

## Application Note

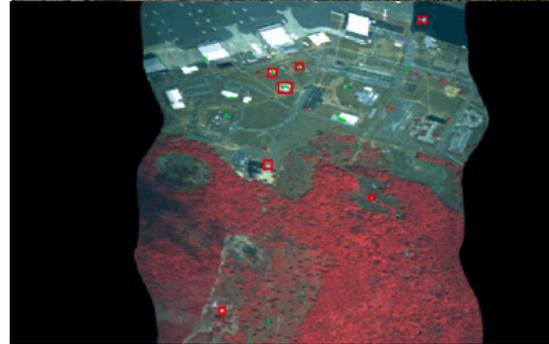
### Military & Defense Hyperspectral Imaging

Designed for reliability in harsh environments, Hyperspec™ imaging sensors are built for the unique performance and durability requirements necessary for a wide range of military and defense applications. Imaging performance is optimized with Headwall's patented, aberration-corrected sensor design which yields exceptional spectral response and spatial resolution.

The Hyperspec™ and Micro-Hyperspec™ imaging instruments are available for a range of deployment platforms including piloted aircraft, unmanned aerial vehicles (UAVs), small satellite systems, as well as unmanned and manned ground vehicles where ISR activities are critical.

The advantages of the Hyperspec™ design eliminate aberrations associated with keystone and smile while maintaining imaging performance across a very wide field of view. Within the field of view of the sensor, hyperspectral imaging simultaneously yields precise information for all wavelengths across the complete spectral range available or, for real-time analysis, specific regions or wavelengths of interest. Headwall offers rugged hyperspectral sensors specifically designed for demanding military and defense applications:

- Derive the spectral signature (tag) for every point within the field of view for material classification
- Color render the image scene based on an established library of known spectral signatures or targets
- For real-time analysis or post-processing, generate wavelength-specific criteria for spectral features or targets of interest



#### Border Security

#### Reconnaissance & Surveillance

#### Search & Rescue

#### Spectral Tagging

#### Targeting

#### Toxic/Industrial/Chemical Analysis

Headwall's award-winning Hyperspec™ imaging spectrometer family is built on a totally reflective concentric, f/2.0 optical design and optimized for imaging in harsh environments. All Hyperspec™ instruments are based on Headwall's patented aberration-corrected, imaging design which feature the company's "original", high efficiency holographic gratings or diamond-turned diffraction gratings. To achieve very low stray light and high signal-to-noise performance, no prism or transmissive optics are used within the spectrometer. With Headwall's unique ability to design and fabricate the diffractive optics, each fully integrated Hyperspec™ imaging sensor is manufactured with application-specific, spectral and spatial imaging performance.

**Headwall Photonics offers the broadest range of spectral imaging instrumentation for demanding applications.**

Hyperspectral Sensors	Spectral Range
Hyperspec® VIS	380 - 825 nm
Hyperspec® VNIR	400 - 1000 nm
Hyperspec® Extended VNIR	600 - 1600 nm
Hyperspec® NIR	900 - 1700 nm
Hyperspec® SWIR	1000 - 2500 nm
Micro-Hyperspec™ VNIR	400 - 1000 nm
Micro-Hyperspec™ NIR	900 - 1700 nm
High Efficiency Hyperspec® NIR	900 - 1700 nm
High Efficiency Hyperspec® SWIR	1000 - 2500 nm



*Information on UV, MWIR, and LWIR Hyperspec® sensors are available upon request.*

**Raman Imaging Instruments**

- Raman Explorer™ 260 nm
- Raman Explorer™ 532 nm
- Raman Explorer™ 785nm
- Raman Explorer™ 830 nm
- Raman Explorer™ 1064 nm
- Raman Discovery™ 532 nm
- Raman Discovery™ 785 nm



**About Headwall Photonics:**

Headwall Photonics 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 the development of innovative spectrographs and imaging spectrometers based on optical technologies, Headwall enjoys a market leadership position through the design and manufacture of patented spectral instrumentation that is customized for application-specific performance. Headwall Photonics was formed in 2003 as the result of a management buy-out from Agilent Technologies. **For more information please call 978.353.4100 or email us at [Information@HeadwallPhotonics.com](mailto:Information@HeadwallPhotonics.com).**

**POLYTEC GmbH**

**Büro Berlin Schwarzschildstraße 1 D - 12489 Berlin GERMANY [w1@polytec.de](mailto:w1@polytec.de)  
 Tel: +49 (30) 63 92 51 40 Fax: +49 (30) 63 92 51 41 [www.polytec.de](http://www.polytec.de)**



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