HOLMARC®
OPTO-MECHATRONICS LTD

532NM CONFOCAL IN-SITU MICRO RAMAN SPECTROMETER

XHARS™
HOLMARC ADVANCED RESEARCH SYSTEMS & SOLUTIONS

Model: HO-SP-CRM225H-INSI

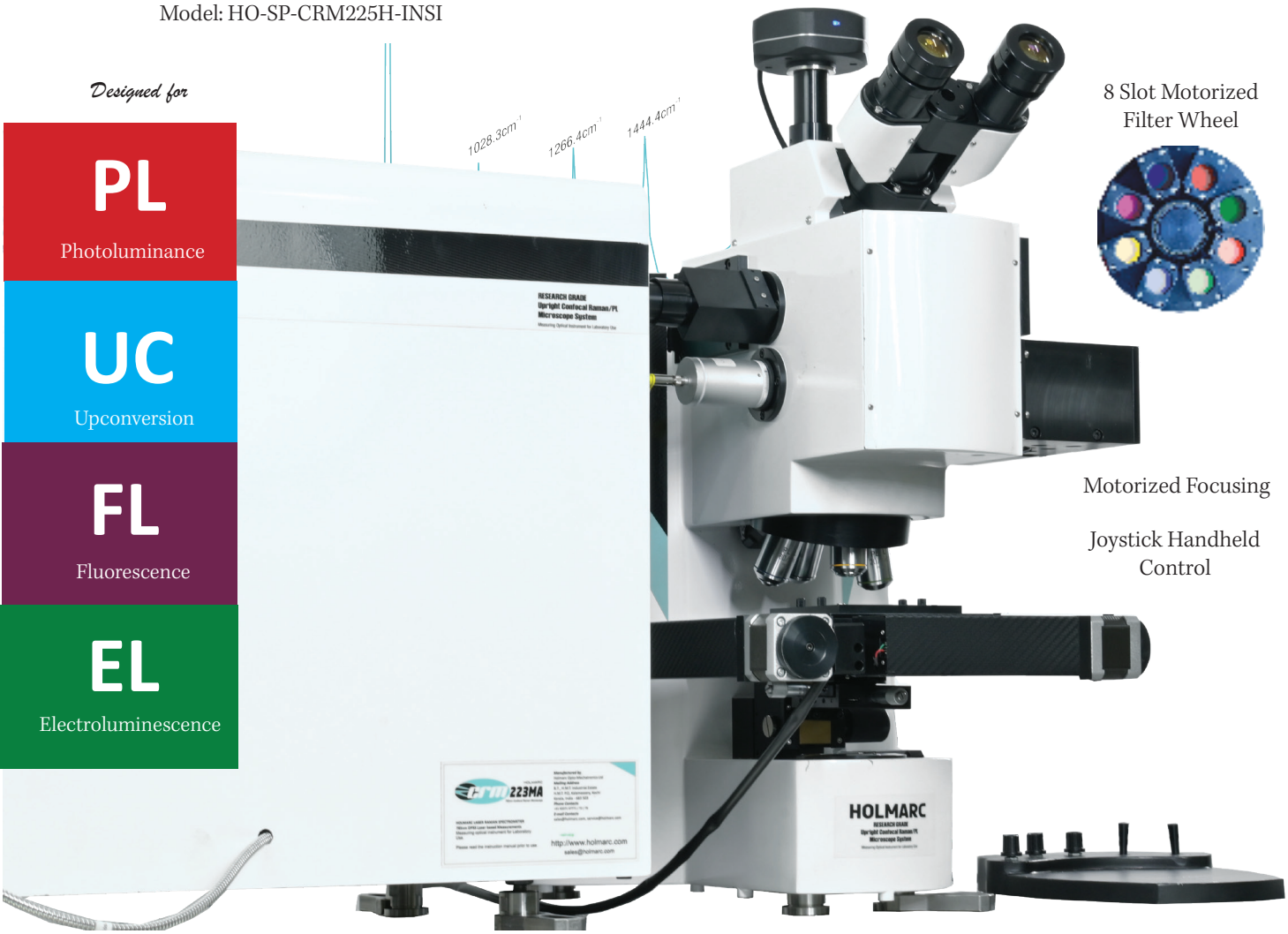
Designed for

PL
Photoluminance

UC
Upconversion

FL
Fluorescence

EL
Electroluminescence



8 Slot Motorized Filter Wheel

Motorized Focusing

Joystick Handheld Control

Stokes and Anti-stokes

RAMAN HYPERSPECTRAL IMAGING

Upright/ Inverted
Microscope Configuration

Shift Measurement Mode

0.1cm⁻¹
Diode Laser

Galvo⁺
High Speed Scanning

AUTO
LIVE FOCUS-TRACK

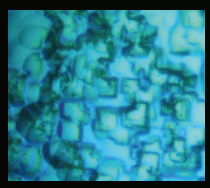
Manufactured and Marketed by HOLMARC™ Opto Mechatronics Ltd

Photoluminescence
Upconversion measurments
Raman Microscopy
Electroluminescence etc.

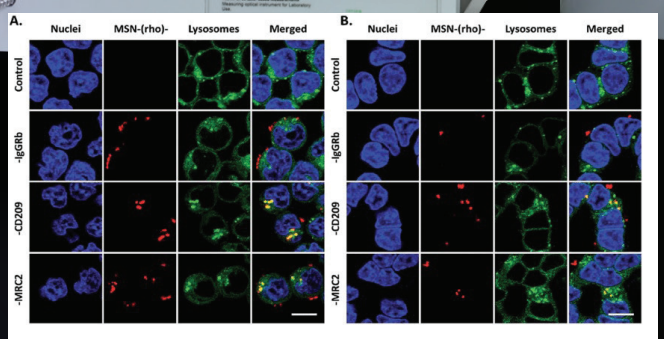
Graphene Sample

WS2 Sample Image

Ruby Pellet PL



Silicon



Cellular Images

ABOUT HO-SP-CRM225H-INSI

The HO-SP-CRM225H-INSI is a confocal micro Raman spectrometer designed for in-situ reaction monitoring and electrochemical studies. Combining 532 nm laser excitation, motorized precision controls, and a Czerny-Turner spectrometer, this system enables real-time spectral analysis with sub-micron spatial resolution. Ideal for battery research, catalysis, and corrosion studies, it integrates seamlessly with electrochemical flow cells for dynamic experiments.

At the heart of the system lies a precision-engineered confocal optical path coupled with a high-stability 532nm excitation laser, enabling researchers to obtain crystal-clear Raman spectra even for challenging samples. The integrated Czerny-Turner spectrometer, equipped with automatic grating switching, provides both wide spectral range and high-resolution measurements in a single platform.

The system's modular architecture supports numerous advanced configurations, including polarized Raman spectroscopy, temperature-controlled experiments, and multi-laser operation. Automated features such as motorized sample positioning, focus control, and objective switching ensure reproducible measurements and efficient workflows.

With its combination of analytical power, experimental flexibility, and robust construction, the HO-SP-CRM225H-INSI establishes a new standard for in-situ spectroscopic analysis, empowering researchers to uncover critical insights into material behavior under realistic operating conditions.

- Fully Motorized Compact Inverted double deck
- Z-axis Specimen stage
- Motorized nosepiece for the Z-axis focusing on a resolution of 10 nm
- Motorized condenser unit Optics compatible with all objectives
- Motorized 6 positions Objective nosepiece turret
- Motorized filter turret in 8 or more positions with individual filter cubes to image common fluntophores (DAPI/ Hoechst, GFP/FITC, RFP/TRITC, CFP). High-quality bandpass filters with no cross talk when simultaneously imaging
- Transmitted Uprght Ilumination LED clear visualization of optically transparent samples
- Fluorescence Illumination LED source, adjustable for the intensity of more the 20000 Hours
- Software control transmission and Reflected light image acquisition
- Port and optics for Epifluorescence and Beight field imaging

Battery Research: Li-ion/SERS studies.

Corrosion Analysis: Real-time surface monitoring.

Catalysis: Reaction intermediate detection.

Optical & Imaging System

Equipment Type	Upright
Optical System	Colour Corrected Infinity Optical System
Sample Stage	Stepper motor controlled
Objectives	Plan objectives 95mm parafocal confocal objective lens (Optional)
Parfocal Length	95mm
Objective Turret	Motorized positioning and 6 slots for keeping
Filter Selection Unit	8-slot dichroic filter cube assembly
Tube Length	200 mm
CONDENSER	Abbe condenser
FOCUS	Motorized Stepper motor controlled
Illumination for imaging	Bottom and Co-Axial HB-LED Based
Illumination Control	Continuously Variable PC-controlled Laser

Standard Objectives	**50X Plan Apo HR Infinity Corrected Objective**	
	Focal Length (FL)	4.00 mm
	Magnification	50X
	Numerical Aperture (NA)	0.75
	Working Distance (WD	5.2 mm
	2X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	100.00 mm
	Magnification	2X
	Numerical Aperture (NA)	0.055
	Resolving Power	5.0 μm
	Depth of Field	91.00 μm
	Working Distance (WD)	34.0 mm
Objective Turret	Motorized positioning and 4 slots for keeping	
Filter Selection Unit	8-slot dichroic filter cube assembly	
Tube Length	200 mm	
CONDENSER	Abbe condenser	
FOCUS	Motorized Stepper motor controlled	
Illumination for imaging	Bottom and Co-Axial HB-LED Based	
Illumination Control	Continuously Variable PC-controlled	

Please Refer Objective Table For other Objectives Options

Laser

Laser wavelength	532nm
Spectral Line Width	0.06nm
Type	Low noise variable power 100mW DPSS Laser
Shutter	Solenoid Type

Mapping Stage

Mapping sample stage	XYMR50 Motorized Stepper motor controlled
Travel	50x50mm
Resolution	0.3125 Micron
Scanning Speed	4mm/sec
Focusing	Motorized Stepper motor controlled
Travel	25mm
Resolution	0.1 Micron
Controller	HOLMARC XYZ Stepper controller
Unit Scanning	Programmable
Joystick	3 Axis Joystick controller

Raman Laser

Laser wavelength	532nm
Operating mode	CW
Spectral Line Width	0.06nm
Type	Low noise variable power 100mW DPSS Laser
Type	Low noise
Variability	Continuously Variable
Power stability	(rms, over 4 hours) : <3%
Transverse mode	Multimode
Warm-up time	<5 minutes
Shutter	Electronic Software controlled.
Optional lasers	support up to 3 lasers in combination with a motorized selection option Additional port for integrating the external lasers
Shutter	Solenoid/Motorized Type

Spectrometer

Spectrometer Type	Czerny-Turner
Focal Length	400 mm
Grating Turret	Motorized Grating Turret
Number of gratings	2 Supports automatic switching between 600 l/mm and 1800 l/mm gratings
Spectral range	3200 ~ 100 cm-1 (Raman)
Extended range by stitching	9000 ~ 100 cm-1 (Raman)
The spectral resolution	0.95 cm-1 with 600l/mm grating 0.32 cm-1 with 1800l/mm grating

Raman Filter set details

RazorEdge Dichroic laser beam splitter	
Edge Steepness (%)	0.2%
Edge Steepness (nm)	1.1 nm
Laser Wavelength 1	532nm
Transition Width (nm)	2.7 nm
Transition Width (cm-1)	90 cm-1

Raman Filter set details Raman Edge Filter Specifications	
Transmission Band 1	Tavg > 93%
Blocking Band	ODabs > 6
Edge Steepness (%)	0.2%
Edge Steepness (cm-1)	37.5 cm-1
Edge Steepness (nm)	1.1 nm
Transition Width (nm)	2.7 nm
Transition Width (cm-1)	90 cm-1

Spectrometer Detector

Make	Hamamatsu
Type	Binning type
Image size	24.576 x 1.464 mm
Number of effective pixels	2048 x 122 pixels
Pixel size	12 x 12 μm
Spectral response range	200 to 1100 nm
Line rate (Typ.)	107 lines/s
Line rate (max.)	203 lines/s
Dark current (Typ.)	30 e-/pixel/s
Readout noise (Typ.)	4 e- rms
Cooling	One-stage TE-cooled, -35 Degree Cooled
Window material	AR-coated sapphire
Package	Metal

Raman Electrochemical Flow Cell

Application	In-situ Raman spectroscopy coupled with electrochemical analysis.
Path Length	4 mm (optimized for optical penetration)
Cell Volume	0.7 mL (low sample consumption)
Body Material	Chemically inert PTFE/PEEK
	Optical Window High-purity quartz (default) / Sapphire (optional)
Electrode Ports	3 (WE, CE, RE) Customizable configurations
Flow Rate Range	0.1–10 mL/min (pump-dependent)
Electrochemical Properties	
Working Electrode (WE Options	Au, Pt, GC, or custom (user-provided).
Surface area	Standard 5 mm^2 (adjustable).
Reference Electrode (RE)	Compatible with Ag/AgCl, SCE
Potential Range	±2 V (solvent/electrode dependent).

Imaging Camera Specifications

Sensor Type	CMOS Global Shutter
Pixel Size	4.0μm×4.0μm
Optical Size	1/2.7”
Resolution	1280x1024
Max Frame Rate	213.9FPS
Effective Sensor Area	5.12mmx4.1mm
SNR	40db
Sensitivity	8V/Lux.S
Bit Depth	10bit
Trigger Mode Hardware Trigger / Software Trigger HDR	60dB
Gain Gain	1-3×
Step	0.125×
Image Format	RAW BMP JPG PNG
Exposure Time	4us-145ms305us
Pixel Formats	AW8 RAW16 BGR24 MONO8 MONO16
Data Interface	USB3.0
Power Supply	USB 5V
Power Consumption Operating	1.64W
Standby	1.12W
Operating Temperature	10^0~50^0
Protocols/Standards	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV

System Control and Data Collection software including Software for Sample Viewing

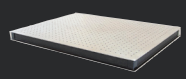
Capable of managing user-built libraries and material identification with spectral databases

HARS™
HOLMARC ADVANCED RESEARCH SYSTEMS & SOLUTIONS

HO-SP-CRM225H-INSI

The **HO-SP-CRM225H-INSI** is a powerful, research-grade Raman EL/PL probe station microscope, designed for advanced material research, semiconductor analysis, and next-generation photonic studies.

Accessories



1. 1200x900mm Optical breadboard and Passive vibration isolation support interconnected with power supply rack

2. Polarized Raman Spectroscopy
   Motorized programmable Glan Thompson Polarizers for polarization dependant Raman spectrum measurements

3. Temperature-controlled Raman Measurement option
   Temperature Measurement Range : RT to 200°C
   Temperature Resolution: 1 °C
   Control: Software based
   Dual Programmable ND Filter Wheels - 8No.s ND Filters for fine laser intensity controls

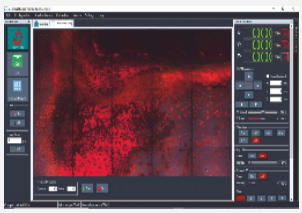
Customization & Scalability

Laser Integration : Up to 8 lasers (internal + external)
Custom Probing : Fiber optic & vacuum stages optional
Integration Ready : Keithley, LabVIEW compatibility

- Ultra-Sensitive Spectroscopy – Captures extremely weak electroluminescence, photoluminescence, and Raman spectra.
- Multi-Function System – Supports Raman, EL, PL, and up-conversion material studies.
- Precision Micro-Manipulation – 4 micro-manipulators for accurate current/voltage application.
- Motorized Automation – XYZ mapping stage, turret, filter selection, and laser switching for fully automated workflows.
- Multi-Laser Support – Accommodates up to 3 laser sources.
- Advanced Software Suite – Real-time data collection, imaging, and spectral analysis.
- High-Resolution Imaging – 20MP cooled CMOS camera for precise micro-imaging.
- Sample Heating & Cooling Options – Enables temperature-controlled spectral analysis.

Software & Control System

Software	System Control and Data Collection software including Software for Sample Viewing Capable of managing user-built libraries and material identification with spectral databases



Optional Objectives

Name	Plan Apo HR Infinity Corrected Objective
1X	FL 200mm, Mag. 1X, NA 0.025, Resolving Power 11.0 μm, Depth of Field 440.00 μm, WD 11.0mm
5X	Mag. 5x, NA 0.14, FL 40.00mm, WD 34.0mm, Resolution 2.0 μm, Depth of Field 14.00 μm
10X	Mag. 10x, NA 0.28, FL 20.00mm, WD 34.0mm, Resolution 1.0 μm, Depth of Field 3.50 μm
20X	Mag. 20x, NA 0.42, FL 10.00mm, WD 20.0mm, Resolution 0.7 μm, Depth of Field 1.60 μm
100X	Mag. 100x, NA 0.70, FL 2.00mm, WD 6.0 mm, Resolution 0.4 μm, Depth of Field 0.60 μm
100X	Mag. 100x, NA 0.90, FL 2.00mm, WD 1.3 mm, Resolution 0.3 μm, Depth of Field 0.30 μm

HOLMARC® OPTO-MECHATRONICS LTD

Contact Information

Registered Office
B.7., H.M.T. Industrial Estate
H.M.T. P.O, Kalamassery, Kochi
Kerala, India, Pin - 683 503

Corporate Office
Door No. 37/386, Manath Tower
Opp. Kalamassery Police Station
Changampuzha Nagar P.O, Kochi
Kerala, India, Pin - 682033

CIN U33125KL1993PLC006984
GST No 32AAACH9492C1ZQ
MSME UDYAM-KL-02-0043524
Business Hours Monday to Saturday 9:00am 5:00pm
E-mail Contacts sales@holmarc.com
Website www.holmarc.com

Sales Contacts:

Email sales@holmarc.com
Engineer - Sales & Service +91 920-719-7771
+91 920-719-7772
+91 920-719-7776

Volume pricing / OEM Solutions

Analytical Instruments
Spectroscopy
Microscopy
Lab Equipments
PHYSICS Lab Instruments
Specialty Products

Technical Support

Get in touch with our technical experts and discuss your application needs and unique requirements You can be sure that you will receive rapid response and service

International sales and Service

Worldwide Distributors

Connect with us on

YouTube

ISO 9001-2015

HOLMARC_CRM SPECTROMETER

www.holmarc.com | sales@holmarc.com

HOLMARC®
HOLMARC
OPTO MECHATRONICS LTD

Corporate Office
Door No. 37/386, Manath Tower
Opp. Kalamassery Police Station
Changampuzha Nagar P.O, Kochi
Kerala, India, Pin - 682033

Registered Office
B.7., H.M.T. Industrial Estate
H.M.T. P.O, Kalamassery, Kochi
Kerala, India, Pin - 683 503

CIN : U33125KL1993PLC006984
GST No: 32AAACH9492C1ZQ
MSME : UDYAM-KL-02-0043524

Follow us on

Holmarc Opto-Mechatronics Ltd has been organized as a provider of engineering tools for scientific research.

HMV-14MAY25-N11