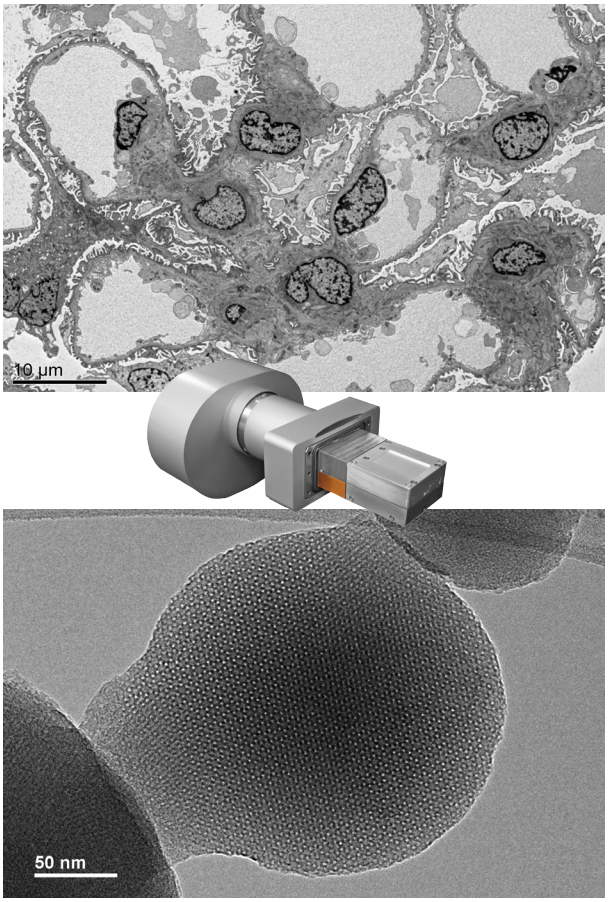
ORIUS® SC1000

Model 832 TEM CCD Camera

The SC1000 ORIUS® CCD camera is the latest generation of large format (11 Megapixel) retractable and fiber-optical coupled CCD cameras. Built with state-of-the-art CCD electronics and improved mechanical design, this new family of TEM camera provides high image quality with real-time speed that guarantees the best price-performance value in the market.



RAPID VIEWING: The SC1000 offers a high speed (>14 fps - frames per second) image viewing mode. This allows the user to search areas within the sample quickly and efficiently. The high speed viewing mode also allows the user to replace the traditional TEM viewing screen. Operations such as microscope alignments, stigmation, and focus can be performed with high precision using the camera display instead of the TEM viewing screen. The real-time fast fourier transform (FFT) functions (built-in to DigitalMicrograph® software) make these complicated and tedious operations painless.

***IN-SITU* OBSERVATION AND DIGITAL STREAMING VIDEO (DSV):** Another benefit of the high frame rate of the SC1000 is the capability of TEM *in-situ* observations. The SC1000 can output high quality (dark and gain corrected) LIVE images via a digital video stream. The digital video stream can then be recorded by using any third party video capture/editing software and saved in industry standard format (AVI and MPEG). Utilizing DSV your images can also be viewed by a remote computer via the internet or high speed network for purposes of remote education and diagnosis.

LARGE FIELD OF VIEW: For applications requiring a large field of view, the 35mm port SC1000W allows the user to view and record images from a sample area larger than conventional photographic film. This is the preferred configuration for most imaging applications in life science that require large fields of view.

HIGH RESOLUTION: The bottom mount SC1000B allows the user to view and record high resolution images with ease. This is the preferred configuration for most materials science imaging applications.

DIFFRACTION: Viewing and recording electron diffraction patterns have been one of the most challenging tasks for CCD cameras. Charge overflow to the neighboring CCD pixels (blooming) can occur due to pixel saturation from the high intensity diffraction spots. This produces strong intensity streaks in the recorded diffraction patterns. The CCD sensor in the SC1000 eliminates any streaking with the excellent built-in anti-blooming capability (100x full-well).

ANALYTICAL COMPATIBILITY: The retractability of the SC1000 ensures complete compatibility with a wide range of TEM equipment, such as Gatan GIF® or ENFINA® spectrometer systems. This provides you with a TEM that has both high-resolution digital imaging and analytical capabilities.

Features	Benefits
14 frames per second readout speed (full CCD, 4x binning)	High speed image viewing mode allows the user to search areas and perform TEM adjustments quickly, replacing the TEM viewing screen. *In-situ* observation and recording
11Megapixel CCD sensor (4008 x 2672)	High resolution, side and bottom mount
HCR™ fiber optical coupling	High image resolution and sensitivity
14-bit data digitization	High image quality and diffraction
IEEE 1394b FireWire interface	Industry standard. Fastest FireWire data transfer to the PC

Images: (Top) Renal tissue biopsy recorded with 35mm port mounted ORIUS SC1000 CCD camera on a 120kV TEM at 400x magnification. (Bottom) [111] HREM image of a mesoporous silica sphere (space group Ia-3d) recorded with a bottom mount ORIUS SC1000 CCD camera at a TEM magnification of 60,000x and 200kV. Image courtesy of Daliang Zhang, Berzelii Centre EXSELENT on Porous Materials, Stockholm University, Sweden.

Specifications

Camera construction	Retractable CCD sensor fiber optically coupled to high-resolution phosphor scintillator (HCR™ technology)
TEM operating voltage	Up to 400kV (bottom mount) 200kV (side mount)
CCD sensor	Progressive interline device 4008 x 2672 pixels (9µm each)
CCD active area	36mm x 24mm
Anti-blooming	On-chip (100x full well)
Scintillator	High-resolution phosphor
Coupling	Fiber optics (1:1)
Binning	1x, 2x, 3x, 4x
CCD readout	Full or sub area
Magnification with respect to film	About 1/3 for 35mm port and 1.3-1.5x for bottom mount
Readout speed	30MHz / 5MHz
Dynamic range	14 bits
Frame rate	> 14 fps @ 4x binning full CCD area (1002 x 668 pixels) 30MHz dual port CCD readout
Readout time	~ 2.5 sec full frame @ 1x binning 5MHz single CCD readout
Peltier cooling	+10°C regulated
Dark current	< 2 counts /pixel/sec (1x binning)
Readout noise	7-10 counts
Mounting position	On-axis TEM bottom port or 35mm port
Gain uniformity	Transparent gain correction and dark subtraction; better than 10% r.m.s. in uncorrected images; better than 0.5% r.m.s. in gain corrected image
Conversion efficiency	2-8 counts/primary e- @100kV
Resolution (Nyquist freq.)	> 0.5 @ 100kV at 1x binning
Saturation (1x binning)	> 50,000 CCD e-
Non-linearity	< 2%
Exposure setting	1 msec – 30 min
TEM shutter	Optional
CCD overheat protection	Yes
Camera dimensions	Depends on TEM configuration and mounting position
Power requirement	< 100W. 100-240V, 50/60HZ
Average shipping weight	30 - 90 kg depending on configuration
Computer-camera interface	IEEE 1394b (Firewire 800); compatible with IEEE 1394a (slower frame rate)
Computer platform	Windows® 2000 Professional and XP
Water connection	Yes, interconnect to existing TEM water line
Water failure protection	Yes
X-ray radiation safety	PTB standard
Regulatory compliance	EN 61326-1: 2002

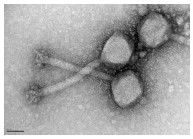
Ordering information

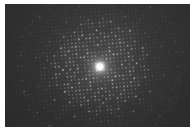
Model	Configuration	Description
832.10W	SC1000W	35mm port, up to 120kV, 11 megapixels. Includes Gatan Microscopy Suite® (GMS) software
832.20W	SC1000W	35mm port, up to 200kV, 11 megapixels. Includes GMS software
832.10B	SC1000B	Bottom mount, up to 120kV, 11 megapixels. Includes GMS software
832.20B	SC1000B	Bottom mount, up to 200kV, 11 megapixels. Includes GMS software
832.40B	SC1000B	Bottom mount, up to 400kV, 11 megapixels. Includes GMS software

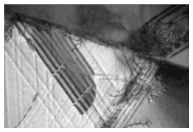
Computer and monitor are not included. Please consult Gatan for a recommended PC specification. Accessories and optional software are not listed. Please consult with your sales representative for details.

Primary applications


Life Science


Viruses


Diffraction


Materials

Images above courtesy of K. Tiekotter, Univ. of Portland; B.D. Miller, D.D. Graham, I.M. Robertson, Univ. of Illinois-UC; D. Zhang, Stockholm Univ.

we get it!

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ISO 9001 BUREAU VERITAS Certification

Certified Quality Management System

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