Leica IC A

User manual

Leica
MICROSYSTEMS

Contents

Safety concept

Symbols used in this user manual

The symbols used in this user manual have the following meanings:

Warning

This symbol denotes information which must be read and obeyed.

Failure to adhere to these directions can result in malfunctioning of, or damage to, the instrument.

Useful information

This symbol denotes additional information or explanations which promote understanding.

▶ **Action**

This symbol within the text indicates that certain operations must be carried out.

Safety directions

Permitted uses

The Leica IC A video module is attached to stereomicroscopes in order to observe the images on monitors or to take up the images on an S-VHS video recorder.

Prohibited uses

- The use of the instrument in a different manner from that described in this user manual can lead to injury, malfunction and damage.
- Use only the plugs or cables supplied.
- The service interface (COMP) is reserved exclusively for servicing. Misuse of this interface will cause malfunctioning.
- Do not dismantle the Leica IC A video module.

Use in medicine

The video module Leica IC A (for Leica M stereomicroscopes) has not been tested in accordance with the German medical products law (MPG), or with IEC 601-1-1 (Europe), or with FDA or FDI (USA).
The video module may be used only if compliance with these standards is not required.

Servicing

- Repairs may only be carried out by Leica-trained service technicians.
- Only original Leica spare parts may be used.

Legal requirements

- Adhere to general and local regulations relating to accident prevention and environmental protection.

EC declaration of conformity

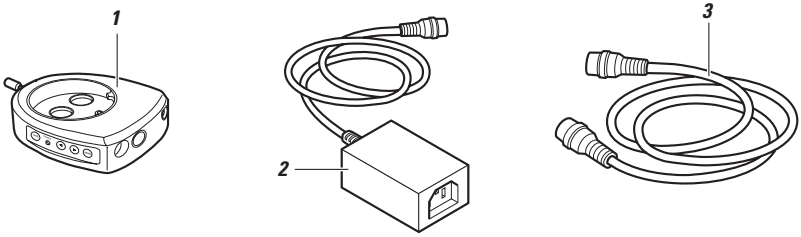
The Leica IC A video module and its accessories are constructed in accordance with the latest technologies and are provided with an EC declaration of conformity.

Directions for the person in charge of the instrument

The Leica IC A video module has been developed and manufactured in accordance with the latest technologies. Hazards can nevertheless arise during its use. Before fitting the Leica IC A video module and setting it into operation, pay attention to the following points:

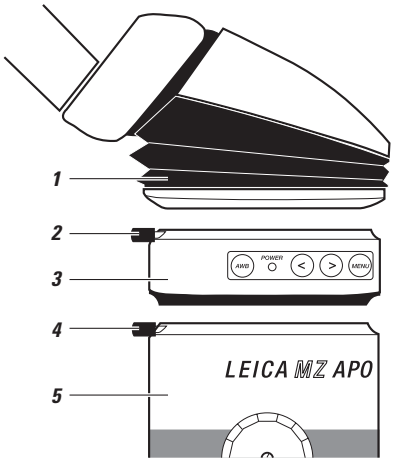
- Read this user manual and follow the directions for safety and care.
- Ensure that the Leica IC A video module is used only by persons authorized to do so.
- Ensure that this user manual is always available at the place where the Leica IC A video module is in use.
- Carry out regular inspections to ensure that the users are adhering to safety requirements.
- If a fault which could cause injury develops in the product, inform your local Leica agency or Leica Microsystems (Switzerland) Ltd., CH-9435 Heerbrugg.
- Read the user manual for your stereomicroscope and observe the directions for safety and care.

Overview of the instrument



1 Leica IC A video module PAL or NTSC
2 Power unit and connecting cable for Leica IC A video module, with power cable
3 S-VHS cable for monitor or video recorder

Inserting Leica IC A video module into beam path of stereomicroscope



- ▶ Unscrew the clamping screws (2) and (4) as far as they will go.
- ▶ Insert the Leica IC A video module (3) into the dovetail ring of the stereomicroscope (5) and tighten the clamping screw (4).
- ▶ Fit the tube (1) into the dovetail ring of the Leica IC A video module in accordance with the user manual for the stereomicroscope, and tighten the clamping screw (2).

When the Leica IC A video module has been inserted into the beam path, 80% of the available light goes to the two eyepieces for observation and 20% to the Leica IC A video module.

Fitting to stereomicroscopes

The Leica IC A video module can be fitted to any Wild or Leica stereomicroscope having the appropriate dovetail ring mount. The sequence can be any of the following, for example:

- Optics carrier – Leica IC A video module – binocular tube
- Optics carrier – coaxial incident light housing – Leica IC A video module – photo tube or drawing tube
- Optics carrier – beam splitter – Leica IC A video module – binocular tube
- Optics carrier – Leica IC A video module – discussion tube – binocular tubes (on both sides)

For instructions on assembly, refer to "Accessories" in the user manual for your stereomicroscope.

Fitting to surgical microscopes

The Leica IC A video module can be fitted to Leica surgical microscope and to accessory which has a dovetail ring mount.

The Leica IC A has not been tested in accordance with IEC 601-1-1 (Med GV, Europe) or with FDA, FDI (USA) and may be used only if compliance with these standards is not required (page 3).

Connecting the Leica IC A video module

The monitor must have an S-VHS connection.

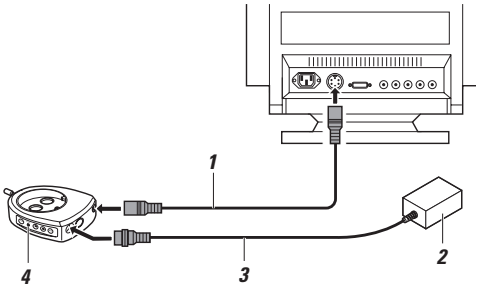
Caution

Risk of damage to the Leica IC A video module.

- ▶ Disconnect the plug of the power unit from the Leica IC A video module before connecting or disconnecting the S-VHS cable.
- The socket "COMP" is only for servicing.

Requirements

- The monitor must be switched off.
- The Leica IC A video module must be separated from the power unit.



- ▶ Connect the S-VHS cable (1) to the monitor and to the "VIDEO" socket on the Leica IC A video module.
- ▶ Attach the connecting cable (3) of the power unit (2) to the "POWER" socket on the Leica IC A video module.
- ▶ Connect the power unit (2) to the mains supply.

When the Leica IC A video module is connected to the power supply, the diode "POWER" (4) comes up. The Leica IC A video module is now ready for use.

Connecting to an S-VHS video recorder

With an S-VHS video recorder, you can record images transmitted from the Leica IC A video module.

The video recorder must be of the S-VHS type.

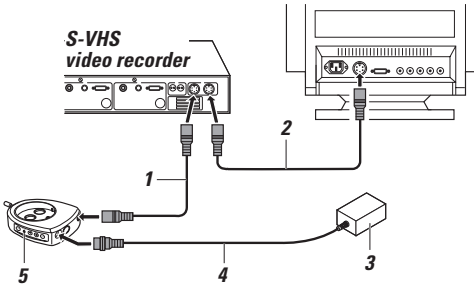
Caution

Risk of damage to the Leica IC A video module.

- ▶ Disconnect the plug of the power unit from the Leica IC A video module before connecting or disconnecting the S-VHS cable.
- ▶ Observe the safety instructions provided by the manufacturer of the video recorder.

Requirements

- The monitor must be switched off.
- The video recorder must be switched off.
- The Leica IC A video module must be separated from the power unit.



- ▶ Connect the S-VHS cable (1) to the video recorder and to the "VIDEO" socket on the Leica IC A video module.
- ▶ Attach the connecting cable* (2) to the monitor and to the video recorder.
- ▶ Attach the connecting cable (4) of the power unit (3) to the "POWER" socket on the Leica IC A video module.
- ▶ Connect the power unit (3) to the mains supply.

When the Leica IC A video module is connected to the mains supply, the diode "POWER" (5) comes up. The Leica IC A video module is now ready for use.

* The cable (2) which connects the video recorder to the monitor is not included in the standard Leica IC A delivery.

Caution

Risk of damage to the Leica IC A video module.

- Protect the Leica IC A video module from direct sunlight and from other strong light sources.
- Protect the Leica IC A video module from damp and vapours.
- Protect the Leica IC A video module from dust and always keep the dust cover on when the module is not in position on the stereomicroscope or surgical microscope.
- Avoid vibration.
- Do not use a sharp object to activate the keys.

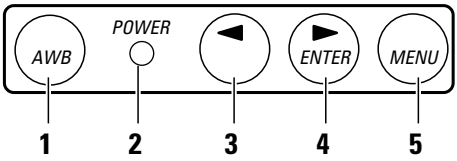
Avoiding ghost images

Under dark-field conditions, and also under low-light conditions, both eyepieces in the binocular tube should be covered. This keeps out parasitic light which might otherwise enter through the eyepieces and get reflected into the camera, and therefore it eliminates disturbing reflexes and ghost images.

Operating modes

The Leica IC A video module has two operating modes: Normal mode and manual mode.
In normal mode, you work with the Leica IC A video module.
In manual mode, you match the Leica IC A video module to your requirements in terms of e.g. colour and brightness.

Control panel of Leica IC A video module



The keys (1, 3, 4 and 5) and the diode (2) on the control panel of the Leica IC A video module have various functions, depending on whether the module is operating in normal mode or in manual mode.

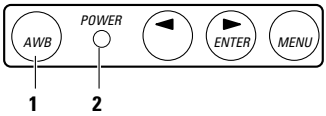
Functions of keys

Key/LED	**Normal mode** (monitor menu not activated)	**Manual mode** (monitor menu activated)
1	Carries out the white-balance procedure	No function
2 (LED)	Comes up as soon as Leica IC A video module is attached to mains supply Flashes during white-balance procedure	Comes up soon as Leica IC A video module is attached to mains supply
3	Press once: Current basic setting appears in menu; refer also to section "Manual mode (monitor menu)" on page 9 Press again: Activates the next basic setting	Reduces the size of a parameter and activates menu points in the submenu
4	Press once: Current basic setting appears in menu; refer also to section "Manual mode (monitor menu)" on page 9 Press again: Activates the previous basic setting	Increases a parameter and activates menu points in the sub-menu
5	Changes to manual mode (displays monitor menu)	Moves the cursor downwards in the main menu

Carrying out the white balance

The white balance ensures that the image on the monitor is reproduced with the correct colour tones.

- During the white-balance procedure, cover the right-hand eyepiece if you are not using it. Stray light results in wrong values.
- Make sure that, during the white-balance procedure, the illumination is not altered and that the white specimen is not moved.



▶ Place a white specimen, e.g. a sheet of white paper, under the stereomicroscope.

▶ Adjust the illumination to what is required later for recording.

▶ Press key (1) AWB (Auto White Balance). The diode (2) flashes.

When the diode (2) stops flashing, the white-balance procedure is complete.

Colour correction

The colour reproduction of single-chip cameras is restricted by the physical characteristics of CCD sensors, and it is never possible to reproduce the entire colour range faithfully. If, for critical mixed colours and for difficult light conditions, the colours are not rendered correctly, they can be corrected in the main menu "Color", submenu Red or Blue (see page 10).

Normal mode

For normal mode, select those basic settings which cannot be altered, and the user-defined settings. These basic settings were optimized in the factory for certain illumination modes.

Basic setting	Illumination mode
INCIDENT	Incident light
BRIGHT FIELD	Transmitted light, bright field
DARK FIELD	Transmitted light, dark field

Selecting the basic setting

▶ Press the ">" or "<" key repeatedly until the basic setting required is displayed on the monitor. This basic setting is now active.

If none of the basic settings gives you a satisfactory image, refer to the section "Manual mode (monitor menu)" on page 10. This tells you how to use the monitor menu to adapt a basic setting.
The changed setting remains stored under the user-defined setting "TEMP" after you quit the monitor menu, even if you switch off the camera. If further changes are made to the setting, the values in "TEMP" are overwritten. The setting selected in "TEMP" can also be stored under "USER" via the monitor menu.

User-defined setting	Significance
TEMP	The latest setting stored in the monitor menu
USER	The latest setting to be stored (see section "Storing user-defined settings", page 10)

Manual mode (monitor menu)

In the monitor menu, adjust the various settings for the Leica IC A video module, e.g. brightness and colour rendering. The overview on this page shows you which parameters are available. The next page explains how to set the Leica IC A video module.
In the "MAIN menu", select a sub-menu in which you can alter the settings. To reset brightness, brightness evaluation and gamma correction, use the main menu.

Selecting a sub-menu

- ▶ Using the "MENU" key, move the cursor to the menu point required.
- ▶ Using the key ">", call up the sub-menu.
- ▶ In the sub-menu, use the "MENU" key to select a menu point, and adjust it with "<" or ">".

Returning to the main menu

- ▶ Press the "MENU" key repeatedly until the cursor is on the menu point *"MAIN Menu"*.
- ▶ Using the key ">", call up the main menu.

Returning to the settings

- ▶ Press the "MENU" key repeatedly until the cursor is on the menu point *"EXIT"*.
- ▶ Using the key ">", call up the settings.

Storing user-defined settings

- ▶ Alter the settings as is described under "Functions of menus" on page 11.
  The current setting is stored in the memory *"TEMP"*.
- ▶ In the main menu, press the "MENU" key repeatedly until the cursor is on the menu point "*Set parameter to user*".
  The image is now stored and is in the memory *"USER"*.
- ▶ Confirm with key ">".
- ▶ Press the "MENU" key repeatedly until the cursor is on the menu point *"EXIT"*. Quit the main menu with the key ">".

Main menu

MAIN Menu
- EXIT
- Color
- Brightness
- Accentuate
- Gamma
- Window
- Set parameter to user
- Info

Sub-menus

For the menu "Color":

MAIN Menu
- Red
- Blue

For the menu "Window":

MAIN Menu
- WindowDisp ON/OFF
- WindowSize:
- Window X:
- Window Y:
- OSD: white ON/OFF

For the menu "Info":

MAIN Menu

LEICA IC A (PAL)
SW-Version Vxx
HW-Version Vxx

Functions of menus

Changing colours (Color)

In the sub-menu of *Color*, adjust the red and blue tones separately.

- ▶ In the main menu, select the menu point *Color* and use the key ">" to change to the sub-menu.
- ▶ Select *Red* or *Blue*. Weaken the tone with key "<" and intensify it with key ">".

Brightness

With *Brightness*, you adjust the basic brightness of the entire image.

Accentuate

With *Accentuate*, brighter or lighter areas of the image are emphasized. Either the darker features (slider left) or the brighter features (slider right) can be brought to the basic value set with *Brightness*.
Example:
With dark-field applications in transmitted light, important information is concealed in the dark parts of the image, and the bright background is of no interest.
With bright-field applications in transmitted light, or with incident light, the important information is in the bright parts of the image, and the dark parts usually are of no interest.

Gamma correction

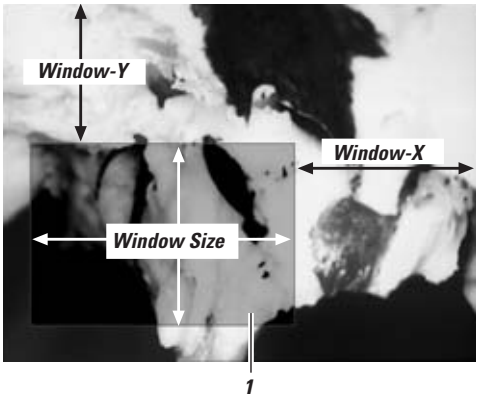
This parameter is for matching the camera to your monitor.

This brightness control or brightness evaluation relates only to the evaluation window. Settings for the evaluation window are described in the following chapter.

- ▶ Within the main menu, select the menu point *Brightness, Accentuate* or *Gamma*.
- ▶ The key "<" shifts the bar to the left (setting weakened)
  The key ">" shifts the bar to the right (setting intensified).

hanging the evaluation window for brightness adjustment and brightness evaluation

This function changes the size and position of the evaluation window (1).



- ▶ Within the main menu, call up the sub-menu *Window.*
- ▶ Using the "MENU" key, position the cursor in front of the menu point *Window Disp ON/OFF* and use the key ">" to display the evaluation window.
- ▶ In the menu point *Window Size*, use the keys ">" and "<" to alter the field coverage.
- ▶ In the menu points *Window-X* horizontal and *Window-Y* vertical, use the keys ">" and "<" to position the evaluation window.
- ▶ In the menu point *Window Disp ON/OFF*, use the key ">" to show or hide the evaluation window.

Changing the colour of the background characters

You can change the colour of the background characters from white to black.

- ▶ Within the main menu, call up the sub-menu *Window.*
- ▶ In the sub-menu *OSD: white ON/OFF*, use the key ">" to change the colour of the characters.

Directions for care and cleaning

- Remove dust with a pneumatic rubber bulb and with a soft brush.
- Clean the lenses of the Leica IC A video module only with special optics cleaning cloths and with pure alcohol.
- Do not use a sharp object to press the keys.
- Use the dust cover when the video module is not fitted to the stereomicroscope or to the surgical microscope.

Protect the Leica IC A video module against

- improper handling
- dust, damp, vapours, acids, alkalis and other corrosive substances
- oil and grease.

What to do if …

The image is too dark

▶ Readjust the settings on the video camera and monitor. Refer to the instructions provided by the manufacturer.

▶ Adjust the brightness of the light source.

▶ Inspect the settings on the stereomicroscope.

Image not sharp

▶ Adjust the settings on the stereomicroscope, referring to the instructions for that instrument.

▶ Ensure that the video module has been fitted correctly (page 5).

No power (LED on control panel of Leica IC A video module does not come up)

▶ Inspect the mains cable connection (page 6).

▶ Inspect the connection between the power unit and the video module (page 6).

▶ Inspect the mains voltage.

No image

▶ Inspect the power supply (see above).

▶ Make sure that the monitor is switched on.

▶ Inspect the settings on the monitor (correct input channel, etc.).

▶ Inspect the connection between the video module and the monitor (page 6).

▶ Inspect the settings on the stereomicroscope.

Incorrect colour rendering

▶ Inspect the settings on the monitor.

▶ Carry out the automatic white balance procedure (page 8).

▶ Inspect the settings and status of the stereomicroscope (filter inserted in beam path e.g. with fluorescence).

▶ Inspect the illumination (colour filter in illumination beam path, etc.).

▶ Correct colour rendering in the menu "Color" (page 10).

Leica IC A Technical data

Monitor	At least S-VHS
Field coverage with 10× eyepieces	Corresponds to diameter of intermediate image of 21 mm
Tube factor	
• On camera side	0.29×
• Observation down binocular tube	1.0×
Partition of light	20% video, 80% observation
Stereo base	24 mm

Camera data

Resolution	440'000 pixels, >470 TV lines
Video outlet	Y/C (S-VHS)
Video standards	PAL (stock no. 10 446 237) or NTSC (stock no. 10 446 238)
CCD sensor	1/3" interline transfer
CCD with colour mosaic filter	
Number of pixels	PAL: (752H × 582V) NTSC: (868H × 492V)
Pixel size	PAL: 6.5 µm × 6.25 µm NTSC: 6.35 µm × 7.4 µm
Shutter control	Shutter: 1/50s to 1/2'000'000 s AGC: 6 db to maximum of 30 db
Signal-to-noise ratio	> 49 dB (with AGC = 6 and shutter 1/2'000'000 s)
Sensitivity to light	Low-noise image uptake up to 3 lux
Power supply	12 V, 200 mA
Weight	480 g (without power unit)
EMV standards	EN 55011, EN 50082-1, EN 61000-3-2, EN 61000-3-3

Power unit

Input voltages	85 V to 264 V / 47 Hz to 63 Hz
Mains plug	IEC 320
Secondary voltage	12 V DC
Low-voltage plug	MiniDIN 5-pole

Environmental conditions

Operating temperature	+10°C to +40°C
Storage and transport temp.	–20°C to +55°C
Permitted air humidity during use	< 85 %

In accordance with the ISO 9001 certificate, Leica Microsystems (Switzerland) Ltd., Stereo & Macroscope Systems, has at its disposal a management system that meets the requirements of the international standard for quality management.

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