

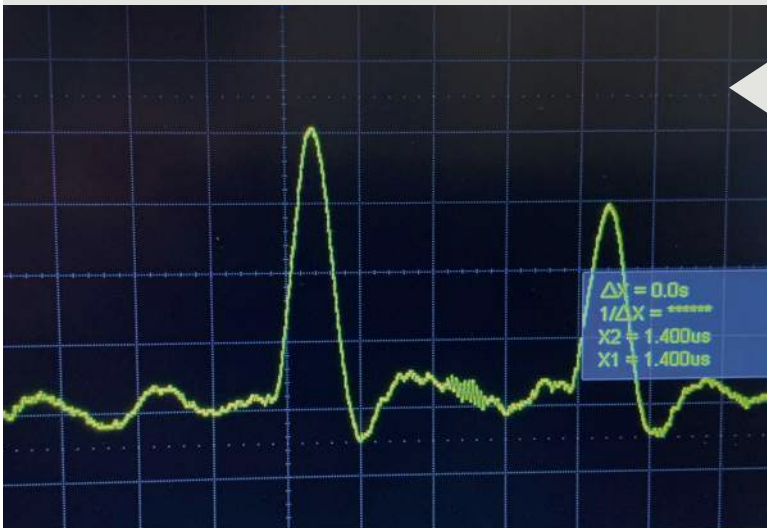
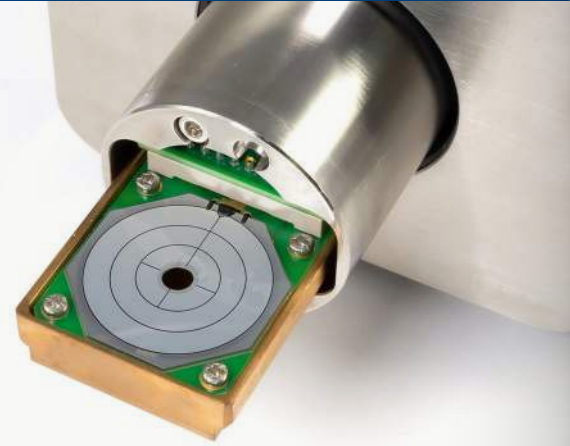
STEM Electron counting

Low-dose imaging in Scanning Transmission Electron Microscopy (STEM)
with single electron counting

Images with calibrated units of individual electrons

STEM detector

- HAADF, ADF and BF signal outputs
- Single electron sensitivity from 60 to 300 keV
- PIN Silicon diode sensor with in-situ preamplifiers
- Insertion/retraction mechanics with interlock control



Analog pulse discriminator

- Converts single electron pulses into digital signals
- Analog discriminator with over-the-threshold logic
- Independed configurable thresholds for each channel

LJ DISS6

- Integrated unit with detector control, pulse discrimination, scan generator and image acquisition
- Multiple digital and analog signal inputs
- Versatile trigger and synchronisation interface
- SDK with API and demo source code



Detector options

- Diodes with/without central hole
- Quadrant geometry on all/no segment
- Pre-amplification gain optimised for high/low dose



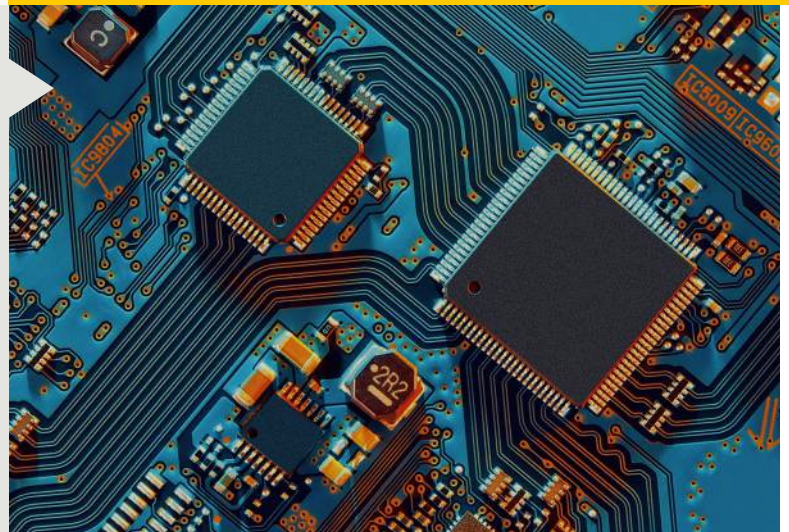
turboTEM PULSE discriminator – optional

- turboTEM PULSE technology
- Adds digital discriminator with gradient-based logic
- Increases dose range by counting piled-up pulses

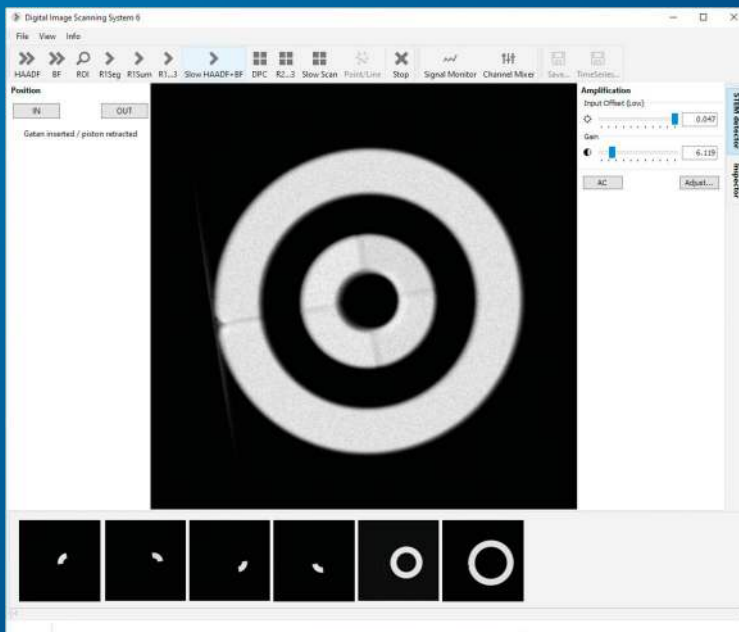
STEM counting

MICS amplifier – optional

- Adds analog multichannel signal amplifier
- Independent brightness & contrast for each signal
- Advanced input and gain normalisation for 4Q



True zero background level and pure Poisson noise

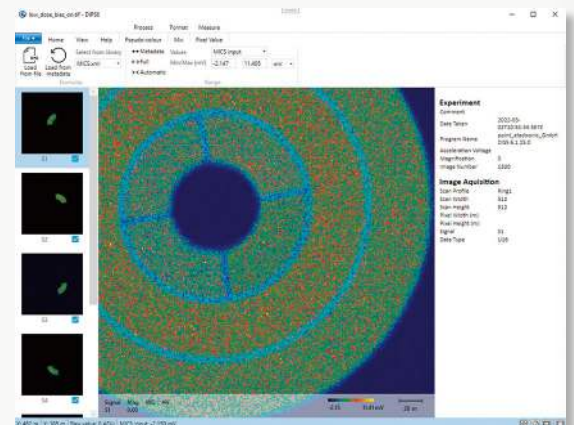


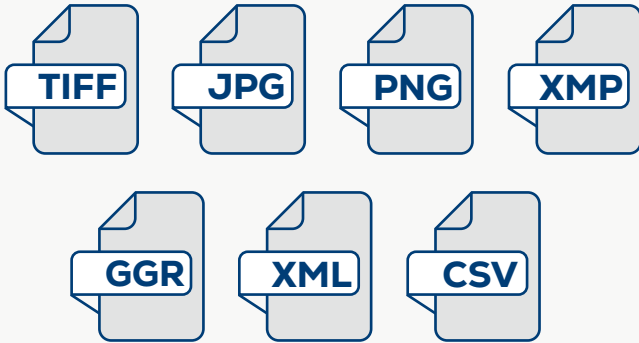
DISS6 - detector control and image acquisition app

- Control of detector and analog discriminator
- Configuration of scans and signals
- Live quantification of pixel values
- Configurable workflows

DIPS6 - image processing app

- Viewer of all image signals and metadata tags
- Selection of pseudo-colour profiles
- Full quantification of pixel values
- Layered colour view of signals





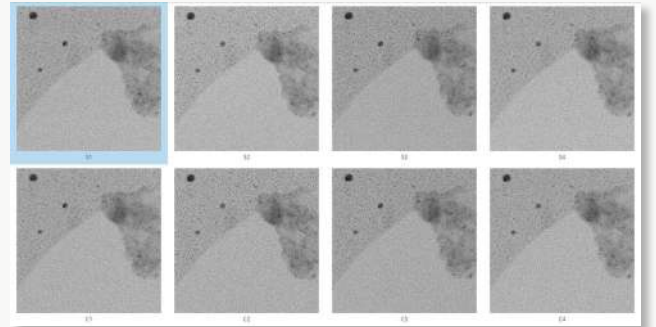
Standard file formats

- TIF un-compressed grayscale data
- JPEG compressed grayscale data
- PNG colour images
- XMP metadata
- GGR colour gradients
- XML formulas
- CSV pixel values

STEM counting

Correlative & in-situ microscopy

- Multiple pages for simultaneous signals/ detectors
- Serial time data acquisition with DISS6
- Advanced folder navigation and view with DIPS6



Quantification of pixel values

- Analog MICS signals are factory calibrated
- DISS6 and DIPS6 apps show quantified values
- Metadata includes calibration parameters
- Import of custom formulas for automated values

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STEM detector

Sensor	segmented Si diode
	max. 32 mm outer diameter
	min. 0.2 mm inner hole diameter
	60...300 keV electron energy range
Preamplifier	mounted in-situ
	1 MHz bandwidth
	200 kV/A gain
Mechanics	pneumatic insertion/retraction
	port mounted
	independent pneumatics control (optional)

LJ DISS6 imaging

Standard inputs	8× calibrated analogue inputs (A1...A4, B1...B4)
	12× digital inputs (D1...D12)
	3× trigger inputs (Pixel, Line and Frame)
	scan pause/resume input
Standard outputs	2× calibrated analogue scan outputs (X, Y)
	2× external control outputs (Blank and Scan)
	4× clock outputs (Pixel, Line, Frame and Blank)
Scan generator	16-bit $\pm 3.5... \pm 12V$ analogue X, Y scans
	Gnd., 5V, 15V external bank/scan
	TTL pause/resume
	TTL clock and synchronisation
	0.5 GPixels maximum frame size (software limit)
	10 ns...10 ms pixel dwell time (selection dependent)
	1...32,000× pixel average (oversampling)
Pulse discriminator	8× independent channels
	threshold-based comparator
	-0.5...0.5 V thresholds range
Signal digitization	12-bit for analogue A1..A4, B1...B4
	16-bit for TTL D1...D12
	32-bit for TTL D1...D6 (optional)
Pneumatics control (optional)	analog interface for valves and sensors
	safe auto retraction firmware automation
MICS amplifier (optional)	16× calibrated inputs (M1...M16) maximum
	-1...1 V input offset M1...M16
	1× ... 1,800× gain M1...M16
	-1...1 V output offsets M1...M16
	3.4 MHz...34 Hz low-pass filter
	automated 4Q global brightness and contrast
	automated input offsets (dark correction)
	Automated gain normalisation (bright correction)

Parts and Cables

STEM detector	Standard	1x
LJ DISS6 imaging	Standard	1x
Pneumatics controller	Optional	1x
turboTEM PULSE discriminator	Optional	1x
MICS amplifier	Optional	1x
Detector cable	Standard	1x
Controller cable	Standard	1x
TEM cable	Standard	1x
USB cable	Standard	1x
USB drive with software	Standard	1x
PC, keyboard, mouse	Optional	1x
Displays	Optional	1x

Software packages

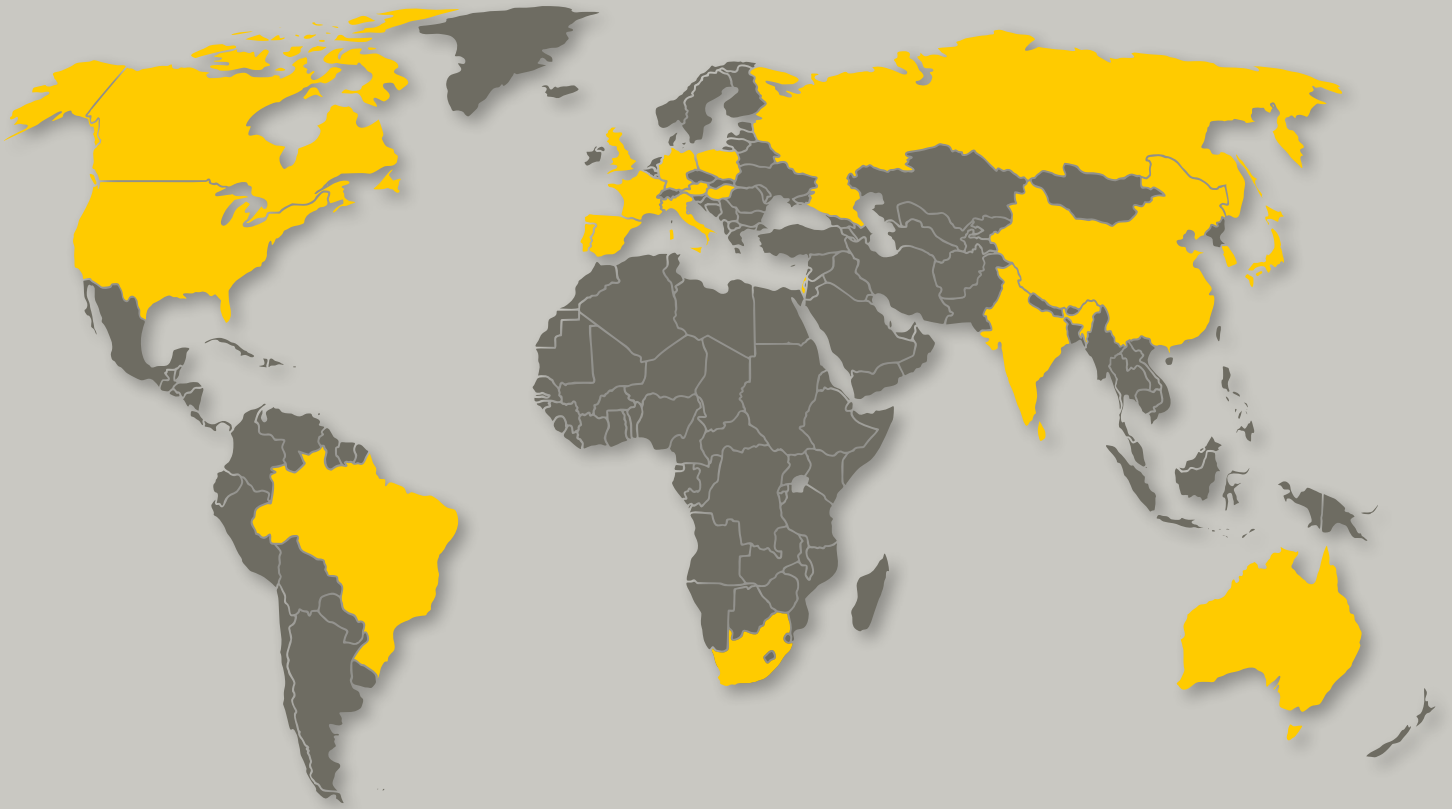
Drivers	PEUSB drivers
	DISS6Control library
Server	EM Gateway (optional)
Apps	DISS 6
	DIPS 6

Weight and Dimensions

STEM detector	43 x 33 x 48 cm
	25 kg
LJ DISS6 imaging	64 x 8.7 x 29.5 cm
	3.4 kg

Site requirements

Power	1x mains 110/220 VAC single phase 50-60 Hz
	on the same earth as the microscope
Microscope	1x external scan interface
	1x earth connection
	1x detector port
Space	LJ DISS6 imaging unit should be placed in a 19-inch rack
	Pneumatics controller may be placed on the lab floor
	PC (optional) should be placed in the control room



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