An Affordable Spectroscopy Solution for Professional Performance

Jireh Scientific Imaging introduces:

Navima™ Spectroscopy System

KEY FEATURES

- High precision wavelength accuracy and repeatability
- Choice of slit and port configuration on both inputs and outputs
- Interchangeable grating turret on precision kinematic mount
- Extensive range of high-quality gratings
- Full range of accessories available
  - Motorized Slits
  - Shutters
  - Filter Wheels
  - Tunable Light Source
  - ETC.
- Industry Proven 1024x256 pixel spectroscopy array
- Air Cooled, 70°C below Ambient Temperature
- USB 2.0 and Ethernet 10/100 for robust communication and lab commonality
- Software Development Kit (SDK) Ease of control integration into complex setups: Matlab, Labview, Visual Basic or C/C+

Jireh Scientific Imaging **has teamed up with** ***Camlin Photonics*** **to bring an Affordable Spectroscopy Solutions for Professional Performance! Introducing** ***Navima*****™ Series Spectroscopy system. We have combined our innovating, high performance Zion Spectroscopy Camera to Camlin Photonics' high precision, wavelength accuracy Monochromators and Spectrographs to provide researchers the best budget friendly spectroscopy solution!**

The JSI ***Navima™*** **Series of Czerny-Turner monochromators provide a customizable range of high-quality direct drive scanning monochromator systems. With focal lengths from 150mm to 750mm and multi-grating turret design features we can provide the appropriate system for low, medium and high-resolution spectroscopy applications.**

The JSI *Navima*™ Series of monochromators are highly customizable allowing choice of spectral range and resolution appropriate for the application. These systems are available with focal lengths of 150mm, 300mm, 500mm and 750mm.

At the shorter focal lengths, they provide a cost-effective tool for low to medium resolution spectral analysis or tuneable light sources, whereas the longer focal length instruments provide the resolution needed to robustly conduct high precision measurements in areas such as photoluminescence and laser fluorescence.

Our multi grating turret design can hold up to three gratings and offers unparalleled repeatability and reproducibility in any spectral position for selecting a particular wavelength of light. Operating ranges are from the ultraviolet through to the long wave infrared range and the instrument can be further customized using gold-coated optics for enhanced optical efficiency in the infrared range.

The monochromator is the backbone of many spectroscopy instruments, not least our tunable light source and fluorimeter systems. Our mechanical design allows for straightforward alignment of the monochromator with other spectroscopy components to which it may be coupled.

We align, calibrate and test every monochromator to ensure it meets our specification. Our robust design, both product and packaging, ensures that the instrument our customer receives, has the same performance as the instrument shipped from our factory.

Spectrograph System Solutions from UV to NIR

Navima™ Spectroscopy System Modularity is Key

Camera Optional Cooling (Below Ambient Temp)

Typical Air Cooling	70'C
Typical Liquid Chilled Cooling	95'C**

Monochromators

150mm, 300mm, 500mm and 750mm focal length Czerny-Turner monochromators to balance your requirements for resolution, light gathering capacity and of course budget.

System Read Out Noise

Typical @ 500KHz	13.5 e-
*Optional 100KHz	11.0 e-*

Data Interface

USB 2.0

Slits & CCD Array Ports

Navima™ Systems are normally supplied with micrometer adjusted bi-lateral precision knife-edge slits. These can be upgraded to be motorized and controlled from our software. Fixed slits at 0.5, 1, 2, 3 and 5mm are also available. We can also provide precision focus and rotation alignment array ports

Zion CCD Options

CCD 30-11 1024x256 26x26 µm

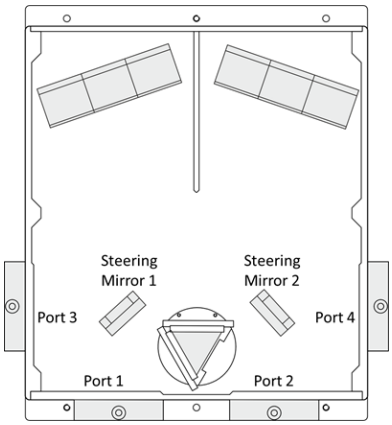
Front Illuminated
- Standard
- Open Electrode
- Deep Depletion

Back Illuminated
- Standard
- UV Coating
- Broadband Coating
- Deep Depletion
- Deep Depletion IR Coating

Also Available
S10140 2068x512
Front & Back Illuminated

Input & Output Ports

Navima™Spectroscopy Systems have a choice of two input ports and two output ports. Where more than one input or output is required, a software-controlled selection of the input or output port.



Shutters

Shutters can be fitted at any input or output port. We have a choice of a 300ms solenoid shutter or a high-speed shutter operating with a speed of less than 10ms

CCD Performance

Spectrometric Well Capacity	Single Pixel	500 Ke-
	Binned	1000 Ke-
Dark Current	FI @ -50'C	0.015 e/pix/sec
	BI @ -50'C	0.08 e/pix/sec
	OE @ -50'C	0.015 e/pix/sec
Vertical Shift Rate	OE (Full Vert Bin)	65 µsec

(SPECS ABOVE ARE AVERAGE/TYPICAL AND SUBJECT TO CHANGE)

Cooling of 95 degrees below ambient with 10'C liquid chiller and with Zion GXP Deep Cooling option

Navima™ Spectroscopy System Modularity is Key

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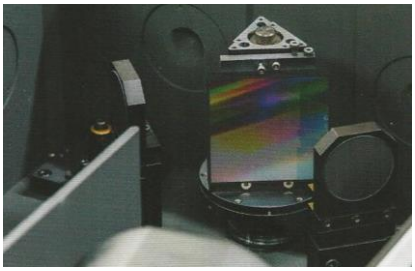
Modularity

The *Navima™* Spectroscopy System has been designed to be wholly modular. Choose focal length, one or more input and output ports to use, diffraction gratings, slits (fixed, manual or motorized), shutters, CCD array ports, filter wheels, filters, fiber optics, liquid light guide adaptors, gold coated optics etc. We maximized the potential benefits of the system! Furthermore, a fully integrated software, *ilustra™*, includes all necessary functionality to drive the monochromators, cameras, and accessories, ensuring a truly 'plug and play' approach.

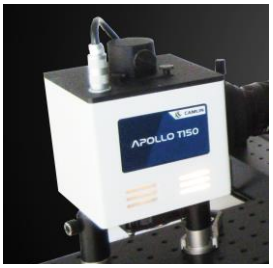


Diffraction Gratings

Our 150mm has a dual grating turret as standard while the 300mm, 500mm and 750 mm models have triple grating turrets. We have a wide range of diffraction gratings which we normally supply, but others are available upon request including holographic gratings.

Light Sources & Tuneable Light Sources

Our range of professional high-performance light sources include continuum sources such as arc and incandescent lamps that covers a wide spectral range from UV to IR. We offer a highly customizable tuneable light source that will meet your power and resolution requirements.

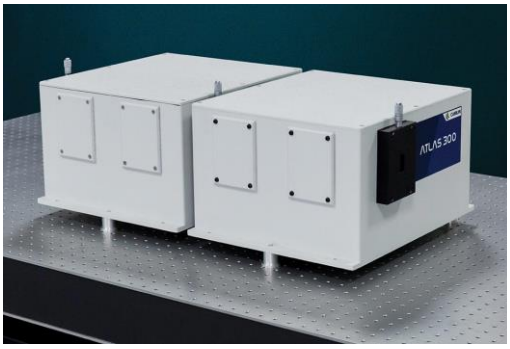


Navima™ Spectroscopy System-Customizable

Navima™ Spectroscopy System Modularity is Key

Double & Triple Systems

The innovative and customizable design of our monochromators allows them to be easily configured in double and triple monochromator configurations to dramatically reduce stray light or to further improve the spectral resolution for the most challenging of applications. Our modular design ensures we can supply such systems more cost effectively than many of our competitors.



Additive or subtractive dispersion modes

The double monochromators can be configured to operate in either additive or subtractive dispersion modes.

Additive Dispersion Mode:

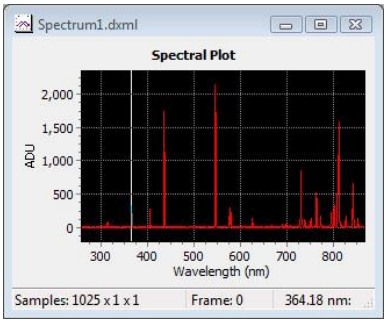
the light dispersed by the first monochromator is further dispersed by the second monochromator

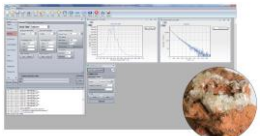
Subractive Dispersion Mode:

in subtractive dispersion, the spectral dispersion at the output is effectively the same as a single monochromator

Both modes dramatically improve stray-light performance with the stray light ratio increasing from approximately 1:105 to 1:1010

In a triple monochromator configuration, three monochromators can be joined in series providing not only additional stray light rejection but also enhanced resolution. Often used in high-grade Raman measurements, such as ultraviolet-resonance Raman spectroscopy, our triple monochromators are an ideal high-performance solution.





Jireh Scientific Imaging
ilustra
Capture & Analysis Software

Ilustra™ Capture & Analysis Software

Our innovative, user friendly *ilustra™* software allows easy control of our Zion Cameras, all monochromator functions and features including control of many of our accessories.

Key Features Includes:

- Wavelength selection
- Grating switch
- Scanning parameters such as start and delay timer, etc.
- Order sorting filter control
- Motorized entrance and exit slits
- Input and output port selection via motorized steering mirrors
- Shutter control

Navima™ Spectroscopy System-Specifications

Navima™ Spectroscopy System Modularity is Key

Model	Navima™ 150 (Coming Soon)		Navima™ 300	Navima™ 500	Navima™ 750
Focal Length	150 mm		300 mm	500 mm	750 mm
Aperture Ratio	f/ 4.0		f/ 3.9	f/ 6.5	f/ 9.7
Mechanical Scanning Range	0 to 900 nm		0 to 1400 nm		
Resolution	0.4 nm		0.1 nm	0.05 nm	0.03 nm
Interchangeable Grating Mount	Dual Grating Turret		Tripple Grating Turret		
Grating Size	40 x 40 mm^2		68 x 68 mm^2		
Reciprocal Linear Dispersion	5.4 nm/mm		2.7 nm/mm	1.7 nm/mm	1.1 nm/mm
Wavelength Accuracy	0.25 nm		0.2 nm		
Drive Step Size	0.01 nm		0.005 nm		
Standard Slits	0.01 - 5 mm, Continuously adjustable precision knife edge slits. Motorized and fixed width slits				
Some Common Gratings	**Grove Density**	**Blaze Wavelength**	**Grove Density**	**Blaze Wavelength**	
	1200 g/mm	300 nm	1800 g/mm	250 nm	
	1200 g/mm	500 nm	1800 g/mm	450 nm	
	600 g/mm	1250 nm	1200 g/mm	300 nm	
			1200 g/mm	500 nm	
			600 g/mm	1250 nm	
Available Gratings for Several Applications			**Grove Density**	**Blaze Wavelength**	
			600 g/mm	300 nm	
			600 g/mm	500 nm	
			600 g/mm	750 nm	
			600 g/mm	1 µ	
			600 g/mm	1.6 µ	
			1200 g/mm	750 nm	

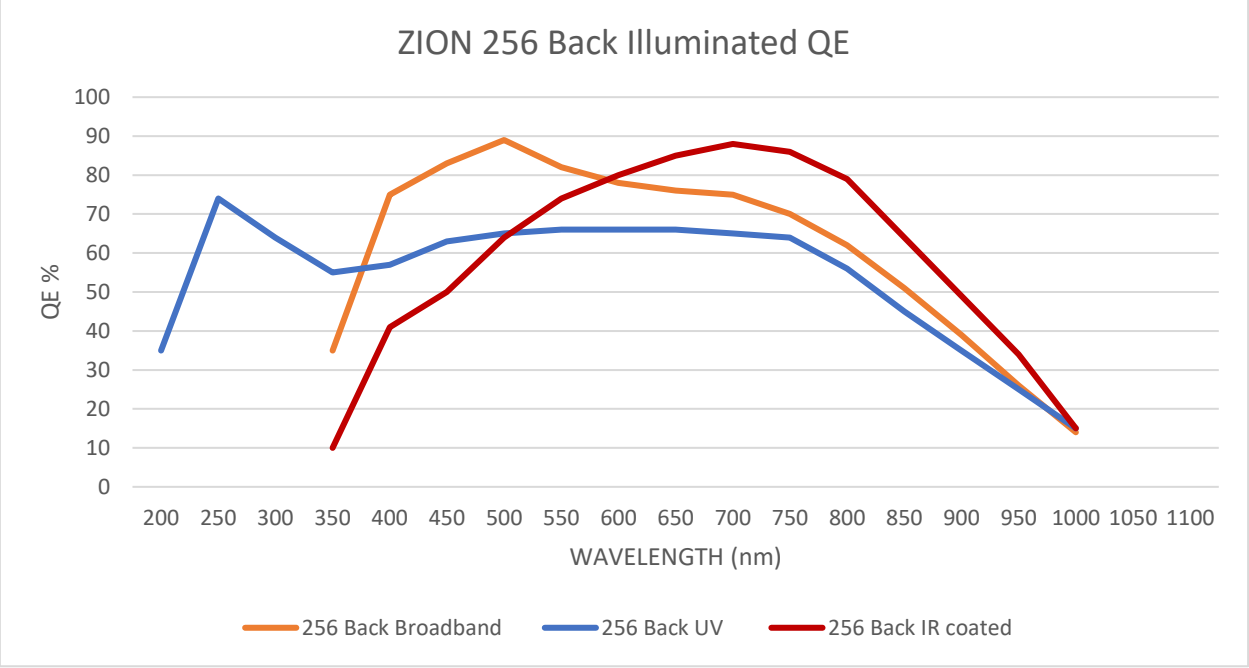
New Zion GXP

The Zion GXP Deep Cooled Technology uses hermetically sealed vacuum technology to ensure cooling as low as 90'C below ambient level! Liquid assist for applications that needs deeper cooling and less fan vibrations. Capable of lowering dark current for long integration and low light. Available in any CCD Configuration.

Navima™ Spectroscopy System Modularity is Key

ZION Spectroscopy Cameras-Specifications

Model	Zion 1024x256	Zion 2048x128	Zion 2048x512
Sensors	CCD30-11 Back, Front Illuminated or Open Electrode, and Deep Depletion	S13240 Back or Front Illuminated	S10141 Back or Front Illuminated
Active Pixels	1024x256	1024x122	2048x506
Pixel Size	26µm x 26µm	12µm x 12µm	
Cooling (Typical)	TE Cooling 65'C Below Ambient/GXP Model 90'C Below Ambient		
Interface	USB 2.0		
Noise at High Gain (Typical) at -50'C	10 e-	9 e-	11 e-
Dark Current (Typical)at -55'C	0.0075 e-/pix/sec	0.01 e-/pix/sec	
Available Speeds	100 kHz or 500 kHz		
	On Board Processing		
CPU Engine	Floating-point DSP, FPGA, FLASH, SDRAM (up to 32MB)		
Full Featured SDK	Can be customized for application specific processing		
Applications	Peak finding, signature analysis, general purpose computing, etc.		



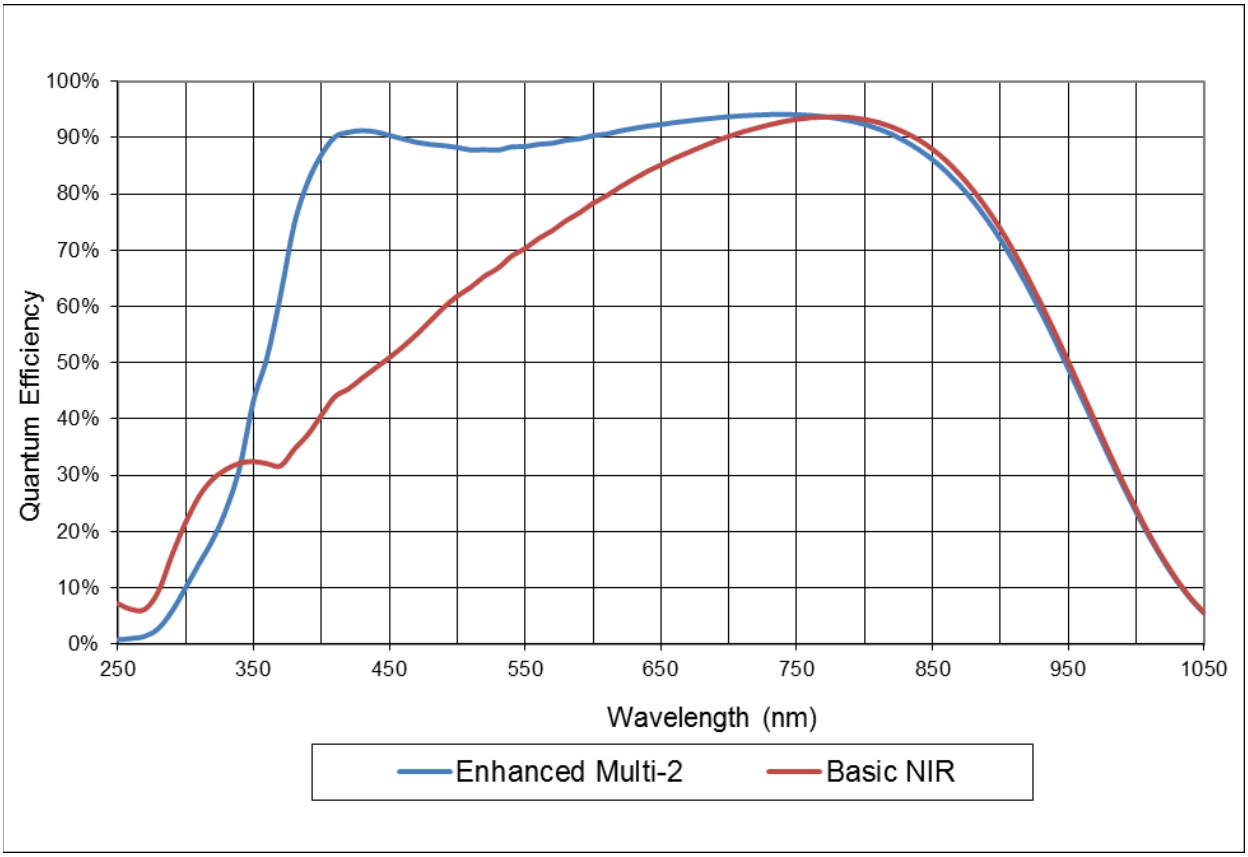
ZION Back Deep Depletion Spectroscopy Camera

Navima™ Spectroscopy System Modularity is Key

CCD Performance

Spectrometric Well Capacity	Single Pixel Binned	400 Ke- 700 Ke-
Dark Current	BDD @ -50'C	0.30 e/pix/sec
Noise,	500kHz	11 e-
Gain, 500kHz	High Low	2.5 e-/ct 16.5 e-/ct

(TYPICAL RESULTS, RESULTS MAY VARY)



ZION 256 BACK DEEP DEPLETION @ -30°C