Leica
MICROSYSTEMS

# TL3000 Ergo
# Transmitted Light Base
# User Manual

# General Notes

### Safety concept

Before using your microscope for the first time, please read the "Safety Concept" booklet included with your instrument. It contains additional information about handling and care.

### Use in clean rooms

The TL3000 Ergo can be used in clean rooms without any problems.

### Cleaning

- You can find noes on cleaning in the appendix, which begins on page 43.

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

# Symbols Used

**Warning! Safety hazard!**

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

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

**Warning of hazardous electrical voltage**

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

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

**Important information**

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

**Explanatory notes**

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

**Figures**

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

# Safety Instructions

### Description

The safety instructions in this manual refer to the installation and use of the TL3000 Ergo transmitted light base. Be sure to read the safety instructions noted in the manual for your Leica stereo microscope before use.

### Intended use

- Refer to "Safety Concept" booklet

### Non-intended use

- Refer to "Safety Concept" booklet

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

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

### Place of use

- Refer to "Safety Concept" booklet

- Electrical components must be placed at least 10 cm away from the wall and from flammable substances.

# Safety Instructions (Continued)

**Responsibilities of person in charge of instrument**

- Refer to "Safety Concept" booklet

Ensure that:

- the base, the Leica stereo microscopes and accessories are operated, maintained and repaired by authorized and trained personnel only.
- All operators have to read, understand and observe this user manual, and particularly the safety instructions.

**Repairs, service work**

- Refer to "Safety Concept" booklet
- 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 circuit can cause injury.

**Integration in third-party products**

- Refer to "Safety Concept" booklet

**Disposal**

- Refer to "Safety Concept" booklet

**Legal regulations**

- Refer to "Safety Concept" booklet

**EC Declaration of Conformity**

- Refer to "Safety Concept" booklet

# Contents

# TL3000 Ergo

# Congratulations!

Congratulations on purchasing your new TL3000 Ergo transmitted light base. You will be surprised, how fast, easy and accurately you can adjust the contrast to see your sample in the best light. Whether bright field, dark field or Rottermann Contrast: The optimal illumination for your specimens is always available while you work. The transmitted light base is maintenance-free due to the energy saving, long-lasting LED light source; lamp replacements are a thing of the past.

Furthermore, the TL3000 Ergo is completely coded. All settings therefore are reproduceable and the light can be controlled or shuttered externally with foot switch, SmartTouch or software.

Though the reliability and robustness of Leica devices is world-renowned, the TL3000 Ergo requires a certain degree of care and attention. Therefore, we recommend that you read this manual. It contains all the information you need regarding operation, safety and maintenance. Simply observing a few guidelines will ensure that even after years of intensive use, your transmitted light base will continue to work as smoothly and reliably as on the very first day.

We wish you the best of success in your work!

# The Modular Design: Everything is Relative

The Leica stereo microscopes and macroscopes provide maximum flexibility in choosing equipment, thanks primarily to the modular configuration and the compatibility that Leica has painstakingly maintained for decades. The optics carriers, eyepieces, bases and more can be combined in any way you choose, allowing you to create the microscope that best suits your needs.

Despite this, you will notice that the control elements and individual components do not differ significantly. Whichever configuration you choose, you will quickly feel right at home.

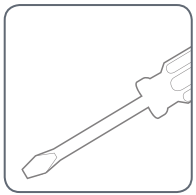
**Have a special request? Let us know!**

Leica Microsystems enjoys an exceptional reputation when it comes to devising customer-specific solutions. If you have a special request that cannot be met with standard parts, contact your Leica consultant. We have a solution for every problem.

# On We Go

If your new equipment configuration has already been assembled and commissioned by your Leica consultant, skip the installation instructions and start with the Quick Start Guide on page 19.

If, on the other hand, you are putting the base and microscope together yourself, continue with the "Assembly" chapter, which begins on page 11.



# Assembly

# Important Information for Assembly

The following instructions refer to the assembly of the TL3000 Ergo transmitted light base together with the M205 C stereo microscope. However, the transmitted light base can be operated with all Leica stereo microscopes or macroscopes – with or without fluorescence. For details on assembling the optics carrier, tube, and eyepieces please consult your stereo microscope's user manual.

# Assembling the Focusing Column

The first step is to connect the focusing column of the M series to the TL3000 Ergo.

### Tools used

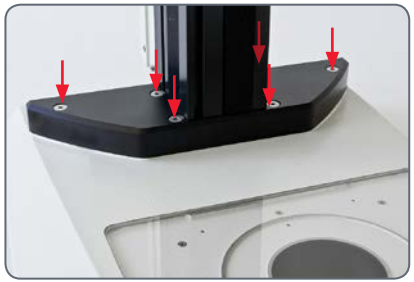
- Hex socket screwdriver, 3 mm

### Assembling the column adapter

1. Securely install the column adapter on the column using the included screws.

### Assembling the focusing column

2. Securely screw the focusing column to the TL3000 Ergo using the included screws.



# Motorized Focus: Restricting the Travel Path

Depending on the work situation, it may be necessary to restrict the maximum travel path of the stereo microscope. This prevents the following:

- Injuries when manipulating the specimen because the fingers or hand get pinched.
- Accidental contact between the objective and the specimen, and potential resulting damage.

### Readjusting the motorized focus

The motorized focus is factory-adjusted and normally does not need to be readjusted – even if the maximum travel path is changed.

Exception: If the power fails while the motorized focus is moving, the position data are lost. In this case, the calibration must be repeated using the Leica software or the SmartTouch. To do so, please consult the respective manual.

### Restricting the bottom travel range

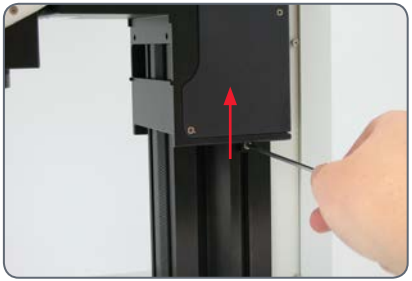
1. Move the motorized focus into the lowest position you want to reach.

2. Untighten the screw of the limit stop on the side of the focusing column.

3. Push the limit stop to the height of the motorized focus.

It is easiest to move the limit stop by keeping the screwdriver inserted and moving it upwards.

4. Tighten the screw of the limit stop.



# Optics Carrier

**Tools used**

- Hex socket screwdriver, 4 mm

If you have any inquiries regarding compatibility and adaptation of other models, please contact your Leica consultant.

**Assembling the optics carrier**

1. Place the microscope carrier on the focusing column so that the screw fits into the thread provided and the lug fits into the groove.

2. Press the microscope carrier backwards to the focusing column and screw it in place using your other hand.

3. Insert the optics carrier into the microscope carrier and fasten it with the locking screw.

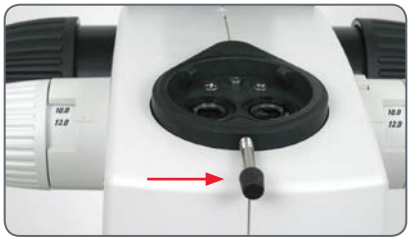
# Tube

All intermediate tubes that fit between the optics carrier and the binocular tube are fitted in the same manner.

Please note that inserting intermediate elements can lead to shading in the border area of the field of view.

### Preparations

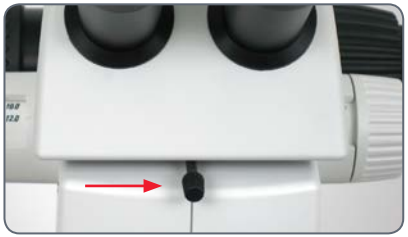
1. Unscrew the positioning screw and remove the protective cover.



### Assembling the tube

2. Push the tube (for example, the inclined binocular tube) into the dovetail ring and rotate it slightly in both directions until the positioning screw meshes with the guide groove.

3. While holding the tube only slightly, carefully tighten the positioning screw. It is automatically brought to the correct position.



# Eyepieces

### Tools used

- No tools required.

### Magnification range

You can extend the overall magnification range using available 10×, 16×, 25× and 40× wide-field eyepieces for persons wearing glasses.

### Preparation

1. If you want to use an optional reticule, insert it now.

2. Remove the plastic tube guard.

### Inserting the eyepieces

3. Push the eyepieces into the tubes as far as they will go and check to ensure that they fit tightly and accurately.

4. Securely tighten the clamping screws.

# Objective

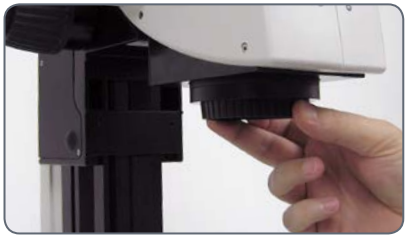
**Tools used**

- No tools required.

⚠ Hold the objective firmly during assembly and disassembly so that it does not fall onto the stage plate. This applies particularly to the 2× planapochromatic objective, which is very heavy. Remove all specimens from the stage plate first.

**Attaching the objective**

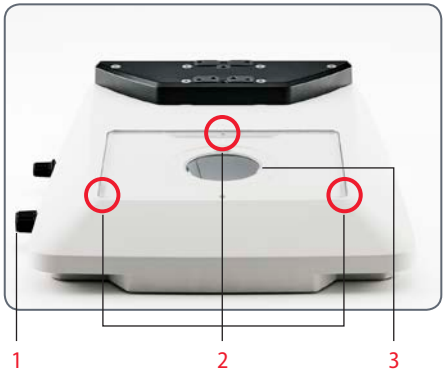
1. Remove the protective cover on the optics carrier.



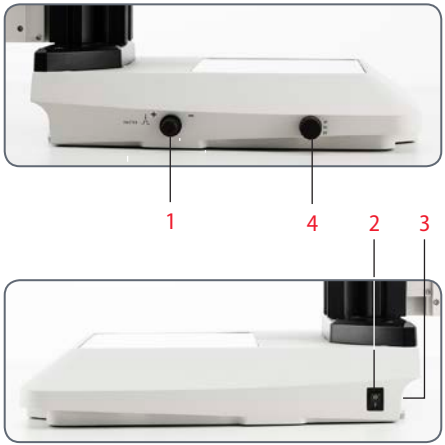
2. Screw the objective clockwise into the optics carrier.

# Quick Start Guide

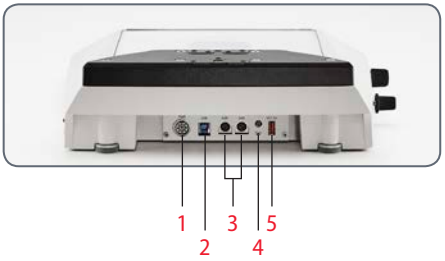
# TL3000 Ergo Description




1. *Contrast*
2. *Holes for stage adaption*
3. *65 mm FOV with 75 mm protective glass plate, can be replaced with contrasting accessories*




1. *Intensity on/off*
2. *Power on/off*
3. *Space for cables*
4. *Contrast adjustment*




1. *Power*
2. *USB connector*
3. *2× CAN*
4. *Footswitch*
5. *USB power out*

# The Different Contrast Methods

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

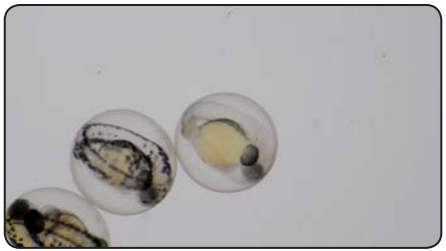
Operation for bright field illumination is explained starting on page 25 .

**Dark field**
For dark field illumination the specimen is lit by the LED in a very flat angle. Only light that is deflected by the specimen hits the objective and makes these structures visible. Key factor is the black background for a perfect contrast.

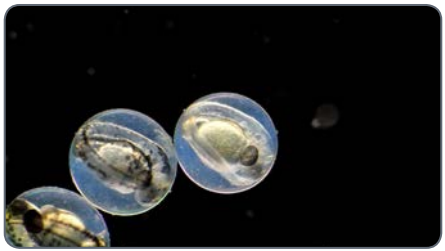
Operation for dark field illumination is explained starting on page 27 .

**Rottermann Contrast**
Part of the lighting unit is covered depending on the position of the contrast knob, which results in contrast effects. Phase structures typically act as spatial, relief-type images.

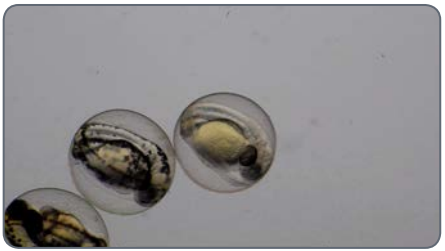
Operation for Rottermann Contrast is explained starting on page 26 .



*Zebrafish with bright field illumination*



*Identical subject with dark field illumination*



*Identical subject with Rottermann Contrast*

# Possible Scenarios

The TL3000 Ergo transmitted light base works together with any device configuration. It is suitable for relatively large fields and has enough aperture to deliver full resolution with all objectives, including 2× corr and 5×/0.5 objectives.

*SmartTouch*

# Switching the Transmitted Light Base on and off

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

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

**Switching the transmitted light base on and off**

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

The following assumes that the power switch on the right side of the device is always switched on. This switch is not mentioned in the remaining part of this user manual.

*Continued on next page*

# Switching the Transmitted Light Base on and off (Continued)

2. Push the on/off switch on the left side once to turn on the illumination. Turn the knob to adjust the intensity.

3. Look through the eyepiece and adjust the light intensity turning the rear knob on the left side. When switching the base off it will remeber the last state and power on with the same brightness.

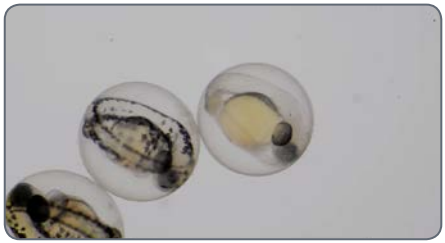
There is no status LED on the base.

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

# Working With Bright Field Illumination

### Bright field illumination

Bright field is suitable for examining translucent objects featuring contrasting structures. The specimen is illuminated directly from below to appear pin-sharp and in natural colors on a bright surface.



### Activating bright field illumination

1. Switch on the base as described on page 23.

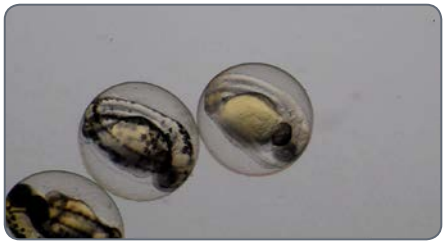
2. Turn the contrast knob all the way to the front.

3. Look through the eyepieces and adjust the light intensity using the control on the left side of the base.

# Working With Rottermann Contrast

### Rottermann Contrast

Part of the lighting unit is covered depending on the position of the contrast knob, which results in contrast effects. Phase structures typically act as spatial, relief-type images.



### Activating Rottermann Contrast

1. Switch on the base as described on page 23 .

2. Adjust the contrast knob on the left side between the two end positions. Perfect Rotterman Contrast has a slightly grey background that contrasts nicely your sample.

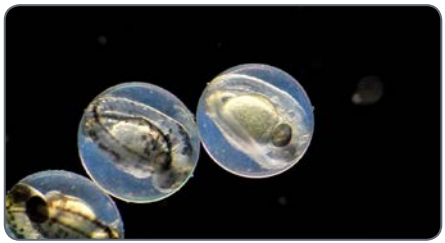
3. Look through the eyepieces and adjust the light intensity using the control on the left side of the base.

4. Change the angle of incidence of the light using the control on the left side of the base in order to find the optimum contrast for your specimen.

# Working With Dark Field Illumination

### Dark field illumination

For dark field illumination the specimen is lit by the LED in a very flat angle. Only light that is deflected by the specimen hits the objective and makes these structures visible. Key factor is the black background for a perfect contrast.



### Activating dark field illumination

1. Switch on the base as described on page 23 .

2. Turn the contrast knob all way back until the background is black. Depending on the objective used this can be a different position.

3. Look through the eyepieces and adjust the light intensity using the control on the left side of the base.

# Accessories and Tips for Improved Contrast

### Display with minimal reflections

If you are be working mainly with dark field illumination or fluorescence, you can remove the protective glass plate from the light source. This way you will have a low-reflection background that will therefore be even darker.

The protective glass plate is located beneath the glass cover of the base, directly above the light source.

If you are working with c. elegans or oocytes then you can use the halogen conversion filter (10 450 691) or the green filter (10 450 564). For diffuse illumination you can use the frosted glass (10 450 563). For polarization you can use the pol insert (10 450 565).

# Preparation for Imaging

# The Basics

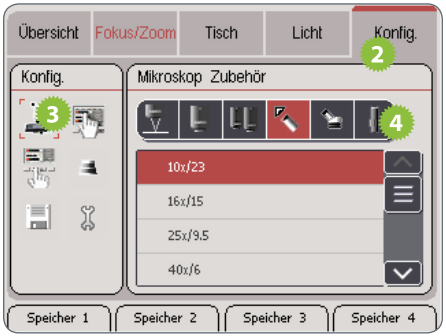
Before you can use the TL3000 Ergo in LAS or LAS X software, the individual components in the equipment configuration must be detected.

This one time detection must be carried out before the first time you use the base with the SmartTouch, Leica Application Suite or LAS X. The configured settings are automatically synchronized between the SmartTouch and LAS X. Redetection is only necessary if the components in the equipment configuration have been changed.

# Detection With SmartTouch

### Detection with SmartTouch

1. Connect the SmartTouch control unit to your microscope equipment.
2. On the SmartTouch, touch the "Config." tab.
3. Touch the "Config." field.
4. In the "Microscope" field select the instrument categories you are using in sequence.
5. In each category, touch the component you are using.

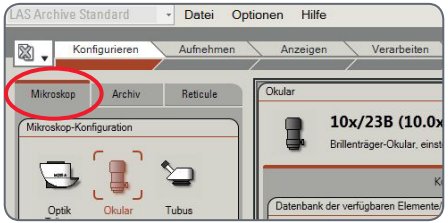



Detection is complete. Now all of the components of your stereo microscope are integrated into the automatic aperture control system correctly.

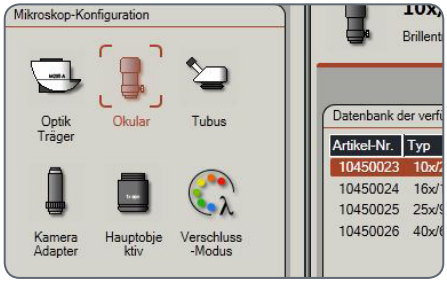
# Detection With Leica Application Suite

### Detection with Leica Application Suite

1. Start Leica Hardware Configurator.
2. Configure your microscope in Hardware Setup.
3. Start Leica Application Suite.
4. Select the "Configure" command from the main menu.
5. Click the "Microscope" tab.




6. Select the instrument categories you are using in sequence.




7. In each category, click on the component you are using.

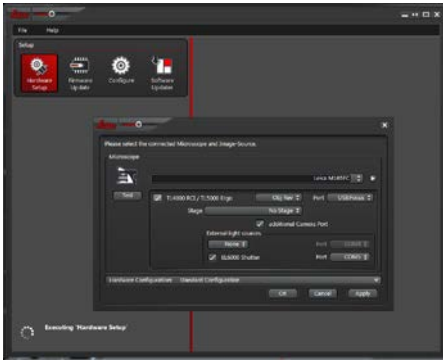

Detection is complete. Now all of the components of your stereo microscope are integrated into the automatic aperture control system correctly.

# Detection With LAS X

### Detection with Leica Application Suite (LAS) X

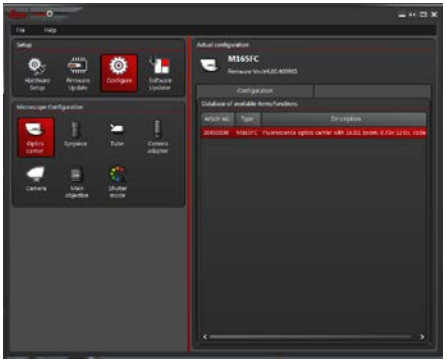
1. Start LAS X Hardware Configurator.

2. Configure your microscope in “Hardware Setup” and tick the box for coded TL light base.



3. Press “Apply” and then click on the "Configure" button.

4. Select the instrument categories you are using in sequence.




5. In each category, click on the component you are using.

Detection is complete. Now all of the components of your stereo microscope are integrated into the automatic aperture control system correctly.

# Operation with SmartTouch

# SmartTouch Expands Your Possibilities!

### About the SmartTouch

The SmartTouch external control unit 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 SmartTouch.

### Controlling the TL3000 Ergo

While interacting with the TL3000 Ergo transmitted light base, the SmartTouch controls the intensity of illumination, and displays the contrast setting.

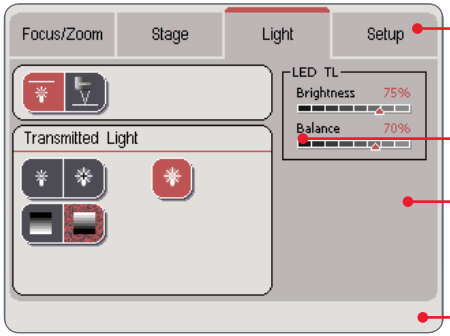
### Additional information

Please consult the manual that was delivered with the SmartTouch for information on installation, wiring and start-up.

*SmartTouch*

# An Overview of the SmartTouch

# Controls on the Touchscreen

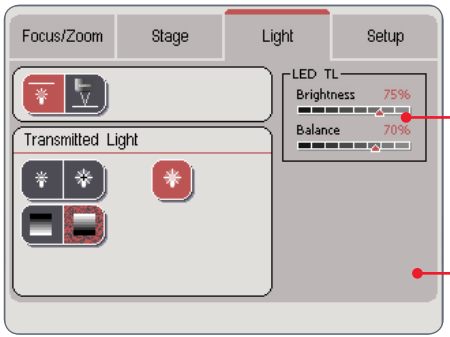



*Tab*

*Display*

*Button*

*Display of the current function of a hardware key*




*Segment*

*Scroll bar arrows*

### 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 SmartTouch.

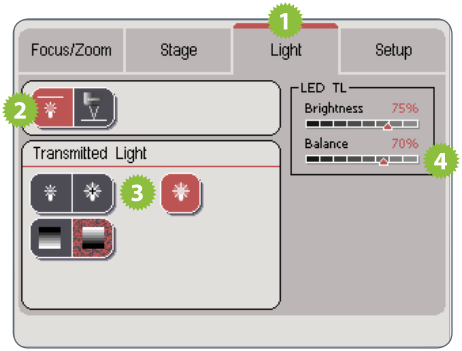
### Color coding conventions

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.

# Accessing the TL3000 Ergo

### Accessing the TL3000 Ergo

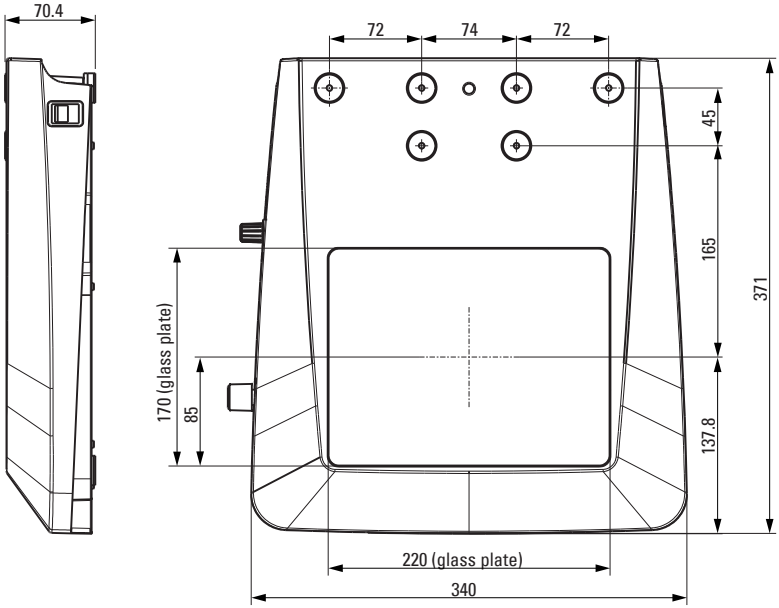
1. Touch the "Light" tab.
2. Touch the symbol for the transmitted light base.
3. Adjust the brightness.
4. Check your contrast setting.




The indicator on the display varies depending on the type of illumination selected. Brightness and contrast are shown in % for easy reproduction. When the light of TL3000 Ergo is switched off, then there is no information about brightness or contrast shown.

# Dimensions and Specifications

# Dimensions


70.4
72
74
72
45
165
371
170 (glass plate)
85
137.8
220 (glass plate)
340

# Technical Data

| TL3000 Ergo | |
|---|---|
| Light source | LED |
| Illuminated area: Bright field ∅ | 65 mm |
| Illuminated area: Dark field ∅ | 65 mm |
| Relief Contrast System (RC) | Yes |
| Internal shutter/lamp control | Yes |
| Remote control options | Yes |
| Integrated filter holder | Yes |
| Matching of high num. aperture | Yes |
| Anti-Shock pads | Yes |
| Size (W×H×D, in mm) | 340 × 70 × 371 |
| Temperature at probe position (above ambient) | 8 deg |
| **Accessories** | |
| IsoPro cross-stage support | Yes |
| Integrated heating stage (optional) | Yes |

| **Power supply** | |
|---|---|
| Input | 100–240 V AC 47–63 Hz |
| Output | 33 VDC 1.51 A max. |
| Max. power consumption at power supply in stand-alone mode | 21 W |
| **USB power out** | |
| Voltage | 5 V |
| Current | 1.2 A |
| Power | 6 W |
| **Connections** | |
| CAN | 2 |
| USB data | 1 |
| Power supply | 1 |
| USB power out | 1 |
| Hand-/footswitch | 1 (2.5 mm phone jack) |

# Appendix

# Care, Maintenance, Contact Persons

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

**Warranty benefits**

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

**Contact address**

However, if your instrument should no longer function properly, contact your technician, your Leica representative or Leica Microsystems (Schweiz) AG, CH-9435 Heerbrugg.

**E-mail contact:**

stereo.service@leica-microsystems.com

**Care**

- Protect your equipment from moisture, fumes and acids and from alkaline, caustic and corrosive materials and keep chemicals away from the instruments.
- Plugs, optical systems and mechanical parts must not be disassembled or replaced, unless doing so is specifically permitted and described in this manual.
- Protect your microscope from oil and grease.
- Do not grease guide surfaces or mechanical parts.

# Care, Maintenance, Contact Persons (Continued)

### Protection from dirt

Dust and dirt will affect the quality of your results.

- Put a dust cover over the microscope when it will not be used for a long time.
- Use dust caps to protect tube openings, tubes without eyepieces, and eyepieces.
- Keep accessories in a dust-free place when not in use.

### Cleaning polymer components

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

### Permitted measures

- Clean the microscope (or parts of it) using warm soapy water, then wipe using distilled water.
- For stubborn dirt, you can also use 75 % ethanol in water (industrial alcohol) or isopropanol. When doing so, follow the corresponding safety regulations.
- Remove dust with a pneumatic rubber bulb or with a soft brush.
- Clean objectives and eyepieces with special optic cleaning cloths and with pure alcohol.
- The mirror of the base is best cleaned with a moist lint-free cloth. For finger prints use alcohol, for cell culture media etc. we recommend soap water. Do not soak the instrument.

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