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Leica IC80 HD
Manual

Leica
MICROSYSTEMS

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General Instructions

Safety Concept

Before using your Leica IC80 HD for the first time, please read the "Safety Concept" brochure included with your instrument. It contains additional information on handling and care.



Use in clean rooms

The Leica IC80 HD can be used in clean rooms without any problems.

Cleaning

- Do not use any unsuitable cleaning agents, chemicals or techniques for cleaning.
- Never use chemicals to clean colored surfaces or accessories with rubberized parts. This could damage the surfaces, and specimens could be contaminated by abraded particles.
- In most cases, we can provide special solutions on request. Some products can be modified, and we can offer other accessories for use in clean rooms.

Servicing

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

Responsibilities of person in charge of instrument

- Ensure that the Leica stereomicroscope is operated, maintained and repaired by authorized and trained personnel only.

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Safety Concept

The Leica IC80 HD is shipped with an interactive CD-ROM, where you can find all relevant user manuals. Keep it in a safe place, and readily accessible to the user. User manuals and updates are also available for you to download and print from our web site www.leica-microsystems.com.

The "Safety Concept" brochure contains additional safety information regarding service work, requirements and the handling of the stereomicroscope, electrical and other accessories as well as general safety instructions.

You can combine individual system articles with articles from external suppliers (e.g. cold light sources, etc.). Please read the user manual and the safety requirements of the supplier.

Before installing, operating or using the instruments, read the user manuals listed above. In particular, please observe all safety instructions.

To maintain the unit in its original condition and to ensure safe operation, the user must follow the instructions and warnings contained in these user manuals.

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Symbols Used

Warning of a danger



This symbol indicates especially important information that must be read and complied with. Failure to comply can cause the following:

- Hazards to persons!
- Instrument malfunctions and damage.

Warning of hazardous electrical voltage



This symbol indicates especially important information. Failure to comply can cause the following:

- Hazards to persons!
- Instrument malfunctions and damage.

Danger due to hot surface.



This symbol warns against touching hot surfaces, such as light bulbs.

Important information



This symbol indicates additional information or explanations that are intended to provide clarity.

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Safety Instructions

Description
The individual modules fulfill the highest requirements in terms of observation and documentation with the Leica IC80 HD.

Intended use
- Refer to the "Safety Concept" brochure.

Non-intended use
- Refer to the "Safety Concept" brochure.

The instruments and accessories described in this manual have been safety-tested and checked for possible hazards. The responsible Leica affiliate must be consulted whenever the instrument is altered, modified or used in conjunction with non-Leica components that are outside of the scope of this manual.

Unauthorized alterations to the instrument or noncompliant use shall void all rights to any warranty claims!

Installation location
- Refer to the "Safety Concept" brochure.
- Electrical components must be placed at least 10 cm away from the wall and from flammable substances.
- Avoid large temperature fluctuations, direct sunlight and vibrations. These conditions can distort measurements and micrographic images.
- In warm and warm-damp climatic zones, the individual components require special care in order to prevent the build-up of fungus.

Requirements to be met by the operator:
- Refer to the "Safety Concept" brochure.

Ensure that:
- The Leica IC80 HD is operated, maintained and repaired only by authorized and trained personnel.
- All operators have read, understood and observe this User Manual, and particularly the safety regulations.

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Safety Instructions (continued)

Repairs, service work

- Refer to the "Safety Concept" brochure.
- Only original Leica Microsystems spare parts may be used.
- Before opening the instruments, switch off the power and unplug the power cable.
- Touching the live electric circuit can cause injury.

Transport

- For shipping or transporting the individual modules of the Leica IC80 HD, use the original packaging.
- In order to prevent damage from vibrations, disassemble all moving parts that (according to the user manual) can be assembled and disassembled by the customer and pack them separately.

Installation in third-party products

- Refer to the "Safety Concept" brochure.

Disposal

- Refer to the "Safety Concept" brochure.

Legal requirements

- Refer to the "Safety Concept" brochure.

EC Declaration of Conformity

- Refer to the "Safety Concept" brochure.

Health risks

Workplaces equipped with stereomicroscopes make it easier to examine extremely small structures, but they also impose high demands on the eyes and holding muscles of the user. Depending on the duration of uninterrupted work at such a workplace, impaired vision and problems with the musculoskeletal system may occur. Therefore, corresponding measures should be taken to reduce the strain:

- Optimal arrangement of workplace, work assignments and work flow (changing tasks frequently).
- Thorough training of the personnel, giving consideration to ergonomic and organizational aspects.

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Leica IC80 HD

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Introduction

Congratulations on purchasing the Leica IC80 HD Digital Camera Module by Leica Microsystems. The special design of the Leica IC80 HD makes it a universal, highly versatile tool for viewing microscopic specimens and capturing still images or even video.

Real Full HD display

The integrated HDMI output allows the microscope image to be output to a High-Definition (HD)-capable monitor, where the following resolutions are possible:

- 1920×1080i ("Full HD"). This resolution provides the best possible imaging performance on a Full HD-capable television.
- 1280×720p ("HD ready"). This resolution is suitable for display on televisions labeled "HD ready".

Leica Application Suite

Along with your Leica IC80 HD, you also obtain the "Leica Application Suite EZ" software (LAS Core on request). It allows additional scenarios to be implemented in which the television and monitor can even be used together. Thus you are ideally prepared for every situation: work at the computer, presentations, training sessions, trade show appearances, material testing and more.

User-friendly even in the smallest detail

Like every digital camera, the Leica IC80 HD reacts differently to different light sources. However, the white balance is factory set to match the Leica LED illuminators. This means that if you use a Leica LED illuminator, you automatically obtain the best results!

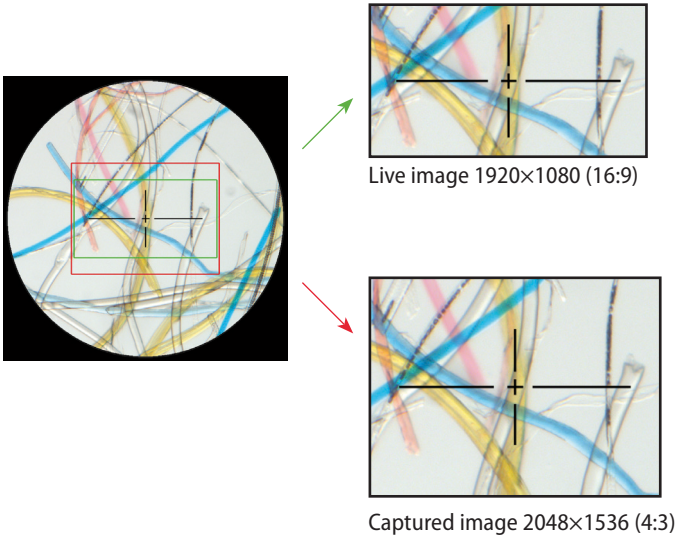
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Effective Displayed Section

Due to the sensor size in the camera, the live image and the final image capture do not show the same section that you see when looking through the eyepieces.

Using the optional graticule

The optional graticule can be inserted into the eyepiece and shows the section of the live or captured image.



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Standard Delivery and Optional Accessories

Standard equipment

The standard delivery of the Leica IC80 HD includes the following:

- Leica IC80 HD camera
- "Leica Application Suite" software DVD
- USB cable for the connection to the computer.

Additional information about working on the computer and with Leica Application Suite is provided in the software's online help.

Optional stand-alone kit

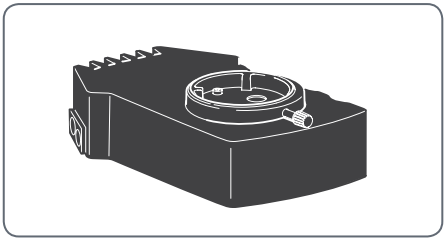
The optional stand-alone kit provides everything you need to operate the Leica IC80 HD even without a computer. It contains:

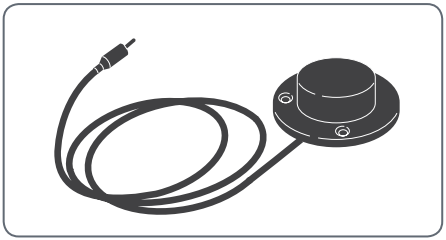
- Power pack
- Remote control
- SD card
- HDMI cable for connection to computer or Full HD television
- Analog video cable with cinch plug

The stand-alone kit is described on page 17

Optional accessory: handswitch/footswitch

You can trigger the camera using the optional handswitch/footswitch. This accessory is recommended if you need both hands to manipulate the specimen or if you use a boomstand or floorstand microscope setup which is very sensitive to vibrations..





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Installation

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Assembling the Camera

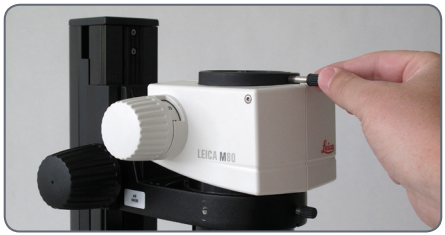
The Leica IC80 HD is installed between the microscope stand and tube.

The Leica IC80 HD is compatible with all Leica M series stereomicroscopes.

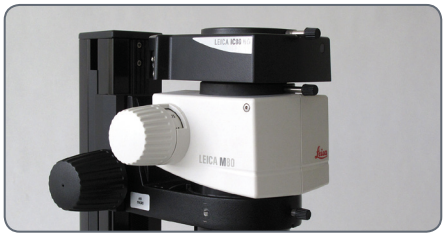
If the tube of the microscope is already installed, remove it according to the User Manual provided with the microscope.

Assembly

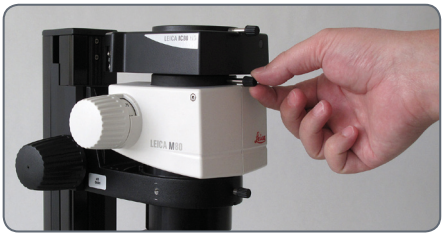
1. Loosen the locking screw on the optics carrier.



2 Place the Leica IC80 HD on the optics carrier.



3. Tighten the locking screw carefully without applying too much force.



4. Install the tube on the Leica IC80 HD as described in the manual for your stereomicroscope.

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Connecting to the Windows PC

For instructions on installing and using the software for PC mode, refer to the DVD provided with the IC80 HD.

Eyepieces have a fixed, circular field of view. However, the image sensor of the Leica IC80 HD is rectangular. Therefore, the image field of the camera shows less information than you see when looking through the eyepieces (see page 10).

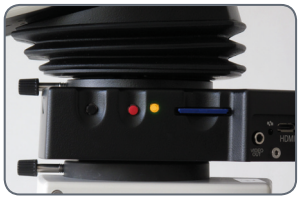
Installation and connection

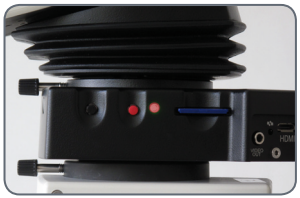
1. Place the DVD provided into the computer's disk drive and follow the instructions for installing the software.
2. Connect the Leica IC80 HD and the computer using the USB cable provided.

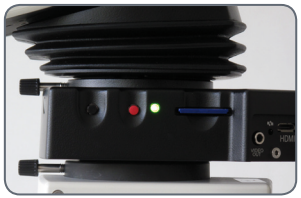


The Leica IC80 HD is powered by the computer via the USB cable. This changes the color of the LED on the Leica IC80 HD. As soon as the LED is green, you can open the software and view, acquire or manage images.

3. Follow the instructions in the software for adjusting and acquiring an image.







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Limitations in PC Mode

Aspect ratio

If the Leica IC80 HD is connected to a computer, images are always output in 4:3 aspect ratio – even if a 16:9 monitor or television is connected via HDMI. The image is necessarily compressed on such a device.

Remote control

If you have equipped the Leica IC80 HD with the stand-alone kit and still connect the camera to the computer, the remote control will not work. The menus of the camera are also no longer displayed on the monitor. Instead, all settings are configured on the computer using Leica Application Suite.



4:3 aspect ratio



16:9 aspect ratio

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Using an Additional HDMI Monitor in PC Mode

In PC mode, the camera image is always shown in the preview window of Leica Application Suite. In addition, another computer monitor or television can be connected via the HDMI interface.

The image cannot be output via both the HDMI and analog ports simultaneously. The HDMI port always has priority. To output the image via the analog port, you have to remove the HDMI cable from the camera.

The image resolution on the attached HDMI or television screen is limited to the live image resolution inside the LAS EZ software. Due to technical limitations it is not possible to provide a HD-ready or Full-HD live image stream to the attached screen. In order to see the higher resolution on the attached screen, please use the camera in standalone mode (see page 17)



Connecting the HDMI monitor

1. Connect the HDMI cable provided to the Leica IC80 HD.
2. Connect the HDMI cable to the HDMI television or monitor.

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Stand-alone Kit

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Application, Standard Delivery, Requirements

Intended use

The stand-alone kit for the Leica IC80 HD extends the possibilities of the camera so that it can be used even without a computer.

The remote control provided enables access to the menus of the camera, so that a computer is no longer required for brightness, white balance and other settings.

Because the camera is no longer connected to the computer, the power pack must be used for the power supply. The power pack is part of the standard delivery of the stand-alone kit.

Standard delivery

The stand-alone kit is composed of the following components:

- Power pack
- Remote control
- SD card
- HDMI cable for connection to computer or Full HD television
- Analog video cable with cinch plug

Requirements

The following requirements must be met in order to use the stand-alone kit:

- Leica M series stereomicroscope
- HDMI-capable monitor or television that is at least «HD ready» certified

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Cables and Terminals

The stand-alone kit is designed for the use of HDMI-capable monitors and televisions. We urgently recommend not using a DVI adapter, as otherwise proper function can no longer be guaranteed!

If there is a simultaneous analog connection, only the HDMI signal is output.

Please pay ultimate attention to only connect the 5V power supply which is part of the stand-alone kit. Applying a wrong voltage can severely damage the IC80 HD camera!

Cables

1. Connect the Leica IC80 HD to a suitable power socket using the power pack.



2. Connect the narrow end of the HDMI cable provided using the camera.



3. Connect the wide end of the HDMI cable to the HDMI input of the television or monitor.

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Information about SD Memory Cards

Be absolutely certain to read the following instructions about formatting and handling the memory card provided in order to prevent malfunctions during image acquisition.



File system and formatting

So that the SD card works correctly and is detected by the Leica IC80 HD, it has to use the "FAT" file system. Most memory cards are factory-formatted with FAT so that they can be used immediately.

An SD card cannot be formatted in the Leica IC80 HD. If it is necessary to format the card, use a computer to do so. You can also delete the files on the card in any digital camera that works with SD cards. During the deletion, the FAT file system is installed automatically.

Capacity

SD cards of class 4 and 6 can be used with the camera. Also so called SDHC (high capacity) cards with up to 32 GB memory are supported.

Write protection

Some SD memory cards are equipped with a slide for write protection. If the slide is pressed down, no new images can be saved. In addition, existing images are protected from being deleted.

If you cannot save any more images to the SD card, check to make certain that the write protection is disabled.

Orientation

Make sure that the memory card is oriented correctly before inserting it into the camera. If you accidentally insert the card the wrong way around, this could damage the camera.

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Capturing Images without a Computer

Before capturing the image, ensure that enough memory is available on the SD card and that write protection has not been activated. If the SD memory card is full or protected, the LED of the Leica IC80 HD remains red, and you cannot acquire any more images.

If you want to use the stand-alone kit, the camera must not simultaneously be connected to a computer. If it is, you cannot save any images to the SD card.

In the highest resolution, a single image takes up approx. 1.3 megabytes of storage space on the SD card. This means that per gigabyte of capacity, you can save over 700 images.

Capturing images

1. Focus on the specimen.
2. Insert the SD memory card into the slot on the side of the camera until you hear it click into position.



The LED of the camera is illuminated in green. The camera is now ready to save images to the SD memory card.

3. Briefly press the red image capture button on the side of the camera to acquire an image.



You hear a signal tone as confirmation. While the image is acquired, the camera LED flashes green and the word "Capturing" flashes on the monitor.

4. After the image acquisition is complete, press the SD memory card into the storage space so that it pops out.

You can now transfer the images to your computer using a corresponding SD memory card reader.

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Viewing images and movies without a computer

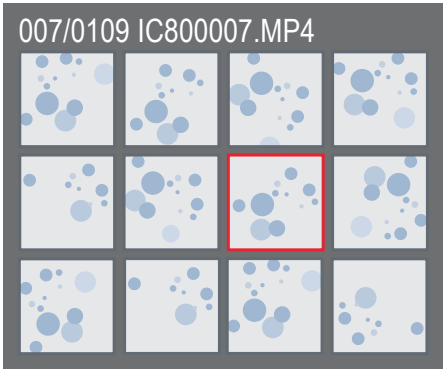
The Leica IC80 HD shows images und movie clips directly on an HD monitor.

Thumbnail view

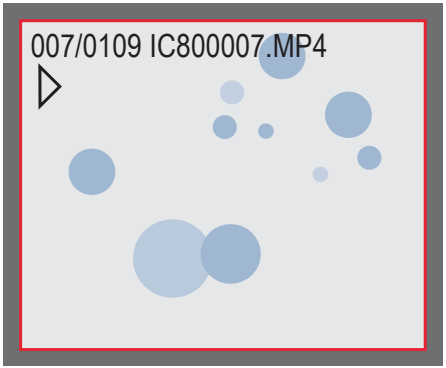
- up/down/left/right ▶ select thumbnail
- OK: Show image in full screen or playback movie clip

  up/down ▶ next image / previous image
  OK ▶ Play movie clip
  left /right ▶ fast forward / rewind

To return to live view press any button on the camera or press the key 1, 2 or 9 on the remote control (see page 24).



Thumbnail view



Playback / fullscreen view

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Adjusting the White Balance

The white balance ensures that the specimen is shown in neutral colors. We recommend carrying out a new white balance adjustment whenever you change the illumination type or color temperature. This is particularly necessary if you are working with halogen light that can be switched from yellow (low intensity) to blue (high intensity).

You can carry out the white balance using the camera's own menu or via the camera trigger.

The white balance of the camera is factory set to automatically provide optimum results when used in conjunction with a Leica LED illuminator.

Manual white balance

- The manual white balance is described on page 30.

Automatic White Balance

1. Position a gray chart under the microscope so that the entire image field is filled in.



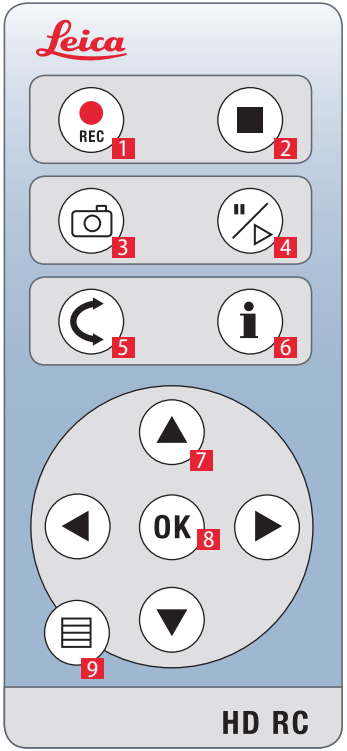
2. Adjust the illumination as desired.
3. Press the trigger and hold it down for 5 seconds. The camera now carries out an automatic white balance.

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Remote control

The remote control does not work if the camera is connected to a computer.

For triggering the camera, the optional footswitch can be used instead of the remote control.



1. *Start video recording*
2. *Stop video recording*
3. *Save still image to SD card*
4. *Stop / continue freeze image*
5. *Playback mode*
6. *Show / hide information box*
7. *Arrow keys for navigation*
8. *OK / confirm*
9. *Call up the camera menu*

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Remote Control: Changing the Battery

Checking the battery

If you are not sure whether the remote control is working correctly, test the function as follows:

1. Switch on the microscope and monitor so that you see the live image on the monitor.
2. Hold the remote control in the beam path so that it faces upwards and press any key.



Because the chip of the camera also responds to the infrared range, you can see the LED at the top of the remote control light up. If this is not the case, the battery probably needs to be changed.

Changing the Battery

1. Remove the battery insert on the rear of the remote control.
2. Replace the battery.

For the replacement, you need a button battery of type CR2025.

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Analog Video Display without a Computer

The image cannot be output via both the HDMI and analog ports simultaneously. The HDMI port always has priority. To output the image via the analog port, you have to remove the HDMI cable from the camera.

Connection

1. Plug the power cable into the corresponding connector on the rear side of the Leica IC80 HD and the other end into a suitable power socket.
2. Plug the video cable into the "Video" port on the rear side of the Leica IC80 HD and the other end into the analog port of the device (projector, monitor, recorder etc.).



Changing the video standard

If you see a distorted image or no image at all on your analog device, you may have to change the video standard.

1. To change between the "PAL" and "NTSC" video standards, carefully press the toggle button once using the tip of a pen or pencil.



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The Camera Menu

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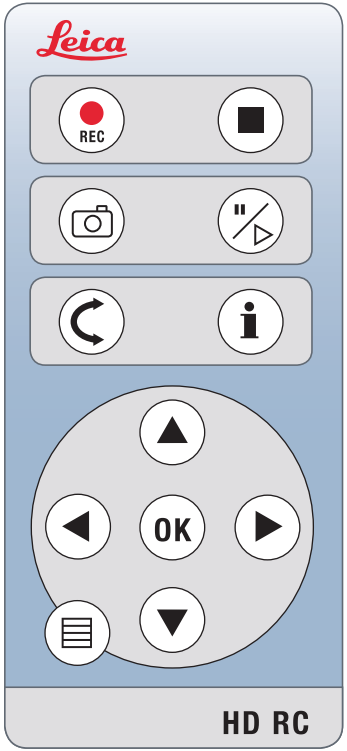
Calling up the Camera Menu

The remote control does not work if the Leica IC80 HD is connected to a computer. The menus of the camera are also no longer displayed on the monitor. In this case unplug the USB cable from the camera and press the black button on the camera for about 5 seconds until the message "Standalone mode" appears on the attached analog or HD screen.



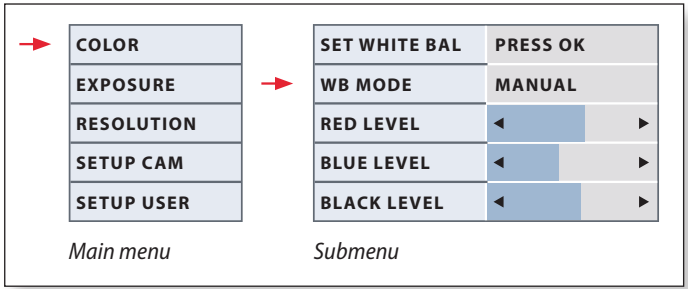
Opening and closing the camera menu

1. Point the remote control towards the camera.
2. Press the ▤ key on the remote control to show the camera menus on the monitor.
3. Press the ▲▼◀ and ▶ buttons to select a menu item.
4. Press the "OK" button to confirm a menu item.
5. Press the ▤ button again to hide the camera menus.



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COLOR (Automatic White Balance)



The "Color" function makes it possible to adapt the camera chip to the ambient light so that color-neutral images can be acquired.

Tip: Whenever possible, always use a neutral gray chart to attain optimum results.

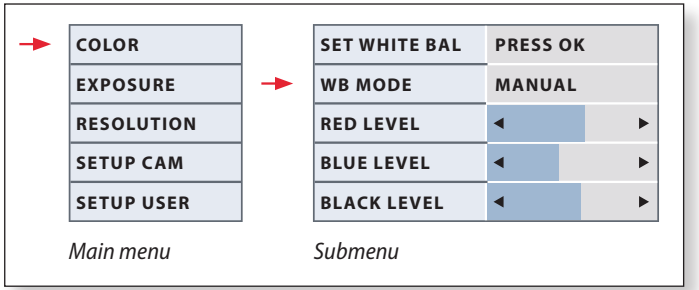
Enabling automatic white balance

1. Press the ▤ button on the remote control.
2. Call up the "COLOR" entry.
3. Set the value for "WB MODE" to "AUTO".
4. Press the ▤ button to exit the menu.

The values for "RED" and "BLUE" cannot be adjusted if the "WB MODE" setting is set to "AUTO".

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COLOR (Manual White Balance)



The "Color" function makes it possible to adapt the camera chip to the ambient light so that color-neutral images can be acquired.

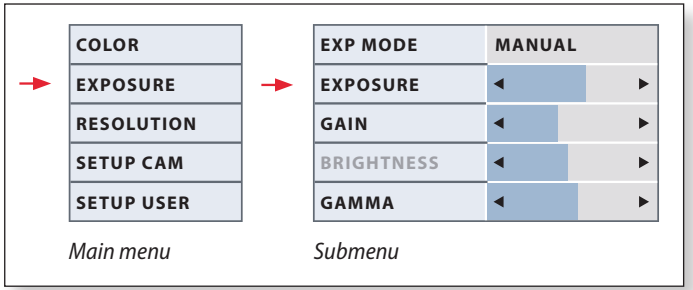
Tip: Whenever possible, always use a neutral gray chart to attain optimum results.

Adjusting the white balance manually (recommended)

1. Place the gray chart under the microscope so that the entire field of view is filled in.
2. Press the ▤ button on the remote control.
3. Call up the "COLOR" entry.
4. Select the "SET WHITE BAL" menu item and press the "OK" button.
4. If necessary, correct the values for "RED" and "BLUE" until the image shows a uniform gray area.
5. Press the ▤ button to exit the menu.

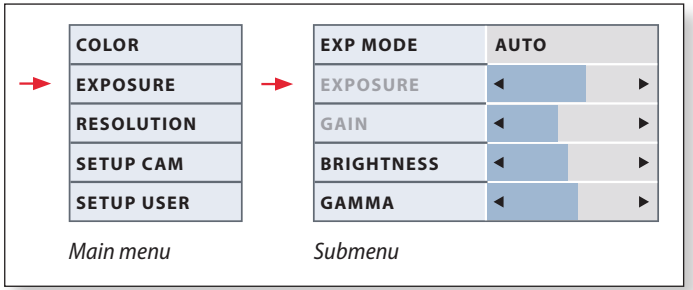
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EXPOSURE



Manual exposure

1. Press the ▤ button on the remote control.
2. Call up the command for manual exposure (see diagram at the left).
3. Set the value for "EXP MODE" to "MANUAL".
4. Correct the values for "EXPOSURE", "GAIN" and "GAMMA" until you obtain the desired results for the image.

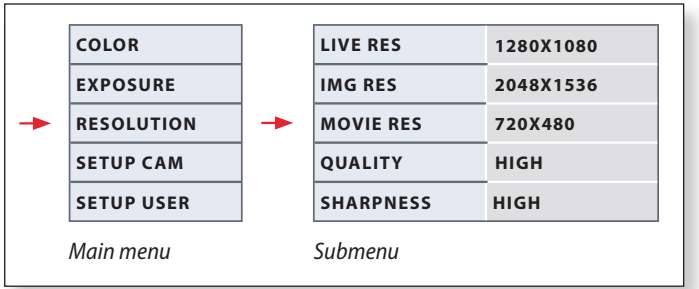


Automatic exposure

1. Press the ▤ button on the remote control.
2. Call up the command for automatic exposure (see diagram at the left).
3. Set the value for "WB MODE" to "AUTO".
4. Correct the values for "BRIGHTNESS" and "GAMMA" until you obtain the desired results for the image.

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RESOLUTION



The "RESOLUTION" menu enables you to define the resolution for the live image on the computer, still image capture and video capture individually. This provides optimum results in every situation.

LIVE RES (resolution of the live image)
Defines the resolution of the live image. The following resolutions are available:

- For direct connection of the Leica IC80 HD to a monitor or television: 1280×720 or 1920×1080 (16:9 aspect ratio).
- For connection to a computer: 640×480, 1024×768 and 1440×1080 (4:3 aspect ratio)

IMG RES (resolution of the captured image)
Defines the resolution of the captured image if the Leica IC80 HD is not connected to a computer. The following resolutions are available: 640×480, 1024×768, 1600×1200 and 2048×1536.

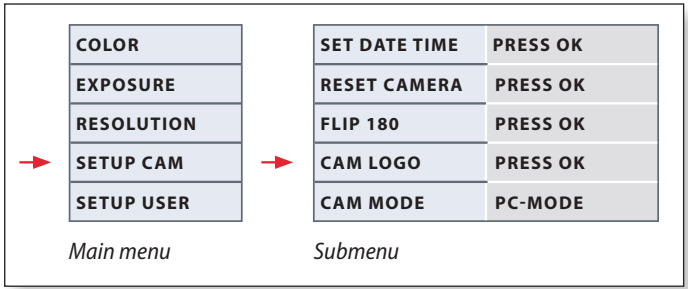
MOVIE RES (resolution of videos)
Indicates the resolution of the captured videos if the Leica IC80 HD is not connected to a computer. The resolution of 720×480 pixels cannot be changed.

QUALITY (of the image capture)
A higher image quality can slow down the image capture process. Two quality levels are available for selection: "NORMAL" and "HIGH".

SHARPNESS (internal camera sharpness)
Define the amount of sharpening to be applied to the image.

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SETUP CAM (Camera Settings)



The camera settings enable you to control internal parameters such as the date or time, update the firmware or reset the camera. You can also switch the camera from stand-alone to PC mode (or vice versa).

SET DATE TIME

This command sets the date and time as well as the format for displaying them. The following formats are available for selection: YYMMDD – DDMMYY – MMDDYY

RESET CAMERA

This command resets the camera to the factory settings. All user information (such as white balance, resolution etc.) is reset.

FLIP 180

Turns the Live image by 180°. A small red mark (↕) is displayed in the top right corner of the screen.

CAM LOGO (camera information)

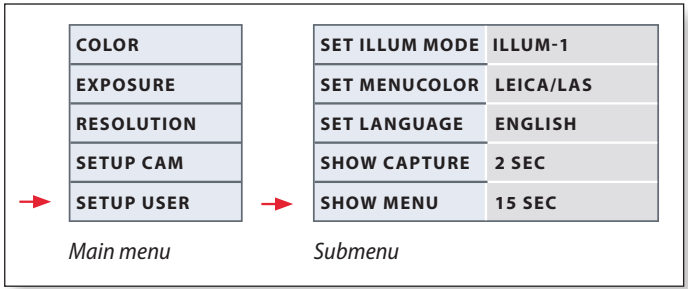
Shows the following on the monitor: Leica logo, histogram, date/time and image counter. In the center of the screen, a cross hair mark is also displayed when CAM LOGO is set to DEFAULT. If you do not want to display any camera information, select NONE.

CAMERA MODE

Toggles between the PC and stand-alone modes. You can also toggle between PC and stand-alone mode by pressing the black button for more than 5 sec until a message appears on the screen.

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SETUP USER (User-defined Settings)



The user-defined settings enable you to, for example, save illumination scenarios and retrieve them later.

SET ILLUM MODE -1 to 3 (save illumination modes)

These settings allow you to store up to three different illumination modes and retrieve them later. This saves the current camera settings for recurring acquisition situations.

SET MENUCOLOR

Currently, two color schemes are available for the menu guidance. Additional colors may be provided in the future via a firmware update.

SET LANGUAGE

Currently, only English is available as the language for the menu guidance. Additional languages may be provided in the future via a firmware update.

SHOW CAPTURE

Defines how long the acquired image is displayed on the screen after being captured. If you select INFINITE then the captured image is displayed until you have confirmed to store or to delete the image.

SHOW MENU

Defines how long the menu is displayed on the screen.

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Predefined Illumination Scenarios

The Leica IC80 HD is supplied with various illumination modes that cover a wide spectrum of possible situations.

Changing the illumination mode

1. Press the black button on the Leica IC80 HD to display the current illumination mode on the monitor or television.



2. Press the button again to switch to the next illumination mode.
3. Press the red image capture button or wait until the menu no longer appears.

To return to the last selected mode, press the button until the "LAST USED" setting appears.

If you do not press the button for 5 seconds, the selected illumination mode is taken over.



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Care and Maintenance

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Care and Maintenance

General

- For good optical results, it is important to keep optical components clean.
- Always cover the microscope and the Leica IC80 HD with the dust cover included in the delivery when the instrument is not in use.
- If an optical surface is very dirty or dusty, flush it using a syringe or clean it using a camelhair brush before attempting to wipe it off.
- Optical surfaces should be cleaned using a lint-free cloth, lens cloth or cotton swab soaked in methanol or a commercially available glass cleaner. Do not use alcohol.
- Avoid excessive use of solvents. The lint-free cloth, lens cloth or cotton swab should be soaked with solvent, but not so wet that solvent runs over the lens.

Danger of electric shock



Risk of electric shock. Removing the cover of the Leica IC80 HD camera or the stand-alone kit exposes electrically live parts which, if touched, can cause potentially fatal injuries. Have technical service carried out by a Leica Microsystems authorized dealer.

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Specifications

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Leica IC80 HD

IC80 HD Digital Camera

- Weight 700 g (camera only)
- Exposure time 2 msec. – 2 sec.
- Live image on computer screen up to 25 fps (1024×768 pixels)
- Live image on HDMI screen up to 45 fps (1280 x 760 pixels)
- Live image on HDMI screen up to 20 fps (1920 x 1080 pixels)
- Full-screen image capture 2048 × 1536 pixels, 3.1 megapixels
- Sensor size: 6.55 mm × 4.92 mm
- Pixel size: 3.2µm × 3.2µm

Sensor

- Sensor type: Micron 1/2" CMOS
- Gain 1× – 20×
- Color depth 24-bit
- File formats JPEG / MP4

Software

Operating systems: Windows XP, Windows Vista

Leica software: LAS EZ Software (PC)

Mechanical and optical interfaces

- Fits between tube and stand via standard Leica dovetail
- Midpoint offset between top and bottom of dovetail < 0.4 mm
- Light distribution optical 50% / camera 50%
- No visible reflections, dust or dirt on the prism
- Internal video magnification 0.5×
- Sensor centered on optical axis ± 0.1 mm
- Sensor aligned horizontally / vertically ±1 degree

Electronic interfaces

- Compatibility: USB 2.0 mini socket
- Analog video port (RCA plug) PAL or NTSC composite video signal
- Pinhole switch for toggling between PAL and NTSC video mode
- 2-color LED for power on (green) / image capture (red)
- Integrated SD slot (Secure Digital)
- Capture switch for image acquisition
- Reset function when capture switch is pressed longer than 10 seconds

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Leica IC80 HD (continued)

Power supply voltage and frequency

- Input: 5 V DC/500mA
- When using the stand-alone kit:
  85-265 V AC, 50/60 Hz
- Input power = 10W
- Power consumption 4 W

Ambient conditions

- Elevation up to 2000 m
- For use in enclosed rooms only
- Temperature 5 °C to 40 °C
- Installation category II
  (overvoltage category)
- Pollution degree 2
- Maximum humidity 80% for temperatures up to 31 °C; linear decrease to 50% relative humidity at 40 °C.

Other

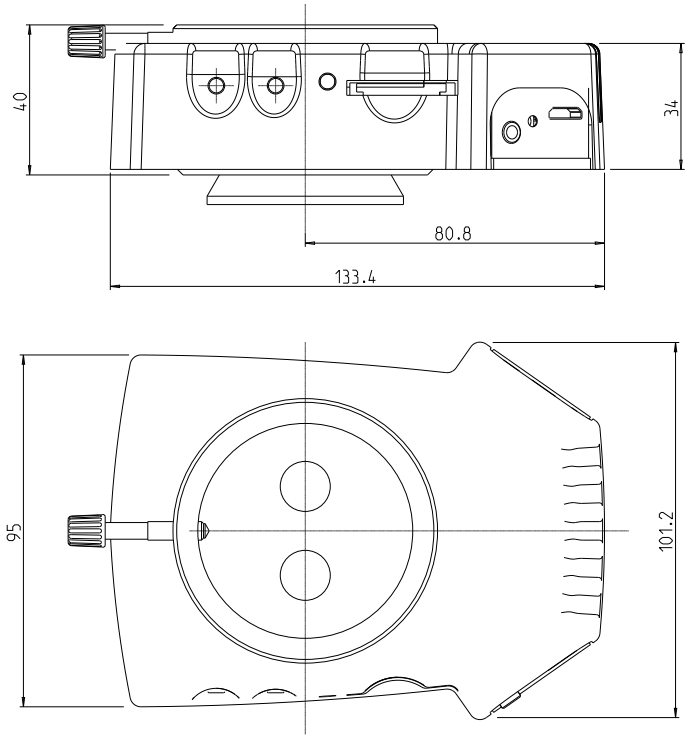
- Power supply via USB 2.0
- External power supply optional
- Operating temperature range +5 °C – 50 °C, humidity 10% – 90%
- Minimum computer configuration:
- Intel Pentium 4 or DuoCore, 2 GHz, 1 GB RAM
- 24-bit graphics, 1024 × 768, CD-ROM drive
- EC Declaration of Conformity available

Standards

- EMI/RFIEN55011-B EN50082-1
- EMC61000-3-261000-3-3

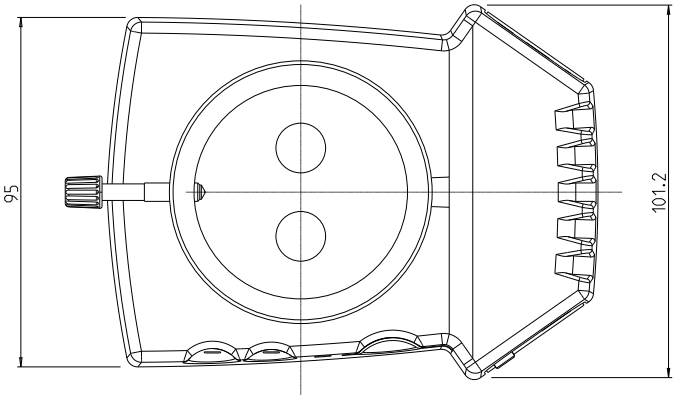
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Dimensional Drawings



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Dimensional Drawings (continued)



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