Airborne Hyperspectral Remote Sensing for Small Manned and Unmanned Aircraft

Miniaturization of Hyperspectral Imaging (HSI) sensors and data acquisition capability enables deployment with low-cost aircraft - manned and unmanned. Powerful software/algorithms enable prompt or even real-time processing of HSI data. Corning provides turnkey imaging and navigation solutions to both government and industry.

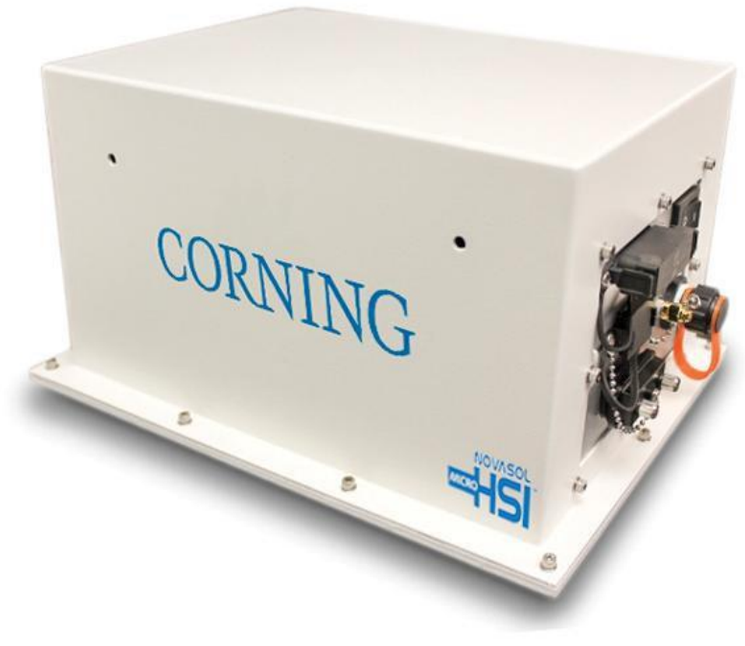
Applications for these systems range from surveillance, tracking, mineral and other natural resource exploration, agriculture, homeland defense, and environmental monitoring to search and rescue, military reconnaissance, and urban planning.

Corning integrates end-to-end systems including custom or standard fore-optics, sensors, navigation/stabilization systems and application software, including a flexible user interface. The HSI system can be configured with any vis-NIR or SWIR high performance HSI sensors, or a combination of multiple sensors, including commercially sourced or customer furnished electro-optic and infrared panchromatic cameras.

Available Spectral Data Processors offer the following capabilities:

- Supervised Matched Filtering
- Anomaly Detection
- Library Matched Filtering
- Change Detection
- Spatial Filtering
- Atmospheric Correction
- Non-uniformity correction and Calibration

Corning offers end-to-end systems providing discriminating capabilities for multi-mission activities in support of defense, security, and environmental monitoring. Our modular approach to sensor system integration and processing allows for customization to a range of applications. Our experienced team is ready to meet the needs of military and commercial projects requiring high performance spectral imaging.

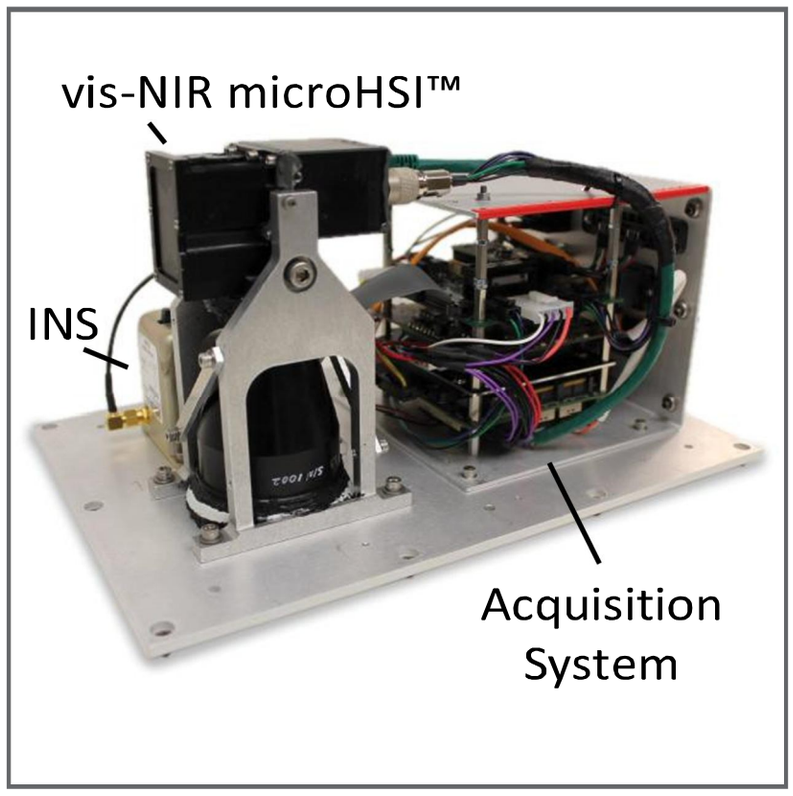


Selectable Hyperspectral Airborne Remote-sensing Kit (SHARK)

SHARK

Selectable Hyperspectral Airborne Remote-sensing Kit

Corning® microHSI™ Sensor



What do users of remote-sensing imagery products want?

Surveys conducted by the American Society for Photogrammetry and Remote-Sensing (ASPRS) provide a clear picture of what users of remote-sensing imagery products want.

- High spectral resolution (many spectral bands)
- High spatial resolution
- High temporal resolution - current, up-to-date imagery
- High geolocation accuracy
- High ground area coverage
- All at a reasonable cost

How do remote-sensing imagery products compare with what users want?

	Satellite (ex. IKONOS II)	Legacy Airborne Systems (ex. NASAAVIRIS)	Miniaturization Enabled Platforms	
			Small Single Engine A/C	Small UAV
Spectral Resolution	visible - 4 bands	visible or infrared > 200 bands	visible - 60 bands SWIR - 102 bands	visible - 60 bands SWIR - 85 bands bands
Spatial Resolution	1 meter (1 band) 4 meters (4 bands)	4 - 20 meters altitude dependent	0.5 meter or better	0.5 meter or better
Temporal Resolution	14 days 1-3 days possible off-axis	significant time overhead for contracting and tasking processes	real-time or near real-time	real-time or near real-time
Geolocation Accuracy	> 10 meters	> 5 meters	< 2 meters	< 2 meters
Precise Ground Coverage	100 km^2 minimum purchase for new imagery	reasonable precise coverage with low altitude aircraft	precisely what is needed	precisely what is needed
Cost Impact Consideration	100 km^2 minimum purchase up-charges for timely tasking, geolocation, accuracy, guaranteed minimum, cloud cover, etc.	high hourly cost high minimum charge	low aircraft operating cost automated pre-processing reduces analyst cost	very low aircraft operating cost automated pre-processing reduces analyst cost

Corning HSI systems are applicable to a wide variety of intelligence and remote-sensing missions:

Commercial Remote-sensing

- Mineral/Petroleum exploration
- Precision agriculture
- Waste/Recycling management
- Terrain/Vegetation/Urban characterization

Flexible Commercial Terms

- Service
- Lease
- Purchase

Military-Civil Light Aircraft and UAV Applications

- Search and rescue
- Disaster mitigation
- Environmental assessment and monitoring
- Humanitarian assistance

Corning HSI systems - providing the best in actionable information for users of imaging products; a world of business opportunities for airborne imaging service providers.

Corning® Hyperspectral Imaging Products

Sensor		Spectrum (nm)	Bands	Frame Rate (Hz)	Swath (pixels)	Weight (kg)	Standard IFOV (µrad)
vis-NIR microHSI™	A	400 - 800	120, 3.3 nm	86	680	0.45	385/770
	B	400 - 1000	180, 3.3 nm	66	680	0.45	385/770
	C	380 - 880	150, 3.3 nm	76	680	0.45	385/770
alpha-vis microHSI™	A	400 - 800	40 bands	1280	1280	2.0	67
	B	350 - 1000	60 bands	800	1280	2.1	67
SWIR microHSI™ 640	A	850 - 1700	170 bands, 5 nm	320	640	3.5	409
	B	600 - 1700	170 bands, 5 nm	220	640	3.5	409
SWIR microHSI™ 640C	A	850 - 1700	170 bands, 5 nm	95	640	1.1	409
	B	600 - 1700	170 bands, 5 nm	73	640	1.1	409
alpha-SWIR microHSI™	A	900 - 1700	160 bands, 5 nm	> 100	640	1.1	250
extra-SWIR microHSI™	A	964 - 2500	256 bands, 6 nm	> 100	320	2.6	492

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For more information, visit our website:
www.corning.com/advanced-optics

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