

Metro Counting Camera

Model 1130

Welcome Metro® – The cutting-edge counting camera for groundbreaking imaging, diffraction, and *in-situ* studies. By enabling counting capabilities while operating your transmission electron microscope (TEM) at low accelerating voltages (60 – 200 kV), imaging your most sensitive samples and low-dose studies is now within reach. This not only enhances results but allows you to push the research boundaries for 2D materials, batteries, catalysts, nanotubes, polymers, and organic/biological materials.

Benefits

- Enables lower dose rates and detection of smaller signals at ≤ 200 kV on your existing TEM
- Images the most beam-sensitive specimens
- Captures fine details, even at the most extreme dose rates
- Allows you to see higher-quality diffraction patterns with virtually no background
- Stores *in-situ*, 2k video at ≤ 41 fps and 512 x 512 video at ≤ 492 fps
- Acquires images with the simple but powerful DigitalMicrograph® interface that you are familiar with from the OneView® IS camera
- With one click, corrects for drift with automatic sub-frame alignment



Built upon the K3® IS camera's pioneering single-electron counting and *in-situ* capabilities, Metro's proprietary sensor is uniquely optimized to detect individual electron events at the lowest doses. While the sensor outputs up to 1,477 full frames per second (fps), this technology subsequently counts individual electrons in real-time to generate virtually no background signal, delivering comparable signal-to-noise and image quality to the K3 camera (Figure 1) across a variety of techniques.

Compared to scintillator-based cameras, Metro has a higher detective quantum efficiency (DQE) to ensure there is very little blurring or detector noise, thus allowing you to resolve details over a large field of view with fewer pixels (Figure 2). The camera detects the faintest diffraction spots and considerably reduces the time to analyze complex 4D STEM datasets.

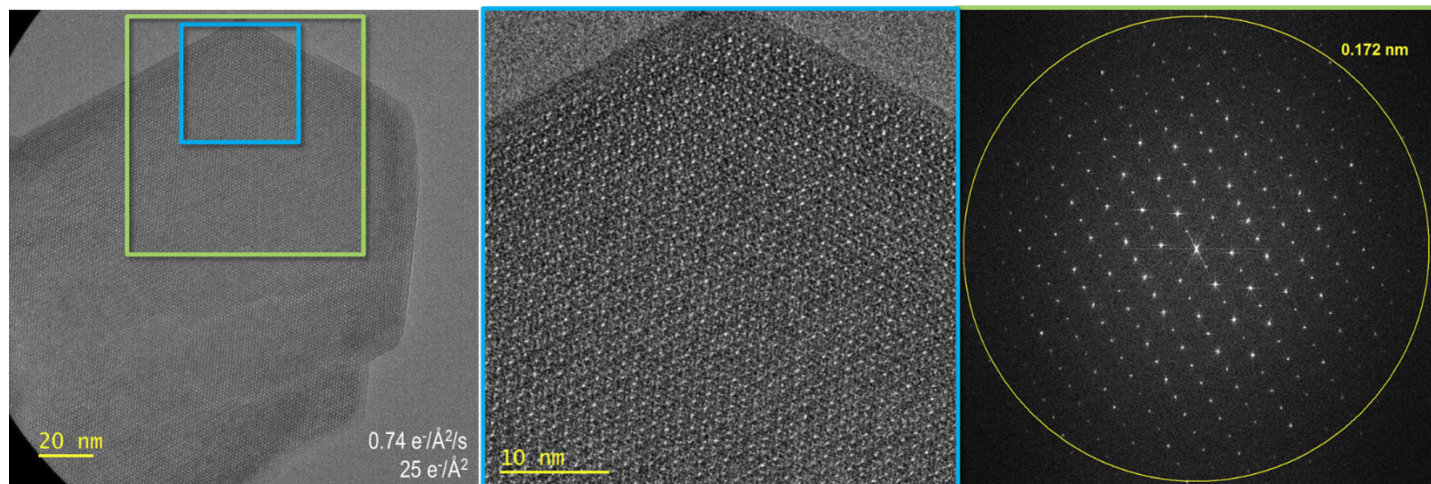


Figure 1. Low dose imaging of a beam-sensitive Zeolite sample. Detail is observed out to the Nyquist frequency of the camera, even at a dose rate of $0.74 \text{ e}/\text{\AA}^2/\text{s}$ and a total dose of just $25 \text{ e}/\text{\AA}^2$, allowing a large field of view to be imaged.

Specifications

TEM operating voltage	60 – 200 kV	
Sensor size	2048 x 2048 pixels	
Pixel size	5 μm	
Full frame read-out speed	1477 fps	
Max. capture rate to disk	492 fps	
512 x 512 pixels	41 fps	
2048 x 2048 pixels		
Image bit depth	32-bit	
DQE	80 kV	200 kV
0.0 Nyquist	>90%	>60%
0.5 Nyquist	>50%	>40%
Read modes	Imaging & Diffraction Bin: x1, x2, x4	
Acquisition modes	Counted drift-corrected imaging, counted video (<i>in situ</i>)	
Mounting position	Bottom, Retractable	
GIF compatible	Yes, mountable above	
STEMx compatible	Yes	
DigitalMicrograph software and PC	Included	

Specifications are subject to change without notice.

Applications

- Environmental TEM
- Liquid cell TEM
- Cryo-microscopy
- Operando experiments
- Diffraction and 4D STEM
- Tomography
- 2D materials
- Battery materials
- Catalysts
- Nanotubes
- Polymers
- Organic/Biological materials

Other products to consider

- STEMx 4D STEM System
- K3 IS Direct Detection Camera
- Cooling *In-Situ* Holders
- Heating *In-situ* Holders
- Vacuum Transfer Holders

Furthermore, Metro’s optimization for lower doses also ensures you can achieve the same resolution during imaging and tomography studies, plus capture fine details while monitoring accumulated beam damage.

During *in-situ* microscopy, Metro delivers an unparalleled signal-to-noise at low dose rates or high frame rates. *In-situ* frame rates are optimized so that individual *in-situ* frames have recognizable contrast, not just sparse counts.

Using a nearly identical DigitalMicrograph interface to the award-winning OneView, Metro simplifies the user experience when transitioning between counting and scintillator-based cameras within the Gatan portfolio. This allows you to streamline your image and video acquisition, plus utilize the existing LookBack™, Timelapse, *In-Situ* Player, and *In-Situ* Editor features that are standard for all Gatan *in-situ* cameras. Combined with DigitalMicrograph and Python scripting, Metro opens up endless opportunities to advance your research.

Ordering

Model	Description
1130	Metro Counting Camera

STEMx® system is required for 4D STEM applications.

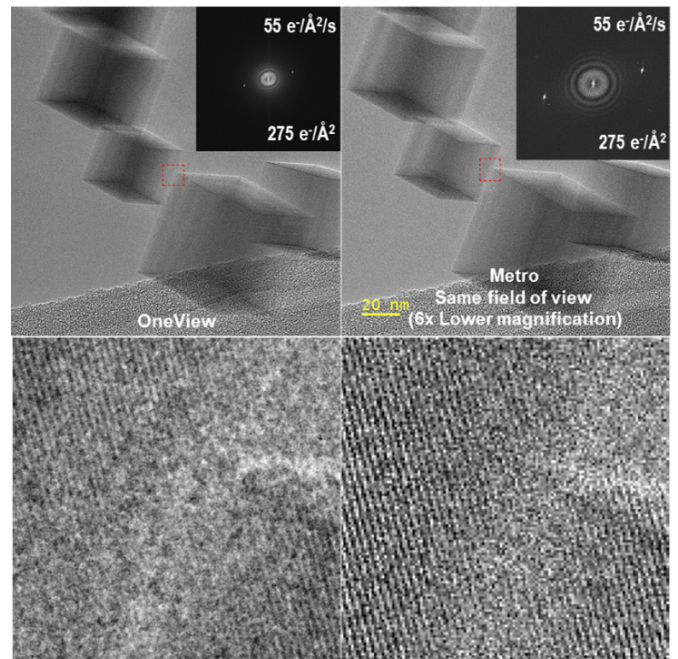


Figure 2. Metro 2k image of the same field of view as a OneView image, showing that the lattice fringes are still clearly resolved, due to the high DQE and minimal blurring of the Metro.

