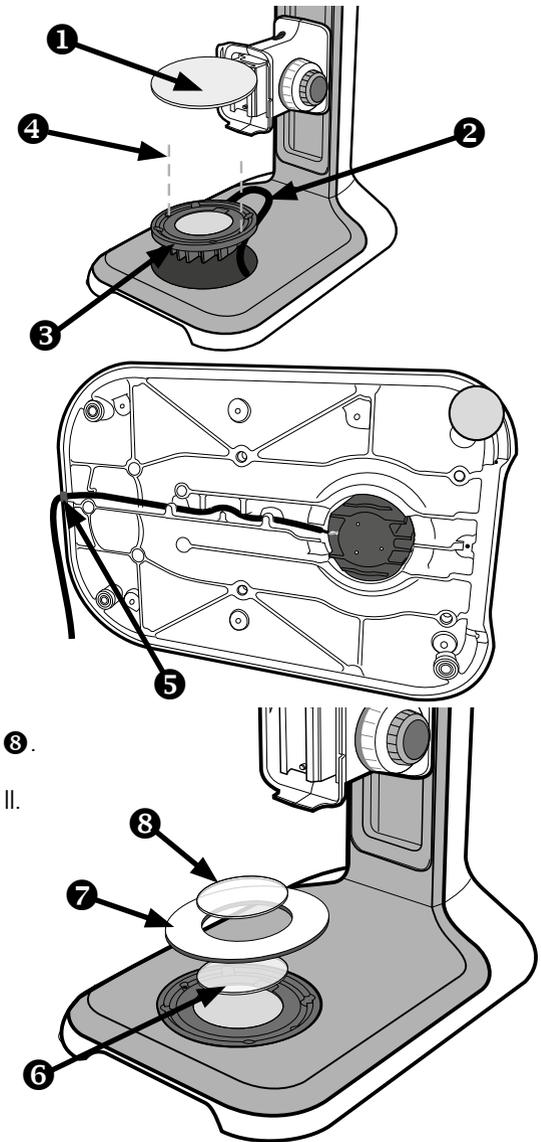
## Transmitted substage illuminator (option)

- ▶ Remove the stage cover plate **1** and thread the lead **2** through the stand base.
- ▶ Locate the illuminator **3** into the stage base and secure it with the 2 screws **4**.

- ▶ Carefully lay the Ergo stand on to its side and thread the lead through the base as shown.
- ▶ Push the cable grommet **5** into the stand.

- ▶ Turn the Ergo stand upright and replace the illuminator diffuser **6** shiny side up, surround **7** and glass **8**.
- ▶ Once EVO Cam II is installed on the stand (see [page 11](#)) connect the sub-stage power cable to the EVO Cam II.

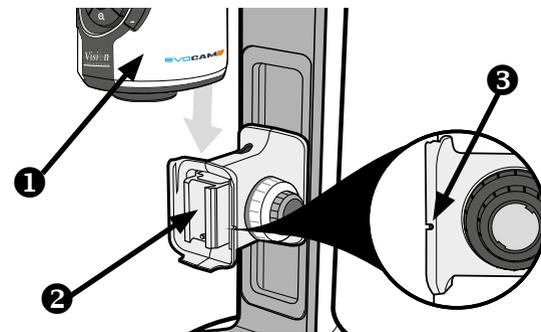
**!** If assembling the optional glare reducing filter, this needs to be placed between the diffuser and the surround.



## Stand mounts

### Ergo stand

- ▶ Locate EVO Cam II **1** on to the stand's dovetail interface **2**.
- ▶ Tighten securing grub screw **3** with HEX key provided



### Polarisation filter (option)

**!** Please contact Vision Engineering to have polariser fitted into the unit by an authorised engineer.

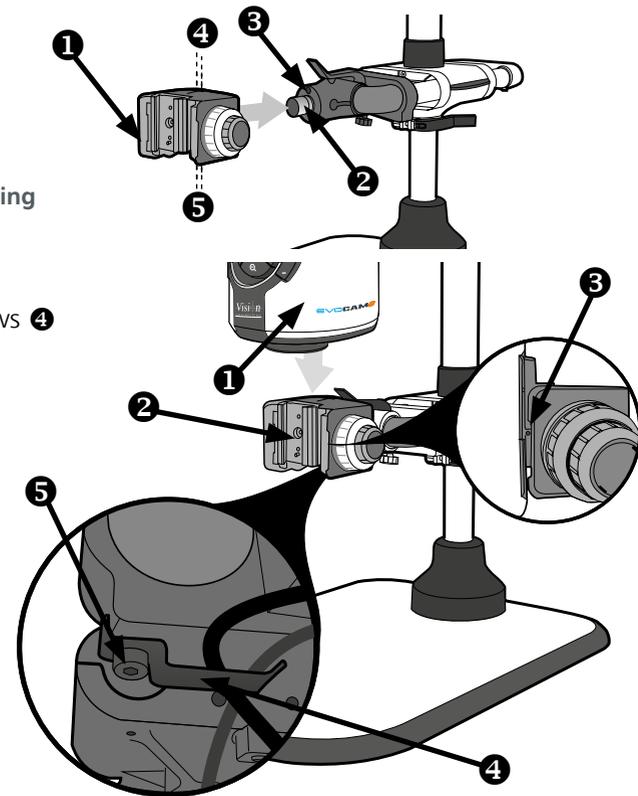
### Multi-axis stand

- ▶ Place focus assembly **1** on the mounting post **2** so that the locator pin is located in the locator pin recess **3**.

**!** To change the camera rotation, remove the locator pin from the focus assembly before attaching it to the mounting post and attach the focus assembly in the desired orientation.

**!** Take care when mounting EVO Cam II.

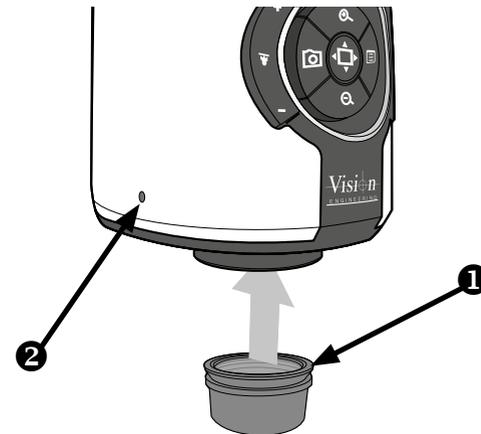
- ▶ Ensure the mounting plate is perpendicular to the base or work bench. Tighten the 2x grub screws **4** at the top of the focus assembly and the 2x grub screws **5** at the bottom of the focus assembly.
- ▶ Locate EVO Cam II **1** on to the stand's dovetail interface **2**.
- ▶ Tighten securing grub screw **3** with HEX key provided
- ▶ Secure the cable retaining clip **4** under the knuckle of the multi-axis stand using the screw **5** provided. The clip can be secured to the left or right side.



## Objective lens

- ▶ While holding the objective lens **1** in position, use the HEX key supplied to secure the lens by tightening the grub screw **2** finger tight.

**!** Do not over tighten the grub screw holding the lens in place.



## Cabling

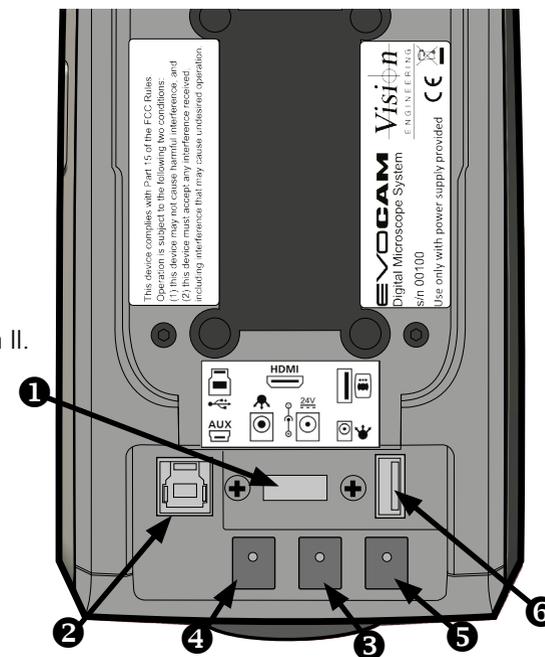
- ▶ Plug the HDMI cable into the EVO Cam II connector **1** and the other end into your HDMI-compatible monitor or TV.
- ▶ The USB3 connector **2** is used for video out and software control.
- ▶ Plug the power supply into a mains socket. Plug the power lead from the power supply into the EVO Cam II power connector **3** on the back of the unit.
- ▶ If required, an external ringlight (option) can be used with EVO Cam II. Plug the external ringlight into the rear panel connector **4** of EVO Cam II.

**!** Only use a Vision Engineering-authorized external ringlight with EVO Cam II.

- ▶ Plug the transmitted substage illuminator cable into the connector **5** on the rear panel of EVO Cam II.

**!** The transmitted substage illuminator is an option for use with the Ergo stand.

- ▶ Plug the external remote keypad (optional) into socket **6** at rear of EVO Cam II.



## Quick start

- 1 Power on/off
- 2 Zoom in
- 3 Zoom out
- 4 Image capture
- 5 Transmitted substage illuminator (option)
- 6 Overview mode
- 7 Ringlight illumination control
- 8 Menu

### Power on/off

- 1 - Short press = Power on  
- Long press = Power off

### Zoom control

- 2 - Zoom in
- 3 - Zoom out

### Image capture

- 4 - Capture image

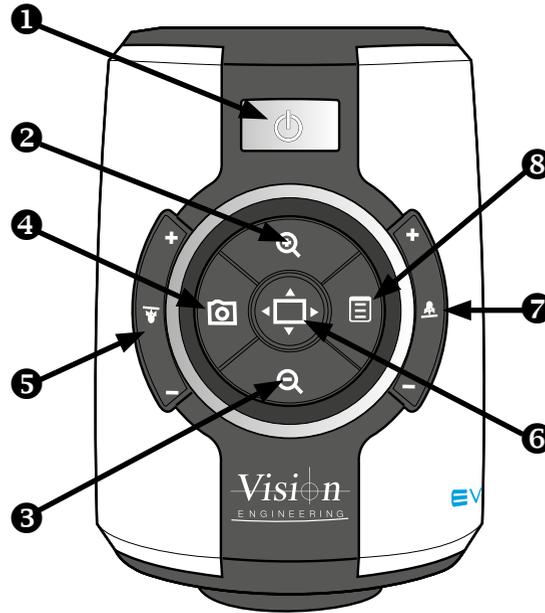
### Transmitted substage illuminator (option)

- 5 - Press '+' to increase brightness  
- Press '-' to decrease brightness

**!** Press and hold '+' or '-' for fast change to illumination.  
Short press '+' or '-' for fine adjustment

### Overview mode

- 6 - Short press = Activate overview mode  
(Press any button to exit overview mode)



### Ring-light illumination control

- 7 - Press '+' to increase brightness  
- Press '-' to decrease brightness

**!** Press and hold '+' or '-' for fast change to illumination.  
Short press '+' or '-' for fine adjustment

### Menu

- 8 - Short press = Access camera menu  
(see [page 16](#))
- 4 - Short press = exit menu

### Image brightness shortcut

In AE or AP mode while on the main screen.

- 8 - Long press (3s) to activate the image brightness shortcut
- 2 - Press to increase image brightness

**!** Not available in ME mode.

# Control functions

## Power on/off

**!** When the system is plugged in the unit will take approximately 8 seconds before it can power on properly

- ▶ Push the power button ❶ to turn the unit on. After four beeps and a few seconds the picture from the camera will appear. If not, switch your monitor to the input used for EVO Cam II.



- ▶ There will also be a panel in the top left of the screen displaying the EVO Cam II's current settings.
- ▶ To turn EVO Cam II off, hold the Power button in for approximately 2 seconds.

## Illumination control

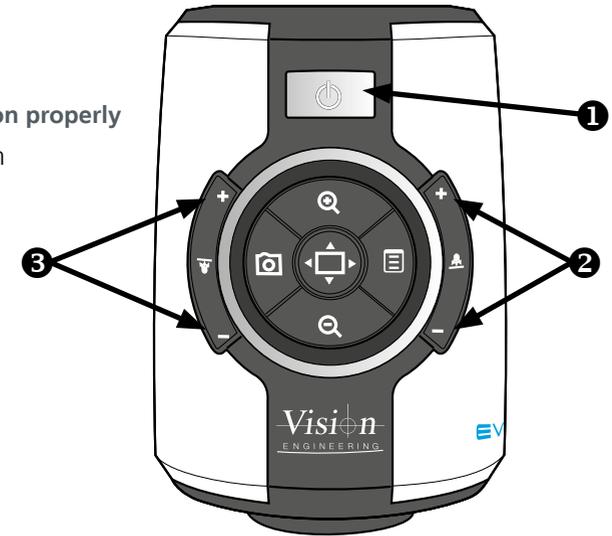
- ▶ The integrated ringlight illumination level can be adjusted by the right hand side buttons ❷.
- ▶ The optional sub-stage illuminator intensity can be adjusted using the left hand side buttons ❸.
- ▶ When connected, the external ringlight illumination level can be adjusted using the right hand side buttons ❷.

**!** Holding down the buttons will allow for faster control of the light settings.  
The internal ringlight is disabled when an external ringlight is connected.

## Image capture

- ▶ To use this feature, insert a USB memory stick into the USB port ❶.
- ▶ When the system has detected the USB memory stick it will report "USB Flash Drive Ready"
- ▶ When you have an image you want to capture, simply press the capture button ❷.
- ▶ The system will indicate the image is being saved to the drive. The image is saved in the format selected in settings (see [Save format options on page 24](#)).
- ▶ The image name is Date and Time stamped and saved in the format "IMG-date.png" where the date is arranged as in the camera settings (see [page 25](#)).

**!** The USB memory stick must be in FAT File System Format. It will not work with any other format.  
When USB memory stick is removed "USB Flash Drive Removed" message is shown



## Magnification

- ▶ Press the Zoom-In button **1** to enlarge the subject within the image and Zoom-Out button **2** to reduce the subject size within the image. The unit will make a sound to indicate when it has reached maximum or minimum zoom limits.

## Magnification level OSD (On Screen Display)

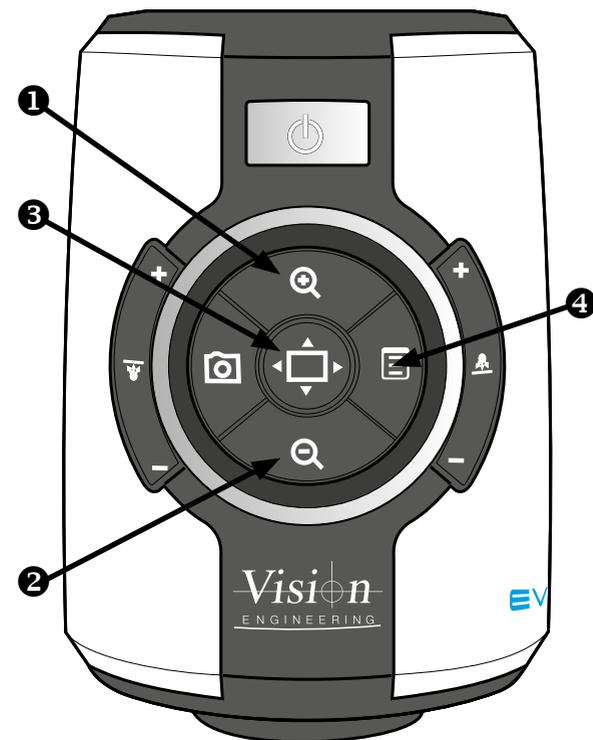
The current magnification level is displayed for example "x30" to show a magnification level of 30. When the magnification changes from optical to digital zoom a 'd' is also displayed, e.g. "x60d" to indicate a magnification level of 60 including digital zoom.

- !** When changing lenses or monitor, the Screen Size and Lens Power settings need to be changed using the menu options (see [page 22](#)) to ensure the correct magnification is displayed.

## Overview

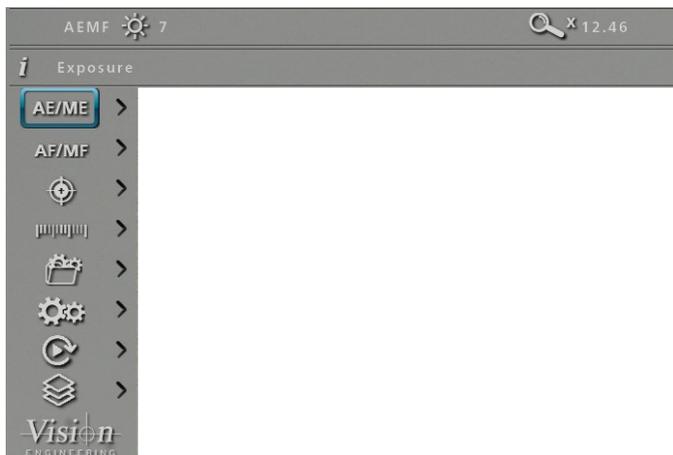
Overview allows you to easily locate a point of interest on the object you are viewing.

- ▶ Press and release the Overview button **3** to make the camera zoom out fully.
- ▶ Place the point of interest in the centre of the screen and press any key to restore the magnification to the previous level.



## Main menu options

- ▶ To access the Main Menu press the Menu button .



- ▶ Use the , , , and  buttons to navigate the menu, and the  button to make a selection.
- ▶ To Exit the menu simply press the image capture button  until it is no longer displayed.

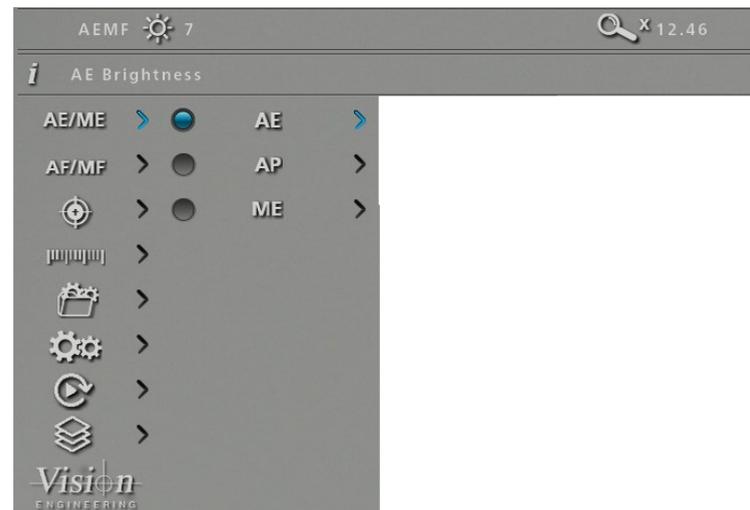
The following main menu options are available:

- Exposure
  - Focus
  - Calibration
  - Measurement
  - Presets
  - Settings
  - Set image replay settings
  - Focus stack settings
- ▶ Use the  and  buttons to select the option required and then press  to display the relevant sub-menu.

## Exposure options

The following main exposure options are available:

- Auto exposure
- Aperture priority
- Manual exposure

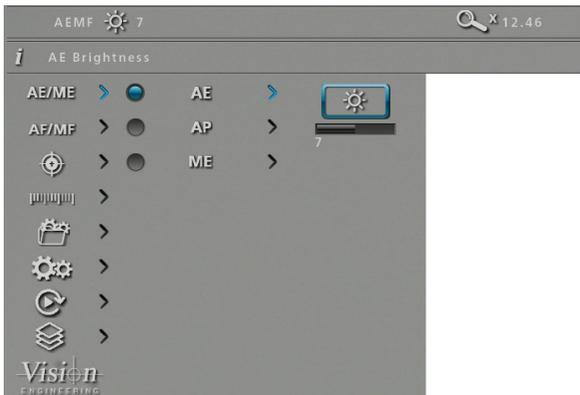


- ▶ Use the  and  buttons to highlight the option required and then press  to enter the relevant settings screen or  to select the option with the current settings then press  to return to the main menu.

## Auto exposure

Using this option, exposure is calculated and adjusted automatically. Target brightness can be set to users desired level.

- ▶ With the exposure options displayed, use the  and  buttons to highlight automatic exposure (AE).
- ▶ Press  to display the highlighted brightness setting.

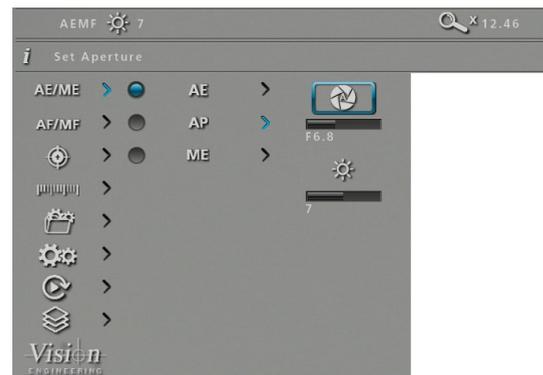


- ▶ Press  to enable the value to be altered if necessary.
- ▶ Use the  and  buttons to decrease or increase the value as required.
- ▶ With the required value set, press  to store it and then press  to return to the exposure menu.
- ▶ Press  to turn on the blue indicator next to the option to select it then press  to return to the main menu.

## Aperture priority

This option allows the exposure to be calculated automatically when the user sets the aperture value (F14 – F1.6 & closed). This allows easy control of the depth of field while maintaining the correct exposure. Target brightness can be set to users desired level.

- ▶ With the exposure options displayed, use the  and  buttons to highlight aperture priority (AP).
- ▶ Press  to display the AP options and then use the  and  buttons to highlight either the f-number option or the brightness option.

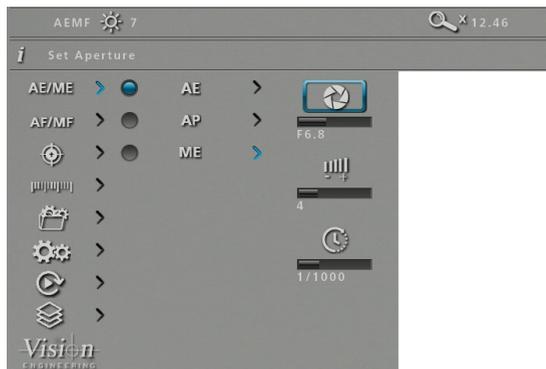


- ▶ With the required option selected, press  to enable the value to be altered if necessary.
- ▶ Use the  and  buttons to decrease or increase the value as required.
- ▶ With the required values set, press  to store it and then press  to return to the exposure menu.
- ▶ Press  to turn on the blue indicator next to the option to ensure it has been selected then press  to return to the main menu.

## Manual exposure

This option enables exposure controls to be set manually. Aperture, Gain and Exposure time can all be adjusted. Aperture (F14 – F1.6 & closed), Gain (1 - 15) and Exposure time (1/10,000 – 1s)

- ▶ With the exposure options displayed, use the  and  buttons to highlight manual exposure (ME).
- ▶ Press  to display the ME options and then use the  and  buttons to highlight either the f-number, gain, or exposure time option.



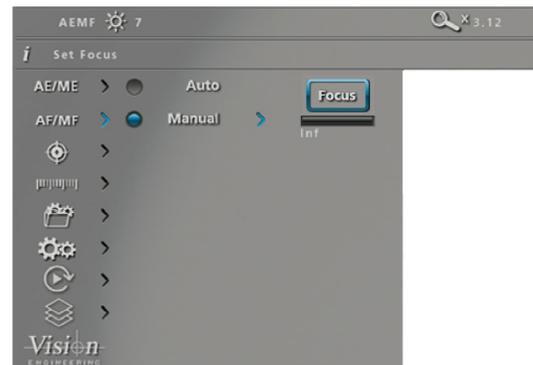
- ▶ With the required option selected, press  to enable the value to be altered if necessary.
- ▶ Use the  and  buttons to decrease or increase the value as required.
- ▶ With the required values set, press  to store it and then press  to return to the exposure menu.
- ▶ Press  to turn on the blue indicator next to the option to ensure it has been selected then press  to return to the main menu.

## Focus options

### Auto/Manual focus

This option allows the user to set the EVO Cam II's focus to be set automatically if the subject is within range, or set a specific focal distance.

- ▶ With the focus options (AF/MF) displayed, use the  and  buttons to highlight automatic or manual focus as required.

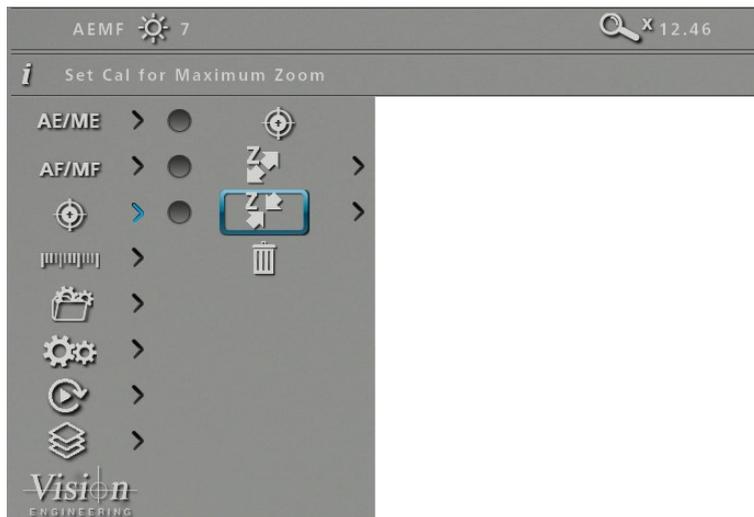


- ▶ Press  to turn on the blue indicator next to the required option to ensure it has been selected.
- ▶ If the manual focus option is selected, press  to display the distance setting.
- ▶ Press  to enable the value to be altered if necessary.
- ▶ Use the  and  buttons to decrease or increase the value as required.
- ▶  **If the focus position is not set to 'Inf' the zoom will not maintain parfocality.**
- ▶ With the required values set, press  to store it and then press  to return to the focus menu.

## Calibration



Before setting a calibration, ensure the unit is in Manual Focus mode at Inf (infinity), see [page 18](#). When a calibration is set, the unit is automatically set to Manual Focus mode and this can cause the object to move out of focus if working in Automatic Focus mode.



There are two types of Calibration setting:

- Minimum zoom calibration (most accurate)
- Minimum/Maximum zoom calibration



Minimum Zoom Calibration will lock the zoom to one point.  
Minimum/Maximum zoom calibration will allow movement through the zoom range while maintaining calibration

### Minimum zoom calibration

- ▶ Press the button enough times to hide the menu panel so only the header bar is shown (as below).



- ▶ Place a known point of measurement under the EVOCam lens. (e.g. a ruler) and use the EVOCam II zoom control to set the minimum zoom position to be calibrated.
- ▶ Press the to display the menu and use the and button to highlight the Calibrate options icon () then press the button to display the options.
- ▶ Use the and buttons to highlight the Minimum Zoom icon () and then press to enable the values to be entered as follows.
- ▶ Use the to highlight the left cursor icon () and then press .
- ▶ Use the and buttons to move the left cursor to the required position.
- ▶ Use the to highlight the right cursor icon () and then press .
- ▶ Use the and buttons to move the right cursor to the required position.
- ▶ With both left and right cursor positions set, press , and to set the calibration.

### Minimum/Maximum zoom calibration

- ▶ Press the button enough times to hide the menu panel so only the header bar is shown (see below).



- ▶ Place a known point of measurement under the EVOCam lens. (e.g. a ruler) and use the EVOCam II zoom control to set the minimum zoom position to be calibrated.

- ▶ Press the to display the menu and use the and buttons to highlight the Calibrate options icon () then press the button to display the options.
- ▶ Use the and buttons to highlight the Minimum Zoom icon and then press to enable the values to be entered as follows.
- ▶ Use the to highlight the left cursor icon and then press .
- ▶ Use the and buttons to move the left cursor to the required position.
- ▶ Use the to highlight the right cursor icon and then press .
- ▶ Use the and buttons to move the right cursor to the required position.
- ▶ With both left and right cursor positions set, press enough times to hide the menu panel again.
- ▶ Use the EVOcam II zoom control to set the maximum zoom position to be calibrated.
- ▶ Press the to display the menu and use the and buttons to highlight the Calibrate options icon () then press the button to display the options.
- ▶ Use the and buttons to highlight the Maximum Zoom icon and then press to enable the values to be entered as follows.
- ▶ Use the to highlight the left cursor icon and then press .
- ▶ Use the and buttons to move the left cursor to the required position.
- ▶ Use the to highlight the right cursor icon and then press .
- ▶ Use the and buttons to move the right cursor to the required position.
- ▶ With both left and right cursor positions set, press , , and to set the calibration.

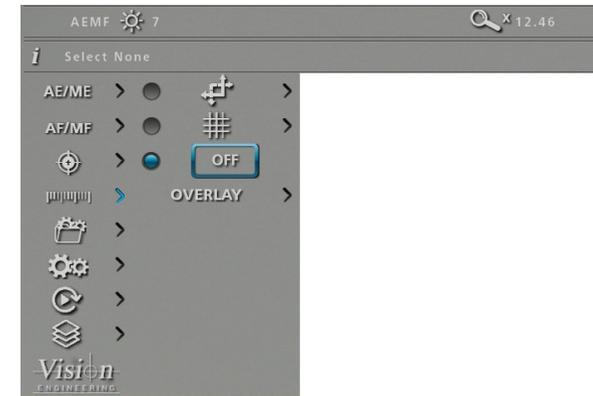
**When maximum/minimum calibration is set and cursors are turned on, the system will display the calibrated range of the system in the measurements bar (see below) Measurements are most accurate in this zoom range. Values outside of this will be extrapolated.**



Measurement X: 0.09 Y: 0.00 D: 0.09 mm CAL X 6.00 - 15.00

## Measurement

- ▶ With the measurement options () displayed, use the and buttons to highlight the option required and then press to highlight and then enable the value to be altered if necessary.



## Cursor

This option enables a measurement to be made between moveable cursors.



**Calibration can be carried out with this option set. No units will be shown if calibration is not set.**



**The cursors' measurement units and colour can be altered using the settings option (see [page 22](#) and [page 25](#) respectively).**

- ▶ Use the and buttons to highlight either the top left cursor () or lower right cursor () and then press to select it in order to change its position.
- ▶ Use the , , and buttons to adjust the selected cursor's position and then press to save the altered position and return to the cursor option.
- ▶ Press to return to the measurement options.

## Grid

This option enables a grid to be displayed on the screen. Both the size and position of the grid can be altered as follows:

 **Calibration can be carried out with this option set. No units will be shown if calibration is not set.**

 **The grid measurement units and colour can be altered using the settings option (see [page 22](#) and [page 25](#) respectively).**

- ▶ Use the  and  buttons to highlight either grid size () or grid position () and then press  to select it in order to change its value.
- ▶ Use the , ,  and  buttons to adjust the selected grid value and then press  to save the altered setting and return to the grid option.
- ▶ Press  to return to the measurement options.

## Off

- ▶ Highlight the Off button and press  to ensure neither the cursor or the grid are displayed.

## Overlay

An overlay file can be imported from the root directory of a USB stick and displayed for comparison with a live image. The file must be PNG format with transparent background, and must match the camera image size (1920x1080 pixels). Files of different sizes will align to the top left corner of the image. Overlay files do not have to have a specific file name, a user can move through the images and select the one they want by using the  and  buttons).

- ▶ Use the  and  buttons to highlight one of the following options then press  to activate it.

**ON:** Turn the overlay on **IMPORT** : Import overlay file from USB stick.

**OFF:** Turn the overlay off **CLEAR:** Clears overlay file from the memory.

 **Importing an overlay file will overwrite any existing overlay file already imported. Once the overlay is imported the USB stick can be removed and the overlay will remain on the system**

## Presets and hotkeys

The current camera settings can be saved as one of the 10 presets. These settings can then be exported and subsequently imported, enabling multiple EVO Cam II cameras to be standardised.

Any of the 10 presets can be assigned to one of the three hotkeys on the optional remote keypad.

### Presets

- ▶ With the presets options () displayed, use the  and  buttons to highlight the required preset and then press  to select it.
- ▶ Press  and then use the  and  buttons to enable one of the following options:

**Save:** press  to save the current EVO Cam II settings to the selected preset

**Export:** press  to export the current settings to a USB stick

**Import:** press  to import a preset file from a USB stick

- ▶ Press  to return to the preset options.

### Hotkeys

This option enables each of the three hot keys on the optional remote keypad to have one of the 10 presets assigned to it.

- ▶ Press  to highlight the Hotkeys option and then use the  and  buttons to highlight the required hotkey.
- ▶ Press  and then use the  and  buttons to highlight one of the 10 presets (or None) as required.
- ▶ Press  to assign the selected preset (or None) to the hotkey and then press  to return to the preset options.

## Settings

With the settings options  displayed, use the  and  buttons to select from the following:

- Magnification
- Image mode
- User interface
- System set up

### Magnification

- ▶ With the magnification () options highlighted, press  and then use the  and  buttons to enable one of the following options:
  - Set screen size
  - Set lens power
  - Set measurement units
  - Set digital zoom
  - Set zoom limits

#### Set screen size

- ▶ With set screen size () highlighted, press .
- ▶ To alter the screen size (its diagonal measurement), press  and then use the  and  buttons to set the size between 1 and 100 inches.
- ▶ With the required value set, press  to store it and then press  to return to the magnification options.

#### Set lens power

- ▶ With set lens power () highlighted, press .



**Some lenses have two options; Optimal Field and Full Field. Optimum Field has been designed to restrict minimum zoom to reduce any vignetting from the set lens. Full Field allows the full zoom range of the lens.**

- ▶ To alter the lens power, use the  and  buttons to highlight the required value, press  to store it and then press  to return to the magnification options.

#### Set measurement units

- ▶ With set measurement units () highlighted, press .
- ▶ To alter the units, use the  and  buttons to highlight either mm or inch, press  to store the change and then press  to return to the magnification options.

#### Set digital zoom

- ▶ With set digital zoom () highlighted, press .
- ▶ To turn digital zoom on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the magnification options.

#### Set zoom limits

- ▶ With the **Limit** button highlighted, press .
- ▶ To turn set zoom limit on or off, use the  and  buttons to highlight the required state, press .
- ▶ To set the minimum  and maximum  zoom limit, use the  and  buttons to highlight the appropriate setting and press .
- ▶ Use the  and  buttons to set the required level (between 0 and 720) and press  to store the setting.
- ▶ When the limits have been set, press  to return to the magnification options.
- ▶ When turned on, zoom limits will be displayed next to the magnification value in the header bar (see below).



## Image settings

- ▶ With the image settings () option highlighted, press  and then use the  and  buttons to enable one of the following options:
  - Auto white balance
  - Black and white
  - Wide dynamic range
  - Infra red mode
  - Noise reduction
  - Save button options
  - Save format options
  - Time stamp positions
  - Metadata on/off

### Auto white balance

- ▶ With auto white balance () highlighted, press .
- ▶ To set auto white balance, press . The 'Auto white balance in progress' message will be displayed for a short time.
- ▶ When the message is no longer displayed, press  to return to the image mode options.

 **White Balance data is lost when the power is turned off. To reset white balance please follow the procedure above.**

### Black and white

- ▶ With set black and white () highlighted, press .
- ▶ To turn black and white on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the magnification options.

### Wide dynamic range

 **Wide Dynamic Range is only effective when in Automatic Exposure Mode.**

Activate wide dynamic range to enhance image information in shadow and highlight areas of high contrast subjects.

- ▶ With wide dynamic range () highlighted, press .
- ▶ To turn wide dynamic range on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the magnification options.

### Infra red mode

Activating the infra red mode removes the internal infrared filter to extend the range of sensitivity. Image is displayed in black and white to incorporate infrared wavelengths. Optionally, IR-transmitting filters (IR720) can be added to objectives for IR only imaging.

- ▶ With infra red mode () highlighted, press .
- ▶ To turn infra red mode on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the magnification options.

### Noise reduction

This function reduces the noise in the image.

- ▶ With noise reduction button () highlighted, press .
- ▶ Press  to enable the value to be set and then use the  and  buttons to set the noise reduction level between 0 and 5.
- ▶ Press  to store the setting and then  to return to the magnification options.

### Save action options

Set this option to **Freeze** to freeze image on first push of capture button with the second press to save. Or, to **Save** to save image on first push of capture button.

- ▶ With the save action button () highlighted, press .
- ▶ To turn the capture mode to **Freeze** or **Save**, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the magnification options.

### Save format options

- ▶ With the save format button () highlighted, press .
- ▶ Use the  and  buttons to highlight the required format (.png, .jpeg+, .jpeg, or .jpeg-), press  to store the format and then press  to return to the magnification options.

### Time stamp positions

- ▶ With the time stamp position button () highlighted, press .
- ▶ Use the  and  buttons to highlight the required position (Off, Up left, Up right, low left, or low right), press  to store the setting and then press  to return to the magnification options.

### Metadata on/off

- ▶ With the metadata on/off button (**METADATA**) highlighted, press .
- ▶ Use the  and  buttons to highlight either on or off, press  to store the setting and then press  to return to the magnification options.

## User interface

- ▶ With the user interface () option highlighted, press  and then use the  and  buttons to enable one of the following options:
  - Language
  - Sound
  - Crosshair size
  - Crosshair colour
  - On screen display
  - Status bar
  - Transparency
  - Supervisor mode
  - Information text

### Language

- ▶ With language () highlighted, press .
- ▶ To select the required language, use the  and  buttons to highlight on of the following:
  - English
  - French
  - German
  - Spanish
  - Italian
  - Portuguese
  - Russian
  - Chinese
  - Japanese
  - Korean
- ▶ Press  to store the change and then press  to return to the user interface options.



Selecting the language changes the language of the information text only. Menu icons are not changed.

### Sound

- ▶ With sound () highlighted, press .
- ▶ To turn the sound on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the user interface options.

### Crosshair size

- ▶ With crosshair size () highlighted, press .
- ▶ To set the crosshair size to off, short or long, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the user interface options.

 **The cross hairs will not appear if the measurement cursors are on the screen.**

### Crosshair colour

- ▶ With crosshair colour () highlighted, press .
- ▶ To set the crosshair colour, use the  and  buttons to highlight the required colour, press  to store the change and then press  to return to the user interface options.

### On screen display

- ▶ With on screen display () highlighted, press .
- ▶ To set the on screen display position to upper left, upper right, lower left, or lower right, use the  and  buttons to highlight the required position, press  to store the change and then press  to return to the user interface options.

### Status bar

- ▶ With status bar () highlighted, press .
- ▶ To set the status bar to off, or position it to upper left, upper right, lower left, or lower right, use the  and  buttons to highlight the required state or position, press  to store the change and then press  to return to the user interface options.

### Transparency

- ▶ With transparency () highlighted, press .
- ▶ To alter the transparency, press  and then use the  and  buttons to set the percentage transparency of the menu.
- ▶ Press  to store the change and then press  to return to the user interface options.

### Supervisor

- ▶ With the Supervisor mode option highlighted, press .
- ▶ Use the  and  buttons to highlight On, Off or Save and press  to select the required option.
- ▶ To create a supervisor code select Save, press  and enter the code:
  -  = 0,  = 1,  = 2,  = 3 and  = 4
- ▶ When the supervisor mode is On, the following will be disabled.
  - Exposure Settings
  - Focus Settings
  - Zoom Range lock
  - Calibration menu
  - Focus stack menu
  - Comparison menu

 **Should the supervisor code be forgotten a Factory Reset (see page 26) will need to be performed to turn off supervisor mode**

### Information text

- ▶ With information text () highlighted, press .
- ▶ To turn the information text on or off, use the  and  buttons to highlight the required state, press  to store the change and then press  to return to the user interface options.

 **Pressing the  key with the  icon highlighted will display information on the software in the device. This will tell you if you have a standard or premium key.**

## System set up

- ▶ With the system set up (⚙️) option highlighted, press (☰) and then use the (←) and (→) buttons to enable one of the following options:
  - Time (set time)
  - Date (set date and date format)
  - Reset (factory reset)
  - Frequency (set frame rate)
  - Import settings (load all settings from a USB stick)
  - Export settings (save all settings to a USB stick)
  - License

### Time

- ▶ With time (🕒) highlighted, press (☰).
- ▶ To set the time, use the (←) and (→) buttons to highlight either hours (HR) or minutes (MIN) and then press (↵) to highlight the value.
- ▶ Use the (☰) and (📷) buttons to set the required value.
- ▶ Press (↵) to store the change and then press (📷) to return to the system set up options.

### Date

- ▶ With date (📅) highlighted, press (☰).
- ▶ To change the date format, use the (←) and (→) buttons to highlight the required format and then press (↵) to store the change.
- ▶ To set the date, use the (←) and (→) buttons to highlight either date (DD), month (MM) or year (YY) and then press (↵) to highlight the value.
- ▶ Use the (☰) and (📷) buttons to set the required value.
- ▶ Press (↵) to store the change and then press (📷) to return to the system set up options.

### Reset (factory reset)

- ▶ To reset the EVO Cam II to its factory settings, ensure the reset icon (RESET) is highlighted, press (☰) and then press (↵) to carry out the reset.
- ▶ Press (📷) to return to the system set up options.

### Frequency

- ▶ With frequency (Hz) highlighted, press (☰).
- ▶ To select the required frame rate, use the (←) and (→) buttons to highlight the required frequency (50 or 60Hz), press (↵) to store the change and then press (📷) to return to the user interface options.

### Import settings from a USB stick connected to the EVO Cam II

- ▶ To import all settings from a USB memory stick, ensure the import icon (📁) is highlighted, press (☰) and then press (↵) to carry out the import.
- ▶ Press (📷) to return to the system set up options.

### Export settings to a USB stick connected to the EVO Cam II

- ▶ To export all settings to a USB memory stick, ensure the export icon (📁) highlighted, press (☰) and then press (↵) to carry out the export.
- ▶ Press (📷) to return to the system set up options.

### License

- ▶ With License highlighted, press (☰).
- ▶ To import or export the license key, use the (←) and (→) buttons to highlight the option and then press (↵).

## Image replay settings

With the Image replay settings  option highlighted, press  and then use the  and  buttons to enable one of the following options:

- Comparison overlay
- Image playback

### Comparison overlay

- ▶ With the Comparison overlay icon  highlighted, press  then use the  and  buttons to highlight the Load image icon  and press  to load the image from USB stick (in the root directory of the drive).
- ▶ Use the  and  buttons to scroll through the images and press  to select the required image.
- ▶ Use the  and  buttons to highlight the Timer icon , press  and use the  and  buttons to set the required comparison time (from 0.25 seconds to 10 seconds).
- ▶ Use the  and  buttons to highlight the On button and press . The current display image will be compared to the loaded image by switching between the two at the timer rate set.
- ▶ To stop the comparison, use the  and  buttons to highlight the Off button and press .
- ▶ If the required overlay image has already loaded, use the  and  buttons to select the On button and press . The comparison will start at the currently set timer rate.
- ▶ To delete the loaded image use the  and  buttons to highlight the  button and press .

### Image playback

- ▶ With the Image Playback icon  highlighted, press the  to enter image playback mode. This mode will playback images stored in the root directory of a USB stick
- ▶ Use the  and  buttons to scroll through the images.
- ▶ Press  and then  again when prompted to exit playback mode.

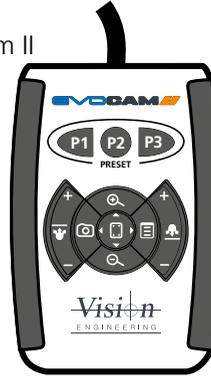
## Focus stacking - premium software key only

- ▶ With the Focus stacking icon  highlighted, press .
  - ▶ If a stack has already been created, use the  and  buttons to highlight the On button and press . This will display the last saved focus stack output.
  - ▶ To return to the normal camera image, use the  and  buttons to highlight the Off button and press .
  - ▶ To set the Minimum focus, use the  and  buttons to highlight the Minimum focus icon , press  and use the  and  buttons to set the required value.
-  **The minimum focus point is the focus point closest to the camera.**
- ▶ To set the Maximum focus, use the  and  buttons to highlight the Minimum focus icon , press  and use the  and  buttons to set the required value.
-  **The maximum focus point is the focus point furthest away from the camera.**
- ▶ To select the number of images to create a composite image from, use the  and  buttons to highlight the Number of images icon , press  and use the  and  buttons to select the required number then press  to save the value.
  - ▶ To start the focus stacking process, use the  and  buttons to highlight the Start focus stacking algorithm icon  and press . The composite image will be displayed when the processing is complete.
  - ▶ To delete the stored images, use the  and  buttons to highlight the Delete icon  and press .

## Using the remote keypad (optional)

The optional remote keypad can be used with EVO Cam II and has identical controls to the EVO Cam II's front panel with the exception of the On/Off button but with the addition of three hotkeys (P1 to P3). These hotkeys allow one of 10 presets to be assigned to each of them (see [page 21](#)).

- ▶ Press a hotkey (P1 to P3) to activate the preset settings allocated to the hot key.



### Auto/Manual exposure switch

- ▶ Press P1 for 3 seconds until the EVO Cam II beeps to quickly switch between Automatic exposure and manual exposure modes.
- ▶ Switch back by following the same procedure.

### Front Panel Lock

The remote keypad can be used to lock out the access to the menu from the front of the EVO Cam II unit.

- ▶ Press P2 for 3 seconds until 'Front Panel Lock On' is displayed on the screen.
- ▶ Disable the lock by following the same procedure.

### Auto/Manual focus switch

- ▶ Press P3 for 3 seconds until the EVO Cam II beeps to quickly switch between Automatic focus and manual focus modes
- ▶ Switch back by following the same procedure.

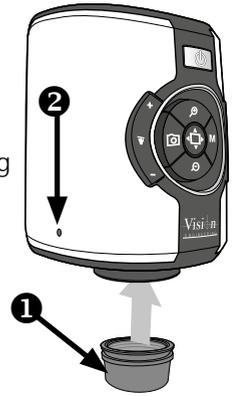
### Quick Auto White Balance

- ▶ Press the  button for 3 seconds until the Auto White Balance message appears to perform a quick auto white balance.

## Changing the camera objective lens

- ▶ Holding the lens barrel **1** from the bottom, use the HEX key supplied to partially unscrew the grub screw **2** releasing the lens from its housing.
- ▶ While holding the objective lens **1** in position, use the HEX key supplied to secure the lens by tightening the grub screw **2**.

**!** Do not over tighten the grub screw holding the lens in place.



## Using the Video Out via USB 3.

- ▶ Connect the USB 3 cable supplied with the system to the connection on the back of the EVO Cam II unit.
- ▶ Connect the other end of the cable to a free USB3 port on a PC.
- ▶ The video output from the camera is a Direct Show Video signal which can be used by a wide range of video viewers. (Windows 10 Camera App, AMCap, and many others)
- ▶ A number of software suites are available from Vision Engineering which allow for control of the camera functions via PC.
- ▶ Contact your local Vision Engineering Sales Representative for more information on the software available.

# Troubleshooting

## Taking care of your EVO Cam II

Do not touch the lens. Dirt on the lens will appear as a blurred or dim image or as fuzzy spots on the screen. If you believe the lens is dirty, it can be cleaned with a soft, dry cloth applying minimal pressure. As the lens is polished and coated, do not use a wet or coarse cloth, avoid detergents and abrasive substances or solvents to clean it.



**Never look directly at the LED light source for any prolonged period of time.**

Use only the supplied power supply and inspect the cabling regularly for damage.



**EVO Cam II contains a small battery to enable time and date settings to be retained while the unit is powered off. Should the battery need replacing please contact your Vision Engineering representative who will be able to advise you.**

## Firmware upgrade

EVO Cam II includes a Firmware Upgrade Function allowing users to install new versions of the firmware.

Any update files will be provided directly from Vision Engineering.

- ▶ Place upgrade file on USB stick
- ▶ Insert stick into EVO Cam II
- ▶ Ensure EVO Cam II is in Standby State (e.g. unit is powered on at the mains, but not switched on and the power LED is not lit)
- ▶ Hold down Zoom In + Zoom Out, then simultaneously press the Power button until front panel LED starts flashing red.
- ▶ The flashing will stop when software update is complete
- ▶ Power off the unit at the mains and switch on again.
- ▶ Unit can be powered on as usual
- ▶ Verify the software update by checking the unit software version number (navigate on the menu to the information text option (i) and press the overview button while the (i) is highlighted)

<b>Camera resolution:</b>	HD 1080p, 1920x1080 at 50/60 Hz
<b>Monitor connections:</b>	HDMI
<b>Monitor requirements:</b>	HD ready or full HD (recommended)
<b>Outputs:</b>	HDMI, USB3.0
<b>Image capture:</b>	USB 2.0 High-speed
<b>Dimensions:</b>	11 x 16.5 x 14 cm (w x h x d)
<b>Power:</b>	Max. 72 Watts - depending on external attachments
<b>Operating temperature:</b>	Storage: -10°C to +60°C. Operating: +5°C to +40°C



*Vision*  
ENGINEERING  
**WARRANTY**

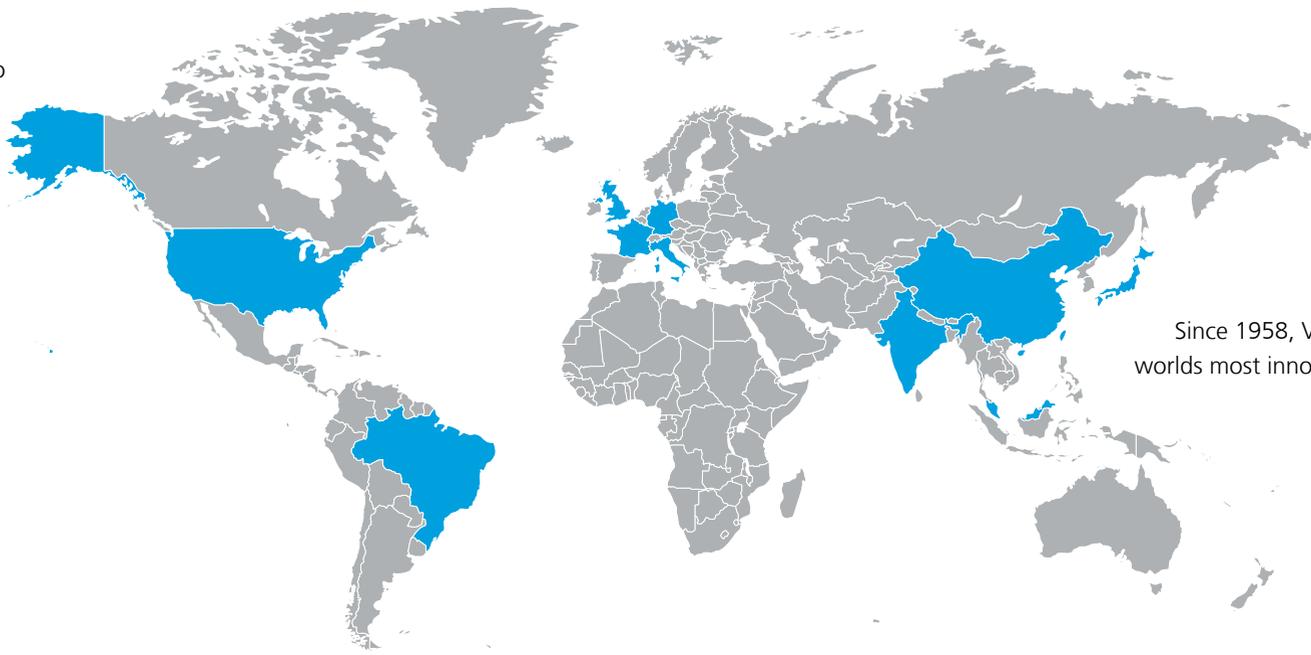
This product is warranted to be free from defects in material and workmanship for a period of one year from the date of invoice to the original purchaser. If during the warranty period the product is found to be defective, it will be repaired or replaced at facilities of Vision Engineering or elsewhere, 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.

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Since 1958, Vision Engineering has become one of the worlds most innovative and dynamic microscope suppliers.



### For more information...

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