

CORNING

microHSI™ 425 Sensor and microHSI™ 425 SHARK

First commercially available single-sensor hyperspectral solution covering the full spectral range from 400-2500nm

Corning has developed a miniaturized, lightweight hyperspectral sensor package, the microHSI™ 425 Sensor for space, airborne, industrial and scientific applications.

The microHSI™ 425 is the first and only commercially available 400-2500 nm hyperspectral solution in a single sensor. This alleviates the need for integrating, precisely aligning and calibrating two separate sensors, and eliminates the complications of recording and post-processing imagery products from two sensors instead of one.



microHSI™ 425 Sensor and SHARK

The microHSI™ 425 Sensor incorporates a single focal plane array and readout electronics package covering the entire spectral range from 400 to 2500 nm, mated with Corning's modular, compact spectrometer and fore-optics for commercial/industrial applications.

The compact spectrometer, when mated to a VISxSWIR focal plane array and a foreoptic, forms a Hyperspectral Imaging (HSI) sensor that is suited for a widely diverse range of applications including space, small manned and unmanned aerial vehicles, industrial process monitoring and other platforms and OEM applications requiring high quality imagery data covering the visible, near IR and SWIR spectra.

The spectrometer is coupled to a sterling-cooled 640 x 512 pixel HgCdTe focal plane array (FPA), with pixel size of 15 µm. The maximum frame rate (full-frame) is 120 Hz. The order sorting filter (OSF) is integrated in close proximity to the FPA, to maintain high performance throughout the wide wavelength range. The sensor has an f/3.3 aperture.

Selectable Hyperspectral Airborne Remote-Sensing Kit (SHARK)

The microHSI™ 425 sensor, integrated with Corning's Selectable Hyperspectral Airborne Remote Sensing Kit (SHARK), comprises a coherent, turnkey airborne remote sensing system. The system is based on Corning's popular microHSI™ 410 Vis/NIR SHARK, currently in wide use for airborne agricultural monitoring and other remote sensing missions.



microHSI™ 425 SHARK interfaces

The flight package, including spectrograph, camera, telescope, navigation system, microcomputer and 1 TB of resident storage weighs 6 pounds (2.7 kg).

Command and control of the microHSI™ 425 SHARK is very similar to the 410 SHARK's web based GUI, requiring no other applications to be installed on the user's computer except for a compatible browser. Any browser that supports Java such as Internet Explorer® or Firefox® can be used. Alternately, the SHARK can be controlled by another device, through the Ethernet socket interface, sending commands detailed in the application programming interface (API).

Key features include:

The ability to record the entire hyperspectral data cube (468 spectral bands), or to record only the bands needed to produce specific data products and solutions.

Digital elevation models for the area to be imaged can be downloaded before flight to improve post-processing orthorectification and geolocation accuracy.

Flexible image collection planning to capture only the area of coverage needed to optimize use of memory capacity and reduce post-processing time and complexity.

Ruggedized to withstand typical commercial and industrial applications when integrated with commercial manned and unmanned aircraft.

microHSI™ 425 Sensor and microHSI™ 425 SHARK

Technical and Performance Characteristics

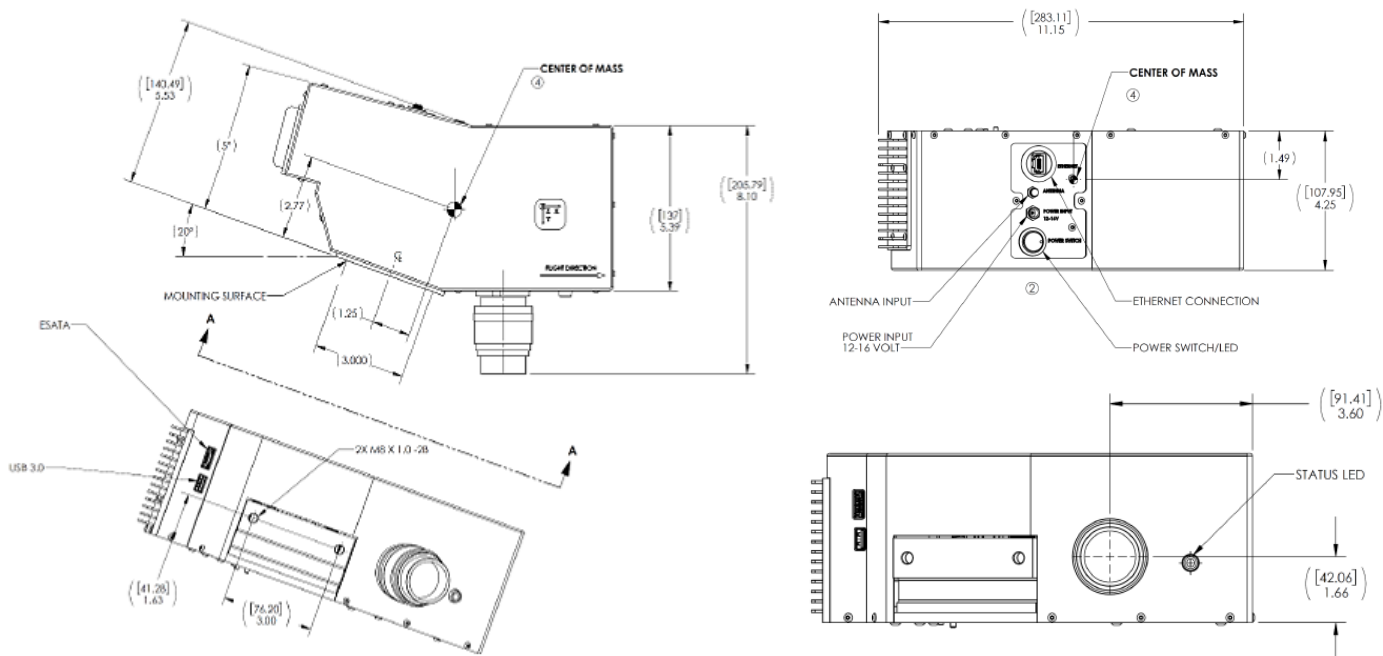
Pixel size (µm)	H (spatial) V (spectral)	15 15
Lens Focal Length	mm	25
Frame Rate	Hz	125
Used Pixel Array	Spatial Spectral	640 468
Dynamic Range	bits	16
Spectral range (µm)	Low High	400 2500
Spectral Resolution (FWHM)	nm	≤8
Lens Aperture	f#	3.3
Weight	kg/lbs	2.7/6.0
Temperature Range (SHARK)	Operating Storage	5-4°C 0-60°C
Humidity	non-condensing	10-90%
Power Consumption	watts	30
Voltage Range	VDC	12 to 16

NOTE:

Specifications may be subject to revisions and updates; IP-rated version available beginning Q2, 2021

microHSI™ 425 SHARK

Dimensions



About Corning Advanced Optics

Corning Advanced Optics is a world leader in the design, fabrication, and system integration of compact, high performance HSI sensors and sensor systems. Corning's line of microHSI™ sensors achieve their combination of low Size, Weight and Power (SWaP) and high spatial and spectral performance through a patented miniaturized solid optical block spectrometer design. This configuration embeds an inherently low optical aberration Offner relay spectrometer, with integrated high efficiency convex diffraction grating, into a solid optical block. Without air spacing, the light ray paths are highly condensed, resulting in the low SWaP and also providing mechanical and thermal robustness. Corning's microHSI™ solid block spectrometers are automatically aligned by design and manufacture, minimizing the thermal and shock misalignment risk due to independent optical component mounting in conventional sensors. The Offner configuration yields impeccable spectral fidelity and exceptional spatial resolution. The high efficiency reflective blazed grating and minimization of optical component surfaces due to the solid block design results in maximal transmission for superior signal to noise ratio performance. Corning microHSI™ sensors are co-developed with in-house designed high performance lenses to ensure preservation of both spectral and spatial fidelity. The microHSI™ spectrometer is designed specifically to work with a particular state-of-the-art FPA detector, ensuring integrated sensor performance optimization from the face of the lens to the digital electronic data output.

This product may be subject to ITAR control.

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