

High resolution Hyperspec® fluorescence sensor covers the 670-780nm region where the O₂-A and O₂-B Oxygen bands reside.

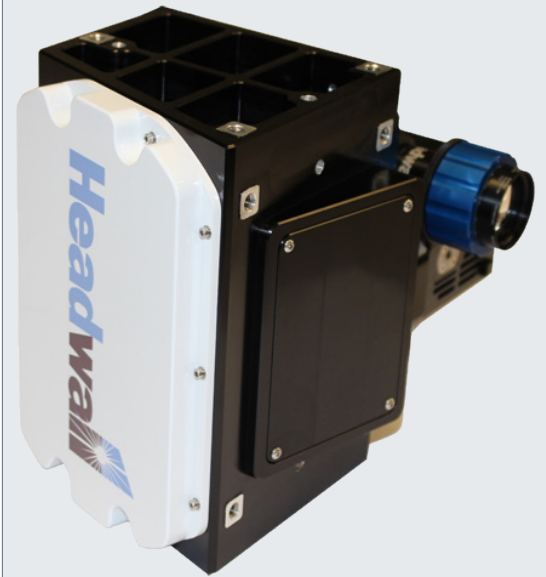
Headwall has responded to market demand for a spectral imaging sensor that collects chlorophyll fluorescence (CF) data vital to understanding plant photosynthesis. Applications such as crop science and climatology will benefit from this new member of the Hyperspec® family, which features an industry-best spectral resolution (FWHM) of 0.20nm or better.

The sensor collects image data at extremely high resolution across the chlorophyll fluorescence emission spectrum from 670 to 780nm. This allows both the important 'Oxygen-A' and 'Oxygen-B' bands (O₂-A and O₂-B) to be exploited for more accurate insight into photosynthetic processes. The sensor uses an all-reflective approach and Headwall's own precise diffraction gratings, meaning high signal-to-noise performance vital to capturing scientific grade data across this critical spectral range.

Headwall's concentric design yields a robust, small, and lightweight instrument that can be used aboard aircraft and satellites as well as suitable UAVs. The sensor weighs about 6kg (~13 lb.) and its footprint measures 300mm x 200mm x 200mm (12" x 8" x 8").

Headwall's patented aberration-corrected optical design assures high spatial / spectral uniformity across the focal plane while minimizing stray light. This unique combination of features makes the high resolution Hyperspec® the most robust imaging sensor available on the market for this application. In addition to airborne missions, this sensor can also be configured to operate as ground-based or tower-mounted observing system. This turnkey solution includes a fully integrated pan-tilt unit for the acquisition of solar induced fluorescence imagery.

Application-Specific Solutions For Critical Environments

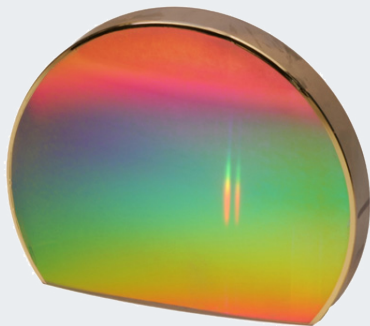


FEATURES

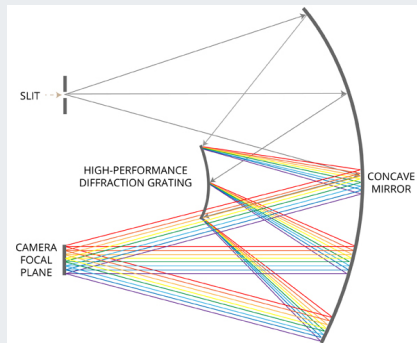
- Spectral range: 670-780nm
- Industry-best spectral resolution of 0.20nm (FWHM)
- Small and light; can be used aboard many UAVs.
- Pan-and-tilt attachment available for ground use.
- Covers O₂-A and O₂-B to provide precise modeling data for photosynthetic activity.
- TE-cooled sCMOS FPA
- All-concentric optical design
- Includes Headwall's telecentric 25mm lens with 'exit-pupil-matching'

Hyperspec® High-Resolution Fluorescence Sensor

Spectral Passband (nm)	670-780
Spectral Sampling Interval (SSI) (nm/pixel)	≤ 0.05
Spectral Resolution (nm)	≤ 0.20 (FWHM)
Working f-Number	≤ f/2.5
Number of un-binned spatial samples	≥ 1500
FPA Technology	TE-cooled sCMOS
Angular FOV (swath width)	25° ≤ FOV ≤ 50°
Maximum Frame Rate (Hz.)	≥ 100
Signal-to-Noise (SNR)	≥ 1000 @ max. signal (est.)
Camera Bit Depth	16
Operational Temperature Range (° C)	-10 to +50
Athermalization	Passive by design; soak @ equilibrium assumed
Operational Humidity	10 - 95% RH
Shock and Vibration	g/sec, gr ² /Hz By design; consistent with anticipated deployment aboard manned aircraft and UAVs
Weight in kg (lb.)	6 (11)
Space Claim in mm (inches)	≤ 300 x 200 x 200 (12 x 8 x 8)
Continuous Power Consumption (W)	≤ 30 (exclusive of data system)
Shutter	electro-mechanical



Headwall-manufactured diffraction gratings manage reflected light with exceptional precision and resolution.



Headwall's concentric design layout using mirrors and gratings provides aberration-free imaging and a wide field-of-view.



Telecentric lens provides a perfectly matched exit pupil that eliminates unwanted image artifacts.

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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