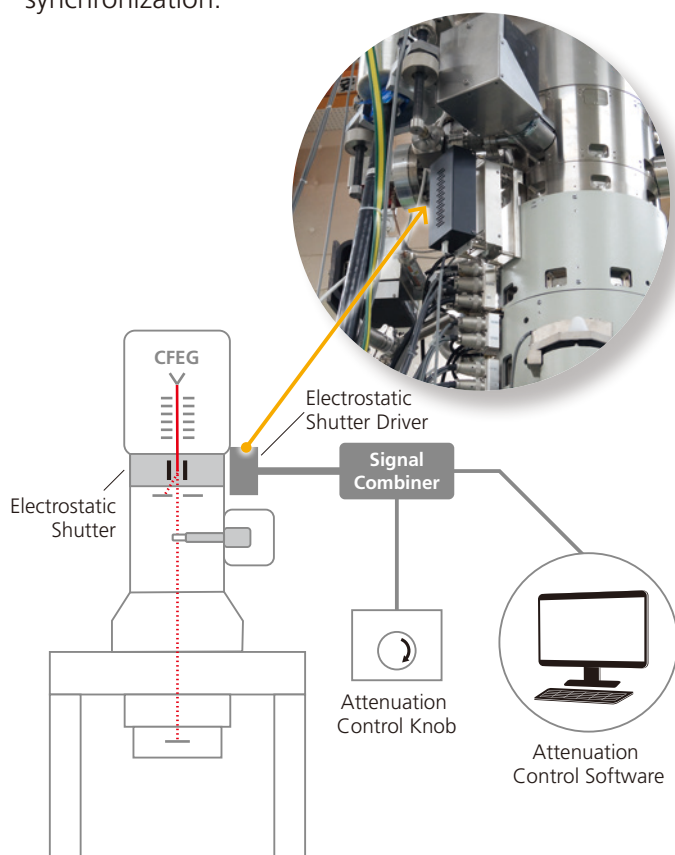


# Electrostatic Dose Modulator

The Electrostatic Dose Modulator (EDM) is a fast beam blanking system with a pre-sample electrostatic deflector, including electronics and software control. With EDM, the beam can switch on or off in less than 20 ns. This 100,000x improvement in blanking speed immediately improves the clarity of data taken at fast exposure times. EDM can also attenuate electron illumination without affecting imaging conditions, giving TEM and STEM users exceptional control over the dose on their samples. Cutting-edge electronics and software add-ons unlock advanced applications such as temporal dose structuring and STEM synchronization.



- Lightning-fast speeds:**  
 EDM systems achieve switching times faster than 20 ns.
- Independent intensity adjustment:**  
 By rapidly turning the beam on and off with variable pulse widths, the EDM makes it easy to adjust the average beam intensity without changing the image conditions. A desktop accessory knob provides an intuitive interface to adjust the dose attenuation factor.
- Dose structuring:**  
 Users can take control of their illumination by applying dose in pulses with variable durations as short as 100 ns and frequencies up to 500 kHz.
- Modern control software:**  
 The EDM works out of the box as a fast beam blander. Control software is included for programmable dose attenuation, logging, and more.
- Integration:**  
 The EDM acts as a fast and reliable pre-sample beam blander while supporting a companion Relativity Sub-Framing System as well as third-party hardware.

## Fast beam blanking

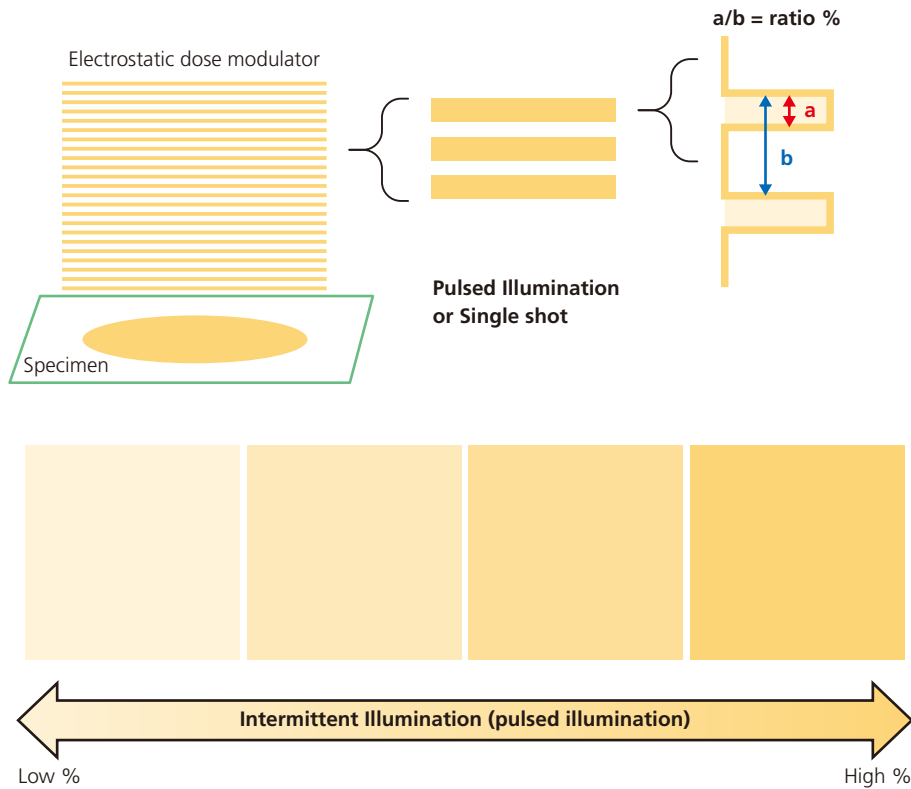
Quantity	Value
Maximum pulse frequency	500 kHz
Transition time 90%-10%	< 20 ns
Blanking signals	3 inputs

## Dose attenuation

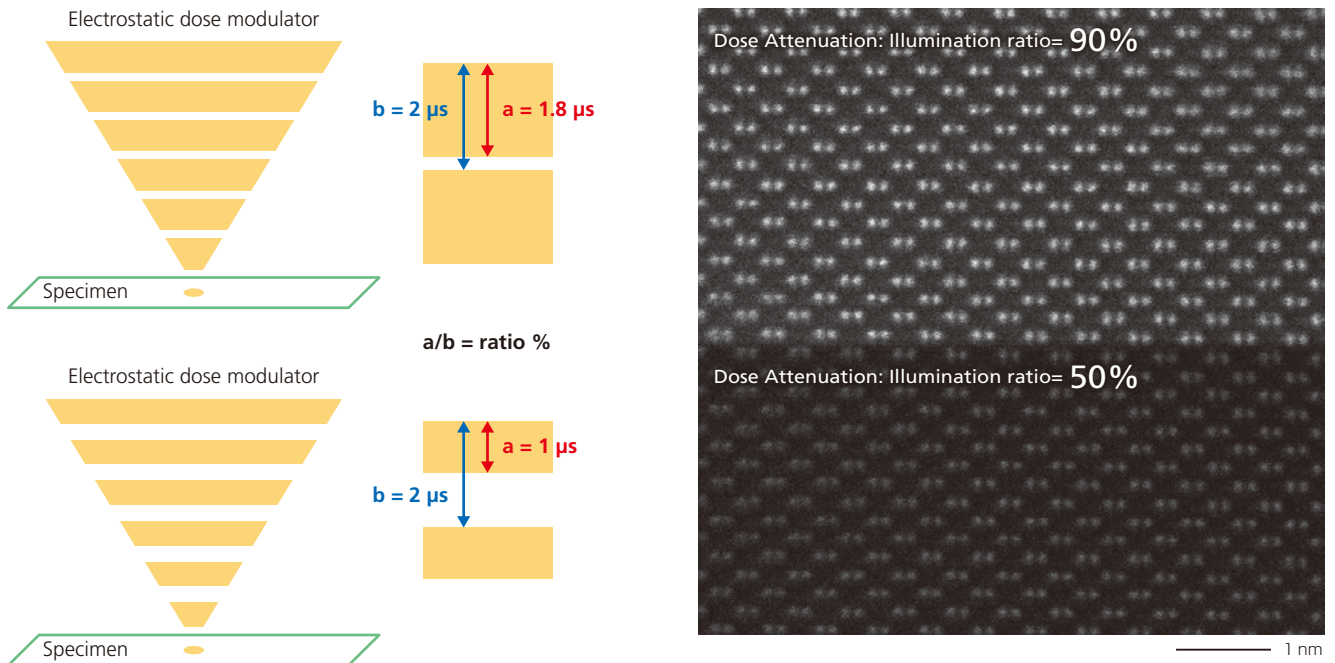
Configuration	EDM Basic	EDM Advanced
Application	TEM imaging	TEM and STEM, pump-probe dynamics
Pulse repetition frequency (max)		500 kHz
Pulse width increment	62.5 ns	10 ns
Minimum pulse width	125 ns	100 ns
Synchronization	No synchronization	TTL trigger input

**Applicable model:** JEM-ARM300F2, JEM-ARM200F (CFEG), NEOARM (CFEG), JEM-F200 (CFEG), JEM-2200FS\*, JEM-2100F\*  
 (\*These models should be equipped with a standard column without the Cs corrector.)

## Pulsed Beam TEM Illumination\*



## Pulsed Beam STEM Illumination\*



Dose attenuation by pulsed illumination with Frequency of 500 kHz (2  $\mu$ s) in a high resolution STEM at 300 kV using Si [110] in the condition of pixel dwell time with 19  $\mu$ s/pixel (1024  $\times$  1024 pixels), by changing duration ratio from 90% to 50% during acquisition of one STEM image in 20 s.

\*Electrostatic Dose Modulator (EDM) offers two versions, EDM Basic and EDM Advanced. EDM Basic provides Pulsed Beam TEM Illumination, and EDM Advanced does both Pulsed Beam TEM Illumination and Pulsed Beam STEM Illumination.

