



SLIT LAMP DOCUMENTATION SYSTEM

INSTRUCTIONS FOR USE

(V3.13b17)

NOTES ON THIS INSTRUCTION MANUAL

The Konnect software was manufactured and tested under strict quality criteria. You have selected a modern and well-engineered product. To ensure safe operation, it is essential that you use the Konnect software correctly.

For this reason, you should thoroughly familiarise yourself with the contents of this instruction manual before operating the device. In particular, pay attention to the safety instructions!

This operating manual describes the management of the patient data, how to perform an examination, and the presentation options for the captured, single images.

Due to ongoing development, the diagrams shown here may vary slightly from the actual software delivered.

If you have any questions or would like additional information about your device, please do not hesitate to contact us. Our team will be happy to assist you.

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1 SCOPE OF DELIVERY

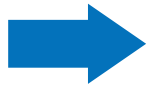
Components	Part numbers
KONNECT LICENSE USB KEY	3020-P-7112
KONNECT SOFTWARE	EP89-10155
KONNECT SOFTWARE IFU	EP59-52052

2 SYMBOLS USED IN THIS MANUAL



CAUTION

Denotes situations which could result in incorrect findings; denotes user instructions and useful or other important information.



Identifies important information about the product and its use, which require special attention.



This symbol denotes menu paths and screen shots.
Example for starting a new examination:
Konnect > Examination > New

which means:

- Select the “Examination” menu from the menu bar.
- Select the menu item “New Examination.”



Legal manufacturer



Country of manufacture



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3 INTENDED USE

Keeler Konnect allows for the capture and archiving of patient images and videos.

Konnect can be used as a repository for storing patient information and diagnostic information that has been made by the clinician directly from the slit lamp device. The images and videos generated from Konnect shall not be used for diagnosis.

3.1 INSTALL SOFTWARE

The Konnect software consists of two programmes that are installed together.

Installation requirements

- Administrator rights.
- Laptop/PC that meets the following specifications:
 - Intel Core™ i5, 256 GB SSD, 1 TB SATA, 8 GB RAM, Windows® 10Pro, USB 3.0 (2 USB slots must be available - at least one powered, for Keeler camera and USB software license Dongle). Recommended screen resolution: 1920 x 1200 pixels.


4 PREPARING FOR CAPTURING IMAGES

Before you can capture images or record video sequences with the camera, you must first make some preparations. These include:

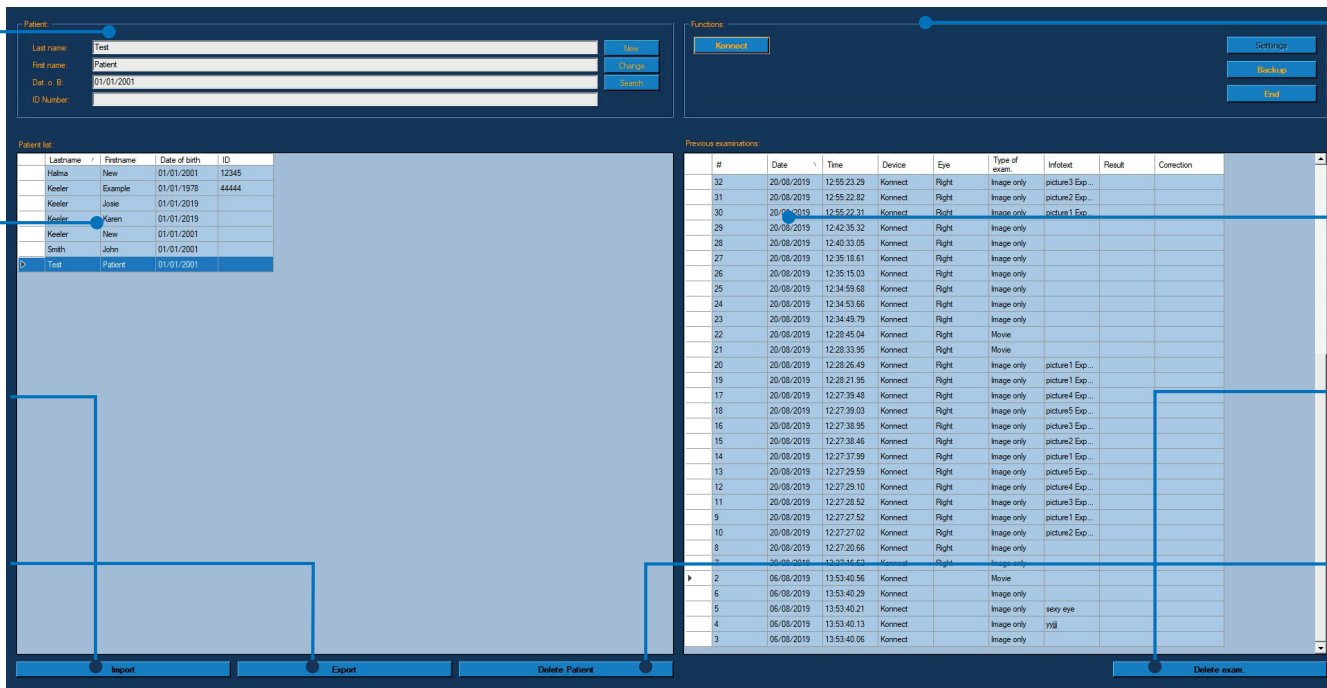
- Start the Patient Data Management (see below).
- Start the Konnect programme (section 4.2, page 8).
- Prepare the camera (section 4.3, page 9).

4.1 STARTING PATIENT DATA MANAGEMENT

You must enter patient data in the Patient Data Management section and then use it. After you have switched on the PC, it first loads the operating system. If the Windows desktop is displayed, you have to start the Patient Data Management programme from there.

- If necessary, click on the Konnect icon: 

The user interface for the Patient Data Management is displayed:



The screenshot shows the Patient Data Management interface. On the left, there is a 'Patient' form with fields for Last name, First name, Date of Birth, and ID Number, along with 'New', 'Change', and 'Search' buttons. Below this is a 'Patient list' table. At the bottom left are 'Import' and 'Export' buttons. On the right, there is a 'Functions' group box with 'Konnect', 'Settings', 'Backup', and 'Exit' buttons. Below this is a 'Previous examinations' table. At the bottom right are 'Delete Patient' and 'Delete exam' buttons.

Lastname	Firstname	Date of birth	ID
Halma	New	01/01/2001	12345
Keeler	Example	01/01/1978	44444
Keeler	Josie	01/01/2019	
Keeler	Karen	01/01/2019	
Keeler	New	01/01/2001	
Smith	John	01/01/2001	
D	Test	Patient	01/01/2001

#	Date	Time	Device	Eye	Type of exam	Infotext	Result	Correction
32	20/08/2019	12:55:23.29	Konnect	Right	Image only	picture3 Exp...		
31	20/08/2019	12:55:22.82	Konnect	Right	Image only	picture2 Exp...		
30	20/08/2019	12:55:22.31	Konnect	Right	Image only	picture1 Exp...		
29	20/08/2019	12:42:35.32	Konnect	Right	Image only			
28	20/08/2019	12:40:33.05	Konnect	Right	Image only			
27	20/08/2019	12:35:18.61	Konnect	Right	Image only			
26	20/08/2019	12:35:15.03	Konnect	Right	Image only			
25	20/08/2019	12:34:59.68	Konnect	Right	Image only			
24	20/08/2019	12:34:53.66	Konnect	Right	Image only			
23	20/08/2019	12:34:49.79	Konnect	Right	Image only			
22	20/08/2019	12:28:45.04	Konnect	Right	Movie			
21	20/08/2019	12:28:33.95	Konnect	Right	Image only			
20	20/08/2019	12:28:26.49	Konnect	Right	Image only	picture1 Exp...		
19	20/08/2019	12:28:21.95	Konnect	Right	Image only	picture1 Exp...		
17	20/08/2019	12:27:39.48	Konnect	Right	Image only	picture4 Exp...		
18	20/08/2019	12:27:39.03	Konnect	Right	Image only	picture5 Exp...		
16	20/08/2019	12:27:38.95	Konnect	Right	Image only	picture3 Exp...		
15	20/08/2019	12:27:38.46	Konnect	Right	Image only	picture2 Exp...		
14	20/08/2019	12:27:37.99	Konnect	Right	Image only	picture1 Exp...		
13	20/08/2019	12:27:29.59	Konnect	Right	Image only	picture5 Exp...		
12	20/08/2019	12:27:29.10	Konnect	Right	Image only	picture4 Exp...		
11	20/08/2019	12:27:26.52	Konnect	Right	Image only	picture3 Exp...		
9	20/08/2019	12:27:27.52	Konnect	Right	Image only	picture1 Exp...		
10	20/08/2019	12:27:27.02	Konnect	Right	Image only	picture2 Exp...		
8	20/08/2019	12:27:20.65	Konnect	Right	Image only			
7	20/08/2019	12:33:46.63	Konnect	Right	Image only			
2	06/08/2019	13:53:40.56	Konnect		Movie			
6	06/08/2019	13:53:40.29	Konnect		Image only			
5	06/08/2019	13:53:40.21	Konnect		Image only	seye eye		
4	06/08/2019	13:53:40.13	Konnect		Image only	WII		
3	06/08/2019	13:53:40.06	Konnect		Image only			

Fig. 4-1: Patient data management user interface



To start the Konnect programme, first enter a new patient or select an existing patient from the list of patients under “Previous Examinations.”

For more information on Patient Data Management, refer to *section 7, page 30*.

4.1.1 ENTERING A NEW PATIENT

- Press the “New” button to enter a new patient in the Patient Data Management system.
- Enter the patient’s last name, first name, and date of birth in the patient window (optionally, you can enter an ID number for the patient).

Patient:		
Last name:	Test	New
First name:	Patient	Change
Dat. o. B.:	01/01/2001	Search
ID Number:		

Fig. 4-2: Entering patients

- To save the data you entered, click the “Save” button. The patient you have just entered now appears in the patient list.

4.1.2 SELECTING AN EXISTING PATIENT

The patient data list on the left-hand side of the screen displays all previously examined patients in alphabetical order.

Patient list:			
Lastname	Firstname	Date of birth	ID
Halma	New	01/01/2001	12345
Keeler	Example	01/01/1978	44444
Keeler	Josie	01/01/2019	
Keeler	Karen	01/01/2019	
Keeler	New	01/01/2001	
Smith	John	01/01/2001	
Test	Patient	01/01/2001	

Fig. 4-3: Patient list

- Choose “Search” to quickly find the patient you are looking for in the list.
- Enter the patient’s name or the first letter of the name in the “Last Name” field.

Alternatively, you can search for the patient using an ID number, first name or date of birth, assuming that one was assigned when the patient was first recorded.

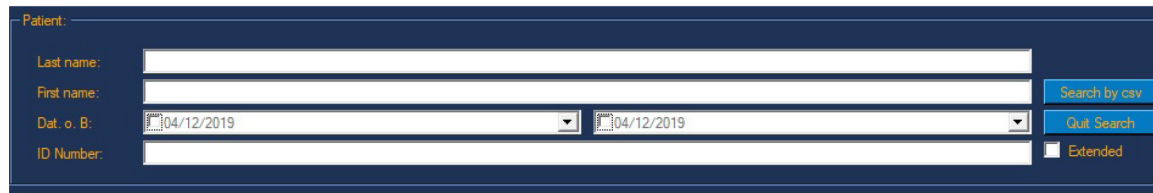
- In the list that appears, click the entry you were searching for to transfer the patient’s name to the patient window. This also brings up a list of any previous examinations for that patient in the examination window (bottom right side).

EXTENDED PATIENT SEARCH: "EXTENDED" CHECK BOX

- Click on the "Extended" check box.

The screen displays additional search parameters which reference previous examinations, for example.

- Enter a search parameter. The patient in question is highlighted in the list.
- Press the "Quit Search" button.



The screenshot shows a search interface with the following elements:

- Patient:** Section header.
- Last name:** Text input field.
- First name:** Text input field.
- Date of Birth (Dat. o. B.):** Two date pickers, both showing 04/12/2019.
- ID Number:** Text input field.
- Search by csv:** Button.
- Quit Search:** Button.
- Extended:** Check box.

Fig. 4-4: Extended search

- Proceed in the same way as you would when inputting a patient name.

4.2 STARTING THE KONNECT PROGRAMME

Transition Patient Data Management > Konnect programme

- After selecting a patient, press the “Konnect” or “KSL Camera” button to start the Konnect programme.
- OR, double-click the selected patient name to start the Konnect programme.
- The following overview screen is displayed:

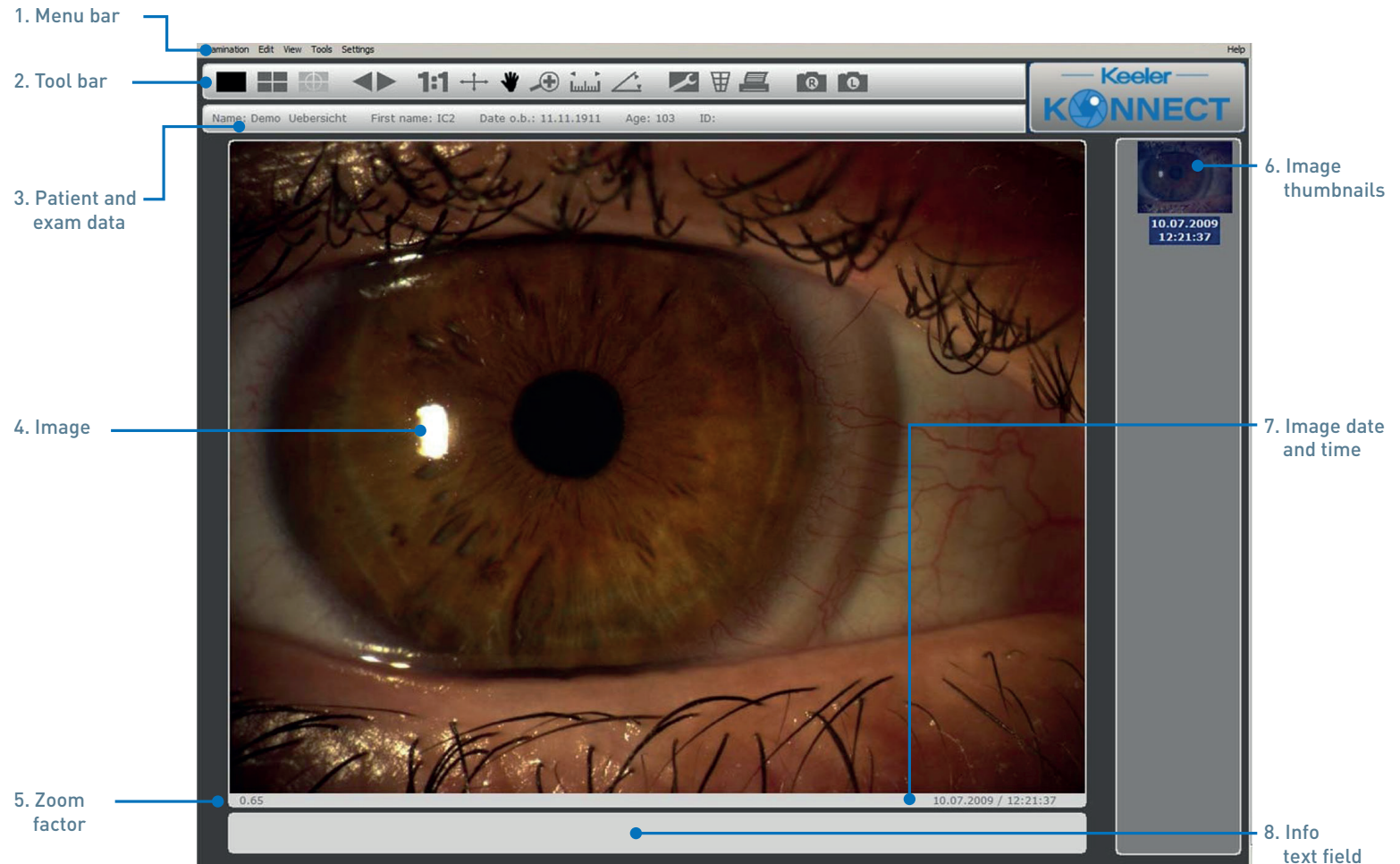


Fig. 4-5: Konnect programme operation


4.3 PREPARING THE CAMERA

Before capturing an image or recording a video sequence, you must prepare the camera.

This includes:

- Select slit lamp magnification (section 4.3.1, page 10).
- Select an exposure programme (section 4.3.2, page 10).
- Adjust the white balance, if necessary (section 4.3.3, page 11).
- Edit a pre-set exposure programme, if necessary (section 4.3.4, page 12).
- Save the edited exposure programme, if applicable (section 4.3.5, page 14 and section 4.3.6, page 14).

To prepare for the image capture, switch over to the image screen:

- Press the “” button for the right eye, or “” for the left eye.

The image screen opens:

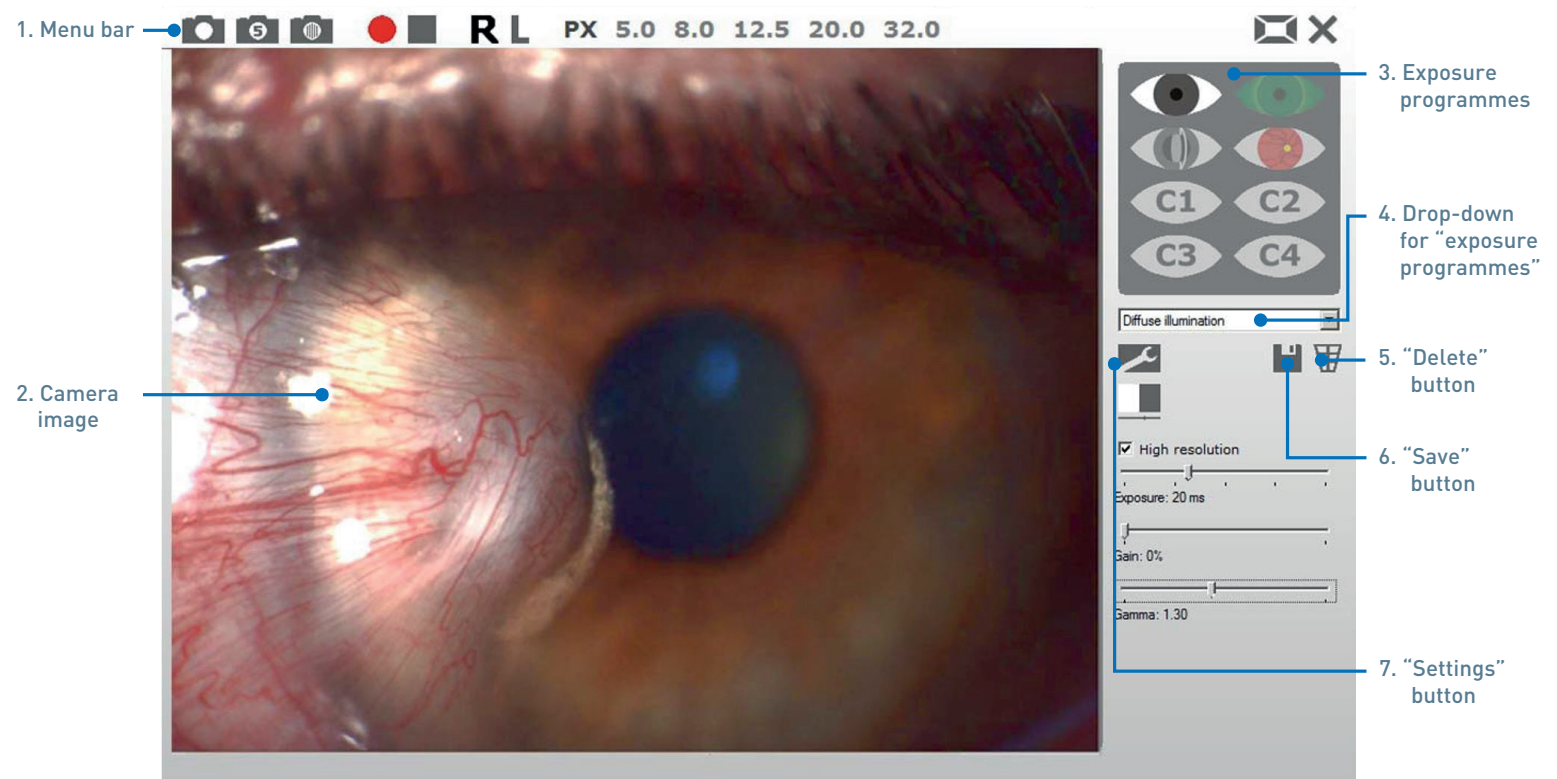


Fig. 4-6: Konnect programme operation 2

4.3.1 SELECT SLIT LAMP MAGNIFICATION

The menu bar shows the magnifications that are available on your slit lamp. If you want to identify lengths in the images later, the selected optical magnification of the slit lamp must be known.

- Select the magnification that you will be using for the image capture. This information is saved together with the image and the correct calibration for the according tool will be used when identifying lengths. You can set the magnification/zoom that you use the most as a default setting.
- Click the right mouse button. The following is displayed:

Use as standard value

- Press this button to set the zoom factor as the standard/default setting. Every time the image capture/camera window is opened, the zoom that has been set as the standard/default value is now pre-defined:

PX 5.0 8.0 12.5 20.0 32.0

Fig. 4-7: Zooms set as default settings

4.3.2 SELECT EXPOSURE PROGRAMME

Settings that relate to the quality of the image are saved in an exposure programme.

Use shortcut to select an exposure programme

An exposure programme enables you to quickly re-access already set image capture parameters. Konnect has pre-set four exposure programmes, which can be opened via the shortcut. You can define another four as needed (section 4.3.5, page 14).

- Select an exposure programme:

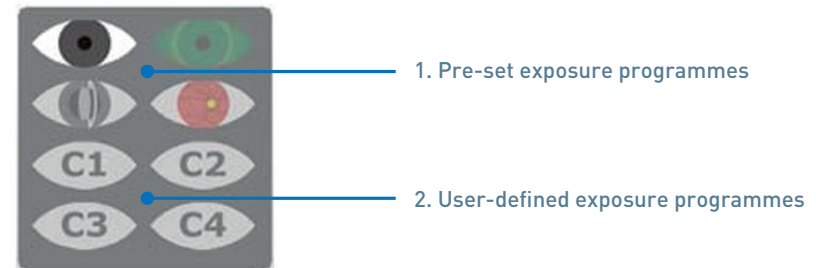


Fig. 4-8: Shortcut to "exposure programmes"

- The respective exposure programme is displayed. If necessary, you can adjust the white balance (section 4.3.3, page 11).

Select an exposure programme from the drop-down list

You can choose various pre-set image capture parameters with the exposure programmes.

You can save any number of configurations (section 4.3.5, page 14).

Select an exposure programme from the drop-down list (fig. 4-6, page 9, item 4):

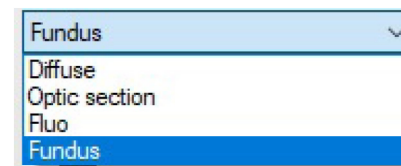







Fig. 4-9: Drop-down list for "exposure programmes"

- If you have created your own exposure programmes, these are displayed in this list (section 4.3.4, page 12).
- If necessary, you can adjust the white balance (see page 11).

4.3.3 ADJUST THE WHITE BALANCE


The light conditions in the examination room can be very different. The light spectrum, i.e. the colour of the slit lamp illumination, also depends on many factors. To capture an image/ video in colour, the white balances should be adjusted:

- After installation of camera and Konnect.
- Whenever the colour fidelity is not good.
- Adjust the white balance separately for every configured exposure programme, **“Use shortcut to select an exposure programme,”** on page 14.
- Then save the white balance for the respective configuration.

Symbol	Description	White Balance
	User-defined exposure programmes, see <i>section 4.3.5, page 14</i>	When necessary
	Diffuse lighting	Adjust the white balance with the slit lamp brightness typical for this illumination type
	Fundus	Adjust the white balance at the maximum slit lamp brightness
	Optical section	Adjust the white balance at the maximum slit lamp brightness
	Fluorescein	Adjust the white balance at the maximum slit lamp brightness

Adjust the white balance as follows:

- Select an exposure programme from the drop-down list (*fig. 4-6, page 9, item 4*).

- If necessary, press the “” button. The following settings are then also displayed on the image screen:

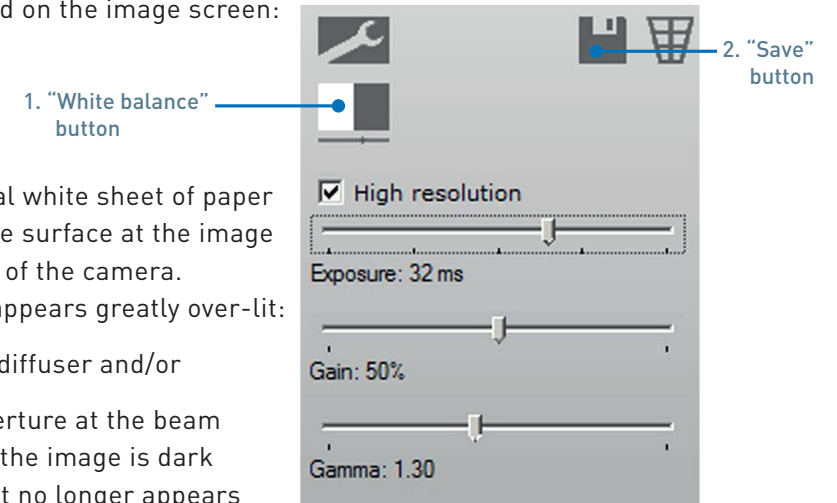




Fig. 4-10: White balance

- Hold a neutral white sheet of paper as a reference surface at the image capture level of the camera. If the paper appears greatly over-lit:
- Swing in the diffuser and/or
- Close the aperture at the beam splitter until the image is dark enough that it no longer appears over-lit.
- Press the “” button (1). The automatic white balancing process will start. The white balance adjustment ends when the red info text “white balance” is no longer displayed in the camera image.
- After completing the white balance adjustment, press the “” button (2). The white balance is now applied to the selected exposure programme.

You can now capture an image or shoot a video sequence (*section 5, page 15*). If you are not satisfied with the image quality, you can edit and save the appropriate parameters accordingly (*section 4.3.4, page 12*).

4.3.4 EDITING PRE-SET EXPOSURE PROGRAMMES, IF NECESSARY

To achieve the best possible image quality, Konnect has pre-set the camera parameters for common image capture situations and has saved them as exposure programmes. You can edit these settings in *section 4.3.2, page 10*.

You can then save the edited settings as your own exposure programme (*section 4.3.5, page 14*).


The following exposure programmes have been pre-set:

	Diffuse illumination	Optical section	Fluorescein images	Fundus images
SLIT LAMP	Medium bright	Very bright	Very bright	Minimally bright
HEAT PROTECTION FILTER*	Swung in	Swung in	Swung in	Swung in
DIFFUSER	Swung forward			
BLUE FILTER			In the illumination beam path	
YELLOW FILTER			In the observation beam path	
SLIT WIDTH	As widely as possible	As widely as possible	As widely as possible	To match pupil diameter
MAGNIFICATION	10–12.5x	10–12.5x	10–12.5x	20x
SLIT LENGTH	Maximum	Maximum	Maximum	To match pupil diameter
BEAM SPLITTER APERTURE	Medium to open	Open	Open	Open
EXPOSURE TIME	20ms	30ms	35ms	38ms
GAIN	0%	35%	20%	62%
GAMMA	1.30	1.0	1.2	1.3

* If present



If you are not satisfied with the image quality, you can optimise the images using the pre-settings; also see *section 5.6, page 17*.

- If necessary, press the “” button. The following settings are then also displayed on the image screen:

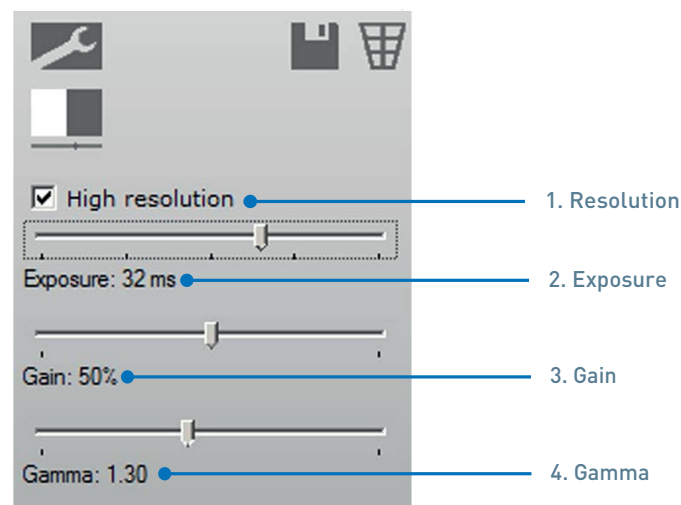


Fig. 4-11: White balance

Adjusting the resolution

- Activate the function “High resolution.”



If you want to record and send an email or a longer video sequence, the lower resolution has a lesser data volume and gives a smoother video.

Change exposure time

The longer the exposure time is, the brighter the image will be. The image can, however, become less sharp as a result caused by motion blur.

- Change the exposure time with the slide control (fig. 4-11, item 2).

Change gain

The image also gets brighter if you increase the gain. However, the image quality suffers as a result; too much gain results in grainy images.

- Change the gain with the slide control (fig. 4-11, item 3).

Change gamma value

You can correct the gamma by changing the gamma value. In other words, the colour values (or grey values) between 0 (black) and 1 (white) can be increased or lowered to achieve an optimal presentation. With the help of the gamma correction, you can influence, for example:

- How pronounced the vessels in the sclera are shown.
- How bright the areas outside of the slit illumination are shown.
- How intensive the colour saturation of the image is.

Change the gamma value with the slide control (fig. 4-11, item 4).

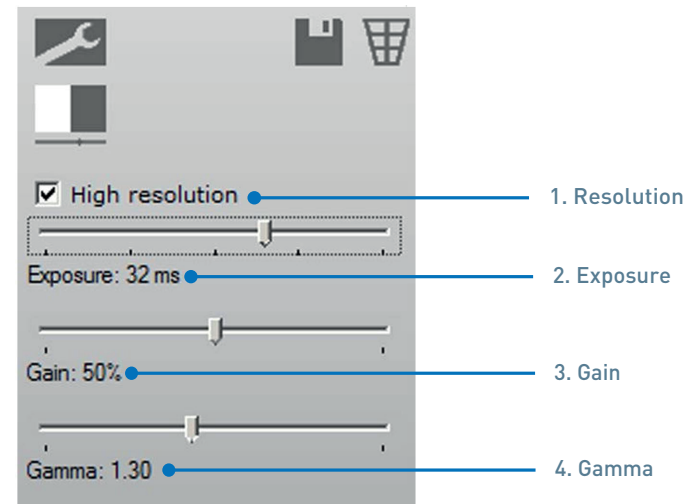
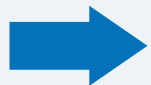




Fig. 4-11: White balance



If the gamma value is too high, image noise can occur in the dark areas.

4.3.5 SAVING USER-DEFINED EXPOSURE PROGRAMMES

In addition to the pre-set exposure programmes, you can also save individual parameter settings as custom/user-defined programmes. An exposure programme saves all the parameters that you have set. Thus once ideal settings have been established, they can be recalled at any time.

- If necessary, press the “” button and set the desired parameters.
- Press the “” button. The following window appears:

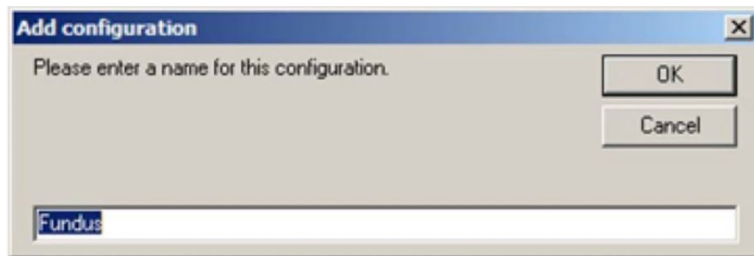



Fig. 4-12: Adding an exposure programme

- Assign a name to the exposure programme and press “OK” to confirm.

The saved parameter settings then appear in the drop-down list of exposure programmes for future use.

Deleting an exposure programme

To delete an exposure programme, select an exposure programme from the drop-down list.

- Press the “” button. The exposure programme is deleted.

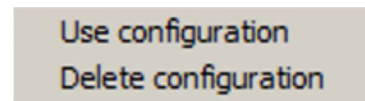
4.3.6 SHORTCUT ASSIGNMENT TO EXPOSURE PROGRAMMES C1 THROUGH C4

You can also save your own configuration as an exposure programme, thus giving you quick access to the desired settings at any later time. Four buttons are provided for this purpose:



Fig. 4-13: Saving your own exposure programme

- Select a configuration from the drop-down list.
- Click with the right mouse button on one of the buttons “C1” to “C4.” The following dialog is displayed:

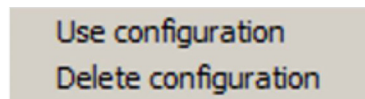


- Select “Use configuration.” The selected configuration is saved as an exposure programme.

Deleting an exposure programme

To delete an exposure programme, proceed as follows:

- Click with the right mouse button on one of the buttons for the exposure programme. The following dialog is displayed:





- Select “Delete configuration.” The selected configuration is deleted as an exposure programme.

5 CAPTURING AN IMAGE OR RECORDING A VIDEO

- Situate the patient so that he/she is sitting comfortably.
- Use the slit lamp in accordance with the instructions given in the supplied user manual for the slit lamp.

Different image-capture screens are opened, depending on which camera is connected. The operating concept is, however, virtually the same. Possible image sources: USB camera, IEEE1394 FireWire. The image-capture screens for the USB camera are documented below.

- If the overview screen is open, select whether the left or the right eye is to be captured: “” for the right eye / “” for the left eye. The image screen opens:

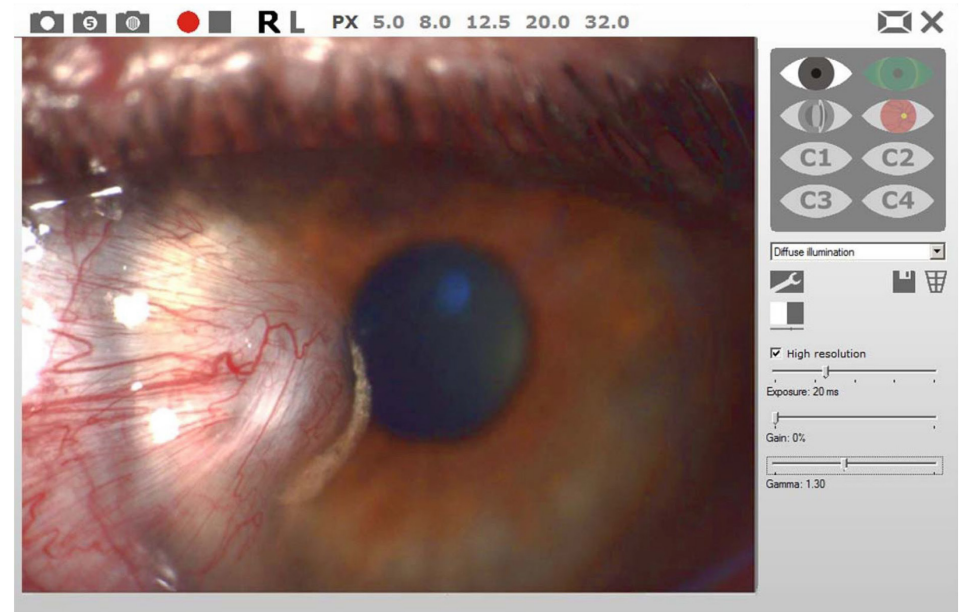



Fig. 5-1: Konnect image window

- If you want to take lengths or angles in the image later, select the magnification that you are using for the image capture (section 4.3.1, page 10).
- To do this, press the “**PX**” button or 5x / 8x / 12.5x / 20x / 32x.

5.1 CAPTURE (GRAB) IMAGE



Click on the “” button.

- **Slit lamp:** Press the capture button on the joystick. The present image is captured.
- To end image/record video mode, press the “” button.

The captured image appears highlighted in green in the thumbnail preview on the overview screen.

5.2 CAPTURING FIVE IMAGES IN A ROW



The eye that you want to record moves very rapidly. By capturing a series of five images in a row, you will get at least one image without movement artefacts.

- Click on the “” button. Five images in a row are captured.
- To end image capture/record video mode, press the “” button.

The five captured images appear marked in green in the thumbnail preview on the overview screen.


5.3 CAPTURE FIVE IMAGES IN A ROW WITH INCREMENTED BRIGHTNESS

You can capture a series of five images in a row with incrementing brightness. Each consecutive image becomes brighter.

- Click on the “” button. 5 images in a row are captured.
- To end image capture/record video mode, press the “” button.



The five captured images appear marked in green in the thumbnail preview on the overview screen.

5.4 RECORD VIDEO

Click on the “” button.

- **Slit lamp:** Press and hold the capture button on the joystick.

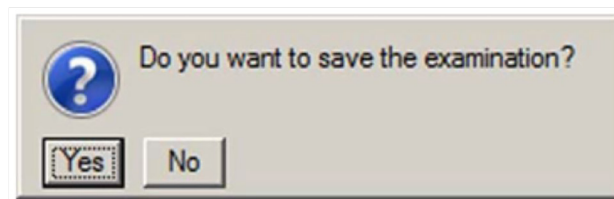
The video recording starts. While recording is in process, the “” button flashes.

- Press the “” button to stop recording.
- Press the “” button to end the recording.

The video recording appears highlighted in green in the thumbnail preview on the overview screen.

5.5 SAVING IMAGES AND VIDEOS

- Close the overview screen.
- To save the captured images/video recording, press “Yes” in the following confirmation dialog box:



The images/videos are listed in the Patient Data Management under “Existing examinations.”

5.6 OPTIMISATION OF THE IMAGE QUALITY

- If you are not satisfied with the quality of the images, there are several different ways of optimising them:



After the optimisation, save the changed camera configurations separately.

Problem	Measure
COLOURS ARE UNNATURAL	<ul style="list-style-type: none">• Adjust the white balance (<i>section 4.3.3, page 11</i>).
COLOURS ARE TOO BOLD	<ul style="list-style-type: none">• Increase the gamma value (<i>"Change gamma value," page 13</i>).
IMAGE IS TOO BRIGHT	<ul style="list-style-type: none">• Close the aperture (<i>fig. 5-1, page 15</i>).• Shorten the exposure time (<i>"Change exposure time," page 13</i>).
IMAGE IS TOO DARK	<ul style="list-style-type: none">• Increase the brightness of the slit lamp.• Open the aperture (<i>fig. 5-1, page 15</i>).• Increase the exposure time (<i>"Change exposure time," page 13</i>).• Increase the gain (<i>"Change gain," page 13</i>).
BLOOD VESSELS ARE EMPHASISED TOO MUCH	<ul style="list-style-type: none">• Increase the gamma value (<i>"Change gamma value," page 13</i>).
PREIPHERY IS TOO DARK	<ul style="list-style-type: none">• Increase the gamma value (<i>"Change gamma value," page 13</i>).
IMAGE IS BLURRED	<ul style="list-style-type: none">• Adjust the eyepiece in 0.5 dpt increments until the user is at the same visual acuity level as the camera. Make sure that young examiners focus on the monitor.

6 VIEWING THE IMAGES

6.1 OVERVIEW OF THE KONNECT PROGRAMME

The following areas are displayed on every screen:

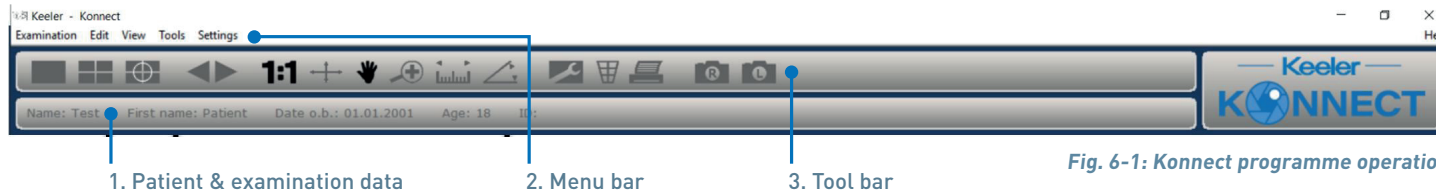
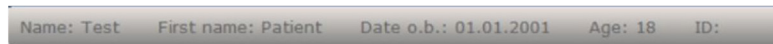


Fig. 6-1: Konnect programme operation

Patient and examination data

The following patient and examination data (1) are displayed:



- Patient's last name and first name.
- Date of birth.
- Age.
- ID number, if applicable.

Menu and tool bar

In the menu bar (2), you can:

- Choose to display either a single image or four images.
- Zoom in selected images and view exactly defined sections.
- Use the function to identify lengths or angles.

You can also perform some of the same actions using the buttons on the tool bar (3).

Furthermore, you can change the settings of the Konnect programme.

6.2 SELECT IMAGE/VIDEO

You can select an image or a video from the image bar.


- Move the cursor onto the desired image/video in the image bar.
- Double-click on it with the left mouse button. The image/video is displayed in the full view.

You can also select an image/video directly from the full view. This applies for both single image display mode and for the active window of four image display mode.


- Press one of the “◀▶” buttons to proceed to the next examination or to return to the previous one. The respective image/video is loaded.

6.3 DISPLAY IMAGE

[Konnect programme > View >](#)

- “One window” mode : image appears in the maximum available size.

[Konnect programme > View >](#)


- “Four windows” mode : Click on the image and drag it with the mouse into the desired frame. A frame is activated by clicking on the image with the mouse. All operations are only executed on the active frame which is marked white.

Combined image mode :

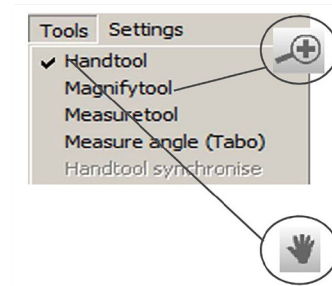
- The four image display mode must first be activated in order to activate combined image mode.
- When you zoom in a section of an image (see section below), the same image section is zoomed in in the other three images at the same time.
- If you pan an image with the hand tool (see section below), the other three images are also panned.

6.4 ZOOMING AN IMAGE AND PANNING AN IMAGE SECTION

You can zoom in and out and select image sections in both one window display mode and four window display mode.

- In the 1:1 presentation **1:1**, one screen pixel is equal to exactly one point of the actual image.
-  The image is adapted to the size of the window (one window display mode or four window display mode).

[Konnect programme > Tools > Magnify tool](#)



- Select a certain point on the image with the magnify lens pointer. Click on the left mouse button to zoom in on the area around this point. The right mouse button will shrink the picture.
- If the image has been enlarged with the zoom or with the 1:1 function, it generally won't fit completely on the screen, so that only part of the image is shown. However, you can change the part of the image this is displayed by scrolling it.

[Konnect programme > Tools > Hand tool](#)

- Instead of the mouse pointer you will now be moving a hand symbol.
- Now click and hold down the left mouse button while you move the mouse. The image moves in the direction that you move the mouse.

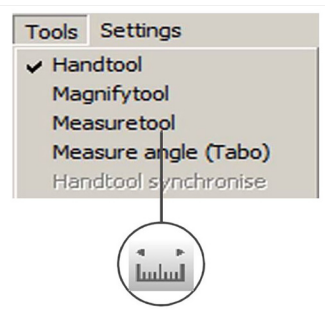
6.5 IDENTIFYING LENGTHS AND ANGLES

With the “Calibrating the function to identify a length” opposite, you can identify both lengths and angles.

6.5.1 IDENTIFYING LENGTHS

In order to identify a length in an image, you must first calibrate the corresponding function, (*“Entering Reference Lengths,” page 21*). You can only take values with an image in single image display mode.

Konnect programme > Tools > Measure tool




- Click on the left mouse button to set the starting point in the image.
- Hold down the mouse button and drag the cursor along the path that is to be identified until you get to the desired end point.
- Read the distance on the screen. On non-calibrated systems the length is specified in pixels (px). Calibrated systems show the lengths in dgt, which equate to millimetres (mm) in the anterior section of the eye.

Calibrating the function to identify a length

To calibrate this function, you must:

- First capture an image of a standard graph paper at all magnifications of the slit lamp.

Capturing an image of standard graph paper at all magnifications of the slit lamp:

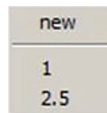
- Open the image capture window (*fig. 4-6, page 9*).
- Select the exposure programme “Diffuse illumination” 
- Fasten a sheet of standard graph paper to the chin rest.
- Start at the smallest magnification of your slit lamp and focus the graph paper as well as possible on the monitor.
- Now capture an image of the graph paper.
- Switch to the next higher magnification of the slit lamp and capture an image.
- Repeat this procedure until you have captured an image of the graph paper at all magnifications. The order of the images should match the order of the slit lamp magnifications.
- Close the image capture window.

Entering reference lengths

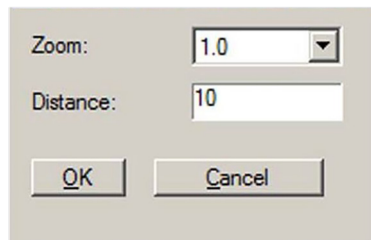
- Open single image display mode.
- Open the graph paper image with the smallest magnification.

Konnect programme > Tools > Measure tool

- Click on the left mouse button to set the starting point in the image.
- Drag the line over 2 squares (equates to 10mm). 10mm has been set as the default reference distance. Depending on the magnification (zoom) at which the image was captured, you need to change the reference distance to 5mm.
- Click with the right mouse button on the white cross at one end of the measuring line. The following window is displayed (example):



- Select “new.”
- Select the magnification of your slit lamp at which the image was captured:



- The reference distance hereby defines the reference length in millimetres.

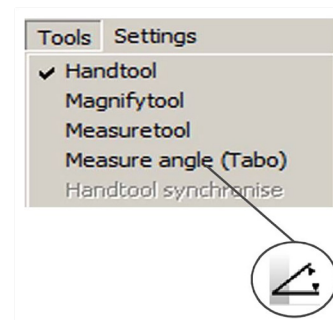
- Confirm your input with “OK” to apply the calibration for the first magnification.
- Repeat the steps for all magnifications in the order of your magnifications.

After you have completed the procedure for all of the different magnifications, the length identification in the anterior section is available in the unit of measure dgt, which corresponds with the millimetre scale.

6.5.2 IDENTIFYING ANGLES FOR TORIC CONTACT LENSES

With this function, you can display an angle which defines the inclination of the contact lens.

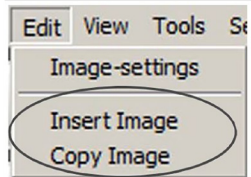
Konnect programme > Tools > Measure angle (Tabo)



- Click on one of the marks.
- Position the free-moving arm through the second mark.

6.6 COPY AND INSERT IMAGE

- Select an image/video.



Konnect programme > Edit > Copy Image

- The selected image/video is pasted to the clipboard.

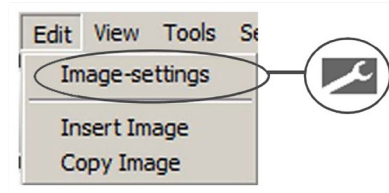
Konnect programme > Edit > Insert Image

- An image from the clipboard is inserted as the last image/video in the image bar. It is saved along with the actual date and time.

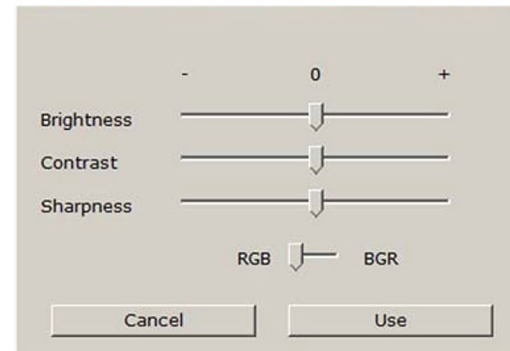
6.7 EDIT IMAGE

You can edit an image at any time later.

Konnect programme > Edit > Image-settings



The following window is displayed (example):



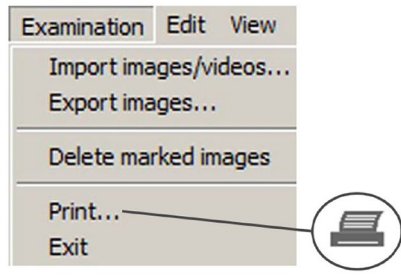
Change the parameters as needed:

- Brightness
- Contrast
- Image sharpness
- RGB to BGR: Change colour space

You can change the colour space, e.g. to let you view blood vessels at a high contrast. The red areas are shown in blue and vice-versa. Green remains the same. All changes effect only the viewer, the original image will not be changed.

6.8 PRINT IMAGE

Konnect programme > Examination > Print...



Example of a print-out in four image mode:

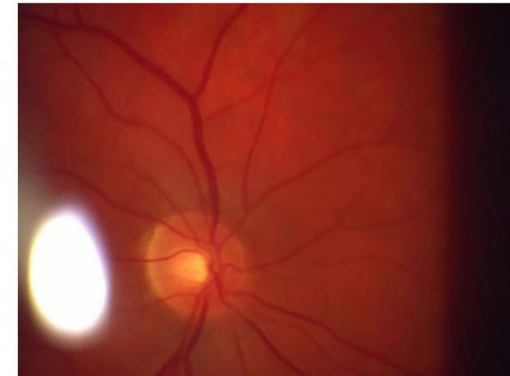
Keeler Konnect Version 3.11r07	Name: Date of birth:	Elsa, Maya 11.11.2011	ID:
-----------------------------------	-------------------------	--------------------------	-----

Exam. date: 18.04.2012
Time: 16:46:27
Eye: ----



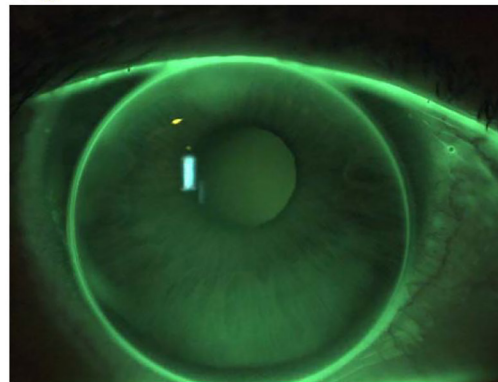
Comment:

Exam. date: 18.04.2012
Time: 16:48:12
Eye: ----



Comment:

Exam. date: 18.04.2012
Time: 16:53:16
Eye: ----

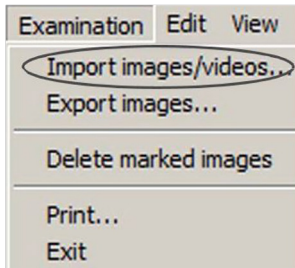


Comment:

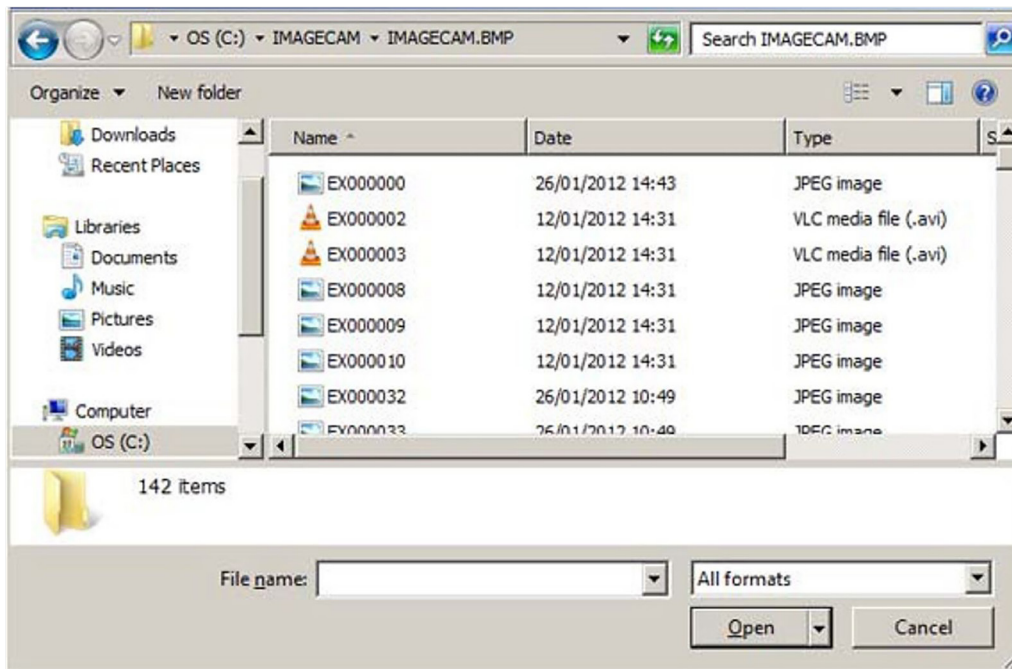
Fig. 6-2: Example of a print-out in four image mode

6.9 IMPORT IMAGE

Konnect programme > Examination > Import images/videos...



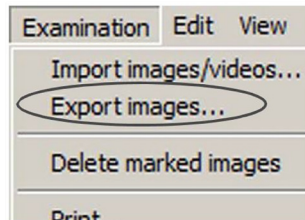
The following window opens:



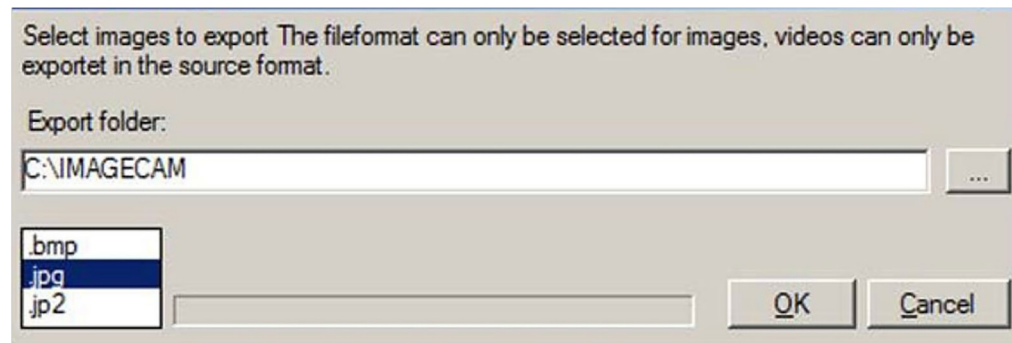
- Select the folder from which the image is to be imported.
- Select the image that is to be imported.
- Press the “Open” button to import the image. The image is displayed both on the screen and in the thumbnail preview.

6.10 EXPORT IMAGE

Konnect programme > Examination > Export images...



The following window opens:



- Select the folder into which the image is to be exported.
- Select the image format with which the image is to be saved. Format selection is only possible for images. Videos are exported in their source format.
- In the thumbnail preview, click on the images/videos that are to be exported. The selected images/videos are highlighted in blue.
- Click on the "OK" button. The selected images/videos are exported to the destination folder.
- Click on "OK" to confirm.

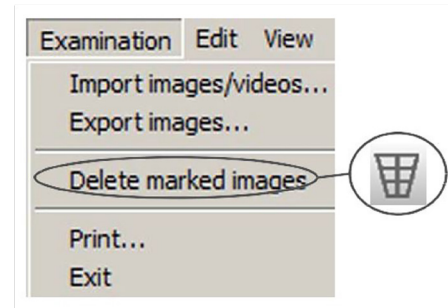
6.11 DELETE IMAGE

Mark the examination that is to be deleted in the thumbnail preview by clicking on the respective thumbnail image. The examination is now highlighted in blue:

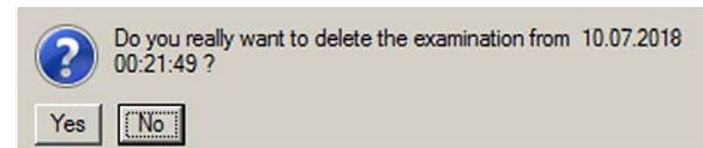


Fig. 6-3: Delete examination

Konnect programme > Examination > Delete marked images



The following window is displayed (example):



- Click on "Yes" to confirm. The marked image is deleted.



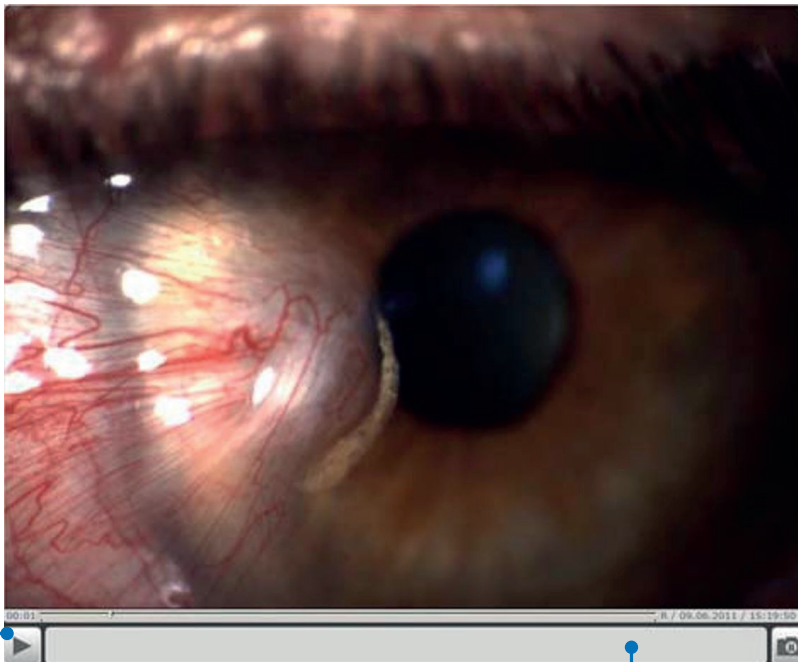
You can delete multiple examinations simultaneously.

- To do this, press and hold down the CTRL key and mark the examinations that you want to delete.

6.12 CAPTURE AN IMAGE FROM A VIDEO

In the Konnect programme, you can copy an individual image frame from a video.

- Start a video. Two buttons appear beside the comments line below the camera image:




1. Start/stop video

2. Comments line

3. Capture image

Fig. 6-4: Capture an image from a video

- Select your favourite frame by the cursor UP/DOWN keys or scroll through the video by using the mouse wheel.
- Press the “” button.
- The present image appears highlighted in green as a new picture in the thumbnail preview.

6.13 CHANGE SETTINGS

In the Konnect programme, you can change basic settings as needed:

Konnect programme > Settings

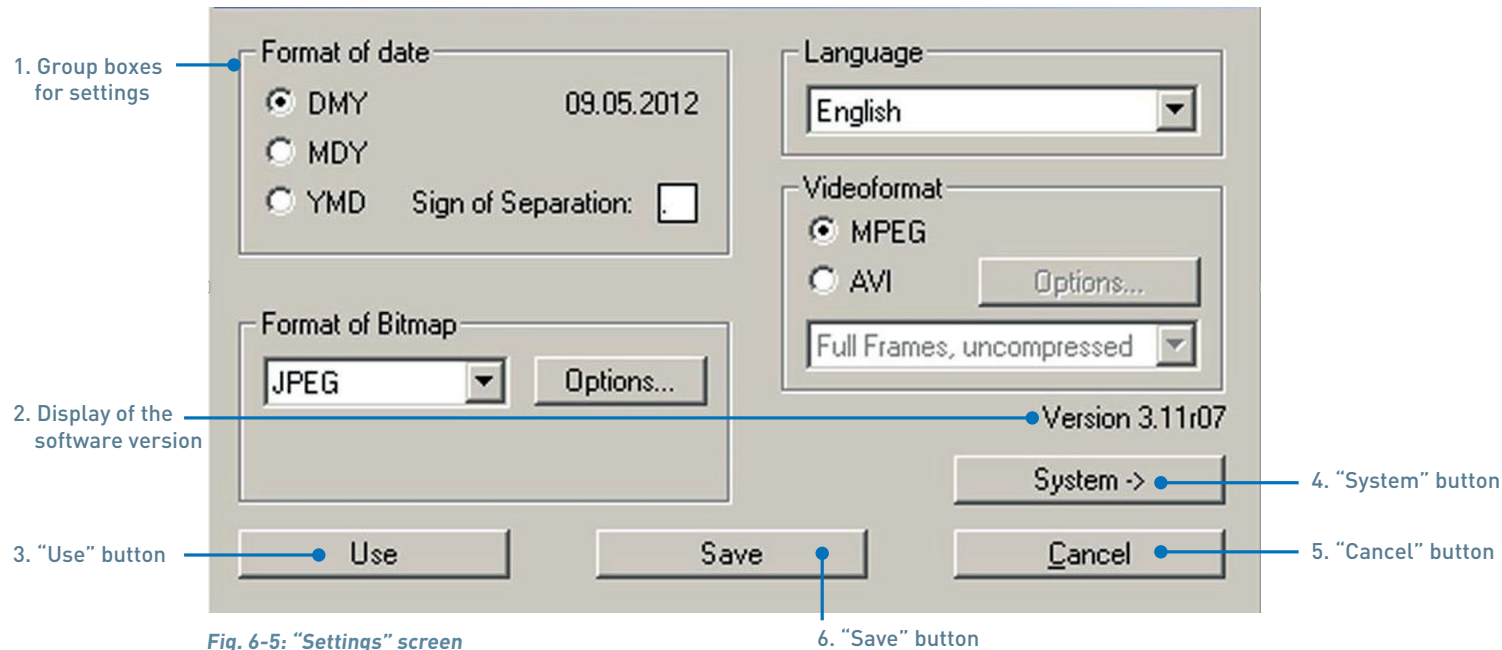


Fig. 6-5: "Settings" screen

6.13.1 BUTTONS AND DISPLAYS

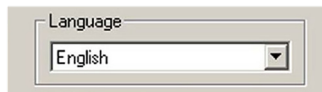
- Press the button (5) to cancel the setting change.
- Press the button (6) to save the setting changes. The changes become active after they are saved.
- Press the button (3) to use the changed settings, but not save them permanently.
- Press the button (4) to display the system settings (section 6.13.6, page 29).
- The version number (2) of the Konnect software is displayed.

6.13.2 CHANGE DATE FORMAT



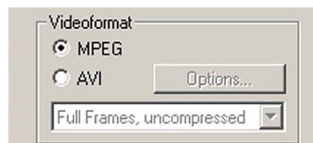
- Activate the date format that you want (D = Day, M = Month, Y = Year).
- Enter a different separator, if necessary.

6.13.3 SELECT LANGUAGE

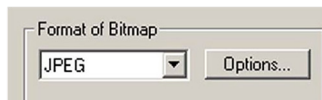


- Select the desired language from the drop-down list.

6.13.4 SET VIDEO FORMAT



6.13.5 COMPRESS IMAGES

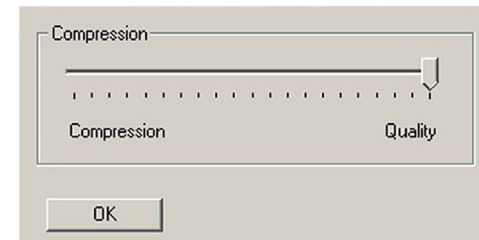


- Select the desired image format from the drop-down list.

Setting the image compression

If you have selected a JPEG format, you can set the image compression to reduce the data quantity of an image. This, of course, impairs the quality of the image.

- Press the “Options” button. The following screen is displayed:



- Change the image compression with the slide control.

6.13.6 DISPLAY SYSTEM SETTINGS INFORMATION

Konnect programme > Settings > System



- The USB camera option is pre-set.

7 PATIENT DATA MANAGEMENT

Once you have completed an examination you can do the following with the patient data:

- Rename it (section 7.1, see below).
- Export it (section 7.2, see below).
- Import it (section 7.3, page 31).
- Data backup (section 7.4, page 32).

You can also change the settings for the Patient Data Management system.

7.1 RENAME PATIENT DATA

Patient data can be changed retroactively after it has been added:

- Press the “Change” button. The input boxes for patient data are now enabled, and the cursor jumps to the “Last name” field.
- Change the entries in the individual boxes.
- Press the “Save” button.

7.2 EXPORTING PATIENT DATA

Patient and examination data can be exported, for example, for forwarding to another clinic:

- Select the patient and also one of the examinations in the respective list as required.
- Press the “Export” button below the patient list.

The following dialog box is displayed:

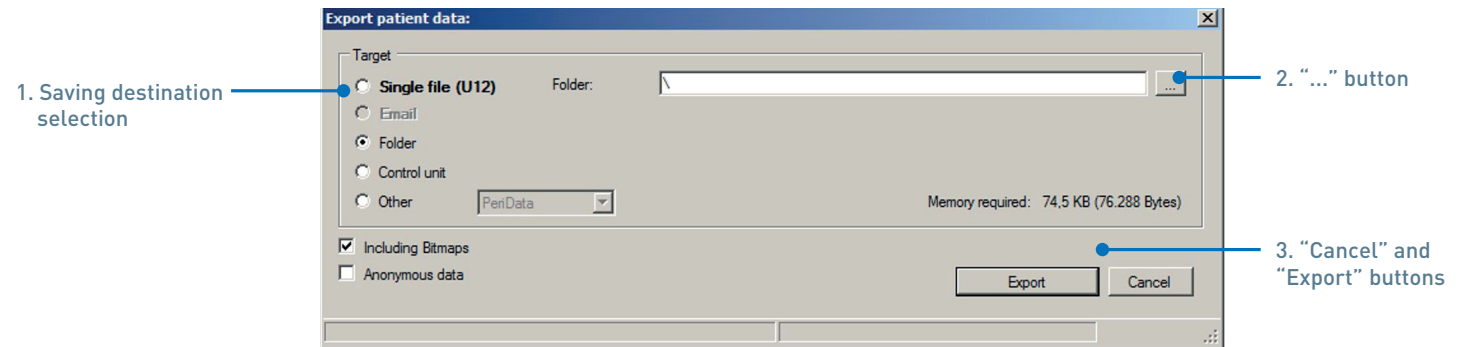


Fig. 7-1: “Export patient data” dialog



The default options for import and export of data are configured in the “Settings” field. Depending on the settings, you may not have to perform all of the following steps (e.g. selection of the directory).

- Select the “Target” (1) where you would like to export the data to.



RECOMMENDATION: Use the option “Single file (U12)” to export the patient data.

- Press the “...” button (2).
- In the dialog that appears, select the folder or the file to which the patient data should be exported.
- Confirm your selection with “OK” or “Open.”
- To export the data, press the “Export” button (3).

HOME

BACK

NEXT

7.3 IMPORT PATIENT DATA

If you receive patient data, for example, on a USB stick, you can import this data.



CAUTION

Risk of loss of data due to computer viruses – computer viruses can cause loss of data. Run a virus check before importing data from the USB drive.



The options for the import and export of data are pre-set in the “Settings” area. Depending on the settings, you may not have to perform all of the following steps (e.g. selection of the directory).



RECOMMENDATION: Use the option “Single File (U12)” to import the patient data.

- Press the “Import” button. The following dialog is displayed:

1. Select data source

2. Patient list

3. “...” button

4. Previous examinations

5. “Import” button

Fig. 7-2: “Import” dialog box

- As option (1), select the location where the source data are located (“Folder” or “Single File (U12)”).
- Press the “...” button (3).
- In the dialog box, select the directory or the file where the patient data are located.
- Confirm your selection with “OK” or “Open.” The patients and the associated examinations that are found are displayed in the lower part of the dialog.
- To import the data, press the “Import” button (5). The data will then be available in the Patient Data Management system.

HOME

BACK

NEXT

7.4 DATA BACKUP

You should make a backup copy of patient and examination data at regular intervals. In case of loss of data, you can reconstruct the data from a previously created backup with the help of this function. Since data backup takes several minutes, depending on the scope of the database and the data to be backed up, a backup should be carried out when the PC and the device will not be needed.



CAUTION

Risk of loss of data due to computer viruses – computer viruses can cause loss of data. Run a virus check before making a backup to a USB flash drive.



The general rules for security backups apply to the creation of backup copies created with the help of the Patient Data Management system. Storage of backup files should always be done on a separate system (e.g. on a USB flash drive with adequate capacity).

7.4.1 BACKUP DATA

- Press the “Backup” button at the top right of the Patient Data Management system. The dialog shown here is displayed:

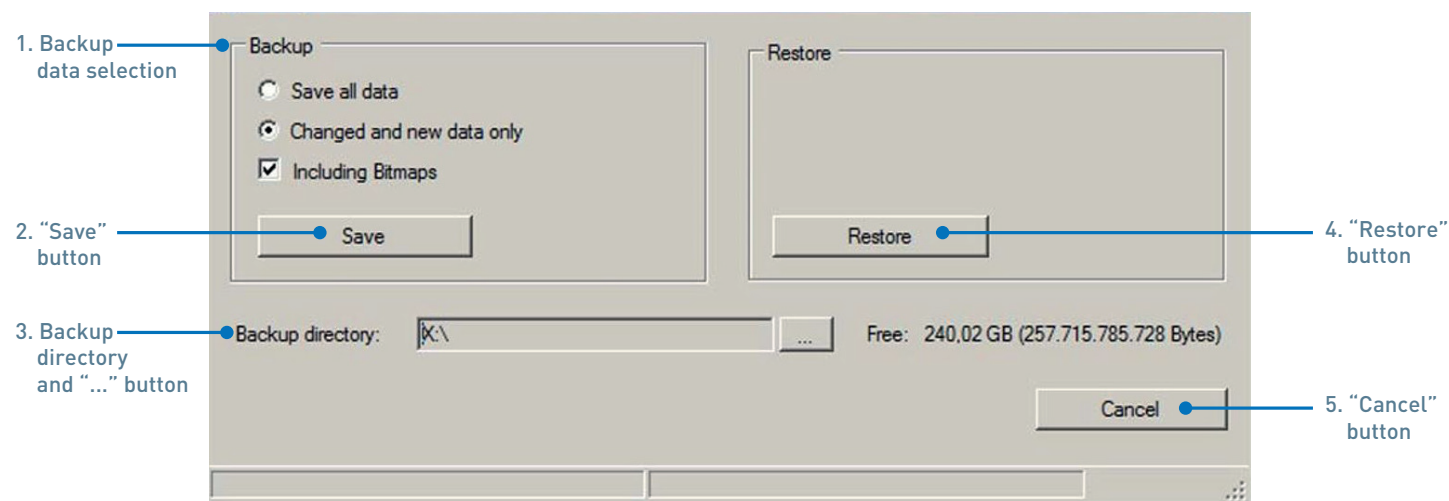


Fig. 7-3: “Backup” dialog box

- Select whether all of the data or only changed data should be backed up.



The Patient Data Management system internally tags all saved data records. If you select the option “Changed and new data only,” only the data records that were not saved during a previous backup will be backed up.

- Press the “...” button to the right of the “Backup directory” box (3).
- In the dialog box that appears, select the folder to which the data should be backed up.
- Confirm your selection with “OK.”
- To back up the data, press the “Save” button (2). The previously selected data will then be backed up to the corresponding folder.

7.4.2 RESTORING DATA

If a loss of data occurs, the data from a previous backup can be re-imported into the Patient Data Management system.

- Press the “...” button.
- In the dialog box that appears, select the folder which contains the backup data.
- Confirm your selection with “OK.”
- To import the data, press the “Restore” button (4). All data in the appropriate directory are copied to the Patient Data Management system.

8 TROUBLESHOOTING

Error	Possible cause	Remedy
IMAGE PREVIEW STAYS BLACK	Exposure is incorrectly set	<ul style="list-style-type: none">• Swivel in the beam splitter• Increase the exposure time• Check the patient's positioning
ERROR MESSAGE: "CAMERA NOT FOUND"	Camera not connected	<ul style="list-style-type: none">• Check the cables• Settings > System > Image source: select the camera that is being used• Check USB dongle inserted
CAMERA LIGHTS UP RED	Driver not set up	<ul style="list-style-type: none">• Set up the driver again
IMAGE IS GRAINY	Gain is too high	<ul style="list-style-type: none">• Increase the slit lamp brightness and simultaneously reduce the gain.
IMAGE OFF-CENTRE WITH RESPECT TO BINOCULAR EYEPIECE	Beam splitter is mal-adjusted	<ul style="list-style-type: none">• Contact Keeler service or your authorised dealer

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HOME

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