



Leica DMS300 User Manual

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General Instructions

Important Safety Notes

Instructions for Use

You can find information on individual system components on the interactive CD-ROM together with a recent user manual in addition. Engineers, fitters, the service engineer and anybody else who the user manual refers to need to read the user manual carefully and understand and fulfil all our safety instructions.

This operating manual describes the basic functions of the Leica DMS300 digital microscope system and calls to your attention instructions for its operation safely, the prevention and avoidance

The 'Safety Concept' manual calls to attention safety information regarding the service work, adjustments and the handling of the microscope accessories and electric accessories as given in safety instructions.

To the file of the manual being the candidate and to ensure safe operation, the user must to observe the instructions and warnings called in these user manuals.



Symbols Used

Warning! Safety hazard!



This symbol indicates essential information that must be read and observed.

The following symbols are used:

- Hazard to person
- Minimum distances or deranged installation

Warning of hazardous electrical voltage



This symbol indicates information that must be read and observed.

The following symbols are used:

- Hazard to person
- Minimum distances or deranged installation

Danger due to hot surface.



This symbol indicates information that must be read and observed.

Important information



This symbol indicates additional information or details that are intended to be read carefully.

Safety Instructions

Description The individual modules fulfill the highest requirements for observation and documentation with the Leica DMS300 digital microscope system.	Just be careful whenever the instrument is altered, modified or used in conjunction with non-authorized components that are outside of the scope of this manual.	Warning and warning symbols are placed on the individual components required to be observed in order to prevent the occurrence of injuries.
Intended Use - Televu "Society Connect" portal Non-intended use - Televu "Society Connect" portal	Just authorized elements to the instrument or functions will be the valid signals to any warning signs. Place of use - Televu "Society Connect" portal - Interface components that 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 create images.	Responsibilities of person in charge of instrument - Televu "Society Connect" portal - Ensure that: - The Leica DMS300 digital microscope system and accessories are operated, handled and tested by authorized and trained persons only. - All operators have read, understood and observe this User Manual and carefully the safety regulations.
Never use the Leica DMS300 or its components for surgical procedures (such as eye surgery) since it is not intended for such use. The instrument and accessories described in this User Manual have been tested for safety and potential hazards. The responsible Leica affiliate		



Safety Instructions (continued)

Repairs, service work

- Tele'la 'Society'Conceal' board
- Only original Leica Microsystems size parts may be used
- Before opening the instruments, switch off the power and unplug the power cable
- Avoid contact with powered electrical parts in order to avoid injury.

Transport

- Before opening the packaging, inspecting and transporting the individual modules of the Leica DMS300 digital microscope system and the necessary components
- In order to prevent damage to the system, disassemble the moving parts that, according to the user manual, can be assembled and disassembled by the customer and pack the respective

Integration in third-party products

- Tele'la 'Society'Conceal' board

Disposal

- Tele'la 'Society'Conceal' board

Legal regulations

- Tele'la 'Society'Conceal' board

EC Declaration of Conformity

- Tele'la 'Society'Conceal' board

Health risks

Work areas with the cameras, the tele and the stage are very bright and they also produce high demands on the eyes and hearing in case of the use. Depending on the duration and the permitted work, exhaustion and musculoskeletal disorders may occur. For this reason, appropriate measures for reduction of the workload must be taken.

- On the assignment of work areas, work assignments and work flow (changing tasks frequently)
- Through the use of the ergonomic, giving consideration to ergonomics and organizational aspects

The ergonomic data is correct and the design of the Leica DMS300 digital microscope system is in full line with the state of the art in the area.

Introduction



Congratulations!

We congratulate you on purchasing the Leica DM5300 digital microscope system by Leica Microsystems. The sleek design of the Leica DM5300 makes it a universal tool for viewing microscopic specimens and capturing still images or even movies.

Real Full HD display

The integrated FCM calculator and the microscope image to be output to a high-definition HD-camera monitor, where the capturing resolution can be easily

- 1920x1080 Full HD. This resolution provides the best basis for imaging before the camera Full HD-camera monitor.
- 1280x720 HD ready. This resolution is suitable for display on monitors sized "HD ready" or on size of monitors with a 10" or 12" diagonal.

Leica Application Suite EZ

Your Leica DM5300 digital microscope system includes the Leica Application Suite EZ (LAS EZ) software. It also adds some software to be implemented in the Full HD monitor and computer monitor can even be used together. This means you will be perfectly equipped for analysis, including working on the camera during presentations, teaching sessions, media presentations, during teleconferencing and more.

You will be informed when the image analysis, the Leica Application Suite EZ Camera and control software have been installed and are ready to use.

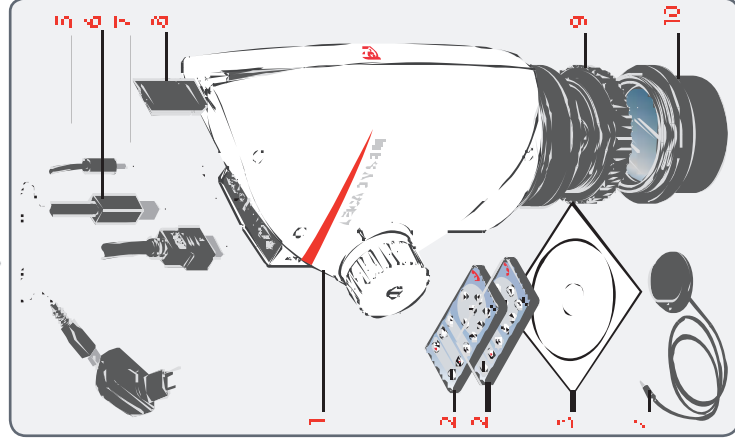
User-friendly even in the smallest detail

Like every digital camera, the Leica DM5300 integrated camera reacts differently to different light sources. However, the white balance is related to the camera's white balance. This means that you will see the color field; you can also easily adjust the white balance.



Standard Delivery

Standard delivery



The Leica DMS300 digital microscope system's standard delivery includes:

- 1 Digital Microscope System Leica DMS300
- 2 Remote control unit, with battery
- 3 Application Suite EZ-AS-EZ1[®] software DVD
- 4 Hand/foot switch
- 5 Connection for foot switch
- 6 USB cable for connecting to a computer or to a power supply unit for supplying power
- 7 HDMI cable for connecting to an HD monitor
- 8 SD memory card
- 9 Protective cover
- 10 Objective

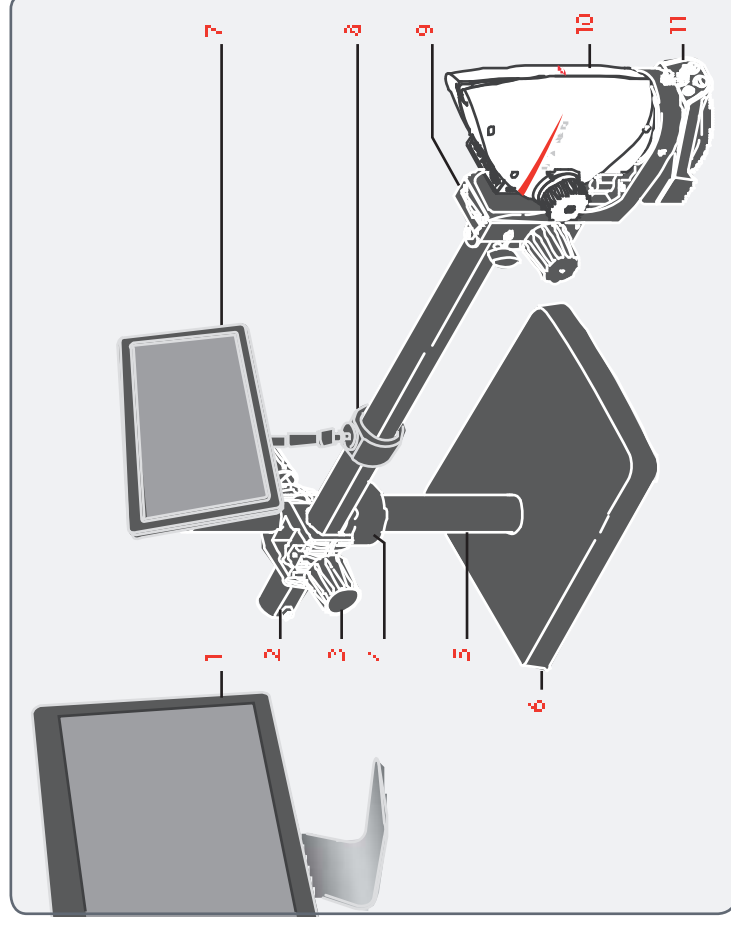


Additional information about working on the computer and on the software can be found in the Application Suite EZ manual.

Various functions can be assigned to the remote control using the button programming procedure, which can be found in the manual.



System Overview – Boom Stand Configuration

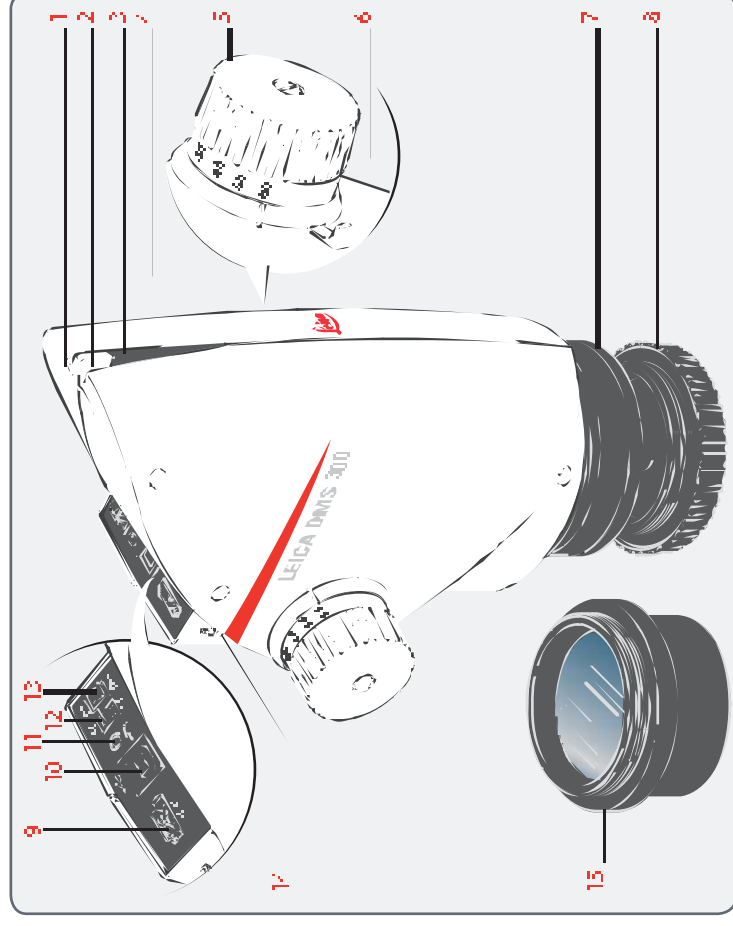


This overview shows the Leica DMS300 in an extended configuration. In addition, the components are listed below:

- 1 19" monitor, a computer with LAS EZ software
- 2 Platform
- 3 Cassette
- 4 Safety ring
- 5 Cabinet
- 6 Baseplate
- 7 19" monitor
- 8 Monitor holder
- 9 Microscope camera
- 10 Leica DMS300
- 11 Lighting light illuminator



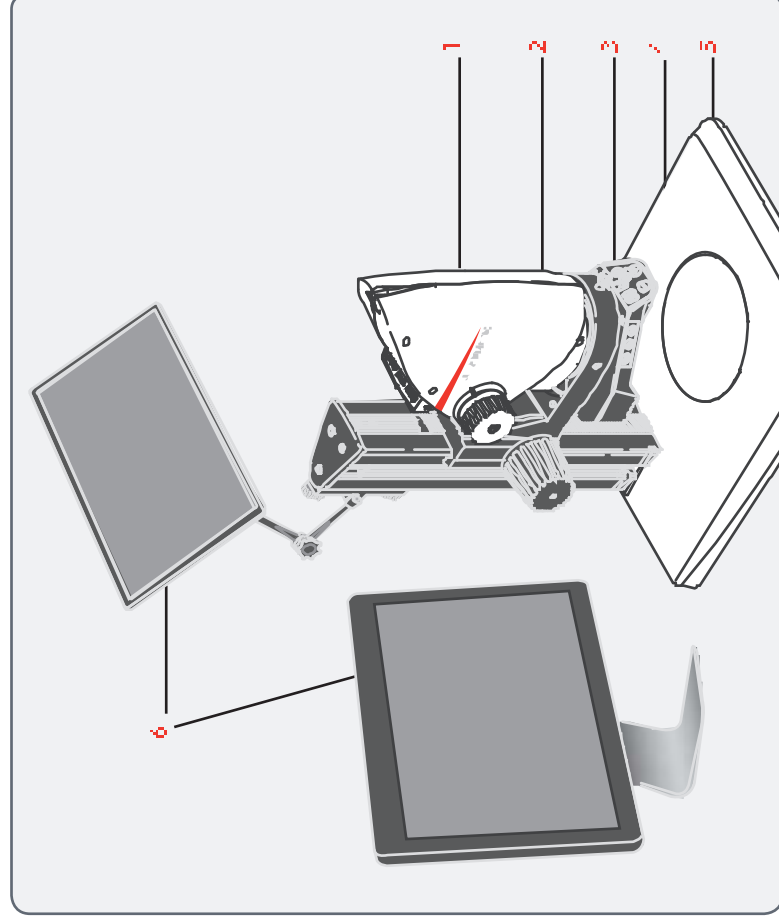
Overview of the Instrument



- 1 Stand holder for USB card
- 2 Front button
- 3 Stop to right
- 4 RF receiver, for remote control of
- 5 Zoom knob
- 6 Click-stop slide
- 7 Leica DMS300 mounting fixture in the microscope
- 8 Objectives cover
- 9 HDMI connection
- 10 USB connection
- 11 Connection to foot switch
- 12 Mode switch, for PC or HD mode
- 13 On/off switch
- 14 Reset button
- 15 Objective



System Overview – Standard Column Configuration

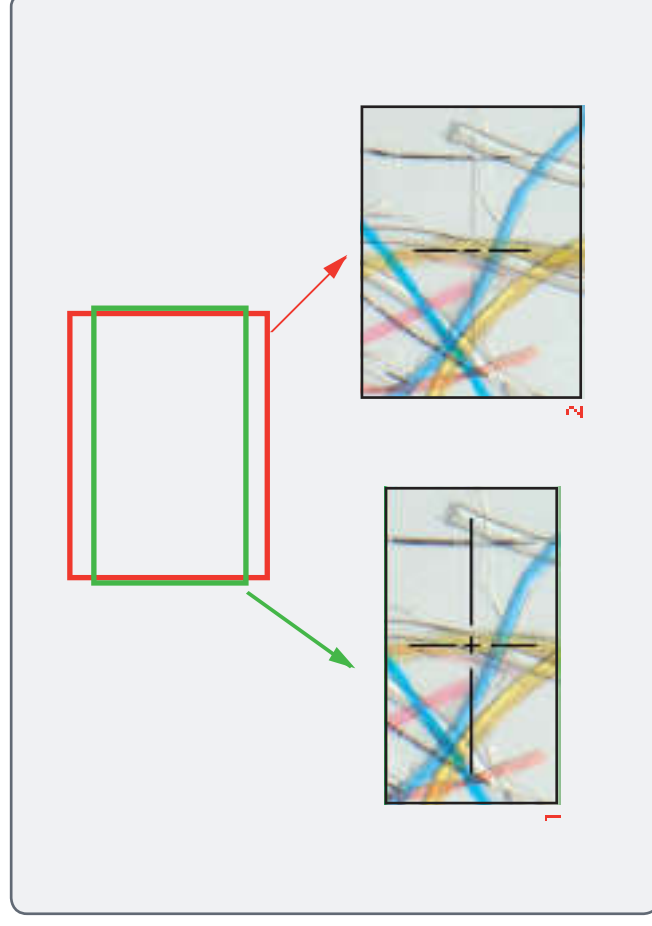


This overview shows the Leica DMS300 in an extended column configuration components

- 1 Leica DMS300
- 2 Microscope camera
- 3 Illumination
- 4 Focusing column
- 5 Baseplate
- 6 PC monitor or computer with LMS software



Effective Displayed Section



The live image on the HD monitor and the final captured image may not show the same section depending on the vertical size of the microscope.

- 1 Live image in L&P is not displayed on the HD monitor.
- 2 Captured image in L&P is not displayed on the computer or saved to an SD card.



Assembly

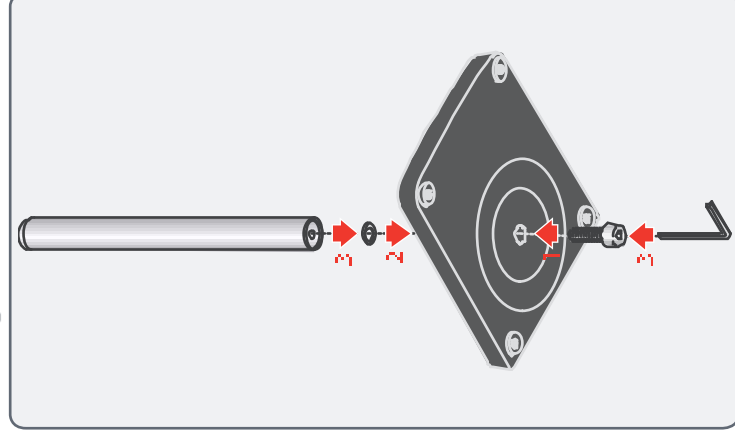


Leica DMS300 swing-arm stand Baseplate and Vertical Column

Instructions for safe assembly

⚠ Due to the heavy weight of the baseplate, the user must use correct lifting or de-weighting techniques. For safety reasons, use two people for this part of the setup.

Assembling the column

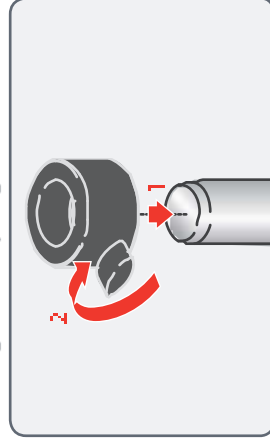


1. Push the locking screw through the baseplate from below.
2. Insert the vertical column into the baseplate.
3. Tighten the vertical column on the baseplate by hand.



Safety Ring and Horizontal Arm

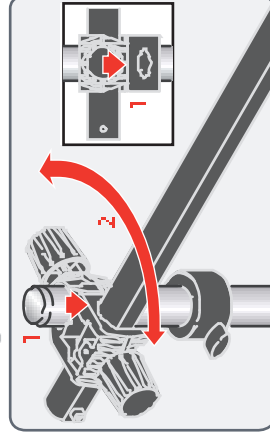
Installing the Safety Ring



1. Push the safety ring over the horizontal arm.
2. Securely tighten the locking screw.

i The safety ring is the most important safety element of the entire configuration. It protects the horizontal arm from accidental injury.

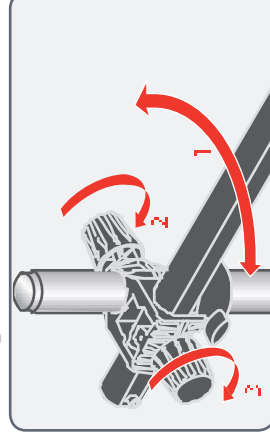
Mounting the horizontal arm



1. Push the cross-reducer onto the horizontal arm. Make sure that the cross-reducer is securely and precisely fitting.
2. You can now rotate the horizontal arm in any direction desired.

i The swing arm stand is designed so that the Leica DM5300 can be moved as desired.

Fastening the horizontal arm



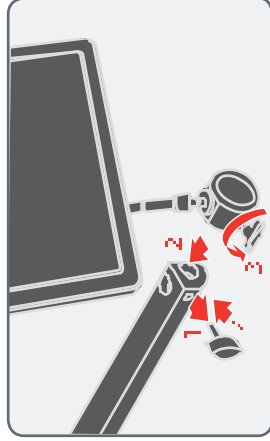
1. Rotate the horizontal arm into a secure position.
2. Securely tighten the locking screw on the cross-reducer to prevent the joint on the column from rotating.
3. Tighten the locking screw to prevent the arm from extending.

! The safety reasons you should fasten the horizontal arm is because when you leave your workstation.



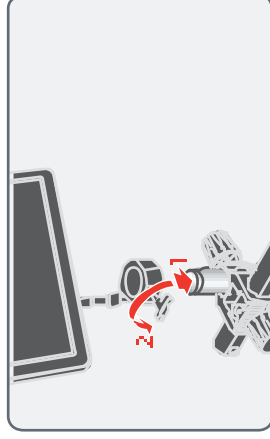
10" monitor

Install on the horizontal arm



1. Remove the existing screw.
2. Tilt the monitor holder on the horizontal arm.
3. Tighten the monitor holder to the existing screw.
4. Tighten the existing screw.

Install on the vertical arm

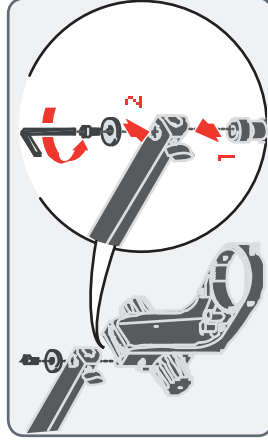


1. Tilt the monitor holder on the vertical arm.
2. Tighten the monitor holder to the existing screw.



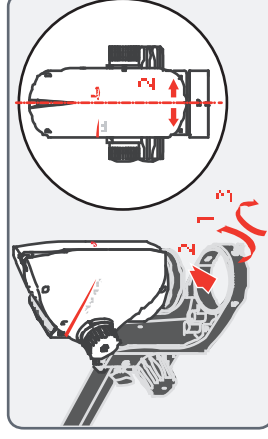
Microscope Carrier and Leica DMS300

Assembling the microscope carrier



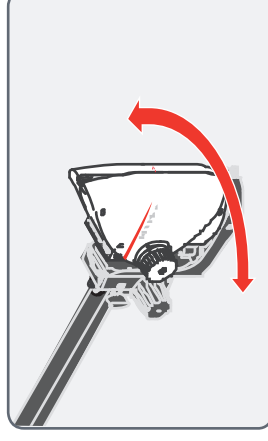
1. Insert the connecting pin into the bearing on the side of the carrier.
2. Tighten the connecting screw using the hex key and screwdriver.

Assembling the Leica DMS300



1. Insert the carrying screw.
2. Place the Leica DMS300 in the microscope carrier so that the top of the microscope housing and the outer carrying screw are aligned.
3. Tighten the microscope housing the carrying screw.

Free movement of the microscope



The microscope can be rotated freely together with the microscope carrier.

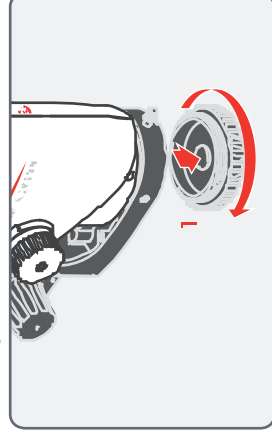


Objective Installation

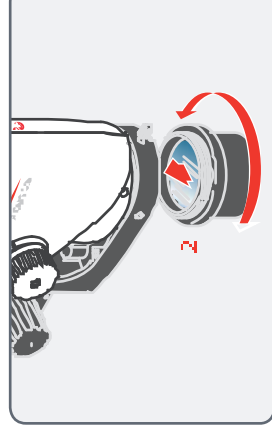
Instructions for safe assembly

 Hold the 0.8X objective firmly during assembly and disassembly so that it does not fall onto the stage plate. Remove specimens from the stage plate first.

Assembly



1. Terrose the objective cell on the objective holder.



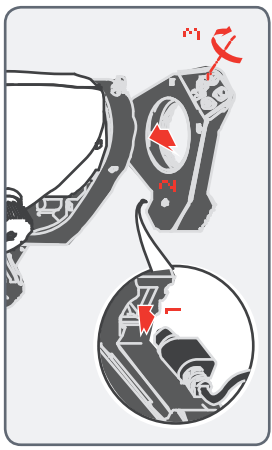
2. Secure the objective into the objective holder.



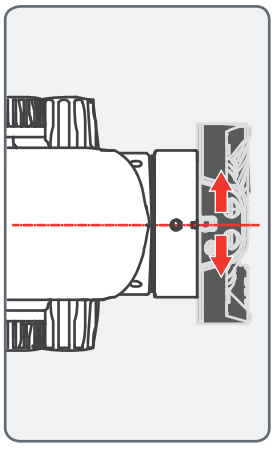


Installing the Leica Ring Light

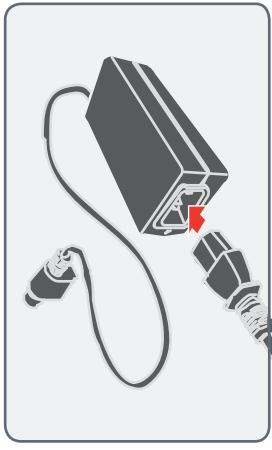
Assembly of the Leica ring light illuminator



1. Connect the external power supply unit to the lighting unit.
2. Attach the lighting unit to the objective lens.
3. Turn the lighting unit.



Ensure that the lighting unit is aligned with the objective lens.

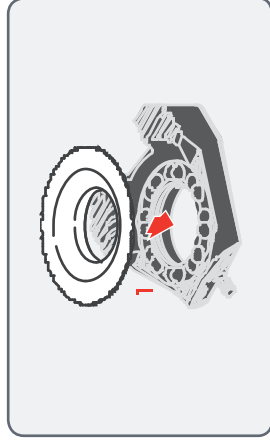


Connect the power supply to the lighting unit.



Illumination: Leica ring light illuminator (continued)

Assembly of the diffuser



1. The diffuser is attached and screwed in between the ring light illuminator.

 We recommend assembling the diffuser on the Leica ring light illuminator as late as possible when mounting the ring light illuminator.



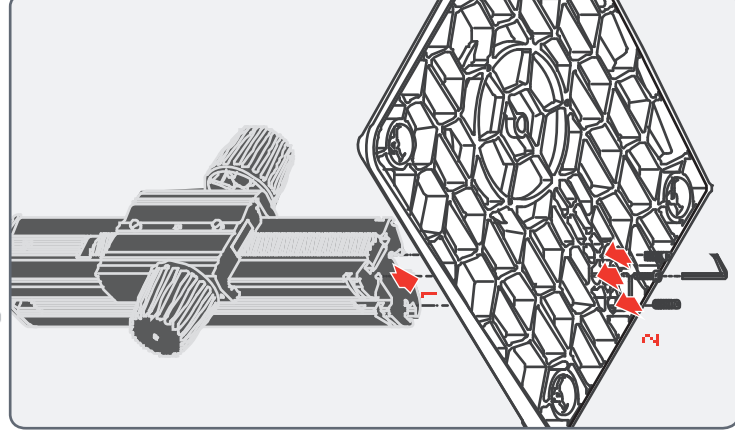
Leica DMS300 with Incident Light Stand

Incident Light Base and Focusing Column

General Notes

-  This schematic shows a recommended assembly of the Leica DMS300 on an incident light base. Images and descriptions may vary when using other incident light base.

Assembling the column

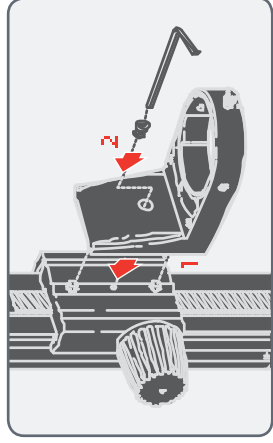


1. Take the three provided screws out of the packaging.
2. Take the incident grid base from the column by the three screws.

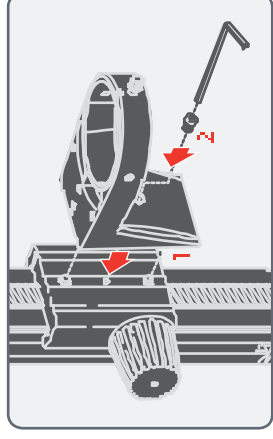


Microscope Carrier and Leica DMS300

Assembling the microscope carrier

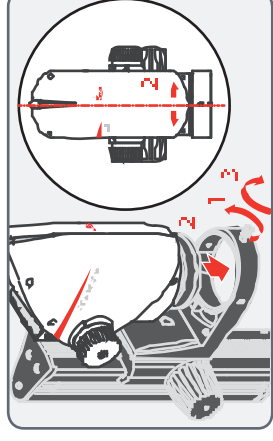


1. Tighten the microscope carrier to the microscope using the provided Allen key and the provided screw (recommended variant for objectives with the same working distance).



2. Alternatively, the microscope carrier can also be tightened using the recommended variant for objectives with the same working distance.

Assembling the Leica DMS300

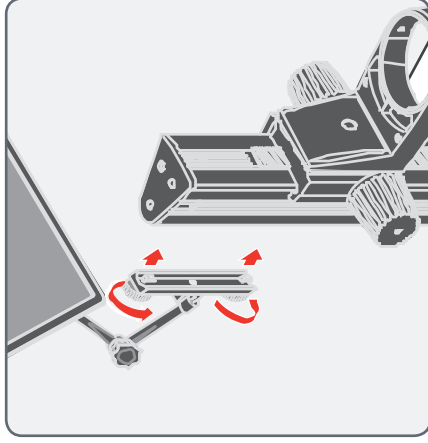


1. Tighten the carrier screw.
2. Place the Leica DMS300 in the microscope carrier so that the notch in the microscope housing and the carrier screw align.
3. Tighten the microscope housing using the carrier screw.

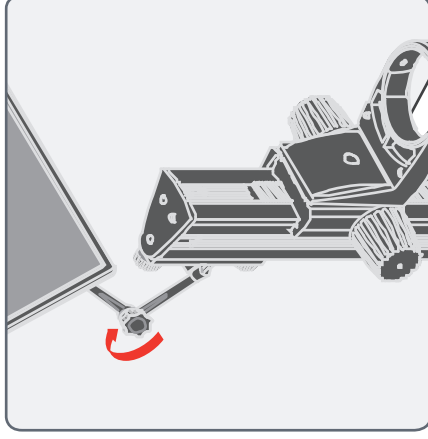


10" monitor

Install on the column



1. Align the mounting arms so that they are aligned with the vertical slot in the back of the deck arm.
2. Insert the arms into the slot so that the mounting bracket is firmly seated on the deck arm.
3. Tilt the monitor so that the mounting arms rotate 90° clockwise.



4. Slightly pull out the monitor so that the mounting arms are in place.
5. While pulling out on the monitor, rotate clockwise to lock the monitor mounting bracket in place.
6. The bracket is now locked as desired on the back of the column.

7. Once the monitor bracket is securely attached, the monitor is ready to be mounted. Try gently to move the monitor to the end of the working space.



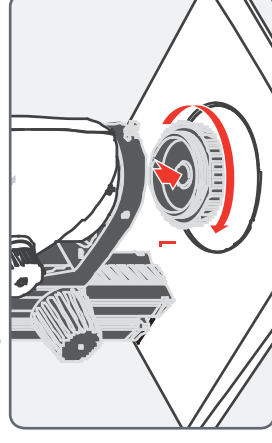
Objective Installation

Instructions for safe assembly

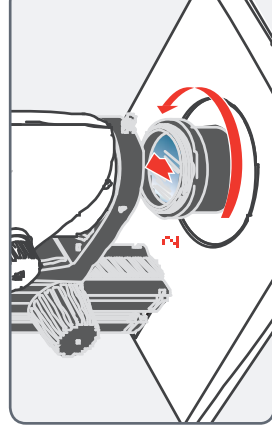
 Hold the objective firmly during assembly and disassembly so that it does not fall onto the stage plate. Remove the objective from the stage plate first.

 The objective is not part of the standard delivery of the Leica DM5300.

Assembly



1. Remove the objective cap on the objective by turning it.



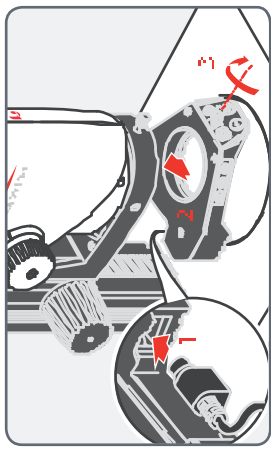
2. Screw the objective into the objective carrier.





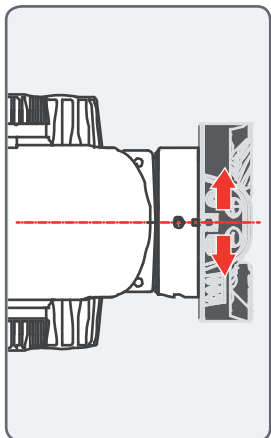
Illumination: Installing the Leica LED3000 RL

Installing the Leica LED3000 RL

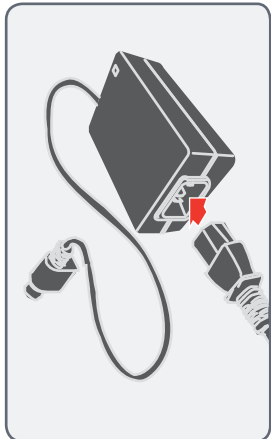


1. Connect the external power supply unit (10 450 266) to the Leica LED3000 RL.
2. Attach the Leica LED3000 RL to the objective turret.
3. Tighten the locking screw.

The supported working distance is between 60 mm and 130 mm.



Ensure the locking screw of the objective turret and the locking screw of the objective are tightened.

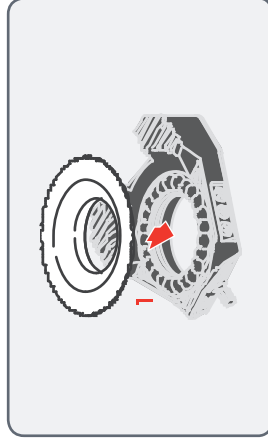


Connect the power supply to the power cable.



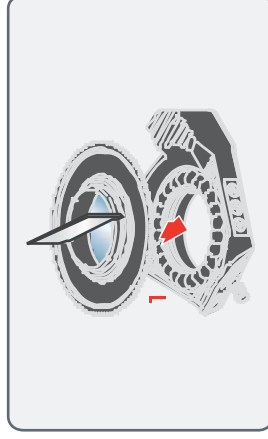
Illumination: Installing the Leica LED3000 RL (continued)

Installing optional accessories



1. The optional diffuser is attached and secured in place in the ring arm holder.

 We recommend assembling the accessories on the Leica LED 3000 RL on a table in reverse and then turning them on the objective together.



1. The optional objective is set in place and the part is collected and secured in place in the ring arm holder. The provided style table is also used as a reference in the process.



Installation



HD Mode (Standalone)

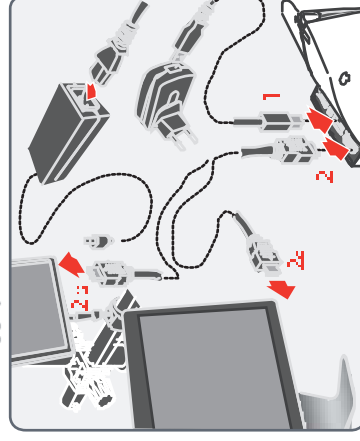
Cables and Terminals, Activating HD Mode (Standalone)

General Instructions

! The Leica DM5300 is designed for the use of HD-capable (high definition) monitors. We strongly recommend connecting the HD monitor using an HDMI cable for achieving the best possible image quality. An external monitor is required.

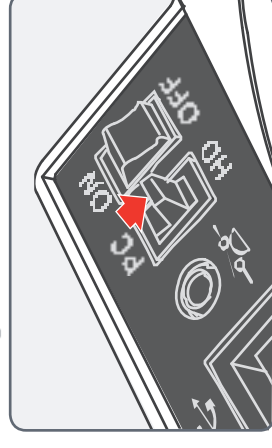
! Please only connect the provided 5V power supply unit. Using an external voltage can substantially damage the Leica DM5300.

Power supply and monitor



1. Connect the Leica DM5300 to a suitable power socket using the USB cable and power supply.
- 2a. Connect the Leica DM5300 to the HD monitor using the HDMI cable (2).
- 2b. Connect the Leica DM5300 to the 10" monitor using the HDMI cable. Connect the 10" monitor to the USB power socket.

Activating HD mode (standalone)



1. Set the mode selector to "HD" in order to set the Leica DM5300 to HD mode (standalone).

i An SD card with sufficient free memory must be inserted into the Leica DM5300 in order to save images in HD mode (standalone).

i In order to avoid malfunctions, please do not connect the Leica DM5300 to a computer when in HD mode (standalone).



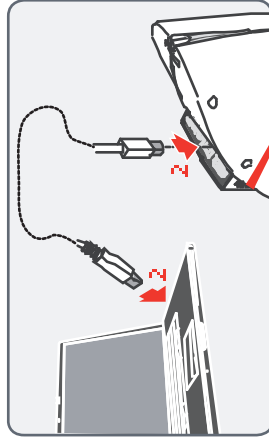
PC Mode

Connecting a Computer, Installing Software, Activating PC Mode

Installation and connection

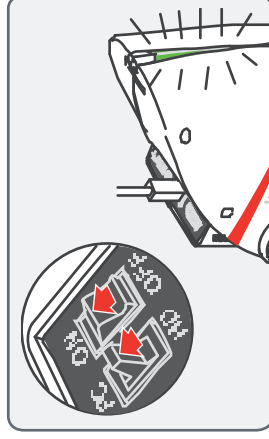
 For instructions on installing and using the software in PC mode, refer to the DVD provided with the Leica DMS300.

1. Place the DVD provided into the computer's disc drive and start the instructions for installing the software.



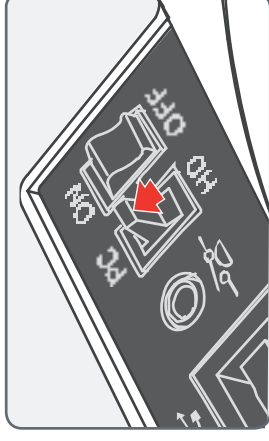
2. Connect the Leica DMS300 to the computer using the USB cable.

 The Leica DMS300 is powered by the computer via the USB cable. It charges the color of the status light. The status light is red when switching on the Leica DMS300; as soon as it is green, you can start the software and view, record or retrace images.



3. To start the instructions in the software or adjust the recording settings.

Activating PC mode



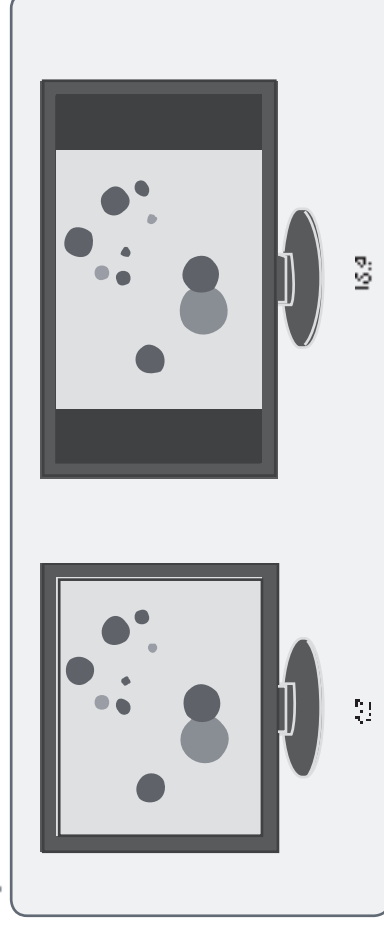
1. Set the mode switch to "PC" in order to set the Leica DMS300 to PC mode.

 The instructions in the software are stored on the computer. In order to use the Leica DMS300 in PC mode, the computer also has to have sufficient free hard drive space.



Limitations in PC Mode

Aspect ratio



Reges are always output in a 4:3 aspect ratio when the Leica UM5300 is connected to a computer – even in 16:9 monitor mode. However, the Reges displayed correctly on these kinds of devices, but will be cut on the screen edges.

Operation

The Leica UM5300 is controlled entirely via the computer in PC mode. The unit starts the Reges control and the tool selection dialog box. The menu for the camera also is displayed on the HD monitor. Status information can be retrieved directly in the software by using  on the Reges control.

Reges control is saved on the SD card in PC mode.



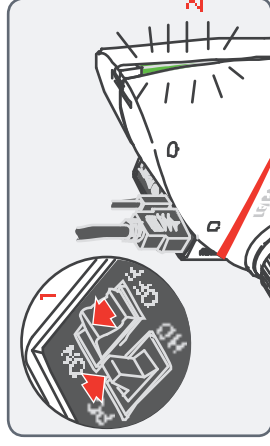
Startup procedure



Leica DMS300

Switching on the Leica DMS300

HD Mode (Standard)



Ensure the objective is secured onto the microscope, the mode selection is set to "HD" and the HD monitor is switched on.

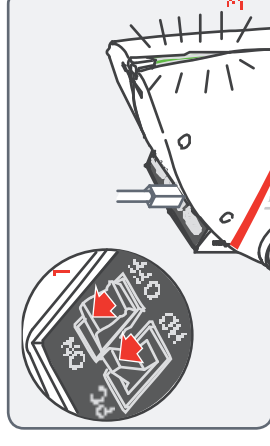
1. Set the on/off switch to "ON" to switch on the Leica DMS300.
2. The status lights LED switches turned to green, a signal tone sounds and the message is displayed on the HD monitor - the Leica DMS300 is ready to use.



The Leica DMS300 is connected to an HD monitor in PC mode.

- The remote control does not respond; in other words, the software does not respond.
- On the HD monitor, a message is shown: "HD expected" or "In black screen" and it will.
- The menu does not appear.
- The message "No camera" appears when selecting the "AS-2" software.

PC Mode



Ensure the objective is secured onto the microscope, the mode selection is set to "PC" and the computer monitor is switched on.

1. Set the on/off switch to "ON" to switch on the Leica DMS300.
2. The status lights LED switches turned to green, a signal tone sounds and the message is displayed on the computer - the Leica DMS300 is ready to use.



Switching on the Illumination

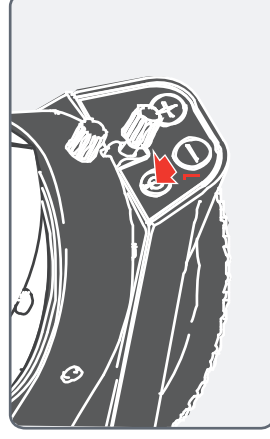
General instructions

 The grill for the side LED illuminator can be very bright and can injure eyes if the LED is on.

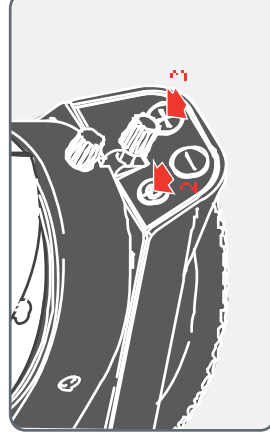
 The intensity of the illuminator can be adjusted in 10 increments.

 When pressing the buttons, hold the keypad between your thumb and index finger. Avoid tapping the keypad with just one finger if possible.

Use



1. Switch on the illuminator by briefly pressing the  button. The green LED on the upper left corner will glow.



2. Adjust the brightness by briefly pressing the  button.
3. Switch off the illuminator by briefly pressing the  button.



Focusing, Adjusting the Resistance of the Focus Drive

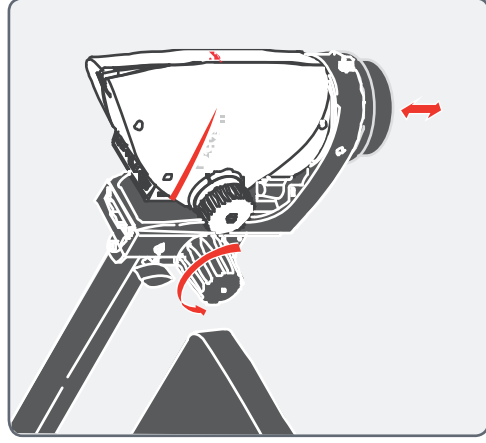
Focusing

Focus by turning the coarse focusing wheel clockwise. The speed of the coarse focusing wheel is the same as the fine focusing wheel.

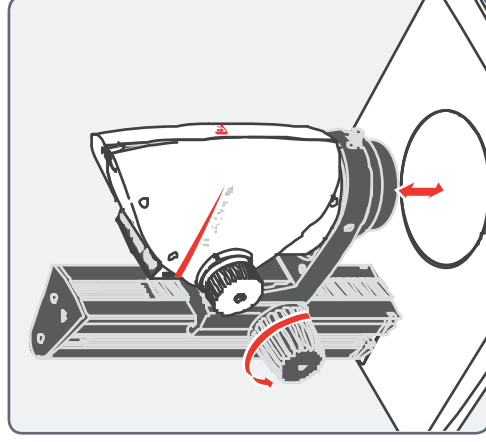
The focus drive can be adjusted in the following way:

Adjusting the resistance

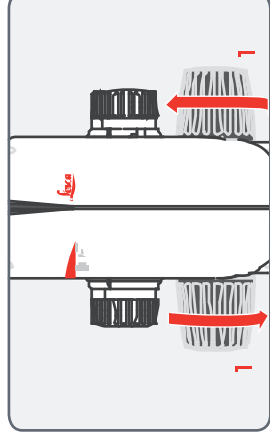
The focus drive has a coarse focus wheel. The speed of the coarse focus wheel is the same as the fine focus wheel. The speed of the coarse focus wheel is the same as the fine focus wheel.



Coarse focus



Coarse defocus

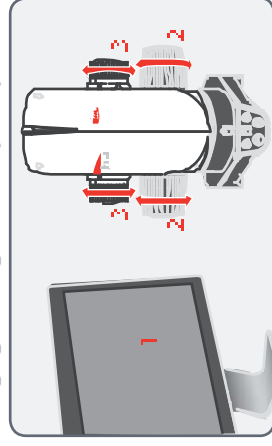


1. Turn the coarse focus wheel clockwise and counter-clockwise until the desired resistance is reached during focusing.



Changing Magnification, Click-stop Feature

Changing the magnification (zoom)



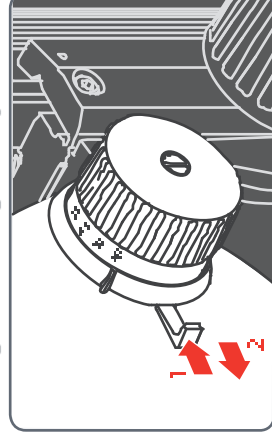
1. Load the HD monitor.
2. Focus on the specimen.
3. Rotate the magnification changer until the desired magnification is configured or it has to be focused.

The video camera or the camera can be used either manually or remotely.

The magnification changer can optionally be operated either with or without click stops enabled. Click stops can be used when the click stops are disabled, which many users find convenient. On the other hand, when the click stops are enabled, analog camera measurement results etc. can be reproduced more accurately.

Parfocality: The Leica DM5500 is parfocal by default. The specimen is in focus at the highest magnification level; this remains true across the entire magnification range.

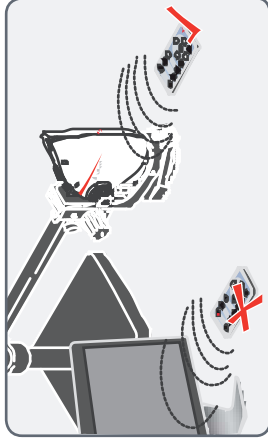
Enabling and disabling click stops



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

Remote control

General instructions

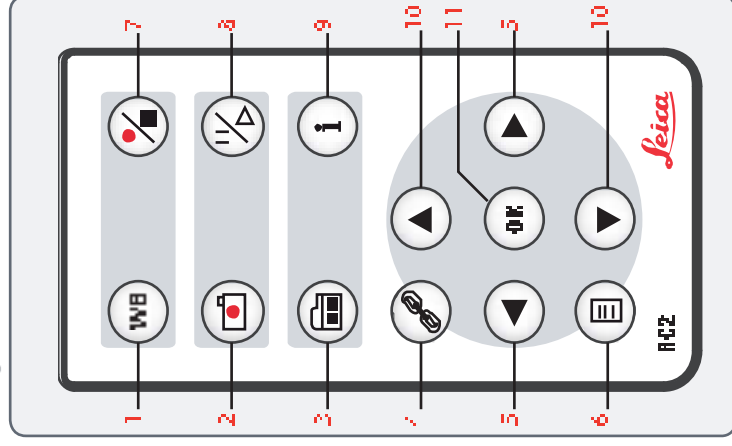


Always keep the remote control pointing towards the microscope's Transceiver.

! The remote control does not respond if the microscope is connected to a computer.

i Instead of the remote control, the 'Start' button on the 'acquisition' (depending on the configuration) can be used to trigger the Leica DM5300.

Description



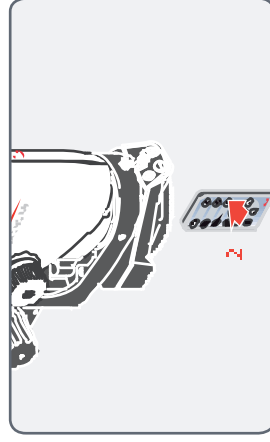
1. Remote automatic white balance
2. Save still image to SD card
3. Show/Hide gallery / review data from SD card
4. Pausing / video capture - remote control off
5. Left / right button: select illumination mode
6. Show/Hide user menu
7. Stop / stop video recording
8. Stop/zoom in live image
9. Show / hide info / motion box
10. Zoom out button: select overlay
11. OK / confirm



Remote Control (continued)

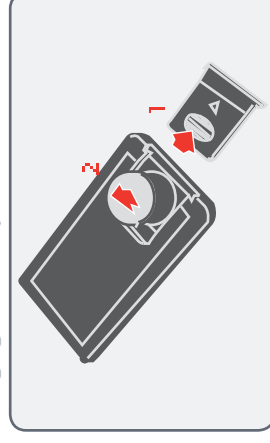
Checking the battery

1. Sit in the driver's seat and HD monitor so that you see the vehicle on the HD monitor:



2. Hold the remote control in the driver's seat so that it does not obstruct the view. Before the truck starts, press and hold the red button on the remote control. The red button is the "ON" button. If the red button is pressed, the truck will start. This is a safety feature. The battery needs to be changed.

Changing the Battery



1. Remove the battery cover on the back of the remote control.
2. Remove the battery and clean the battery cover.



"Pairing" the Leica DMS300 with a Remote Control

Pairing

 The Leica DMS300 and the remote control can be paired and then only respond to each other. This can be helpful when using multiple transceivers and remote controls.

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

 In order to be successful, pairing must be started by the 3rd step and be finished within 30 seconds.

 The result is displayed after 2 seconds. Press the  button again to start the process.

Resetting to factory setting

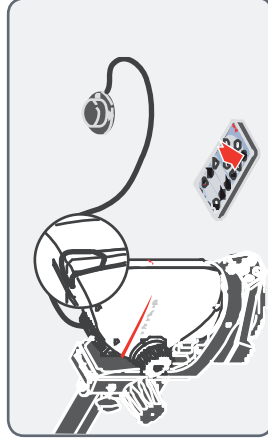
1. Press the button  to start the process.
2. Press the button  until the corresponding confirmation is displayed on the HD monitor.

See more on this topic in our online videos at our website www.leica-geosystems.com.



Configuring the Front Button or Footswitch

General Instructions



Both the Leica DMS300's front button and footswitch can be configured with the remote control as defined by the user.

 The default setting is CAPTURE for configuration mode.

 The Leica DMS300's front button and footswitch can be configured in PC mode.

Configuring

1. Point the remote control towards the Leica DMS300.
2. Press the button  to start the configuration mode.
3. Select SETUP JSCT in the menu.



Configuring the Front Button or Footswitch (continued)

3. The following configurations are possible by selecting the corresponding button:
 - **HOME** button: Home
 - **GO TO** button: Go to the page and save it to the SD card
 - **SHOW LIST** button: Show a preview of the most recently acquired image
 - **MOVIE** button: Video recording starts/ video recording pauses in progress. Saved to the SD card as an MP4 file
 - **OVERLAY** button: Enable/ disable overlay showing the button status. Press twice to toggle the status on and off.
 - **WHITE BAL** button: White balance correction. For additional information on white balance, refer to page 31.

See more on this topic in our online videos at www.leica-camera.com.



Operation



HD Mode (Standalone)

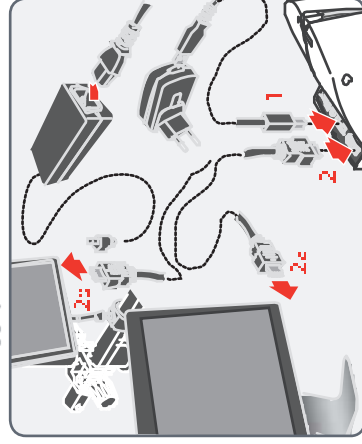
Checking Cables and Terminals

General Instructions

 The Leica DM5300 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 connector, as otherwise proper picture centering might be required.

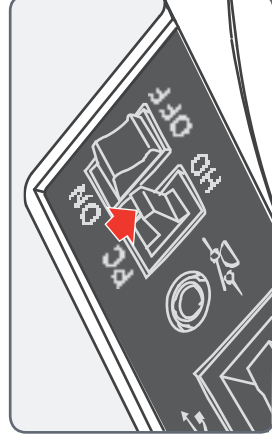
 Please only connect the provided 5V power supply unit. Using incorrect voltage can substantially damage the Leica DM5300.

Power supply and HD monitor



1. Check that the Leica DM5300 is properly supplied with power via the 5V power supply.
- 2a. Check whether the Leica DM5300 is connected to the HD monitor properly via the HDMI cable (1).
- 2b. Check whether the Leica DM5300 is connected to the HD monitor via the DVI cable (2b) and the monitor selected for power socket.

HD Mode (Standalone)



1. Check whether the mode selection is set to "HD" (Standalone).

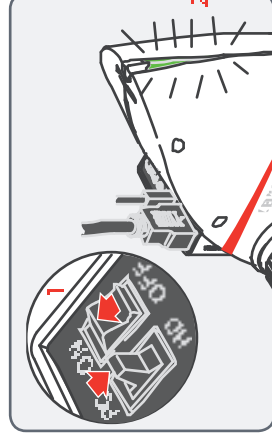
 An SD card with sufficient free memory must be inserted into the Leica DM5300 in order to be able to save images in HD mode (Standalone).



Switching on the Leica DMS300

Switching on the Leica DMS300 (standard net)

- 1. Ensure the lid is closed and the lid is locked.
- 2. Press the power button on the front of the device to switch it on.



1. Set the on/off switch to "ON" to switch on the Leica DMS300.
2. The status LEDs will start to flash, indicating the device is powered on. The green LED indicates the device is ready for use. The red LED indicates the device is not ready for use.



Information about SD Memory Cards

General instructions

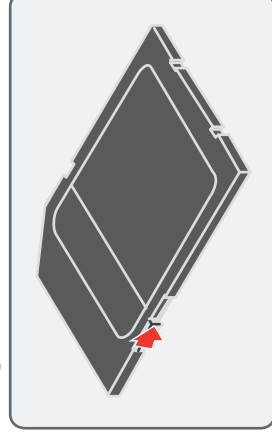
 Because you will need time to carry out instructions about formatting and redefining the memory card provided, make sure to prevent the functions during reformatting.

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 DM5300. Most memory cards are factory-formatted with FAT so that they can be used immediately.

An SD card cannot be formatted in the Leica DM5300. 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.

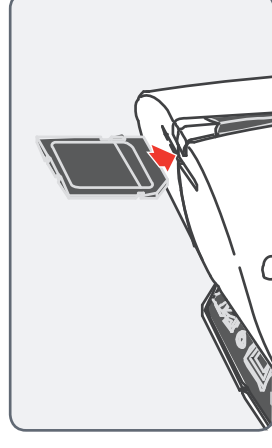
Write protection



 Some SD memory cards are equipped with a device for write protection. The device is pressed during formatting. Cards can be saved, read but not during formatting. Cards are protected from being deleted.

• Your camera save any new images to the SD card, checks to make certain that the write protection is set.

Orientation



 Make sure that the memory card is oriented correctly before inserting it into the Leica DM5300. Accidentally inserting the card the wrong way around could damage the camera.

Capacity

Class 7 and 6 SD cards can be used with the Leica DM5300. SDHC (high capacity) cards up to 32 GB are also supported.



Capturing Images without a Computer

General Instructions

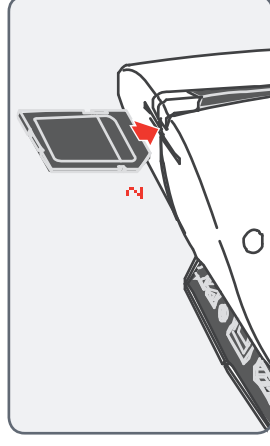
⚠ Before capturing the image, ensure that enough memory is available on the SD card and that the selected images have not been deleted. The SD memory card's full capacity is indicated. The Leica DMS300's status grill displays red and you can not acquire more images.

i In order to avoid disturbing the functions, do not connect the Leica DMS300 to a computer with a USB cable while it is in use.

i The highest resolution is 5 megapixels (approx. 1.3 megabyte) storage space on the SD card. This means that the generated image takes up over 700 images.

Recording

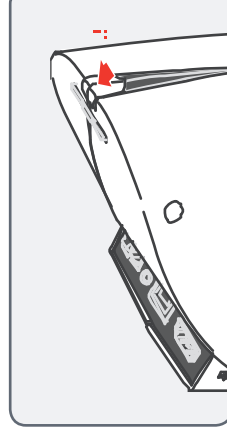
1. Touch on the status grill.



2. Push the SD memory card into the slot on top of the Leica DMS300 until it clicks into place.

The Leica DMS300's status light is illuminated in green. The microscope is now ready to save images to the SD memory card.

i Depending on the configuration, the status button can be used for capturing an image for additional information, refer to page 3.



3. Briefly press the Leica DMS300's front button to capture the image.

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

4. In order to remove the SD card from the camera, press on the SD memory card in the memory slot and the button.

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



Displaying Images and Videos without a Computer



The Leica DMS300 can display images and videos directly on the LCD monitor.

Control via remote control:

1. : Switching on the LCD viewer.
2. : Select the image (image 007.0109) or video (MP4).
3. Turn on the image
 - : Display the image on the screen (loaded in 1/4, 2x, 3x, 4x magnification, depending on the image).
 - : Next image or video.
3. Turn on the video (if):
 - : Play video.
 - : Stop the video.
 - : Turn off the video.

4. In order to return to the live image, press the , , or button – if you are the owner of the image, you may need to do this more than once.

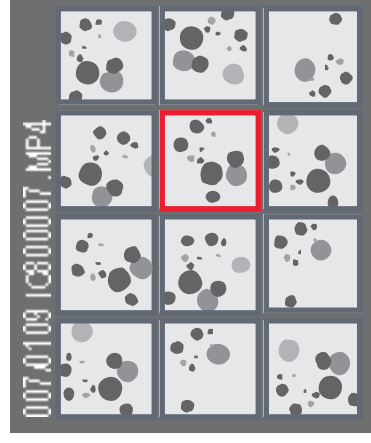
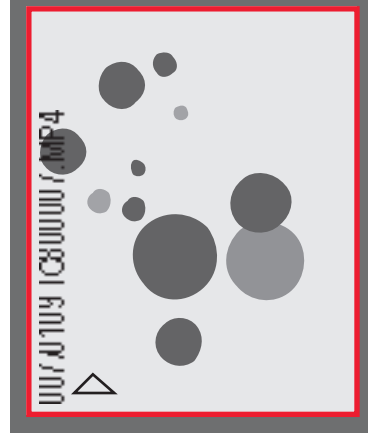


Image View



Video on the screen



White Balance

General Instructions

 The white balance is set by the message when a warning in the LCD is shown. We recommend trying out a new white balance adjustment whenever you change the illumination type or camera temperature. This is particularly necessary if you are working in the open air. The camera is set to the factory default, which is 5600K, but you can adjust it to suit your needs.

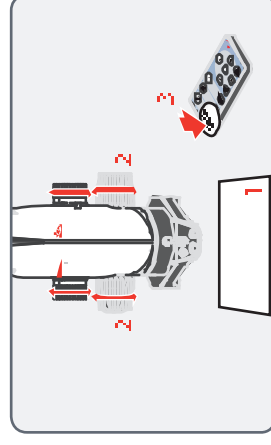
 Configure the white balance via the user menu using the remote control. Depending on the configuration, automatic white balance is set by default using the 'auto' button on the back of the camera.

 The white balance of the microscope is factory set to 5600K. You can manually adjust it when needed. To adjust the white balance, go to the menu.

Manual white balance

- Manual white balance is described on page 58.

Automatic white balance



1. Position a grey object or a grey, neutral object under the microscope so that the entire image field is filled in.
2. Adjust the illumination as desired.
3. Press the (ON) button on the remote control or - if configured accordingly - press and hold the 'auto' button on the back of the camera. The microscope now carries out an automatic white balance adjustment.



PC Mode

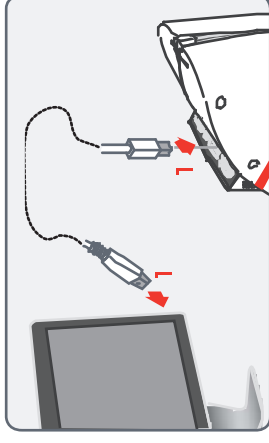
Checking Cables, Terminals and Software

Software

 Leica AutoStation Suite 2 tries to be installed on the computer in order to use the Leica DMS300 in PC mode. The computer also has to have sufficient free hard drive space.

 You need to perform the following steps to check the Leica AutoStation Suite 2.0S Core and control software. You also need to install the Leica DMS300.

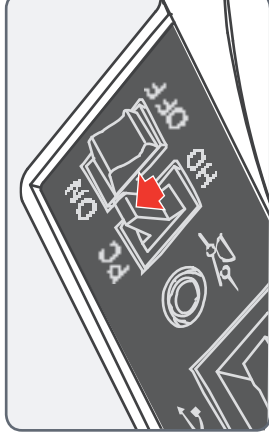
Leica DMS300 and computer connection



1. Check whether the Leica DMS300 and the computer have been connected properly via the USB cable provided.

 The Leica DMS300 is powered by the computer over the USB cable.

PC Mode

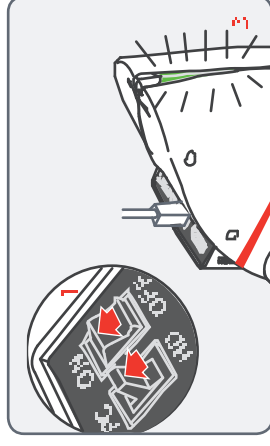


1. Check whether the modeswitch is set to PC. The modeswitch is located on the side of the device. For more information, see page 27.

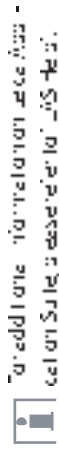
 The Leica DMS300 is controlled entirely via the computer in PC mode. The unit controls the remote control and the data collection. Status information can be viewed at any time directly by using the remote control.

Switching on the Leica DMS300

Switching on the Leica UMIS300 (PC mode)



1. Set the on/off switch to "ON" to switch on the Leica DM5300.
2. Slide the Auto calibration Z.
3. The status lights LED switches turned to green, the signal sounds and the voltage is displayed on the controller – the Leica DM5300 is ready to use.
4. To turn the calculations of the software for editing and recording when triggered.



Additional information is available at www.southcoastnsd.net.



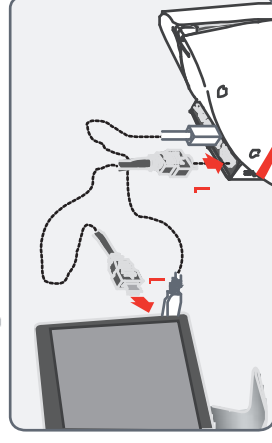
Additional Use of a HD Monitor in PC Mode

General Instructions

 In PC mode, the microscope image is displayed on the screen of the connected HD monitor. In addition, an external HD monitor can be connected via the HDMI interface.

 The resolution of the connected HD monitor is limited by the image resolution of the VIS Z software. Due to technical reasons, it is not possible to display a 21" HD monitor on the connected HD monitor. In order to do this, you have to select the 16:9 VIS300 to HD mode (slide and see page 61).

Connecting the HD monitor



1. Connect the Leica UM5300 to the HD monitor using the HDMI cable.



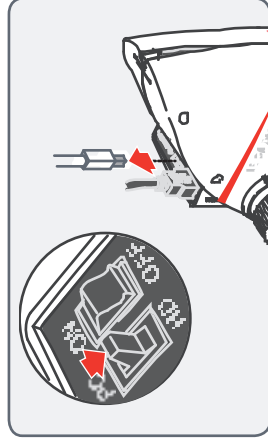
User Menu



Calling up the User Menu

General Instructions

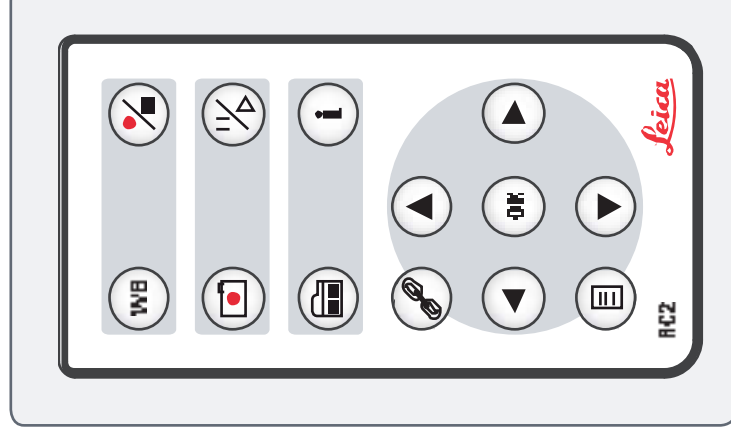
 The Leica DM5300 is controlled entirely via the controller. In PC mode the front button, the remote control and the touch screen do not work. The menu on the camera screen is displayed on the HD monitor. Status information can be retrieved via the display left by pressing  on the remote control.



Check to ensure that the Leica DM5300 is in HD mode and that the video signal cable is connected to the monitor.

Calling up and closing the user menu

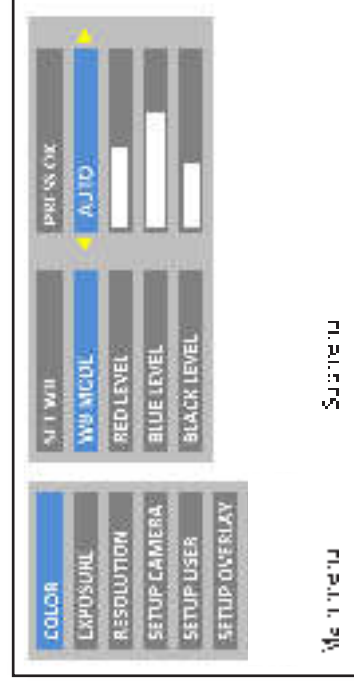
1. Press the remote control towards the Leica DM5300.
2. Press the  button to show the user menu on the HD monitor.
3. Press the   buttons to select a menu item.
4. Press the  button to confirm a menu item.
5. Press the  button again to hide the user menu.



See more on this topic in our online videos at www.leica-microsystems.com.



Automatic White Balance



Activating automatic white balance

1. Press the **[F]** button on the remote control.
2. Go to the **COOL** entry.
3. Set the value to **W3 MODE** (or **AUTO**).
4. Press the **[F]** button to save the menu.



The video for **COOL** menu adjustment and **W3 MODE** menu adjustment is available on the **W3 MODE** setting page.

The **COOL** function makes it possible to adjust the camera's color balance to different light conditions. The video can be viewed.

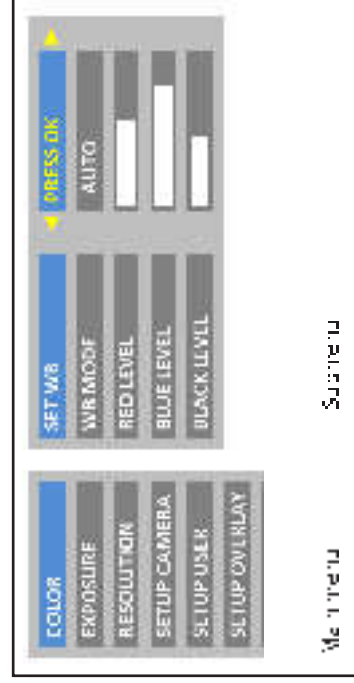
Whenever possible, use the built-in grayscale calibration chart to achieve accurate color reproduction.

For transmitted light specimens, configure the white balance to the built-in standard grayscale calibration chart as recommended.

See more on this topic in our online videos at www.leica-microsystems.com.



MANUAL WHITE BALANCE



i The 'CO.DOT' function takes 1 pass to balance the camera and 10 to the current grid so that color-neutral targets can be acquired.

i Whenever pass 2 is required, the neutral grey chart is also required.

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 **(WB)** on the remote control. The white balance is stored and saved to the camera.

3. Remove the gray chart and place the camera on the desired target.

1. Press the button **(WB)** on the remote control.

2. Go to the 'CO.DOT' entry.

3. Select the 'SET WB' menu item.

4. Press the button **(WB)**.

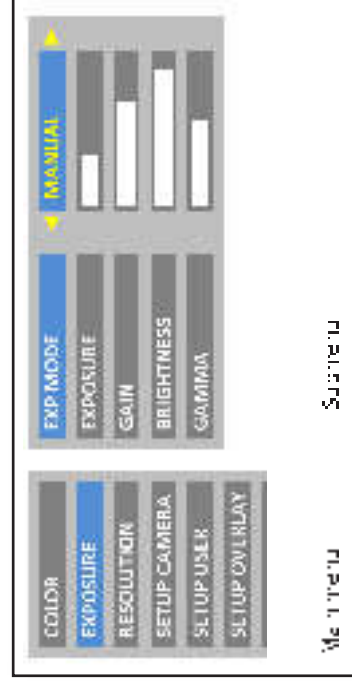
i You do not need the grey chart if the target is the same as the one used for the first pass. You can use the same grey chart for the first pass and the second pass. The target does not need to be grey.

i The white balance mode is displayed in 'MAIN' after the white balance adjustment is completed. Press the 'AUTO' button.

See more on this topic in our online videos at www.leica-microsystems.com.

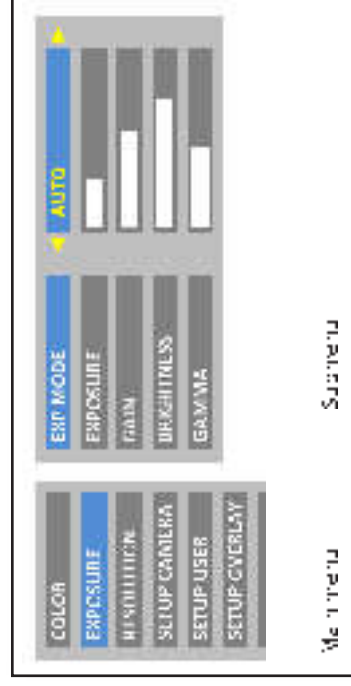


Exposure



Manual exposure

1. Press the button **B** on the remote control.
2. Go to the 'EXPOSURE' entry.
3. Set the value of 'EXPOSURE' to 'MANUAL' for manual exposure.
4. Correct the values of 'EXPOSURE', 'GAIN' and 'GAMMA' until you obtain the desired results on the image.



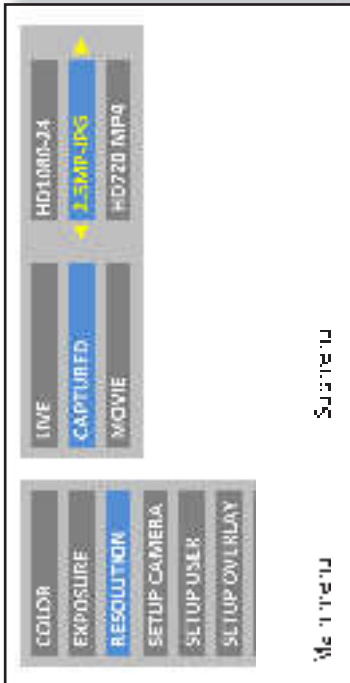
Automatic exposure

1. Press the button **B** on the remote control.
2. Go to the 'EXPOSURE' entry.
3. Set the value of 'EXPOSURE' to 'AUTO' for automatic exposure.
4. Correct the values of 'BRIGHTNESS' and 'GAMMA' until you obtain the desired results on the image.

See more on this topic in our online videos at our website www.lekacamera.com.



Resolution



The "RESOLUTION" menu lets you define the resolution individually for the live, captured, and movie images and settings. The "RESOLUTION" menu is divided into three sections: "Resolution", "Frame Rate", and "Frame Size".

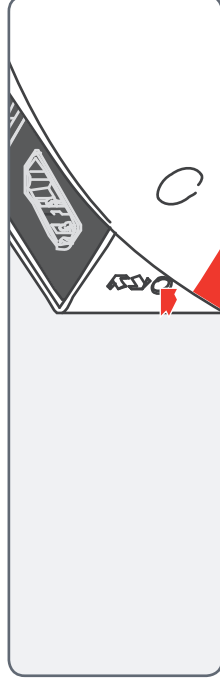
Resolution of the live image {LIVE}
Defines the resolution of the live image. The following resolutions are available:

- HD720-50 and HD720-60: 1280x720 pixels at 50 Hz or 60 Hz frame rate
- HD1080-24 and HD1080-30: 1920x1080 pixels at 24 Hz or 30 Hz frame rate
- HD1080-50 and HD1080-60: 1920x1080 pixels at 50 Hz or 60 Hz frame rate

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

Resolution (continued)

The resolution cannot be displayed on the LCD monitor. To check, you can change the resolution by the menu.



When the resolution is set, the screen will display the resolution.

- Pressing the reset button for the first time displays the current live resolution on the LCD monitor.
- Pressing the second time switches to the next live resolution and displays the resolution.
- Pressing the third time the resolution is displayed. The camera can activate 6 different resolutions in sequence.

 Address the live resolution when activating the recommended default resolution HD1080-50.

Resolution of the captured image (CAPTURED)
Defines the resolution of the captured image saved directly to the SD card.
The following resolution is available:

- 1.1 MP: 1280x960 pixels
- 2.5 MP: 1920x1080 pixels

Resolution of videos (MOVIE)
Defines the resolution of video captures saved directly to the SD card. The following resolution is available:

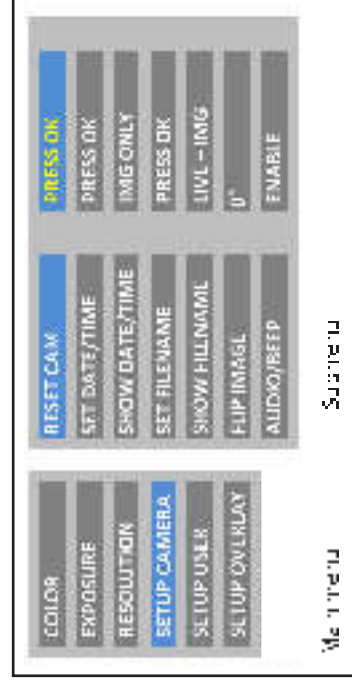
- HD720-MP: 1280x720 pixels
- HD1080-MP: 1920x1080 pixels

About 50 MB of data are produced per minute with HD720 and 100 MB with HD1080. It is only dependent on the content and compression method. 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.

See more on this topic in our online videos at our website www.leica-camera.com.



Camera Settings



i The **STATUS CAMERA** menu lets you configure various internal parameters, such as the date and time, the file name for images on the SD card, and the signal format you'd like to use. These are

Reset camera! RESET CAM!!

Tells the tracee to the delay dialling a destination
by a certain service and that it will send this function, you
cancel the tracee in the tracee and it will send you the
cancel the tracee in the tracee and it will send you the
cancel the tracee in the tracee and it will send you the

i Alternative method for solving these items: Use the last of each row for a cell, then work back to the first cell without the need for a calculator.

Set the date and time SET DATE/TIME

Display the date and time {SHOW DATE:TIME}

[illegible]

Set the filename/SETFILENAME

Let's you feely select the first four characters of the filename for both single and double word records. The numeric extension is added by sequential numbering, is added by either .25 or .10 value, register a value for double word records.

Camera Settings (continued)

UIS play the filename (SHOW FILENAME)

Depending on the setting, this does not display the filename at all, just displays the live view image, just the image captures or just the live view and image captures. The filename is also shown or written into the top right corner of the image.



If you save the filename or the date and time in to images, they cannot be deleted later, even if you rename the files or change the date.

Rotate image (FLIP IMAGE)

Toggles the image by 180°.

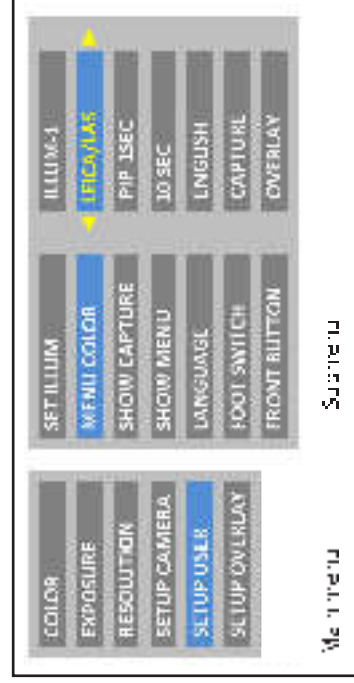
Signal tone (AUDIO: BEEP)

Depending on the setting, you can have a one signal tone sound after each image is taken. This can be helpful when working in the field when you want to capture images without taking your eyes off the microscope.

See more on this topic in our online videos at www.leica-microsystems.com.



User-Defined Settings



i The **SETUP** menu helps you change or select the following 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 of the standard grid or one of the "grill" (to save the current camera settings or recording acquisition data and relieve the memory).

Press **◀▶** to select illumination mode 1, 2 or 3. Press **⏻** to save the current camera settings and the displayed illumination mode.

i In order to select a pre-defined or newly defined illumination mode quickly, hold the **⏻** button, press the **◀▶** or **⏻** button.

Set menu color (**MENU COLOR**). Currently, two color schemes are available for the menu guide. 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 a screen or capture bubble (pop) on the monitor after capturing an image. You can also select whether the created capture is to be displayed on a second, third or fourth screen.

Display the menu (SHOW MENU)

Defines how long the menu is displayed on the screen. You can stop the menu from being displayed by the bypassing the menu button or by selecting menu entry.

Set the language (LANGUAGE)

Lets you set the language for menu guidance. Select the fifth entry in the menu. You have just entered it selected as the language that was originally used until the menu display has been turned on. The menu entry for selecting the language is keypad-coded with 5/0/0/0/0.

Configure the footswitch (FOOT SWITCH)

Lets the footswitch be configured with another function. By default, pressing the footswitch triggers "regression" function. However, you can choose this should be done while the screen is in the "record" video or display the calibration instead.

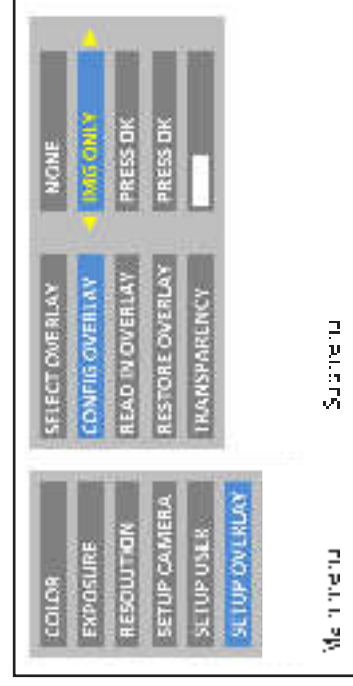
Configure the front button (FRONT BUTTON)

Lets you configure another function for the front button. By default, pressing the front button triggers "regression" function. However, you can choose this should be done while the screen is in the "record" video or display the calibration instead.

See more on this topic in our online videos at our website www.electrodata.com.



Setting the overlay (SETUP OVERLAY)



 The Leica DMS300 lets you superimpose predefined or user-specific images in the view field and captured images. These superimposed images are overlaid on the displaying calibration data. The Leica DMS300 also has a coordinate overlay. Up to 10 overlays can be defined, of which the first overlay (01) is reserved for displaying a size display in the calibration corner. Overlays 02 through 10 can contain either predefined or user-specific content and let you configure your microscope for specific tasks.

[illegible]

As you approach the station, the train will stop at the platform.  The train will stop at the platform for a short time.  The train will stop at the platform for a short time.  The train will stop at the platform for a short time.

Configure an overlay (CONFIGOVERLAY)

Deciding on the sell-off, it does not state, is one of a company's top priority. The company must first determine the value of the assets and the value of the company as a whole. It must also determine the value of the assets and the value of the company as a whole. It must also determine the value of the assets and the value of the company as a whole.

```
|import an overlay {READ IN OVERLAY}
```

In ports user-specific overlays from the SD card from the "Overlay" directory. The overlays need have both the appropriate resolution and specifically defined filename. Various overlays are available for download on the www.mcsystems.com/keene/overlay.htm or you can create your own overlays to add those not available here, over, etc.



Setting the Overlay (continued)

```
Restore an overlay {RESTORE OVERLAY}  
The overlay's opacity is 1.0 by default. To make the overlay  
transparent, use the opacity property. The opacity property  
is a number between 0 and 1.0. A value of 0.5 makes the  
overlay 50% transparent.  
  
Set transparency {TRANSPARENCY}  
The overlay's edges are rounded. The radius of the rounded  
edges is 10 pixels by default. To make the edges sharper,  
use the radius property. The radius property is a number  
between 0 and 10. A value of 0 makes the edges sharp.
```



The `radius` property does not change the transparency of the overlay.

See more on this topic in our online videos at
www.luxon.com/developers/overlay.



Configuring Predefined Illumination Scenarios

Changing the Illumination mode

The Leica DMS300 is supplied with various illumination modes that cover a wide selection of basic test applications.



To return to the selected mode press the **LAST USED** setting.

1. Press **◀▶** on the remote control to display the current illumination mode on the HD monitor.

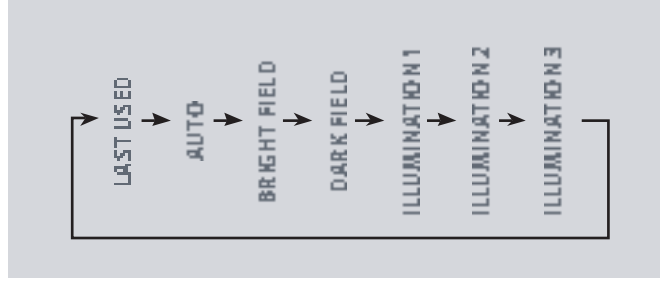
2. Press **◀▶** again to switch to the next illumination mode. The microscope then displays the illumination mode and sets the stored parameters.

3. The LED displayed illumination mode disappears from the monitor. This means the illumination mode's next active

illumination mode is selected. If you do not press **◀▶** for 5 seconds, the selected illumination mode is used.



Sequence



Service





Care, Maintenance, Contact Persons

General

We hope you enjoy using your ingersoll-
rande excavator. We excavators are
renowned for their vastness and long service
life. Observing the following care and main-
tenance instructions will ensure that even after years and
decades, your excavator will make
work as well as it did on the very first day.

Warranty benefits

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

Contact address

Your distributor will arrange your service.
Contact your local ingersoll-
rande. You can find information on worldwide
service representatives on the www.ingersollrande.com.



Care, Maintenance, Contact Persons (continued)

Care	Protection from dirt
• Keep the contact components clean and free of dirt. Do not use any abrasive materials or cleaning agents that could damage the contact surfaces.	• Protect your microscope from moisture, dust and dirt. Do not use the microscope in a dusty or dirty environment.
• Do not use the microscope in a dusty or dirty environment. Do not use the microscope in a humid environment.	• Do not use the microscope in a humid environment. Do not use the microscope in a corrosive environment.
• Do not use the microscope in a corrosive environment. Do not use the microscope in a high temperature environment.	• Do not use the microscope in a high temperature environment. Do not use the microscope in a low temperature environment.
• Do not use the microscope in a low temperature environment. Do not use the microscope in a high pressure environment.	• Do not use the microscope in a high pressure environment. Do not use the microscope in a low pressure environment.
• Do not use the microscope in a high pressure environment. Do not use the microscope in a low pressure environment.	• Do not use the microscope in a low pressure environment. Do not use the microscope in a high pressure environment.



Care, Maintenance, Contact Persons (continued)

Cleaning polymer components	Permitted measures	Servicing
Some components are made of polymers and are polymer-coated. They are therefore resistant and cannot be handled with the usual cleaning agents and techniques can damage polymers.	• Clean the microscope for parts of 11 using warm soapy water. Then use distilled water. • To disassemble, you can use acetone to dissolve a contact. When doing so, do not use contact cleaning solutions. • Remove dust with the pneumatic suction and the aspirator. • Clean the objectives with special oil cleaning cotton and acetone.	• Tests may only be carried out by a service technician. Microscopes and service technicians must only use service Microscopes and parts may be used. Danger of electric shock  Tests of electric shock: Removing the cover of the Zeiss DMS300 causes electric voltage which, if touched, can cause potentially fatal injuries. Never perform service carried out by a service Microscopes author and dealer.





Spare parts



Item	Leica article number	Designation
1	19 000 872	HDMI cable (2 m)
2	19 000 871	USB cable (1.8 m)
3	13 302 708 9/ 6 915	5W USB adapter with interchangeable connector
4	19 000 658	25W power supply for Leica ring light J11111111
5	19 000 873	12.2 mm cable
6	19 000 870	SD card / G31
7	12 730 229	Toolbox for



Specifications



Technical Data

Live Image (Full HD): Objective

Optical data	Leica DMS1000
Max. resolution	1/2 µm
Max. field	32 mm
Max. field	18 mm
Max. depth	3.5 mm
Working distance	117 mm
Max.22°-rotation	15° – 119°

Live Image (Full HD): Achromatic objective

Optical data	Leica DMS3000g highest zoom position	Leica DMS3000g lowest zoom position
Resolution	1/2 µm	2 µm
Field	106 mm	32.7 mm
Field	2.28 mm	18.25 mm
Depth	0.178 mm	3.78 mm
Max.22°-rotation	119.2°	15.1°

4 With 10° rotation



Objective

Optics carrier	
Designing meeting	Multi-eyepiece binocular system with beam splitter and the objective selected
Coating	Fully coated zoom
Specific surface resistivity (max. 191)	2x10 ¹⁰ Ω/m ² Changeable: 0.2 seconds from 1000V to 100V
Engaged zoom values	Engage: 0.1 seconds for release
Slender objective	Maximal objective 0.8x

Technical Data (continued)

Leica UMIS300 - digital camera

Optics camera	
Active image resolution	HD ready: 1280x720 - 50 Hz/60 Hz - 30 fps Full HD: 1920x1080 - 50 Hz/60 Hz/25 Hz/30 Hz - 30 fps HD 1600x1200 - 10 fps / 1024x768 - 24 fps
Image resolution (capture)	2.5 megapixels (1824x1368) 1.1 megapixels (1216x912)
Video resolution	HD1080 (1080x1920) HD720 (1280x720)
Pixel size	3.27 µm x 3.27 µm
Sensor grade	Active 12.3 CMOS
Sensor size	6.1 mm x 6.6 mm
Shutter time	0.5 msec - 500 msec
Gain	1x to 12x
Color depth	24 bits (16 bit)
Frame intervals	Frame: 255 Video: 1024

Accessories	
Supported operating systems	Windows XP/Windows 7, Mac OS X
Leica Software	Leica LMS & LMS Z software Leica Leica Acquisition Software
Computer system (recommended)	PC or Mac, min. Core 2 Duo, 4GB RAM / 512 MB 24-bit graphics 12.8 x 1024



Technical Data (continued)

Electronic interfaces

Accessories	
Connector	USB 2.0, standard, USB type 3
High-definition connector	HDMI 1.3, standard HDMI connection type A
On/Off switch	Five side
Power button	Five side
Reset button	Display or the current resolution, change to next resolution level, firmware upload
Temperature	TC2, fixed temperature control, with built-in battery type 12025
Temperature trigger (date: 12/2022/9)	Standard, built-in trigger, with 1.5 m cable
Standard (Secure Digital)	SD-HC compatible, 128 MB – 32 GB
Status LED	3 colors green – power on, yellow – standby, red – error
Power supply	Via USB cable to controller or to external 5 V USB power supply unit
Power requirement	5 W

Miscellaneous

Operating temperature range	+10°C to +30°C
Humidity	10–90%
Weight	1.3 kg
CE Declaration Conformity	Five side
Tested standards	EMC/ET: EN 55011 EN 61010-1 EMC/EN 61326-1

Optical data

Objective	Adm. 0.8x	
Working distance	114mm	
Field of view {zoom setting}	FOVx	FOVy
0.75	32/6	13.26
1.0	27/6	13.70
1.25	19/8	10.96
1.6	15.22	8.56
2.0	12.18	6.85
2.5	9.77	5/8
3.2	7.61	4.28
4.0	6.09	3/2
5.0	4.87	2.77
6.0	4.06	2.28

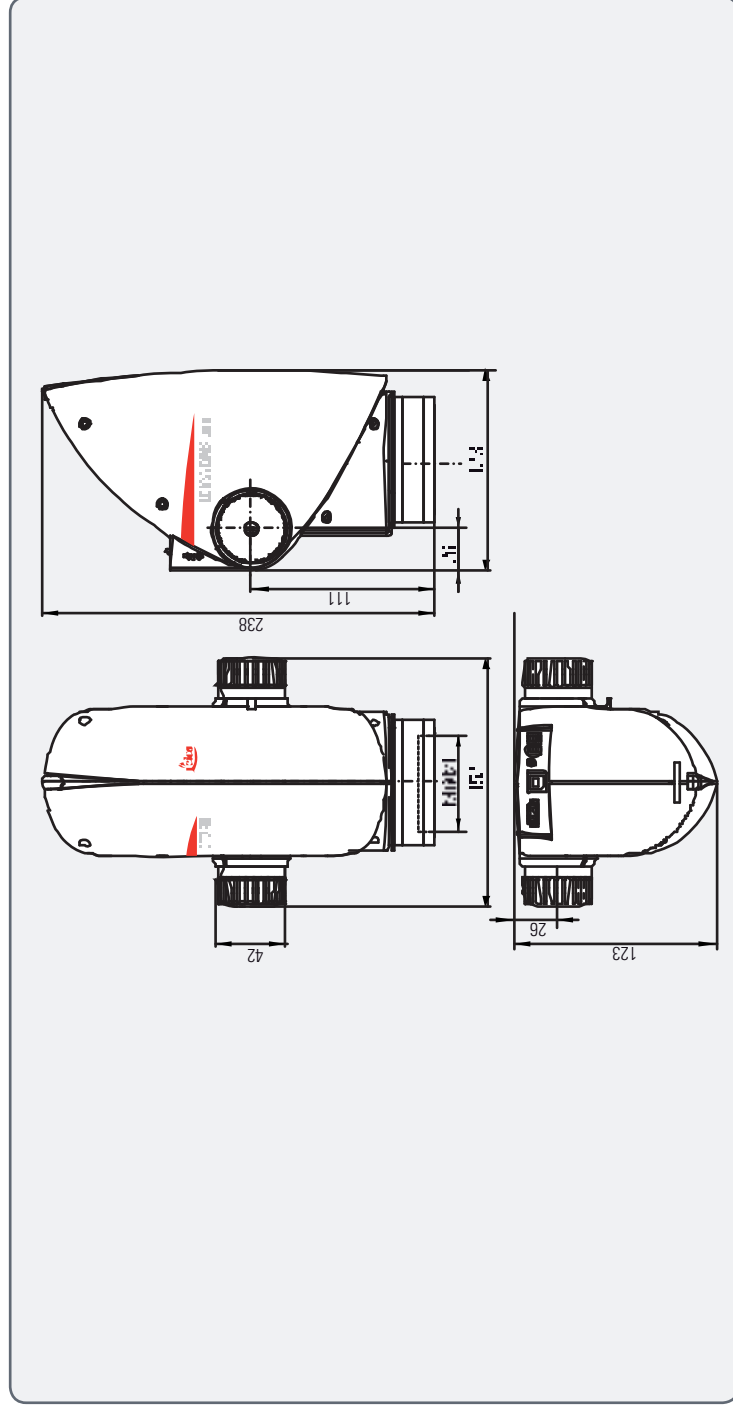
Objective		Adm. 0.5 $\times$	
Alamtor	Zoom setting	Total mag.	DOF
10 μ	0.6	6.0	0.4 μ
	1.0	3.7	2.70
	1.25	11.4	1.4 μ
	1.6	14.3	0.97
	2.0	16.2	0.82
	2.5	22.7	0.50
	3.2	29.7	0.36
	4.0	36.1	0.26
	5.0	43.4	0.22
	6.0	54.3	0.19
19 μ	0.6	13.0	0.4 μ
	1.0	17.2	2.70
	1.25	21.6	1.4 μ
	1.6	27.6	0.97
	2.0	29.5	0.82
	2.5	42.2	0.50
	3.2	55.2	0.36
	4.0	69.1	0.26
	5.0	86.7	0.22
	6.0	102.6	0.19

Objective		Adm. 0.3 $\times$	
Alamtor	Zoom setting	Total mag.	DOF
22 μ	0.6	13.0	0.4 μ
	1.0	20.0	2.70
	1.25	23.0	1.4 μ
	1.6	32.0	0.97
	2.0	40.0	0.82
	2.5	55.0	0.50
	3.2	64.0	0.36
	4.0	72.0	0.26
	5.0	92.0	0.22
	6.0	112.0	0.19
24 μ	0.6	10.4	0.4 μ
	1.0	27.6	2.70
	1.25	27.1	1.4 μ
	1.6	34.9	0.97
	2.0	41.0	0.82
	2.5	54.3	0.50
	3.2	62.6	0.36
	4.0	66.2	0.26
	5.0	102.0	0.22
	6.0	110.6	0.19



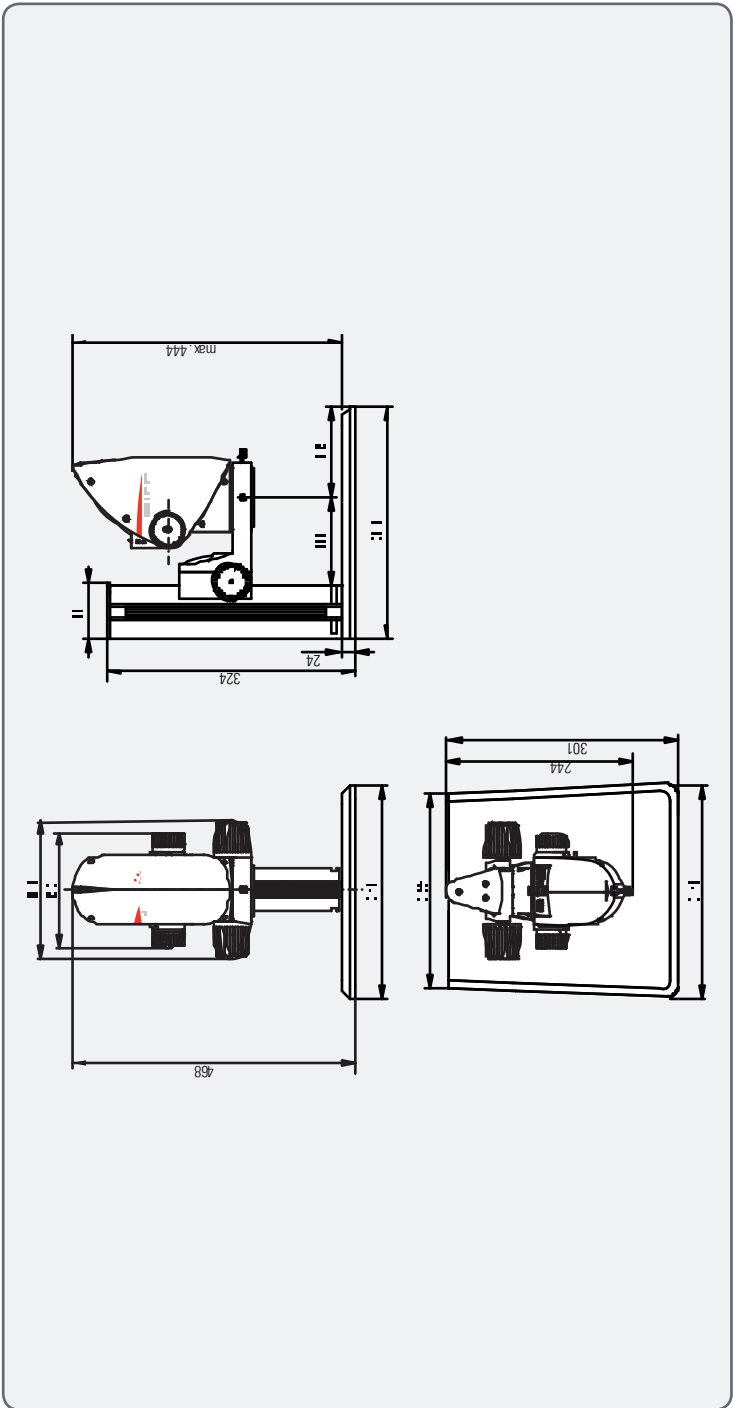
Dimensional Drawings

Leica DMS300

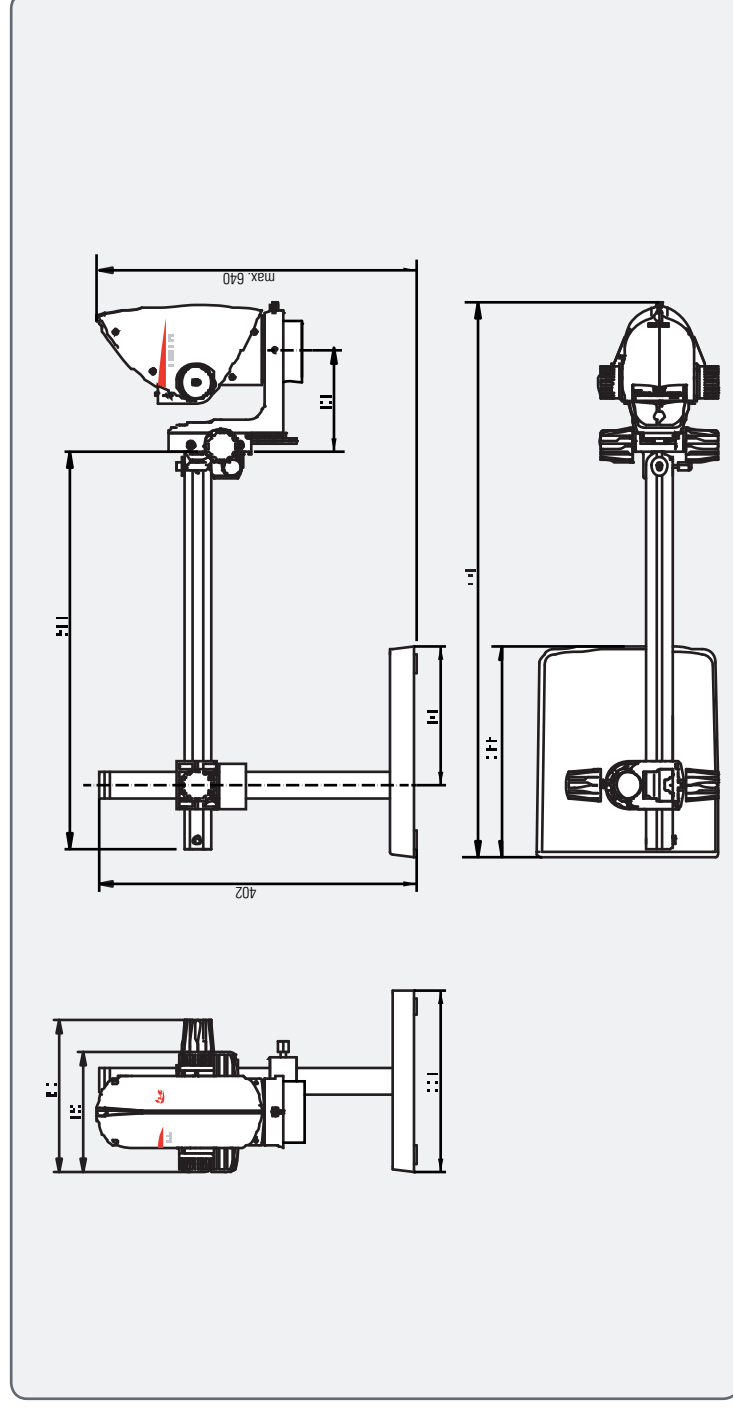




Leica DMS300 with Incident Light Stand



Leica DMS300 with Swing-arm Stand



The productive cooperative effort within the Leica for the Leica® has always been the basis for the innovative strength of Leica Microsystems. On this, we have developed our five corporate values:

• excellent high end quality, commitment, dedication to science, and continuous improvement. What makes these values truly **Leica** is the following:

LEICA FOR THE Leica

The Leica Microsystems industry division focuses on scientific equipment of the highest quality and result by providing the best and most innovative imaging systems for the needs to see, measure, and analyze microstructures. To do more are used in basic and research education also on one, in medical science and quality control, in forensic science, in engineering and education and also others.



Leica Microsystems is an international company with an extensive worldwide customer service network.

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France: Melun-Paris	44 800 208 2344	9082483 2
France: Marseille	33 8 000 664	3403233 23
Italy: Milan	39 0257486	02 574 0302
Japan: Tokyo	8 3542 2800	3542 2894
Canada: Courville/Quebec	800 248 0 23	847 405 0 44
Korea: Seoul	82 2 5 455 43	2 5 455 48
The Netherlands: Rijswijk	3 7014 32 00	7014 32 00
Spain: Madrid	43 466 80 50 0	466 80 50 30
Sweden: Solna	35 2 388 9 2	2 385 4688
Switzerland: Zurich	41 842 5 4543	842 5 45 0
Switzerland: Herten	4 7 734 34 34	7 734 34 44
Switzerland: Zug	65 479 78 23	479 78 28
United Kingdom	34 03404 05 30	03 404 05 32
USA: Fairfield/Groton/Lebanon	800 248 0 23	847 405 0 44
England: Farnham/Chichester/Haverham	452 2546499	25464 43
Switzerland: Zurich	41 2 687 6604	2 687 6608

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