

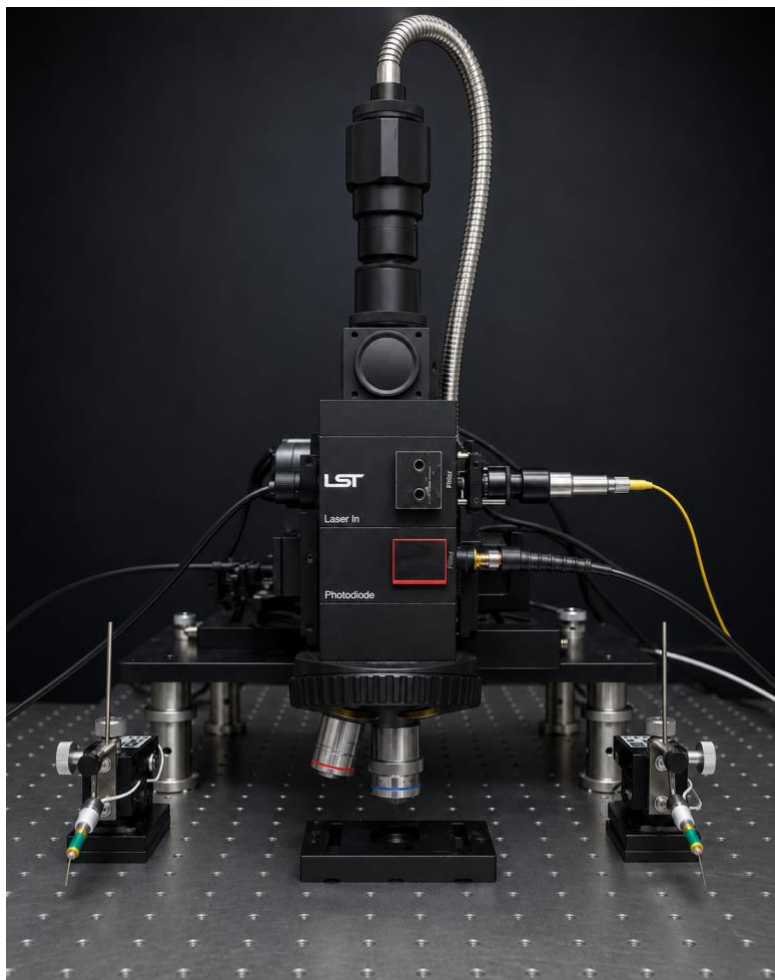


TECHNICAL DATA SHEET

LST Scanning Photocurrent Microscope

SPCM System

Correlated photocurrent, reflection and optical-power mapping for advanced materials and optoelectronic devices.



25 × 25 × 25 mm	25 nm	100 nm	$\sim 10^{-13}$ A
XYZ travel	Commanded step (XYZ)	Repeatability	Low-current capability ¹

Move the microscope - keep the sample and its connections in place.

¹ With appropriate preamplification, shielding, grounding and measurement bandwidth. Final performance is configuration- and application-dependent.

A flexible platform for optoelectronic mapping

The LST SPCM System scans a compact confocal microscope head over a stationary specimen. Electrical probes, cryostats, hotplates and other sample-environment hardware can remain connected while the system builds synchronized photocurrent and reflection maps.

Why researchers choose LST SPCM

Correlated signals. Photocurrent, reflected-light response and applied laser power are recorded together, pixel by pixel.

Stationary sample architecture. The microscope moves instead of the sample, preserving device contacts and experimental hardware.

In-Plane focus compensation. User-defined Z-height points keep tilted or profiled samples in focus across the scan.

Flexi-Scan geometry. Define areas at any in-plane orientation without rotating the specimen or collecting unnecessary pixels.

Real-Power monitoring. Continuous laser-power measurement adds an optical-power record to every experiment.

Open, upgradeable platform. Choose SPCM, spectral imaging or a combined configuration, with custom integration available.

Platform configurations

CONFIGURATION	CAPABILITY
SPCM	Photocurrent and reflection mapping with lock-in detection, widefield navigation and real-time laser-power monitoring.
Combined SPCM + SSI	Photocurrent and spectral imaging on one platform, simultaneous acquisition can be configured for the application.
Custom	Confocal optical platform integrated with a selected scanner or configured for pointwise measurement.

Designed for

- Photodetectors, photovoltaic structures and other optoelectronic devices
- Semiconductors, thin films, nanostructures and spatially non-uniform materials
- Device studies requiring electrical probing during optical mapping
- Temperature-dependent experiments using compatible cryostats or hotplates

Scanning and mechanical specifications

PARAMETER	SPECIFICATION
XYZ scanner	High-precision motorized XYZ positioning system
Travel range	25 mm in X, Y and Z
Commanded step	25 nm in each axis
Repeatability	100 nm
Position control	Closed-loop
Area scan	Serpentine scan (raster mode also available)
Additional scan modes	Arbitrary-orientation Flexi-Scan, line scan and point scan
Focus-plane control	In-Plane compensation using user-defined Z-height reference points
Mounting	Rigid arch with metric or imperial mounting holes

Optical and imaging specifications

PARAMETER	SPECIFICATION
Confocal mapping	Diffraction-limited when configured with suitable optics and installed on an optical table
Objectives	Single-objective mount or multi-position RMS nosepiece, Zeiss and RMS-threaded mount options
Objective guidance	40× or higher objective recommended for diffraction-limited scanning
Widefield navigation	LED illumination with Full HD, 60 fps CMOS camera (CCD option available)
Illumination control	Software and hardware intensity control with automatic illumination
Wavelength configurations	UV, visible or infrared, selected for the application
Excitation coupling	Single-mode fiber via FC/APC, FC/PC or SMA connector
Reflected-light collection	Multimode fiber via FC/PC or SMA connector
Filter access	Incoming and outgoing filter positions with EZ-Filter (expanded filter box optional)
Polarization	Polarization-maintaining optics available on request

SPCM measurement and acquisition

The SPCM configuration synchronizes confocal scanning with phase-sensitive electrical detection. A dedicated reflection channel and a separate photocurrent lock-in provide real-time, pixel-by-pixel maps while widefield imaging and laser-power monitoring remain active.

PARAMETER	SPECIFICATION
Photocurrent lock-in	Compatible with industry-standard analog and digital lock-in amplifiers, supported models are confirmed for each configuration
Reflection detection	Dedicated lock-in channel with integrated electronics and Si photodetector
Photocurrent capability	Sub-picoampere / approximately 10^{-13} A with suitable preamplification and noise control
Typical pixel integration	Approximately 3 ms/pixel for picoampere sensitivity (total map time depends on settings and scan size)
Device connections	Front-panel BNC connections
Measurement topology	Two-terminal measurements supported
Laser modulation	Adjustable with an optical chopper
Laser-power record	Continuous, real-time measurement and recording
Live acquisition	Photocurrent and reflection maps displayed during scanning

Software features

- Guided experiment setup with a user-friendly interface
- Area, line and point scanning with arbitrary scan orientation
- In-Plane focus compensation for tilted or profiled samples
- Automatic illumination control and real-time map formation
- Synchronized laser-power logging for reproducible measurements
- Analysis software and upgrade path to combined photocurrent/spectral imaging

MEASUREMENT PERFORMANCE Sensitivity and acquisition time depend on the preamplifier, lock-in bandwidth, modulation frequency, optical power, device impedance, grounding, shielding and environmental noise. LST configures the measurement chain for the target application.

Configure the system around your experiment

LST SPCM is a modular platform. Optical, electrical and sample-environment interfaces are selected to match the material, device and measurement objective.

CONFIGURATION AREA	AVAILABLE CHOICES
Optical configuration	Excitation wavelength, fiber coupling, objective, beam splitter, polarization and filters
Electrical configuration	Lock-in amplifier, preamplifier, bias method, device cabling and two-terminal measurement support
Sample environment	Probe access, cryostat or hotplate compatibility, working distance and mechanical envelope
Imaging configuration	Single objective or RMS nosepiece, CMOS or CCD widefield camera, spectral-imaging upgrade
Motion and protection	Mounting arch, metric/imperial interface
Custom integration	Alternative scanner integration or pointwise configuration for specialized experiments

Site and integration essentials

- Rigid optical-table installation for diffraction-limited operation
- Laser source compatibility with the selected wavelength and experiment
- Grounding, shielding and utilities appropriate for low-current electrical measurements
- Mechanical clearance and working distance confirmed for probes, cryostats or hotplates

What to share with LST

For a configuration review, send the sample or device type, expected current range, laser wavelength and power, modulation frequency, objectives, scan dimensions, sample-environment hardware and required maps.

Discuss your SPCM application with LST

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Specifications are configuration-dependent and may change as the platform evolves. The signed quotation and configuration sheet define the final scope of supply and performance commitments.