CASI1500

Wide-Array Airborne Hyperspectral VNIR Imager (0.38 – 1.05 microns)

Programmable, Up to 288 Spectral Channels

40° FOV

High Signal-to-Noise Ratio

Continuous VNIR – SWIR Coverage with SASI-600

Custom diffraction-limited, high performance optics[1]

itres

HYPERSPECTRAL & THERMAL REMOTE SENSING

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

CASI1500

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

SENSOR TYPE

VNIR Pushbroom Sensor
(Compact Airborne Spectrographic Imager)

PERFORMANCE

Spectral Range (Continuous Coverage)	380-1050nm
# Spectral Channels	Up to 288
# Across-Track Pixels	1500
Total Field of View	40 degrees
IFOV	0.49 milliradians
f/#	f/3.5
Spectral Width Sampling/Row	2.4nm
Spectral Resolution (FWHM)	<3.5nm
Pixel Size	20x20 microns
Dynamic Range	14-bits (16384:1)
Frame Rate	Up to 333 frames per second
Data Rate	19.2 Mb/sec
Spectral Smile/ Keystone Distortion	±0.35 pixels
Peak Signal to Noise Ratio	SNR models for various radiance conditions are available

CASI-1500 Imagery:

CASI-1500 imagery (60 cm) acquired using gyro-stabilized mount. No geocorrection has been applied.

DIMENSIONS, WEIGHTS, AND POWER

ITEM	W / H / D (CM) / WT. (KG)
SHU	47.0 / 46.7 / 53.5 / 25
ICU (Single)	48.3 / 17.8 / 52.3 / 16
15" Display	42.3 / 32.2 / 10.3 / 10
Power	24-32VDC 13.5A (Typical)

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	15" sunlight readable, 1024x768 resolution. High altitude display available.
Operator	Control Via keyboard, Windows™ OS
Real-Time Display	Scene Image, automated sensor health diagnostics, signal level display
Remote Diagnostics	Ethernet-ready remote diagnostic capability on ICU
Data Storage	Swappable mass storage
Multiple Sensor Operation	Up to 4 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

- GPS/IMU 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/ORTHOCORRECTION 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 km^2 at 1.25 m spatial resolution and 144 bands (110 knots)
- Up to 230 km^2 at 1.0 m spatial resolution and 72 bands (150 knots)
- Up to 248 km^2 at 1.0 m spatial resolution and 36 bands (162 knots)
- Up to 93 km^2 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