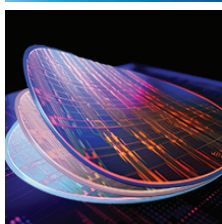
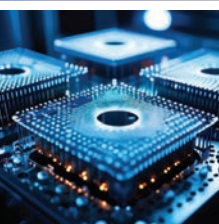
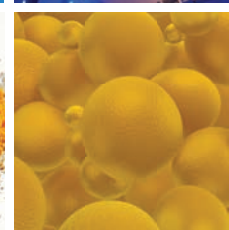
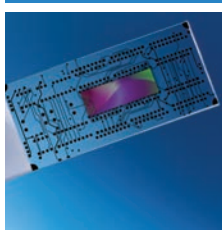
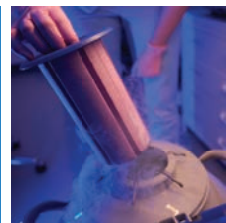
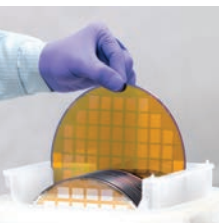


HORIBA

SMS-CRYO

Cryogenic Low Temperature Micro-Spectroscopy Solutions



Modular and flexible
performance
without compromise

microspectroscopy.com

Explore the future

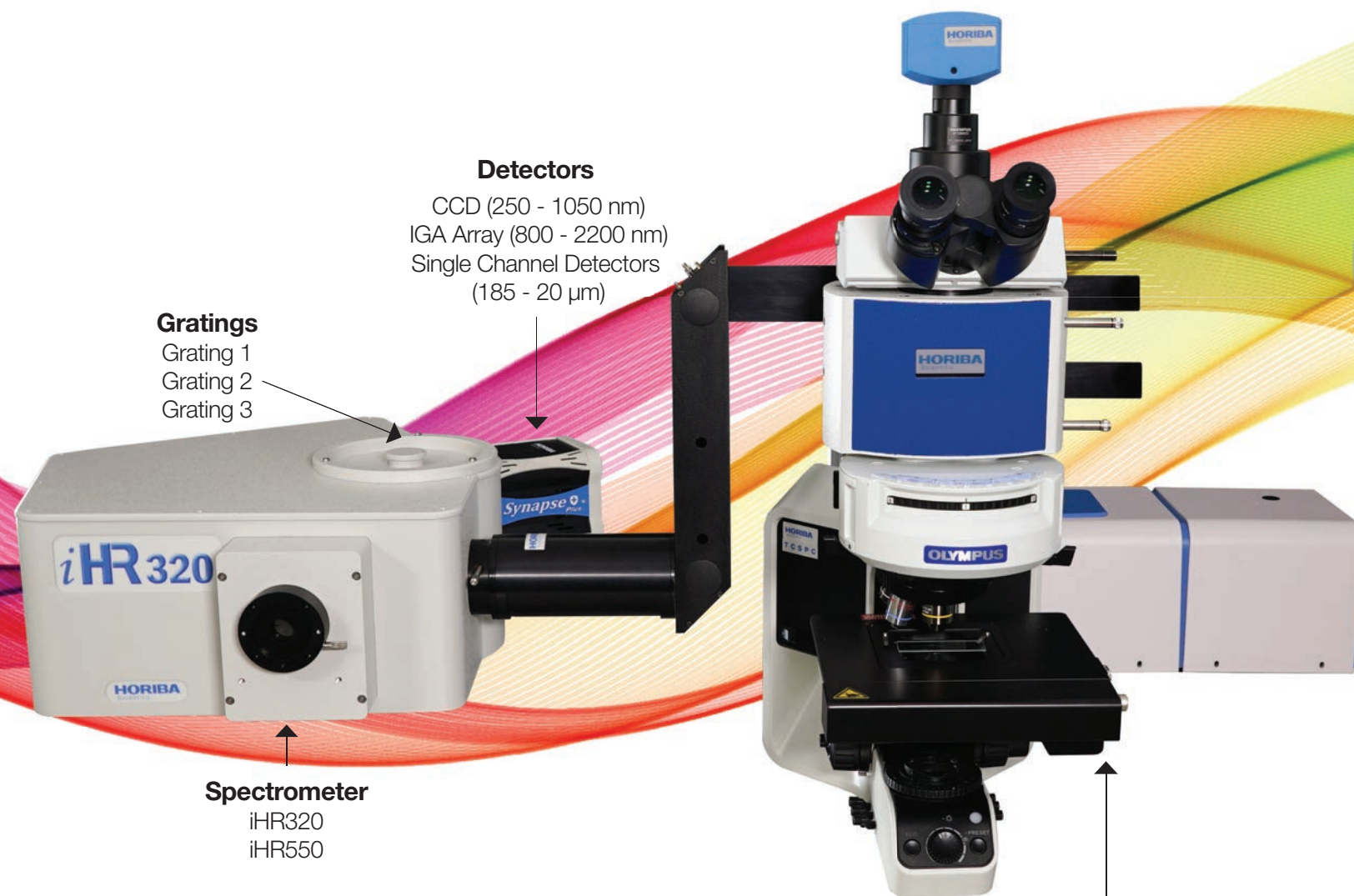
HORIBA

SMS

STANDARD MICROSCOPE
SPECTROSCOPY SYSTEMS

Add Spectroscopy To Any Microscope

Turnkey SMS systems or simple upgrades to microscopes
integrate seamlessly with cryostats.



Gratings

- Grating 1
- Grating 2
- Grating 3

Detectors

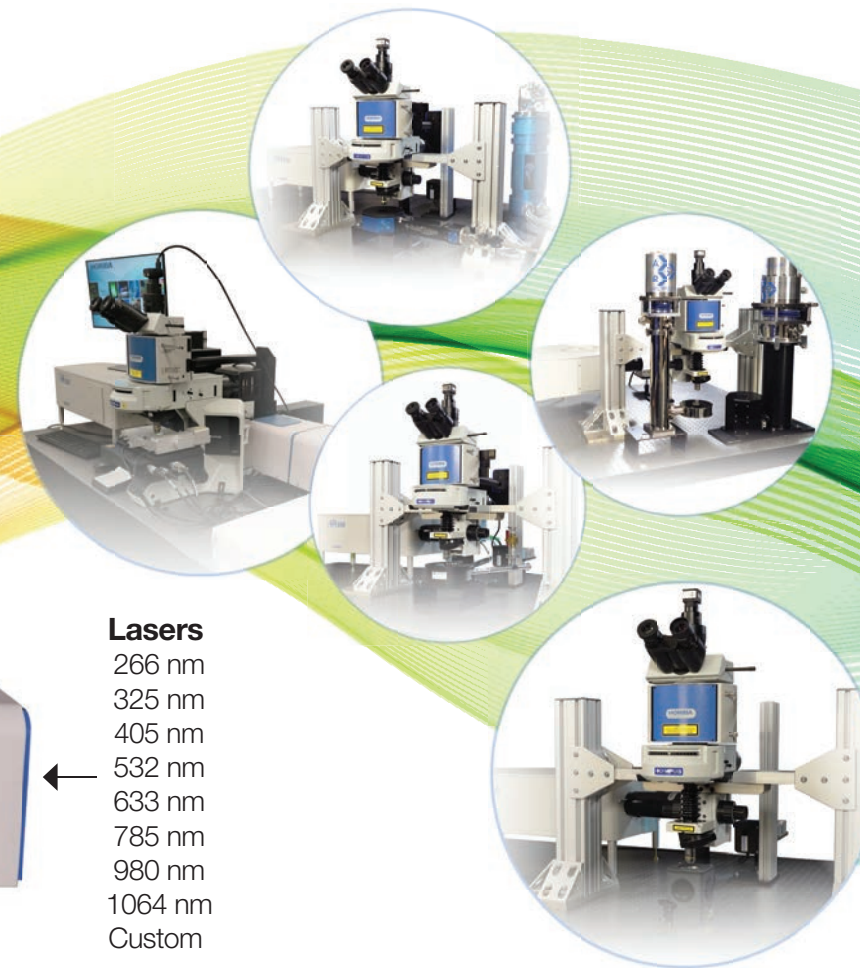
- CCD (250 - 1050 nm)
- IGA Array (800 - 2200 nm)
- Single Channel Detectors (185 - 20 μm)

Spectrometer

- iHR320
- iHR550

Manual/Motorized XYZ Stages

- Sample Positioning and Conditioning
- Mapping Up to 300 x 300 mm
- Temperature Control



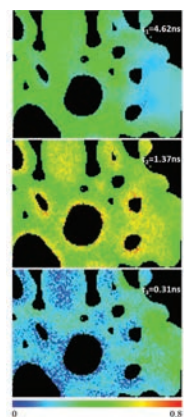
Lasers

- 266 nm
- 325 nm
- 405 nm
- 532 nm
- 633 nm
- 785 nm
- 980 nm
- 1064 nm
- Custom

Multitask Your Microscope™

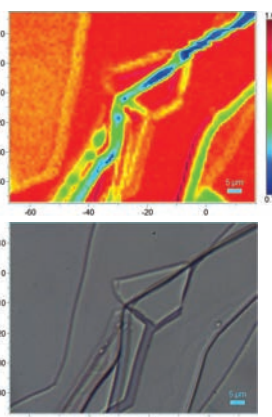
SMS CRYO Features

- Seamless integration of a wide variety of cryostats from most major manufacturers
- Enables the multimodal performance for the following micro-spectroscopies at temperatures down to 4K
- Raman, Photoluminescence (PL), Time-resolved PL, Reflectance, Electroluminescence, Photocurrent and Darkfield Scattering
- From upgrades to existing user components to complete turnkey solutions that work out of the box
- Completely modular solution that can be adapted to changing work needs and requirements



Time-resolved Photoluminescence (TCSPC)

Add Time-resolved Photoluminescence or lifetime point and imaging measurement to any SMS system with the Time Correlated Single Photon Counting (TCSPC) option.



Reflectance and Transmittance

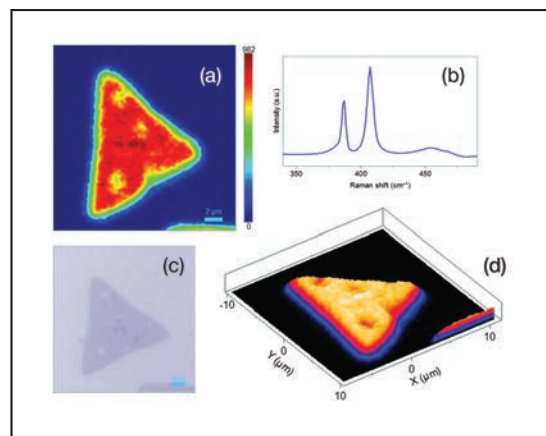
Perform broad-spectrum reflectance and transmittance measurements from UV to NIR with high spatial resolution.



Darkfield Scattering

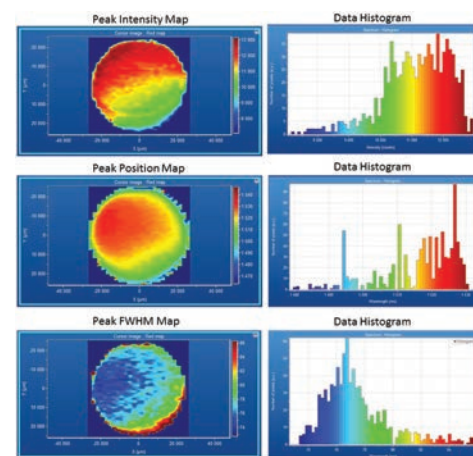
Take advantage of darkfield functionality on the microscope to perform nanospectroscopy on the SMS.

Enable characterization of nanomaterials by measuring the light scattering spectrum in darkfield mode.



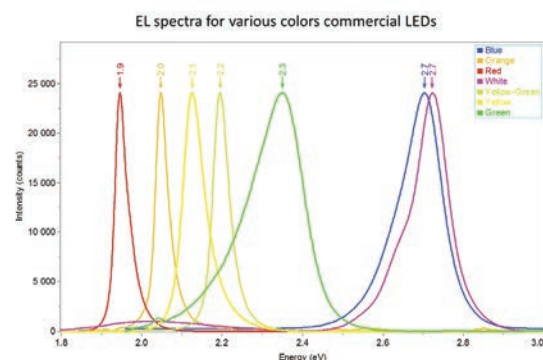
Raman

The SMS offers high performance Raman microspectroscopy with specifications comparable to high-end benchtop systems, but with unrivaled flexibility.



Photoluminescence

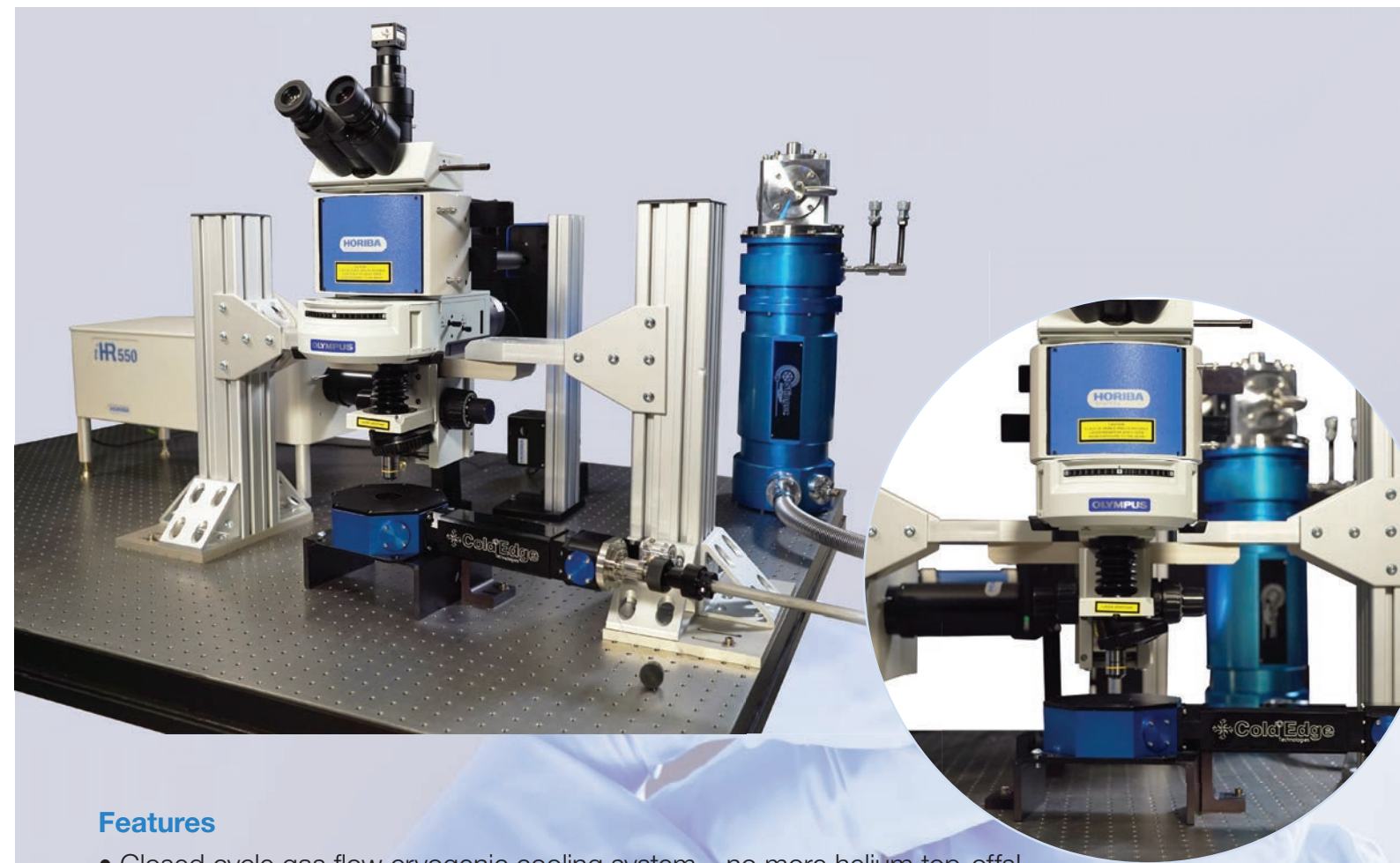
The SMS system uses mainly reflective optics in its design, offering a wide spectral range for both excitation (266 nm – 1064 nm) and emission (250 nm – 2200 nm).



Electroluminescence and Photocurrent

With its open microscope frame design, the SMS system can accommodate micro-probes to enable electroluminescent measurements on LEDs, photovoltaic and other semiconductor materials.

SMS CRYO with Cold Edge Cryostat (Stinger®)



Features

- Closed cycle gas flow cryogenic cooling system – no more helium top-offs!
- Wide temperature range (3.8 K to 800 K) directly at the sample point
- The Stinger cryocooler has a small footprint with no dewar
- Long flexible line with low vibration at the sample (<10 nm), and freedom of movement of sample chamber and flexible positioning of the Stinger cryocooler.
- Customizable sample-to-window distance

Key Specifications

- Compressor water-cooled, 200 or 380/400/480 V 3 phase, 50/60 Hz
- 6, 10 or 20 m gas line set & CCR head power cable
- Re-circulation compressor, 220/230 V 50/60 Hz 1 phase
- 1.8 meter transfer line flexible section (3m optional)

SRDK-408 4K Cryocooler system. Cooling capacity* 1 W @ 4.2K

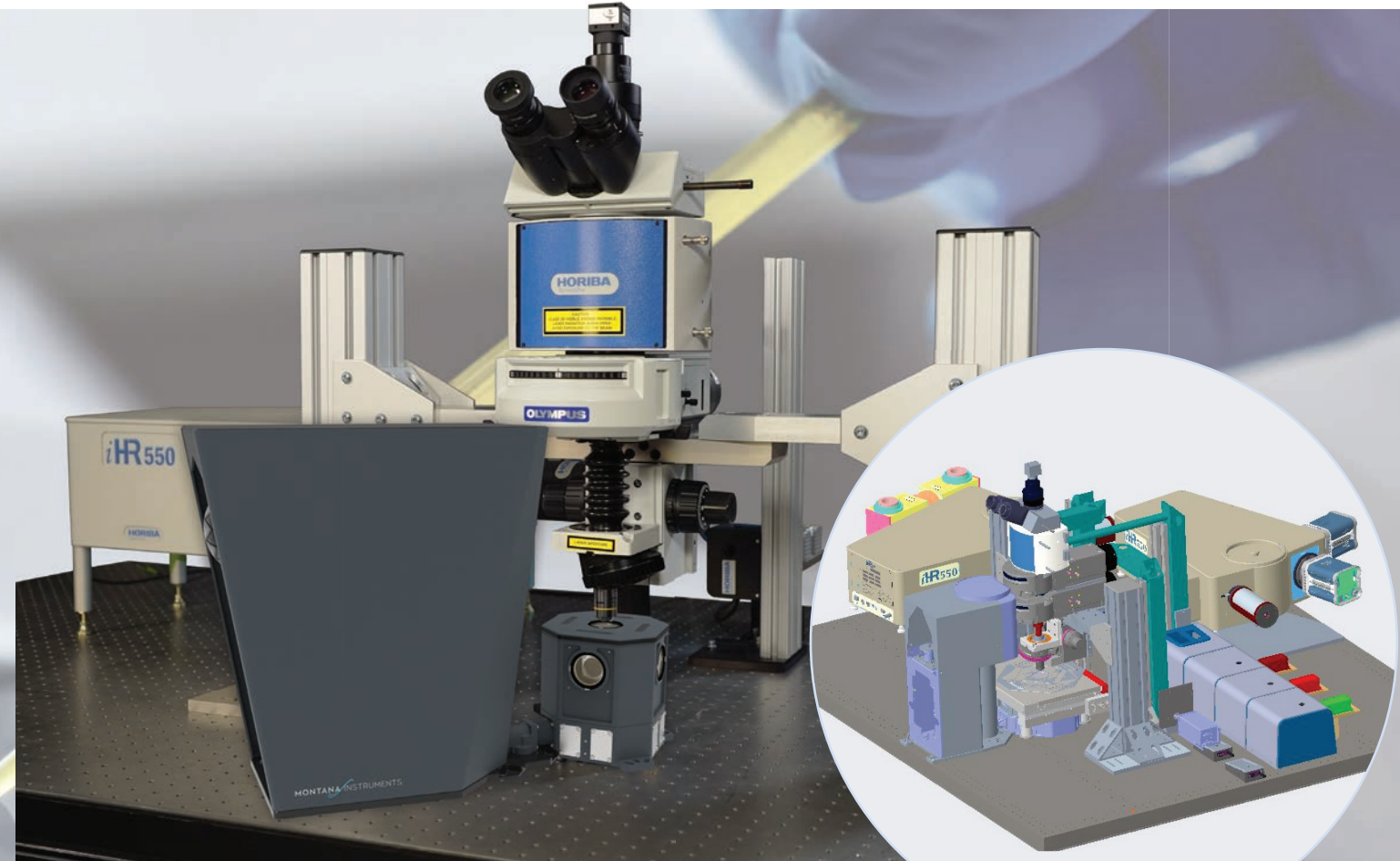
6m gas line set & head power cable for CCR

0.5 watts @ 4.2 K

10 K Stinger® CH-210N 6.5K, 4 W @ 10 K

6m gas line set & head power cable for CCR

0.25 watts @ 10 K



Features

- Closed cycle and flow-through gas cryogenic cooling system!
- Wide temperature range (3.5 K to 475 K) at the sample point
- Fast cool down ~ 30 minutes
- Customizable sample-to-window distance
- Compact version (ST-500-C) to fit on standard microscope stages

Key Specifications

- Magnetic chamber accessory: 0.45-1 T

	ST-500	ST-500-C
Temperature Range	3.5 K to 475 K	6K to 475 K
Cryogen Consumption (LHe at 10 K)	0.5L/h @10 K	0.8L/h @10 K

Features

- Closed cycle gas flow cryogenic cooling system – no more helium top-offs!
- Wide temperature range (3.2 K to 350 K) directly at the sample point
- Fully integrated turnkey system – gets you up and running quickly with minimal effort
- Patented vibration damping technology – isolates cryocooler without need for external support structures.
- Cryo-optic and cryo-magnetic accessories available for sensitive optical and magnetic measurements

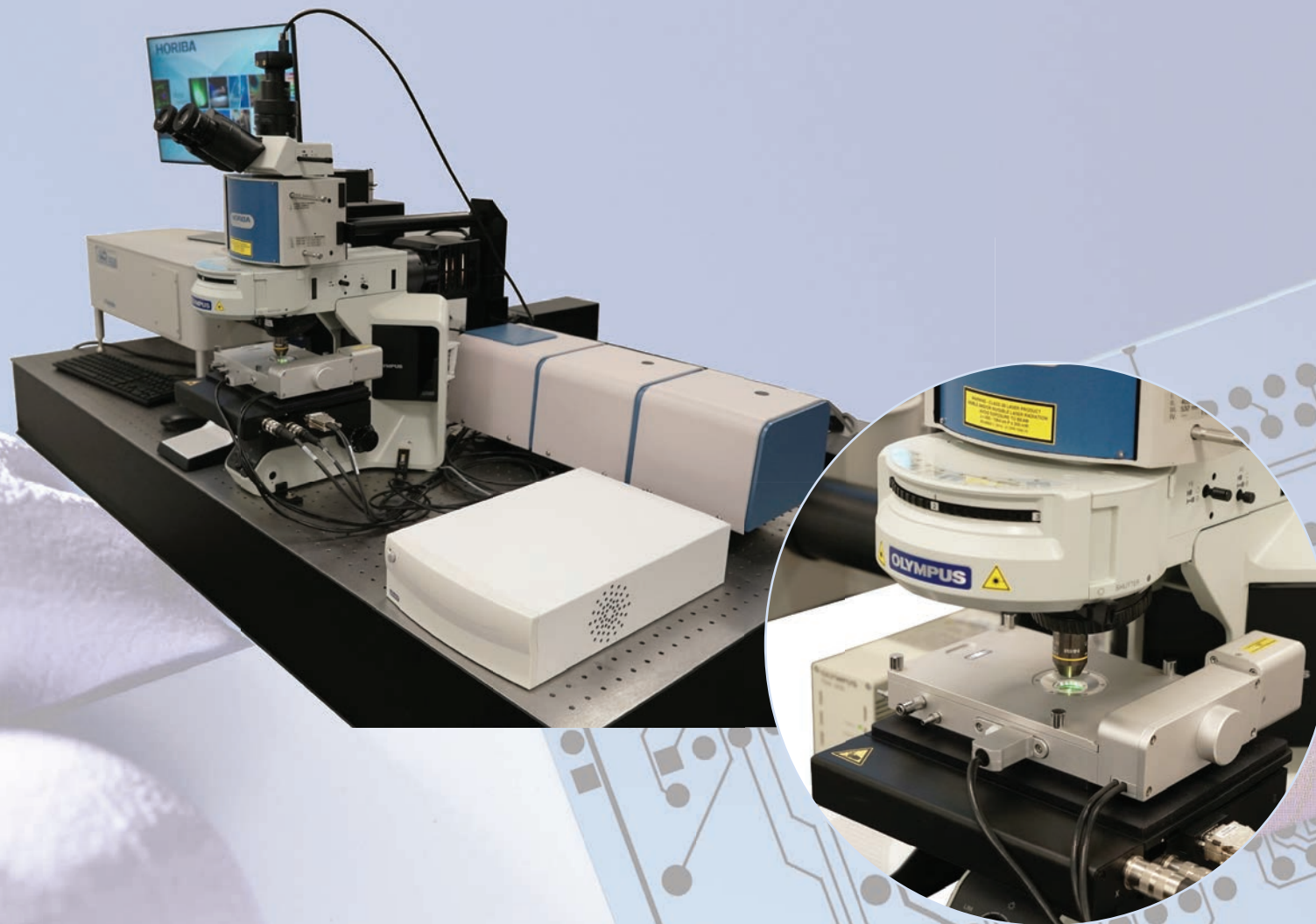
Key Specifications

- Magnetic chamber accessory: 0.45-1 T

	CRYOSTATION	S50	S200
Base Temperature		3.2 K	3.6 K
Vibration		0.25 watts @ 10 K	<15 nm

SMS CRYO with Linkham® Heating/Cooling Stage

SMS CRYO with ARS® Cryostat



Features

- Low profile Linkam heating and cooling stages fit on most standard microscopes
- Included adapter plate to mount to microscope
- Rapid heating and cooling rates ~ 150 °C per minute
- Over 15 mm of travel in X and Y directions
- High degree of accuracy and stability over temperature range

Key Specifications

	THMS600
Temperature Range	-195 °C - 600 °C
XY Manipulation	15 mm
Objective Lens Working Distance	4.8 mm
Temperature Stability	<0.01 °C

Features

- Solvay™ cryocooler provides strong cooling power with minimal vibration
- Helium exchange interface with nanometer scale vibration isolation at the sample
- Modular sample chamber with breadboard capability for flexible sample mounting
- Capable of in-vacuum and cold objectives for ultimate low-working distance microscopy and spectroscopy applications

Key Specifications

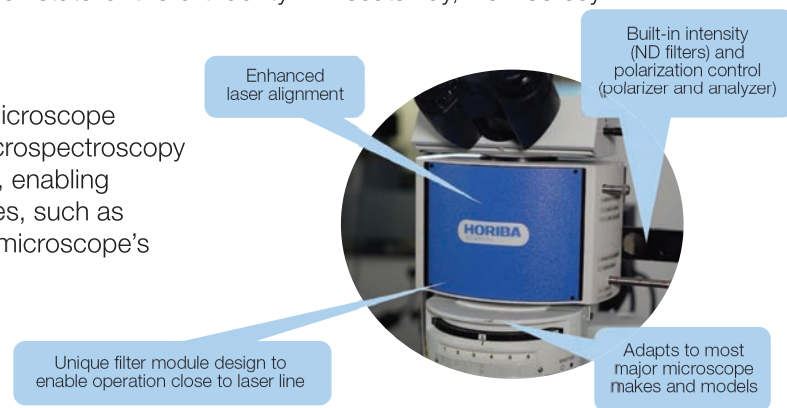
	μDrift Cryostat
Base Temperature	3.8 K
Cool Down Time	4 hr
Vibration	10 nm
Drift Per Hour	100 nm

High-end performance with no compromise

HORIBA is not simply a system integrator buying components from third party vendors and integrating them. As an original equipment manufacturer, HORIBA designs and manufactures most of the key components relevant to spectroscopic performance of the SMS system in their state-of-the-art facility in Piscataway, New Jersey.

The Universal Microscope Adapter (UMA)

A key enabler for the SMS system is the Universal Microscope Adapter (UMA). The UMA is a uniquely designed microspectroscopy accessory that adapts to most upright microscopes, enabling high-end performance for challenging spectroscopies, such as Raman, PL and lifetimes without compromising the microscope's native functionality.



Gratings, Spectrometers and Detectors

HORIBA has long history in high performance optical instrumentation design and manufacturing, from high quality gratings to the triple grating imaging spectrometer, and an assortment of deep-cooled scientific array detectors used in SMS systems. This means that we back our instruments with deep knowledge of the underlying components, and industry leading applications support.

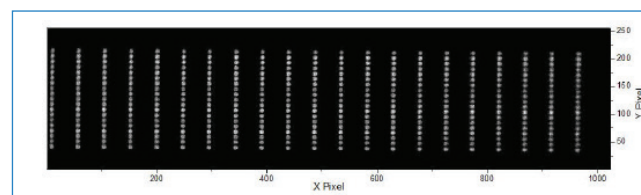


Image of a 633 nm laser moved across the focal plane through nineteen 200 μm fibers. The 1x imaging adapter was used with an iHR550 spectrometer, 1200 gr/mm grating blazed at 500 nm, and 1024x256 open-electrode CCD.

Accessories

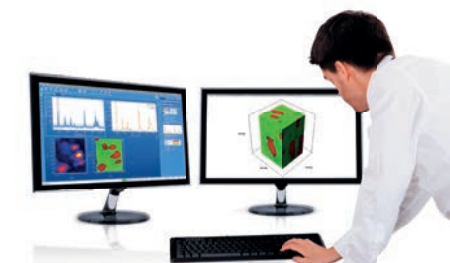
Customize your SMS system to address different sample handling and conditioning needs, from unusually sized samples to low temperature measurements.

- Up to 300 mm wafer mapping stage
- Low temperature measurements down to 4 Kelvin (4K) using most commonly available cryostats.



Software

Benefit from our industry-leading LabSpec 6 software. With a simple and intuitive user interface, LabSpec 6 offers advanced features for instrument control, automated data collection and analysis, as well as user account management.



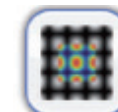
Instant processing

Advanced on-the-fly custom processing gives data ready for immediate analysis, without further time-consuming treatment



OneCheck

Automated alignment and calibration tools ensure that valid and optimized data are obtained time and time again



Video overlay

Overlay Raman images onto optical microscope images for hybrid sample viewing



Image analysis and display

Fast conversion of hyperspectral map data into meaningful chemical images, with full display control



Database searching

Identify material composition with large spectral databases using the KnowItAll® informatics platform



Customized reporting

Create customized multi-data, multi-page templates for fast reporting of results



Batch processing

Fast batch processing of multiple data files, for efficient high throughput data treatment



Templates and methods

Instant recall of hardware settings, and fast, easy customization and automation of data acquisition and analysis functions



VBS / ActiveX

Integrated VBS script editor for in-software programming, and external hardware control via ActiveX



User accounts

Secure password protected user access control with optimized user level based interfaces

Applications



The SMS systems are manufactured at HORIBA's brand new, state-of-the-art 132,000 square foot facility in Piscataway, New Jersey, featuring the highest quality manufacturing processes and efficiencies.



Made in the USA



HORIBA Instruments has a policy of continuous product development, and reserves the right to amend part numbers, descriptions and specifications without prior notice.

HORIBA

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