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# Operating instructions
## Video microscope

**KERN** **OIV 345, OIV 901, OIV 902**

Version 1.1
2024-07
EN

EN

# KERN OIV-3

Version 1.1 07/2024

**Operating instructions Video microscope**

Table of contents

# 1 Technical data

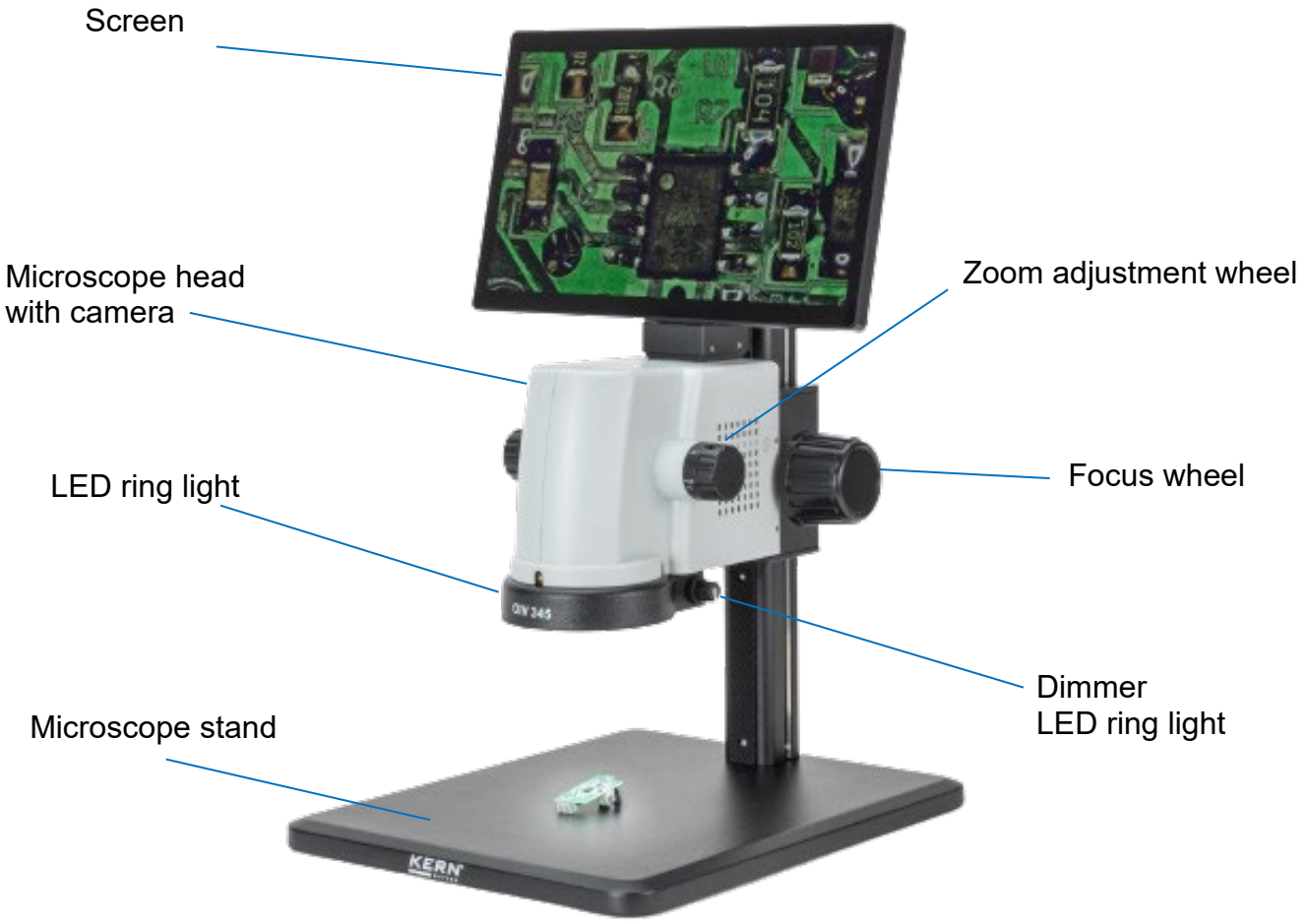
| CORE | OIV 345 |
|---|---|
| Item number/type | TOIV 345-B |
| Optical system | Greenough System |
| Lighting | LED ring light 3.3 W |
| Dimmable lighting | Yes |
| Stand | Mechanical, upright height 325 mm,<br>base plate 260x320 mm |
| Optical zoom | 0.7x - 4.5x |
| Digital zoom | 17x - 110x |
| Magnification ratio | 6,4 : 1 |
| Field of vision | Ø 17.6 - 1.47 mm |
| Tilting the screen | 48° |
| Screen size | 11.6 inch |
| Screen sharing | 1920x1080 HD |
| Camera resolution | 5 MP |
| Sensor | SONY CMOS 1/2.8" |
| Real-time refresh rate | 60fps / 1920x1080 |
| Recording | 60fps / 1920x1080 |
| Output interface | HDMI |
| Input interface | USB 2.0 2x |
| Storage of data | Snapshot, Recording, USB |
| Camera parameters | Exposure, white balance, gain, gamma, brightness, contrast, hue, saturation, grayscale |
| Measurements | Point, line, parallel lines, dashed lines, angle, diameter circle, radius circle, three-point circle, distance from circle to line, concentric circles, double circle, vertical line, any line, polygon, arc, marking, screenshot, table data export, calibration, parameter settings |
| Other functions | Mirror horizontally, mirror vertically, freeze |
| Languages | German, English, French, Italian, Russian, Japanese, Chinese |
| Net weight | 4 kg |
| Product dimensions WxD | 260x320 mm |
| Gross weight | 6 kg |
| Packaging dimensions | 425x395x240 mm |

## 2 Declaration of conformity

The current EC/EU Declaration of Conformity can be found online at:

https://www.kern-sohn.com/shop/de/DOWNLOADS/

## 3 Device overview




# 4 Before use

## 4.1 General information

The packaging must be opened carefully to prevent the accessories inside from falling to the floor and breaking.

In general, a microscope should always be handled with great care, as it is a sensitive precision instrument. Avoiding abrupt movements during operation or transportation is therefore particularly important, especially to avoid endangering the optical components.
You should also avoid dirt or fingerprints on the lens surfaces, as in most cases this impairs the sharpness of the image.

If the performance of the microscope is to be maintained, it must never be disassembled. Parts such as objective lenses and other optical components should therefore be left as they are at the start of operation.

# 5 Basic information (general)

## 5.1 General information on warnings

Warnings are used in these operating instructions to warn you of possible personal injury or damage to property in certain situations.

| Signal word | Description |
|---|---|
| **DANGER** | Failure to observe the instructions will lead directly to serious injury, permanent impairment (e.g. loss of a limb) or death of the user or third parties |
| **WARNING** | Failure to observe the instructions may result in serious injury, permanent impairment (e.g. loss of a limb) or death of the user or third parties |
| **CAUTION** | Failure to observe the instructions may result in minor injuries or temporary damage to the user or third parties (e.g. minor cuts) |
| **NOTE** | Failure to observe the instructions may result in damage to property |

**Symbols in warning notices:**

| Icon | Meaning |
|---|---|
| **Warnings** | Warning signs warn you of dangers that could lead to injury. The symbol indicates the type of danger. |
|  | Indicates general hazards or a danger point |
|  | Warning of electrical voltage |

| Icon | Meaning |
|---|---|
| **Commandment sign** | Mandatory signs prescribe measures that you must take to avoid personal injury or damage to property. The symbol indicates the necessary actions or objects to prevent damage. |
|  | Indicates a prescribed action |

### 5.2 Intended use

The OIV 345 is very well suited for inspection and quality control.

### 5.3 Improper use

The OIV 345 must not be used for medical purposes.
Do not use the device in potentially explosive atmospheres or for measurements in liquids or on live parts.
Unauthorized structural changes, additions and conversions to the appliance are prohibited.

### 5.4 Warranty

The guarantee expires in the event of

- Non-compliance with our specifications in the operating instructions
- Use outside the described applications
- Changing or opening the device
- Mechanical damage and damage caused by media, liquids, natural wear and tear
- Improper set-up or electrical installation
- Improper assembly or electrical installation

## 5.5 Notes on the electrical system

Before connecting the device to the mains, you must ensure that you are using the correct input voltage. The information for selecting the correct mains cable can be found on the device, on the back of the product directly above the connection socket. It is essential that you follow this information. If you do not adhere to these instructions, this may result in fire or other damage to the appliance.

The main switch must also be switched off before the mains cable is connected. In this way, you avoid triggering an electric shock.

If you are using an extension cable, the mains cable you are using must be earthed. Only carry out work that comes into contact with the electrical system of the appliance when it is de-energized.

## 5.6 Storage and transportation

Avoid exposing the device to direct sunlight, high or low temperatures, shocks, dust and high humidity.

The suitable temperature range is 0 - 40 °C and a relative humidity of 85% should not be exceeded.

The appliance should always be placed on a firm, smooth and horizontal surface.

When the microscope is not in use, it is best to cover it with the dust cover supplied. Dust or dirt inside the optics of a microscope can in many cases lead to irreversible malfunctions or damage.

Accessories consisting of optical elements, such as additional lenses, are preferably stored in a drying box with desiccant.

**Note**

If you store or transport the device improperly, the device may be damaged. Observe the instructions for transporting and storing the appliance.

**Packaging / return transportation**

Returns are only possible within the framework of the General Terms and Conditions Keep all parts of the original packaging for any necessary return transportation.

- Only the original packaging may be used for return transportation.
- Disconnect all connected cables and loose/movable parts before shipping.
- Reattach any existing transport locks.
- Secure all parts against slipping and damage.

# 6 Basic warnings and safety instructions

## 6.1 Observe the notes in the operating instructions

Read the operating instructions carefully before commissioning/using the device, even if you already have experience with KERN devices. Always keep the instructions in the immediate vicinity of the appliance.

## 6.2 Staff training

The appliance may only be used by persons who have read and understood the operating instructions, in particular the chapter on safety.

## 6.3 Safety

| ⚠ WARNING | |
|---|---|
|  | **Read all safety information and instructions.**<br>Failure to observe the safety information and instructions may result in electric shock, fire and/or serious injury.<br>**Keep all safety information and instructions for future reference.**<br>● The design of the device must not be modified. This can lead to incorrect measurement results, safety defects and destruction of the device<br>● Do not operate the appliance in potentially explosive rooms or areas and do not install it there.<br>● Do not operate the device in an aggressive atmosphere.<br>● Do not immerse the appliance in water. Ensure that no liquids penetrate the inside of the device.<br>The device may only be used in a dry environment and under no circumstances in rain or relative humidity above the operating conditions.<br>● Protect the device from permanent direct sunlight.<br>● Do not expose the appliance to strong vibrations.<br>● Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in a legible condition<br>● Do not open the device<br>● The lamp generates a lot of heat during operation. Avoid touching the lamp housing during operation and for some time afterwards.<br>● Do not operate the device in an aggressive atmosphere. |

## ⚠ WARNING

**Risk of injury due to electric shock!**
● Risk of short circuit due to penetration of liquids into the housing!
● Do not immerse the appliance or accessories in water. Make sure that no water or other liquids get into the housing.
● Work on electrical components may only be carried out by an authorized specialist company!
● Take care not to twist or kink the mains cable.
●Only use the original adapter supplied.

## ⚠ WARNING

**There is a risk of suffocation!**
Do not leave the packaging material lying around carelessly. It could become a dangerous toy for children.
The appliance is not a toy and does not belong in the hands of children.
● This appliance can be dangerous if it is used improperly or not as intended by untrained persons! Observe the personell qualification**!**

## ⚠ WARNING

**Electrostatic sensitive device!**
● The device can be destroyed by electrostatic discharges. Connectors for HF signals are particularly at risk.
Please observe the handling instructions for electrostatically sensitive components.

## CAUTION

Keep a sufficient distance from heat sources.
Do not use the device in environments with high humidity or water mist

## NOTE

To avoid damaging the device, do not expose it to extreme temperatures, extreme humidity or moisture.
● Do not use harsh cleaning agents, abrasives or solvents to clean the appliance.

# 7 Unpacking and commissioning

## 7.1 Unpacking

! In the event of a return shipment, please observe the instructions in the chapter "Packaging/return transportation

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On receipt of the device, please check in advance whether there is any damage caused during transportation and whether the outer packaging, the housing, other parts or even the device itself are damaged. If any damage is apparent, please notify KERN & Sohn GmbH immediately.

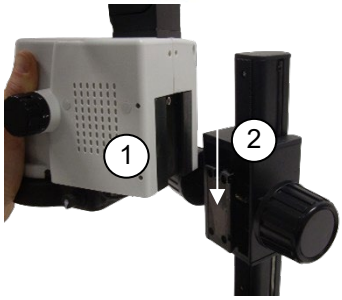
# 8 Assembly

## 8.1 OIV 345 with microscope stand

**Microscope stand**

Attach the microscope stand with the base plate and the supplied M5 threaded screws (3x). Tighten the screws on the underside of the plate using the M5 hexagon tool supplied.

Set up the microscope stand after successful assembly.




**Microscope head**

Then insert the microscope head (1) into the guide on the holder (2) of the microscope stand.

To attach the microscope head to the stand, tighten the screws (2x) on the outside of the housing using the Allen key supplied.

**Power connection**

Plug the mains cable into the connection on the microscope.
*Note: Take* care not to twist or kink the mains cable. Only use the original adapter supplied.

## 8.2 OIV 901/902 with universal stand

**Universal stand**

Attach the microscope column to the edge of the table using a clamp (OIV 901) or screw the base plate to the table using the M8 threaded screws (4x) supplied (OIV 902).


Insert the movable arm into the microscope column and tighten the locking screw (1). Now loosen the knurled screw (2) and insert the holder for the microscope head into the shaft.


Secure the holder for the microscope head (3) with the knurled screw (4) to prevent it from falling down.


**Microscope head**

Then insert the microscope head (1) into the guide on the holder (2) of the microscope stand.

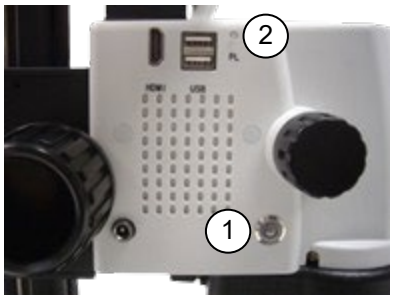
To attach the microscope head to the stand, tighten the screws (2x) on the outside of the housing using the Allen key supplied.

**Power connection**

Plug the mains cable into the connection on the microscope.
*Note: Take* care not to twist or kink the mains cable. Only use the original adapter supplied.

## 8.3 Operation and function of the microscope

When the microscope is ready for use after assembly, it must first be connected to the mains via the mains cable. Only insert the mains plug into a suitable socket. Ensure that the mains cable is laid correctly.
The following sections describe all the important functions that are useful for operating the device.




### Switching on the device

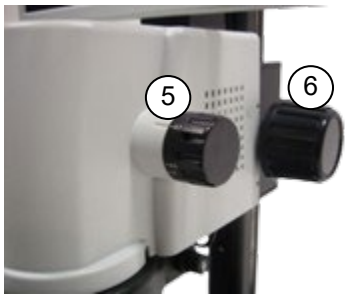
To switch the microscope on, press the On/Off button (1) until it is backlit in blue. The LED operating indicator (2) (PL) lights up green as soon as the microscope is switched on. The system now starts in operating mode.


### Switching the lighting on and off

The switch for the ring lighting is located on the side of the ring light. To switch the lighting on/off, press the switch (3).


### Setting the illuminance

Turn the dimmer for the lighting (4) on the right rear side of the ring light to adjust the lighting.




### Set magnification and focus

As the OIV series are zoom microscopes, the zoom factor (0.7x-4.5x) can be changed using the zoom adjustment wheel (5). Turn the dial to the maximum magnification. Focus the image using the focusing wheel (6). Repeat the process if necessary. *Note*: The max/min parfocality is already optimally preset on delivery.


**Connections and interfaces**

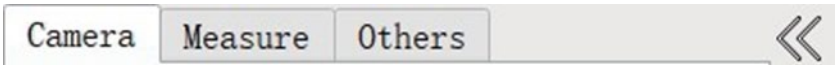
The device has an internal and external software application.
Internal software via the screen:
To operate the software, a mouse must be connected via the USB port. To do this, plug the USB receiver, which is located in the battery compartment of the wireless mouse supplied, into one of the two USB slots (7).
A USB stick (max. 128 GB) must be connected for data storage.
External software via a PC / laptop:
The video microscope can be connected to a PC/laptop via a USB cable (type A to typ A). To do this, connect the USB cable to one of the two USB slots (7) and to a USB port on the PC/ laptop.
The external software is available for download at https://www.kern-sohn.com/shop/de/downloads.
The picture can be transmitted to another output device via the additional HDMI output (8).

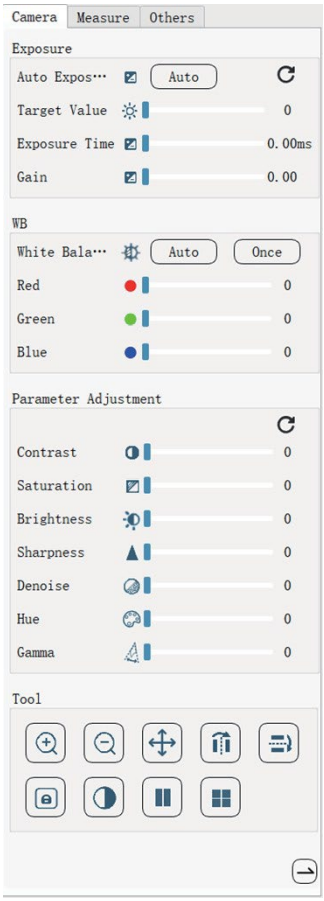

**MicroSD card connection**

There is a slot for a microSD memory card on the back of the device. The connection offers an additional option for saving data (max. 128 GB). Use a pointed object to push the MicroSD memory card into the card slot until it is fully engaged.

# 9 Operation and functionality of the software

## 9.1 Camera menu




Click on the **camera** to switch to the camera page, set the relevant camera parameters and use the corresponding tools.

## 9.2 Exposure and white balance



Automatic exposure is activated. The target value can be set by  dragging the slider to the left or right.

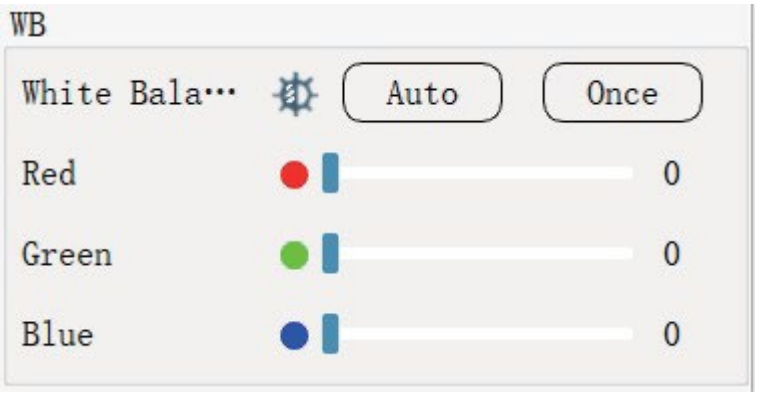
This deactivates manual adjustment of the exposure time or the amplifier (gain)




Automatic exposure is deactivated. The target value cannot be changed

 Exposure time and amplifier (gain) can be  set manually using the sliders.

 Click this button to reset the exposure parameters and activate automatic exposure.




Auto automatic white balance is activated.

Manual adjustment of the red, green and blue levels is not possible

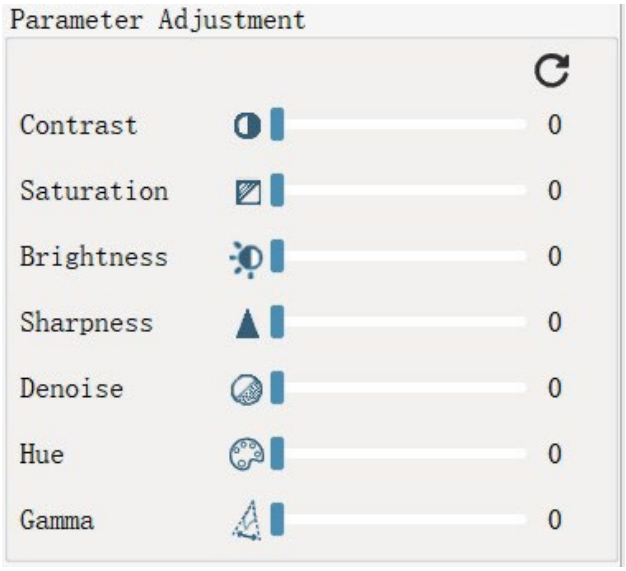
The RGB values are regulated automatically by the camera.

Auto Automatic white balance is deactivated.

The parameters for red, green and blue levels can be adjusted manually. To do this, drag the slider to the left or right accordingly.

Once This function is a one-time white balance. Click once and the camera automatically sets the values for red, green and blue levels.

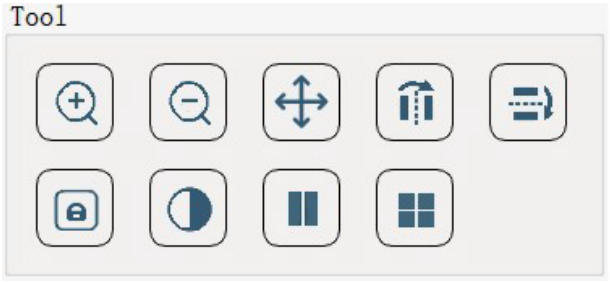
### 6.1 Adjust parameters




Drag the slider to the left or right to increase or decrease the values.

Click on this button to reset all parameters to their default values.

## 9.3 Control elements




 Magnification: Magnification of the camera. The middle of the magnification is determined by the position of the previous magnification of the scroll wheel; if the scroll wheel has not been magnified, it is set to the middle magnification by default.

*Note*: The magnification is reset to 1.0X after opening the gallery. The magnification can also be increased using the mouse wheel.

 Reduce: Reduce the magnification of the camera. The center of the magnification is determined by the position of the last magnification, the next magnification is determined by the position of the last magnification, etc.

*Note*: The magnification is reset to 1.0X after opening the gallery. The mouse wheel can also reduce the magnification.

 Move: If the current magnification factor is greater than 1.0, you can press and drag the left mouse button after clicking to move the current camera image.

 Mirror horizontally: The entire image is mirrored horizontally. The result of this process is that the point in the top right-hand corner swaps position with the point in the top left-hand corner and the point in the bottom right-hand corner swaps position with the point in the bottom left-hand corner.

Vertical mirroring: The entire image is mirrored vertically. The result of this process is that the dot in the top right-hand corner swaps position with the dot in the bottom right-hand corner and the dot in the top left-hand corner swaps position with the dot in the bottom left-hand corner.

To prevent damage to the focusing system, the left and right adjustment wheels of the coarse and fine drive must never be turned in opposite directions at the same time.

Freeze: Freezes the image displayed by the current camera.

*Note*: Increase in power, decrease in magnification, horizontal tilting, vertical tilting,

Monochrome and quad split screen cannot be performed in the current state. Freezing is automatically switched off when the gallery is opened.

Monochromatic: The color of the current frame is removed.

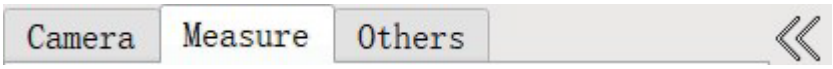
Comparison: After clicking, first open the gallery and then the photo or video to display the left and right frame. The left frame is the image of the current camera, and the right frame is the selected photo or video. The slider at the bottom moves to the left and right to show the incomplete display area of the camera image or the photo or video.

*Note*: The video contrast is only effective when the video is being played.

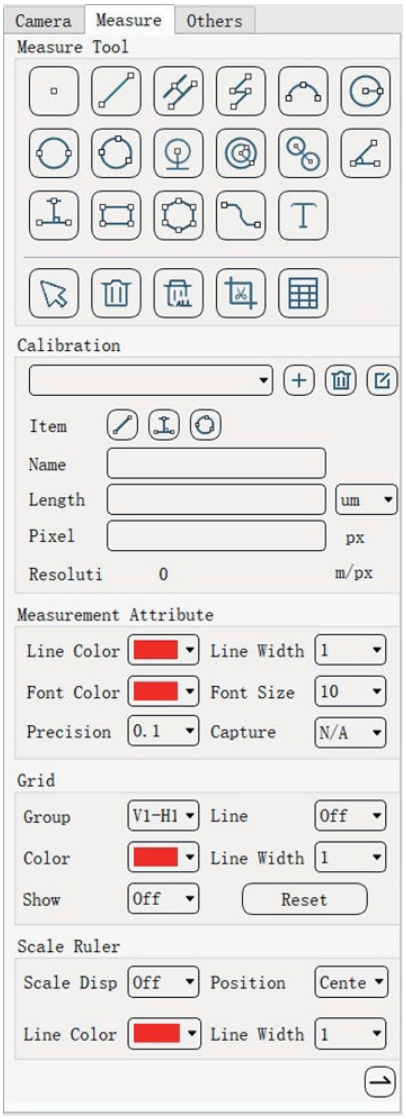
Four-part screen: After clicking, the screen is divided into four parts. Left-click on one of the screens to freeze it and click again to unfreeze it. Click on the quartered screen again to exit the quad screen. Exit the quad screen automatically when you open the gallery or the contrast.

*Note*: The measurement cannot be carried out if the quartering mode is open.

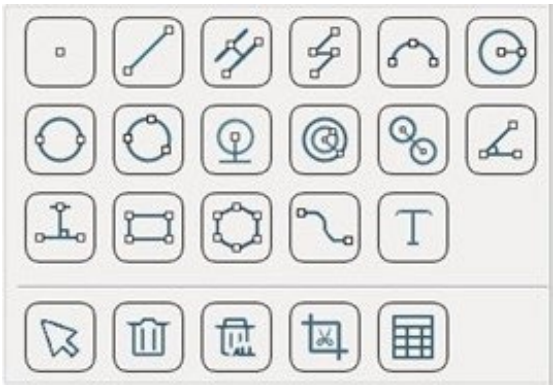
## 9.4 Measurements




Click on **Measure** to switch to the measurement page, take measurements and change measurement attributes. As shown in the illustration on the right.




## 6.2 Measuring tools



Point: Move the mouse pointer to the position to be measured, click the left mouse button and raise it to complete the drawing and display the corresponding coordinates.

*Note*: The coordinate values change depending on the position of the scale and the size of the calibration.

Line: The first click selects the starting point, the second click completes the line drawing and displays the line and its length.

*Note*: The length of the line depends on the size of the calibration.

Parallel line: The first click selects the starting point, the second click identifies a line, and the third click draws parallel and vertical lines between the two lines.

*Note*: The distance between the parallel lines depends on the size of the calibration.

Polyline: Click the left mouse button to get the different activities, after completion, click the right mouse button to stop, and show the total length of all lines.

*Note*: The length of the dashed line depends on the size of the calibration.

Arc: Select three points at different positions and draws an arc according to the distance between the three points and displays the radius and angle of the arc.

*Note*: The radius of the arc depends on the size of the calibration.

Radius circle: select the center of the circle, click the left mouse button and lift off, move the mouse, reach the point on the arc, click the left mouse button again, the operation is completed, select a circle corresponding to the two points, display the radius.

*Note*: The radius of the circle depends on the size of the calibration.

Diameter of the circle: Select a point on the arc, click the left mouse button, move to another point on the arc, click the left button again, the operation is completed, after the two points mark a circle, show the radius.

*Note*: The radius of the circle depends on the size of the calibration.

Three-point circle: With the left mouse button click three points in different positions, after the three points mark a circle, and show the radius of the circle.

*Note*: The radius of the circle depends on the size of the calibration.

Circle to line: the left mouse button click on two points in different positions, after the two points mark a circle, click the left button again, the point and the center of the circle mark a line after the point to do the vertical line of the line, show the distance from the point to the center of the circle.

*Note*: The distance between the circle and the line depends on the size of the calibration.

Concentric circles: Select the center of the circle, left-click and raise it, move the mouse to the point on the arc, click again, select the first circle corresponding to the two points, move the mouse to the end, left-click to raise it, select the second

circle corresponding to the center of the circle and the end point, and display the radius of the double circle.

*Note*: The radius of the circle depends on the size of the calibration.

Double circle: Click three points at different positions with the left mouse button, select a circle corresponding to the three points, select three points at different positions again, click the left mouse button, select a circle in the same way, display the distance between the two circle centers.

*Note*: The length between the two centers depends on the size of the calibration.

Angle: The left mouse button click on three different positions of the point, after the three points to form two lines, show the angle of the two lines.

Vertical line: click the first time to select the starting point, click the second time to define a line, click the third time after the third point to form a vertical line, display a short line perpendicular to the line, display the length of the vertical line.

*Note*: The length of the vertical line depends on the size of the calibration.

Rectangle: Select the upper left corner of the rectangle, click the left mouse button to raise it, move the mouse to the lower right corner of the rectangle, click the left mouse button again to raise it, the operation is completed, the area and perimeter of the rectangle are displayed.

*Note*: The area and circumference of the rectangle change depending on the size of the calibration.

Polygon: Click the left mouse button to get each active point, after completion, click the right mouse button to stop, show the area and perimeter of the polygon.

*Note*: The area and circumference of the polygon change depending on the size of the calibration.

Any line: Move the mouse pointer to the position to be measured. Press the left mouse button and move it to draw any line. Press the left mouse button to complete the drawing.

Text: Move the mouse to the position to be measured, click on two points with the left mouse button, draw an arrow corresponding to the two points and open the input field. Click OK after the input in the input field is completed, and the entered text will be displayed from the end point of the input text. If you click Cancel, no text is entered, only the arrow is displayed.

Move: After clicking this icon, the mouse can capture the drawn points, line segments and circles. If the point clicked on is a measured point that has been drawn, you can change the size and position of the point. If this is not the case, switch to full movement.

*Note*: Polylines, polygons and arbitrary lines cannot move as a whole. If the whole thing moves, the text moves with it. If the position of the click is text, the text can be moved separately.

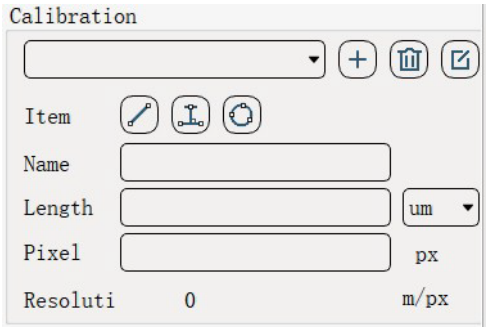
Delete: Click on this icon and left-click on the drawn measurement to delete the measurement.

Delete all: After clicking on this symbol, a reminder message appears. If yes, delete everything. If no, delete everything.

Screenshot: Capture the current image. Take screenshots without adding them to the toolbar with various prompts.

Table: To view the details of all currently drawn line segments, click Export to export the Excel file saved in the MEASUREMENT folder on the USB stick.

## 9.5 Calibration setting




Select the currently saved calibration options.

 Add calibration: Click to enter the "Add Calibration" mode, enter the name and length, and then click the "Save" button to save the newly created calibration.

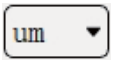
 Delete calibration: Deletes the currently selected calibration.
*Note*: The first calibration cannot be deleted.

 Edit calibration: Edit the currently selected calibration.

 Straight line calibration: Switches the current calibration to a straight line.

 Vertical calibration: Switches the current calibration to vertical.

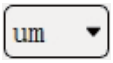
 Three-point circle calibration: Switches the current calibration to three-point circle.



Unit: Switches the current calibration unit.

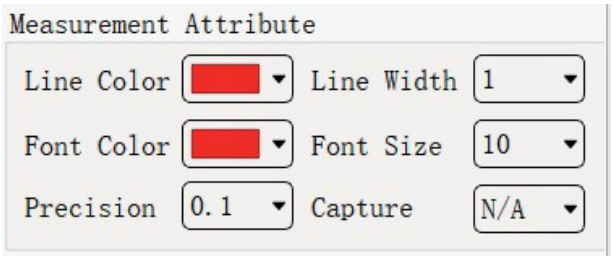
Add a new calibration: Click on  to add a new calibration, the delete calibration cannot be clicked at this point, the selection field for the calibration is empty. Select the calibration style  and click on the name input field, the keyboard appears. Enter the name or click  to close the keyboard and finish entering the name. Click on the input field for the length to call up the numeric keypad. After entering , click on  to close the numeric keypad and complete the name entry. Click on the drop-down field for the unit to complete the unit change. Click on  to save the calibration. Adding the calibration completed.

Edit the order of calibration: Click Select calibration,  then the calibration selection bar, new calibration and delete calibration cannot be clicked. Select the desired calibration style,  click on the name and the keyboard will appear. After completing the entry, click ENTER or  to close the keyboard and finish entering the name. Click on the input field for the length to call up the numeric keypad. When you have finished entering, click on  to close the numeric keypad and complete the name entry.

Click on the  drop-down field for the unit to change the unit and click on  to save the calibration. Edit calibration completed.

Delete calibration sequence: Select the calibration you want to delete in the selection bar  and click on  to delete the calibration.

## 9.6 Measurement attributes




:

Line Color (Line Color): After clicking, a drop-down field appears. After selecting the color, you can change the color.

*Note*: The measured color that was drawn is also changed.

Line width (Line Width): After clicking, a drop-down field appears. Select the width and change the line width.

*Note*: The width of the measured line width that was drawn is also changed.

Font color (Font Color): After clicking, a drop-down field appears. Select the color and change the font color.

*Note*: The font color of the drawn measurements is also changed.

Font size (Font Size): After clicking, a drop-down field appears in which you can select the size and change the font size.

*Note*: The font size of the drawn dimensions also changes.

Accuracy (Precision): The drop-down box appears after clicking, select the precision option and change the precision.

*Note*: The accuracy of the plotted measurements will also change.

## 9.7 Scale ruler


Display of the scale (Scale Disp): If you switch to On, the scale is displayed; if you switch to Off, the scale is closed.

Position: Switches the position displayed on the scale. If it is switched to the center, the reference point of the scale is in the center; if it is switched to the top left, the reference point of the scale is at the top left; if it is switched to the bottom right, the reference point of the scale is at the bottom right.

Color (Line Color): Click on the drop-down box that appears and select the color you want to change.

Width (Line Width): Switches the width of the scale of the scale.

## 9.8 Further settings


Click **Others to switch** to other pages to view and change the properties of the system.

## 9.9 Languages


Select language

### 9.10 Storage space

If the USB flash drive has several drives, you can select the drive on which the files are to be saved.

### 9.11 Resetting the data to the factory settings

After the factory settings have been restored, the exposure parameters are reset to the default values and automatic exposure is activated. Reset the white balance parameters to the default values and activate manual white balance. Contrast, saturation, brightness, sharpness, noise reduction, hue and gamma are reset to the default values.

Magnification zoom, screen movement, screen flip, freeze, monochrome, four-screen does not participate in factory restore.

The color of the measurement attribute is reset to red, the line width is reset to 2, the font color is reset to red, the font size is reset to 10, the accuracy is reset to 0.01 and the detection is reset to 10px.

The group color of the grid line V1-H1 is reset to red, the line is set to Off and the line width is reset to 1.

The group color of grid line V2-H2 is reset to orange, the line is reset to Off and the line width is reset to 1.

The group color of grid line V3-H3 is reset to yellow, the line is reset to Off and the line width is reset to 1.

The group color of the grid lines V4-H4 is reset to green, the lines are reset to Off and the line width is reset to 1.

The group color of grid line V5-H5 is reset to cyan, the line is set to Off and the line width is reset to 1.

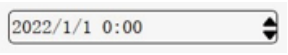
The group color of the grid lines V6-H6 is reset to blue, the line is reset to Off and the line width is reset to 1.

The group color of the grid lines V7-H7 is reset to violet, the line is set to Off, the line width is reset to 1.

The color of the VB-HB group line is reset to white, the line to Off and the line width to 1.

The Group name option is reset to the first group V1-H1 and the display is reset to On. The scale display is reset to Off, the position is reset to the middle, the color is reset to red and the width is reset to 1.

### 9.12 Set date / time

Change the time in 

Click the mouse to change the year or month or day or hour or minute or second, the mouse wheel increases or decreases after the cursor flickers at the top, also you can click the small arrow on the right to change the setting system time. Click on 

to modify the system time.

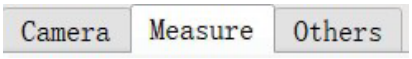
### 9.13 Switch between two displays

If you connect the monitor, you can control the display on the monitor or on the small screen here. If you connect HDMI before switching on, the system automatically displays the screen.

*Note*: You cannot switch when you are recording the screen. After you have clicked on the switch, the time-lapse photo will end automatically.

### 9.14 Move and hide toolbar

 This button hides the side toolbar. If the current toolbar page is the measurement page.

If you click on the "Measurement tool" 

button in the left toolbar (with the exception of "Delete all", "Screenshot" and "Table") and move the mouse over the left toolbar, the left toolbar is automatically hidden. If you want to show it, you can click the button  in the upper left corner to show it or click  to show the left status bar.

There is a move button  at the bottom of the camera, measurement and other pages in the left status bar, which can be clicked to move the left status bar to the right, and the simple measurement tool on the right will be moved to the left when it is displayed.

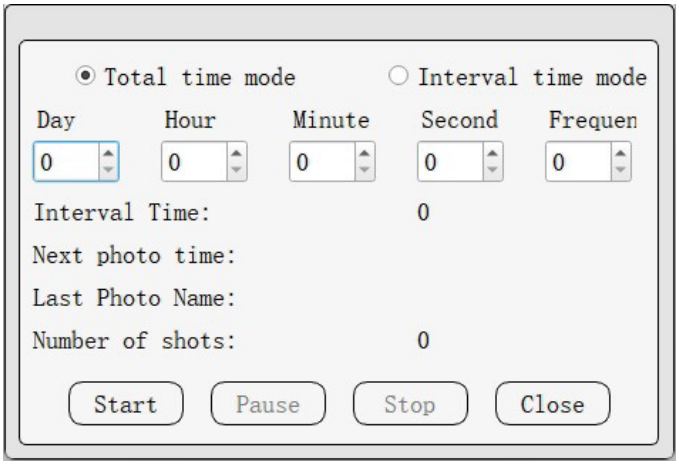
# 10 Toolbar

## 10.1 Camera

When the system recognizes that the USB flash drive is inserted and the available capacity is sufficient, click  to start recording. The top right corner will show that the photo is being saved. During this time, the camera button cannot be clicked again. The camera button can only be clicked when the message "Recording successful" is displayed in the top right-hand corner. The captured photo is named according to the current system time. Once the photos have been successfully saved, you can open the gallery to view the photos taken.

## 10.2 Camera timer

 If the system recognizes that the USB flash drive is inserted and the available capacity is sufficient, the timer page of the camera is displayed.




Total time mode (Total time mode): Set the timer mode to the number of photos taken in total time.

Interval time mode (interval tome mode): Set the interval at which a photo is taken.

Day (Day): Set the number of days. Click with the mouse, scroll wheel or click on the small button to control the increase or decrease.

Hour (Hour): Set the hours. Click with the mouse, scroll wheel or click on the small control button to increase or decrease.

Minute: Set the minutes. Click the mouse, scroll wheel or click the small button to increase or decrease the control.

Second (Second): Set the second speed. Click the mouse, scroll wheel or click the small control button to increase or decrease the speed.

Frequency: Specify the number of recordings. Click the mouse, scroll wheel or click the small control button to increase or decrease the frequency.

Interval Time (Interval Time): Displays the time interval for each photo taken in the current mode.

Time for next photo (Next photo time): Shows how much time is left until the next photo is taken.

Name of the last photo (Last photo name): Displays the name of the last photo taken.

Number of shots (Numbers of shots): Number of timed photos taken this time

Start: The camera timer starts.

*Note*: Time photography cannot be activated if the interval is less than two seconds.

Pause: The camera timer pauses.

Stop: Camera timer is stopped

Close: Closing the camera timer window and stopping the camera timer

### 10.3 Video recording

If the system recognizes that the USB flash drive is inserted and the available capacity is sufficient, click on the Video button  to start recording. The status of the button is 

The recording time and the indicator  are displayed in the top right or left corner. Click the video button again to end the video recording. At this time, the upper right or left corner will display that the recording is being saved and the video recording button cannot be clicked. When the saving process is complete, the success of the recording and the. The recording button is restored.  You can resume recording at this point.

If the storage space on the USB flash drive is less than 50 MB, the recording will stop automatically. After saving, recording is automatically activated and continued until the storage space on the USB flash drive is less than 50 MB.

*Note*: If you disconnect the USB flash drive during recording, the video file may be damaged and can no longer be opened.

### 10.4 Gallery

If the system recognizes that the USB stick is inserted and is not recording, you can call up the gallery to view  photos and videos.

 Switch to the image preview.

 Switch to the video preview. A appears  above each video to remind you that the current file is a video file.

 to the first page

 to the last page

 to the previous page

 to the next page

Displays the current page number. After clicking, a drop-down field appears from which you can select the page you want to jump to.

Sort order, date or name.

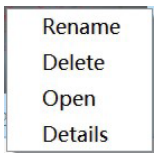
Sort order, ascending or descending.

 Select an image or video and click Delete to delete the image or video. You can also select multiple items and then click Delete to delete them from the batch.

 Home, Leave gallery.

### 10.5 Rename image and video files

 After you have clicked on the image or video file, the selected image or video appears in the selected style.



Right-click on the file to open the menu and select "Rename" or double-click on the file name to be renamed.

 The cursor appears at the file name and calls up the keyboard.

After you have entered the name, click on 

or to close the keyboard  and complete the name change.

### 10.6 Delete image and video files

You can select one or more image/video files for deletion. After you have selected the file(s), the file(s) will have a blue background.  Then click on  to delete the file(s). Deleting the menu bar, which is called up by right-clicking on the file, can only delete the currently selected individual file.

### 10.7 Open image files

Double-click on the image to open it or right-click on the file to call up the menu and click on "Open" to open the image. After opening, the name of the current file is displayed in the control bar.

 to switch to the previous screen

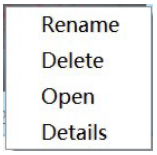
 to switch to the next picture

 Leave gallery

### 10.8 Open video files

Double-click on the video to open it or right-click on the file, call up the menu and click on "Open" to open the video. After opening, the name of the current file is displayed in the control bar. After the video has been opened, it will play automatically and the "Play" button will change to  Click  again to pause the current video and use the "Play" button to change to  Click  to switch to the previous video and play it automatically. Click on  to switch to the next video and play it automatically. Click to  pause the current video. Click to  exit the gallery.

## 10.9 File details




Right-click on the desired file, call up the menu bar and click on "Details" to display the details of the current file.

## 11 Optional accessories

| Accessories | |
|---|---|
| Auxiliary lens 0.5x | OBB-A3225 |
| Auxiliary target 2.0x | OBB-A3226 |
| Solder protection lens | OBB-A3227 |
| Cleaning set for microscopes | OCS 901 |

## 12 Troubleshooting

| Problem | Cause | Solution |
|---|---|---|
| Stains or dust on the picture | Contaminants are present on the sample | Clean sample |
| The image is blurred | Impurities are on the lens surface | Clean lens |
| | The focus is not correct | Setting the focus |
| The video image is not displayed | The external power cable is not connected | Connect the external power cable |
| The picture is too bright or too dark | The LED lighting is set incorrectly | Set the brightness of the LED ring light. |
| | Check the display settings | Open the "Settings" menu to set the brightness |
| The display does not respond | Overlaps in the system (too many processes) lead to error loops | Restart the system |
| The LED ring light does not light up when it is switched on | No power | Check the connection of the mains cable |
| | The LED light has burned out | Replace them with new lighting |
| The LED light has suddenly burned out | The voltage is too high | Use a suitable external mains adapter |
| The lighting brightness is not sufficient | The voltage is too low | Use a suitable external mains adapter |

# 13 Service

If, despite studying these operating instructions, you still have questions about commissioning or operation, or if, contrary to expectations, a problem should occur, please contact your specialist dealer. The device may only be opened by trained service technicians authorized by KERN.

# 14 Power supply

## 14.1 Mains connection

The microscope may only be connected to the mains if the information on the microscope ( sticker ) and the local mains voltage are identical.

**Important:**

- - Check the mains cable for damage before commissioning
- - Ensure that the power supply unit does not come into contact with liquids
- - The mains plug must be accessible at all times.

# 15 Maintenance, servicing and disposal

Disconnect the appliance from the power supply before carrying out maintenance, cleaning or repair work.

## 15.1 Maintenance and cleaning

The appliance must always be kept clean and regularly freed from dust.
Before wiping the appliance when it gets wet, make sure that the power is switched off.

Glass components should preferably be wiped lightly with a lint-free cloth if they become dirty.

To wipe off oil stains or fingerprints from lens surfaces, the lint-free cloth is moistened with a mixture of ether and alcohol (70/30 ratio) and then used for cleaning

Ether and alcohol must always be handled with care as they are highly flammable substances. It is therefore essential to keep them away from naked flames and electrical appliances that are switched on and off and only use them in well-ventilated rooms.

However, organic solutions of this type should not be used to clean other components of the appliance. This could cause changes to the paintwork. It is sufficient to use a neutral cleaning agent for this purpose.

Other cleaning agents for the optical components include
:

- Special cleaner for optical lenses
- Special optical cleaning cloths
- Bellows
- Brush

If handled correctly and checked regularly, the microscope will function smoothly for many years

Should a repair nevertheless be necessary, please contact your KERN dealer or our Technical Service.

## 15.2 Waste disposal

Old appliances and accessories must not be disposed of with household waste.

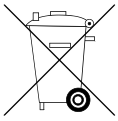
The operator must dispose of the packaging and the device at the place of use in accordance with the applicable national or regional legislation The device consists of various components and materials, such as

- Electronic components (printed circuit boards, electrical cables
- Plastic (housing)
- Metal

Improper disposal of the appliance can have harmful effects on people and the environment.

Proper and environmentally friendly disposal can prevent harmful effects and recover raw materials.

**Disposal of rechargeable batteries and batteries:**



Rechargeable batteries and batteries do not belong in household waste.

The disposal of rechargeable batteries and batteries must be carried out by the operator in accordance with the applicable national or regional law of the place of use.

## 16 Battery law

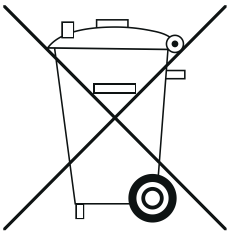
## Note in accordance with the Battery Act - BattG:

**INFORMATION**

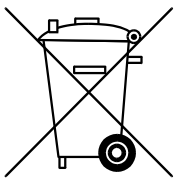
- The following information is valid for Germany.

In connection with the sale of batteries and rechargeable batteries, we are obliged as a dealer under the Battery Act to inform end users of the following:

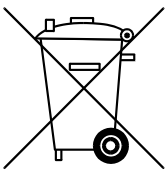
- End users are legally obliged to return used batteries and rechargeable batteries.
- After use, batteries and rechargeable batteries can be returned free of charge to municipal collection points or retailers. The normal end of use of the batteries/rechargeable batteries must be reached, otherwise precautions against short circuits must be taken.
- The return option is limited to batteries and rechargeable batteries of the type that we carry or have carried in our range and to the quantity that end consumers usually dispose of.
- A crossed-out waste garbage can means that you must not dispose of batteries or rechargeable batteries in household waste under any circumstances. Old batteries or rechargeable batteries may contain harmful substances that can damage people and the environment if not disposed of correctly.



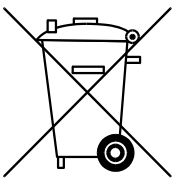
- Batteries containing harmful substances are marked with a symbol consisting of a crossed-out dustbin and the chemical symbol (Cd = cadmium, Hg = mercury, or Pb = lead) of the heavy metal responsible for the classification as containing harmful substances.



Cd



Hg



Pb

## 17 Further information

The illustrations may differ slightly from the product.

The descriptions and illustrations in these operating instructions are subject to change without notice. Further developments to the device may result in such changes.

All language versions include a non-binding translation. The original German document is binding.