

TemCam-F416

TemCam CMOS Camera (4k, 16 μ m, 16bit)

Introducing a new generation of TEM cameras, TVIPS launches TemCam-F416, the latest 16 MegaPixel camera, covering an image area of 64 x 64 mm². Custom designed CMOS architecture resulting in a large fill factor, high sensitivity and superior resolution combines the advantages of classical slow scan 4k CCD cameras with an exceptional acquisition speed. The CMOS sensor, showing absolutely no blooming or smearing on intensive illumination and the high quality 16 bit analog-to-digital converter, makes this camera an excellent choice for all types of applications requiring high dynamic range, such as for the acquisition of diffraction patterns.

NEW



TVIPS

TemCam-F416 features and benefits

Large field of view

Image area of 64 x 64 mm².

Fast readout

Four readout ports, each sampling with 10 MPixel/sec, digitize the image information at full resolution within 1 sec. For a subarea of 4k x 1k, frame rates of 2.5 fps can be achieved.

Rolling shutter mode

For even faster readout the sensor can be operated in the rolling shutter (RS) mode whereby no beam shutter is needed. Frame rates of up to 10 fps for a 1k x 1k subarea can be achieved. This mode is well suited for searching the object of interest.

Near-axis flange

TVIPS has designed a special flange which combines TemCam-F416 with FastScan-F114NX, a high-quality fiber-optically coupled CCD camera operating at video rate. Due to disadvantages of side-mounted cameras, the FastScan camera in the near-axis position is an interesting option to monitor the TEM image and its power spectrum in real-time, for the main purpose of alignment or low-dose search.

Fiber-optical coupling

Fiber-optical coupling of the electron-sensitive layer (scintillator) with the sensor increases the amount of light collected in comparison with lens-optical coupling and, as a result, the sensitivity of the camera.

Rotatable

Depending on the specific flange, the camera can be freely rotated.

	TemCam-F416
Sensor type	CMOS
Format (pixel)	4096 x 4096
Pixel size (µm ²)	15.6 x 15.6
Fill factor (%)	72
Field of view (mm ²)	63.9 x 63.9
Readout rate (16 bit)	4 x 10 MPixel/sec
Frame rates (readout times): Full resolution Subarea, 2k x 2k, RS Subarea, 1k x 1k, RS	 1.0 fps (1 sec) ~ 5 fps (0.2 sec) ~ 10 fps (0.1 sec)
Post-magnification	~ 1.5x
Electron-optical coupling	1:1 fiber-optics
Scintillator type	polycrystalline phosphor
Sensor cooling	< -15°C (regulated)
Binning factors	1x, 2x, 4x
Dynamic range (max./noise)	10 000:1
Non-linearity (after flatfield correction)	< 1 %
Sensitivity (for a single 200 keV electron)	18 counts (HR) 50 counts (HS)
SNR (for a single 200 keV electron)	3:1 (HR) 8:1 (HS)
Resolution @ 200 keV (NTF at Nyquist frequency)	~ 22 % (HR) ~ 11 % (HS)
Blooming	not present
Bottom mounted	on-axis
System requirements	Windows XP, Intel Dualcore CPU, optical gigabit ethernet (PCI Express x4 slot)
Options	FastScan-F114NX in near-axis position
Software	EM-MENU, tomography, single particle collection, EM-SPECTRO2, recording to hard disk

Data in this brochure is typical and not binding.

Optimized scintillators

TVIPS optimizes the scintillator for individual demands. For each high tension up to 400 kV, two standard types (scintillator thicknesses) are available: optimized for high resolution (HR) or for high sensitivity (HS). On customer request individual scintillators can be manufactured.