# GIF Continuum and Continuum S
## Advanced Systems for EELS & EFTEM

The Continuum series represents the next generation of electron energy loss spectroscopy (EELS) and energy-filtered transmission electron microscopy (EFTEM) systems from Gatan. By focusing on simplifying the operation of energy-loss systems without sacrificing any of the power or flexibility, the Continuum series enables new levels of productivity and data throughput. Built around new and exclusive detector systems, the Continuum delivers outstanding detector speed and quality for both EELS and EFTEM applications.

### >10x higher productivity

- >8000 spectra per second at >95% duty cycle
- >10x faster system tuning
- Streamlined, workflow-based user interface

### Revolutionary data quality

- Low-noise, high dynamic range CMOS detector
- Improved MTF and DQE from new XCR™ sensor stack technology
- Full gain correction in all acquisition modes
- Exclusive dynamic focus control
- Choose the K3® electron counting direct detector for the ultimate EELS and EFTEM data quality

### Emerging applications

- Energy-filtered 4D STEM*
- *In-situ* EELS and EFTEM*
- Momentum-resolved EELS*

### Applications

- Materials research
- Failure analysis
- Composition and chemical analysis
- High-speed *in-situ* materials research
- Catalysis and environmental microscopy

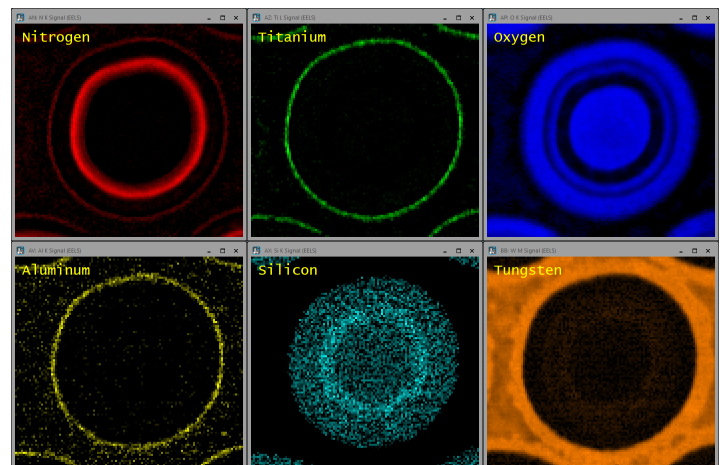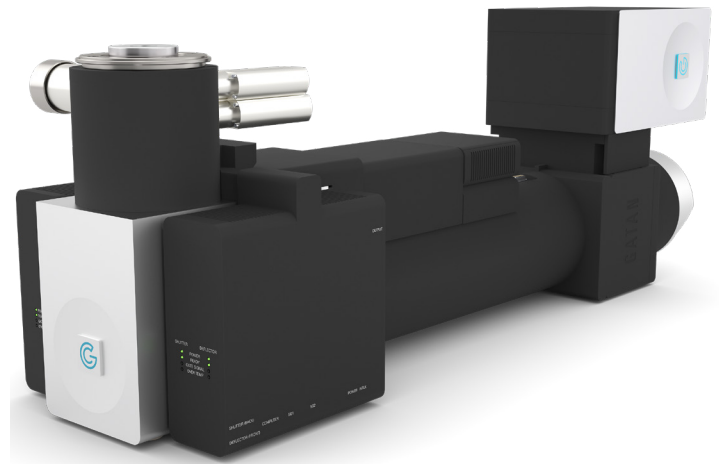*\* Requires optional components*





**Figure 1.** High-speed EELS composition map of 3D NAND device structure. 114 x 106 pixels recorded at 0.15 ms/pixel (x10 frames) greatly reducing dose rate at sample. Full, live model based quantification at each pixel allows accurate separation of overlapping edges (N-K / Ti-L / O-K and Si-K / W-M).

## Specifications

| | GIF | | | | Spectrometer |
|---|---|---|---|---|---|
| **Model** | **Continuum ER** | **Continuum HR** | **Continuum K3** | **Continuum K3 HR** | **Continuum S** |
| Model number | 1065 | 1066 | 1069 | 1069HR | 1077 |
| Operating range (kV) | 40[1] – 200/300 | 40[1] – 200/300 | 80 – 200/300[2] | 80 – 200/300[2] | 40[1] – 200/300 |
| EFTEM mode | ● | ● | ● | ● | – |
| EELS mode | ● | ● | ● | ● | ● |
| **Detector** | | | | | |
| Sensor type | | | CMOS | | |
| Sensor size (pixel x pixel) | 2048 x 2048 | | 3456 x 3456 | | 2048 x 64 |
| Pixel size (µm) | 18 | | 5 | | 18 |
| Detector technology | High-speed XCR™ | | Direct detection | | High-speed XCR |
| **Performance** | | | | | |
| Target system resolution (eV)[3] | <0.3 | <0.02 | <0.3 | <0.02 | <0.3 |
| Design energy resolution (eV)[4] | 0.1 | <0.02 | 0.1 | <0.02 | 0.1 |
| Energy range (eV)[5] | 3000 | | 3000 | | 3000 |
| Imaging @ full resolution (fps) | 90 | | 75 | | – |
| Spectral rate, max. (sps) | 8000 | | 3000 | | 8000 |
| **Features** | **Continuum ER** | **Continuum HR** | **Continuum K3** | **Continuum K3 HR** | **Continuum S** |
| 100 ns electrostatic shutter | ● | ● | ● | ● | ● |
| 2 kV DualEELS™ | ● | ● | ● | ● | ● |
| Live STEM EELS mapping* | ● | ● | ● | ● | ● |
| Real-time ZLP stabilization | ● | ● | ● | ● | ● |
| Dynamic focus control | – | ● | – | ● | – |
| Integrated BF/DF detector | ● | ● | ● | ● | – |
| Centered beam stop | ● | ● | ● | ● | – |
| Continuous EFTEM | ● | ● | ● | ● | – |
| **Recommended options** | | | | | |
| High-speed spectrum imaging | ● | ● | ● | ● | ● |
| ω-q slit | ● | ● | ● | ● | – |
| Energy-filtered 4D STEM | ● | ● | ● | ● | – |
| *In-situ* acquisition and analysis | ● | ● | ● | ● | – |
| High-speed EDS acquisition | ● | ● | ● | ● | ● |

*Specifications are subject to change without notice.*

*\* Requires optional components*

[1]30 kV option available. 30 kV option uses low-kV XCR scintillator which does not support 8 kHz spectral rate. Contact Gatan for scintillator options.

[2]K3 camera for 80 – 200/300 kV operation only. Add 30 – 80 kV operation with optional low-kV XCR scintillator camera. Contact Gatan for scintillator options.

[3]Final system resolution is dependent on (S)TEM performance and environment.

[4]Theoretical resolution in the absence of source, environment, and other instabilities.

[5]Field of view at maximum operating voltage.

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