

From Eye to Insight

Leica
MICROSYSTEMS

PRO CLASS FOR FLUORESCENCE

CCD Cameras Leica DFC7000 T and DFC7000 GT



Pro Class for Fluorescence

The DFC7000 cameras from Leica Microsystems are perfect work-horses:

The monochrome DFC7000 GT for demanding fluorescence applications, or the color DFC7000 T developed for both brightfield and fluorescence imaging.

These cooled 2.8 megapixel cameras provide a new paradigm for camera image quality through truly innovative design.

TWO CAMERAS – BEST FITTED FOR YOUR TASKS

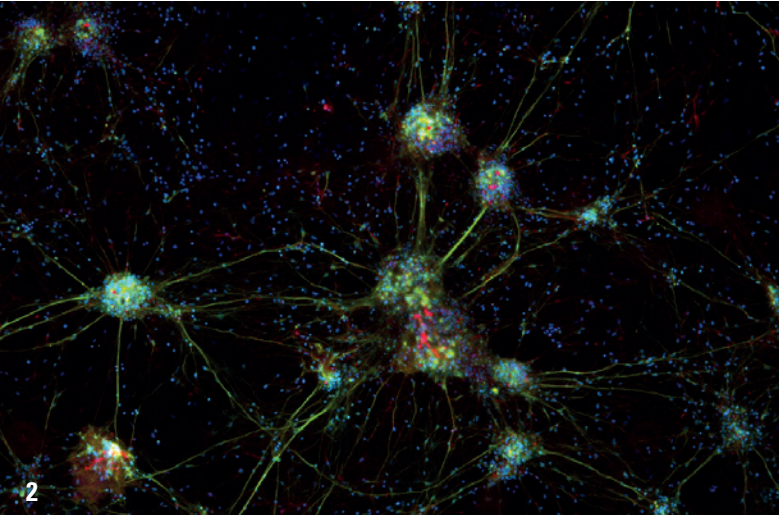
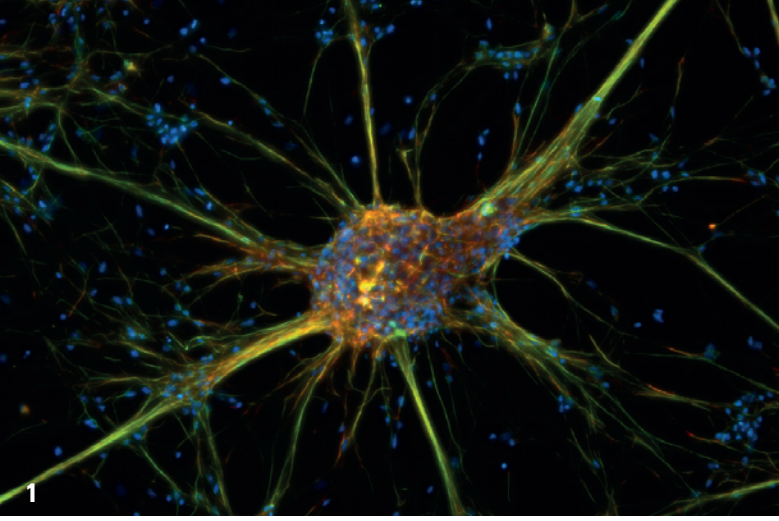
The Leica DFC7000 T is designed for brightfield and fluorescence applications. It can be easily switched from fluorescence imaging to brightfield documentation with outstanding color fidelity. Does your application requires higher sensitivity for low light fluorescence? In this case the monochrome DFC7000 GT is the best choice thanks to its exceptionally sensitive sensor.

LARGE FIELD OF VIEW OBSERVATION

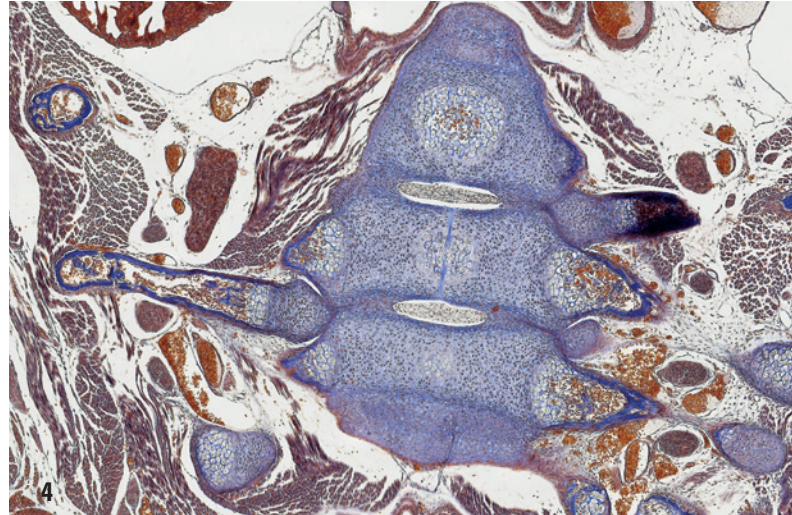
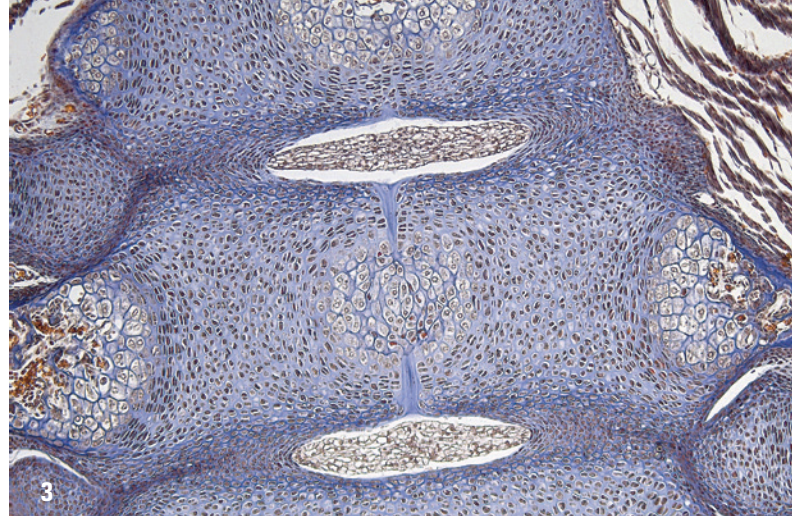
Two factors enable users to observe extremely large fields of view: First, the camera sensor which features 2.8 Megapixels with a pixel pinch of 4.54 μm . Secondly, Leica Microsystems' latest generation objectives with low magnification and high-numerical aperture objectives. It is the combination of the two that enlarges the field of view to speed up applications like tile scans. Based on new pixel architecture, this high resolution camera also maintains a wide dynamic range. We call that a paradigm shift!

HIGH SPEED OF ACQUISITION

Up to 40 live frames per second at full resolution – in high speed mode, enables you to position and focus samples effortlessly without any time delays. They can capture real-time, high-speed time-lapse recordings easily to collect precise kinetic data labeled with accurate time stamps. And if you need to be really fast, you can achieve up to 120 frames per second in 5 x 5 binning mode. What else could you want?



Cultured cortical neuronal cells (mouse). Simultaneous acquisition of 3 fluorochromes. Blue: DAP I, nuclei; Green: Anti-Tubulin-Cy2; Red: Anti-Nestin-Cy3. (1) 40 x magnification, (2): 10 x magnification



Stained section of a mouse embryo. Brightfield image with 40 x objective (3) and as tile scan (4) of the backbone. Sample property of Didier Hensch, IGBMC, France.

MASTERING LOW-LIGHT FLUORESCENCE APPLICATIONS

Fluorescence documentation takes advantage of crisp fluorescent signals against a dark background. The DFC7000 GT with a maximum Quantum Efficiency of 70% is a master of low light imaging: Peltier Cooling combined with very low dark current, correlated pixel double-sampling, and the optional Black Balance function to reduce unwanted noise. They work together to create favorable environments that so far have not been achievable in this class of CCD cameras.

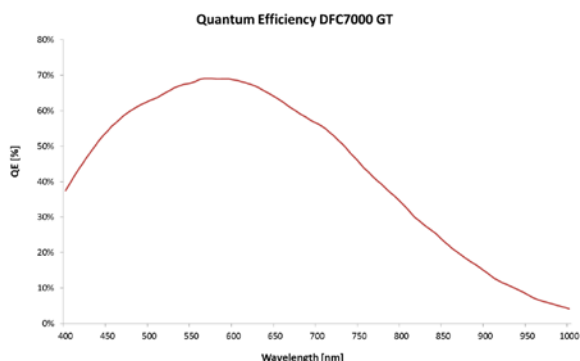
TRAIL-BLAZING BRIGHTFIELD DOCUMENTATION

The challenge of stained specimens is to display the colors as close to reality as possible. The DFC7000 T blazes new trails with its color interpolation technology as it is based on an innovative 5 x 5 demosaicing algorithm. This makes the camera exceptionally well suited to discern even subtle color differences and enables users to do so as well.

EFFICIENT SYSTEM SOLUTIONS

Integration of systems provides users confidence that all components will work together smoothly in their experiments. The DFC7000 cameras accomplish a perfect integration: They work seamlessly with Leica Microsystems' software platforms to support a broad range of applications: with Leica Application Suite (LAS) for basic image acquisition and material analysis, and with LAS X, the highly modular, powerful software platform, for acquisition and analysis.

Quantum efficiency Leica DFC7000 GT



KEY FEATURES FOR YOUR SUCCESSFUL EXPERIMENTS:

Brightfield applications:

- > Excellent color fidelity to discern subtle color differences
- > Reproducible color settings at any time
- > High-speed live preview for smooth focusing

Fluorescence applications:

- > Excellent signal-to-noise ratio – crisp and clear fluorescence signal against dark background
- > High sensitivity reduces sample bleaching and phototoxicity
- > Leading-edge trigger capability for efficient interplay of all microscope components

	DFC7000 T	DFC7000 GT
Camera type	Digital color, high-sensitivity, cooled camera for fluorescence and brightfield microscopy	Digital monochrome, high-sensitivity, cooled camera dedicated for fluorescence applications
Housing	Aluminum, Size (L x W x H) 120 mm x 93 mm x 150 mm, Weight 1900 g	
Sensor	Sony ICX674AQG, EXview HAD II CCD technology, quad-tap	Sony ICX674ALG, EXview HAD II CCD technology, quad-tap
Shutter	Interline transfer progressive scan, global shutter	
Pixel	1920 x 1440 (~ 2.8 MP); 4.54 µm x 4.54 µm pixel size	
Full well capacity	> 15.000 electrons (e ⁻) typical	
Color filter	RGB Bayer mask	no
Exposure time	4 µsec - 200 sec*	
Bit depth	8 bit / 12 bit with A/D converter of 16 bit	
Cooling	One stage Peltier, stabilized	
Binning modes	2 x 2 (color/ mono); 3 x 3 (color/ mono, speed optimized); 4 x 4 (color/ mono); 5 x 5 (color/ mono, speed optimized); color sensitive binning: R,G, or B pixel only	2 x 2 (mono); 3 x 3 (mono); 4 x 4 (mono); 5 x 5 (mono)
Partial scan	Freely definable ROI (region of interest), combination with binning possible	
Dark noise	<0.05 e ⁻ /px/sec	
Read out noise	Typical 6 e ⁻ / 10 MHz	
Dynamic range	~ 68 dB	
Pixel clocking rate	10 MHz/ 40 MHz	
Analog gain	Continuous 1x – 10x	
Advanced features*	Image averaging, sharpening with active noise reduction, black balance, on-head image buffer, quad-tap read-out and mono-tap read-out, external trigger capability; dynamic defect pixel correction, HDR acquisition, streaming mode	
Image formats	fps*at 40 MHz / 8 bit	
Turbo mode (1280 x 1024)	50	50
Full frame (1920 x 1440)	40	40
2x2 binning (960 x 720)	40	69
3x3 binning (640 x 480)	91	91
4x4 binning (480 x 360)	40	108
5x5 binning (384 x 288)	123	124
Supported operating systems	Windows 7, Windows 8 (32 / 64 bit)*, Windows 10	
Software	LAS X, LAS	LAS X
c-mount	0.7x for inverted and upright compound microscopes; 0.63x for stereo microscopes	
Interfaces	USB 3.0 single cable (5 Gbit/s) and optional trigger cable	
Power supply	5 V via external DC power supply	
Power consumption	~14 W (with Peltier cooling)	~15 W (with Peltier cooling)
Operating temp. range	+5°C .. +50°C	
Storage temperature	-20°C .. +70°C	
Air humidity	max 80%, non-condensing	
Conformity	CE: EN 61326-1, limited class B, EN 61010-1 ROHS 2 compliant, China ROHS 50 compliant	

* depends on software/ hardware in use