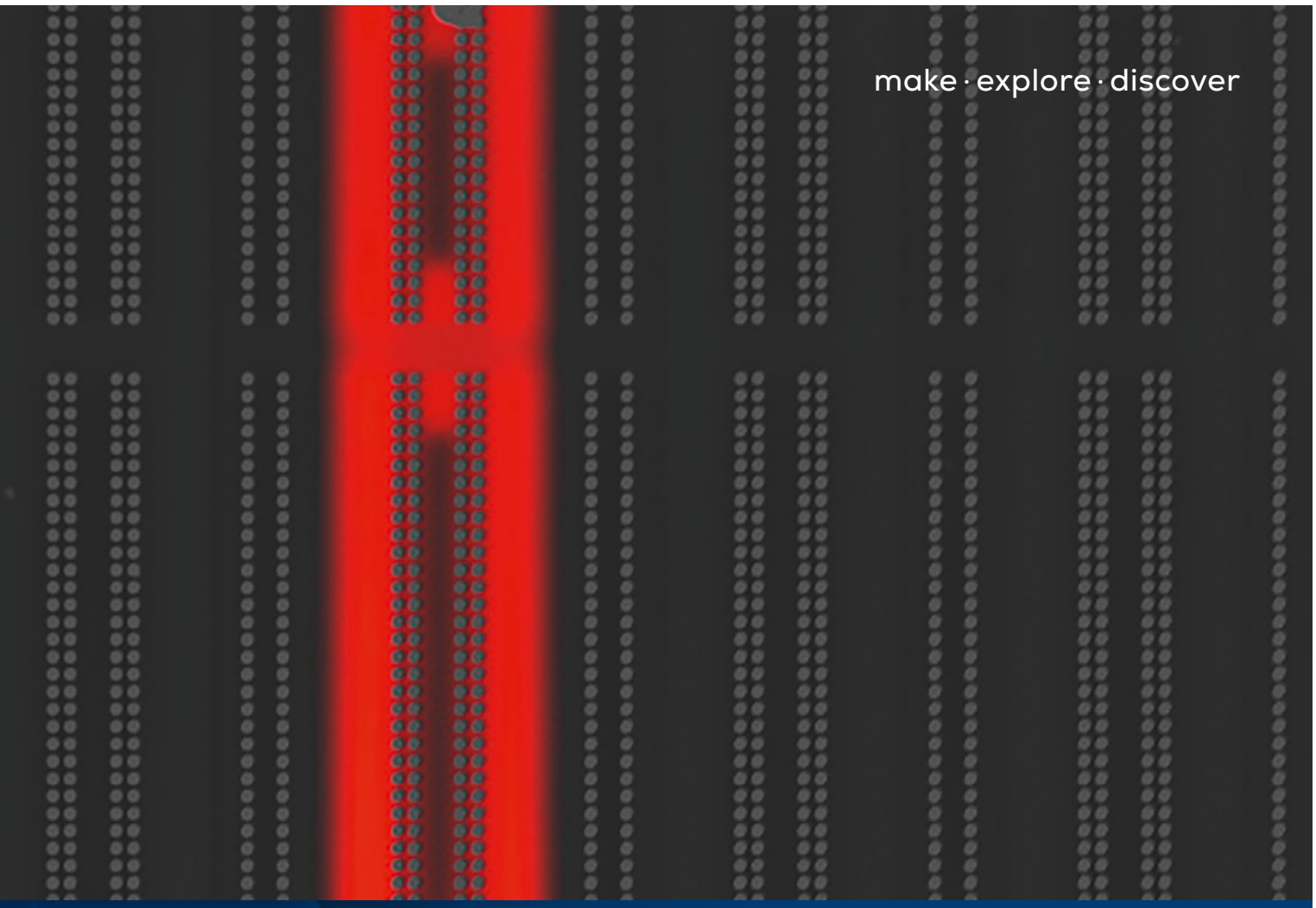


make · explore · discover

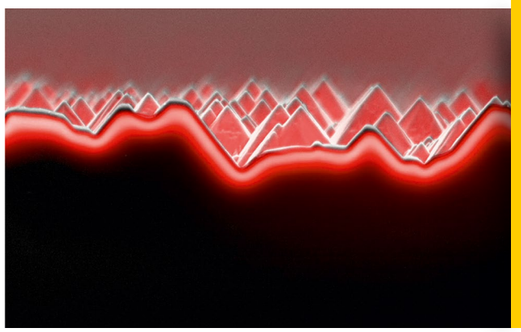
Electrical Analysis for SEM

The best quantitative electronics and software for analysis of electrical properties in SEM and FIB/SEM

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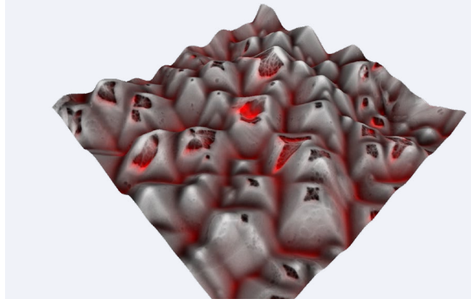
Explore electrical properties at the microscale

The Electrical Analysis system supports all electrical analysis techniques in SEM, including EBIC, RCI, and EBIRCH, for precise, high-quality visualization of electrical properties and defects. Advanced features include ultra-fast multi-channel imaging, live-color mixing, quantitative signal, in-situ preamplification, and integrated lock-in EA to ensure rapid, intuitive analysis and to maximize application versatility.



MAPS OF INTERNAL ELECTRIC FIELDS

Map active areas of junctions and contacts, perform quantified reference sample verification, observe electrical behaviour under bias, and measure diffusion length.

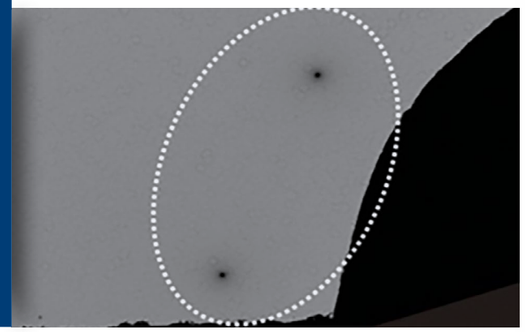


MULTI-SIGNAL IMAGING - NOW WITH TOPOGRAPHY

Acquire and visualize electrical data together with composition and topography such as EBIC with topography, for enhanced correlative workflows.

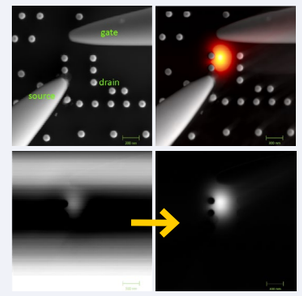
ELECTRICAL ACTIVITY OF DEFECTS

Identify regions of elevated recombination activity, continue with high-resolution techniques, and export data to quantify recombination intensity.



NOISE REMOVAL

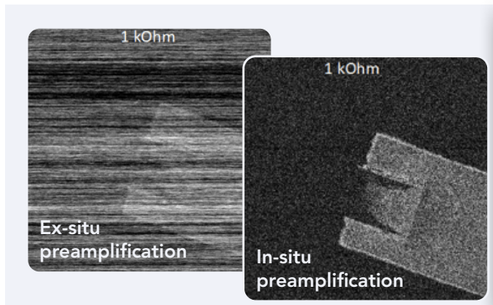
Use the built-in lock-in amplifier with scan-mode assisted beam blanking to remove high-current offsets and low-frequency noise.





RESISTANCE AND CONDUCTIVITY

Map electrical resistance to identify shorts, opens, weaknesses, and leakage paths in devices.



VERSATILE APPLICATIONS

Operate the in-situ ultra-fast low-noise preamplifier with pA noise level for sensitive devices and minimum carbon contamination.

Run the optional RCI in-situ preamplifier for low resistive samples, down to 100 Ohm.

The highest level of integration and automation

CUSTOMIZABLE WORKFLOW

Configurable buttons and scan settings, including fast scan for alignment, high-resolution EA profile for analysis, and simultaneous EA/SE scan for localization

DIGITAL LOCK-IN (OPTIONAL)

Removal of high current-offsets e.g. bias induced, and of low-frequency noise. Scan-assisted beam modulation available

INTEGRATED AMPLIFIER CONTROL

Software integrated, complete control of all amplifier functions, including routing, calibration, gains, offsets, bias and compensation. Auto time filter matches scan speed

DIRECT CORRELATION

Simultaneous acquisition of Electrical Analysis with up to 20 further detector signals, live signal mixing and processing tools

INTEGRATED CURRENT-VOLTAGE SWEEP TOOL

Configurable range, points, and timing to verify electrical connections and inspect for beam damage

MICRODIP PROCESSING APP

Full image and metadata viewer with automated quantification, pseudo-colors, profile line extraction, measurement tools and automated diffusion length determination

EA amplifier control | EA and SEM image acquisition
Automated quantification | Current-voltage sweep tool
Live image mix tool | Standard file formats

Best quantitative EA system for SEM

As a complete solution, all electronics are fully integrated and controlled via software.



Calibrated electronics and software

EA amplifier | EA Imaging system | DISS6 app
microDIP app | Display panel | EA sample holders

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EA AMPLIFIER

Wide range amplification for maximum flexibility, with built-in voltage bias and current compensation, factory calibrated gains and offsets



EA IMAGING

Multi-channel imaging system for simultaneous acquisition of EA and other SEM signals, with optional lock-in



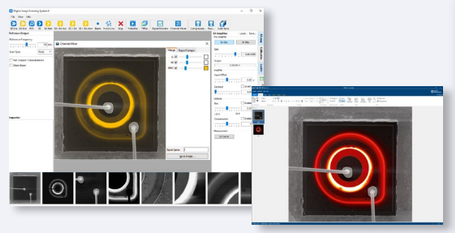
DISPLAY PANEL

Hardware control panel with touch display and encoders for easy, fast and precise software control



EA SAMPLE HOLDER

Compatible with various SEM stages, including built-in Faraday cups and optional preamplifier and load-lock compatibility



DISS6 AND MICRODIP APPS

DISS6 image acquisition and amplifier control, with color mixing, current-voltage (IV), line scans, inspection and export functions of calibrated image data. microDIP for image processing.

EA amplifier for SEM

Inputs	1x BNC for EA high (sense)
	1x BNC for EA low (switchable ground or bias)
Analog pre-amplifier(s)	10^2 … 10^9 V/A variable ex-situ gain
	10^5 - 10^{12} V/A fixed in-situ gain with in situ preamplification
	Approx. 100kHz bandwidth at 10^7 V/A
	8 levels low-pass filter
Digital main amplifier	-0.5V...0.5V input offset
	1....3600 contrast
	Signal inversion
Internal sources	-10 … 10 V, 16-bit bias voltage
	-10 ... 10 µA, 16-bit compensation current
	Current limitation to 10mA, 30mA and 100mA
Power	1x D-SUB for in-situ preamplifier

EA Imaging

Signal inputs	1x calibrated EA
	4x calibrated SEM
Digitization	20bit digitization EA saved to 16-bit
	12-bit SEM, saved to 16-bit
	32,000× max. oversampling (pixel averaging)
Scan generator	X and Y scan outputs (calibrated)
	Beam blank output (optional)
	64k × 64k pixels maximum resolution
	0.5 GPixels maximum frame size (software limit)
	1 µs minimum pixel dwell time (EA input limit)
	6 milliseconds maximum pixel dwell time
	256× max. frame average
	50x max. line average
	Frame, line, pixel synchronization (optional)

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EA Imaging app

EA amplifier control	Gain, Contrast, Brightness, Bias, Compensation, Inv.
	Save/load amplifier profile
EA DISS6 imaging control	Configurable scan profiles
	Signals, pixel size, speed, averaging, sync
	Manual/automatic image range
Inspector tool	Automatic quantification of pixel values
	Editable formula files
Current voltage (IV) tool	Voltage range, steps, time
	Live plot with data export
Image mixing tool	Manual colour assignment
	Live mix with image export
Save file formats	Uncompressed 16-bit multi-page TIF
	Compressed JPEG
	XMP metadata embedded into TIF and JPEG
Operating systems	Windows 11 … 7

microDIP app

Input file formats	Uncompressed 8-bit or 16-bit multi-page TIF
	Compressed JPEG
	XMP metadata embedded into TIF and JPEG
Export file formats	PNG images
	CSV data with pixel values
View modes	Single page image and metadata
	Multiple pages/file
	Layers/image mix view
Quantification	Automatic, using XMP values and formulas
	Manual, using XML formulas
Pseudo-colour	GGR gradient based colour mapping
	Automatic and manual control of range
Operating systems	Windows 11 … 7

EA sample holder

Configurations	2x probes
	4x probes
	4x probes with in-situ preamp
	4x probes for load-lock transfer
Faraday cage	Standard
Flange with feedtrough	Optional

Display panel

Configuration	Panel interaction with software interface via events and actions
Display	Display 480 x 800 px (4.3”)
	Resistive touch
Encoders	4 encoders
	360 increments per revolution
	Beeper and vibration motor for haptic and acoustic feedback
Housing	Sturdy metal housing for stability
Interface	USB interface for control and power

Software packages

Drivers	PEUSB
Libraries	DISS6 Control
Apps	DISS6 app
	microDIP app
Server	EMGateway

Parts and Cables

EA amplifier for SEM	Standard	1x
DISS6 scan controller	Standard	1x
EA power supply	Standard	1x
EA ground strap	Standard	1x
EA signal cable	Standard	1x
SEM external scan interface cable	Standard	1x
USB cables	Standard	1x
USB memory stick with software	Standard	1x
EA reference samples	Optional	-
Display panel	Optional	1x
EA sample holders	Optional	-
Flange with feedtrough	Optional	-
PC, keyboard, mouse	Optional	1x
Display	Optional	1x

Weight & Dimensions

EA amplifier	10.5 x 4.1 x 11.8 cm typ.
	0.4 kg typ.
EA DISS6 imaging	23.5 x 8.7 x 29.5 cm
	3.4 kg
Display panel	20 x 15.5 cm
	0.9 kg
Shipping	typ. 36 x 32 x 56 cm
	typ. 6.5 kg

Site requirements

Power	1x mains 110/220 VAC single phase 50-60 Hz
	On the same earth as the microscope
Microscope	1x vacuum electrical feedtrough to device under test
	1x connection to SEM earth
	1x external scan interface on SEM
Space	EA amplifier must be placed in the proximity of SEM chamber
	EA DISS6 imaging may be placed on the SEM bench or in a rack

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Our design principles

We look back on over 30 years of experience in development and manufacture of high-performance instruments and technologies for microscopy.

We are driven by an ambition to expand abilities and to improve performance of electron microscopes.

Our aspiration is to make the best quality tools and to join our customers on their journeys of scientific exploration and discovery.

Performance
Microscopy must be a reliable and enjoyable experience
- Design for highest speed and resolution at the lowest noise
- Develop smart independent controllers for live optimization
- Support new users with simple and automated controls
- Assist advanced users with access to all parameters

Efficiency
Microscopes must provide an uninterrupted focus
- Use standard microscope controls and data formats
- Give instant feedback with live image mixing and processing
- Add bespoke software tools and algorithms for repetitive tasks
- Enable more developers with libraries and documentation

Environment
Products and technologies must be sustainable
- Reduce power consumption through smart design
- Minimize material use, embrace reuse where possible
- Save weight and volume for shipping and maintenance
- Enable everyone to develop sustainable innovations

Quantification
Data and control must be in physical units
- Calibrate, in production, for measured inputs and outputs
- Provide samples, procedures and software for calibration
- Give all control parameters in device independent values
- Ensure safe operation according to IEC61010-1 and IEC 61326-1

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