



## Application Note

### Space and Satellite Hyperspectral Imaging

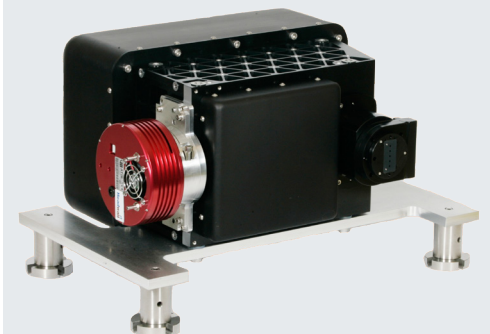
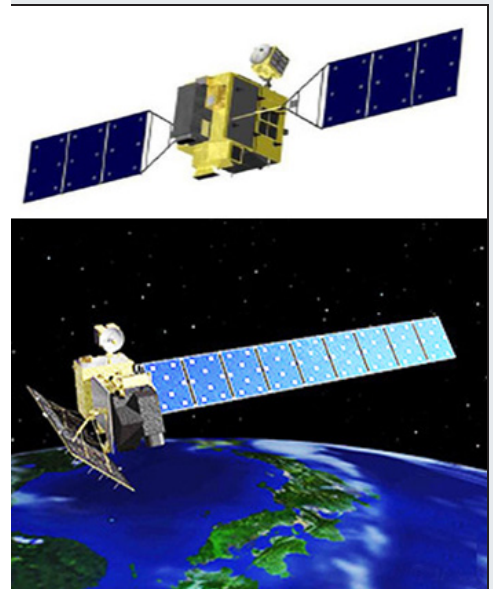
For space-based applications, Headwall's family of Hyperspec® imaging sensors offer significant and unique advantages for researchers.

Given the expense and criticality of satellite deployment and space research, application requirements demand a completely reflective sensor design, the highest optical efficiency, aberration-corrected imaging performance, a very wide field of view, and athermalization of the instrument.

Designed for imaging in harsh environments, Headwall's Hyperspec® imaging sensors are customized for high performance imaging in critical space applications while offering proven, light-weight designs.

Imaging performance is optimized with Headwall's patented, aberration-corrected sensor design that eliminates all aberrations associated with keystone and smile while maintaining high resolution and imaging performance across a very wide field of view. Hyperspec sensors are available for a wide range of spectral regions and optimized configurations.

Within the field of view of the sensor, hyperspectral imaging simultaneously yields precise information for all wavelengths across the complete spectral range. For real-time analysis, multiple regions or wavelengths of interest can be selected.



• Atmospheric Sciences

• Environmental Monitoring

• Remote Sensing



Headwall is the world's leading manufacturer of hyperspectral imagers (Hyperspec®) for a wide range of industries including remote sensing, advanced machine vision, precision agriculture, and others. The Company also manufactures OEM spectrographs and spectral engines that are exceptionally precise with respect to high spectral and spatial resolution and signal throughput.

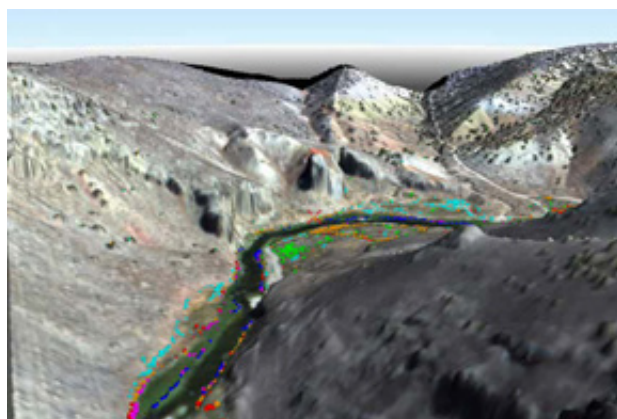
The core technology fundamental to these products is the holographic diffraction grating, which Headwall manufactures to exacting dimensions and tolerances and to customer specification. This allows for small and rugged

optical imaging instruments that deliver aberration-corrected performance and a very wide field-of-view. Used in Headwall's *concentric-style* imagers along with mirrors, the designs are simple yet elegant and feature no moving parts.

In addition to hyperspectral, Headwall also manufactures Raman imaging instruments that are available in a wide range of laser excitation wavelengths. Raman Explorer and Raman Discovery are very well suited for chemical imaging applications as well as biotechnology and medical applications.



*Headwall's Hyperspec® sensors are designed for space deployment. Rugged construction, no moving parts, and a lightweight concentric optical design deliver a wide field of view, outstanding spectral and spatial resolution, high SNR, and aberration-corrected imaging across the NIR, VNIR, Extended VNIR and SWIR spectral regions.*



**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.

Information in this document is subject to change without notice. Headwall Photonics, Inc. reserves the right to change or improve its products and specifications and to make changes in content without obligation to notify any person or organization of such changes or improvements. The Hyperspec® name (and all its derivations) is a registered Trademark of Headwall Photonics, Inc.

