Leica DM4000–6000

Brilliant, Easy Imaging at the Speed of Light!
The New Generation of Leica Digital Microscopes for Biomedical and Industrial Research
Brilliant, Easy Imaging
at the Speed of Light!

Innovative design and technological excellence
At first glance: a clear, attractive design. Looking through the microscope for the first time: fascinating insights. The Leica DigitalMicroscope family. Unrivaled image brilliance and image contrast in this class of microscope – the Leica DM4000 B LED through DM6000 B for life science and clinical research and the Leica DM4000 M LED and DM6000 M for industrial research.

New standards for ease of use
Work quickly and effortlessly with Leica’s new generation of DigitalMicroscopes. Complex analysis sequences at the microscope are easily automated. All microscope and camera parameters are quickly and easily saved, which makes the microscope easy to reset to exactly the same status at any time.

Work the way you choose
The new, external Leica STP6000 SmartTouch Panel offers a new level of operational freedom. All automated microscope functions can be set from the SmartTouch external control panel. The panel provides the same graphical user interface as Leica Application Suite (LAS) software.

User-friendly through ergonomics
Ergonomics is a word often heard to describe ease of use. With Leica DigitalMicroscopes, ergonomic design means a user-friendly microscope system that you can actually feel. Working closely with the Fraunhofer Institute*, Leica designed these microscopes to not only exceed the latest technical standards, but also to meet the highest standards of ergonomic design.

Software seamlessly integrates the entire microscope system
Leica Application Suite (LAS) software completely integrates the camera and microscope controls. With its modular design, LAS consists of various modules that can be added at any time to meet future research requirements. LAS allows the user to evaluate data quickly and reproducibly, and to easily archive data. Future Leica microscope software and hardware components will also be controlled using the intuitive LAS user interface.

* The Fraunhofer Institute IAO (Stuttgart, Germany) investigates ergonomic aspects of various products. The institute works with partners in industry to develop industrial designs that meet the most demanding ergonomic requirements.
Automated transmitted light axis

Excellent results with ease
Obtain reliable results faster with Leica’s intelligent, automated transmitted light axis:
– motorized aperture and field diaphragm
– motorized shutter
– Constant Color Intensity Control (CCIC)

Light manager
The Leica DigitalMicroscopes are outfit with automatic Köhler light management. The microscope detects the objective and the contrast method, and then automatically sets the best values for aperture, field diaphragm, and light intensity. The user can adjust these values at any time. Modified settings are automatically stored and imported as the microscope’s new default values.

Constant Color Intensity Control (CCIC)
Leica’s CCIC module (DM5000-6000) filters out red and orange hues at low lamp voltages and runs (unnoticeably) in the background. CCIC maintains the color temperature at a constant 3200 K. The white balance that is normally required for digital camera use is now a thing of the past. With the new Leica DM4000 LED microscopes, the transmitted light LED illumination provides constant color temperature at all light intensity levels.

Filter magazine
Almost completely unnecessary with CCIC, the mechanical filter magazine for two filters that is inserted into the beam path manually.

Automated fluorescence axis

1. Automated transmitted light axis

2. Automated fluorescence axis

Brilliant fluorescence at the press of a button
Leica’s fluorescence axis reveals brilliantly-colored specimens at the press of a button:
– motorized fluorescence filter changer, field diaphragm and shutter.
– fluorescence intensity management (FIM)
– fast internal filter wheel (IFW)

Leica FIM (Fluorescence Intensity Management)
Leica FIM, a unique innovation, provides fast, accurate, and reproducible adaptation of the fluorescence intensity. Pinhole diaphragms of varying translucence are placed on the FIM aperture disk. The intensity of the excitation light can be reduced in five stages: from 100% to 55%, 30%, 17%, to a low of 10%. Advantages include absolute reproducibility, faster intensity change, and reduced specimen bleaching. A separate FIM level can be saved in order to adjust different fluorescence intensities for each fluorescent filter.

Motorized shutter
The FIM disk also features a fast shutter that stops fluorescence excitation in less than 0.1 seconds.
Motorized Excitation Manager
The Excitation Manager is used to balance fluorescence when viewing multiple probes simultaneously. It offers sixteen steps for reproducible attenuation of red or green-emitting fluorescence.

Fast Internal Filter Wheel (IFW)
Leica’s IFW controls single excitation channels when using a dual or triple fluorescence cube. This allows much faster color changes for almost all fluorescence proteins.

Motorized field diaphragm
The motorized disk in the field diaphragm level features six round and square field stops of various sizes, which can be saved separately for every filter cube. When using a digital camera, the square field stops best match the image section to the chip size of the camera. Advantages: Leica’s motorized disk prevents bleaching of prepared sections that have not yet been imaged and improves the signal-to-noise ratio.

Motorized fluorescence turret
The fluorescence turret is available as a 5-cube or 8-cube model. Both work with the same filter cube size for easy switching between instruments. The switch between filter positions takes less than 0.5 seconds. The user can select continuous change, move directly to an individual cube, or a combination of both.

Booster lens
If more fluorescence light is needed, simply switch the fluo booster into the beam path. The booster lens immediately increases the fluorescence by 30%.

3. Automated industrial axis
Every industrial sample is viewed in the correct light.
Experience the comfort of using Leica’s industrial axis, which makes work at the microscope much easier:
- motorized reflector disk accommodates up to four reflector or fluorescence cubes
- motorized pinhole disks in the aperture stops and illuminated field diaphragm level

Motorized aperture diaphragm
The aperture diaphragm features a motorized disk with eleven stops of various sizes that can be saved separately for every objective. The aperture openings can be varied between 5% and 100% — and reproduced at any time.

Motorized field diaphragm
The field diaphragm features a motorized disk with four round and two square field stops of various sizes that can be saved separately for every objective. Similar to the fluorescence axis, square field stops are recommended for work with digital cameras to match the image section to the camera’s chip size.

Motorized reflector turret
The reflector turret is available as a 4-cube model. Two positions are reserved for a Smith reflector and DF (darkfield) cubes; the remaining positions can be used as desired. Switching between two filter cubes takes less than 0.5 seconds.
4. Focus drive

Sharp images – focus adjustments are perfectly simple
The manual Leica DM4000* and DM5000 Microscopes both feature a mechanical, 2-speed gear system. The left side of the stand has a conventional focus knob for coarse and fine focus adjustment. The flat focus knob on the right side of the stand for fine focus adjustment ensures comfortable operation:
– single-handed operation of the focus and stage drives
– work ergonomically with a symmetrical body position

* The Leica DM4000 M LED is optionally available with motorized focus drive

Focus once – always in focus
The automated Leica DM5500 and DM6000 Microscopes are both outfit with a motorized focus drive for fast focus, which does not require additional, manual adjustment. The electronically-controlled focus drive has five speeds, and a different speed can be set for every objective. For individual, manual focusing, a coarse focus mode is available. Parfocal compensation can be saved for all objectives. For a higher degree of user safety and comfort, the user can define a bottom z-threshold and save the focus position.

6. Overview objective 1.25x

The best panorama view
New overview objective 1.25x. Available in a pure reflected light version for material sciences and as a reflective/transmission version for biological applications.

7. Variable function buttons

All microscope functions under control
Conveniently located, intuitive operation: three separate function buttons are located behind the right and left manual focus knobs. The user can program these buttons to perform any desired function. Additional programmable function buttons are located on the Leica SmartMove remote control and on the external Leica STP6000 SmartTouch Panel control.

Contrast manager
Leica DigitalMicroscopes make changing contrast methods easier than ever before. Simply press a pre-programmed function button, and the selected contrast method is automatically set. The appropriate light rings, prisms or darkfield stops are automatically set. Also, the aperture diaphragm, field diaphragm, and light intensity are set.
The DIC (differential interference contrast) is also completely automated. Press one button and the objective prism, condenser prism, analyzer, and polarizer automatically swivel into place.

8. Displays

Everything in view
The new generation Leica DigitalMicroscopes are outfit with an easy-to-read LCD.

New: status display
The Leica DM4000 Microscope features a large, clear display that shows all of the settings at a glance – a unique feature in this class of microscope.

New: Leica SmartTouch
All automated components of the Leica DM5000 through DM6000 models can be quickly and intuitively controlled via the new Leica SmartTouch which is integrated into the stand.

9. Condensers

Never touch phase rings again
Leica DigitalMicroscopes automatically activate the correct light ring for the selected objective. The aperture diaphragm for the perfect phase contrast image is also automatically opened. All condensers feature automated condenser buttons and are fully effective from 1.25x to 100x magnification.

BF (Brightfield) Condenser
Leica’s BF condenser has been specially developed for brightfield applications and is particularly useful for materials analysis.

PH (Phase Contrast) Condenser
Leica’s PH condenser is ideal for phase contrast and is also suitable for brightfield and darkfield. New: a separate light ring can be used for every objective, which makes centering unnecessary when changing objectives.

DIC (Differential Interference Contrast) Condenser
Leica’s DIC condenser enables operation of fully automated DIC with an integrated, motorized polarizer. The DIC condenser can also be used for brightfield, darkfield, and phase contrast methods in materials science and biomedical applications.

10. DIC concept

Semi-automated, or …
The Leica DM4000 M LED Microscope for materials sciences is outfit with a manual turret for objective prisms. Together with a motorized polarizer and analyzer, the system enables semi-automated reflective interference contrast.

… Fully automated
The Leica DM5000 through DM6000 DigitalMicroscopes feature unique fully automated DIC. The Electronically-controlled prism disk has up to three objective prisms. The correct objective, and if applicable – condenser prisms, automatically move into the beam path. The polarizer and analyzer adjust also. The fine adjustments for objective prisms are saved for every objective and are reproducible at any time.
11. Tubes

The optimum view
Leica’s family of tubes have been specifically designed to offer a variety of options to Leica DigitalMicroscope users:

- **BT25**, basic binocular tube – the entry-level model
- **AET22**, ergonomic tube for demanding work in the laboratory
- **EDT22 F50/50**, ergonomic tube for documentation
- **BDT25+ V100/50/0**, documentation tube specifically for reflective and fluorescence methods

**MBDT25+ V100/50/0**, motorized documentation tube with three settings (100/50/0) and optionally, one or two camera outputs; also available as a manual model (BDT25+ V100/50/0).

**AET22**, ergonomic tube with variable tube optics (5°–32°) and a 30 mm eyepiece extension. Also available as a documentation tube without eyepiece extension (EDT22 F50/50).

12. Stages and specimen holders

The best stage movement
The Leica DigitalMicroscope line features stages and specimen holders that meet the highest ergonomic standards. All microscope stages are ceramic-coated and are outfitted with telescopic stage controls. The stage drive torque can be adjusted separately for x and y. Leica’s 6” stages for materials analysis feature an additional fast adjustment mechanism. The rack in the x-direction has been replaced by a belt drive for working at the microscope in comfort.

The motorized stage operates with a stepper motor and features a working range of 76 x 50 mm. The stage movement adjusts to the magnification of the objective. Similar to the focus drive, the motorized stage can be switched to a “fast mode.” A number of stage positions can be saved to re-locate an area of interest on the specimen, quickly and accurately.

13. Leica SmartMove

Quickly select the correct settings
The microscope user can control all three axes of the microscope (x,y: stage; z: focus) with the Leica SmartMove remote control. Additional microscope functions can also be assigned to four function buttons.

14. Leica STP6000 SmartTouch Panel

Control the microscope from any position
The new Leica STP6000 SmartTouch Panel can be used to completely and conveniently control the microscope from any position at the laboratory workstation. All automated functions can be set intuitively from the external control panel. The SmartTouch Panel provides the same graphical user interface as LAS (Leica Application Suite) software. The SmartTouch Panel also offers a focus wheel for fine and coarse adjustment, controls for x,y stage adjustments, and eleven programmable function buttons. This provides easy, convenient control of all functions with just one module.

Leica SmartMove remote control is used to control the x, y, and z settings.

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## Specifications

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### Notes
- BF, DF, POL (x) (x)
- DIC (automated) (x) (x)

*SL7000 for DM4000-B 400 M*
Leica Microsystems operates globally in three divisions, where we rank with the market leaders.

**LIFE SCIENCE DIVISION**
The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement, and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems’ customers at the leading edge of science.

**INDUSTRY DIVISION**
The Leica Microsystems Industry Division’s focus is to support customers’ pursuit of the highest quality and 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.

**MEDICAL DIVISION**
The Leica Microsystems Medical Division’s focus is to partner with and support surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

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

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<th>Active worldwide</th>
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