



Leica DM Series

Simply Microscopy!

Technical information on the
new Leica DigitalMicroscopes

Leica
MICROSYSTEMS

Simply Microscopy!

The Exterior: New Technology in a New Design

The first thing you will notice about our new DigitalMicroscopes is their new design: clear, attractive contours.

Looking Through the Microscope: Fascinating Insights

Once you have seen a sample through one of these new microscopes, you will never want to use any other. No microscope in this class can offer better image brilliance, field depth and contrast.

Just Rely On Your Intuition

Our new Leica DM DigitalMicroscope series provides the answers to many of our customers problems. One of the most frequently voiced requests was to lighten the workload. So we found ways of doing a lot of the work for you. You can operate the microscope intuitively and easily automate complex routines to suit your specific needs.

Experts Call it Ergonomics. We Call it User-Friendly

Ergonomics is a word often used. On our new microscopes you can actually feel it. Cooperating closely with the Fraunhofer Institute*, our designers have not only outperformed the latest technological standards but also all the ergonomic specifications.

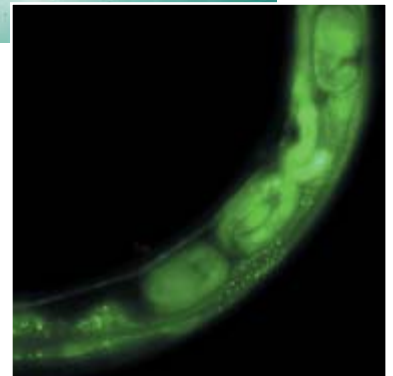
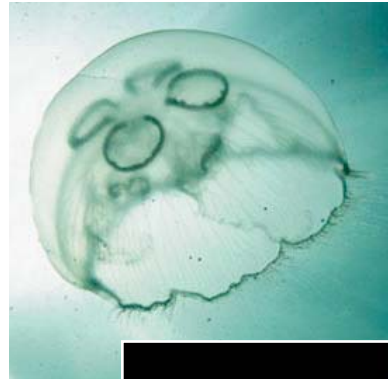
We offer a range of products that has everything

Whatever you need for your diagnoses or research we can provide: the microscopes, cameras and also the software for processing and archiving the data.

New software that connects everything together

Along with the new Leica DM DigitalMicroscope series we also offer a completely new, Leica-developed software concept. Now all our hardware and software components run together under the same integrated user interface.

*The Fraunhofer Institute IAO in Stuttgart tests products for their ergonomic characteristics. In cooperation with partners in industry they develop industrial designs that meet the highest ergonomic demands.



GFP expression in *C. elegans*.
Courtesy of Dr. M. Morcos, Heidelberg, Germany



Leica DM4000 B with the basic BT25+ tube in a configuration for fluorescence and with the new fully motorised phase contrast condenser



Fully automated transmitted light axis 1



The light manager is conveniently positioned and easy to access on the left side of the microscope. It can be used to change the Köhler settings for light intensity, aperture and field diaphragm and to save them.



CCIC is located at the rear end of the transmitted light axis. The rotating disk with continuous color and scatter filters moves depending on the selected lamp voltage and keeps the color temperature constant.

1. Fully automated transmitted light axis

At the newly developed transmitted light axis, the following components are fully automated:

- motorized iris shutters in the aperture and field diaphragm level
- motorized shutter
- Constant Color Intensity Control (CCIC)

Illumination manager

The new Leica DM Series has an integrated Köhler control system. The microscope detects the selected objective and contrasting method and automatically sets the optimum values for aperture, field diaphragm and light intensity.

These values can be customized for your personal requirements at any time. The modified settings are automatically saved and used as the new default values.

Constant Color Intensity Control (CCIC)

A routine runs fully automatically – in the background – to filter out red and orange components of the light at low lamp voltages. The color temperature is maintained at a constant 3200 K – the obligatory white balance for digital cameras is a thing of the past.



Filter magazine

With the CCIC nearly superfluous: mechanical filter magazine for two filters (D= 32 mm), which are manually positioned in the optical path.

2. Fully automated fluorescence axis

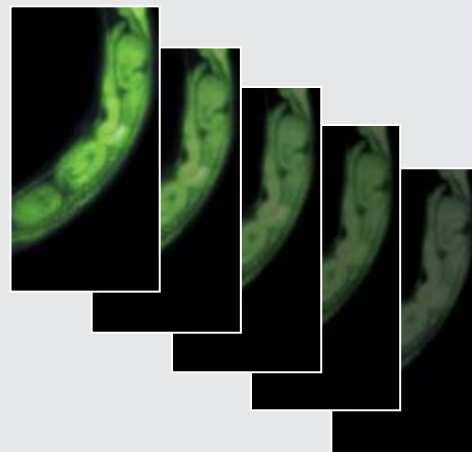
At the newly developed fluorescence axis, the following components are fully automated:

- motorized fluorescence turret for filter cube
- motorized pinhole disk in the field diaphragm level
- motorized shutter
- Fluorescence Intensity Manager

Leica FIM

(Fluorescence Intensity Management)

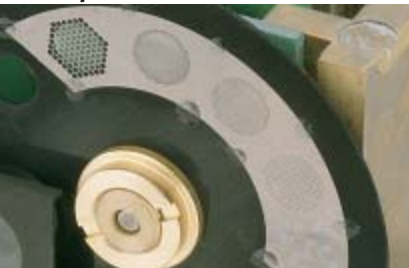
FIM consists of a diaphragm disk with pinhole diaphragms of varying transmission capacities. The intensity of the excitation light can be reduced in five fixed steps. The light can be changed from 100% to 55%, 30% and 17% down to 10%. The advantage of this procedure: absolute reproducibility and fast switching between intensity levels. A separate FIM level can be stored for every fluorescence filter. Different intensities of fluorescence can thus be harmonized.



Motorized shutter

The fast shutter (closure less than 0.1 seconds) is also on the FIM disk.

Fully automated fluorescence axis 2



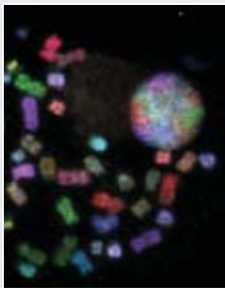
The motorized FIM disk is in the aperture level of the axis. The light can be reduced in fixed steps with the pinhole diaphragms of varying transparency. The homogeneity of the illumination is increased at the same time.

Motorized field diaphragm

At the field diaphragm level there is a motorized disk with six round and six rectangular field diaphragms of various sizes. Rectangular field diaphragms are recommended for use with digital cameras to match the image section with the chip size of the camera. Advantages: It prevents unphotographed preparation sections from bleaching and the signal-to-noise ratio is improved by reducing scattered light.

Booster lens

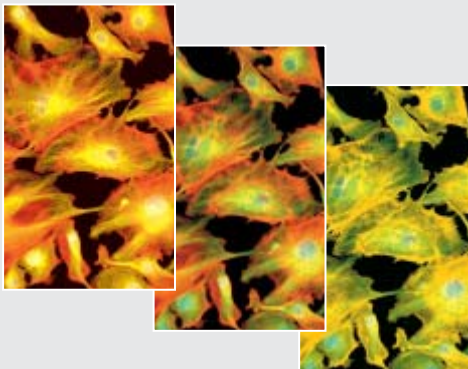
Amplification of excitation light – also very simple in future: a booster lens can be inserted into the optical path from outside. It can increase the fluorescence by up to 30%.



Metaphase-spread FISH – stained chromosomes
Photo: Dr. Yumiko Suto, Laboratory of Human Evolution Graduate School of Frontier Sciences, The University of Tokyo

Excitation Manager

Multiple excitations can be shown well-balanced with the Excitation Manager. It can be used to filter out glare from specific excitations.



BG38 Filter

The BG38 is now superfluous. We have integrated it into the fluorescence cubes for which it is required.

Motorized fluorescence disk

The fluorescence turret is available as a 5-fold and also – Leica DM5000 B and DM 6000 B – as an 8-fold version. All turrets operate with the same filter cube size, so cubes can easily be interchanged between different disks. It takes less than half a second to switch between two filter blocks. The user can select continuous filter cube change, direct addressing of single cubes or a combination of the two.

3. Fully automated industrial axis

At the newly developed industrial axis, the following components are fully automated:

- motorized reflector disk for reflector cubes
- motorized pinhole disk in the aperture diaphragm level
- motorized pinhole disk in the field diaphragm level
- motorized shutter

Motorized aperture diaphragm

At the aperture diaphragm level, there is a motorized disk with 11 openings of various sizes, which can be saved separately for every objective. This allows aperture openings from 5% to 100% to be approached, and can be reproduced at any time.

Motorized field diaphragm

At the field diaphragm level, there is a motorized disk with four round and two rectangular field diaphragms of various sizes, which can be saved separately for each objective. Like the fluorescence axis, rectangular field diaphragms are recommended for use with digital cameras to match the image section with the chip size of the camera.

3 Fully automated industrial axis



The aperture disk in the field diaphragm level offers fast and reproducible switching between various positions.

Focus drive 4



The close-by positioning of focus and stage drive makes single-handed operation of x, y and z quite simple.

Objective nosepiece 5



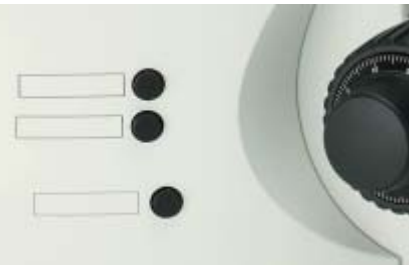
Coded objective nosepiece DM4000 B: 6x; M25

Overview objective 1.25x 6



The new 1.25x objective with high field depth and optimum illumination.

Variable function buttons 7



Intuitive operation: the new variable function buttons, which can be customized with personal functions.

Motorized reflector disk

The reflector disk is available for use with up to 4 cubes. Of these, 2 fix mounted positions are reserved for Smith reflectors, BF or DF cubes; the remaining positions can be used as desired. It takes less than half a second to switch between two filter blocks.

4. Focus drive

The Leica DM4000-5000 stands have a mechanical two-speed planetary gear box. On the left side of the stand you can find a conventional focus button for coarse and fine adjustment. On the right side there is a flat fine-focus button specially designed for ergonomic operation:

- one-hand operation of focus and stage operation
- relaxed working with symmetrical body attitude

Leica DM6000 stands have a motorized focus drive. The drive can be set electronically to 5 different increments. A separate step increment can be set for each objective. For a quick focus movement, the user can switch to the "coarse mode." Of course, a parfocality calibration can be saved for each objective. To guarantee maximum safety and comfort, the user can also save a lower Z threshold and the focus position.

5. Objective nosepiece

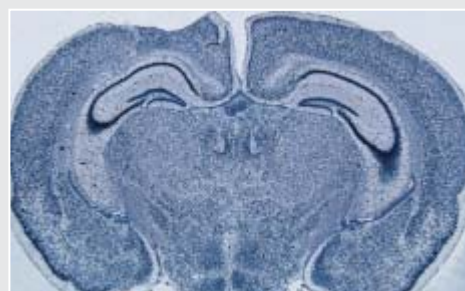
Leica DM4000-5000 stands have absolute encoded, manually operated objective nosepieces:

- Leica DM4000 B: 6x; M25 thread
- Leica DM4500 B: 7x; M25 thread
- Leica DM5000 B: 7x; M25 thread
- Leica DM4000 M: 6x; M32 thread

The objective nosepieces of the Leica DM6000 stands are absolute encoded and motorized.

- Leica DM6000 B: 7x; M25 thread
- Leica DM6000 M: 6x; M32 thread

The implemented objectives can be used in 2 different modes: the customer can switch between dry and immersion mode. When one mode is activated, the use of objectives of the other mode is blocked automatically, thus reliably preventing immersion oil from coming into contact with the front lens of a dry objective!



6. Overview objective 1.25x

The new overview objective 1.25x: Outstanding field depth, brilliant resolution and perfectly homogeneous illumination ensure excellent results for photographs taken at low magnifications.

7. Variable function keys

Intuitively positioned and simple to operate: three customizable function keys are placed on each side behind the right and left focus wheel. The user can assign any desired functions to these keys.

Additionally, the Leica DM6000 stands have 4 function keys, which are located on the well-known Leica SmartMove control unit. These can also be programmed individually.

Contrast manager

With the new Leica DM Series, changing the contrasting methods is easier than ever before. Just press one of the variable function keys and the selected contrast is automatically set. This naturally covers more than just setting the appropriate light rings, prisms or dark-field stops; it also includes automatic calibration of aperture diaphragm, field diaphragm and light intensity. We have also completely automated the DIC. For you, this means that you only have to press one button – and objective prism, condenser prism, analyzer and polarizer are all automatically switched into the light path.

8. Displays

All units have LC displays that show all important information at a glance.

Information display

Leica DM4000 B/4500 B and DM4000 M have an LC display that shows information on the current settings of the instrument.

LeicaScreen

Leica DM5000 B, DM6000 B and DM6000 M have a touch-sensitive display, which shows information on current settings. In addition, all automated modules can be controlled. Just by pressing the touch-sensitive field for the contrasting methods, the user can, for example, get an overview of which mode is actually in use and can switch from one contrasting method to another.

9. Condensers

For our new automation concept, we have developed condensers that meet all requirements. All condensers have automated condenser heads and are continuously effective from 1.25x to 100x.

Condenser BF

This condenser has been specially developed for applications in bright field and is used particularly in materials but also biological applications.

Condenser PH

The condenser PH has been developed for phase-contrast applications and can also be used for bright field, dark field and partially automated DIC. New: a separate light ring can be used for every objective, making centring unnecessary when changing objectives.

Condenser DIC

This condenser enables fully automated DIC with the integrated motorized polarizer. It can also be used for bright field, dark field and phase contrast.

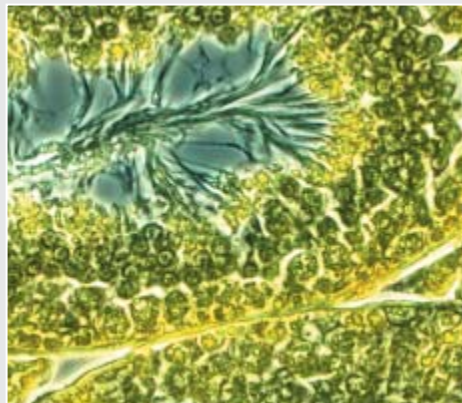
10. DIC concept

Leica DM4000 M/DM4500 B

These stands are equipped with a mechanical slider for objective prisms (not pictured). Together with the motorized polarizer and analyzer, and – in the case of the Leica DM4500 B – motorized condenser prisms, this allows you to perform a partially automated DIC.

Leica DM5000 B/DM6000 B/DM6000 M

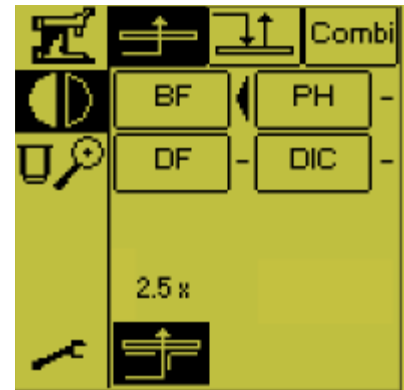
These stands have an automated prism disk for up to 3 objective prisms, and thus have a fully automated DIC. The objective prisms' fine adjustment is done electronically. For you this means: the fine adjustment of the prisms is stored separately for every objective and can be reproduced at any time.



8 Displays



In the Leica DM4000 Series' display, information on contrasting method, magnification and Köhler settings can be read at a glance.



Contrasting method-page of the LeicaScreen. Contrast can be changed here by simply pressing a button.

9 Condensers



Open condenser PH with bolt-on surface for the condenser head and motorized condenser disk.

Tubes 11



BDT25+ V100/50/0, documentation tube with 3 settings (100/50/0) and optionally one or two camera outputs. Also available as a motorized model as MBDT25+ V100/50/0.



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

Stages and slide holders 12



Bio I stage, travel distance 76 x 25 mm, 110° rotation, with single-hand slide holder



Industry stage, travel distance 76 x 50 mm, 110° rotation, with industrial slide holder

11. Tubes

A new range of tubes including ergo and documentation tubes has been developed specially for the new DM Series.

BT25+, binocular basic tube – our introductory model

AET22, the convenience tube for the highest demands

EDT22 F50/50, the ergonomic tube for documentation

BDT25+ V100/50/0, the documentation tube specially for fluorescence

MBDT25+ V100/50/0, the motorized model of the BDT25+

12. Stages and slide holders

New stages and slide holders that meet the most demanding ergonomic requirements have also been developed for our new range of microscopes. All stages are ceramic-coated and have telescopic drives.

The drive torque can be separately adjusted – without tools – for x and y. The rack in the x-axis has been replaced with a v-belt to guarantee working without injury.

Left-handed stages are available on request.

The Leica DM6000 stands work with a motorized stage with stepper motor and a travel distance of 76 x 50 mm.

For each objective, a separate step increment (= speed) can be saved for the stage movement. And, similar to the focus drive, the user can switch to a "Fast Mode" for quick travel.

To find particularly interesting specimen areas both quickly and accurately, the user can save up to 6 stage positions and recall them later.

13. Leica SmartMove

The well-known Leica SmartMove remote control: with this unit, all 3 axes of the microscope (x,y: stage; z: focus) can be controlled. Various microscope functions can be programmed using the 4 function keys.



Specifications

			DM4000 B	DM4500 B	DM5000 B	DM6000 B	DM4000 M	DM6000 M
Stand	Power supply	– integrated into the stand – in Electronics box	x	x	x (CTR5000)	x (CTR6000)	x	x (CTR6000)
	Display	– Display (3,7 x 7,7 cm) – LeicaScreen (7,3 x 7,3 cm)	x	x	x	x	x	x
	Interfaces	– 1x RS 232	x	x	x	x	x	x
Operation	Focus	– mechanical – 2-gear drive	x	x	x		x	
		– motorized – 5 electronic transmissions – including parfocality function – switching between coarse and fine mode – storage space for 2 z positions				x		x
	Objective nosepiece	– absolute encoded	x	x	x	x	x	x
		– motorized – including dry and immersion mode				x		x
		– 6-fold M25 thread – 7-fold M25 thread – 6-fold M32 thread	x	x	x	x	x	x
	Stage	– motorized – Stepper motor – Toggling between fast and precise mode – incl. storage space for 6 stage positions				x		x
		– mechanical – ceramic-coated – y-drive with cable control – telescopic stage drive – adjustable torque – 110° rotation – optional left-hand version	x	x	x	(x)	x	(x)
	Control elements	– 6 freely programmable function keys	x	x	x	x	x	x
		– SmartMove – Control elements for z (focus) movement – Control elements for x,y (stage) movement – 4 freely programmable function keys				x		x
TL-axis	Illumination	– 12V 100W halogen lamp	x	x	x	x	x	x
	Automation	– illumination manager (light intensity, aperture and field diaphragms) – contrast manager – Constant Color Intensity Control (CCIC)	x	x	x	x	x	x
	Contrasting methods	– BF – PH – DF – POL – DIC (partially automated) – DIC (automated)	x	x	x	x	(x)	(x)
Fluorescence axis	mot. filter disk	– 5-fold – 8-fold	x	x	x	x		
	Illumination	– 100W Hg lamp – 50W Hg lamp	x	x	x	x		
	Automation	– illumination manager FIM (light intensity) – contrast manager (field diaphragm) – round and rectangular field diaphragms for eyepiece and camera observation	x	x	x	x		
RL axis	mot. filter disk	– 4-fold – 2 fixed positions – 2 interchangeable positions					x	x
	Illumination	– 12V 100W halogen lamp – 100W hg lamp – 50W hg lamp					x	x
	Automation	– illumination manager (light intensity, field and aperture diaphragms) – contrast manager – round and rectangular field diaphragms for eyepiece and camera observation					x	x
	Contrasting methods	– BF – DF – DIC (partially automated) – DIC (automated) – POL					x	x
Condenser	Automation	– mot. condenser head – 7-fold condenser disk, motorized (optional) – Polarizer, motorized (optional)	x	x	x	x	x	x
			x	x	x	x	(x)	(x)
			x	x	x	x	(x)	(x)

Leica Microsystems – the brand for outstanding products

Leica Microsystems' mission is to be the world's first-choice provider of innovative solutions to our customers' needs for vision, measurement, lithography and analysis of microstructures.

Leica, the leading brand for microscopes and scientific instruments, developed from five brand names, all with a long tradition: Wild, Leitz, Reichert, Jung and Cambridge Instruments. Yet Leica symbolizes innovation as well as tradition.

The companies of the Leica Microsystems Group operate internationally in four business segments, where we rank with the market leaders.

● Microscopy Systems

Our expertise in microscopy is the basis for all our solutions for visualization, measurement and analysis of microstructures in life sciences and industry. With confocal laser technology and image analysis systems, we provide three-dimensional viewing facilities and offer new solutions for cytogenetics, pathology and materials sciences.

● Specimen Preparation

We provide comprehensive systems and services for clinical histo- and cytopathology applications, biomedical research and industrial quality assurance. Our product range includes instruments, systems and consumables for tissue infiltration and embedding, microtomes and cryostats as well as automated stainers and coverslippers.

● Medical Equipment

Innovative technologies in our surgical microscopes offer new therapeutic approaches in microsurgery.


● Semiconductor Equipment

Our automated, leading-edge measurement and inspection systems and our E-beam lithography systems make us the first choice supplier for semiconductor manufacturers all over the world.

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

Australia:	Gladesville	Tel. +61 2 9879 9700	Fax +61 2 9817 8358
Austria:	Vienna	Tel. +43 1 486 80 50 0	Fax +43 1 486 80 50 30
Canada:	Richmond Hill/Ontario	Tel. +1 905 762 2000	Fax +1 905 762 8937
Denmark:	Herlev	Tel. +45 4454 0101	Fax +45 4454 0111
France:	Rueil-Malmaison	Tel. +33 1 473 285 85	Fax +33 1 473 285 86
Germany:	Bensheim	Tel. +49 6251 136 0	Fax +49 6251 136 155
Italy:	Milan	Tel. +39 0257 486.1	Fax +39 0257 40 3273
Japan:	Tokyo	Tel. +81 3 5435 9600	Fax +81 3 5435 9615
Korea:	Seoul	Tel. +82 2 514 65 43	Fax +82 2 514 65 48
Netherlands:	Rijswijk	Tel. +31 70 4132 100	Fax +31 70 4132 109
People's Rep. of China:	Hong Kong	Tel. +852 2564 6699	Fax +852 2564 4163
Portugal:	Lisbon	Tel. +351 21 388 9112	Fax +351 21 385 4668
Singapore		Tel. +65 6779 7823	Fax +65 6773 0628
Spain:	Barcelona	Tel. +34 93 494 95 30	Fax +34 93 494 95 32
Sweden:	Sollentuna	Tel. +46 8 625 45 45	Fax +46 8 625 45 10
Switzerland:	Glattbrugg	Tel. +41 1 809 34 34	Fax +41 1 809 34 44
United Kingdom:	Milton Keynes	Tel. +44 1908 246 246	Fax +44 1908 609 992
USA:	Bannockburn/Illinois	Tel. +1 847 405 0123	Fax +1 847 405 0164

and representatives of Leica Microsystems
in more than 100 countries.

 www.light-microscopy.com


LEICA
MICROSYSTEMS