Living up to Life

Leica
MICROSYSTEMS

User Manual

Leica DMS1000 B TLST
Leica DMS1000 B TL5000

CE

Copyright

The instructions contained in the following documentation reflect state-of-the-art technology. We have compiled the texts and illustrations as accurately as possible. Still, we are always grateful for comments and suggestions regarding potential mistakes within this documentation.

The information included in this manual may be changed without prior notice.

Revision 1.0, published March 12, 2013 by:

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Responsible for contents:
Marketing CMS

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General Notes

Function of the Microscopes

The Leica DMS1000 B TLST and Leica DMS1000 B TL5000 microscopes, for which this User Manual has been written, are designed for routine examinations of cell and tissue cultures, liquids, and sediments. This includes examining specimens taken from the human body for the purpose of gaining information about physiological or pathological conditions or inborn anomalies, or testing for safety and compatibility for potential recipients, or for monitoring therapeutic measures.

The manufacturer assumes no liability for damage caused by, or any risks arising from, using the microscope for other purposes than those for which they are intended or not using them within the specifications of Leica Microsystems CMS GmbH. In such cases, the Declaration of Conformity shall be invalid.

These (IVD) instruments are not intended for use in the patient environment defined by DIN VDE 0100-710. Nor are they designed to be combined with medical instruments in accordance with EN 60601-1. If a microscope is electrically connected to a medical instrument in accordance with 60601-1, the requirements listed in EN 60601-1-1 shall apply. Not suitable for examining potentially infectious specimens. This type of instrument may be operated by trained laboratory personnel only.

IVD

The above-named microscopes comply with the Council Directive 98/79/EC concerning in vitro diagnostics.

DMS1000 B TLST type plate

DMS1000 B TL5000 type plate

General Notes

Use in clean rooms

The Leica DMS1000 B digital microscope system 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.
- The cleaning of glass surfaces and objectives in particular should be carried out exclusively as outlined in the brochure "Cleaning of Microscope Optics". The information can be downloaded at: http://www.leica-microsystems.com/products/. Select your product and go to the "Download" page.

For additional information, refer to page 68

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 microscope is operated, maintained and repaired by authorized and trained personnel only.

Important Safety Notes

User Manual

This User Manual describes the special functions of the Leica DMS1000 B digital microscope system and contains important instructions for its operational safety, maintenance, and accessories.

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 instructions from the supplier.

Before installing, operating or using the instruments, read the user manuals listed above. In particular, please follow 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.

We guarantee the quality of our products. Our guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

Symbols Used

Warning! Safety hazard!

This symbol indicates especially important information that is mandatory to read and observe.

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

Warning of hazardous electrical voltage

This symbol indicates information that must be read and observed.

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

Danger due to hot surface.

This symbol warns against touching hot surfaces, e.g. those of light bulbs.

Important information

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

Explanatory notes

- This symbol within the text stands for additional information and explanations.

Figures

(1) Numbers in parentheses within the descriptions relate to the figures and the items within those figures.

Disposal.

Notes on how to dispose on the microscope, its components and expendables.

China RoHS 50 year EFUP (Environmentally friendly use period)

IVD labeling

IVD nstrument for in vitro diagnostics.

MM/YYYY IVD manufacturing date, for example 11 / 2011 for November 2011.

Safety Instructions

Description

- The individual modules fulfill the highest requirements for observation and documentation with the Leica DMS1000 B digital microscope system.

Intended Use

- Leica Microsystems microscopes are optical instruments for improving the visibility of objects or specimens through magnification. Accessories such as optical accessories, stands, illumination, cameras etc. supplement the equipment configuration.

Non-intended use

- Using the instrument in any way contrary to the specifications in the user manual can lead to bodily harm and damage to objects. Never use microscopes for in vivo examinations or eye surgery if they are not expressly intended for such use. Never install any other plug or unscrew optical systems and mechanical parts unless expressly instructed to do so in the instructions.

The instruments and accessories described in this User Manual have been tested for safety and potential 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 as well as product liability and the Declaration of Conformity.

Place of use

- Only use the instruments in closed, dust free rooms and between +10 °C and +40 °C. Protect the devices from oil, chemicals and extreme humidity. If using the devices outdoors, protect them from dust and moisture. Never use electrical devices outdoors.
- 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 micrographic images, for example.
- In warm and warm-damp climatic zones, the individual components require special care in order to prevent the build-up of fungus.

Safety Instructions (continued)

Responsibilities of person in charge of instrument

- These Safety Instructions must be available at the workplace.

Ensure that:

- The Leica DMS1000 B digital microscope system and accessories are operated, maintained and repaired by authorized and trained personnel only.
- All operators have read, understood and observe this User Manual, and particularly the safety regulations.

Repairs, service work

- Repairs may only be carried out by Leica Microsystems-trained service technicians.
- Only original Leica Microsystems spare parts may be used.
- Before opening the instruments, switch off the power and unplug the power cable.
- Avoid contact with powered electrical circuits, which can lead to injury.

Transport

- Use the original packaging for shipping or transporting the individual modules of the Leica DMS1000 B digital microscope system and the accessory components.
- 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.

Integration in third-party products

- When installing Leica products into third-party products, the manufacturer of the complete system or its dealer is responsible for following all applicable safety instructions, laws and guidelines.

Disposal

- Once the product has reached the end of its service life, please contact Leica Service or Sales about disposal.
- Please observe and comply with the national and federal laws and regulations that are equivalent to EC directives such as WEEE.

Like all electronic devices, the microscope, its accessory components and consumables must never be disposed of with general household waste.

Safety Instructions (continued)

Legal regulations

- Observe the generally applicable statutory and country-specific regulations for accident prevention and environmental protection.

EC Declaration of Conformity

- Electrically operated accessories are constructed based on the state of the art of technology and are provided with an EC Declaration of Conformity. See page 66

Health risks

Workplaces with microscopes facilitate and improve the viewing task, but they also impose high demands on the eyes and holding muscles of the user. Depending on the duration of uninterrupted work, asthenopia and musculoskeletal problems may occur. For this reason, appropriate measures for reduction of the workload must be taken:

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

The ergonomic optics concept and the design of the Leica DMS1000 B digital microscope system aim to limit the strain on the user to the lowest possible level.

Careful handling

- Exercise particular care when setting up the instruments. If it is specified that two or more people are required for setup, compliance with this is mandatory.
- Never spill any liquids on electrical instruments. This could cause the stereomicroscope and other equipment to become electrically live and damage people and instruments.
- Never clean instruments using corrosive cleaning agents or those containing acetone. For detailed information about care, refer to the User Manual for the instrument.
- Check the power cables regularly. Defective power cables can cause injuries.
- Wait for bulbs to cool off before changing them. Touching hot bulbs can cause burns.

Safety Instructions (continued)

Light sources: safety regulations

- Light sources pose a potential irradiation risk (glare, UV radiation, IR radiation). Therefore, lamps have to be operated in closed housings and in installed condition.
- Never look directly into the beam path (blinding hazard).
- Do not select a white, strongly reflective background for the specimen.

External power supply for TL5000 Ergo

Permitted power supply:
SINPRO SPU130-110

Specifications:

Input:	100-240 V AC
	47-63 Hz
	3.2 A
Output:	33 V DC
	3.93 A
	max. 130 W

For indoor use only.

Use only the power supply specified above. Other power supplies must not be used. If the original power supply fails or is damaged, it must be replaced. Repair is not permitted. Original power supplies are available from your Leica branch office or Leica dealer.

Power supply unit for the integrated camera

Permitted power supply:
PSB05R-050Q

Specifications:

Input:	100-240 V AC
	50/60 Hz
	200 mA
Output:	5 V DC
	1 A max.

For indoor use only.

Introduction

Congratulations!

Congratulations on purchasing the Leica DMS1000 B digital microscope system by Leica Microsystems. The special design of the Leica DMS1000 B 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:

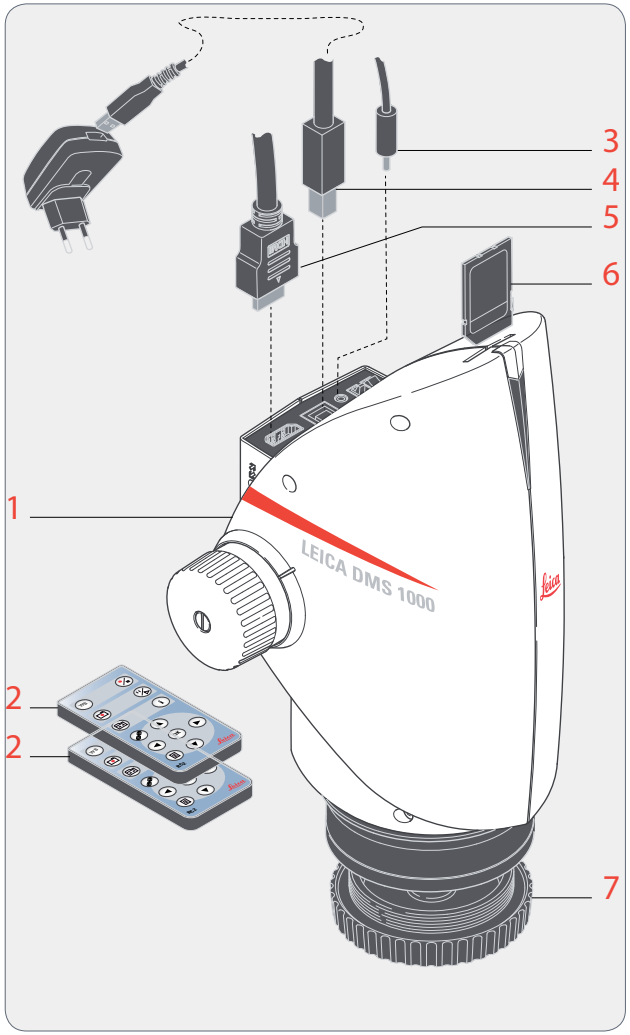
- 1920×1080i ("Full HD"). This resolution provides the best possible imaging performance on a Full HD-capable monitor.
- 1280×720p ("HD ready"). This resolution is suitable for display on monitors labeled "HD ready" or on smaller screens with a 10" or 12" diagonal.

User-friendly even in the smallest detail

Like every digital camera, the Leica DMS1000 B's integrated camera reacts differently to different light sources. However, the white balance is matched to the TL5000 Ergo LED illuminator from Leica at the factory.

Standard Delivery and Optional Accessories

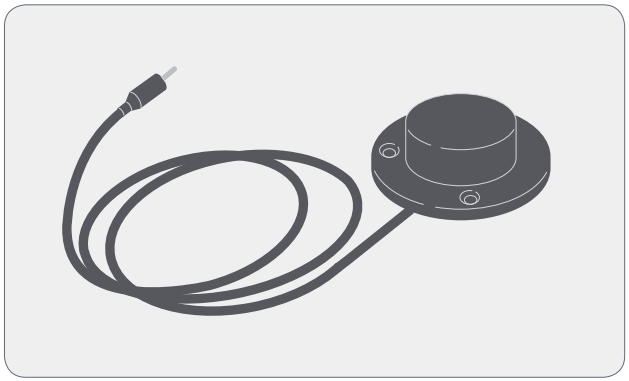
Standard delivery



The Leica DMS1000 B digital microscope system's standard delivery includes:

1 *Leica DMS1000 B digital microscope system, without objective*
2 *2 remote control units, with battery*
3 *Connection for optional footswitch*
4 *USB cable, for connecting to the power supply unit for supplying power*
5 *HDMI cable, for connecting to an HD monitor*
6 *SD memory card*
7 *Protective cover*

Optional Accessories: handswitch/foot-



switch

Various functions can be assigned to the optional handswitch/footswitch (12 730 229) (such as taking individual pictures, white balance).

For information on additional accessories, such as objectives and adapters, illumination or the dust cover for the microscope, please contact your Leica Microsystems authorized dealer.

You can find detailed descriptions of different accessories in their corresponding user manual.

System Overview

This overview shows the Leica DMS1000 B in an example application with additional components.

1 Leica DMS1000 B

2 Microscope carrier

3 Objective

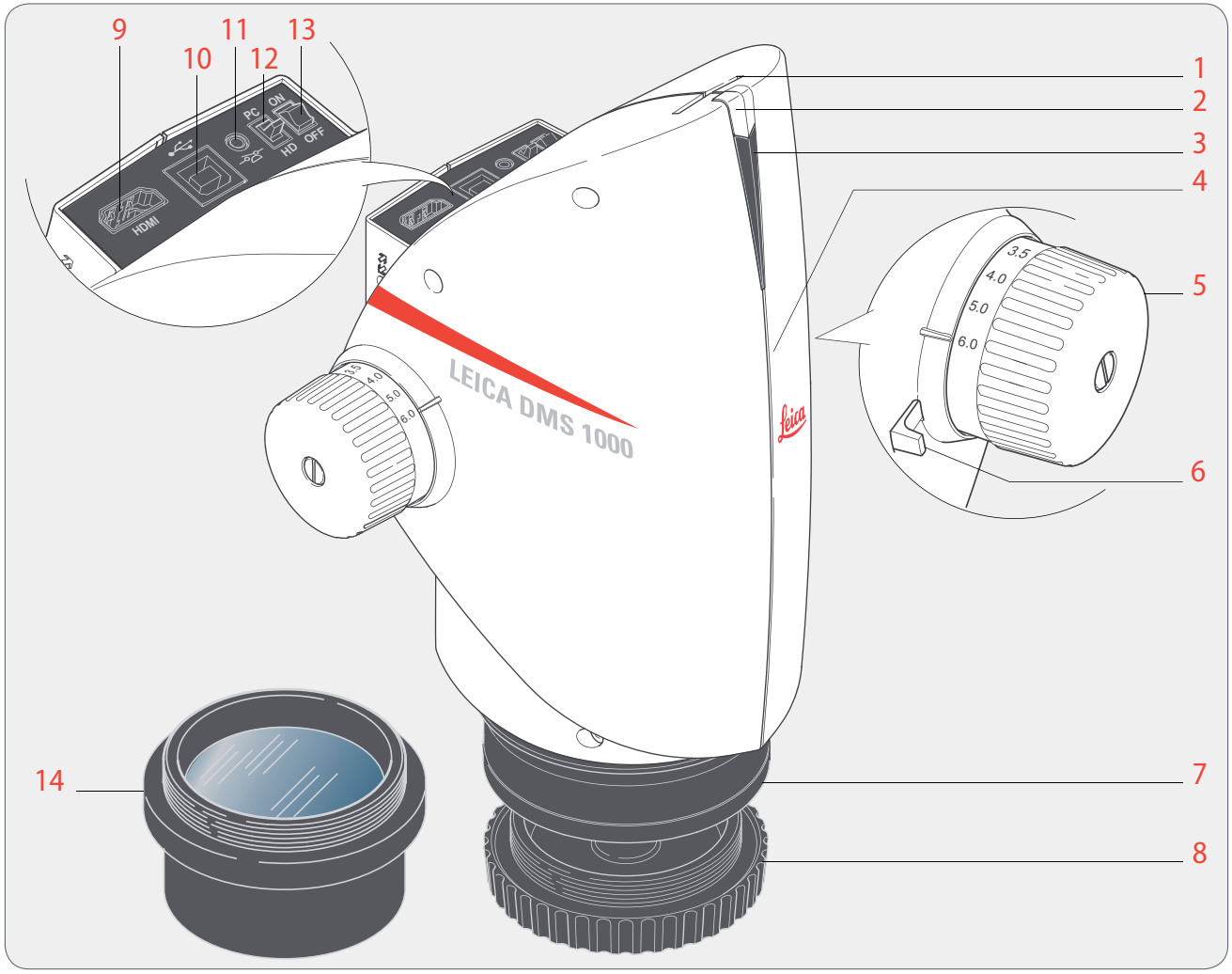
4 Focusing column

5 Transmitted light base

6 HD monitor

7 MATS (optional)

Overview of the Instrument



1 *Card holder for SD card*

2 *Programmable front button*

3 *Status light*

4 *IR receiver, for remote control*

5 *Zoom knob*

6 *Click-stop slider*

7 *Leica DMS1000 B fixture in the microscope carrier*

8 *Protective cover*

9 *HDMI connection*

10 *USB connection*

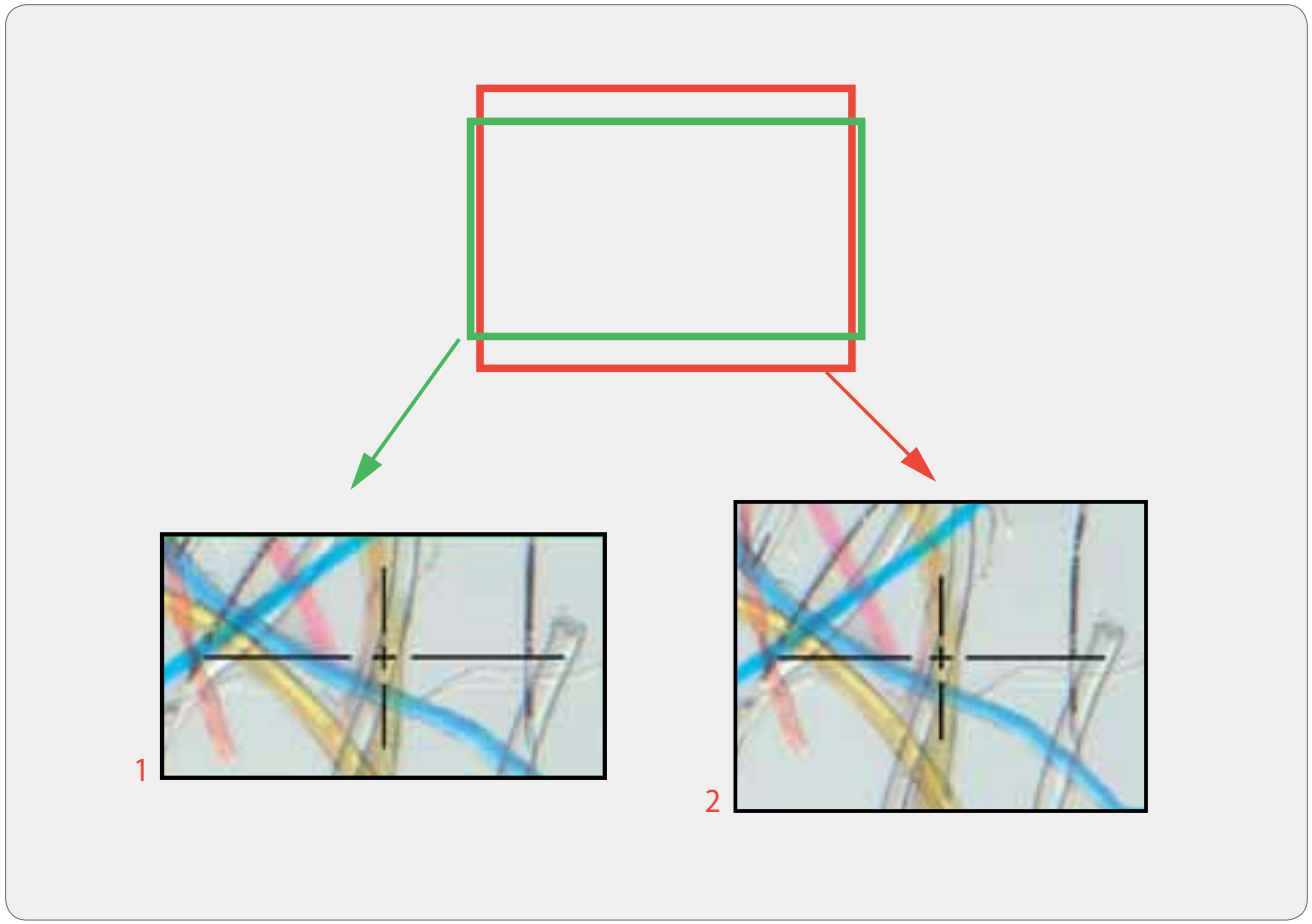
11 *Connection for footswitch*

12 *Mode switch, for HD mode*

13 *On/off switch*

14 *Objective (not included in the delivery package)*

Effective Displayed Section



The live image on the HD screen and the final captured image may not show the same section depending on the sensor size in the microscope.

1 Live image 1920×1080 (16:9), displayed on the HD monitor
2 Recorded image in 4:3 format

Assembly

Leica DMS1000 B with Transmitted Light Base

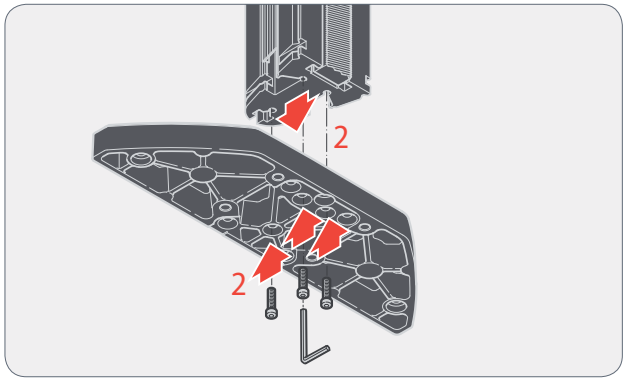
Transmitted Light Base and Focusing Column

General Notes

This chapter shows an example of assembly of the Leica DMS1000 B on a transmitted light base. Images and descriptions may vary when using another transmitted light base.

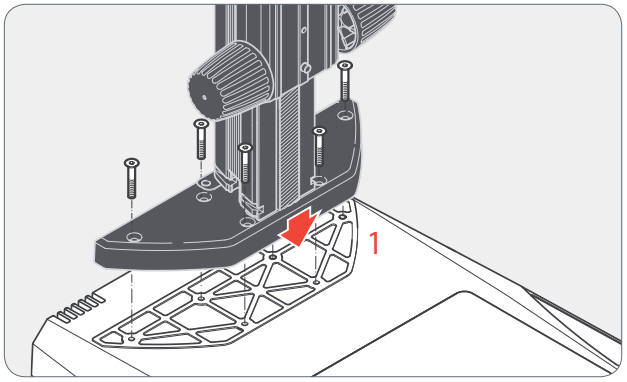
Refer also to the separately provided User Manual for the TL ST transmitted light base and the TL5000 Ergo transmitted light base.

Installing the column adapter



1. Take the three provided screws out of the packaging.
2. Install the column adapter on the column using the three screws.

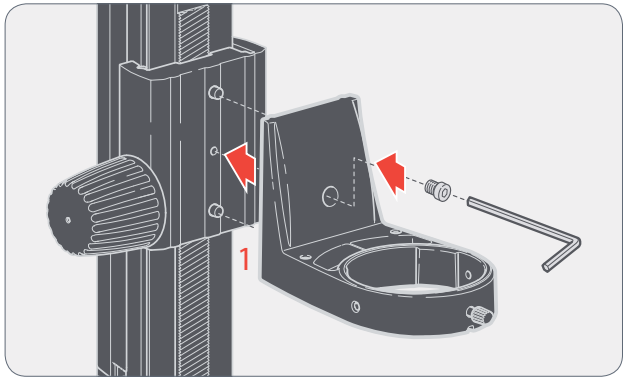
Assembling the column



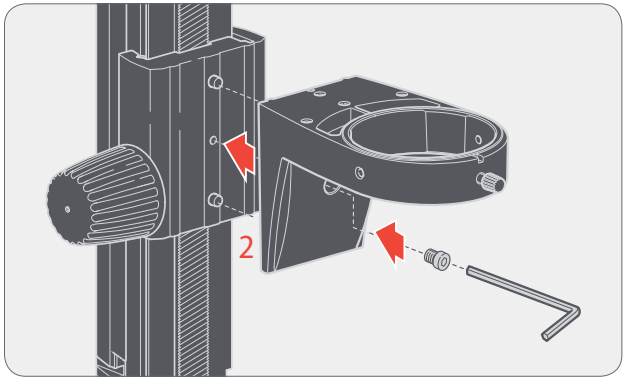
1. Install the column adapter and column to the transmitted light base using the six screws provided.

Microscope Carrier and Leica DMS1000 B

Assembling the microscope carrier

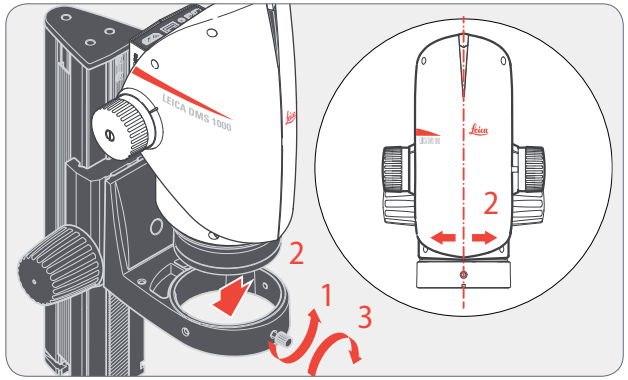


1. Fasten the microscope carrier to the column using the provided Allen key and the screw provided (recommended variant for objectives with a short working distance).



2. Alternatively, the microscope carrier can also be installed upside-down (recommended variant for objectives with a large working distance).

Assembling the Leica DMS1000 B



1. Unscrew the clamping screw.
2. Place the Leica DMS1000 B in the microscope carrier so that the notch in the microscope housing and the lower clamping screw overlap.
3. Fasten the microscope in place using the clamping screw.

Objective and Illumination

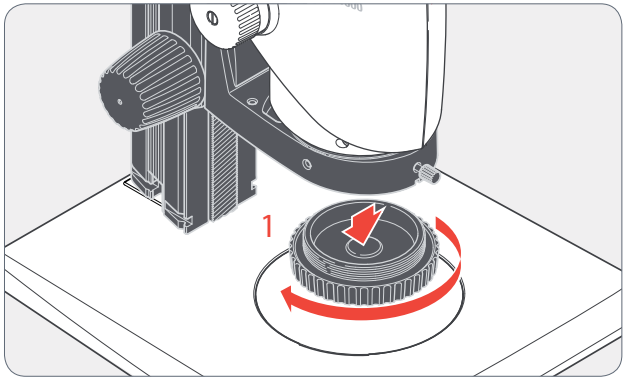
Standard Objective

Instructions for safe assembly

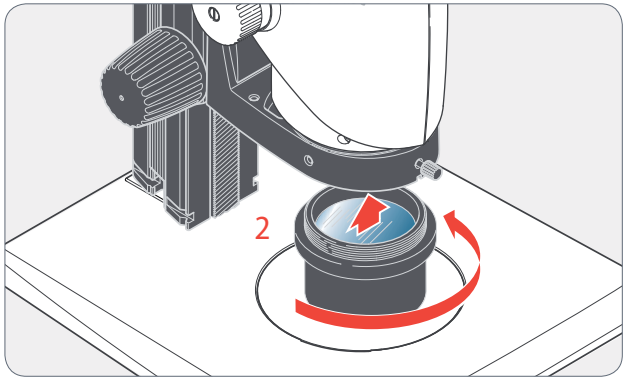
Hold the objective firmly during assembly and disassembly so that it does not fall onto the stage plate. Remove all specimens from the stage plate first.

The objective is not part of the standard delivery of the Leica DMS1000 B.

Assembly



1. Remove the protective cap on the optics carrier by turning it.



2 Screw the objective into the optics carrier.

Objective with Telecentric Optics

Instructions for safe assembly

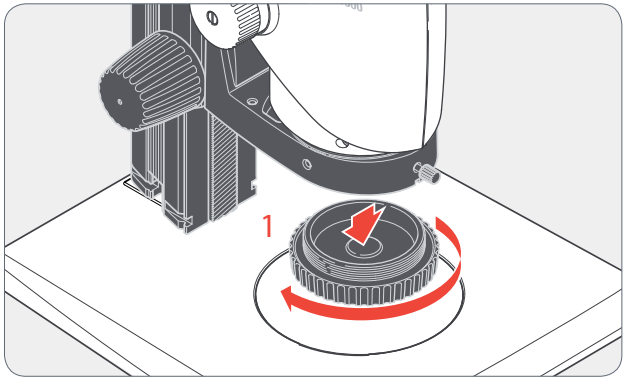
Hold the objective firmly during assembly and disassembly so that it does not fall onto the stage plate. Remove all specimens from the stage plate first.

The objective is not part of the standard delivery of the Leica DMS1000 B.

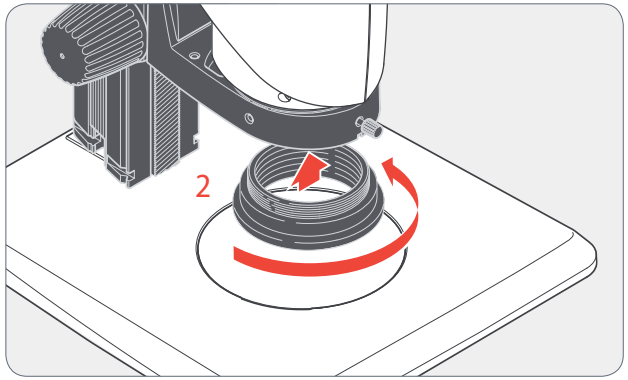
Notes on telecentric optics

The Leica DMS1000 B can be used for special measuring requirements when using an objective with telecentric optics. This is made possible by using a special objective and compatible adapter combination.

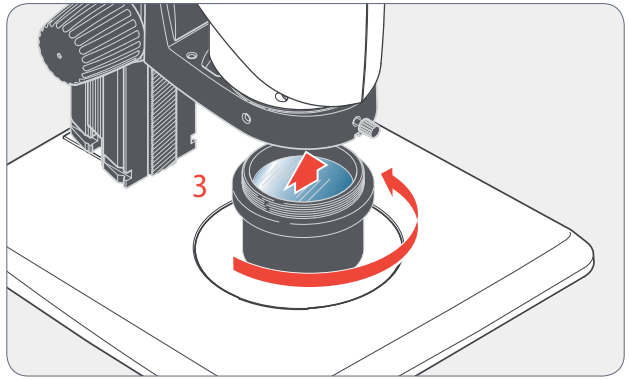
Assembly



1. Remove the protective cap on the optics carrier by turning it.



2. Screw the compatible adapter onto the optics carrier.



3. Screw the objective onto the adapter.

Objective with Telecentric Optics (continued)

Overview of objectives and adapters

The following table shows which combinations of objective and compatible adapter are provided by telecentric optics.

Objective	Leica article number	Compatible adapter
0.5× planapochromatic Z-series	10 447 177	10 450 650
0.8× planapochromatic Z-series	10 446 360	10 450 651
1.0× planapochromatic Z-series	10 447 176	10 450 651

Installation

Operation in HD Mode (Standalone)

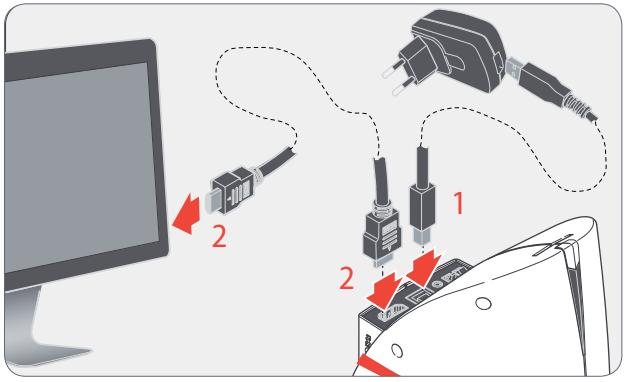
Cables and Terminals, Activating HD Mode (Standalone)

General Notes

The Leica DMS1000 B is designed for the use of HD-capable (high definition) monitors. We highly recommend connecting the HD monitor using an HDMI connector and not using a DVI adapter, as otherwise proper function can no longer be guaranteed!

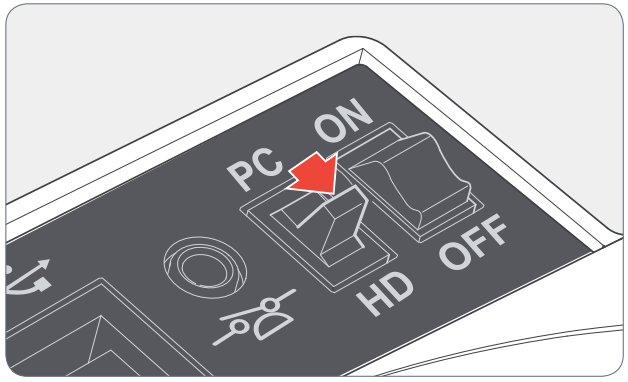
Please only connect the provided 5 V power supply unit. Using an incorrect voltage can substantially damage the Leica DMS1000 B.

Power supply and HD monitor



1. Connect the Leica DMS1000 B to a suitable power socket using the USB cable and power supply.
2. Connect the Leica DMS1000 B to the HD monitor using the HDMI cable.

Activating HD mode (standalone)



1. Set the mode switch to "HD" in order to set the Leica DMS1000 B to HD mode (standalone).

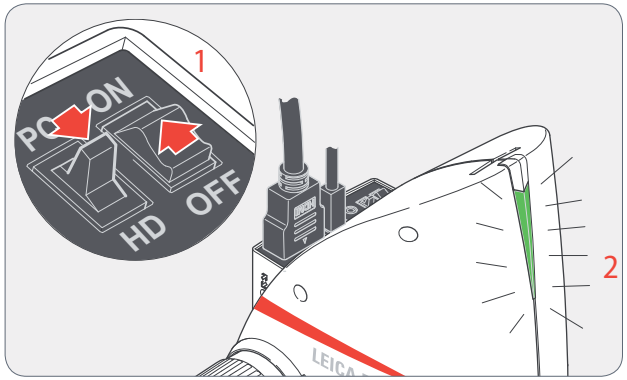
An SD card with sufficient free memory must be inserted into the Leica DMS1000 B in order to save images in HD mode (standalone).

The Leica DMS1000 B is operated in HD mode exclusively. No computer may be connected.

Startup Procedure

Switching on the Leica DMS1000 B

Operation in HD Mode (Standalone)

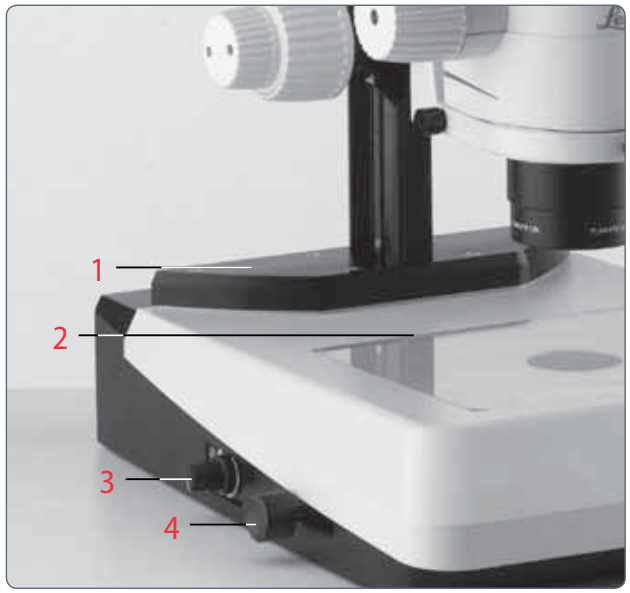


Ensure that the optional objective is screwed onto the microscope, the mode switch is set to "HD" and the HD monitor is switched on.

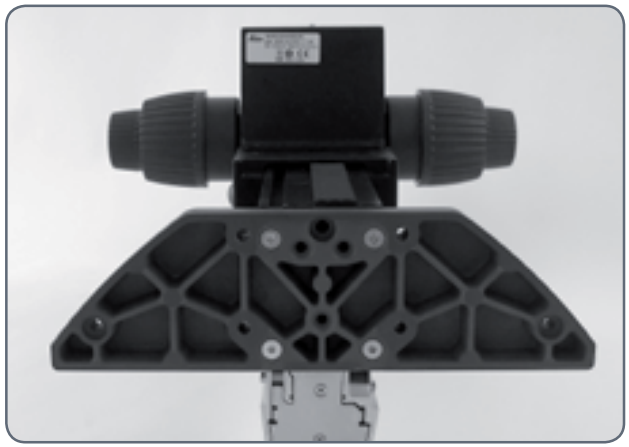
1. Set the on/off switch to "ON" to switch on the Leica DMS1000 B.
2. The status light's LED switches from red to green, a signal tone sounds and the live image is displayed on the HD monitor - the Leica DMS1000 B is ready to use.

Leica TL ST Transmitted-light Base: Controls (Leica DMS1000 B TLST)

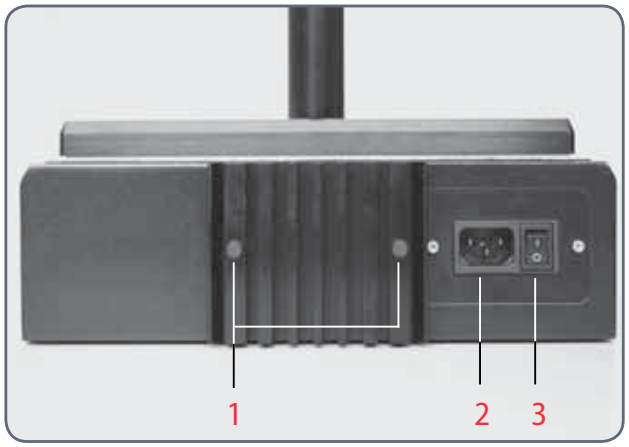
Refer also to the separately provided User Manual for the TL ST transmitted light base and the Ergo transmitted light base.



1 Adapter plate for easy assembly of focusing drives
2 Removable glass plate
3 Controller for light intensity
4 Adjustment for path-folding mirror



Extension plate of the Transmitted Light Base TL ST



Rear side of the transmitted light base TL ST
1 Screws for changing the halogen lamp
2 Power connection socket
3 Power switch

Leica TL ST Transmitted-light Base: Operation

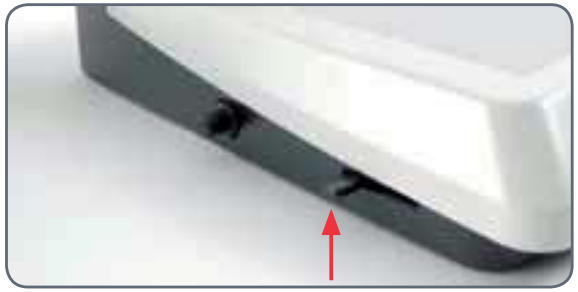
Light intensity control

The left control adjusts the intensity of the 12 V/20 W halogen illumination.

1. Switch on the illumination of the base at the power switch.
3. Focus on the specimen.
3. Set the illumination to the desired intensity using the left control.

Control of the transmitted light

The transmitted light base TL ST has a slider that automatically moves the path-folding mirror in the base when moved. The mirror is kept in the correct position at all times and permits smooth changeover between bright field and opaque transmitted light.



Bright field

Bright field is suitable for examining translucent objects featuring contrasting structures. The object is directly illuminated from below and is seen in its natural colors against a bright background.

- Move the slider backwards until the desired effect is achieved.

Inclined transmitted light

Transmitted light that traverses the object obliquely will provide additional resolution and information when observing semitransparent, opaque objects.

- Slowly pull the slider towards yourself until the desired effect is achieved.

Leica TL ST Transmitted-light Base: Lamp Replacement

Changing the halogen lamp

Before you change the lamp, it is absolutely necessary to unplug the power plug from the base to prevent the risk of electric shock!

The halogen lamp becomes very hot during operation. Therefore, to avoid being burned, let the base cool off for approx. 10 minutes after switching it off!

Do not touch new halogen lamps with your bare fingers—this drastically reduces the service life of the lamp!

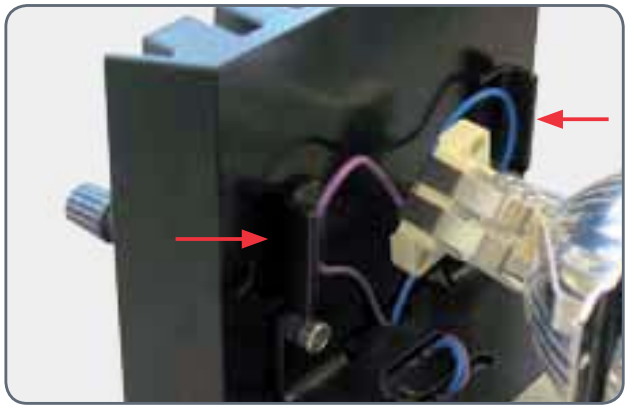
Changing lamps

1. Unscrew the two screws on the cooling unit and pull the cooling unit out, along with the lamp.

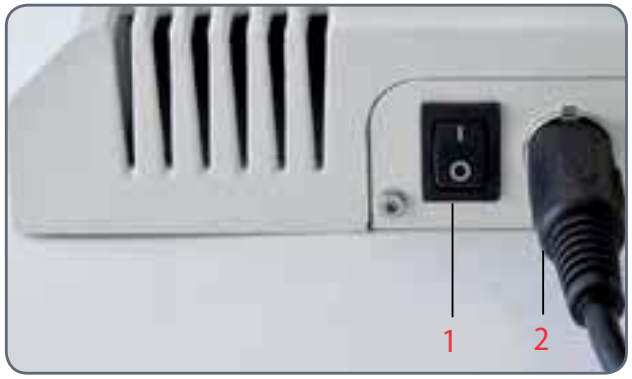
2. Carefully pull out the lamp and mount by pulling them upwards.
3. Disconnect the lamp from the mount.
4. Insert the new lamp into the mount and reinsert the lamp holder.

Safety precautions

When inserting the lamp, ensure that the cables are inside the two metal clamps. This prevents the cables from getting caught during insertion.

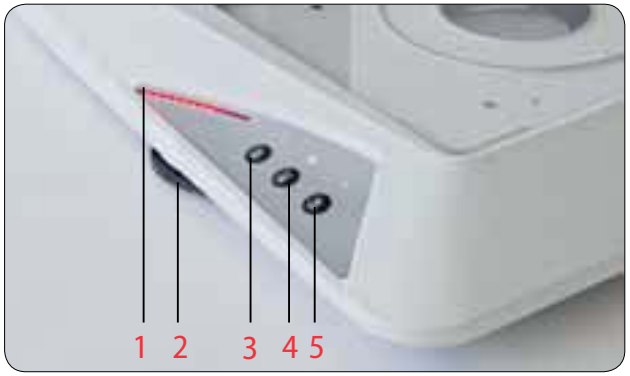


Leica TL5000 Ergo transmitted-light base: Controls (Leica DMS1000 B TL5000)



Rear side of the TL5000 Ergo

1 *Power switch for the base*
2 *Power supply connection*



Left side of the TL5000 Ergo

1 *LED display for opening and positioning the aperture or for balance in DF mode.*
2 *Control for the size of the aperture/ balance*
3 *"BF" button for bright field (press and hold for 2 seconds to (de)activate the automatic aperture)*
4 *"RC" button for Rottermann Contrast / in the RC mode, press and hold the button to define the aperture size*
5 *"DF" button for dark field*

Right side of the TL5000 Ergo

1 *On/Off switch for the light source / Press and hold for 5 seconds to reset the base to factory default settings*
2 *Controls for controlling the brightness intensity*

Refer also to the separately provided User Manual for the TL5000 Ergo transmitted light base.

Leica TL 5000 Ergo Transmitted-light Base: Operation

The transmitted light base must only be connected to a grounded socket with a faultless power cable! Failure to observe these warnings may result in serious personal injury or even death!

The LED illumination can be very bright! Check and adjust the intensity of the illumination to a suitable brightness before looking through the eyepieces.

Switching the transmitted light base on and off

1. Switch on the transmitted light base with the power switch on the rear side.

2. Press the on/off switch on the right side once to turn on the illumination.

Continued on next page.

Leica TL 5000 Ergo Transmitted-light Base: Operation (Continued)

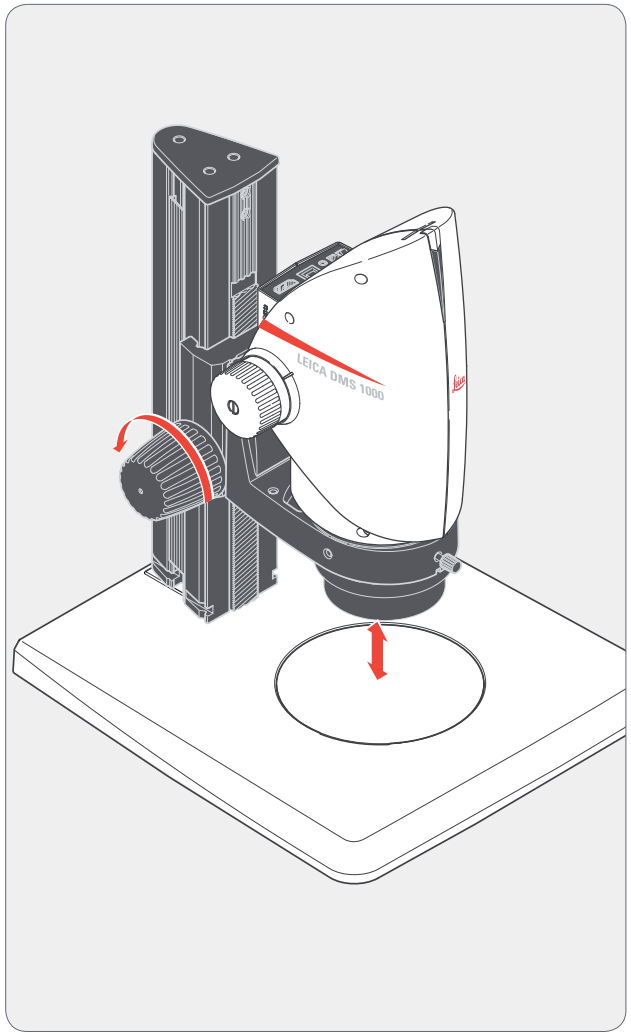
3. Look through the eyepiece and adjust the light intensity using the control on the right side. The intensity of the illumination is visualized by the LED scale.

4 Press the on/off switch on the right side once again to turn off the illumination on the base.

The following assumes that the power switch on the rear side of the device is always switched on. This switch is not mentioned in the remaining part of this User Manual.

Focusing, Adjusting the Resistance of the Focus Drive

Focusing

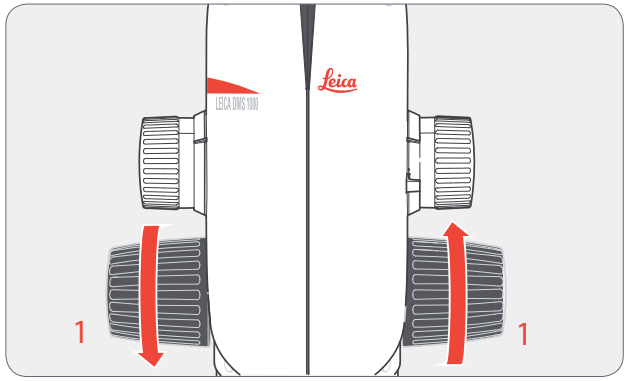


Focusing raises or lowers the microscope using the focusing drive. The specimen detail is brought into sharp focus as soon as it is in the focal point of the objective.

- The focusing drive can be operated either left- or right-handed.

Adjusting the resistance

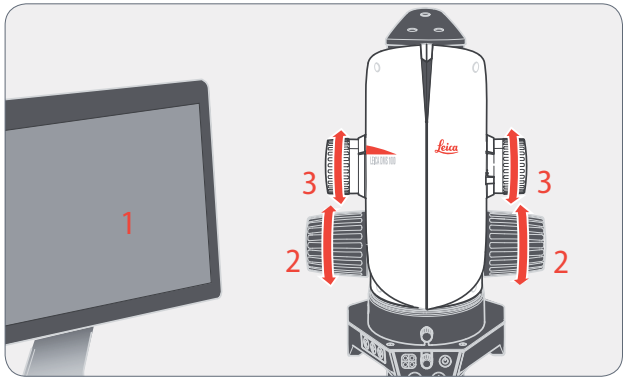
Is the focusing drive too loose or too tight? Does the equipment tend to slide downwards? The resistance can be adjusted individually depending on the equipment weight and personal preferences as follows:



1. Grip the drive knobs with both hands and turn them towards each other until the desired resistance is reached during focusing. On focusing columns with separate coarse and fine adjustment, the outer drive knobs have to be twisted in opposite directions relative to each other.

Changing Magnification, Click-stop Feature

Changing the magnification (zoom)



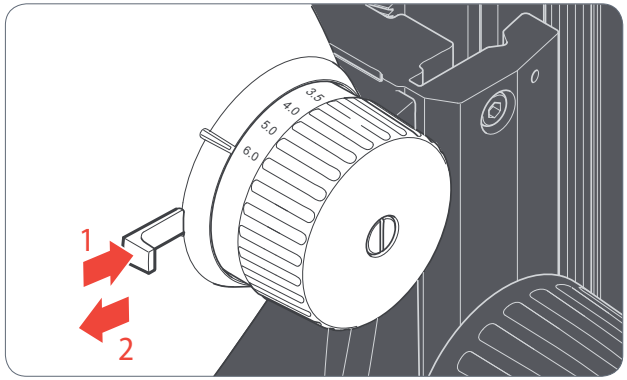
1. Look at the HD monitor.
2. Focus on the specimen.
3. Rotate the magnification changer until the desired magnification is configured or it has to be refocused.

The rotary knob for the zoom can be used either left or right-handed.

The magnification changer can optionally be operated either with or without click stops enabled. Continuous zoom is possible when the click stops are disabled, which many users find convenient. On the other hand, when the click stops are enabled, photographs, measurement results etc. can be reproduced more accurately.

Parfocality: the Leica DMS1000 B is parfocally matched. If the specimen is in focus at the highest magnification level, this remains true across the entire magnification range.

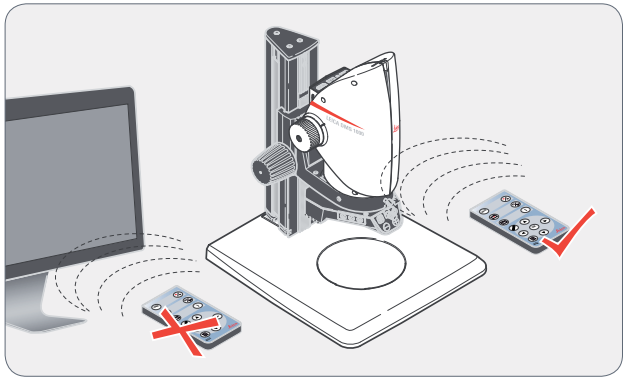
Enabling and disabling click stops



1. Push the button towards the knob to enable the click stops.
2. Push the button away from the knob to disable the click stops.

Remote control

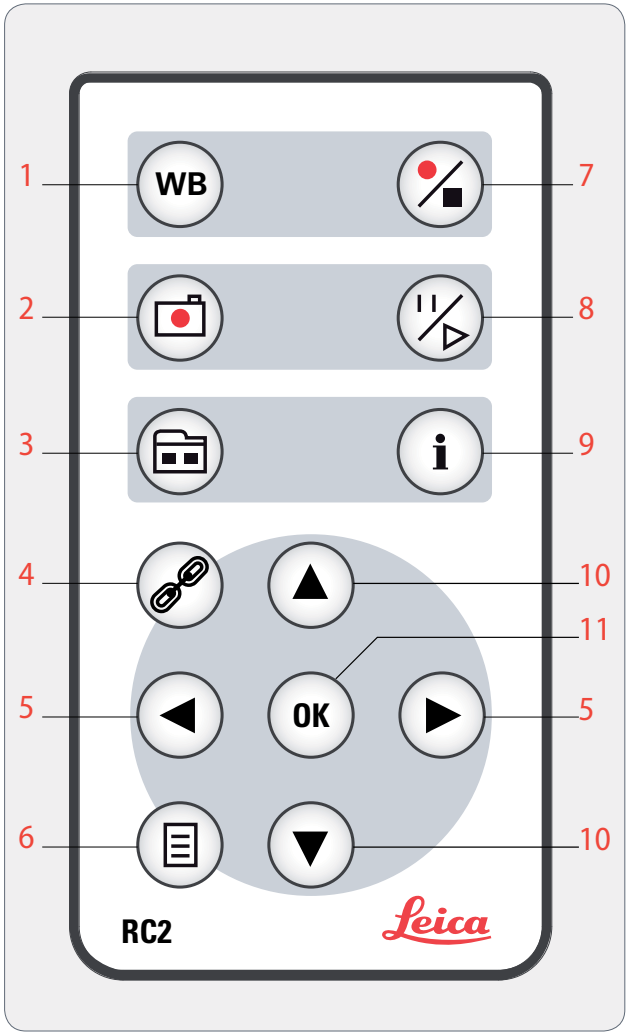
General Notes



Always keep the remote control for controlling the Leica DMS1000 B pointed towards the microscope's IR receiver.

Instead of the remote control, the front button or the optional footswitch (depending on the configuration) can be used to trigger the Leica DMS1000 B.

Description

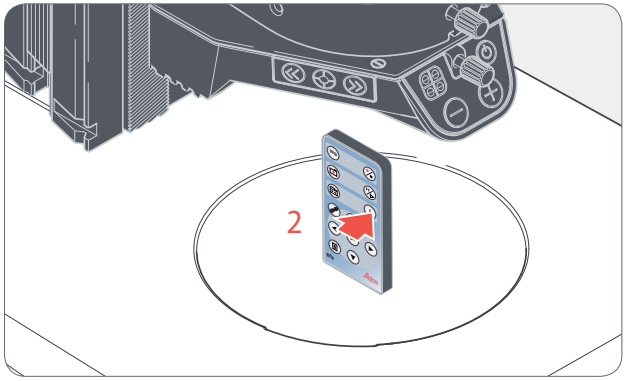


1. *Automatic White Balance*
2. *Save still image to SD card*
3. *Show/hide gallery, retrieve data from SD card*
4. *Pairing (microscope - remote control)*
5. *Left/right button, select illumination mode*
6 *User Menu*
7. *Start/stop video recording*
8. *Stop / continue freeze image*
9. *Show/hide information box*
10. *Up/down button, select overlay*
11. *OK/confirm*

Remote Control (continued)

Checking the battery

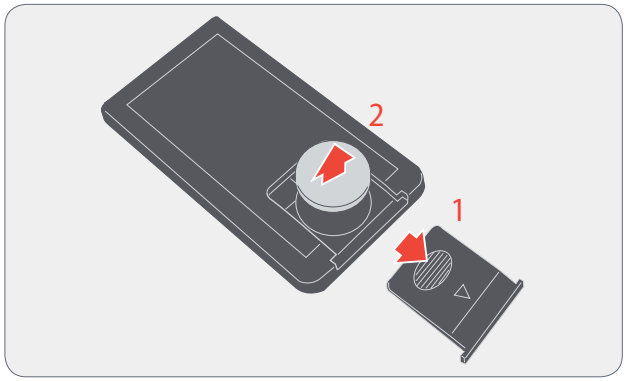
1. Switch on the microscope and HD monitor so that you see the live image on the HD monitor.



2. Hold the remote control in the beam path so that it faces upwards and press any key.

Because the microscope's chip also responds to the infrared range, you can see how the LED on top of the remote control lights up on the HD monitor. If this is not the case, the battery needs to be changed.

Changing the Battery



1. Remove the battery cover on the rear side of the remote control.
2. Replace the battery and close the battery cover.

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

"Pairing" the Leica DMS1000 B with a Remote Control

Pairing

The Leica DMS1000 B and the remote control can be paired and then only respond to each other. This can be helpful when using multiple microscopes and remote controls.

1. Press the button to start or end the process.

In order to achieve successful pairing and avoid pairing by mistake, the 3rd step must be performed within four seconds.

2. Select a button on the remote control that you want to define as the pair button. Only the button cannot be used for this.
3. Press and hold your pair button until a corresponding confirmation is displayed on the HD monitor.
4. The microscope only responds to the remote control commands from this remote control.

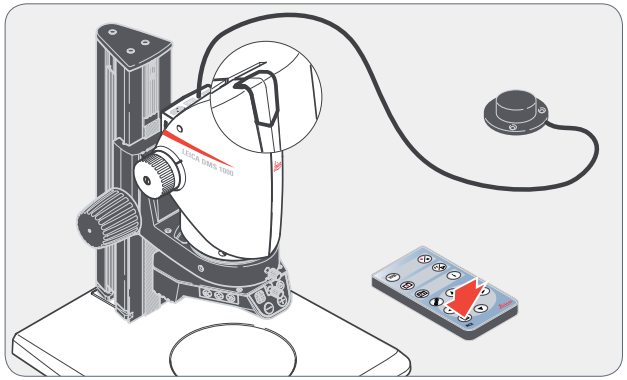
Resetting to factory setting

1. Press the button to start the process.

2 Press the WB button until a corresponding confirmation is displayed on the HD monitor.

Configuring the Front Button or Footswitch

General Notes



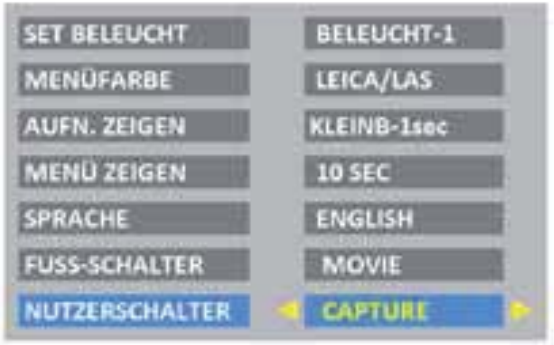
Both the Leica DMS1000 B's front button and optional footswitch can be configured with the remote control as defined by the user.

The default setting is "CAPTURE" for capturing an image.

Configuring

1. Point the remote control towards the Leica DMS1000 B.
2. Press the button to show the user menu on the monitor.
3. Select "SETUP USER" in the main menu:

4. Select "FRONT BUTTON" for the front button or "FOOT SWITCH" for the footswitch:



Configuring the Front Button or Footswitch (continued)

5. The following configurations are possible by selecting the corresponding option:

- NONE: No function
- CAPTURE: Capture an image and save it to the SD card.
- SHOW LAST: Show a preview of the most recently acquired image.
- MOVIE: Start video recording or stop a video recording that is in progress. Saved to the SD card as an MP4 file.
- OVERLAY: Show crosshair or overlay. Pressing this button multiple times scrolls through the list of crosshairs or overlays.
- WHITE BAL: Run white balance for color correcting the camera. For additional information on white balance, refer to page 49

Application

Operation in HD Mode (Standalone)

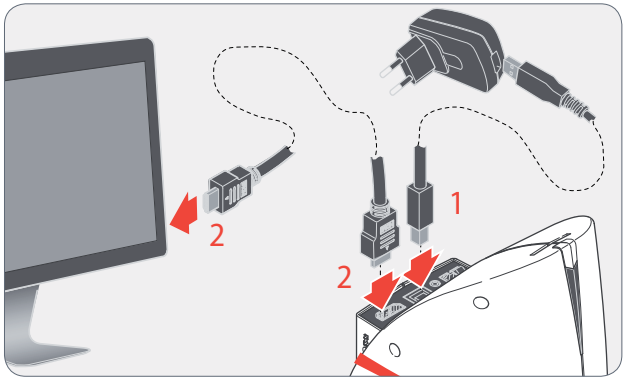
Checking Cables and Terminals

General Notes

The Leica DMS1000 B is designed for the use of HD-capable (high definition) monitors. We highly recommend connecting the HD monitor using an HDMI connector and not using a DVI adapter, as otherwise proper function can no longer be guaranteed!

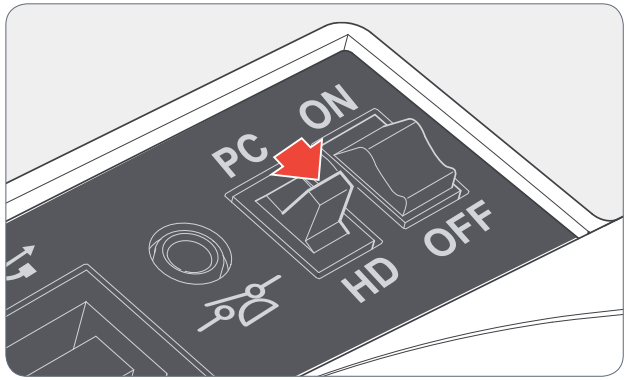
Please only connect the provided 5 V power supply unit. Using an incorrect voltage can substantially damage the Leica DMS1000 B.

Power supply and HD monitor



1. Check that the Leica DMS1000 B is properly supplied with power via the USB power supply.
2. Check whether the Leica DMS1000 B is connected to the HD monitor properly via the HDMI cable.

Operation in HD Mode (Standalone)



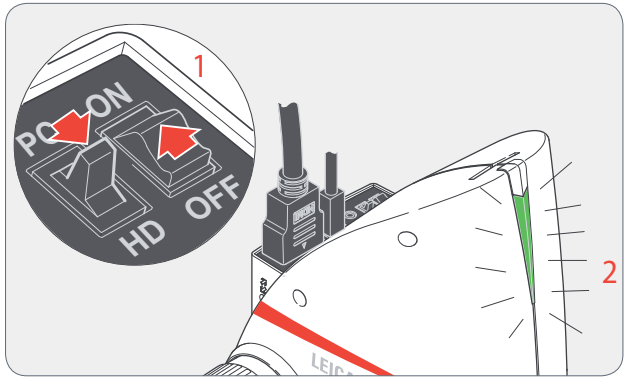
1. Check whether the mode switch is set to "HD" (standalone).

An SD card with sufficient free memory must be inserted into the Leica DMS1000 B in order to be able to save images in HD mode (standalone).

Switching on the Leica DMS1000 B

Switching on the Leica DMS1000 B (stand-alone)

Ensure that the optional objective is screwed onto the microscope, the mode switch is set to "HD" and the HD monitor is switched on.



1. Set the on/off switch to "ON" to switch on the Leica DMS1000 B.
2. The status light's LED switches from red to green, a signal tone sounds and the live image is displayed on the HD monitor – the Leica DMS1000 B is ready to use.

Information about SD Memory Cards

General Notes

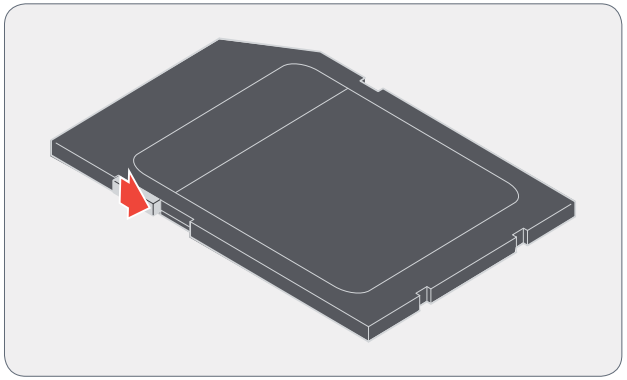
Be absolutely certain to read the following instructions about formatting and handling the memory card provided in order to prevent malfunctions during image acquisition.

File system and formatting

The FAT file system has to be used so that the SD card works correctly and is detected by the Leica DMS1000 B. Most memory cards are factory-formatted with FAT so that they can be used immediately.

An SD card cannot be formatted in the Leica DMS1000 B. 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.

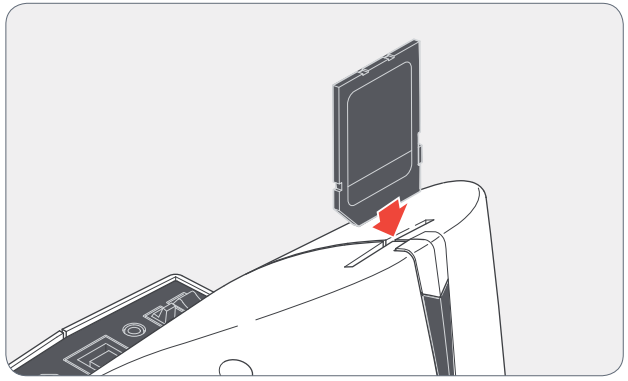
Write protection



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 Leica DMS1000 B. Accidentally inserting the card the wrong way around could damage the microscope.

Capacity

Class 4 and 6 SD cards can be used with the Leica DMS1000 B. SDHC (high capacity) cards up to 32 GB are also supported.

Acquisition of Images

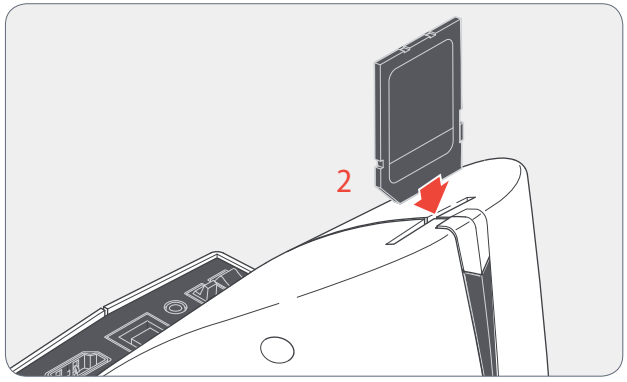
General Notes

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 Leica DMS1000 B 's status light stays red, and you cannot acquire any more images.

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.

Recording

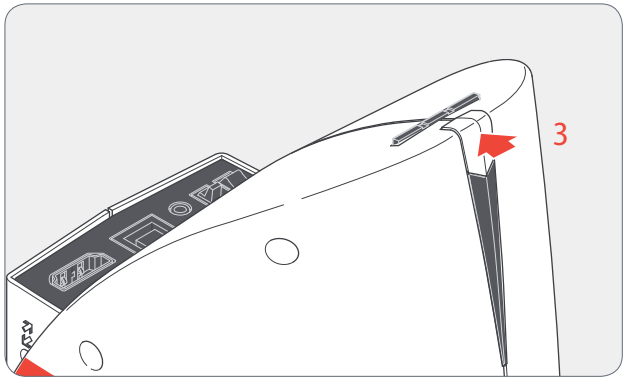
1. Focus on the specimen.



2 Push the SD memory card into the slot on top of the Leica DMS1000 B until it clicks into place.

The Leica DMS1000 B's status light is illuminated in green. The microscope is now ready to save images to the SD memory card.

Depending on the configuration, the front button can be used for capturing an image. For additional information, refer to page 41



3. Briefly press the Leica DMS1000 B's front button to capture an image.

You hear a signal tone as confirmation. While the image is being acquired, the status light flashes green and the word "Capture..." flashes on the HD monitor.

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

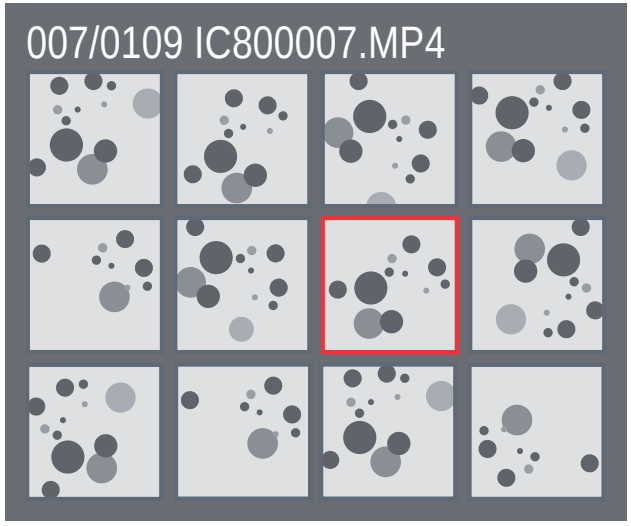
You can now transfer the images to your computer using an SD memory card reader.

Displaying Images and Videos

The Leica DMS1000 B can display images and video clips directly on an HD monitor.

Control via remote control:

1. : Show/hide thumbnail view.
2. : Select thumbnail image (JPG or MP4).
3. For a JPG image:
   : Display image in full size and zoomed in 1x, 2x, 3x (when pressing repeatedly).
   : Next/previous image.
3. For an MP4 video clip:
   : Play video.
   : Stop/play video.
   : Rewind/fast forward video.
4. In order to return to the live image, press the , , or button - if you are in a zoomed-in image, you may need to do this more than once.



Thumbnail view

Reproduction / full screen

White Balance

General Notes

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).

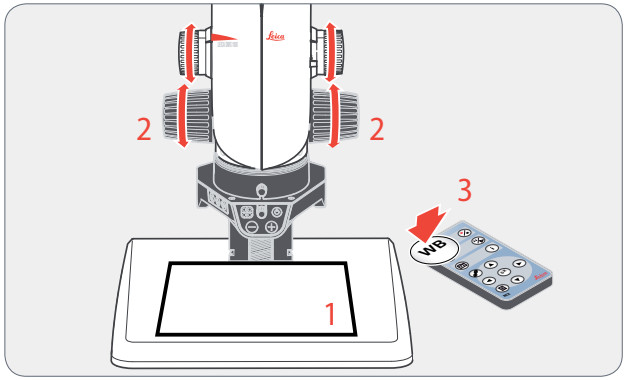
Configure the white balance via the user menu using the remote control. Depending on the configuration, automatic white balance can also be carried out using the front button or the footswitch.

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

Manual white balance

- Manual white balance is described on page 53.

Automatic white balance



1. Position a gray chart or a gray, neutral object under the microscope so that the entire image field is filled in.
2. Adjust the illumination as desired.
3. Press the WB button on the remote control or - if configured accordingly - press and hold the front button or footswitch for 5 seconds. The microscope now carries out an automatic white balance adjustment.

User Menu

Calling up the User Menu

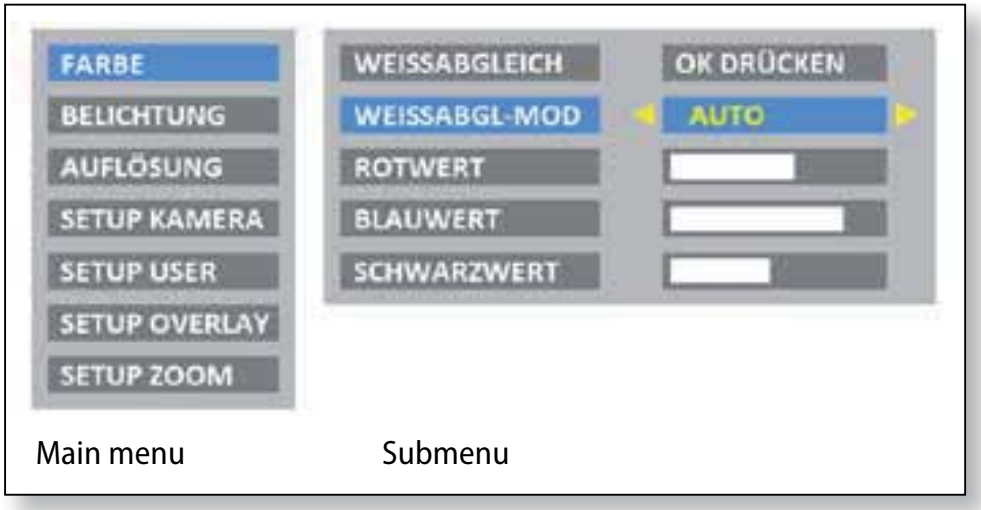
General Notes

Make sure that the mode switch is at "HD".

Calling up and closing the user menu

1. Point the remote control towards the Leica DMS1000 B.
2 Press the button to show the user menu on the monitor.
3. Press the / buttons to select a menu item.
4. Press the button to confirm a menu item.
5. Press the button again to hide the user menu.

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.

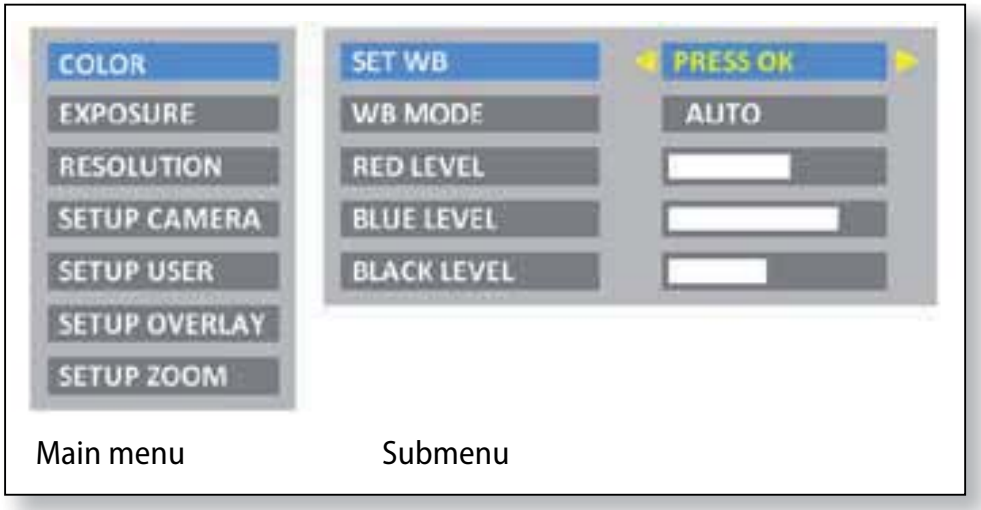
Whenever possible, always use a neutral gray chart to attain optimum results.

Activating 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 leave the menu.

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

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.

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

Adjusting the white balance manually (recommended)

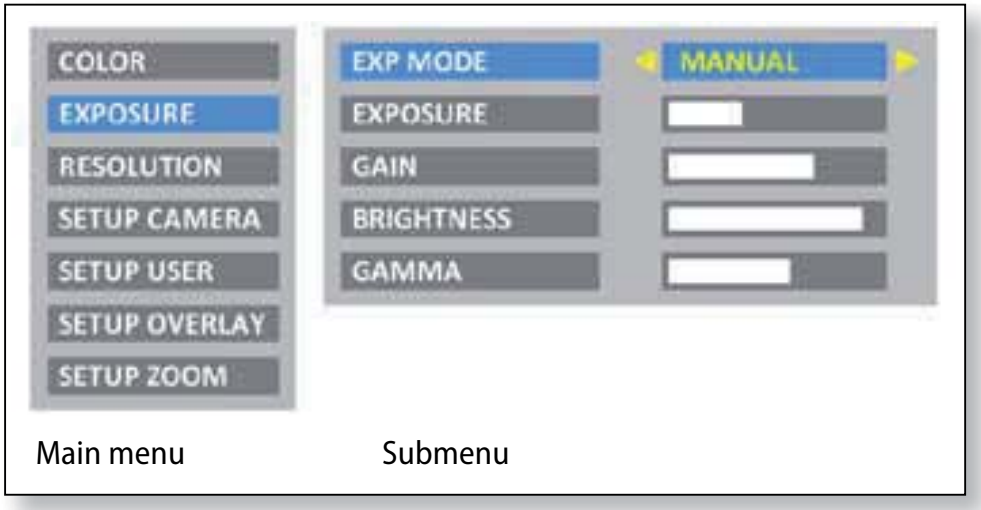
1. Place the gray chart under the microscope so that the entire field of view is filled in.
2. Press the WB button on the remote control. The white balance is calibrated and saved to the camera.

Alternatively, you can also calibrate the white balance using the user menu.

1. Press the ☰ button on the remote control.
2. Call up the "COLOR" entry.
3. Select the "SET WB" menu item.
4. Press the OK button.

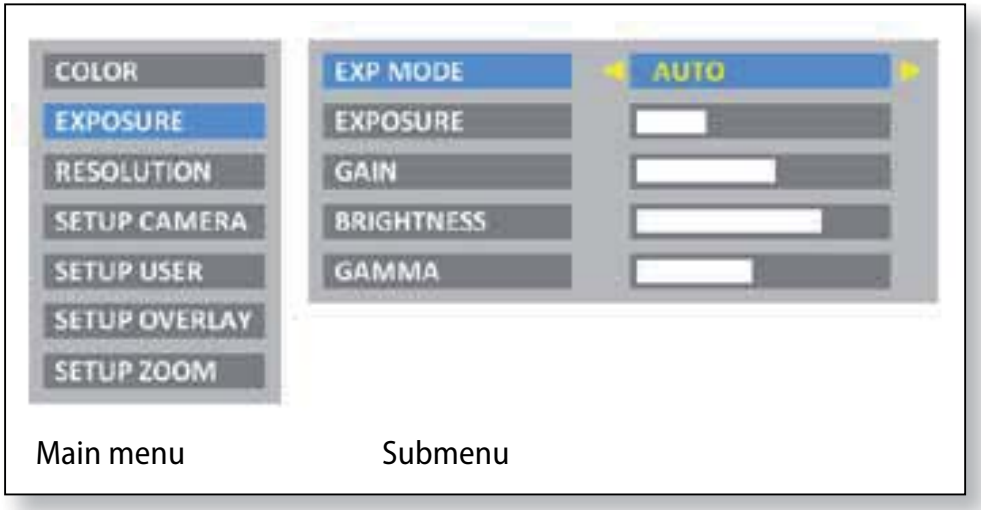
If you do not have a neutral gray area in the image or if the illumination has a very strong color cast, you can manually set the values for "RED LEVEL", "BLUE LEVEL" and "BLACK LEVEL" until the image displays a harmonious gray.

Exposure



Manual exposure

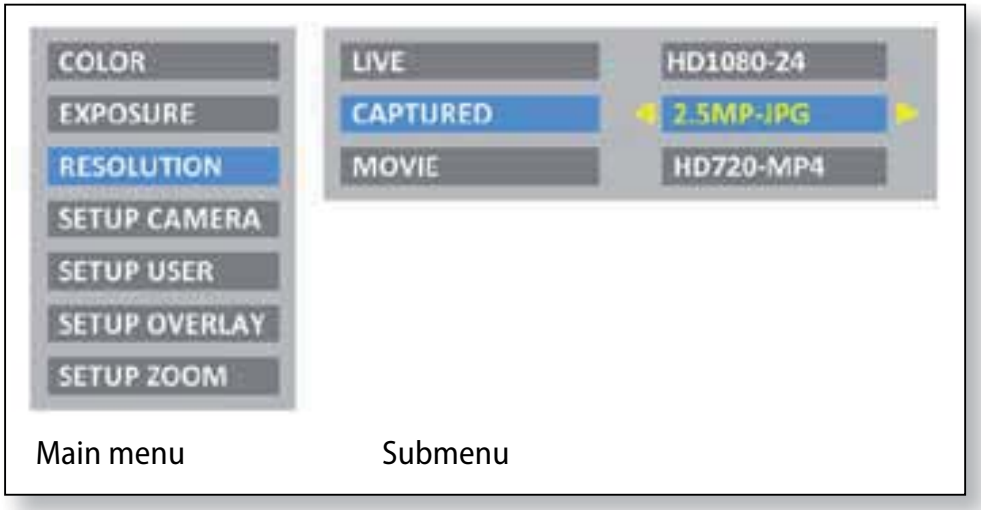
1. Press the ⊟ button on the remote control.
2. Call up the "EXPOSURE" entry.
3. Set the value for "EXP MODE" to "MANUAL" for manual exposure.
4. Correct the values for "EXPOSURE", "GAIN" and "GAMMA" until you obtain the desired results for the image.



Automatic exposure

1. Press the ⊟ button on the remote control.
2. Call up the "EXPOSURE" entry.
3. Set the value for "EXP MODE" to "AUTO" for automatic exposure.
4. Correct the values for "BRIGHTNESS" and "GAMMA" until you obtain the desired results for the image.

Resolution



The "RESOLUTION" menu lets you define the resolution individually for the live image on the computer, capturing individual images and capturing video. This provides optimum results in every situation.

Resolution of the live image (LIVE)

Defines the resolution of the live image. The following resolutions are available:

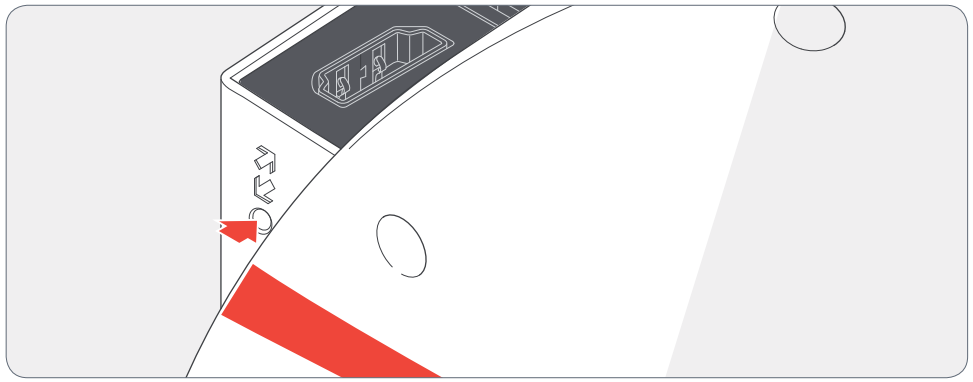
- HD720-50 and HD720-60: 1280×720 pixels, at 50 Hz or 60 Hz image refresh rate.
- HD1080-24 and HD1080-30: 1920×1080 pixels, at 24 Hz or 30 Hz image refresh rate, progressive.
- HD1080-50 and HD1080-60: 1920×1080 pixels, at 50 Hz or 60 Hz image refresh rate, interlaced.

Select a resolution that can be displayed on the HD monitor correctly without flickering and without an error message.

Resolution (continued)

If a resolution cannot be displayed and the HD monitor remains black, you can do the following to display a live image again in the HD monitor:

Use the tip of a ball-point pen (or a bent paperclip) to press the hidden button:



- Pressing the button for the first time displays the current live image resolution on the HD monitor.
- Pressing it a second time switches to the next live image resolution.
- Press and hold it for 10 seconds to trigger a reset. Follow the instructions in the display to set the live image resolution back to the factory setting.

Resolution of the captured image (CAPTURED)

Defines the resolution of the captured image saved directly to the SD card. The following resolutions are available:

- 1.1 MP - JPG: 1216×912 pixels
- 2.5 MP - JPG: 1824×1368 pixels
- 5.0 MP - JPG: 2592×1944 pixels

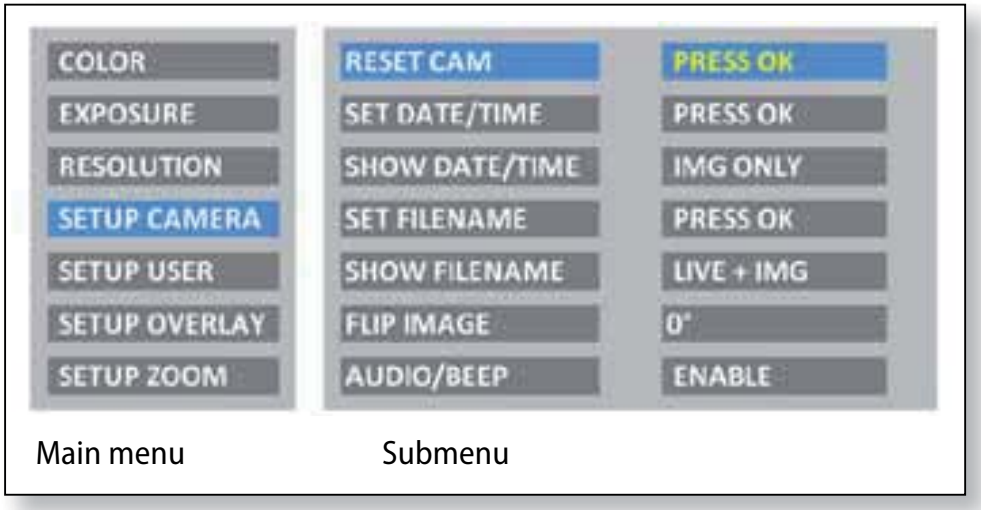
Resolution of videos (MOVIE)

Defines the resolution of video captures saved directly to the SD card. The following resolutions are available:

- HD720-MP4: 1280×720 pixels
- HD1080-MP4: 1920×1080 pixels

About 50 MB of data are produced per minute with HD720 and 100 MB with HD1080 (slightly dependent on the contents and compression applied). A new file is created each time a file size of 1 GB is reached; capturing continues without interruption. Video capturing is discontinued if the SD card runs out of memory.

Camera Settings



The "SETUP CAMERA" menu lets you configure various internal parameters, such as the date and time, the file name for images on the SD card or whether a signal tone should sound each time an image is captured.

Reset camera (RESET CAM)

Resets the microscope to the factory default settings. All user information (such as white balance, resolution, etc.) is reset. Select this function if you are getting the impression the microscope is not responding normally or a setting has not been made correctly.

Set the date and time (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: YYYY.MM.DD – DD.MM.YYYY – MM/DD/YYYY

Display the date and time (SHOW DATE/TIME)

Depending on the setting, this does not display the date and time at all, just displays it in the live image, just in image captures or in both the live image and image captures. The date and time are displayed in the top right corner of the image.

Set the filename (SET FILENAME)

Lets you freely select the first four characters of the filename for both single exposures and video recordings. By default, either MC12 or MC17 are used for the first four characters. These characters are followed by sequential numbering, followed by either JPG for individual images or MP4 for video recordings.

Camera Settings (continued)

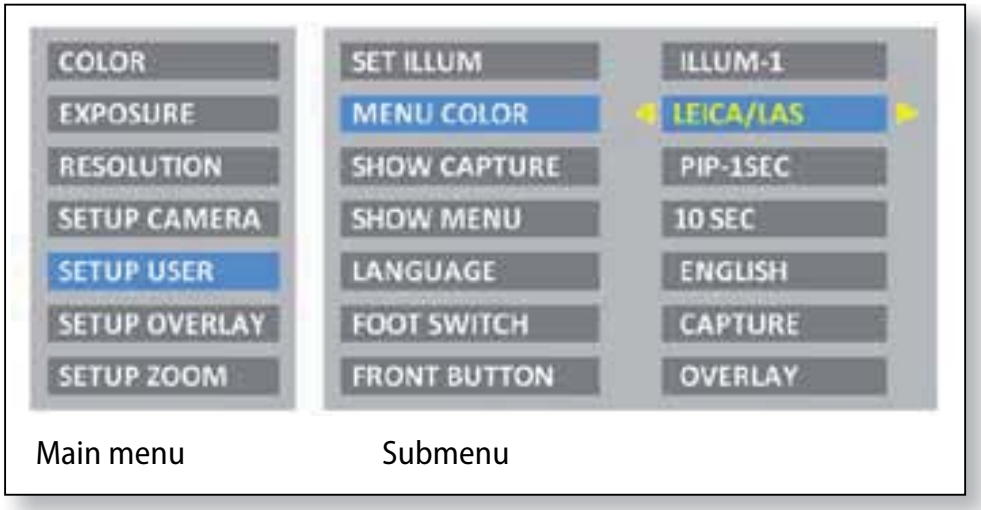
Display the filename (SHOW FILENAME)
Depending on the setting, this does not display the filename at all, just displays it in the live image, just in image captures or in both the live image and image captures. The filename is also shown or written into the top right corner of the image.

If you save the file name or the date and time into images, they cannot be deleted later, even if you rename the files or change the date.

Rotate image (FLIP IMAGE)
Rotates the image by 180°. A red mark ↕ appears on the monitor.

Signal tone (AUDIO/BEEP)
Depending on the setting, you can have a brief signal tone sound after capturing an image. This can be helpful when working with a footswitch if you want to capture images without taking your eyes off the microscope.

User-defined Settings



The "SETUP USER" menu lets you change or switch certain user-specific settings to make working with the microscope a more enjoyable experience.

Set the illumination mode (SET ILLUM)

These settings allow you to define up to three different illumination modes, such as one for transmitted light or one for polarized light. This can save the current camera settings for recurring acquisition situations and retrieval again at any time.

Press ◄ ► to select illumination mode 1, 2 or 3. Press OK to save the current camera settings under the displayed illumination mode.

In order to select a pre-defined or newly defined illumination mode, press ◄ ► in the live image.

Set menu color (MENU COLOR)

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

User-defined Settings (continued)

Show the capture (SHOW CAPTURE)

Lets you set whether or not a recently saved image is to be displayed in full screen or as picture-in-picture (PIP) on the screen after capturing an image. You can also select whether the created capture is to be displayed for one second, three seconds or permanently (INFINITE).

Display the menu (SHOW MENU)

Defines how long the menu is displayed on the screen. You can stop the menu from being displayed at any time by pressing the menu button again or selecting a menu entry.

Set the language (LANGUAGE)

Lets you set the language for menu guidance. Select the fifth entry in the main menu if you have (unintentionally) selected an Asian language that uses logograms and want to return to a menu display that is alphanumeric. The menu entry for selecting the language is always added in English as well.

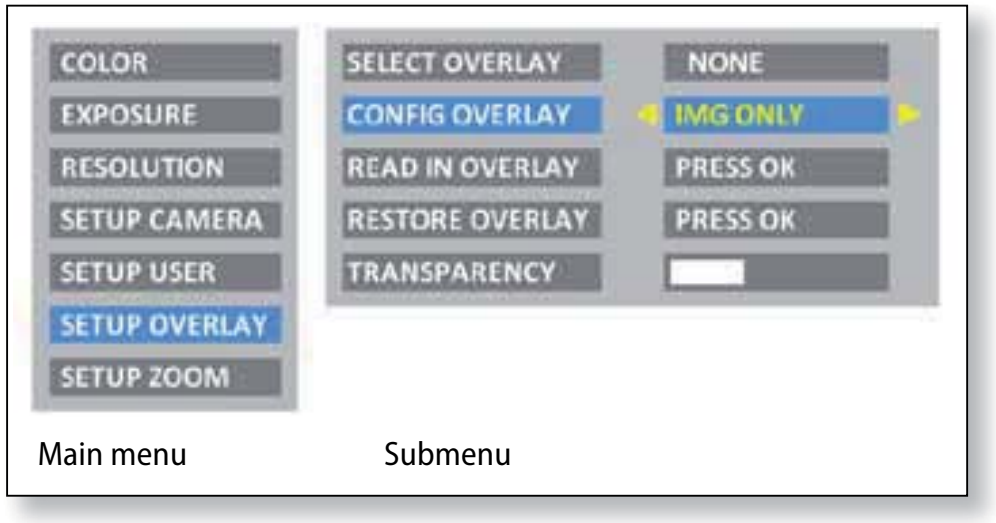
Configure the footswitch (FOOT SWITCH)

Lets the footswitch be configured with another function. By default, pressing the footswitch triggers image acquisition. However, you can choose if this should perform a white balance adjustment, record a video or display the last capture instead.

Configure the front button (FRONT BUTTON)

Lets you configure another function for the front button. By default, pressing the front button triggers image acquisition. However, you can choose if this should perform a white balance adjustment, record a video or display the last capture instead.

Setting the overlay (SETUP OVERLAY)



The Leica DMS1000 B lets you superimpose predefined or user-specific images in the live image and in captured images. These superimposed images (called overlays) can contain anything, but usually just contain a few elements such as a crosshair or company logo. Up to 10 overlays can be defined, of which the first overlay (01) is reserved for displaying a small histogram in the bottom left corner. Overlays 02 through 10 can contain either predefined or user-specific content and let you configure your microscope for special tasks.

Select an overlay (SELECT OVERLAY)

Press ◄ ► to select another overlay. Press OK to activate the selected overlay and leave the menu.

If you want to quickly display other overlays, press ▼ ▲ when the live image is displayed to show the next or previous respective overlay.

Configure an overlay (CONFIG OVERLAY)

Depending on the setting, this does not show an overlay, only shows the overlay in the live image or shows it in both the live image and the image capture.

Import an overlay (READ IN OVERLAY)

Imports up to 10 user-specific overlays from the SD card from the "Overlay" directory. The overlays need to be saved as a JPG with 4:2:2 compression and must have both the appropriate resolution and a specifically defined filename. Various overlays are available for download on the Leica Microsystems website, as well as a manual for how to create your own overlays. Follow those instructions to create new overlays.

Setting the Overlay (continued)

Restore an overlay (RESTORE OVERLAY)

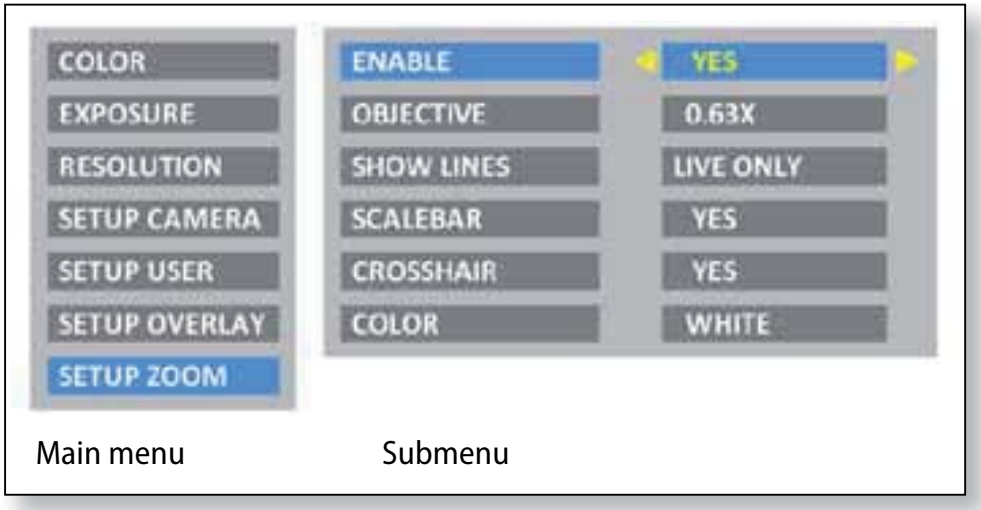
Sets the overlays back to the factory setting: A histogram, a Leica logo, a crosshair over the entire live image and a small crosshair in the middle of the live image.

Set transparency (TRANSPARENCY)

The overlay's edges are more or less prominent depending on the selected setting.

This setting does not change the transparency of the overlay.

Scalable Display



The Leica DMS1000 B has a "scalable display". This means that the zoom scale and crosshair are also magnified at the corresponding setting based on the selected magnification.

Enable zoom scale (ENABLE)
The display of the coding can be enabled or disabled using this setting.

"YES" enables the zoom scale, "NO" disables it.

Select the objective (OBJECTIVE)
Press ◄ ► to select an objective. This information is necessary for correctly calculating scaling.

Set the display of lines (SHOW LINES)
If the zoom scale is enabled, this can be used to select where it is to be displayed. There are options for displaying them in the live image (LIVE ONLY), or in the live image and the saved image (LIVE + IMG).

Enable the scale bar (SCALEBAR)
Select "YES" or "NO" to enable or disable the scale bar.

Enable the crosshair (CROSSHAIR)
Select "YES" or "NO" to enable or disable the crosshair.

Select the color of the line (COLOR)
Select the color for the scale bar and crosshair. "WHITE", "BLACK" or "YELLOW" are available.

Configuring Predefined Illumination Scenarios

Changing the illumination mode

The Leica DMS1000 B is supplied with various illumination modes that cover a wide spectrum of possible situations.

1. Press ◄ ► on the remote control to display the current illumination mode on the HD monitor.
2. Press ◄ ► again to switch to the next illumination mode. The microscope immediately switches the illumination mode and sets the stored parameters.
3. Wait until the displayed illumination mode disappears from the screen. This means that illumination mode is now active.

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

If you do not press ◄ ► for 5 seconds, the selected illumination mode is applied.

Sequence

Service

Care, Maintenance, Contact Persons

General

We hope you enjoy using your high-performance microscope. Leica microscopes are renowned for their robustness and long service life. Observing the following care and cleaning tips will ensure that even after years and decades, your Leica microscope will continue to work as well as it did on the very first day.

Warranty benefits

The guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

EC Declaration of Conformity

To download the EC Declaration of Conformity, use this link

http://www.leica-microsystems.com/products/stereo-microscopes-macroscopes

Select the microscope type and go to the "Download" page.

Contact address

If your instrument no longer works perfectly, contact your Leica representative. You can find information on worldwide Leica representatives on the Leica Microsystems website: www.leica-microsystems.com

Care, Maintenance, Contact Persons (continued)

Care

- Keeping all optical components clean is important for maintaining good optical performance.
- If any optical surface becomes badly coated with dust or dirt, flush the surface using a syringe or by brushing it off with a camel hair brush before attempting to wipe it clean.
- Optical surfaces should be cleaned using a lint-free cloth, lens cloth or cotton swab soaked in ethanol 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.
- Protect your microscope from moisture, fumes and acids and from alkaline, caustic and corrosive materials and keep chemicals away from the instruments.
- Plugs, optical systems and mechanical parts must not be disassembled or replaced, unless doing so is specifically permitted and described in this manual.
- Protect your microscope from oil and grease.
- Do not grease guide surfaces or mechanical parts.

Protection from dirt

Dust and dirt will affect the quality of your results.

- Put an optionally available dust cover over the microscope when it will not be used for a long time.
- Keep accessories in a dust-free place when not in use.

Care, Maintenance, Contact Persons (continued)

Cleaning polymer components

Some components are made of polymer or are polymer-coated. They are, therefore, pleasant and convenient to handle. The use of unsuitable cleaning agents and techniques can damage polymers.

Permitted measures

- Clean the microscope (or parts of it) using warm soapy water, then wipe using distilled water.
- For stubborn dirt, you can also use ethanol (industrial alcohol). When doing so, follow the corresponding safety regulations.
- Remove dust with a bellows and a soft paintbrush.
- Clean the objectives with special optics cleaning cloths and pure alcohol.

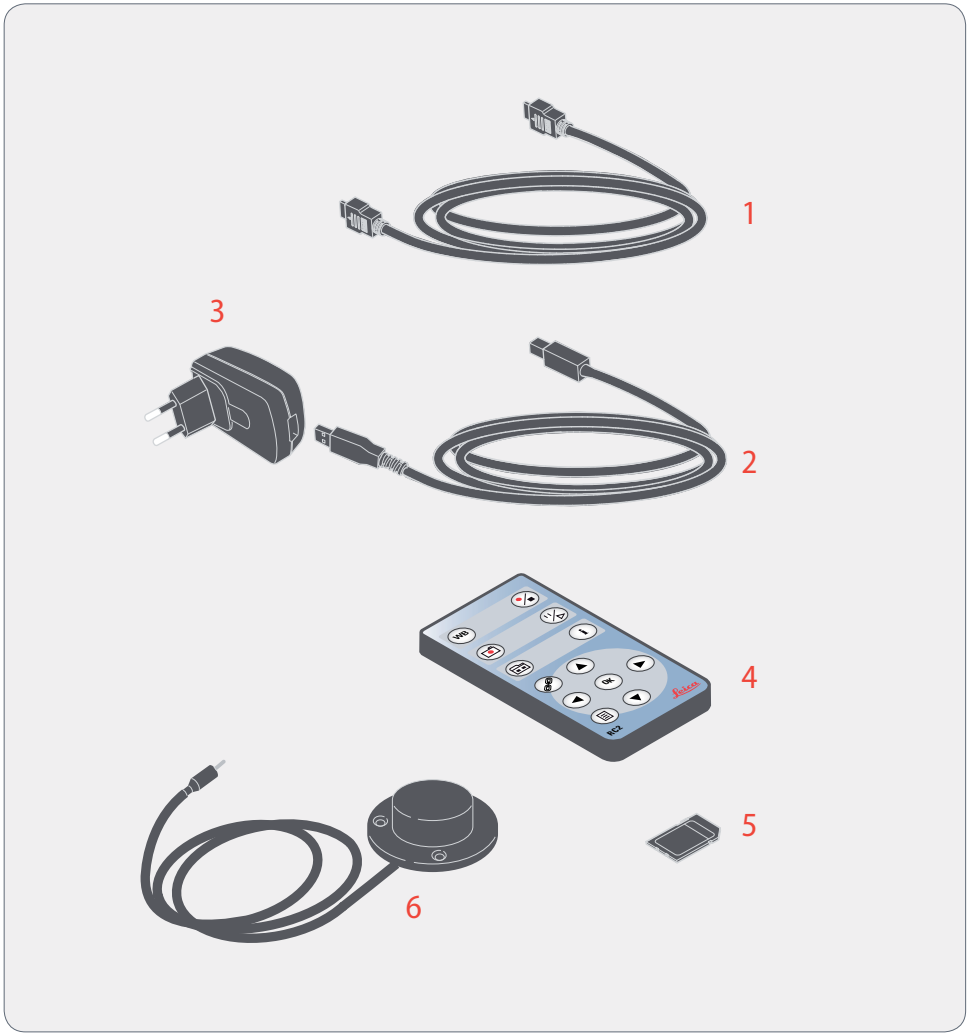
Servicing

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

Danger of electric shock

Risk of electric shock. Removing the cover of the Leica DMS1000 B exposes electrically live parts, which, if touched, can cause potentially fatal injuries. Have technical service carried out by a Leica Microsystems authorized dealer.

Spare parts



Item	Leica article number	Designation
1	19 004 872	HDMI cable (2 m)
2	19 004 871	USB cable (1.8 m)
3	13 302 708 946 915	5 W USB adapter with interchange-able connector
4	19 004 873	RC2 remote control
5	19 004 870	SD card (4 GB)
6	12 730 229	Footswitch

Specifications

Leica DMS1000 B

Zoom objective

Optical data	Leica DMS1000 B
Magnification rate	8:1 manual, encoded zoom
Resolution*	169 LP/mm
Working distance	89.6 mm
Field of view	3.25 mm × 1.83 mm 25.97 mm × 14.61 mm
Maximum values	
Magnification	297×
Resolution	240 LP/mm
Max. FoVx	82 mm
Max. FoVy	46 mm
Working distance	303 mm

Optical data	Leica DMS1000 B
Additional working distances	303 mm (achromatic 0.32×)
	188.5 mm (achromatic 0.5×)
	148 mm (achromatic 0.63×)
	114 mm (achromatic 0.8×)
	89.6 mm (achromatic 1×)
	65.5 mm (achromatic 1.25×)
	46 mm (achromatic 1.6×)
	27.4 mm (achromatic 2.0×)

* For a system with a 22" HD monitor and 1.0× objective

Leica DMS1000 B (continued)

Zoom objective

Optics carrier	
Design engineering	Multi-layered tempered optics system with beam path and main objective, lead-free
Coding	Fully coded zoom
Specific surface resistivity (housing)	2×10^{11} Ω/mm^2 Discharge time <2 seconds from 1000 V to 100 V
Engageable zoom notches	Eight switchable positions, for repetitive tasks
Standard objective	Achromatic 1.0×
Additional objectives	Achromatic: 0.32×, 0.5×, 0.63×, 0.8×, 1×, 1.25×, 1.6×, 2×
Additional objectives (with adapter)	Z-series planachromat: 0.5×, 0.8×, 1×

Accessories	
Adapter for telecentric lens	For Z-series planachromat: 0.5×, 0.8×, 1×
Footswitch	For hands-free operation (e.g. image acquisition and other tasks)

Leica DMS1000 B (continued)

Leica DMS1000 B - digital camera

Optics carrier	
Live image resolution	HD ready: 1280×720 - 50 Hz/60 Hz - 30 fps Full HD: 1920×1080 - 50 Hz/60 Hz/25 Hz/30 Hz - 30 fps PC: 1600×1200 - 10 fps / 1024×768 - 24 fps
Image resolution (capture)	5 megapixels (2592×1944) 2.5 megapixels (1824×1368) 1.1 megapixels (1216×912)
Video resolution	HD1080 (1090×1920) HD720 (1280×720)
Pixel size	2.35 µm × 2.35 µm 3.34 µm × 3.34 µm
Sensor grade	Micron 1/2" CMOS
Sensor size	6.1 mm × 4.6 mm
Exposure time	0.5 msec - 500 msec
Gain	1× - 12×
Color depth	3×8 bit = 24 bit
File formats	Image: JPEG Video: MP4

Leica DMS1000 B (continued)

Weight

- 17 kg

Electronic interfaces/switches

- USB2.0, Type B, jack
- HDMI jack
- Jack for footswitch
- Integrated SD slot
- Front button on the front side
- Switch for HD mode
- ON/OFF switch
- Reset button

Ambient conditions

- Elevation up to 2000 m
- For use in enclosed rooms only
- Operating temperature +10 °C to 40 °C

Optical Data - Field of View

Objective	Achr. 0.32×		Achr. 0.5×		Achr. 0.63×		Achr. 0.8×		Achr. 1.0×		Achr. 1.25×		Achr. 1.6×		Achr. 2.0×	
Working distance	303 mm		188.5 mm		148.2 mm		114 mm		89.6 mm		65.5 mm		46 mm		27.4 mm	
Field of view (zoom setting)	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy	FOVx	FOVy
0.75	81.99	46.12	52.01	29.25	41.19	23.17	32.46	18.26	25.99	14.62	20.82	11.71	16.25	9.14	13.00	7.31
1.0	61.52	34.61	39.03	21.95	30.91	17.39	24.36	13.70	19.50	10.97	15.62	8.79	12.20	6.86	9.76	5.49
1.25	49.22	27.69	31.22	17.56	24.73	13.91	19.48	10.96	15.60	8.77	12.50	7.03	9.76	5.49	7.81	4.39
1.6	38.45	21.63	24.39	13.72	19.32	10.87	15.22	8.56	12.19	6.86	9.77	5.49	7.62	4.29	6.10	3.43
2.0	30.76	17.30	19.51	10.98	15.46	8.69	12.18	6.85	9.75	5.48	7.81	4.39	6.10	3.43	4.88	2.74
2.5	24.61	13.84	15.61	8.78	12.36	6.95	9.74	5.48	7.80	4.39	6.25	3.52	4.88	2.74	3.90	2.20
3.2	19.23	10.81	12.20	6.86	9.66	5.43	7.61	4.28	6.09	3.43	4.88	2.75	3.81	2.14	3.05	1.72
4.0	15.38	8.65	9.76	5.49	7.73	4.35	6.09	3.42	4.87	2.74	3.91	2.20	3.05	1.72	2.44	1.37
5.0	12.30	6.92	7.81	4.39	6.18	3.48	4.87	2.74	3.90	2.19	3.12	1.76	2.44	1.37	1.95	1.10
6.0	10.25	5.77	6.50	3.66	5.15	2.90	4.06	2.28	3.25	1.83	2.60	1.46	2.03	1.14	1.63	0.91

Optical Data - Magnification and Depth of Field

Objective		Achr. 0.32×		Achr. 0.5×		Achr. 0.63×		Achr. 0.8×		Achr. 1.0×		Achr. 1.25×		Achr. 1.6×		Achr. 2.0×	
Monitor	Zoom setting	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF
10"	0.75	2.7	34.76	4.3	13.99	5.4	8.77	6.8	5.45	8.5	3.49	10.6	2.24	13.6	1.37	17.0	0.87
	1.0	3.6	19.56	5.7	7.87	7.2	4.94	9.1	3.07	11.3	1.96	14.2	1.26	18.1	0.77	22.7	0.49
	1.25	4.5	12.52	7.1	5.04	8.9	3.16	11.4	1.96	14.2	1.26	17.7	0.81	22.7	0.49	28.3	0.31
	1.6	5.8	7.64	9.1	3.07	11.5	1.93	14.5	1.20	18.2	0.77	22.7	0.49	29.0	0.30	36.3	0.19
	2.0	7.2	4.89	11.3	1.97	14.3	1.23	18.2	0.77	22.7	0.49	28.3	0.32	36.3	0.19	45.3	0.12
	2.5	9.0	3.13	14.2	1.26	17.9	0.79	22.7	0.49	28.4	0.31	35.4	0.20	45.4	0.12	56.7	0.08
	3.2	11.5	1.91	18.1	0.77	22.9	0.48	29.1	0.30	36.3	0.19	45.3	0.12	58.1	0.08	72.6	0.05
	4.0	14.4	1.22	22.7	0.49	28.6	0.31	36.3	0.19	45.4	0.12	56.6	0.08	72.6	0.05	90.7	0.03
	5.0	18.0	0.78	28.3	0.31	35.8	0.20	45.4	0.12	56.7	0.08	70.8	0.05	90.7	0.03	113.4	0.02
	6.0	21.6	0.54	34.0	0.22	42.9	0.14	54.5	0.09	68.1	0.05	85.0	0.04	108.8	0.02	136.0	0.01
19"	0.75	5.1	34.76	8.1	13.99	10.2	8.77	13.0	5.45	16.2	3.49	20.2	2.24	25.9	1.37	32.4	0.87
	1.0	6.8	19.56	10.8	7.87	13.6	4.94	17.3	3.07	21.6	1.96	26.9	1.26	34.5	0.77	43.1	0.49
	1.25	8.5	12.52	13.5	5.04	17.0	3.16	21.6	1.96	27.0	1.26	33.7	0.81	43.1	0.49	53.9	0.31
	1.6	10.9	7.64	17.2	3.07	21.8	1.93	27.6	1.20	34.5	0.77	43.1	0.49	55.2	0.30	69.0	0.19
	2.0	13.7	4.89	21.6	1.97	27.2	1.23	34.5	0.77	43.1	0.49	53.8	0.32	69.0	0.19	86.2	0.12
	2.5	17.1	3.13	26.9	1.26	34.0	0.79	43.2	0.49	53.9	0.31	67.3	0.20	86.2	0.12	107.8	0.08
	3.2	21.9	1.91	34.5	0.77	43.6	0.48	55.3	0.30	69.0	0.19	86.2	0.12	110.4	0.08	138.0	0.05
	4.0	27.4	1.22	43.1	0.49	54.4	0.31	69.1	0.19	86.3	0.12	107.7	0.08	138.0	0.05	172.5	0.03
	5.0	34.2	0.78	53.9	0.31	68.0	0.20	86.4	0.12	107.9	0.08	134.6	0.05	172.5	0.03	215.6	0.02
	6.0	41.0	0.54	64.7	0.22	81.7	0.14	103.6	0.09	129.4	0.05	161.5	0.04	207.0	0.02	258.7	0.01

Optical Data - Magnification and Depth of Field (continued)

Objective		Achr. 0.32×		Achr. 0.5×		Achr. 0.63×		Achr. 0.8×		Achr. 1.0×		Achr. 1.25×		Achr. 1.6×		Achr. 2.0×	
Monitor	Zoom setting	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF	Total mag.	DOF
22"	0.75	5.9	34.76	9.4	13.99	11.8	8.77	15.0	5.45	18.7	3.49	23.4	2.24	29.9	1.37	37.4	0.87
	1.0	7.9	19.56	12.5	7.87	15.7	4.94	20.0	3.07	25.0	1.96	31.2	1.26	39.9	0.77	49.9	0.49
	1.25	9.9	12.52	15.6	5.04	19.7	3.16	25.0	1.96	31.2	1.26	38.9	0.81	49.9	0.49	62.4	0.31
	1.6	12.7	7.64	20.0	3.07	25.2	1.93	32.0	1.20	39.9	0.77	49.8	0.49	63.9	0.30	79.8	0.19
	2.0	15.8	4.89	24.9	1.97	31.5	1.23	40.0	0.77	49.9	0.49	62.3	0.32	79.8	0.19	99.8	0.12
	2.5	19.8	3.13	31.2	1.26	39.4	0.79	50.0	0.49	62.4	0.31	77.9	0.20	99.8	0.12	124.7	0.08
	3.2	25.3	1.91	39.9	0.77	50.4	0.48	64.0	0.30	79.9	0.19	99.7	0.12	127.7	0.08	159.6	0.05
	4.0	31.6	1.22	49.9	0.49	63.0	0.31	79.9	0.19	99.8	0.12	124.6	0.08	159.6	0.05	199.5	0.03
	5.0	39.6	0.78	62.4	0.31	78.7	0.20	99.9	0.12	124.8	0.08	155.8	0.05	199.6	0.03	249.4	0.02
	6.0	47.5	0.54	74.8	0.22	94.5	0.14	119.9	0.09	149.8	0.05	186.9	0.04	239.5	0.02	299.3	0.01
24"	0.75	6.5	34.76	10.2	13.99	12.9	8.77	16.4	5.45	20.4	3.49	25.5	2.24	32.7	1.37	40.8	0.87
	1.0	8.6	19.56	13.6	7.87	17.2	4.94	21.8	3.07	27.2	1.96	34.0	1.26	43.5	0.77	54.4	0.49
	1.25	10.8	12.52	17.0	5.04	21.5	3.16	27.3	1.96	34.0	1.26	42.5	0.81	54.4	0.49	68.0	0.31
	1.6	13.8	7.64	21.8	3.07	27.5	1.93	34.9	1.20	43.6	0.77	54.4	0.49	69.7	0.30	87.1	0.19
	2.0	17.3	4.89	27.2	1.97	34.4	1.23	43.6	0.77	54.5	0.49	68.0	0.32	87.1	0.19	108.8	0.12
	2.5	21.6	3.13	34.0	1.26	42.9	0.79	54.5	0.49	68.1	0.31	85.0	0.20	108.8	0.12	136.0	0.08
	3.2	27.6	1.91	43.5	0.77	55.0	0.48	69.8	0.30	87.1	0.19	108.7	0.12	139.3	0.08	174.1	0.05
	4.0	34.5	1.22	54.4	0.49	68.7	0.31	87.2	0.19	108.9	0.12	135.9	0.08	174.2	0.05	217.7	0.03
	5.0	43.2	0.78	68.0	0.31	85.9	0.20	109.0	0.12	136.2	0.08	169.9	0.05	217.7	0.03	272.1	0.02
	6.0	51.8	0.54	81.6	0.22	103.1	0.14	130.8	0.09	163.4	0.05	203.9	0.04	261.2	0.02	326.5	0.01

Leica TL ST Transmitted Light Base

Light source	Halogen lamp 12 V/20 W
Quick illuminant change	Yes
Illuminated area	50 mm
Power supply	Input voltage 100 – 240 V~, frequency 50/60 Hz Energy consumption 30 W max. Ambient temperature 10 – 40 °C
Connections	Power plug
Weight	7.4 kg

Illumination modes

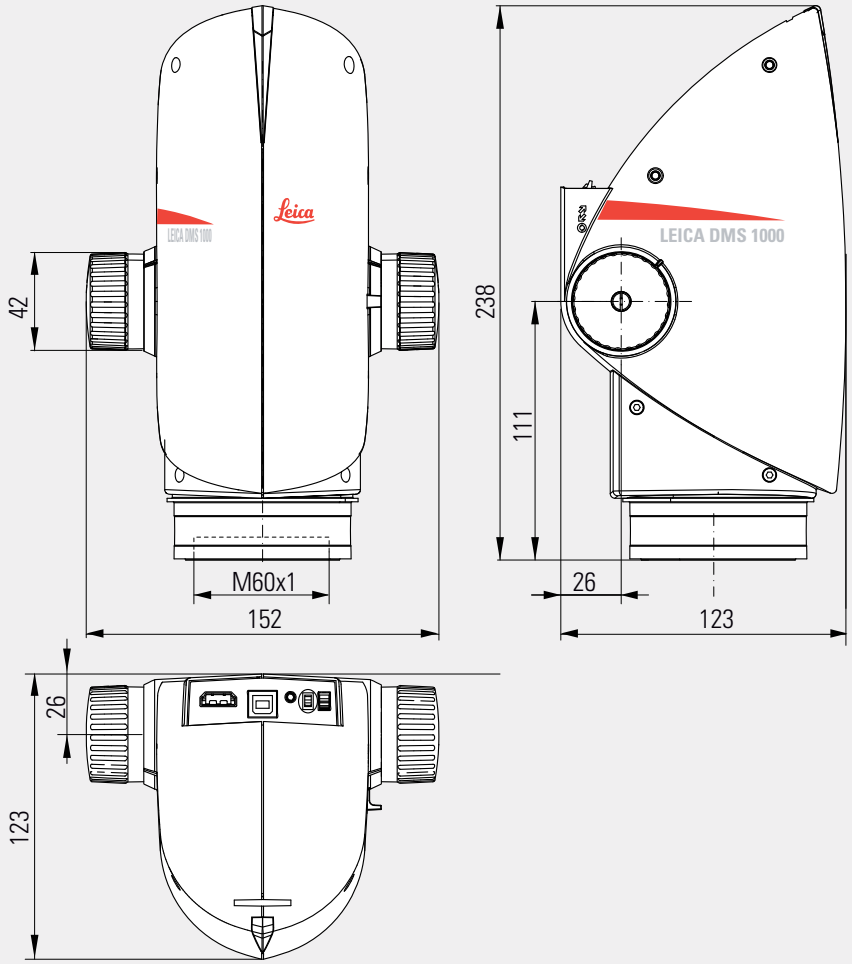
Bright field	Yes
Dark field	Yes (single-sided)
Oblique light	No
Relief Contrast System (RC™)	No
CCIC (Constant Color Intensity Control)	No
Internal shutter/lamp control	No
Integrated filter holder	Yes
Coated optics for increasing the color temperature	Yes
Matching of high num. aperture	No
Remote control options	No
AntiShock™ Pads	Yes
Dimensions (W×H×D)	340×430×85 mm

Leica TL5000 Ergo Transmitted Light Base

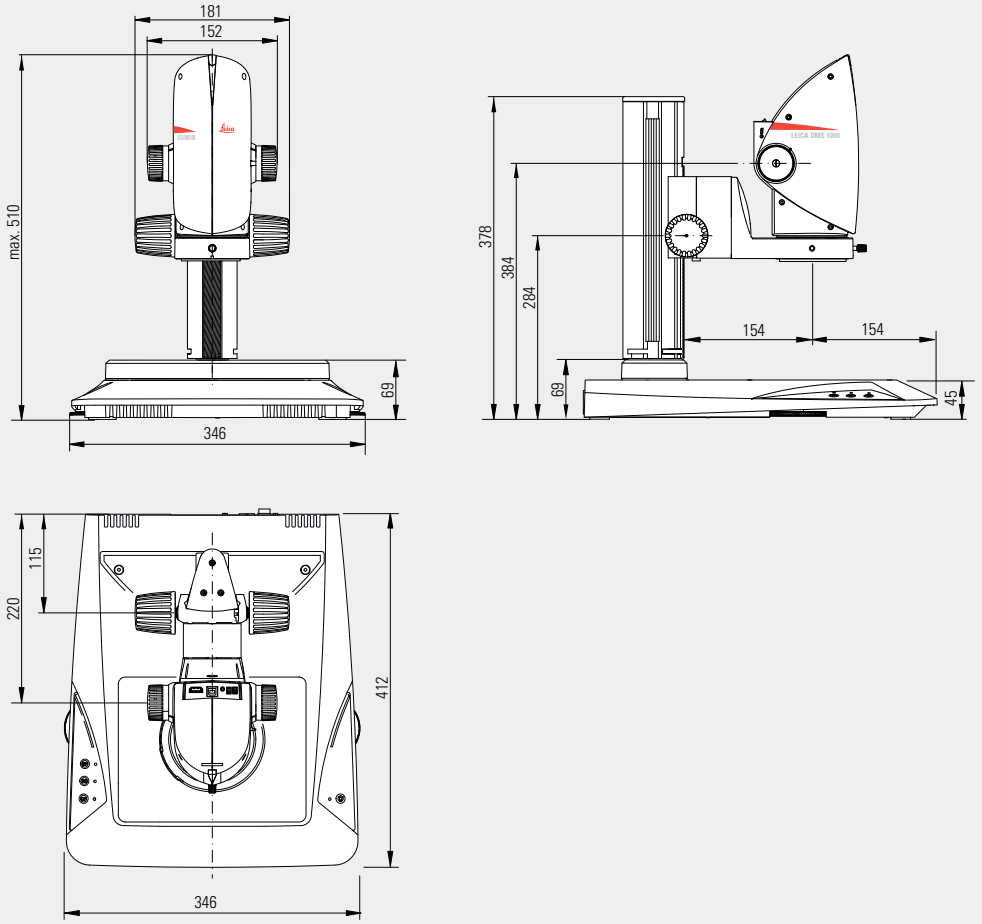
Light source	
Light source	LED
Illuminated field: Bright field ∅	65 mm
Illuminated field: Dark field ∅	40 mm
Relief Contrast System (RC™)	Yes
Internal shutter/lamp control	Yes
Integrated filter holder	Yes
Matching of high num. aperture	Yes
Remote control options	Yes
AntiShock™ Pads	Yes
Dimensions (W×H×D)	412×341×46 mm
Power supply	
Input	100–240 VAC 47 – 63 Hz 3.2 A
Output	33 VDC 3.93 A 130 W MAX
Connections	
Power supply	1

Dimensional Drawings

Leica DMS1000 B



Leica DMS1000 B with TL5000 Ergo Transmitted Light Base



Order Nos. of the editions in: **English/German/French xxx xxx** • Spanish xxx xxx • Italian xxx xxx • Part No. xxx-xxx
Printed on chlorine-free bleached paper. III/13/M.H. Revision 1.0, issued March 12th, 2013

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