

Living up to Life

*Leica*

MICROSYSTEMS

**Leica TL3000 ST**  
**Leica TL4000 BFDF**  
**Leica TL4000 RC™/RCI™**  
**Leica TL5000 Ergo**

The Perfect Illumination for Demanding Tasks





# Perfect Illumination for Your Work

Leica Microsystems' range of bases for routine applications and high precision research

The foundation for effectively observing and documenting experiments is perfectly orchestrated light. Any optical system is only as good as the light that is available to it. Leica Microsystems offers a wide range of illumination options for stereomicroscopes and macroscopes to fit your specific application – from a simple halogen illumination solution to an innovative transmitted light base equipped with LED technology.

Leica stereomicroscopes and macroscopes are known worldwide for their exceptional optical performance, modularity, and ergonomic design. They offer the ideal solution for any application, any space requirement, and any budget.

## **Leica TL3000 ST**

The Leica TL3000 ST base for routine applications features a sliding mirror for guiding light through the specimen at different angles and is equipped with halogen illumination.

## **Leica TL4000 BFDf**

The Leica TL4000 BFDf base offers continuously adjustable changeover between brightfield and darkfield, which enables a wide range of illumination variations. The field of view is illuminated by an external LED or halogen light source.

## **Leica TL4000 RC™/TL4000 RCi™**

Both high-performance bases, the Leica TL4000 RC™ and the Leica TL4000 RCi™, feature three different forms of lighting: Rotterman Contrast™, brightfield, and darkfield illumination. With Rottermann Contrast™ it is possible to display objects that are almost transparent in rich contrast using partial illumination. Light is supplied by either an external LED or halogen cold light source (Leica TL4000 RC™), or by an integrated halogen light source (Leica TL4000 RCi™).

## **Leica TL5000 Ergo**

The flat Leica TL5000 Ergo base with automatic contrast optimization offers a large, homogeneous field of view that is illuminated with LED technology. The specimen can be illuminated using the Rottermann Contrast™ technique or with brightfield or darkfield. The base also has an aperture located directly above the LED light source, which automatically adapts to the preset magnification of the optics. As a result, the specimen is always optimally illuminated and with perfect contrast. If the magnification is changed, the base immediately optimizes the illumination of the specimen; no user intervention is required.

# Leica TL3000 ST Transmitted Light Base

This routine base features a variable light guide and is designed for maximum user-friendliness. Brightness is adjusted with a rotary knob. It is equipped with a mirror that guides light through the specimen with variable diffusion and stepless shifting in the horizontal plane. The tilt angle of the mirror is automatically tracked. In this way, transmitted light can always be directed quickly and reliably at the best angle for viewing a variety of specimens. To enable the viewing of large objects as well, the object field has a diameter of 50 mm. Excellent illumination is provided by a highly efficient halogen lamp.

## INTERNAL LIGHT SOURCE

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Illumination is provided by a highly efficient halogen lamp. The lamp provides the same light yield as a standard 35 Watt lamp with consumption of just 20 Watts. This also generates less heat, so that the base and specimens do not undergo significant heating. Illumination is adjusted quickly and easily by unscrewing two screws on the heat sink.

## WORKING COMFORTABLY

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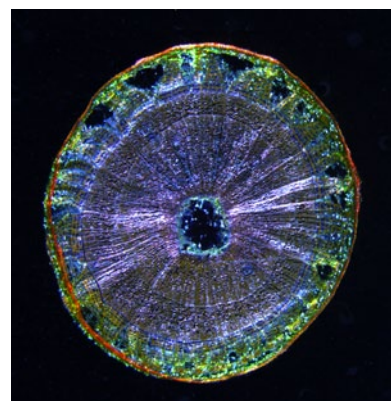
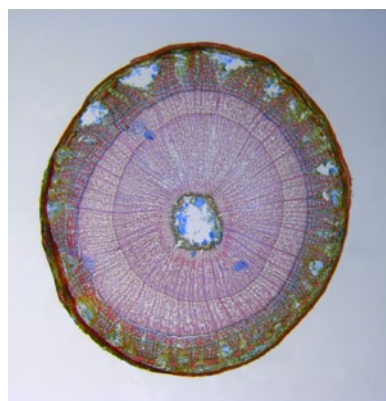
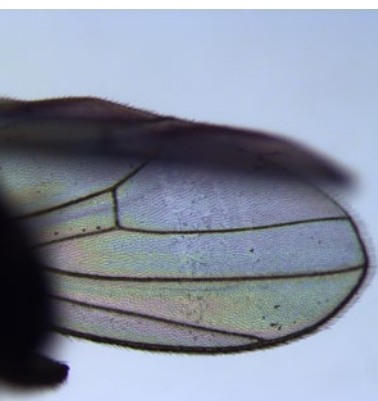
The base features a large, flat work surface to allow comparison of several specimens at the same time. In this way, while one specimen is viewed under the stereomicroscope, others can also be placed on the base, ready to be viewed when needed. The extra large glass plate also prevents liquid from getting into the base.

## DAYLIGHT FILTER

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The highly tempered glass raises the color temperature and lessens the infrared and UV spectra of the halogen lamp. The result is a spectrum that is close to daylight. A daylight filter is also available for demanding tasks.

- › **Brightfield and one-sided darkfield**
- › **Variable light guide**
- › **Efficient halogen illumination**



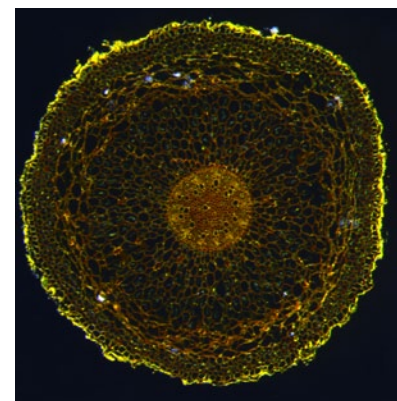
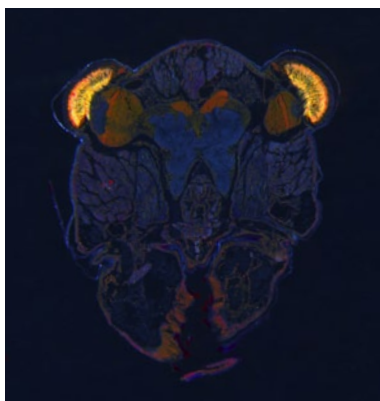
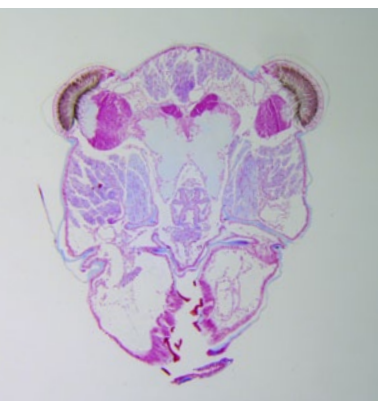
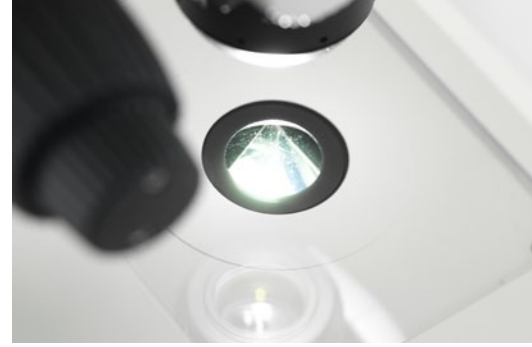
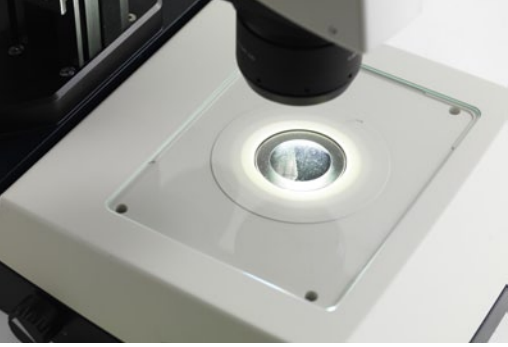
*Drosophila melanogaster* wing, brightfield

*Drosophila melanogaster* wing, one-sided darkfield

*Tilia* cross section with AAA staining brightfield

*Tilia* cross section with AAA staining one-sided darkfield





Grasshopper frontal cross section head, brightfield

Grasshopper frontal cross section head, darkfield

*Convallaria*, cross section of root, brightfield

*Convallaria*, cross section of root, darkfield

# Leica TL4000 BFDF Transmitted Light Base

This base features a larger range of illumination options. Light can be directed at various angles ranging from flat to steep, so that the degree of diffusion through the specimen is varied. For example, if the light rays are passed absolutely vertically through the specimen, an exact brightfield with maximum brightness is created. The specimen can be examined with full contrast, in natural color, and on a bright, homogeneous background.

On the other hand, if the light beams are guided through the specimen at an oblique angle, it is much easier to view semi-transparent specimens such as tissue sections stained with hematoxylin and eosin. The lower the angle at which the light beams are deflected into the object plane, the darker the background appears. Contours, fine edges, and structures stand out clearly against the dark background, created by diffraction of the light beams. The 40 mm field of view is illuminated by an LED or halogen cold light source.

## EXTERNAL LIGHT SOURCE

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Both the Leica KL LED cold light series and the Leica KL halogen cold light series are available. Their intensities can be controlled, and they can be switched on and off manually, or via PC with a USB interface.

## SLIDE-ON™ DESIGN

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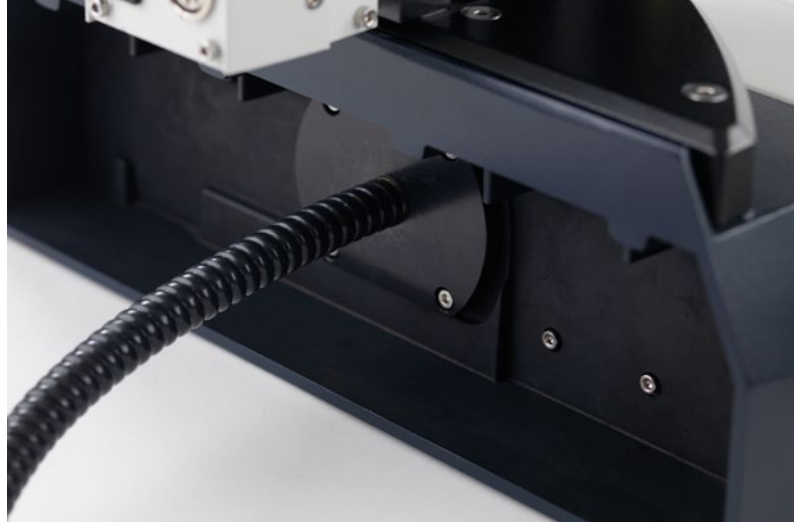
The Slide-On™ design enables the standard stage to be replaced with the IsoPro series cross-stage and vice versa. The changeover can be completed very quickly with minimal effort. The main advantage: after the standard stage is changed, the object plane remains at exactly the same height as before, and the illumination settings are unchanged.

## VIBRATION DISSIPATING

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The feet of the Leica TL4000 BFDF are made from a special vibration dissipating material. This reduces the negative effects of vibration on the base (impact sound, fans on external light sources, etc.) while working. This represents a critical advantage, particularly when studies involve structures in the  $\mu\text{m}$  range, such as micromanipulation, or long-term experiments.

- › Brightfield and darkfield
- › Wide range of illumination options
- › External LED cold light source
- › Slide-On™ design



*Drosophila*, one-sided darkfield

*Drosophila*, brightfield

*Drosophila*, Rottermann Contrast™



# Leica TL4000 RC™ Transmitted Light Base & Leica TL4000 RCI™

Both high-performance bases feature a third contrast method, Rottermann Contrast™ in addition to brightfield and darkfield. Rottermann Contrast™ shows changes in the refractive index as differences in brightness. In this way, structures in specimens that are almost transparent, such as oocytes or diatoms, can be viewed as spatial, relief-like images. The Rottermann Contrast™ technique is based on a special form of partial illumination. It is created by two variable diaphragms located in the beam path. The field of view of the base has a diameter of 35 mm, and LED and halogen illumination are also available.

## EXTERNAL OR

### INTERNAL LIGHT SOURCE

The high-performance bases are available in two designs, with integrated halogen illumination (Leica TL4000 RCI™) or with a connection port for an external cold light source (Leica TL4000 RC™). The Leica KL LED series or the KL halogen series can be used as cold light sources. Some of these models are equipped with USB ports for controlling intensity and for switching on and off via PC. Additionally, up to three different color filters can be used at the same time. Neutral gray, fluorescence, BG38, and UV filters are available as accessories; custom filters can also be produced to meet individual requirements.

### CONSTANT COLOR TEMPERATURE

Color temperature and brightness are each regulated separately with the Leica TL4000 RCI™ base. Using the CCIC function, brightness can be adjusted independently from the color temperature. This means that the required color impression remains exactly the same, even if the illumination intensity is changed.

### SEMI-AUTOMATIC CONTROL

The high-performance Leica TL4000 RCI™ base features two USB ports and two CAN bus sockets. When Leica Application Suite (LAS) or Leica Application Suite Advanced Fluorescence (LAS AF) software is used, color temperature, brightness, and the shutter can be controlled via PC. Extensive test series can then be programmed and run automatically with the aid of LAS or LAS AF.

- › Rottermann Contrast™, brightfield, and darkfield
- › Constant color temperature
- › External LED cold light source or efficient halogen illumination
- › Slide-On™ design
- › Semi-automatic controls

# Leica TL5000 Ergo Transmitted Light Base

The powerful LED light source on this high-performance base features a color temperature that is almost identical to that of daylight. Moreover, the color temperature is always constant, and consequently unaffected by intensity through the use of LED technology. This makes it easier to observe and document than with conventional halogen illumination.

The homogeneously illuminated field of the base is large, with a diameter of 65 mm, making it ideal for a range of applications, from observing single cells in animal and plant tissues to documenting entire organisms.

## AUTOMATED LIGHT SOURCE APERTURE

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The variable aperture elements integrated with the Leica TL5000 Ergo transmitted light base control emerging light, enabling perfect illumination of the specimen. In automatic brightfield and in Rottermann Contrast™ mode, the base calculates the optimum aperture for the illumination unit according to the magnification setting of the optics, and immediately adjusts it whenever changes are made.

## FLAT, ERGONOMIC DESIGN

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This high-performance base is comfortable to use, even when working for long periods. It features a low profile and a large support surface to facilitate specimen handling and allow a clear view of the workstation. The base is designed with an intuitive operating concept. The selected contrast-ing procedure, the aperture, balance, and light intensity are displayed on LED elements. A polarizing filter and several color filters are also available as accessories.

## FULLY AUTOMATIC CONTROL

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The base is equipped with one USB port and three CAN bus sockets. When Leica Application Suite (LAS) or Leica Application Suite Advanced Fluorescence (LAS AF) software is used, all functions from brightness to positions of aperture elements in the base can be controlled and stored for repeated use. From simple documentation to complex time-lapse experiments, anything is possible with this fully automatic base.



*Drosophila melanogaster*  
brightfield, light field fully open, automatic aperture inactive

*Drosophila melanogaster*  
brightfield, optimally illuminated light field, automatic aperture active

*Drosophila melanogaster*  
light field illuminated in Rottermann Contrast™ mode, light source is displaced out of the beam path

*Drosophila melanogaster*  
darkfield, low-reflection black background, indirect illumination

# Leica TL5000 Ergo Transmitted Light Base

Three different contrast methods are available: Rottermann Contrast™, brightfield, and darkfield. All three methods are fully automatic and can be controlled either at the base or from a PC with the aid of LAS or LAS AF software. In addition, the last settings used for each contrast mode are stored.

## ROTTERMANN CONTRAST™

In Rottermann Contrast™ mode, only partial lighting is provided. Shifting the aperture, and thereby the illuminated field, out of the beam path of the optics causes the light to fall on the specimen at an angle. This creates a highly contrasted relief effect. If the magnification of the optics is changed, not only the size of the lighted field, but also its position, is adjusted so that the Rottermann Contrast™ can be retained. In this way, optimum contrast of the specimen is assured at all times, even when the magnification is rapidly changed.

## BRIGHTFIELD

In brightfield mode, the user can choose between an automatic aperture, which creates the optimum illumination for the specimen, and a manual mode. In automatic mode, the digital aperture of the transmitted light base is synchronized with the aperture of the optics. By limiting the illumination angle in this way, the specimen can be observed in perfect contrast, with no scattered light. In manual mode, the user can set the aperture at will, in order to use a fully open aperture and the entire illuminated field of view, for example.

## DARKFIELD

In darkfield mode, the aperture is completely closed, creating a low-reflection, black background. Even illumination of the specimen is assured by two opposing LED units. To create even greater contrast, the focal point of the illumination can be varied between the two light sources.

- › Rottermann™ Contrast, brightfield, and darkfield
- › Flat ergonomic design
- › Optimized aperture of the light source
- › Powerful LED light source
- › Fully automatic control







# Perfect Integration of Accessories Make Your Work Easier

## 1 HIGHLY ACCURATE HEATING STAGE

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The Leica MATS heating stage creates the best possible environment for living cells during microscopic analysis. With a tolerance of just  $\pm 0.2^{\circ}\text{C}$  between the stage and the specimen, experiments can be conducted quickly and reproducibly.

## 2 4× SLIDE ADAPTER

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When used together with the cross-stage or the IsoPro™ stage, it serves as the ideal addition for comparative analysis of up to four specimens on specimen slides.

## 3 "LIVE ON STAGE" PRODUCTS

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The Live on Stage product line (incubation systems, pH check, cell culturing systems and many more) for live cell imaging using Leica Inverted microscopes can now be used with Leica stereomicroscopes. This greatly extends the range of their applications.

## 4 ADAPTER FOR 120 MM INSERT

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This adapter for 120 mm diameter inserts can be used with accessories such as the gliding stage, cup stage, or even the polarization stage.

## 5 EXTERNAL COLD LIGHT SOURCES

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Leica offers a range of powerful external cold light sources such as the Leica KL1500 LED P and the Leica KL2500 LED. These provide a spectrum that is like daylight.

## 6 FATIGUE-FREE WORKING

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The Leica ErgoRest™ armrest gives comfort to the user, especially beneficial for long experiments. The lower arm is effectively supported to relieve fatigue.

## 7 FOOTSWITCH

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If the experiment requires the use of both hands, the potentiometer-controlled footswitch is the perfect addition for controlling the stereomicroscope. The two rockers of the footswitch can control the functions of the motorized focus, zoom control, filter changer, and more.

## 8 MICROMANIPULATION

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A wide range of highly accurate micromanipulators is available for use with Leica stereomicroscopes. They are optimized for microinjection used in transgenic experiments, electrophysiological experiments, and many other applications.

## 9 MOVABLE STAGES

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Leica offers a number of movable stages, for example, the manual XY stage and the motorized IsoPro™ stage. Both can be quickly mounted on any of the transmitted light bases with the Slide-On™ motion.

	Leica TL3000 ST	Leica TL4000 BFDF	Leica TL4000 RC™	Leica TL4000 RCI™	Leica TL 5000 Ergo
<b>Light source</b>	Halogen lamp 12V/20W	Externally via cold light source	Externally via cold light source	Halogen lamp 12V/20W	LED Light Source
Illuminated field: Brightfield Ø	50 mm	40 mm	35 mm	35 mm	65 mm
Illuminated field: Darkfield Ø	50 mm <sup>1</sup>	40 mm	35 mm <sup>1</sup>	35 mm <sup>1</sup>	40 mm
Rottermann Contrast™ system (RC™)	–	–	Yes	Yes	Yes
CCIC (Constant Color Intensity Control)	–	Yes <sup>2</sup>	Yes <sup>2</sup>	Yes	– <sup>3</sup>
Internal shutter/lamp control	–	Yes <sup>4</sup>	Yes <sup>4</sup>	Yes	Yes
Remote control options	–	Yes <sup>4</sup>	Yes <sup>4</sup>	Yes	Yes
Integrated filter holder	Yes	–	Yes	Yes	Yes
Coated optics for increasing the color temperature	Yes	–	Yes	Yes	– <sup>3</sup>
Adaption to high numerical apertures	–	–	Yes <sup>5</sup>	Yes <sup>5</sup>	Yes
Quick illumination changeover	Yes	–	–	Yes	– <sup>3</sup>
Anti-Shock™ pads	Yes	Yes	Yes	Yes	Yes
Size (W×H×D, in mm)	340 × 430 × 85	340 × 390 × 90	340 × 390 × 95	340 × 440 × 95	412 × 341 × 46
<b>Accessories</b>					
IsoPro™ cross-stage support	–	Yes	Yes	Yes	–
Integrated heating stage (optional)	Yes	Yes	Yes	Yes	Yes
Integrated slide adapter (optional)	Yes	Yes	Yes	Yes	Yes
ErgoRest™ (optional)	Yes	Yes	Yes	Yes	–

<sup>1</sup> One-sided   <sup>2</sup> For LED light sources with constant color temperature   <sup>3</sup> Function with LED light source no longer necessary   <sup>4</sup> With Leica KL1500 LED Plus / KL2500 LED   <sup>5</sup> Concave mirror

The statement by Ernst Leitz in 1907, “with the user, for the user,” describes the fruitful collaboration with end users and driving force of innovation at Leica Microsystems. We have developed five brand values to live up to this tradition: Pioneering, High-end Quality, Team Spirit, Dedication to Science, and Continuous Improvement. For us, living up to these values means: Living up to Life..

### INDUSTRY DIVISION

The Leica Microsystems Industry Division’s focus is to support customers’ pursuit of the highest quality end result. Leica Microsystems provide the best and most innovative imaging systems to see, measure, and analyze the microstructures in routine and research industrial applications, materials science, quality control, forensic science investigation, and educational applications.

Leica Microsystems – an international company with a strong network of worldwide customer services:

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