

WISE

Watersat Imaging Spectrometer Enhanced (0.36 – 1.05 microns)

Custom Reflective Fore-Optics, Diffraction-Limited, Low Distortion

New, Novel, Dyson-Based High-Throughput Optical System

Enhanced Performance Across VNIR Spectrum

Increased Blue-Green Sensitivity

Smaller sensor head with embedded controller

Programmable, Up to 288 Spectral Channels

High Signal-to-Noise Ratio

40° FOV

Continuous VNIR–SWIR Coverage with SASI-1000



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HYPERSPECTRAL & THERMAL REMOTE SENSING

¹Diffraction-limited optics ensure that every pixel is a spatially independent sample with no smearing. This gives users optimal image quality and focus.

WISE

Custom Dyson-Based Enhanced performance across VNIR spectrum; increased blue-green sensitivity.

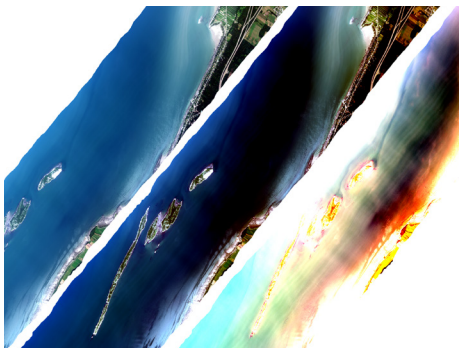
Optical Water Quality / Coral Reefs / Wetlands / Vegetation Classifications / Invasive Species / Forestry
Agriculture / Change Detection / Environmental Impact Assessments / Utility Corridors

SENSOR TYPE

VNIR Pushbroom Sensor
(Watersat Imaging Spectrometer Enhanced)

PERFORMANCE

Spectral Range (Continuous Coverage)	360-1050nm ±10nm
# Spectral Channels	Up to 288
# Across-Track Pixels	1500 ±3%
Total Field of View	40 degrees ±2%
IFOV	0.49 milliradians ±10% (0.028 degrees)
f/#	f/2.5
Spectral Width Sampling/Row	2.4nm ±0.1nm
Spectral Resolution (FWHM)	<3.5nm
Pixel Size	20x20 microns
Dynamic Range	14-bits (16384:1)
Frame Rate	>70Hz; Up to 333 fps
Data Rate	19.2 Mb/sec
Spectral Smile/Keystone Distortion	<0.02 pixels
Peak Signal to Noise Ratio	SNR models for various radiance conditions are available



WISE imagery showing information content in bathymetry data.

DIMENSIONS, WEIGHTS, AND POWER

ITEM	W / H / D (CM) / WT. (KG)
SHU	24.1 / 37.9 / 38.1 10
15" Display (min)	40.3 / 34.2 / 0.52 / 5.4'
Power	26-32VDC, 2.5A (SHU only)

¹Typical size; other models available.

ENVIRONMENTAL CONSTRAINTS

Operating Temperature	Ambient 0 to +35°C (+32 to +104°F) RH 20-80% non-condensing
Maximum Altitude	3,048m (10,000 ft) ASL (unpressurized, non-condensing environment)
Storage Temperature	Optimum -20 to +60°C (-4 to +120°F) RH 10-90% non-condensing

OPERATION

Display (Typical)	15" sunlight readable, minimum 1024x768 resolution. High altitude display available.
Operator Control via Real-Time Display	keyboard, Windows Scene Image, automated sensor health diagnostics, signal level display
Remote Diagnostics	Ethernet-ready remote diagnostic capability
Data Storage	Embedded SSD mass storage
Multiple Sensor Operation	Up to 5 ITRES imagers may be simultaneously operated via MuSIC™ System

DATA PROCESSING SYSTEM

- Processing software Linux or Windows-based
- Playback software (Quicklook)
- Generates 16-32 bit BIP format data compatible with ENVI (BIL, BSQ formats possible)
- ASCII format ancillary QC data output – clocking, attitude, logging, GPS, and sensor health monitoring information
- Outputs diagnostic information
- Selectable band output

GEOCORRECTION SYSTEM

- GNSS-Inertial integration to POS AV (other systems available)
- Data synchronization (GPS, attitude, and image streams)
- Precision positional accuracy
- After bundle adjustment no need for GCPs
- Stabilized mount option

GEOCORRECTION/ORTHO CORRECTION SOFTWARE

- Best nadir pixel selection function during mosaicking
- Accepts Lidar, Ifsar, and USGS DEM inputs
- Nearest neighbor algorithm used – maintains radiometric fidelity
- Separately stores ancillary data (e.g. pointing vector, DEM)

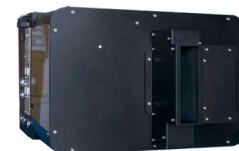
MOSAIC HOURLY COVERAGE

Real-world operational assumptions: 35% sidelap, 3.5 minute turns, zig-zag flight direction, integration time flexibility used to optimize for faster aircraft ground speed within typical fixed-wing survey speed range. Note that as the CASI is both spectrally and spatially programmable, many other band number/airspeed/pixel resolution combinations are possible. Four simple examples (smaller pixel resolutions possible):

- Up to 212 km² at 1.25 m spatial resolution and 144 bands (110 knots)
- Up to 230 km² at 1.0 m spatial resolution and 72 bands (150 knots)
- Up to 248 km² at 1.0 m spatial resolution and 36 bands (162 knots)
- Up to 93 km² at 0.5 m spatial resolution and 48 bands (121 knots)

SPATIAL RESOLUTION & FLIGHT ALTITUDE

- Resolutions between 20 cm to 1.5 m possible with typical unpressurized aircraft at 110 knots
- 1m Pixel Example (96 bands):
Flight altitude = 6760 ft AGL, air speed = 110 knots



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All ITRES sensors are calibrated to traceable standards. Specifications subject to change without notice.