



# Leica SmartTouch™ Manual

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# General Instructions

## Safety Concept

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



## Use in clean rooms

The Leica SmartTouch™ can be used in clean rooms without any problems.

## Cleaning

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

## Servicing

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

## Responsibilities of person in charge of instrument

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

## Safety Concept

The Leica SmartTouch™ is shipped with an interactive CD-ROM, where you can find all relevant user manuals. Keep it in a safe place, and readily accessible to the user. User manuals and updates are also available for you to download and print from our website: [www.leica-microsystems.com](http://www.leica-microsystems.com).

This user manual describes the special functions of the Leica SmartTouch™ and contains important instructions for its operational safety and maintenance.

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

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

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

# Symbols Used

## Warning of a danger



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

- Hazards to personnel
- Instrument malfunctions and damage
- Damage to or possibly destruction of the specimen

## Warning of hazardous electrical voltage



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

- Hazards to personnel.
- Instrument malfunctions and damage.

## 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 intend to provide clarity.

## Intended use

- Refer to the "Safety Concept" brochure.

## Non-intended use

- Refer to the "Safety Concept" brochure.

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

# Safety Instructions

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

## Installation location

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

## Requirements to be met by the operator:

- Refer to the "Safety Concept" brochure.

Ensure that:

- The Leica SmartTouch™ is operated, maintained and repaired only by authorized and trained personnel.
- All operators have read, understood and observe this user manual, and particularly the safety regulations.

## Repairs, service work

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

## Transport

- Use the original packaging for shipping or transporting the Leica SmartTouch™.
- 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.

## Safety regulations (continued)

### Disposal

- Refer to the "Safety Concept" brochure.

### Legal requirements

- Refer to the "Safety Concept" brochure.

### EC Declaration of Conformity

- Refer to the "Safety Concept" brochure.

### Health risks

Workplaces equipped with stereomicroscopes make it easier to examine extremely small structures, but they also impose high demands on the eyes and holding muscles of the user. Depending on the duration of uninterrupted work at such a workplace, impaired vision and problems with the musculoskeletal system may occur. 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 design and construction of Leica M stereomicroscopes are intended to reduce the exertion of the user to a minimum.



# Leica SmartTouch™

## Introduction

Congratulations on purchasing the digital "SmartTouch™" control panel by Leica Microsystems. It allows you to control, save and later restore practically every aspect of your Leica M series stereomicroscope.

The Leica SmartTouch™ makes a variety of tasks easier, combined with an easy-to-understand and well-organized user interface. Control the zoom, focus, and camera. Move the stage with the specimen, restore the test conditions at the touch of a button or change the filter for fluorescence images. All that and much more will be possible with the Leica SmartTouch™.

The following pages contain all the information you need for smooth operation. We strongly recommend that you study this documentation thoroughly so you can make full use of all the functions and options.

We wish you great joy and the best of success in your work!

*Leica Microsystems (Switzerland) Ltd.  
Industry Division  
Max-Schmidheiny-Strasse 201  
9435 Heerbrugg  
Switzerland*

# Installation

# Unpacking

## Unpacking

- Carefully remove the components out of the packaging.
- Check content for completeness.


## Package contents

- Leica SmartTouch™
- CAN-bus cable
- CD-ROM with manuals in PDF format.

# Assembly

## Required tools

- None

 The Leica SmartTouch™ is supplied with power via the focusing drive. No additional power supply is required.


## Assembly

1. Place the Leica SmartTouch™ on the left or right side of your microscope on a level, stable substrate.
2. Connect the CAN-bus cable provided to the Leica SmartTouch™.



3. Connect the other end of the CAN-bus cable to the focusing drive of your microscope.



 In order for the Leica SmartTouch™ to function properly, the CAN-bus cable must only be connected to the focusing drive.



# General Information

# An Overview of the Leica SmartTouch™



## Encoded and Unencoded Components



The Leica M series has various encoded and motorized components; this means that the current status of a component is automatically transmitted to the Leica SmartTouch™. These data are displayed on the control panel and included in various calculations. At the same time, it is possible to control motorized components remotely via the Leica SmartTouch™.

### Encoded components

For example, if you adjust the encoded iris diaphragm on a Leica M205 C using the dial, the size of the aperture is automatically transmitted to the Leica SmartTouch™. The transmitted value is then used to calculate and display the depth of field, for example.

For some instruments, such as the Leica M205 A, this also works the other way around: the iris diaphragm can be opened and closed by input on the Leica SmartTouch™.

### Unencoded components

Not all components of the M series are encoded. The objectives, spacer rings and eyepieces are among the unencoded elements.

To ensure that these unencoded elements are included in the various calculations correctly, a one-time configuration of these elements is required. For instructions, refer to [page 24](#).



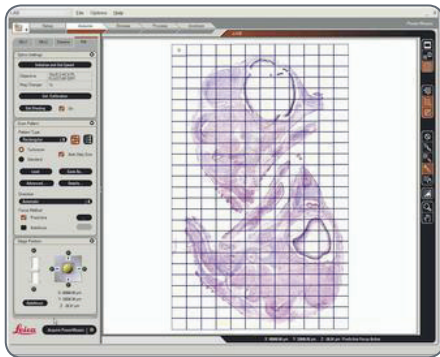
If an unencoded component is replaced with another component, this component must be detected correctly – otherwise, the Leica SmartTouch™ will show incorrect values on the display.



# Leica SmartTouch™ and Leica Application Suite (LAS)



The Leica SmartTouch™ can control the entire microscope configuration. In many cases, there are additional options when the Leica SmartTouch™ is used in conjunction with the Leica Application Suite (LAS) PC software.

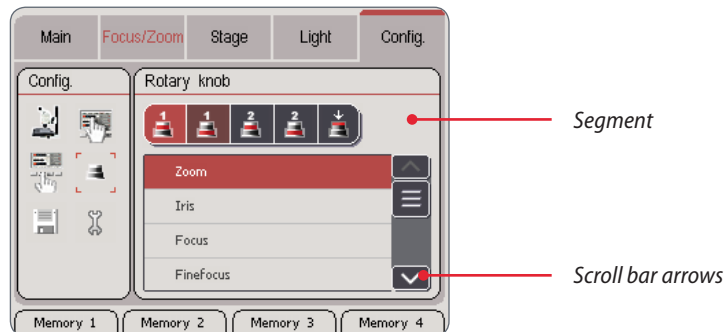
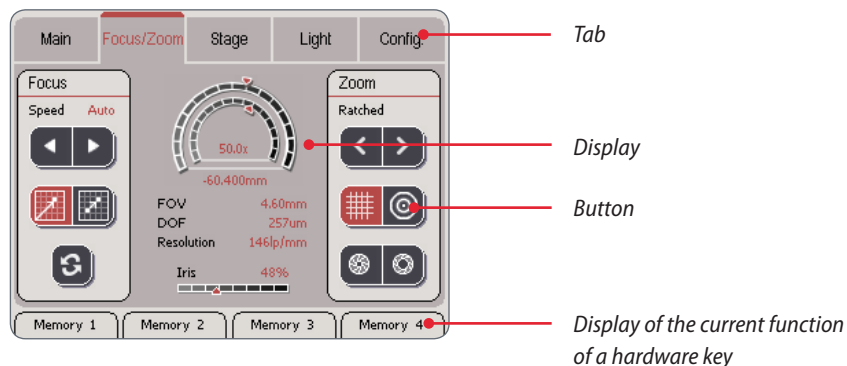


## Advanced options


By interacting with LAS, the Leica SmartTouch™ can supplement the PC-based control system in the following areas:

- Controlling the camera via Leica SmartTouch™.
- Synchronizing the settings (for example, hardware setups or key assignments) between the Leica SmartTouch™ and LAS.
- Displaying the stage position when using LAS PowerMosaic.


## Controls on the Touchscreen




### Display conventions


 The display on the display panel only shows the configuration that is actually present. For example, if the motorized mechanical stage is not connected, the corresponding settings are not displayed. The screenshots in this manual may thus differ from the display on your Leica SmartTouch™.

### Color coding conventions

 All fixed elements of the user interface (such as labels or titles) are displayed in a black font. All the values that can be modified (such as the zoom factor, status of the illuminator, etc.) are displayed in a red font.

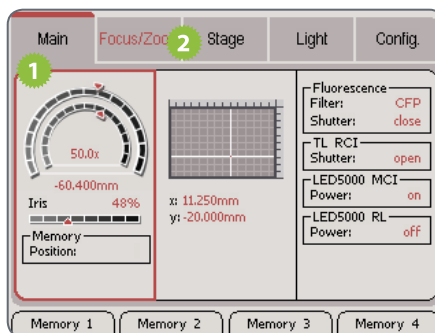
## Calling up the Main view

 The "Main" view allows you to see at a glance which components can be controlled via the Leica SmartTouch™. The current values and positions of connected instruments are also displayed. These include, for example, the aperture of the iris diaphragm, the position of the motorized mechanical stage, the currently used filters and more.

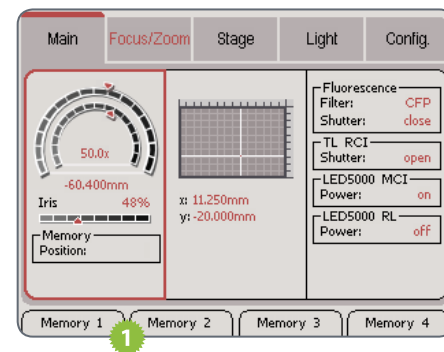
 In the Main view screen, settings cannot be modified. However, the stored configurations can still be called up (see [page 63](#)).

### Calling up the Main view

1. Touch the "Main" tab to display the current values.
2. Touch the "Focus/Zoom", "Stage" or "Light" tabs to modify the settings for the respective instruments.




## Calling up a stored configuration

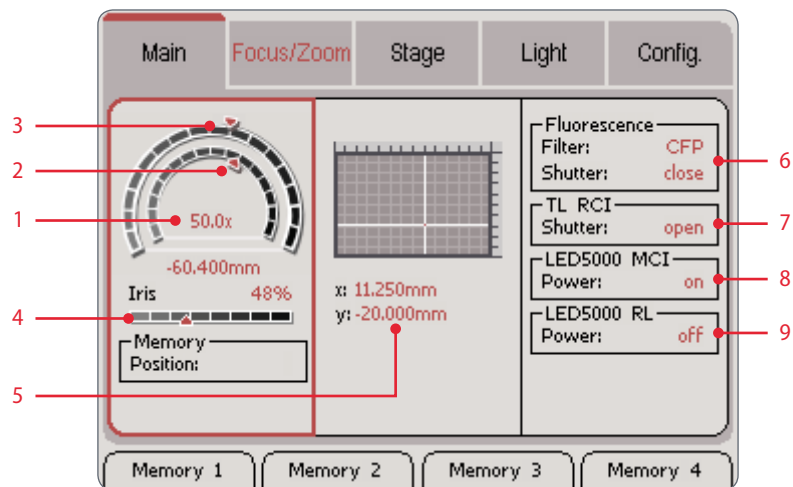


1. Touch the desired hardware key to call up a different configuration.

## The "Main" View


 Only instruments that are actually connected are displayed.

1. Total visual magnification
2. Position within possible magnification
3. Motorized focus position within positioning range
4. Aperture of the iris diaphragm in values between 20% (closed) and 100% (completely open)
5. Current position of motorized mechanical stage
6. Filter used and status of the shutter for fluorescence equipment configuration
7. Status of the shutter for the Leica "TL RCI" transmitted light base
8. Status of Leica "LED5000 MCI" illuminator
9. Status of Leica "LED5000 RL-80/48" illuminator



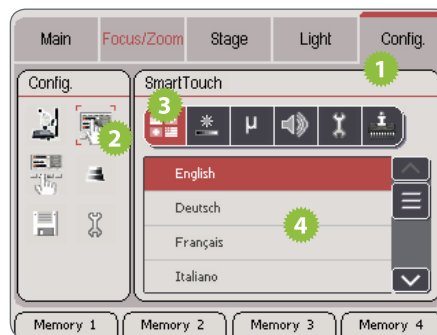
# Setup and Configuration

## Selecting the Desired Language


 The user interface of the Leica Smart-Touch™ is displayed in English by default. In addition, the following languages are available:

- German
- French
- Italian
- Spanish
- Chinese
- Japanese


### Changing the language




1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for language selection.
4. Touch the desired language.

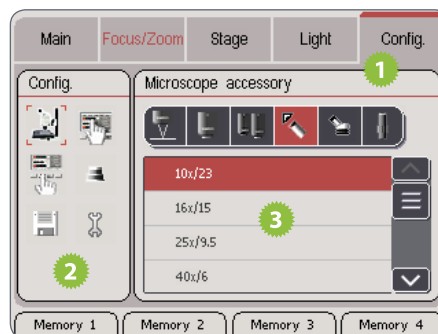
 The selected language is used immediately. Restarting the instrument is not required.

## The "Config." Tab

 The "Config." tab contains all the commands and settings so that the Leica SmartTouch™ can be better adapted to your needs and requirements. This includes settings you can adjust at your discretion, for example, switching the key tone on or off or adjusting the brightness of the display. Other settings, however, are indispensable, for example, detecting unencoded components (refer also to [page 16](#)).


 Any changes to the settings are carried out immediately and stored.


### Calling up the settings



1. Touch the "Config." tab.
2. Select the desired category in the "Config." field.
3. Configure the settings in the right field.

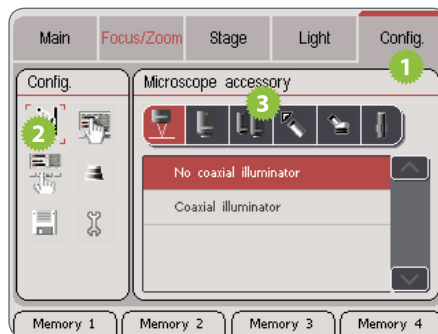
## Configuration of Unencoded Components

 Unencoded components (such as an objective) are not detected automatically by the Leica SmartTouch™. To ensure that these components are included in the various calculations (depth of field, zoom factor, etc.) correctly, they must be configured in the Leica SmartTouch™.

 These configurations must be carried out on the following occasions:

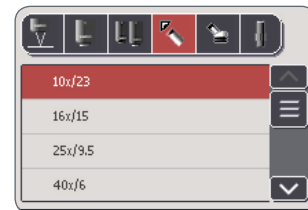
- Initial commissioning of the microscope.
- After an unencoded component has been replaced by a component with different properties.
- After the Leica SmartTouch™ has been reset to the factory defaults.


### Registering components



1. Touch the "Config." tab.
2. In the left area, touch the symbol for the microscope accessories.
3. Touch the symbol of the instrument component that you would like to detect.


4. In the list with the available components, touch the components you are using.
5. Repeat steps 3 and 4 for all components that you would like to use.



 Each change is stored immediately. Restarting the instrument is not required.

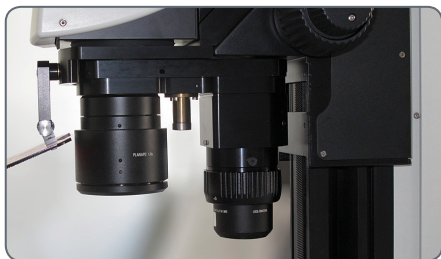


## Configuration of the Objective Nosepiece

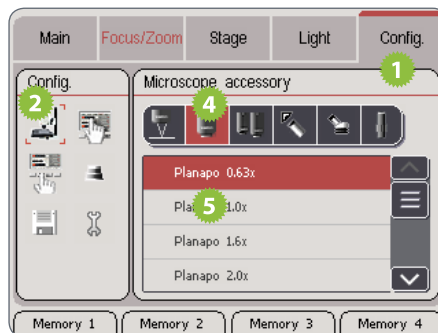
 The encoded objective nosepiece holds two objectives or FluoCombi™ so that they can be exchanged by simply turning them.

### Preparations

1. Install the encoded objective nosepiece and the two objectives on the optics carrier.



### Registering the first objective



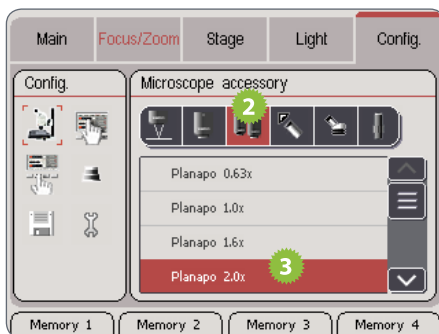
1. On the Leica SmartTouch™, touch the "Config." tab.
2. In the left area, touch the symbol for the microscope accessories.
3. Rotate the first objective so it is in the beam path of the microscope carrier.


4. Touch the symbol for detecting the first objective.
5. Touch the type of objective that is in the beam path.

*(Continued on next page)*

## Registering the objective nosepiece (cont'd)


### Detecting the second objective





 From this point forward, the Leica Smart-Touch™ knows which objective is in the beam path and can subsequently calculate the magnification, depth of field and other values correctly.

1. Rotate the second objective so it is in the beam path of the microscope carrier.
2. Touch the symbol for detecting the second objective.
3. Touch the type of objective that is in the beam path.

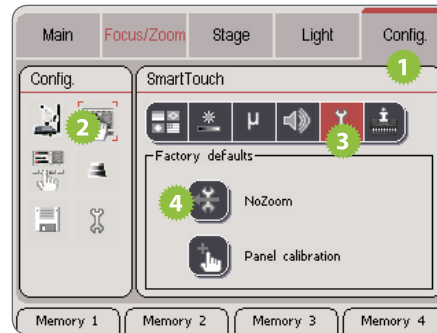
## Resetting to Factory Defaults

 When the Leica SmartTouch™ is reset to the factory defaults, all values are reset without exception. However, a stereomicroscope with fluorescence equipment configuration will have different factory defaults than a macroscope.

 The label of the button for the factory defaults depends on the connected microscope.


 When the button for factory defaults is touched, the Leica SmartTouch™ is reset immediately without further warning. This command cannot be undone.

### Resetting to Factory Defaults

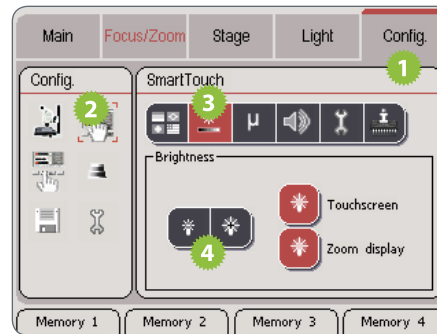


1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for the factory defaults.
4. Touch the button for resetting to the factory defaults.

## Adjusting the Brightness of the Display

 In critical applications (such as fluorescence microscopy), the backlighting of a display can produce unwanted ambient light. Therefore, it can be attenuated or even switched off entirely – both on the Leica SmartTouch™ itself and on the Leica M205 A and M205 FA stereomicroscopes.

### Adjusting the display brightness

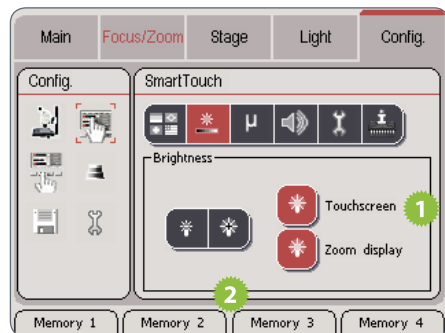


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1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for the display brightness.
4. Touch the symbols for the brightness multiple times to adjust the display illumination on the Leica SmartTouch™ and on the stereomicroscope.

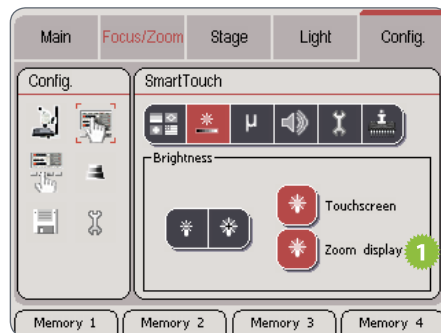
## Adjusting the Display Brightness (cont'd)

### Switching the backlighting of the Leica SmartTouch™ on and off




1. Touch the symbol next to the "Touchscreen" title to switch off the backlighting on the Leica SmartTouch™.
2. Touch any desired location on the touchscreen to switch the backlighting back on.

### Switching the microscope display on and off

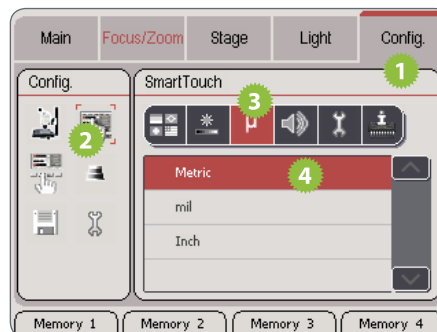


1. Touch the symbol next to the "Zoom display" title to switch off the backlighting of the microscope display.
2. Touch the symbol a second time to switch the backlighting back on.

## Changing the Units of Measure


 To specify distance, you can use the units of measure "Metric" (millimeter), "mil" (1/10 inch) and "Inch" (1 inch = 2.54 cm) on the Leica SmartTouch™.

### Selecting the unit of measure

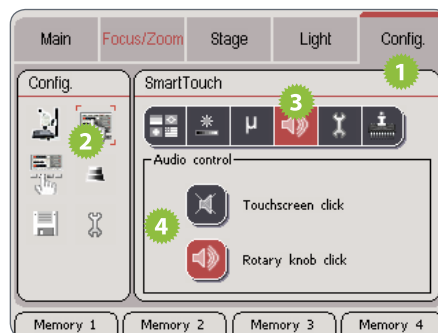


1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for the units of measure.
4. Touch the desired unit of measure.

## Switching the signal tone on and off


 The Leica SmartTouch™ confirms each touch of the display and each turn of the double rotary actuator with a signal tone. This signal tone can be switched off if necessary.

### Switching the signal tone on and off

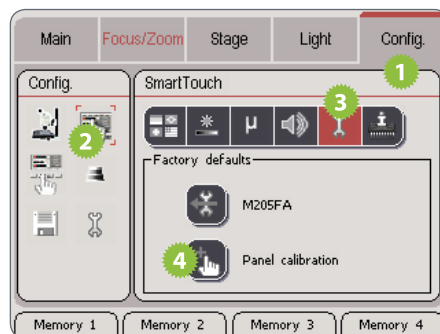


1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for the signal tones.
4. Touch the desired symbol to switch the signal tones off and on again.

## Calibrating the touchscreen

 The touchscreen of the Leica Smart-Touch™ must be calibrated whenever touching a button triggers the wrong function or none at all.

### Calibrating the touchscreen





1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for the hardware configuration.

4. Touch the "Panel calibration" button to start the calibration of the touchscreen.
5. Follow the instructions on the touchscreen.




## Calibrating the zoom

 Every Leica instrument and accessory is built and inspected according to the most stringent criteria. In most cases, the preinstalled configuration should meet your needs. However, if you want to use the Leica Smart-Touch™ to measure as accurately as possible, you can calibrate the zoom. This compensates for the already tiny manufacturing tolerances.

 For the calibration, the optional graticule 10 450 054 and a stage micrometer are required.

### Preparations

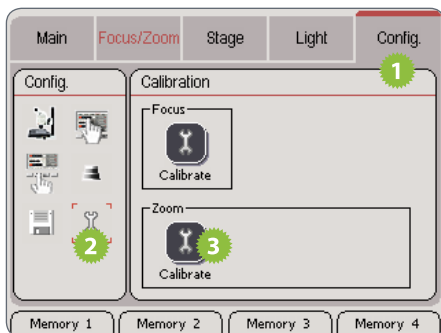
1. Insert the graticule into the eyepiece.
2. Place the stage micrometer under the microscope.
3. Adjust the instrument to the magnification you want to calibrate (for example 50×).

 The calibration improves accuracy over the entire zoom range. However, you will obtain the most accurate results at the magnification you have selected for the calibration.

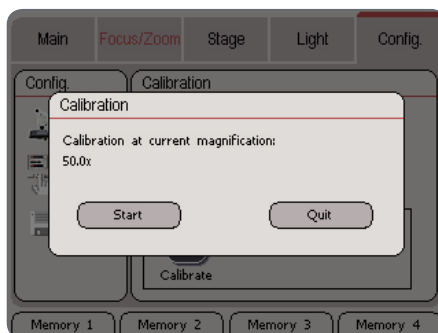
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## Calibrating the Zoom (cont'd)

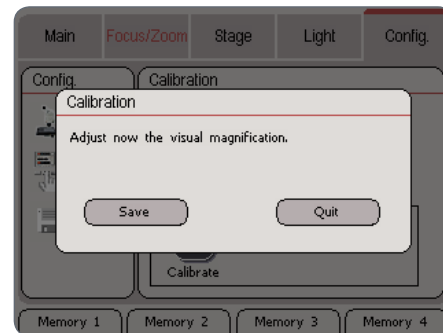
### Calibrating the zoom



1. Touch the "Config." tab.
2. Touch the button for the calibration.
3. Touch the "Calibrate" button.
4. Touch the "Start" button.
5. Look through the eyepieces and zoom using the rotary actuators until you have brought the graticule and stage micrometer into alignment.




6. Touch the "Save" button.

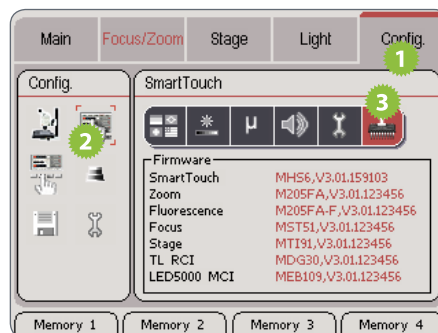


For example, if you want to calibrate the 50 x magnification and the stage micrometer is divided into units of 0.1 mm, you have to bring 5 mm into alignment.

## Checking the Firmware Version

 The Leica SmartTouch™ shows both its own firmware version as well as that of all connected motorized and encoded instruments.


### Checking the firmware



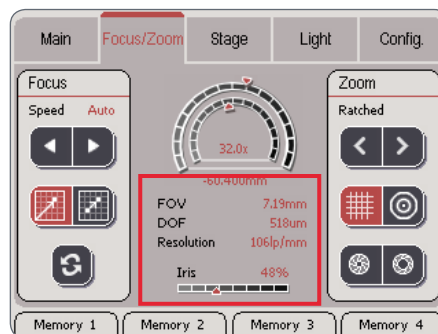
1. Touch the "Config." tab.
2. Touch the button for the SmartTouch™ settings.
3. Touch the button for displaying the firmware.

# The "Focus/Zoom" Tab

## Information about the Displays

 The changes to the zoom are shown in the middle area of the display.

### Meaning of the abbreviations



### FOV = Field Of View

The field of view shows the diameter of the cutout in the object field that is visible in the eyepiece.


### DOF = Depth Of Field

The depth of field refers to the vertical area displayed in sharp focus in the eyepiece.

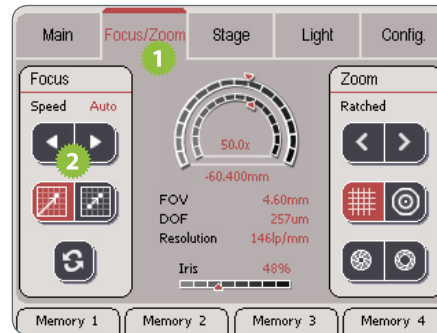
### Resolution

The resolution of the current setting is specified in "lp/mm" (line pairs per millimeter). This resolution varies with the optical magnification and the aperture of the iris diaphragm.

## Focus Settings

 The settings in the "Focus" area enable you to adapt the behavior of the motorized focus to your wishes and requirements.


### Changing the speed of focusing



1. Touch the "Focus/Zoom" tab.
2. Touch the "Speed" buttons to change the setting between "Slow", "Fast" and "Auto".

- The "Slow" setting changes the focus only slowly. It is particularly suitable if you usually work at a high magnification.
- The "Fast" setting changes the focus more quickly. It is suitable if you usually work at a low magnification.
- The "Auto" setting adapts the speed to the respective magnification. It is particularly suitable if you have to change magnification frequently. Note that: High magnification level = slow focus – Low magnification level = fast focus.

*(Continued on next page)*

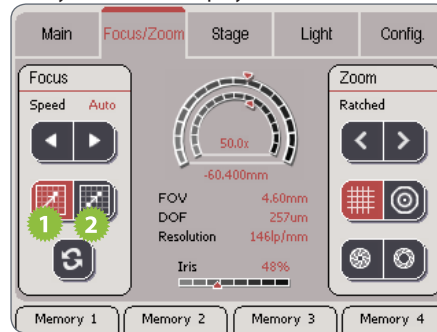
 Before the Leica SmartTouch™ can measure the distance between the current and top position, you have to calibrate the focus. For instructions, refer to [page 33](#).

## Focus Settings (cont'd.)

### Changing the reference coordinates

1. Touch the "Absolute reference point" symbol. The display shows the distance between the current position and the uppermost position that can be assumed by the motorized focus.

2. Touch the "Relative reference point" symbol. The display shows the distance



between the current position and the zero point defined by the user.

*(Continued on next page)*

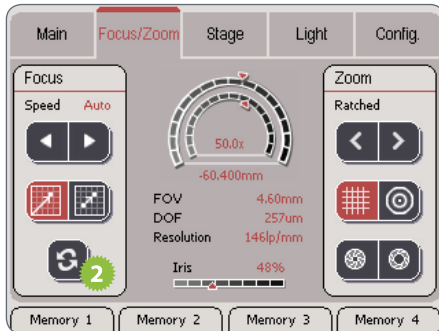
### Manually defining the zero point

To measure the distance between two motorized focus positions, proceed as follows:

1. Move the motorized focus into the position that is to be the zero point.

## Focus Settings (cont'd.)

2. Touch the button with the double arrow to define this position as the zero point.



3. Move the motorized focus into the new position. The display now shows the distance to the manually set zero point.

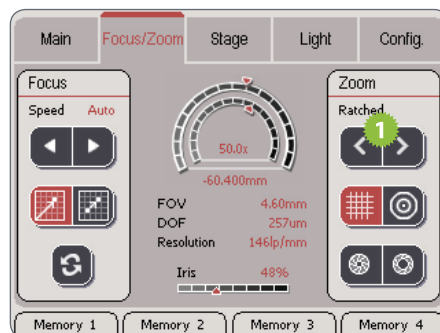


## Zoom Settings



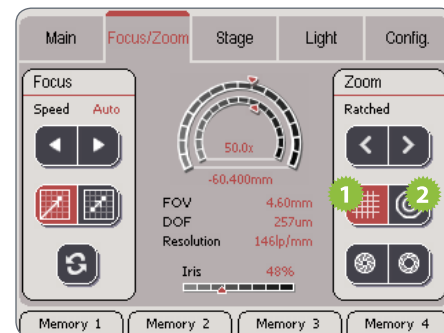
In the "Zoom" area, you can configure the settings for the ratchet stop, measurement and the iris diaphragm.

### Ratchet



1. The zoom position is controlled using the "Ratchet" buttons. This changes the zoom in predefined increments ("ratchet stops"). This behavior corresponds to the ratchet stops of manual microscopes.

### Switching between measurement and field of view




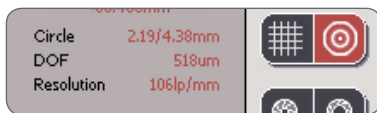
1. Touch the grid key to reach the display of the optical resolution.

*(Continued on next page)*

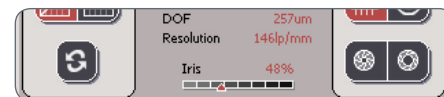
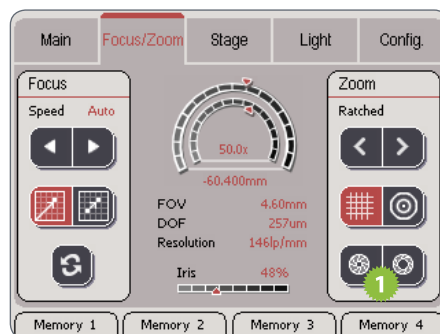
## Zoom Settings (cont'd.)

2. Touch the circle key to use the area covered by the optional graticule (Art. No. 10450054) for the measurement. Use this measuring method only if your microscope is equipped with this graticule in the eyepiece.

 The effects of the selected measuring method are shown directly in the display.




### Iris diaphragm control

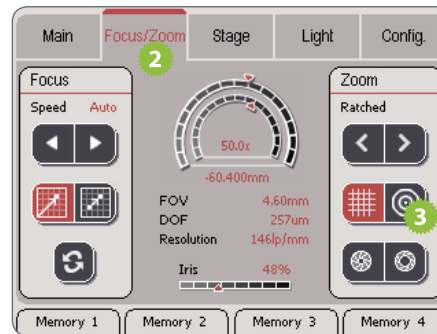


1. Use the iris diaphragm control keys to open and close the iris diaphragm. The effects on the depth of field are shown on the Leica SmartTouch™ under "DOF" (Depth Of Field).

## Measuring with the graticule

 Using the optional graticule (Art. No. 10450054), you can carry out simple measurements directly using the Leica SmartTouch™.


### Measuring with the graticule



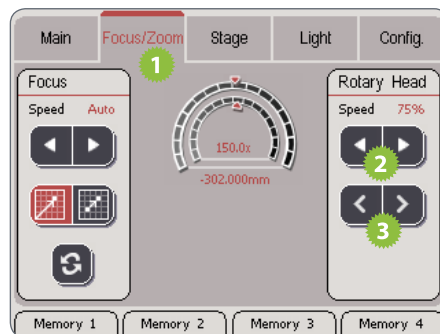
1. Insert the graticule into the eyepiece.
2. On the Leica SmartTouch™, touch the "Focus/Zoom" tab.
3. Touch the symbol for the circular graticule.

4. Zoom in on the specimen to be measured so that it fills in the small or large circle on the graticule as accurately as possible.
5. Read the measured value on the Leica SmartTouch™. The Leica SmartTouch™ shows you the measurement results of the larger (left) and the smaller circle simultaneously. The values correspond to the radii in the specimen plane.

## Moving the Rotary Head

 Using the Leica SmartTouch™, you can bring the rotary head on the Leica DVM5000 into the desired position.

### Moving the rotary head

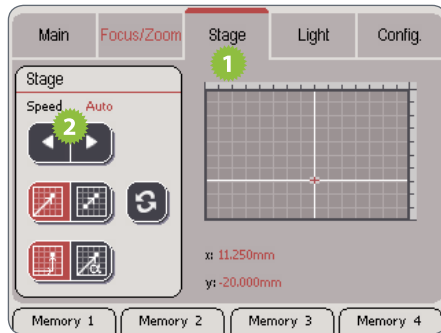


1. On the Leica SmartTouch™, touch the "Focus/Zoom" tab.
2. Touch the upper arrow buttons to define the speed of rotation.
3. Click the lower arrow keys to rotate the rotary head.

# The "Stage" Tab

# Modifying the travel path speed

## Modifying the Travel Path Speed



1. Touch the "Stage" tab to call up the settings for the motorized mechanical stage.


2. Touch the "Speed" buttons to change the setting between "Slow", "Fast" and "Auto".

- The "Slow" setting moves the stage only slowly. It is particularly suitable if you usually work at a high magnification.
- The "Fast" setting moves the stage more quickly. It is particularly suitable if you are working at a low magnification or want to move to a distant specimen quickly.
- The "Auto" setting adapts the speed to the respective magnification. It is particularly suitable if you change magnification frequently. Note that: High magnification level = slow movement – Low magnification level = fast movement.

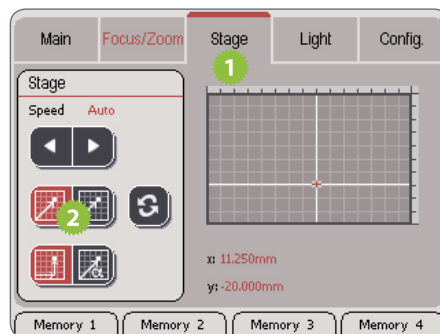


The stage surface can also be moved using the double rotary actuator.

## Changing the Reference Coordinates

 The coordinates of the motorized mechanical stage are based either on the bottom left corner of the stage or a zero point defined by the user.

### Changing the reference coordinates



1. Touch the "Stage" tab.
2. Touch the desired measurement method:
  - Absolute reference point (left symbol): Shows the distance between the bottom left corner and the current position.

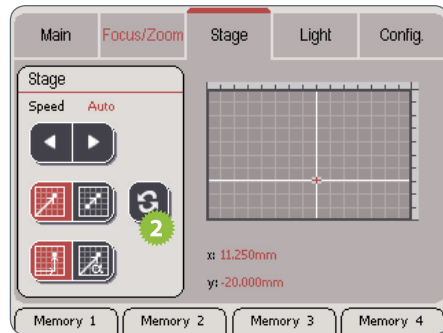
- Relative reference point (right symbol): Shows the distance between the current position and the zero point defined by the user.

*(Continued on next page)*

## Changing the Reference Coordinates (cont'd)

### Manually defining the zero point

To measure the distance between two positions, proceed as follows:




1. Move the "IsoPro" motorized mechanical stage into the position that is to be the zero point.
2. Touch the button with the double arrow to define this position as the zero point.

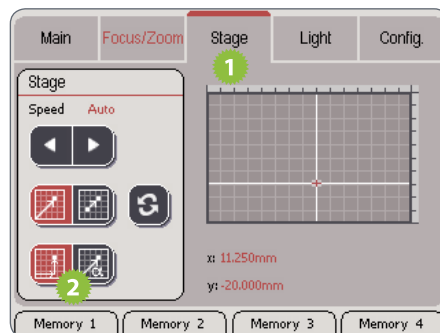
3. Move the mechanical stage into the new position. The display now shows the distance to the manually set zero point.




## Changing the Coordinate System

 You can toggle the coordinate system between the Cartesian coordinate system and the polar view.


### Changing the coordinate system



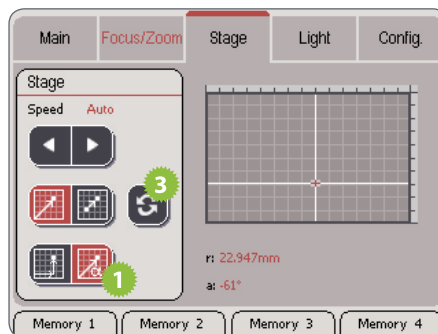
 The display as polar coordinates can also be used for simple distance measurements.

1. Touch the "Stage" tab.
2. In the "Stage" area, touch the desired coordinate system:
  - Cartesian coordinates (left symbol): Shows the distance between the bottom left corner and the current position based on the X/Y-axes.
  - Polar coordinates (right symbol): Displays the distance based on the radius and angle.

## Measuring via polar coordinates

 You can also carry out simple distance measurements using the polar view.

### Measuring via polar coordinates




1. Switch the display to polar coordinates.
2. Move the Leica "IsoPro" motorized mechanical stage to the first measurement position.


3. Set the reference point to "Zero" by touching the button with the double arrow.
4. Move the motorized mechanical stage to the second measurement position.

You can now read the traveled distance on the Leica SmartTouch™ under "Radius".

# The "Light" Tab

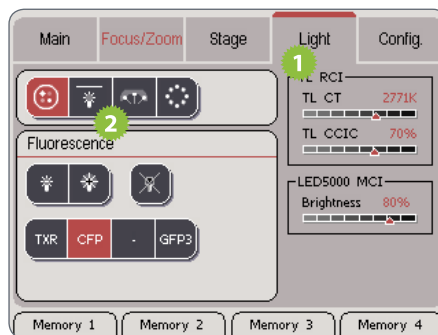
## Selecting the light source

 Depending on the selected light source, the lower area of the display changes accordingly.

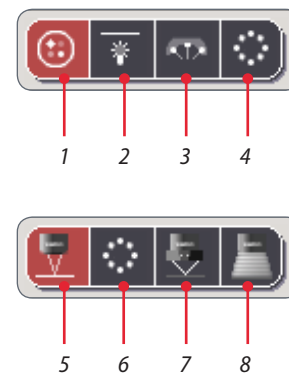
 Only those light sources that are actually connected are displayed.

### Selecting the light source

1. Touch the "Light" tab.
2. Touch the desired light source in the upper area.



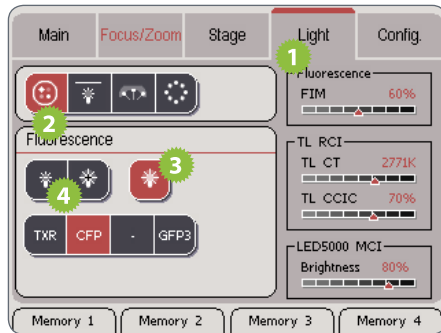
### Symbols for light sources




1. Fluorescence illumination
2. Transmitted Light Base RCI
3. LED5000 MCI
4. LED5000 RL-80/48
5. LED5000 CXI
6. LED3000 RL
7. LED3000 NVI
8. LED5000 HDI

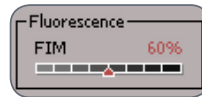
# Control of the Leica Fluorescence Illumination

## Adjusting the illumination





1. Touch the "Light" tab.
2. In the upper area, touch the symbol of the fluorescence light source.
3. Touch the symbol of the fluorescence shutter to open the shutter.
4. Adjust the brightness.

 The brightness is controlled by the FIM (Fluorescence Intensity Manager). This is a diaphragm that controls the quantity of light. The aperture of the FIM is displayed on the Leica SmartTouch™.



## Changing the filter

 The illuminator and the filter wheel can be controlled using the Leica SmartTouch™. The filters are encoded so that the label always corresponds to the actual inserted filter. An empty filter insert is indicated by a line (-).

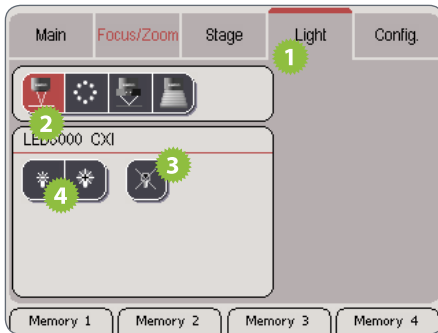
 When using a Leica M165 FC stereomicroscope, you cannot change the filter and shutter using the Leica SmartTouch™. However, the type and position of the filter is detected and displayed on the Leica SmartTouch™.

1. Touch the desired filter to swing it into the beam path.



# Control of the Leica LED5000 CXI

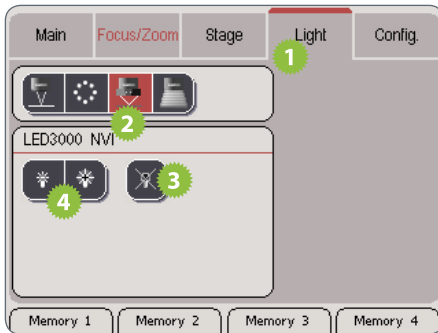
## Adjusting the illumination



1. Touch the "Light" tab.
2. In the upper area, touch the symbol of the Leica LED5000 CXI.
3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.


# Control of the Leica LED3000 NVI

## Adjusting the illumination

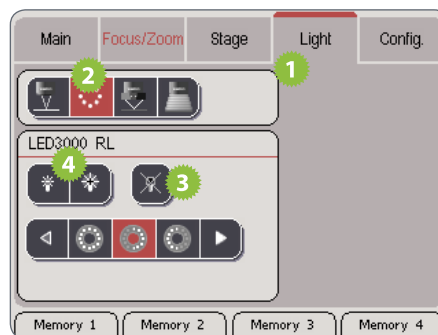


1. Touch the "Light" tab.
2. In the upper area, touch the symbol of the Leica LED3000 NVI.
3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.

## Control of the Leica LED5000 3000 Ring Illuminator

 Using the Leica SmartTouch™, you can control both the brightness and various illumination scenarios for the Leica LED3000 RL ("Ring Light").


### Adjusting the illumination



1. Touch the "Light" tab.
2. In the upper area, touch the symbol for the Leica LED3000 RL.
3. Switch on the illuminator.


4. Touch the lamp symbols to adjust the intensity of the light.
5. Touch one of the symbols for the light scenarios to adjust the lighting to your needs.



 You cannot modify the default illumination scenarios.

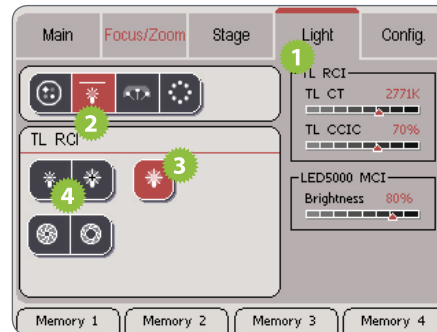


## Control of the Leica TL RCI Transmitted Light Base


 The quantity of light for the Leica "TL RCI" transmitted light base can be adjusted in two ways.

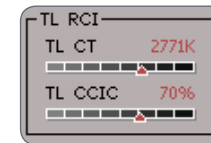
- If the brightness is controlled via the light intensity, the color temperature changes along with the brightness.
- If the brightness is controlled via the mechanical diaphragm, the color temperature remains constant. When using a Leica digital camera, no additional white balance is necessary.

### Adjusting the illumination



1. Touch the "Light" tab.
2. In the upper area, touch the symbol of the transmitted light base.
3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.

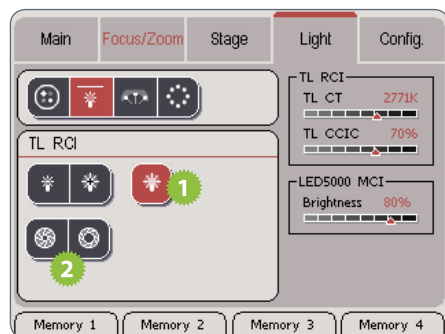
 The color temperature changes along with the brightness. The current color temperature is displayed on the Leica Smart-Touch™.




*(Continued on next page)*

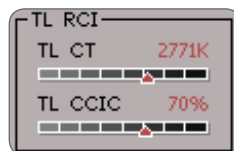
## Control of the Leica TL RCI Transmitted Light Base (cont'd)

### Changing the quantity of light




1. Switch on the illuminator.
2. Touch the symbols with the iris to adjust the brightness via the diaphragm aperture.

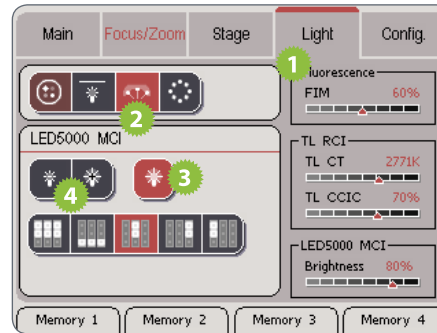
 The color temperature remains constant at any brightness. The size of the diaphragm aperture is displayed on the Leica SmartTouch™ under "TL CCIC" ("Constant Color Intensity Control").




# Control of the Leica LED5000 MCI

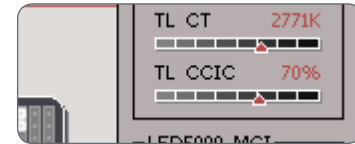
 Using the Leica SmartTouch™, you can control both the brightness and various illumination scenarios for the Leica LED5000 MCI ("Multi Contrast Illumination").

## Adjusting the illumination



1. Touch the "Light" tab.
2. In the upper area, touch the symbol for the Leica LED5000 MCI.
3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.


 The selected brightness is shown on the right side of the display.




5. Touch one of the symbols for the light scenarios to adjust the lighting to your



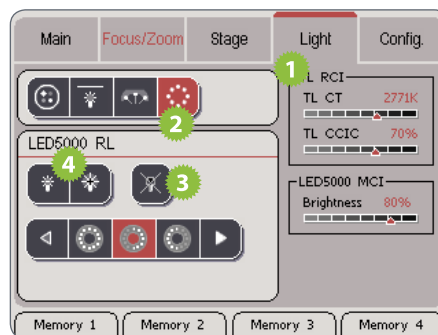
needs.

 You cannot modify the default illumination scenarios.


## Control of the Leica LED5000 RL-80/48 Ring Illuminator

 Using the Leica SmartTouch™, you can control both the brightness and various illumination scenarios for the Leica LED5000 RL ("Ring Light").

### Adjusting the illumination




1. Touch the "Light" tab.
2. In the upper area, touch the symbol for the Leica LED5000 RL.
3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.

 The selected brightness is shown on the right side of the display.




5. Touch one of the symbols for the light scenarios to adjust the lighting to your needs.

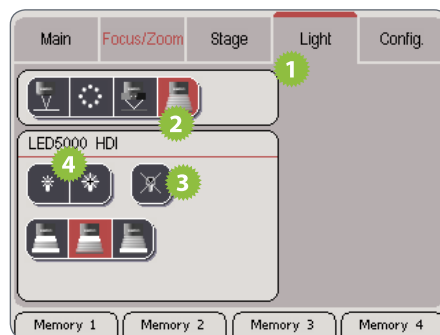


 You cannot modify the default illumination scenarios.

## Control of the Leica LED5000 HDI

 Using the Leica SmartTouch™, you can control both the brightness and the various illumination scenarios for the Leica LED5000 RL ("Ring Light").

### Adjusting the illumination




1. Touch the "Light" tab.
2. In the upper area, touch the symbol for the Leica LED5000 HDI.

3. Switch on the illuminator.
4. Touch the lamp symbols to adjust the intensity of the light.
5. Touch one of the symbols for the light settings to adjust the lighting to your needs.



# Memory Key Assignment

## Information about the Memory Keys

 The Leica SmartTouch™ has four hardware keys that can be assigned almost any function. The assigned function is displayed on the bottom edge of the touchscreen.

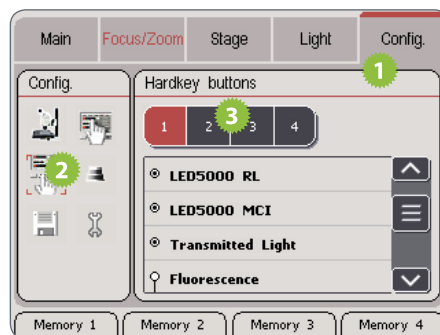


## Assigning Memory Keys



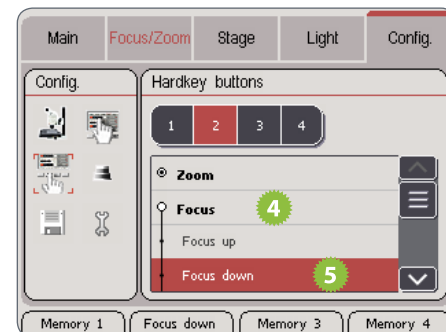
Each of the four keys can be assigned any desired function of the Leica SmartTouch™.

### Assigning a Memory key



1. Touch the "Config." tab.
2. Touch the button for the memory key assignment.
3. Touch the desired memory location (1 to 4).

4. Touch an instrument or category to view the possible commands.



5. Touch the command you want to assign to the selected button.

*(Continued on next page)*



## Assigning Memory Keys (cont'd)



The key on the bottom end of the touchscreen changes its designation to indicate the current assignment.

6. To configure the next memory key, touch the desired memory location and repeat steps 3 to 5.

### Quick assignment of a Memory Key

If you want to configure Memory Key 2 without having to use the menus, for example, proceed as follows:

1. On the touchscreen, press the key you want to assign for 3 seconds. The Leica Smart-Touch™ goes automatically to the key settings.
2. Assign the desired function to the key as described.

## Memory Key Commands List

<b>Zoom</b>	
Zoom in	Enlarges the view (zoom)
Zoom out	Reduces the view (zoom)
Ratchet +	Switches to the next ratchet stop position
Ratchet -	Switches to the previous ratchet stop position
Open iris	Opens the iris (= smaller depth of field, but more light)
Close iris	Closes the iris (= greater depth of field, but less light)
<b>Focus</b>	
Focus up	Moves the focusing column upwards in larger increments
Focus down	Moves the focusing column downwards in larger increments
Focus fast	Switches the focusing speed to "Fast"
Focus autom.	Switches the focusing speed to "Auto"
Focus slow	Switches the focusing speed to "Slow"
Focus abs./rel.	Changes the focus display between "absolute" and "relative"
Focus ref.	Sets the current focus position to the value "0"
<b>Fine focus</b>	
Fine focus up	Moves the focusing column upwards in small increments
Fine focus down	Moves the focusing column downwards in small increments

## Memory Key Commands List (cont'd)

<b>X/Y stage</b>	
Stage X+	Moves the motorized mechanical stage towards the left
Stage X-	Moves the motorized mechanical stage towards the right
Stage Y+	Moves the motorized mechanical stage towards the rear
Stage Y-	Moves the motorized mechanical stage towards the front
Stage fast	Switches the travel speed to "Fast"
Stage autom.	Switches the travel speed to "Auto"
Stage slow	Switches the travel speed to "Slow"
Stage abs./rel.	Switches the coordinate display for the motorized mechanical stage between "absolute" and "relative"
Stage ref.	Sets the current position of the motorized mechanical stage to the value "0"
Coord. stage	Switches the coordinate display between the Cartesian and the polar display
<b>LED5000 RL80/48</b>	
RL on/off	Switches the LED5000 RL80/48 ring illuminator on and off
RL +	Increases the brightness
RL -	Decreases the brightness
RL #1-11	Scrolls through illumination scenarios 1 to 11
RL #1 ... RL #11	Activates illumination scenario 1 to 11 directly

## Memory Key Commands List (cont'd)

<b>LED5000 MCI</b>	
MCI on/off	Switches the Leica LED5000 MCI Multi Contrast Illumination on and off
MCI +	Increases the brightness
MCI -	Decreases the brightness
MCI #1-5	Scrolls through illumination scenarios 1 to 5
MCI #1 ... MCI #5	Activates brightness scenario 1 to 5 directly
<b>CXI</b>	
CXI on/off	Switches the Leica CXI coaxial illuminator on and off
CXI +	Increases the brightness
CXI -	Decreases the brightness
<b>LED3000 NVI</b>	
NVI on/off	Switches the Leica LED3000 NVI illuminator on and off
NVI +	Increases the brightness
NVI -	Decreases the brightness

## Memory Key Commands List (cont'd)

Transmitted light	
TL shutter	Switches the illuminator of the transmitted light base on and off
Toggle TL/FL	Changes the status of the transmitted light and fluorescence shutter
TL color temp +	Increases the lamp voltage
TL color temp -	Decreases the lamp voltage
TL brightness +	Opens the CCIC diaphragm
TL brightness -	Closes the CCIC diaphragm
Fluorescence	
Filter 1 ... Filter 4	(Fluorescence) Rotates the filter wheel directly into filter position 1 to 4
FL shutter	Opens and closes the shutter of the fluorescence illuminator
FIM +	Increases the brightness by opening the FIM (Fluorescence Intensity Manager)
FIM -	Reduces the brightness by closing the FIM
Filter left	Replaces the current filter with the one to the left of it
Filter right	Replaces the current filter with the one to the right of it


## Memory Key Commands List (cont'd)


Camera	
Photo	Takes a photograph using the connected Leica digital camera. (Leica Application Suite must be started for this purpose.)
Video	Starts recording a film sequence using the connected Leica digital camera. (For this purpose, the Leica Application Suite must be loaded and the optional "Movie" expansion module must have been added.) To stop, press the button a second time.
Memory	
Memory +	Memory positions are approached incrementally
Memory -	Memory positions are approached decrementally
Memory 1	Memory position 1 is approached
Memory 2	Memory position 2 is approached
Memory 3	Memory position 3 is approached
Memory 4	Memory position 4 is approached
Memory 5	Memory position 5 is approached



# Double Rotary Actuator Assignment

## Information about the Double Rotary Actuator


 The double rotary actuator consists of two knobs, each of which can be assigned two different functions. Thus a total of four functions are available, which can be assigned individually.

 The toggle button is located at the top end of the double rotary actuator. It is used to toggle between the two assignments. If the rotary actuators are not doubly assigned, the toggle button can be assigned a function.

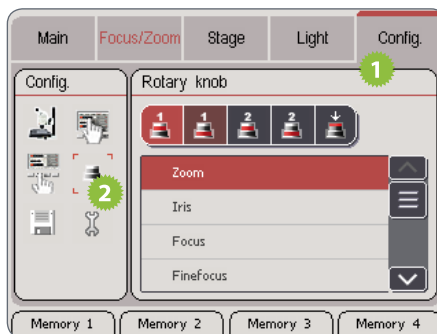




## Assigning a Function to the Knobs

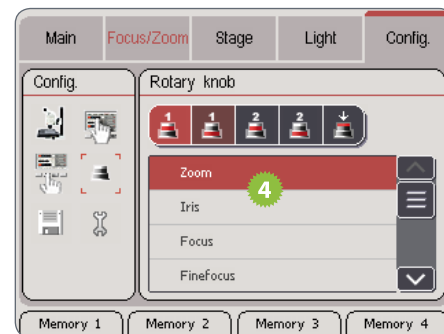
 Each knob can be assigned two different functions.

### Assigning the first function



1. Touch the "Config." tab.
2. Touch the button for the double rotary actuator assignment.

3. Touch one of these two symbols to select the desired rotary actuator.
4. Touch the command you want to assign to the selected rotary actuator.



*(Continued on next page)*

## Assigning a Function to the Knobs (cont'd)

### Assigning the second function

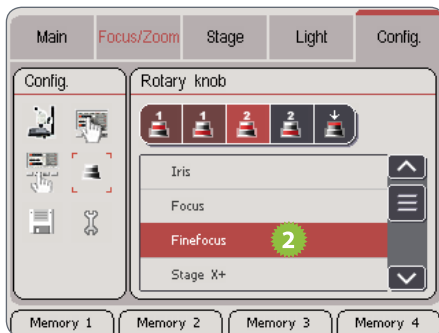
1. Touch one of the following two symbols to select the desired rotary actuator.



2. Touch the command you want to assign to the selected rotary actuator.

### Toggling between the two assignments


1. Press the toggle button once briefly to switch from assignment 1 to assignment 2 (and vice versa).



## Commands List: Rotary Knob

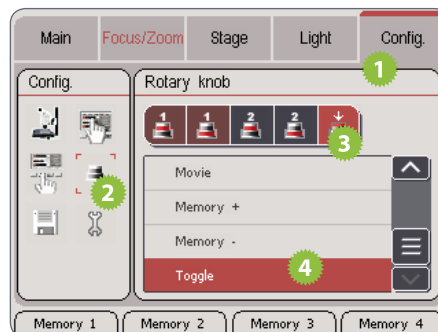
Name	Function
Zoom	Changes the magnification factor (zoom)
Iris	Opens and closes the iris
Focus	Controls the coarse focus
Fine focus	Controls the fine focus
Stage X+	If the knob is moved clockwise, the motorized mechanical stage moves towards the left.
Stage Y+	If the knob is moved clockwise, the motorized mechanical stage moves towards the rear.
Stage X-	If the knob is moved clockwise, the motorized mechanical stage moves towards the right.
Stage Y-	If the knob is moved clockwise, the motorized mechanical stage moves towards the front.
TL CT	Controls the brightness of the lamp in the transmitted light base
TL CCIC	Controls the aperture of the shutter in the transmitted light base
FIM	Controls the brightness of the fluorescence illumination
LED5000 RL-80/48	Controls the brightness of the LED5000 RL-80/48 ring illuminator
LED5000 MCI	Controls the brightness of the LED5000 MCI Multi Contrast Illumination
LED5000 CXI	Controls the brightness of the coaxial illuminator
LED3000 NVI	Controls the brightness of the LED5000 NVI (Near Vertical Illumination)

## Assigning a Function to the Toggle Button

 If you do not need the second level of rotary actuators, you can assign the toggle button on the double rotary actuator its own function. Then, a total of three functions are available to you:


Rotary actuator 1 + rotary actuator 2 + toggle button

### Assigning the toggle button



1. Touch the "Config." tab.
2. Touch the button for the double rotary actuator assignment.

3. Touch the symbol of the toggle button to select it.
4. Touch the command you want to assign to the toggle button.

 If you want to go back to using the toggle button for switching between the two command levels, assign the "Toggle" command to it.

## Commands List: Toggle button


Name	Function
Focusing speed	Changes the focusing speed between "Fast", "Slow", and "Auto"
Focus abs./rel.	Changes the focus display between "absolute" and "relative"
Focus ref.	Sets the current focus position to the value "0"
Specimen stage speed	Changes the travel speed of the motorized mechanical stage between "Fast", "Slow", and "Auto"
Stage abs./rel.	Switches the coordinate display for the motorized mechanical stage between "absolute" and "relative"
Stage ref.	Sets the current position of the motorized mechanical stage to the value "0"
Coord. stage	Switches the coordinate display between the Cartesian and the polar display
RL on/off	Switches the Leica LED5000 RL-80/48 ring illuminator on or off
RL #1-11	Switches between the various illumination scenarios of the Leica LED5000 RL-80/48 ring illuminator
MCI on/off	Switches the Leica LED5000 MCI Multi Contrast Illumination on and off
MCI #1-5	Switches between the different illumination scenarios of the Leica LED5000 MCI Multi Contrast Illumination
CXI on/off	Switches the Leica CXI coaxial illuminator on and off
NVI on/off	Switches the Leica LED3000 NVI illuminator on and off
TL shutter	Switches the illuminator of the transmitted light base on and off


## Commands List: Toggle Button (cont'd)

Name	Function
Toggle TL/FL	Switches between the transmitted light shutter and the fluorescence shutter – or vice versa.
FL shutter	Opens and closes the shutter of the fluorescence illuminator
Filter left	Rotates the fluorescence filter wheel one position to the left
Filter right	Rotates the fluorescence filter wheel one position to the right
Photo	Takes a photograph using the connected Leica digital camera. (Leica Application Suite must be loaded for this purpose.)
Video	Starts recording a film sequence using the connected Leica digital camera. (For this purpose, the Leica Application Suite must be loaded and the optional "Movie" expansion module must have been added.) To stop, press the button a second time.
Memory +	Switches to the next assigned memory position
Memory -	Switches to the previous assigned memory position
Toggle	Switches between the two command levels of the rotary actuator

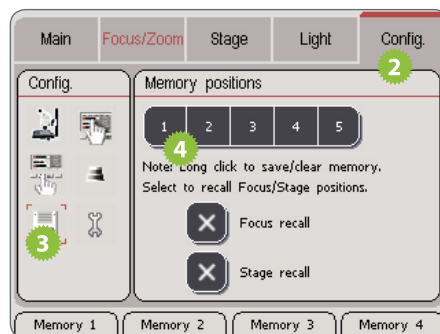
# Calling Up and Saving Scenarios


## Saving Scenarios

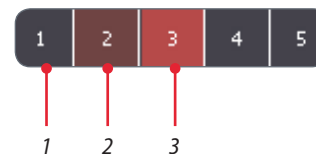
 The Leica SmartTouch™ can store up to 5 scenarios and reproduce them later at the touch of a button. These include the focus, the position of the stage, fluorescence filter and more.

 If the iris and zoom are encoded, but not automated, when calling up a scenario, you are prompted to set the memory position manually. For this purpose, the value of the memory position and the current position are displayed on the touchscreen.

### Saving a scenario



 The color-coding of a key indicates whether a memory location has already been assigned a scenario:



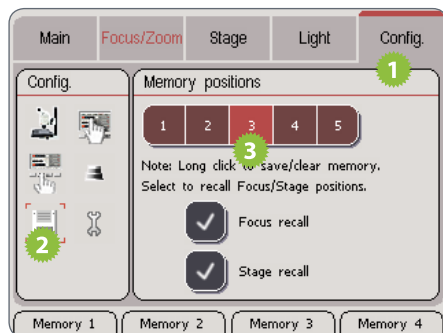
1. Available memory location
2. Assigned memory location
3. Assigned, active memory location

1. Adjust the zoom, position of the stage, filter wheel etc. to the positions you want to save.
2. Touch the "Config" tab.
3. Touch the symbol for assigning the memory locations.
4. Press approx. 3 seconds on the memory location you want to assign the current scenario to.




# Calling Up Scenarios

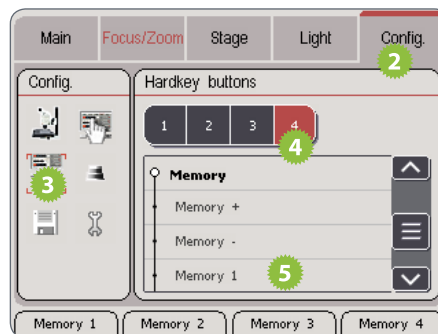
## Calling up using touchscreen



1. Touch the "Config" tab.
2. Touch the symbol for assigning the memory locations.
3. Touch the desired memory location.

## Calling up using the hardware keys


 The easiest way to call up frequently used scenarios is using the hardware keys of the Leica SmartTouch™.



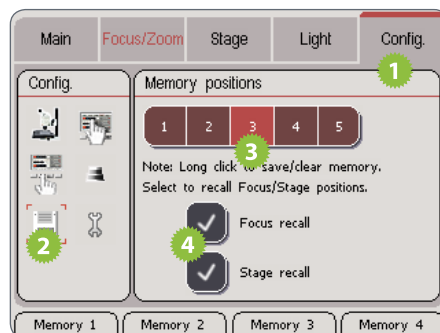
1. Save a scenario as described on [page 80](#).
2. Touch the "Config" tab.

3. Touch the symbol for configuring the operating buttons.
4. Touch the desired operating button.
5. Under "Memory", select the memory location that contains the desired scenario.

## Safety Measures for Focus and Stage

 The focus and/or the stage position can be excluded when saving. In this way, you can prevent the objective from colliding with a specimen when you call up a memory location that moves the objective far downwards. This also prevents the motorized mechanical stage from changing its position when a scenario is called up.

### Excluding the focus and/or stage



1. Touch the "Config" tab.
2. Touch the symbol for assigning the memory locations.
3. Touch the assigned memory location.
4. Touch "Focus recall" and/or "Stage recall" so that these two components are no longer controlled by the memory.