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User instructions
Video microscope

KERN **OIV-2**

OIV 254, OIV 255

Version 1.2
06/2024

OIV-2-BA-e-2402

KERN OIV-2
Version 1.2 06/2024
**Operating instructions
Video microscope**

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1 Before use

1.1 General notes

The packaging must be opened carefully to prevent any 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 transport is therefore particularly important, especially to avoid endangering the optical components.

Similarly, you should avoid dirt or fingerprints on the lens surfaces, because in most cases this reduces image clarity.

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

1.2 Notes on the electrical system

Before connecting to a power supply network, it is important to ensure that the correct input voltage is used. The information to select the correct mains cable is located on the device, on the side of the product directly next to the connection socket. You must comply with this information. If you do not comply with these specifications, then fires or other damage to the device could occur.

Likewise, the main switch should be turned off before connecting the mains cable. This prevents an electric shock from being triggered.

If you use an extension cable, the mains cable used must be grounded.

All handling of the units that involves contact with the electrics, such as changing lamps, may only be carried out when the power supply is disconnected.

1.3 Storage

Avoid exposing the unit 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 unit should always be on a firm, smooth and horizontal surface.

When the microscope is not being used, you should cover it with the enclosed dust protective cover.
Dust or dirt inside the optics of a microscope can in many cases cause irreversible malfunctions or damage.

The best way to store accessories which consist of optical elements, such as, for example, additional objectives, is in a dry box with desiccant.

1.4 Maintenance and cleaning

In any case, the unit must be kept clean and regularly cleaned of dust.
Before wiping down the unit when wet, make sure that the power is switched off.

Glass components should preferably be wiped lightly with a lint-free cloth if contaminated.

To wipe off oil stains or fingerprints from lens surfaces, the lint-free cloth is moistened with a mixture of ether and alcohol (mixing ratio 70 / 30) 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 to use them only in well-ventilated rooms.

However, organic solutions of this type should not be used to clean other components of the unit. This could result in 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 still be necessary, contact your KERN dealer or our Technical Service.

2 Nomenclature

Screen

HDMI connection

Housing for microscope and camera

USB connection (2x)

Power connection

Snapshot button (OIV 254)

Focus wheel

Zoom adjustment wheel (with click-stop at OIV 255)

Dimmer

LED ring illumination

Microscope stand

3   Basic data

Optical system	Axial
Lighting	2W LED ring light
Lighting dimmable	Yes
Stand	Mechanical
Optical zoom	0.7x - 5x
Digital zoom	9.88x - 70.57x
Magnification ratio	7,1:1
Screen tilt	-5°–15°
Screen size	12 inch
Screen resolution	1920x1080 HD
Camera resolution	2 MP
Data storage	External via USB (Max 128 GB)
Net weight	6 kg
Dimension product WxDxH	320x260x483 mm
Gross weight	7 kg
Dimension packing WxDxH	510x430x350 mm

Standard configuration

Model	Standard configuration					
KERN	Resolution camera	Interface	Sensor	Field of view mm	Objective Zoom	Software functions
OIV 254	2 MP	HDMI (60 FPS)	CMOS 1/2"	⌀ 29,82–4,18	0,7×–5×	Image capture
OIV 255	2 MP	HDMI (60 FPS)	CMOS 1/2"	⌀ 29,82–4,18	0,7×–5×	Images and videos, measurements

4   Assembly
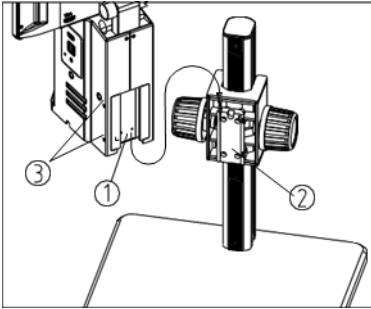
Assembling the microscope body

1) Slide the dovetail attachment on the microscope ① into the corresponding groove ② on the microscope stand.
2) Tighten the screws on the outside of the microscope with an M4 hexagonal spanner ③.
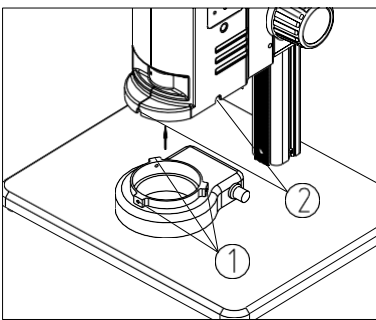
Attaching the LED ring light

Hold the LED ring light against the microscope housing according to the direction of the arrow. Align the screw holes in ring and housing ① and tighten the screws (Ø 2mm) ②.
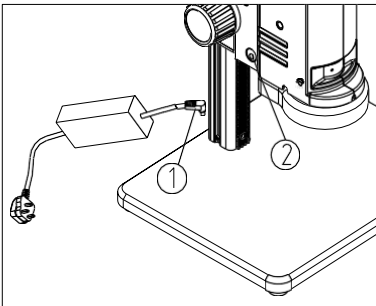
Power connection

Plug the power cable ① (incl. switch) into the fitting plug ② on the microscope.

Be careful not to twist or bend the power cable.
Only use the original adapter supplied.
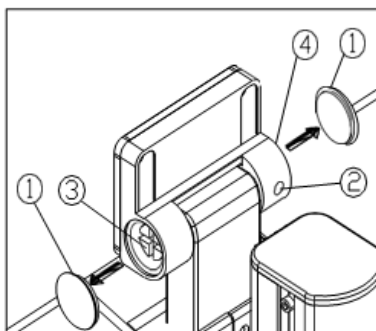
Screen flexibility adjustment

Remove the cover ① with a pointed tool.
Loosen the screw ② with the M3 Allen key.
Adjust the flexibility using a screwdriver on the screws ③ + ④.
Replace the cover ①.

The flexibility is already preset on delivery.

5   Operation and functionality

When the microscope is ready for use after it has been assembled, the first step is to connect it to the power supply using the cable.
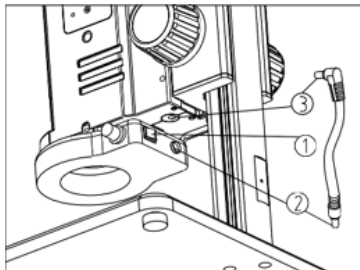
All important functions that play a role in the use of the units discussed here are described in the following sections.
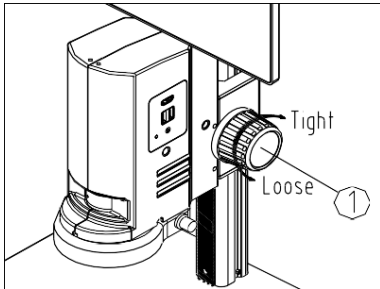
5.1   Torque of the focus wheels

To adjust the tension of the focus wheels, hold the left wheel while turning the right wheel ①.

Be careful not to loosen the tension excessively to prevent the microscope from dropping under its own weight.

5.2   Attaching the lighting

Connect the power cable to the ring light ② and attach the other end to the microscope housing ③. At the rear end of the ring light is the on/off switch ①.
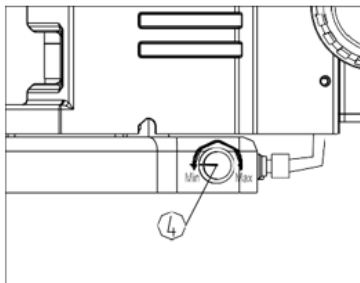
5.3   Adjusting the lighting

Turn the wheel on the right side of the ring light to adjust the illumination.
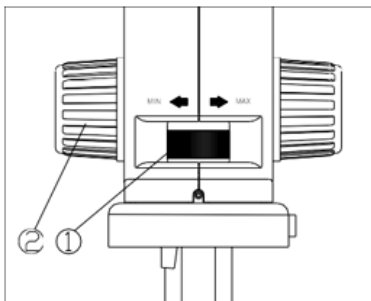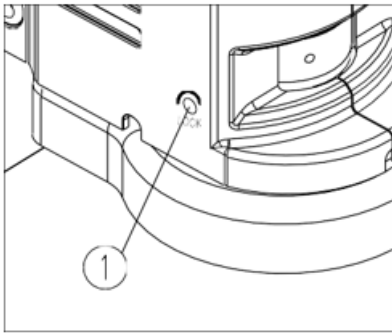
5.4   Adjusting the magnification and focus

As the OIV series is a zoom microscope, the zoom factor can be changed on the adjustment wheel ①.
Turn the adjustment wheel to the maximum magnification. Focus the image using the focus wheel adjustment ②.
Repeat the process if necessary.

The max/min parfocality is already optimally preset on delivery.

5.5 Locked magnification

With the help of the screw on the left side of the setting wheel ①, the magnification level can be locked.
Use an M4 hexagonal spanner (length 3mm).
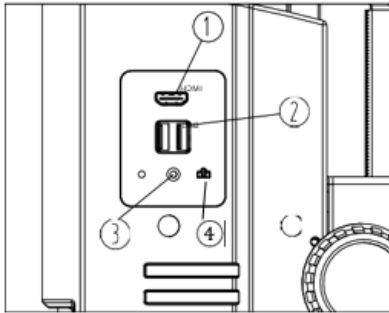
5.6 Snapshot button and interface

The screen must be connected to the camera via HDMI in order to use the interface or the snapshot button ①.
On our OIV 255 with measuring software, a mouse must be connected via USB port ② for operation.
Both our OIV 255 and our OIV 254 with snapshot function require a USB stick to be connected for data storage. An image can be triggered on our OIV 254 model via the snapshot button ④.
The LED ③ indicates that the camera is operational.

6 Equipment

Accessories	
Attachment lens 0.5x	OZB-A2101

7 Troubleshooting

Problem	Cause	Solution
Stains or dust on the picture	Impurities are present on the sample	Clean sample
The picture is blurred	Impurities are on the lens surface.	Clean lens
	The focus is not correct.	Adjust 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.	Adjust the brightness of the LED ring light.
	Check the display settings.	Open the settings display menu to adjust the brightness.
The display does not respond.	Overlapping in the system (too many operations) leads to error loops.	Restart the system
The focus wheel is not flexible.	The focus wheel is too tight.	Loosen the focus wheel
The focus is not held because the microscope descends on its own.	The focus wheel is too loose	Tighten the focus wheel.
The zoom does not work.	The zoom adjustment ring is locked.	Loosen the magnification locking screw.
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 burnt out.	Replace it with new lighting.
The LED light has suddenly burnt out.	The voltage is too high.	Use a suitable external power adapter.
The illumination brightness is not sufficient.	The voltage is too low.	Use a suitable external power adapter.

8 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 unit may only be opened by trained service technicians authorised by KERN.

9 Disposal

The packaging is made of environmentally friendly materials that you can dispose of at local recycling points. Disposal of the storage box and unit must be carried out by the operator in accordance with the valid national or regional law of the user's location.

10 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 unit may entail such changes.

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

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User instructions

KERN	**OIV-2-SW**
Version 1.2 06/2024	

Software System

This instruction manual is for the pre-installed software of the OIV-2 video microscopes. Please read this manual carefully before use and keep it in a safe place. The manufacturer reserves the right to make technically necessary modifications to the software.

Modifications that do not affect the function of the software can be changed without lead time and without notice.

OIV-2-SW-BA-e-2402

Table of contents

2 System and features

The OIV-2 software system is a new intelligent measuring system developed by *Wise Image*. The powerful, easy-to-use and customisable interface allows you to work with templates, automatic edge finding and mirror function. A wide range of measuring tools are available, such as line, circle and angle measurements.

3 Functions

3.1 Switch on

After you have connected the camera to the screen (12V, 1A power connection) and switched it on, the start screen appears as shown in 3.2.

3.2 User interface

As a user, you can edit the user interface according to your preferences "3.3.5 Advanced settings" (the controls themselves cannot be changed).

3.3 Controls - Auxiliary Tools

3.3.1 Image transmission

▶ Start image transmission   ❚❚ Pause image transmission (freeze image)
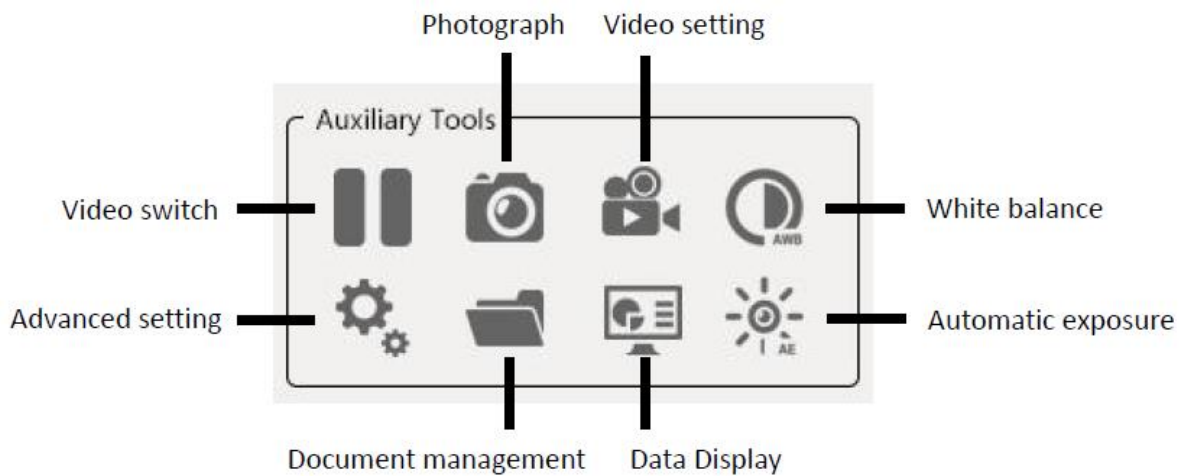
3.3.2 Photo (snapshot)

When image transfer is in progress, an image can be transferred to an external storage unit and saved in jpg format by clicking on the photo 📷 icon.
The automatic naming, the storage path and the co-transmission of the picture elements can be changed individually.

3.3.3 White balance

White balance must be activated after setting the light source. This can be activated in image transfer mode and is carried out by clicking on the 🔘 icon.

3.3.4 Automatic exposure

Automatic exposure compensation is activated by clicking on the ☀ symbol. The exposure time is automatically adjusted by the camera to the preset optimal level. The desired brightness level can be adjusted as described in "3.3.5 Advanced settings - Video settings". By clicking on the ☀ symbol again, the automatic exposure compensation can be terminated.

3.3.5 Advanced Settings

3.3.5.1 Photo (snapshot) Settings

1) The default naming of the camera images is "IMG", the total number of images taken when the camera is started is "N" - 1. The images are automatically stored in a folder named "img". An external memory (recommended USB 3.0 stick) must be installed to store images. The USB 3.0 port only supports FAT32 format. After attaching the USB stick, the 📱 icon appears in the lower left corner of the user interface.

2) The naming of the pictures can be changed. Under the menu "Shooting Settings" the automatic naming can be changed to "Manual". The item "Manual" must be activated for this. If a photo is now taken, the request to name it appears.

3) "Safe Graphics" to save drawings and measurements with the image must be "Safe Graphics" - "Yes" must be activated. If these are not to be deposited with the image, then "No" must be activated.

3.3.5.2 Measurement Setup (Settings)

"Edge findig range": The value of the range in which the measuring point moves for automatic edge finding (see 3.3.8).

Width of the measuring line: The width can be set under "Line".
Font size: The font size can be changed under "Font".

Colour of the elements: After adjusting the colour under the item "Graphics", the setup can be closed. The changes are then applied to new elements.

Font colour: After adjusting the colour under the item "Font", the setup can be closed. The changes are then applied.

Calibration colour (scales): After adjusting the colour under the item "Scale", the setup can be closed. The changes are then applied.

Display of the calibration: Under the item "Scale" the current scale can be shown or hidden.

3.3.5.3 Restore factory settings

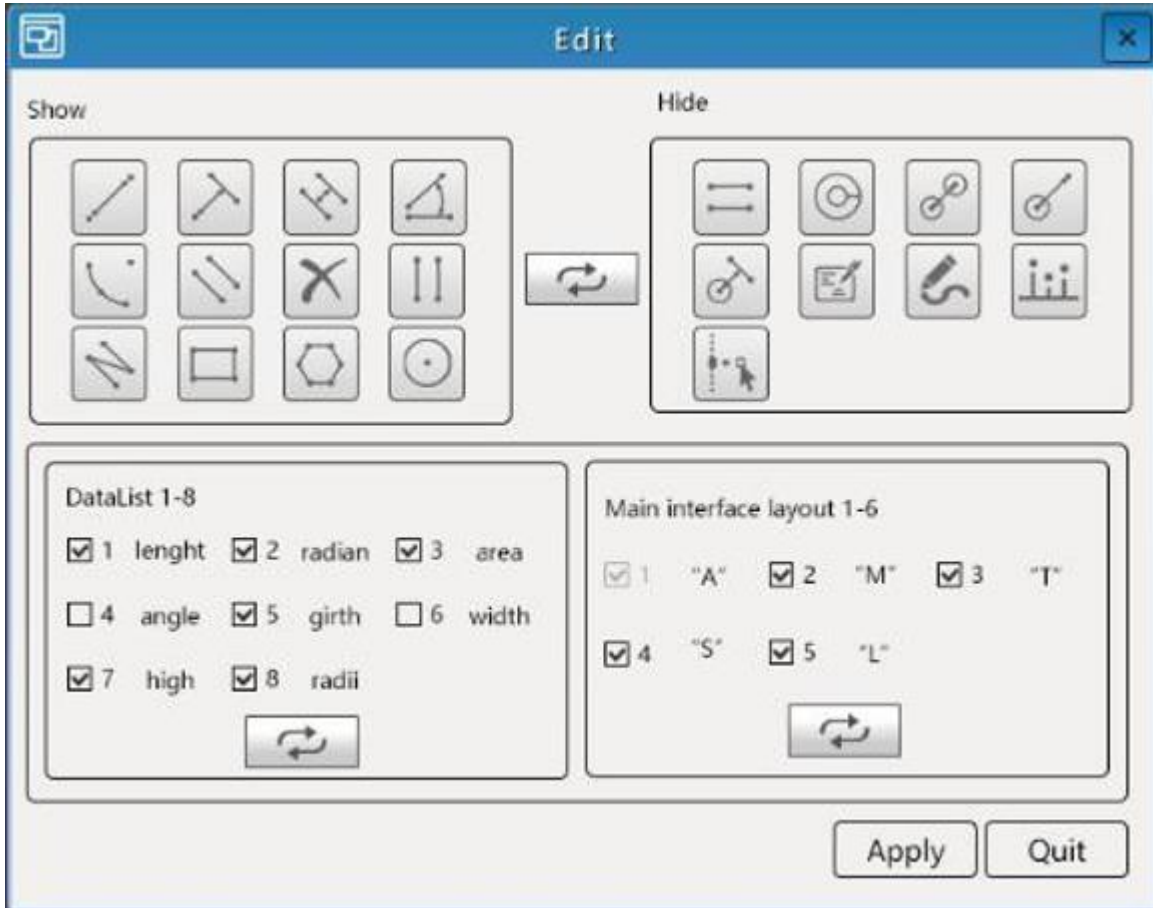To reset the unit to factory settings, click on the "Restore" button.

3.3.5.4 Languages

The languages English and Chinese (traditional / simplified) are supported.

3.3.5.5 Setting the Measurement Setup

Open "Settings" - "Edit"
Under this function, the layout of the "Measurement Setup" can be adjusted.

1) Measuring tool display: The left side shows the measuring instruments displayed on the user interface. The right side shows instruments that are not currently displayed. By marking two elements and clicking on the middle button, they can be exchanged. Click on "Apply" to apply the changes.
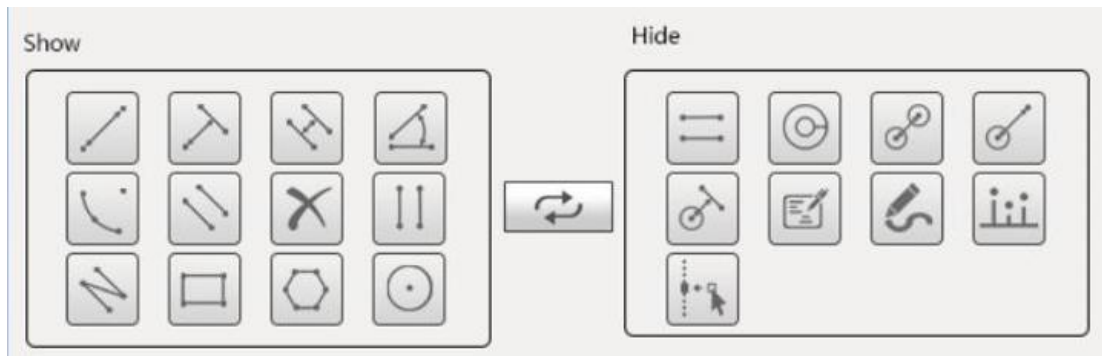
2) Measurement data display: By ticking, you can determine which measurement data are to be included in the "Measure Data" table.
Click on "Apply" to apply the applications.

DataList 1-8

☑ 1   lenght   ☑ 2   radian   ☑ 3   area

☐ 4   angle   ☑ 5   girth   ☐ 6   width

☑ 7   high   ☑ 8   radii

3) Display options of the user interface
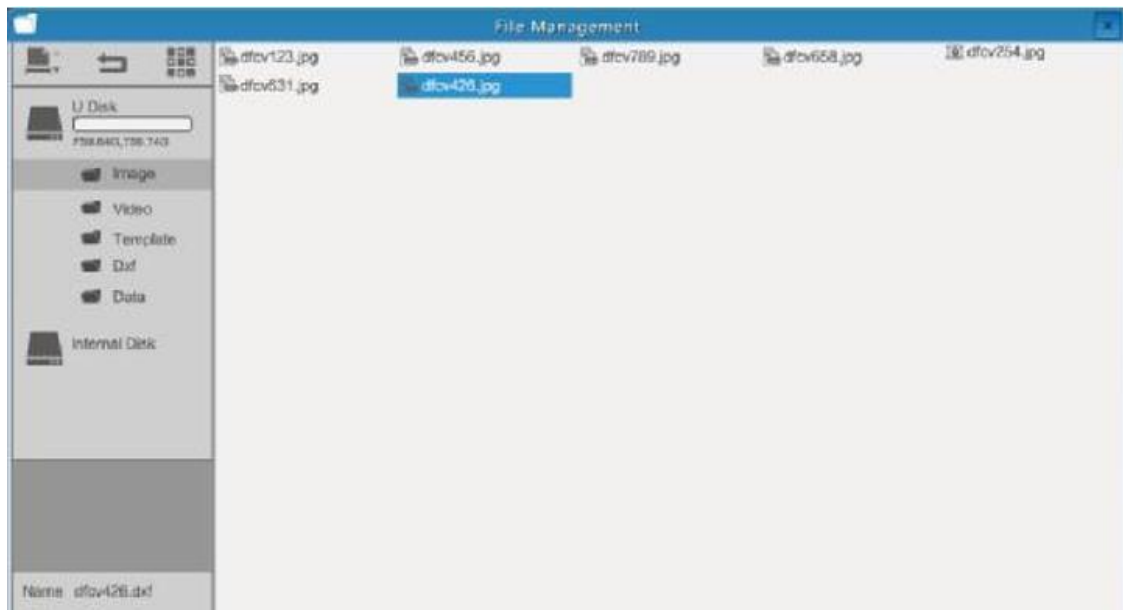By marking, you can determine which menu item is displayed on the user interface.

Main interface layout 1-6

☑ 1   "A"   ☑ 2   "M"   ☑ 3   "T"
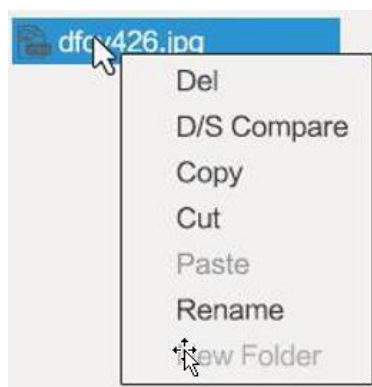
☑ 4   "S"   ☑ 5   "L"

3.3.6 Document management

The icon can be used to open the document management to find saved files.

Right-click to open the submenu for the selected file.
The file can be deleted (DEL), compared with the current screen display (D/S Compare), copied and cut. A new folder can be created on an empty space.

3.3.7 Data Display

	Name	Lenght	Radian	Area	Angle	Girth	Width	High	Radii
1	L1	0.00	0.00	52.45	0.00	0.00	0.00	0.00	52.45
2	A1	0.00	0.00	0.00	0.00	86.26	0.00	0.00	0.00
3	A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4		0.00	0.00	22.89	0.00	22.89	0.00	0.00	22.89
5		0.00	0.00	77.01	0.00	77.01	0.00	0.00	77.01
6		0.00	0.00	141.55	0.00	141.55	0.00	0.00	141.55
7		311.95	774.03	190.14	311.95	190.14	774.03	311.95	190.14
8		592.00	2170	22.89	592.00	22.89	2170	592.00	22.89
9		0.00	0.00	190.14	0.00	190.14	0.00	0.00	190.14
10	R1	454.26	0.00	107.90	454.26	107.90	0.00	454.26	107.90
11	P1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Measure Data

Expart Data   mm

This table shows the details of the measuring elements drawn. By clicking on a line in the chart, the corresponding measuring element is activated and coloured yellow.
By marking the measurement data in the chart, they can be changed.

Right-clicking on the element in the screen activates the corresponding measurement on the screen.
By clicking on "Export Data" the chart can be saved to a USB stick and read later as an Excel file.

The content of the Data Display can be adjusted as described in chapter 2.3.5.6.

(Note: Angles, broken lines and polygons cannot be changed).

3.3.8 Automatic edge finding

Click on the "Automatic edge finding" button to activate this function. You can automatically detect the boundary of lines, circles, arcs, etc. based on the range of points and select the nearest boundary as the measuring point. You can view and adjust the range of automatic edge finding in the "Advanced Settings" user interface, adjusting the range in 5-25 pixels; this function can significantly improve measurement accuracy.

3.4 Measurement functions
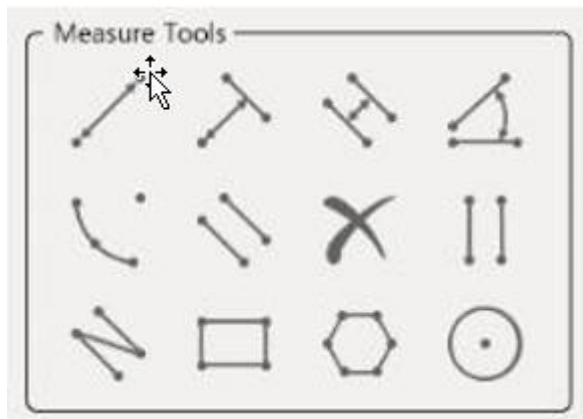
3.4.1 Operation of the measuring elements

(1) After selecting the measuring element, the mouse pointer appears as a cross in the operating area. Pressing the left mouse button starts the measurement.
(2) To stop the measurement, press the right mouse button.
(3) When the measurement is finished by pressing the right mouse button, the drawn measuring element can be picked up and moved by clicking the right mouse button. The mouse pointer then takes on the 🖑 shape.
At the end points of the elements the mouse pointer takes the 🖑 shape, now the shape of the element can be adjusted.
(4) An element can be deleted by a quick double-click on the right mouse button.
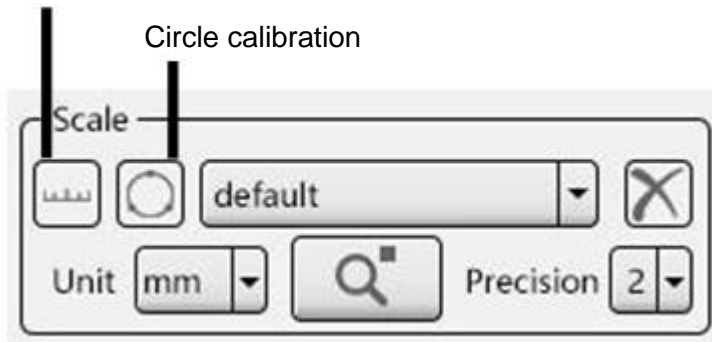
3.4.2 Free Drawing

By selecting the ✍ symbol, free lines can be drawn. These cannot be changed or moved later.

3.4.3 Comments

By pressing the 📝 symbol, you can create comments. After marking the symbol, a comment can be added anywhere on the screen.

3.5 Calibration

Line calibration

Circle calibration

3.5.1 Recalibration

The user can select line or circle calibration by clicking on it. The calibration can now be done freely, within the screen area. By clicking the left mouse button, you start the calibration line, by clicking again at the end of your scale you end the calibration.
The following window opens in which you can enter the calibration details and confirm with "OK".

3.5.2 Calibration settings

The user can create, delete and set units and accuracies.

## 3.6 Custom Template (Template)
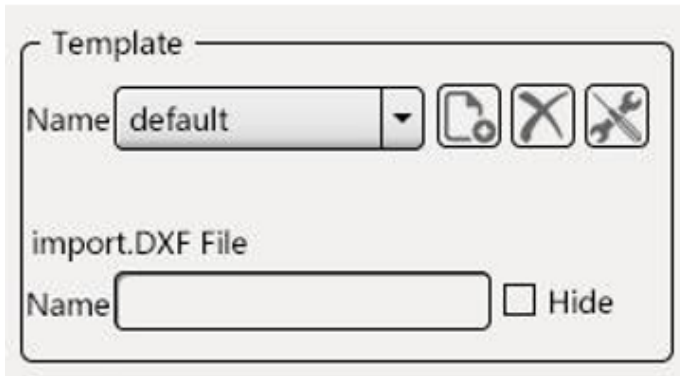
3.6.1 New template (template)

(1) While no drawings/measurements are on the screen, click on the (New Template) icon to create a new template.
Then carry out your measurements. Then enter the name of the template and press "Save".

(2) If measurements and drawings already exist in the image area, then go into template mode, click on the "New" icon, convert the
Measuring element into a template and save it after your measurement/drawing is complete.

(3) Templates are automatically stored in the internal memory and can be changed and copied as needed.

3.6.2 Template customization

A template can be edited if it has been newly created or in customization mode. Click on "Modify" when a template is open to edit a template. After finishing your modification, press "Save".

(1) Click on a measuring element with the left mouse button to select it.
(2) Hold it with the right mouse button to move or change it.
(3) Mark it with the left mouse button and delete it by double-clicking the right mouse button

3.7 Scale
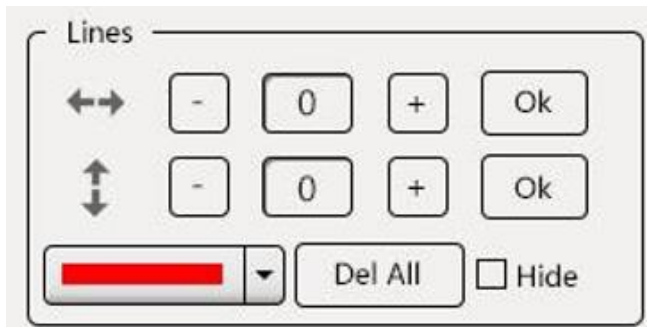
The scales (X and Y axis) are divided into 100 horizontal and vertical lines.

Adjustment of the lines.
- (1) The number of horizontal and vertical lines can be set via "-/+".
  Set the desired number and confirm with "Ok".
- (2) The line marked by a right click appears yellow, can be moved and the mouse pointer takes on the 🖑 shape.
- (3) If you want to delete a certain line, this cannot be done by "-".
  The line can be deleted by double-clicking the right mouse button. The line can be moved by holding the right mouse button.
- (4) The number of lines on the screen can be subsequently increased by "+". The newly added lines are then also displayed with any changes made (e.g. colour).
- (5) With "Del all" all lines can be removed.
  Clicking the "Hide" function hides all lines.
- (6) By double-clicking on a line it can be edited, the menu shown below appears.
- (7) After the adjustments have been made, the menu can be closed by pressing "X".