Hyperspectral imaging sensor with co-registered pixels for superb performance from 400-2500nm.

As the industry's most versatile sensor system, Headwall's VNIR-SWIR imaging sensor utilizes Headwall's patented design which provides very high spectral and spatial resolution with stable measurement accuracy. With diffractive optics specifically designed and manufactured by Headwall, the hyperspectral sensor does not exhibit image aberrations such as stray light, optical distortions, or thermal instabilities. Along with aberration-corrected imaging, the Hyperspec VNIR-SWIR sensor offers a wide field of view and high signal-to-noise (SNR) performance.

Headwall's Hyperspec® VNIR-SWIR sensor delivers 640 fully co-registered pixels, reducing processing times and yielding superior imaging performance. The sensor accomplishes its high performance by combining the high diffraction efficiency for the VNIR and SWIR spectral regions coupled with very high quantum efficiency of the electronic subsystems. The result is the highest SNR performance available on the market.

The VNIR sensor uses a Silicon Scientific-CMOS focal-plane-array, while the SWIR sensor uses a Stirling-cooled MCT array. Headwall's VNIR-SWIR airborne sensor is approximately 15" x 14" x 8" (381mm x 355mm x 203mm) in size and weighs approximately 25 pounds (11.4 kg). This includes the compact data system, making the overall package ideally-sized for airborne platforms that can include moderate-sized UAVs.

By establishing hyperspectral benchmarks and cost-effective performance, Headwall's Co-registered VNIR-SWIR sensor is a perfect solution for demanding airborne remote sensing applications.

Application-Specific Solutions For Critical Environments
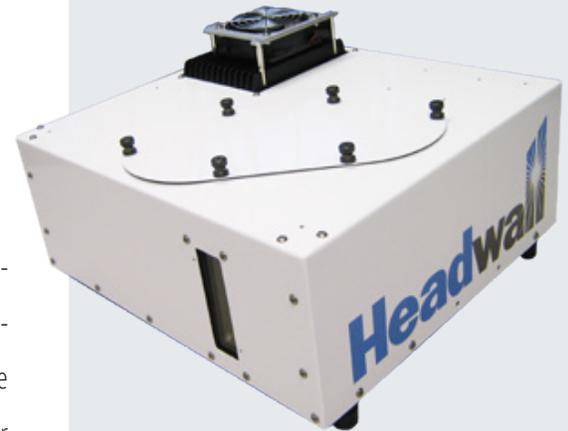
Applications:

- Airborne remote sensing
- Precison agriculture
- Minerals & mining exploration
- Environmental monitoring
- Petroleum & pipeline monitoring

Key Benefits:

- Superb imaging performance
- Wideband coverage
- Co-registered VNIR/SWIR pixels
- Small form-factor, lightweight
- Robust and environmentally rugged
- Aberration-corrected
- High spatial and spectral resolution
- Wide field-of-view

Hyperspec® VNIR/SWIR with Co-Registered Pixels

	VNIR (400-1000nm)	SWIR (950-2500nm)
Spectrometer Design	concentric imager	
Imaging Performance	Aberration-corrected design	
Thermal Stability	All-reflective, no transmissive optics	
Wavelength range (nm)	400 - 2500nm	
Spatial pixels	1600 (VNIR)	640 (SWIR)
Co-registered spatial pixels	640 (VNIR / SWIR)	
Spectral pixels	369	267
Entrance Slit Width (microns)	20	
Dispersion per Pixel (nm/pixel)	1.6	6
FWHM Slit Image (nm)	5	8
ƒ/#	2.5	
Focal Plane Array	Scientific-CMOS	Stirling-cooled MCT
Bit Depth	16-bit	
Maximum Frame Rate (Hz)	450*	
Maximum Power (w)	90	
Size (in/mm)	approx. 15" x 14" x 8" (381mm x 355mm x 203mm)	
Weight (lbs./kg)	25 lbs. (11.3)	

System throughput is a function of FPA frame rate, binning, and data storage rates

All-Reflective Aberration-Corrected Imager Design

Headwall's hyperspectral sensors deliver aberration-corrected imaging characterized by high spatial and spectral resolution, a wide field of view, and very high signal throughput. Headwall's own application-specific diffraction gratings are fundamental to these key specifications, which are crucial for airborne hyperspectral sensors. Headwall's all-reflective, concentric sensor design is robust and thermally stable.
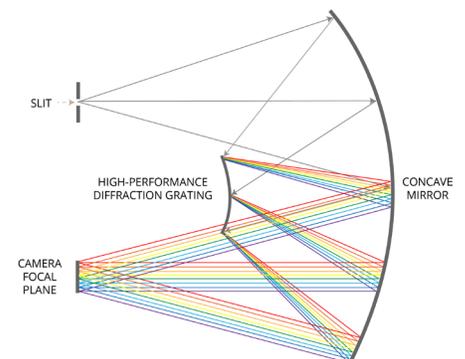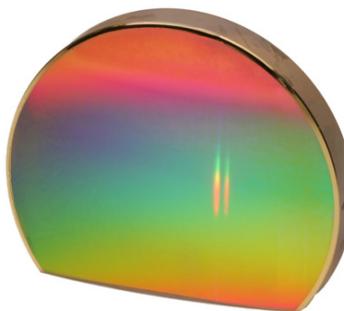
About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by OEM and end-user customers around the world for use in critical application environments. As a pioneer in advanced, patented optics technology, Headwall enjoys a market-leading position through the design and manufacture of spectral instrumentation that is customized for application-specific performance.

Headwall