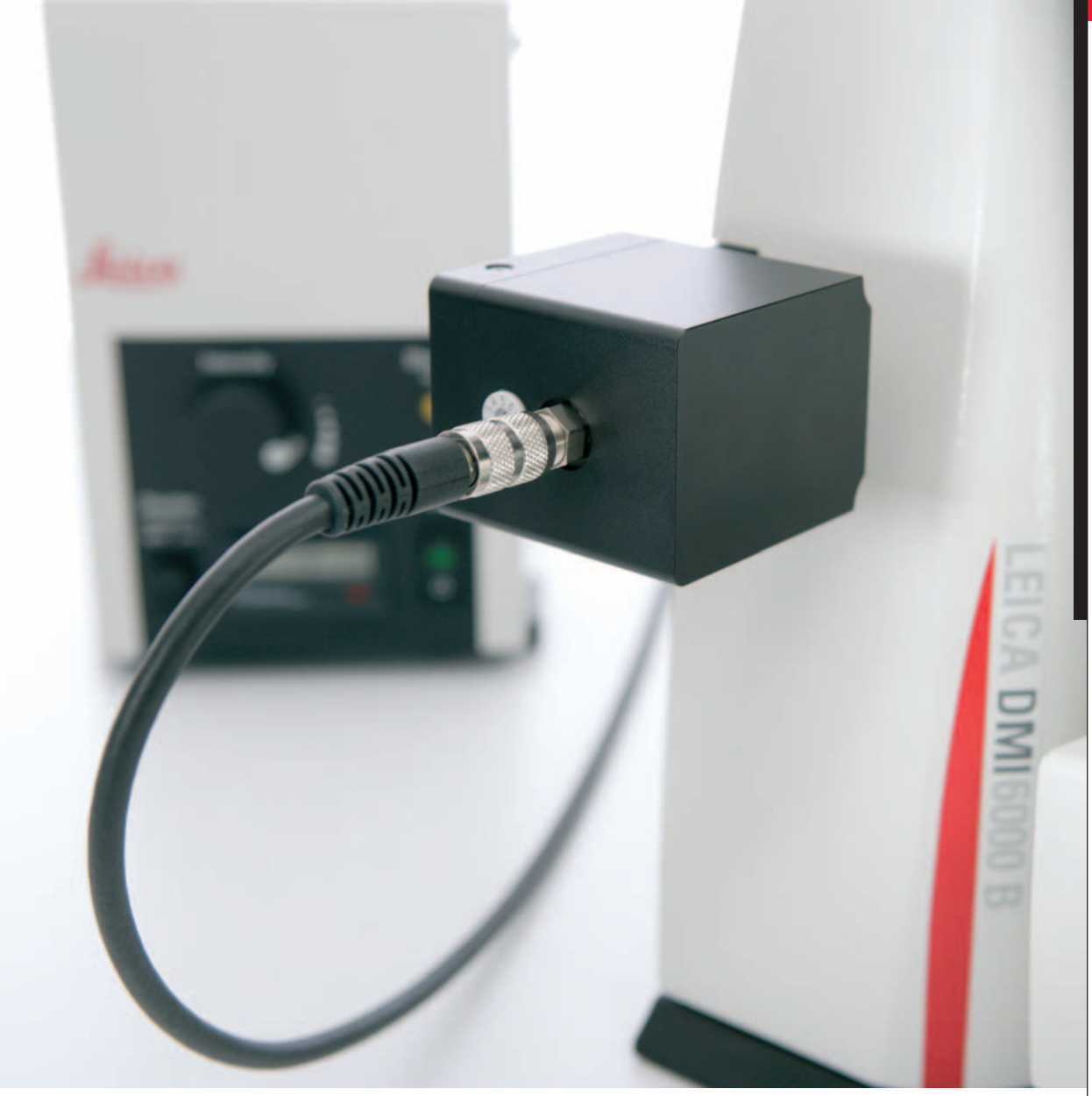

Fluorescence at the Speed of Life

Leica's Ultra-Fast Filter Wheels for Live Cell Imaging

Living up to Life

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Fluorescence at the Speed of Life

Introducing Leica's fluorescence light source combined with new (external) Fast Filter Wheels for excitation, attenuation, and emission control

Powerful solutions for fluorescence microscopy

Leica Microsystems continues to develop innovative, powerful instrumentation and accessories to help advance research using fluorescence microscopy. The Leica EL6000 External Light Source is a prime example; designed to provide precise control of fluorescence experiments and ease-of-use.

- Long-life (+2000 h) metal halide lamp is a cost-effective and time-saving solution
- Homogenous fluorescence images are ensured since the lamp needs no alignment
- Easily attenuate the excitation light intensity via the integrated diaphragm
- The power supply is placed away from the microscope so there is no heat transferred to the stand, stage or climate chamber

New for the Leica EL6000: Fast Filter Wheels

Leica's new external filter wheels combine ultra-speed (10–30 ms switching) and low-vibration movement to allow fast change of excitation light, selection of emission light, and individual attenuation of excitation colors.

Motorized excitation filter wheel slides are inserted into the Leica EL6000's liquid light guide adapter. A variety of excitation filter sets are available to fit specific applications; from standard fluorescence to Calcium-ratioing to FRET.

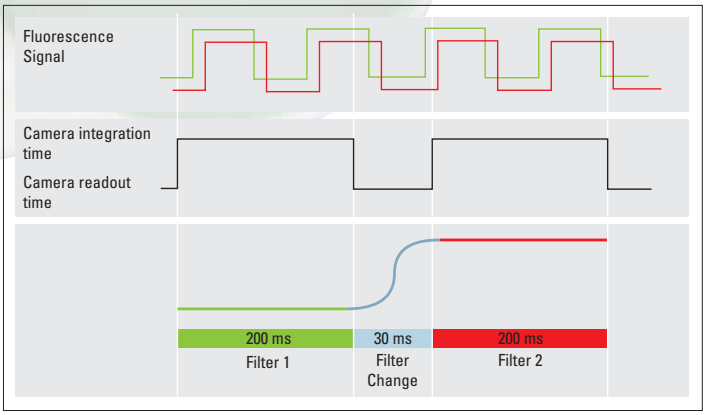
To control light output to the digital camera, emission filter wheel sliders can either be inserted into the microscope stand or into a specially designed C-mount coupler. Again, a variety of emission filter sets are available.

Enhanced speed

The fluorescence filters used with Leica's new Fast Filter Wheels are specially designed to be lightweight and small in diameter. This design allows extremely fast filter switching and minimal vibration; the end result is very accurate imaging.

Leica has further improved the switching speed of these filters with completely integrated electronic control. Harmony is the key word, since the total attainable switching speed varies depending on a system's configuration. All system components such as filter wheels, electronics, firmware, software, and camera shutter speed influence the total imaging speed (Fig. below). With a completely integrated system from Leica, harmonization is assured from light source to camera to software!

The temporal resolution of fluorescence signals mainly depends on the switching times of the components. The processes should lie within the integration times of the camera if possible. Optimum values here are 10–30 ms. Leica filter wheels are able to meet these high requirements.

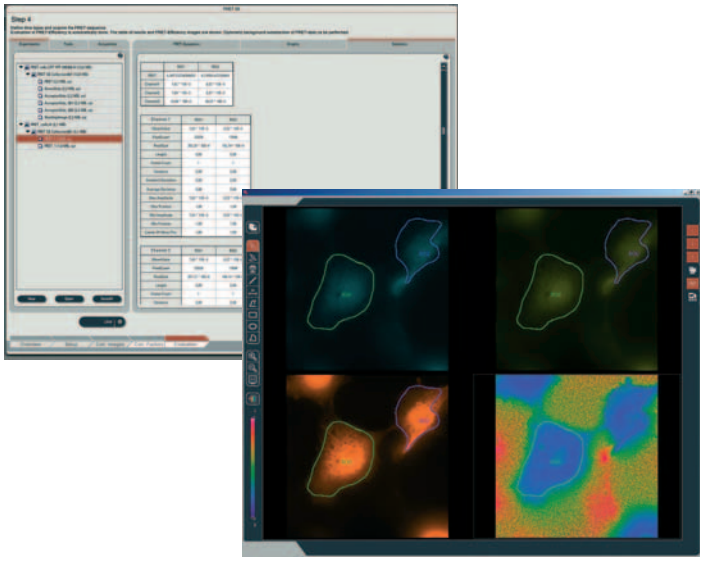


Ideal for complex life science applications

The fluorescence filter sets for each filter wheel are easily exchanged in order to address different applications. Leica offers tailor-made application packages of filters for complex life science applications. Software control of highly complex hardware systems is easily accomplished via Leica Application Suite (LAS) software or AF6000 fluorescence software. Both packages offer a streamlined user interface that guides users through experiments as opposed to simply providing a never-ending toolbar with drop-down menus. Each step of an experiment is defined from instrument set-up to post-image processing. Both LAS and AF6000 offer expansion modules that can be purchased as needed, allowing the user to define software functionality.

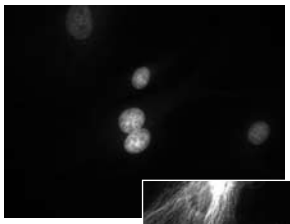
Calcium-ratio and FRET applications require speed and superior imaging performance

Filtering speed is key when conducting Ca++ and FRET experiments, but transferring that speed to the imaging device (digital camera) is just as important. Not only is Leica's solution harmonized from hardware to software, but Leica also offers a full complement of digital cameras including Leica brand, Hamamatsu, and Roper. The ability to select the correct imaging device for your experiment sets Leica apart from other sole-source providers.

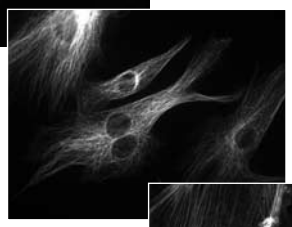


Available for use with many Leica microscope systems

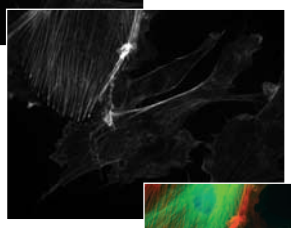
The Leica EL6000 fluorescence light source and its new external Fast Filter Wheel system can be adapted to both upright and inverted microscopes. As such, Leica high-speed imaging solutions offer performance for every budget. In addition to research grade microscopes, Leica offers a TIRF system that can also accept the Fast Filter Wheel accessories, allowing users to add functionality when needed. The AF6000 LX multi-dimensional, high-speed, live-cell system is another Leica product that can benefit from Fast Filter Wheels. In this scenario, the same instrument would be able to multi-task FRET plus high-speed, live cell experiments. For high-speed fluorescence imaging think Leica!



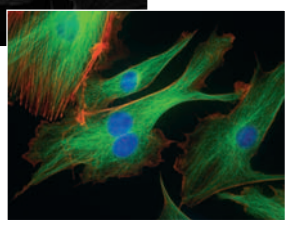
Nuclei with DAPI



Alpha-tubulin with Bodipy FL



Actin with Texas Red Phalloidin



Overlay image
Sample: BPAE
(Molecular Probes Fluo Cells #2)

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