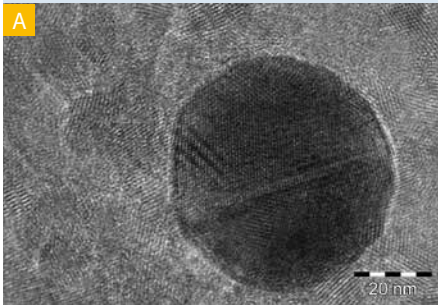
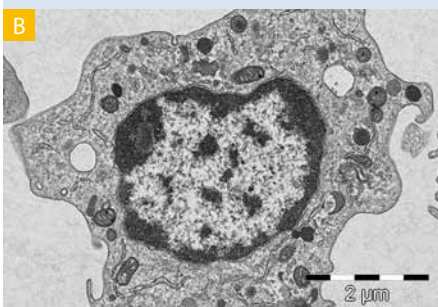


11 MegaPixel Bottom-Mounted TEM CCD Camera

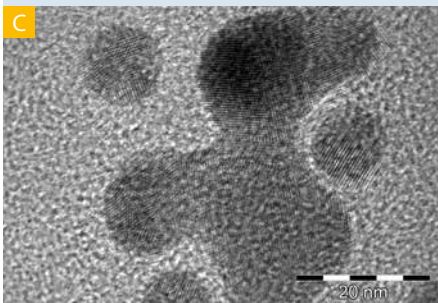




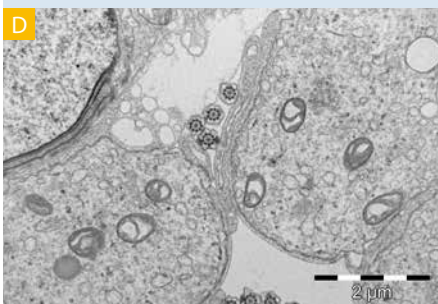
Au-ZrO₂, 1,500,000x, 200 kV
(courtesy of Max-Planck Institute for Coal Research, Muelheim/Ruhr, Germany)



Bloodcell, 6,800x, 120 kV



Gold on Carbon, 800,000x, 200 kV



Human testis, 2,900x, 120 kV

QUEMESA – 11 MEGAPIXEL BOTTOM-MOUNTED TEM CCD CAMERA

Quemesa is EMSIS' high-resolution, 11 MegaPixel bottom-mounted TEM CCD camera. It is the perfect choice – and the most versatile – for all current TEM applications.

The Quemesa camera system combines a large, fast sensitive CCD chip with attractively high readout speed, tapered fiber optics fulfilling the most stringent quality demands and a perfectly matched phosphor scintillator. The most satisfying aspect of this new CCD TEM camera is that the TEM itself is now the only limiting factor with regard to resolution and sensitivity for most current TEM applications – no longer the camera. The Quemesa provides everything expected of a high-end TEM CCD camera today: the extremely high resolution, very high sensitivity, superior contrast, high frame rates, and a large field of view. These superior properties make the Quemesa the ideal choice both for biomedical and materials science applications.

Another milestone

EMSIS has earned a remarkable reputation for their successful TEM camera and software product line-up over the past two decades. Based on our profound technological know-how and, just as important, our application experience, EMSIS has released innovative and notably successful TEM camera solutions. The Quemesa is the logical high-end completion of our TEM CCD camera portfolio.

Everything counts – the camera concept

High sensitivity and contrast at optimal resolution are the requisite ultimate goals for any TEM camera system. Every single photon generated in the scintillator per incident electron is of importance. The camera scintillator needs to be optimized to achieve the maximum signal from the pear-shaped interaction volume. This is done by matching the effective pixel size through optimization of scintillator thickness. The Quemesa camera system does this superbly. Bringing scintillator thickness and pixel size into ideal correlation with one another ensures the maximum number of photons is detected. This guarantees an outstanding image. High quality tapered fiber optics are also required. The taper provides a further benefit – an extremely large field of view for a bottom-mounted TEM CCD camera. Its dimensions are comparable to the photo plate size of most current TEMs.



Obtaining the best possible photon yield in the scintillator per incident electron is done by matching the pixel size to the interaction volume through optimization of scintillator thickness.

Features

- Up to 4008 x 2664 Pixel
- 12 fps @ binning 4
- FireWire™ (IEEE 1394a)
- Fibre optically coupled (2:1 taper)
- 14 bit
- Phosphor scintillator
- Dedicated water cooling system

Applications

- Life Science
- Pathology
- Virology
- Materials Science
- HRTEM
- Low Dose
- Diffraction

CCD Chip

The highly sensitive and fast interline CCD chip provides 4008 x 2664 pixel resolution with 14-bit dynamic range, a full well capacity of over 60,000 electrons and anti-blooming of more than 100x.

Tapered fiber-optical coupling

The 2:1 fiber-optical taper provides the highest quality. This increases effective pixel size to 18µm x 18µm. In combination with the optimized scintillator thickness, this ensures optimal resolution and sensitivity.

Read-out modes: fast and variable frame rates

Quemesa's very fast single port read-out supports high frame rates of more than 12 fps, making it much more convenient to scan and focus on the PC monitor. The use of single port readout ensures a homogeneous CCD response over the whole readout area. Even when in the highest quality mode (full resolution) the camera provides more than 2 fps. This camera provides superb dynamic range and sensitivity no matter which resolution mode is employed.

Binning – Flexible speed and sensitivity

The Quemesa supports several binning modes: binning 1 to binning 4. Using the binning mode means increasing the frame rates and sensitivity. At binning 2 the Quemesa offers up to 2004 x 1332 pixels with up to 3.6 fps, while at binning 4 (1002 x 666 pixels) 12 fps can be achieved.

High sensitivity

Due to highly efficient conversion of primary electrons in the scintillator and optimized electronics design, the Quemesa system gains a near perfect signal-to-noise ratio, resulting in very high sensitivity. This enables you to view your samples on your monitor at beam intensities so low it would normally prevent seeing an image on the TEM viewing screen. The finest detail is still shown perfectly in the camera image.

Dedicated cooling system

The CCD chip of the Quemesa is Peltier-cooled and stabilized at a temperature of 20°C. What is even more crucial is that this is achieved by a small dedicated, smart water cooling system which does not interfere with the TEM cooling system. No external connections to the microscope are necessary as the circuit is fully closed and safe.

Software integration

The Quemesa is completely integrated with iTEM and RADIUS, EMSIS' TEM imaging platforms. This guarantees numerous real-time functions such as real-time shading correction, real-time gray-value histograms, automatic contrast enhancement as well as Fast Fourier Transformation during live image acquisition. Furthermore, iTEM and RADIUS offers functions such as image labeling, image processing, archiving, analysis and report generation. Print-outs in photo quality can be made mere seconds after acquisition.

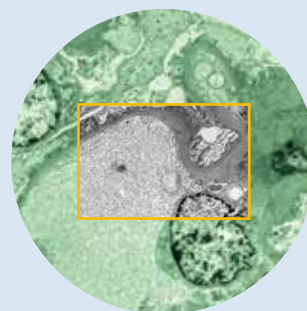
E Quemesa

11 MegaPixel Bottom-Mounted TEM CCD Camera



F Field of View (depends on TEM)

Frame shows camera field of view within TEM fluorescence screen



Myelin, 4,800x, 120 kV

Specifications

Quemesa

Image resolution	Full resolution: up to 4008 x 2664 Pixel Binning 2: up to 2004 x 1332 Pixel Binning 3: up to 1336 x 888 Pixel Binning 4: up to 1002 x 666 Pixel
Pixel size	18 µm x 18 µm
Optical coupling	Tapered fiber optics (2:1)
Field of view	72 mm x 48 mm
Read Out	Fast single port readout
Dynamic range	16384 Grey values @ 14 Bit
Exposure time	1 ms - 100 s
Max. frame rate (depends on PC)	Full resolution: High quality mode: approx. 2.1 fps Full resolution: High speed mode: approx. 3.6 fps Binning 4: High speed mode: more than 12 fps
Display	Full image at any frame rate
Cooling	20°C regulated, Peltier-/Water-cooling with a dedicated chiller @ 25°C ambient temperature
Camera mount	Bottom port on-axis
Anti-blooming	> 100x
PC Interface	FireWire™ (IEEE1394a)

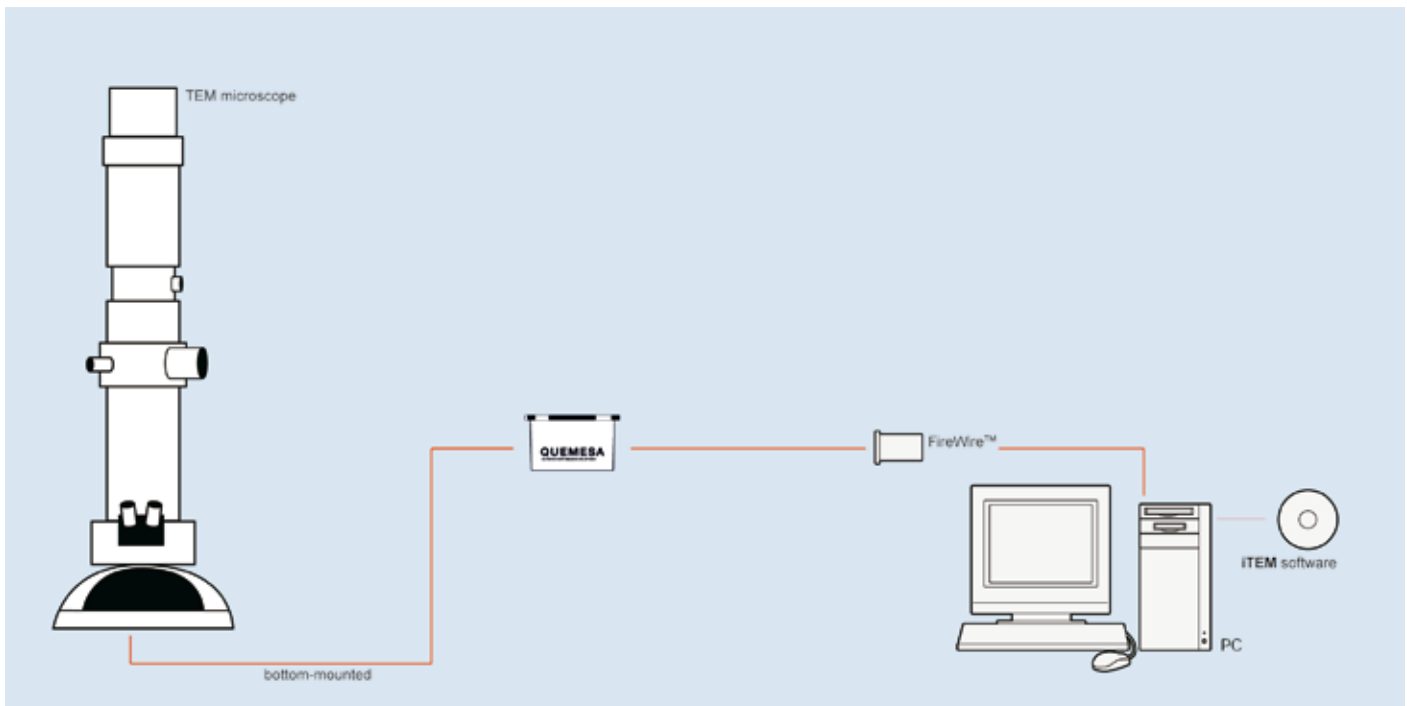
Quemesa

Bottom-Mounted TEM CCD Camera



Made in
Germany

System Diagram



Specifications are subject to change without any obligation on the part of the manufacturer.