...SEE the Future

Princeton Instruments ACTON

TriVista CRS - Confocal Raman System

PI/Acton's new TriVista Confocal Raman Microscope Systems are designed to deliver extreme performance, flexibility and return on investment. The TriVista CRS integrates the high resolution, low frequency and tuning capabilities of PI/Acton's triple spectrograph with our extensive range of high performance CCD detectors and Olympus upright and inverted microscopes to bring you dedicated Raman systems with both micro- and macro sampling capabilities. Intuitive software permits easy switching between the additive mode, which allows the highest resolution possible for investigation of minute structural changes, and the subtractive mode, which allows the possibility of detecting Raman bands less than 5cm^{-1} from the laser line. The unique modular mechanical design allows easy configuration for multiple applications including a single spectrometer mode for lower resolution, higher throughput experiments.

Applications: Life science, Cell dynamics, Semiconductor research, Materials analysis, Carbon nanotube characterization

Features	Benefits
Optically coupled Microscope and/ or Macro chamber	Full featured Turn Key triple Raman Spectrometer which allows easy switching from Micro to Macro mode
High stability base plate, with 5 point mounts	Rigid coupling assure long-term stability and repeatable measurements
Seamless operation through intuitive yet powerful software interface	Optimal system control allowing easy switching between additive and subtractive modes, faster results and easy experimental set-up. Multi layer calibration assures precision measurements at any wavelength
Can support multiple lasers	Switch between laser lines with ease
Incomparable resolution in additive mode	Minute structural changes can be investigated
Extreme stray light rejection in subtractive mode	Low frequency measurements possible, allowing detection of bands less than 5cm^{-1} from the laser line depending on sample and measuring conditions
Single stage mode	High throughput
Modular design	Easy configuration for multiple applications, giving maximum flexibility configurations can consist of individual spectrometers or combinations of single and double spectrometers.
Imaging spectrometers used	Maximum confocal resolution
Multiple detector options including PI/Acton's scientific grade CCD cameras and InGaAs arrays	Maximize signal detection through the widest range of detectors commercially available
6 position filter wheel	Maximum flexibility
Dual spectrometer exits	May be configured for dual multichannel arrays, dual slits for single channel data collection or one Multi channel array and one slit
Up to 3 triple grating turrets can be used with each spectrometer	Allows up to 9 gratings with calibration stored in spectrometer memory
Over 100 gratings available, including a full line of holographic gratings	Maximize your experimental results
Optional Large Raman Macro Chamber	
Design includes optics for right angle scattering, back scattering, and Brewster angle standard with the option for multi-pass of the laser beam	Analyze solids liquids and gasses with ease
Large capacity	Accommodate several brands of cryostat
Modular optical design	Allows for easy setup and alignment of the sample
Back Alignment camera	Provides real time image of the light entering the spectrometer for FAST and PRECISE sample position and measurements

Microscope Options						
BX51 Upright	Manual XY stage 5 position revolving nose piece Wide range of objectives for deep UV to NIR is available. Reflected and Transmitted light illumination Video Imaging system for sample visualization and precision targeting of small features					
IX71 Inverted	Manual XY stage 6 position revolving nose piece Wide range of objectives for deep UV to NIR is available Reflected and Transmitted light illumination Video Imaging system for sample visualization and precision targeting of small features					
Additional Options	Motorized XY tables with step width <0.1µm and XY Raman Mapping Software Motorized Z- Focus with step width < 0.1µm and XYZ Raman Mapping and Auto-Focus Software Microscope Heating and cooling stages for various temperature ranges					
Confocal Performance	Diffraction limited (1 micron)					
Spectrometer Systems	TR555		TR557		TR777	
	Additive	**Subtractive**	**Additive**	**Subtractive**	**Additive**	**Subtractive**
Focal Length (mm)	1500	500	1750	750	2250	750
Grating Size	68 X 84		68 X 84		68 X 68	
Aperture	f/6.5		f/6.5		f/9.8	
Repeatability	+/- 1 Pixel		+/- 1 Pixel		+/- 1 Pixel	
Wavelength Range	180 nm-IR		180 nm-IR		180 nm-IR	
Motorized Intermediate slits	10µm to 12 mm		10µm to 12 mm		10µm to 12 mm	
Resolution (nm) 1800 l/mm grating 20µ pixel CCD @500nm	0.005	0.02	0.0043	0.014	0.0033	0.014
Resolution (cm^{-1}) 1800 l/mm grating 20µ pixel CCD @500nm	0.2	0.6	0.17	0.4	0.14	0.4
Total CCD Coverage	CCD coverage is dependent on grating selection and spectrograph mode Choice of three gratings on three individual grating turrets allows one set of gratings with low grove density to be matched to achieve an overview spectrum of 2000cm^{-1} to 3000cm^{-1}					
Detector Systems	Choose between over 30 different Princeton Instruments CCD, ICCD, EMCCD and InGaAs multi channel arrays PMT, Si, Ge and other single channel detectors also available upon request					
Wavelength Range	200nm-2.2µ Multi Channel 190nm-<3 microns Single Channel Custom optical coatings available to optimize performance for all reflective surfaces					

TriVista CRS CCD Selection Chart

Model	Pixel Formats available[model]	Pixel size (µm)	Max. Cooling[1]	QE[2] (peak QE) Options	System Read Noise[3]
PIXIS:100	1340 x 100	20 x 20	-80°C	BI (95%),FI (50%),UV(50%),BR (90%)	2.5 e- rms
PIXIS:400	1340 x 400	20 x 20		BI (95%),FI (50%),UV(50%),BR (90%)	2.5 e- rms
PIXIS:2K	2048 x 512	13.5 x 13.5		BI (95%),UV(50%)	3.5 e- rms
PIXIS:256E	1024 x 256	26 x 26		OE (55%)	6 e- rms
Spec-10:100	1340 x 100	20 x 20	-120°C	BI (95%),FI (50%),UV(50%),BR (90%)	3 e- rms
Spec-10:400	1340 x 400	20 x 20		BI (95%),FI (50%),UV(50%),BR (90%)	3 e- rms
Spec-10:2K	2048 x 512	13.5 x 13.5		BI (95%),UV(50%)	3.5 e- rms
Spec-10:256	1024 x 256	26 x 26		OE (55%)	6 e- rms
OMA-V: 512-1.7	512 x 1	50 x 500	-100°C[4]		520 e- rms
OMA-V: 1024-1.7	1024 x 1	25 x 500			
	1024 x 1	25 x 250			

1. Max. cooling is specified at an ambient temperature of 20°C.
2. F=Front illuminated, B=Back Illuminated, BR-DD=Back Illuminated Deep Depletion,UV =UV enhanced CCDs, Front illuminated UV enhanced with Lumogen, back illuminated UV enhanced with UnichromeTM
3. Read noise specification is for the entire detector system, not just the CCD. All read noise figures for 100 kHz readout rate (except for OMA-V, which is taken at 1MHz).
4. OMA-V standard cooling range is -50°C to -100°C. Enhanced option available for -70°C to -120°C cooling range, where required.

TriVista CRS ICCD Selection Chart

	Model	Pixel Formats available	Pixel size (µm)	Image Area (mm x mm)	Max. Cooling[1]	Image intensifier Size (mm)	Max. Digitization rate, Spectral rate[2]
PI-MAX ICCD TE cooled	PI-MAX2:512	512 x 512	24 x 24 (effective)	12.3 x 12.3	-20°C	18	5MHz, 1350 Hz
	PI-MAX:1024	1024 x 256	26 x 26	26.6 x 6.7	-20°C	18 or 25	1MHz, 185Hz (200µm high @ 630Hz)
	PI-MAX:512	512 x 512	24 x 24 (effective)	12.3 x 12.3	-20°C	18	1MHz, 500Hz (200µm high @ 875Hz)
	PI-MAX:1K	1024 x 1024	13 x 13	13.3 x 13.3	-20°C	18	1MHz, 30Hz (200µm high @ 280Hz)

1. Max. cooling is specified at an ambient temperature of 20°C.
2. Spectral rate (spectra per second) with full vertical binning (front-illuminated CCD) is specified. Faster rates specified in parenthesis require "Custom Chip" software option.

intensifier Option[3]		Input Window	Spectral Range (nm)	Gating Speed[4] (ns FWHM)	Max Rep Rate[5] (kHz)	Resolution Limit (lp/mm)	Phosphor[6]
Gen II	RB	BK7 Glass	200 - 900	< 2 (500 ps)	50 / 500	54 to 64	P43
	SB	BK7 Glass	200 - 700	< 2	50 / 500	54 to 64	P43
	UV	$MgFl_2$	150 - 900	< 2	50 / 500	54 to 64	P43
Gen III	HB	BK7 Glass	350 - 900	< 5	5 / 50	64 to 72	P43
	HQ	BK7 Glass	450 - 900	< 5	5 / 50	64 to 72	P43
	UNIGEN	Fiber	150 - 900	< 5	5 / 50	64 to 72	P43
Gen III *filmless*	HBf	Borosilicate Glass	300 - 700	< 2 (500 ps)	50 / 500	57 to 64	P43
	HQf	Borosilicate Glass	300 - 800	< 2 (500 ps)	50 / 500	57 to 64	P43

3. All intensifier specifications are for 18mm, fast-gate intensifiers. 25mm option available for PI-MAX:1024 models
4. Specified as optical FWHM. Inquire about ultra-fast gating option for 500ps.
5. Max rep rates are listed as "sustained / burst "
6. P46 phosphor available upon request

See individual data sheets for more detailed specifications.

Princeton Instruments
ACTON

www.piacton.com
email: moreinfo@piacton.com
USA +1.877.4 PIACTON | Benelux +31 (347) 324989
France +33 (1) 60.86.03.65 | Germany +49 (0) 89.660.779.3
Japan +81.3.5639.2741 | UK +44 (0) 28.38310171