Headwall

The High-Efficiency Micro-Hyperspec® family of hyperspectral sensors provides superb spectral/spatial imaging and high sensitivity in a small, lightweight, power-efficient package. Versions covering VNIR, NIR and SWIR are available.

Headwall's High-Efficiency Micro-Hyperspec® sensors address the need for very small, lightweight, and robust hyperspectral imaging instruments capable of being deployed in harsh airborne environments and where payload restrictions are critical. The sensors are particularly well suited for applications where high spectral/spatial resolution, high dynamic range, and measurement stability over wide temperature ranges are key performance parameters.

Micro-Hyperspec® is built on a totally reflective concentric f/2.5 optical design optimized for imaging in harsh environments. It can weigh as little as 1.5 lb. depending on configuration. Headwall's imaging sensors minimize stray light and aberrations by eliminating transmissive optical components such as prisms. In addition to airborne deployment, these sensors are also suited for a wide range of other imaging applications. Headwall's 'airborne package' comprises GPS/IMU, optional LiDAR, control software, and data processing and storage. Designed and optimized for airborne deployment, it can be added to any of Headwall's hyperspectral sensors.

## Application-Specific Solutions For Critical Environments

FEATURES

- **VNIR**: 1600 Spatial bands; 369 Spectral bands; CameraLink

- **NIR**: 525 Spatial bands; 100 Spectral bands; Gig-E

- **SWIR**: 384 Spatial bands; 166 Spectral bands; CameraLink and RS232.

- SWaP optimized for small UAVs

- High-efficiency diffraction gratings

- High SNR

- Athermalized for excellent optical/mechanical performance across wide temperature range

- Wide field of view

- GPS/IMU, software, storage, & data processing available in a compact, airborne package

High-Efficiency Micro-Hyperspec®

Configuration	VNIR E-Series	NIR B-Series	SWIR M-Series
Wavelength Range (nm)	400-1000	900 - 1700	900-2500
Focal Plane Array	Scientific CMOS	InGaAs	MCT
Pixel Pitch (microns)	6.5	20	24
Aperture	F/2.5		
Slit Length (mm)	10.5		
Dispersion/Pixel (nm per pixel)	1.6	8	9.6
Entrance Slit Width (µm)	20	25	25
FWHM Slit Image (nm)	5	10	10
Spectral Bands	369	100	166
Spatial Bands	1600	525	384
Aberration-Corrected Design	Yes		
Maximum Frame Rate (Hz)	250	300	450
ADC Bit Depth	16	14	16
Cooling	TE Cooled		Stirling Cooled
Digital Output Format	Full CameraLink, 80-Bit	Gig-E	RS232/Base CameraLink
Max Power (W)	13.2	9	14.4
Weight without lens (lb / kg)	2.4 / 1.1	1.9 / 0.9	4.4 / 2.0

All-Reflective Concentric Optical 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.

SLIT

HIGH-PERFORMANCE DIFFRACTION GRATING

CONCAVE MIRROR

CAMERA FOCAL PLANE
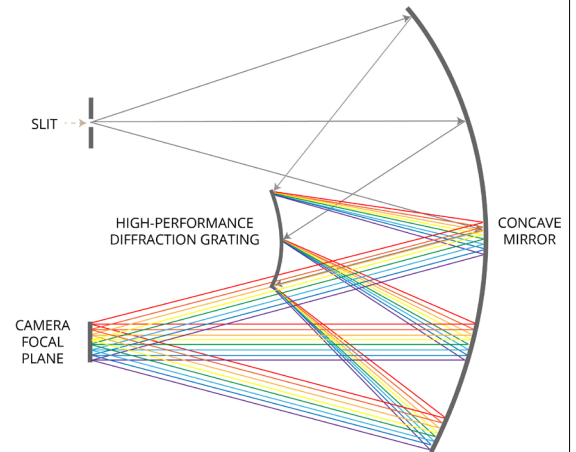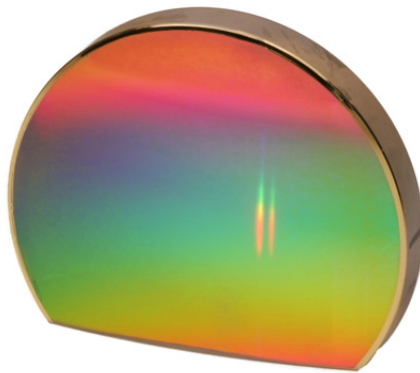
About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by 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.

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