aisa EAGLE hyperspectral sensor

The best performance-to-cost efficiency for airborne hyperspectral imaging in the VNIR range (400 - 970 nm). AisaEAGLE system acquires full, high quality hyperspectral data with 1024 swath pixels and high image rates.

AisaEAGLE sensor
L: 146 mm
W: 145,5 mm
H: 347 mm
Mass: 6,5 kg

AisaEAGLE is an excellent analytical, detection and mapping tool that provides an exceptional performance in airborne and field use at an affordable cost.

The sensor has established its ability in a range of commercial, research and public service applications. The applications that AisaEAGLE has been involved in include forestry management, vegetation cultivation, environmental investigations, precision farming, target identification, water assessment and land use planning.

HIGH DATA QUALITY

AisaEAGLE provides the highest performance in terms of signal dynamic range, signal-to-noise ratio (SNR), image rate and resolution. The first two characteristics are the most significant ones to guarantee the quality of hyperspectral data and that reliable information is obtained from it. High dynamic range and SNR are of utmost significance in applications where the target includes, either spectrally or spatially, high and low reflectance signals. It a standard situation with all vegetation targets where the low blue-green reflectance is contrasted with high signals beyond the red edge. In coastal areas there is large contrast between high reflectance from shore ground and low signal from water. In these situations, it is possible to obtain a good SNR in the low signal region only if the imager's dynamic range is high, like it is in AisaEAGLE.

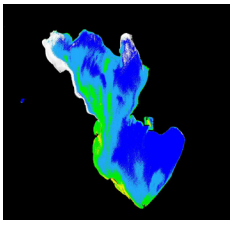
AisaEAGLE Airborne Hyperspectral Imaging System

SPECIM provides AisaEAGLE as a full, ready-to-use system. The complete AisaEAGLE system consists of

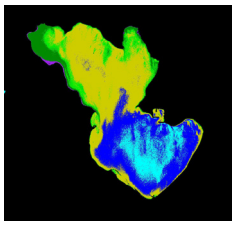
- The AisaEAGLE sensor
- Data Acquisition and Power Unit (DPU) with a user-friendly interface and image acquisition software (RSCube)
- High performance GPS/IMU sensor
- CaliGeoPRO pre-processing software

For more information about the complete system, please see the AISA Systems brochure.

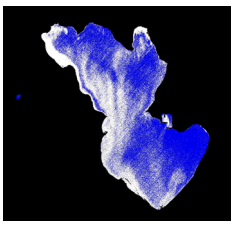
Rectified Reflectance Image



Lake Chlorophyll Map



Lake Total Suspended Solids Map



Lake Phycocyanin Map

AisaEAGLE usage on inland water application.
Target area is Pawnee Lake in Lincoln, Nebraska.
(Courtesy of CALMIT Center of Advanced Land Management Information Technologies, University of Nebraska, the Nebraska Game and Parks Commission and the Nebraska Department of Environmental Quality.)

AisaEAGLE

OPTICAL CHARACTERISTICS	TYPICAL SPECIFICATIONS
Spectrograph	High efficiency transmissive imaging spectrograph. Throughput practically independent of polarization. Smile ± 0.35 nm, Keystone ± 0.25 pix.
Numerical aperture	F/2.4
Spectral range	400-970 nm
Spectral resolution	3.3 nm
FODIS (optional)	Diffuse down welling irradiance collector and fiber optic cable (5 m standard) with SMA connector
Calibration	Sensor provided with wavelength and radiometric calibration file.

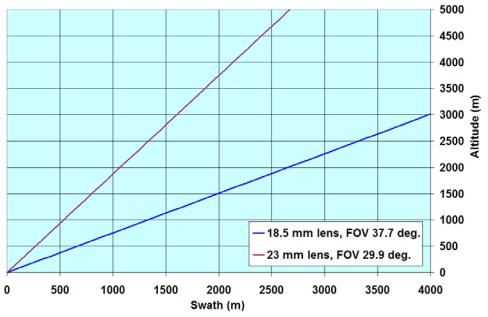
FORE OPTICS			
Fore optics options	OLE23	OLE18,5	OLE9
FOV	29.9 degrees	37.7 degrees	Wide FOV lens More specifications upon request
IFOV	0.029 degrees	0.037 degrees	
Swath width	0.53 x altitude	0.68 x altitude	
Ground resolution @ 1000 m altitude	0.52 m	0.68 m	

ELECTRICAL CHARACTERISTICS				
Detector	Progressive scan CCD detector			
Spectral binning options	1x	2x	4x	8x
Number of spectral bands	488	244	122	60
Spectral sampling/band	1.15 nm	2.3nm	4.6nm	9.2nm
Frame rate, up to (frames/s)	30	59	100	160
Spatial pixels	Up to 1024, of which 70 - 80 FODIS pixels (optional)			
Output	12 bits digital			
SNR	1250:1 (maximum theoretical) More detailed SNR data in various conditions available from SPECIM.			
Integration time	Adjustable, independent of image rate			
Shutter	Electromechanical shutter for dark background registration, user-controllable by software.			
Operating modes	Hyperspectral and multispectral The operator can create application specific band configurations, and quickly change from one mode or configuration to others in flight operation.			
Power consumption, sensor	40 W (typical), 70 W (max)			
Complete system with rack PC	235 W (typical), 325 W (max)			
Complete system with lightweight PC	140 W (typical), 200W (max)			

ENVIRONMENTAL CHARACTERISTICS	
Storage	- 20 ... +50 °C
Operating	+ 5 ... +40 °C, non-condensing

Disclaimer: specifications are subject to change without prior notice. Any errors or omissions are unintentional.

Swath width vs altitude



Ground pixel size vs. altitude

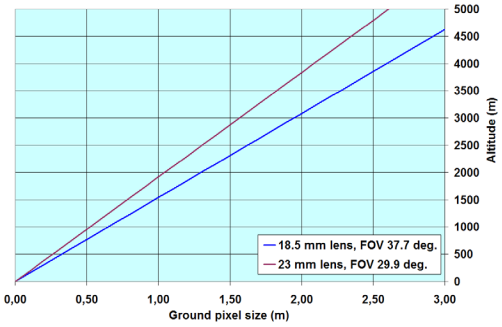
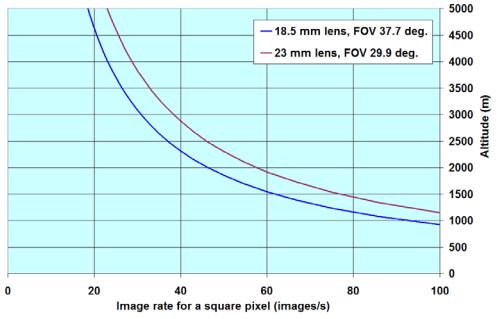
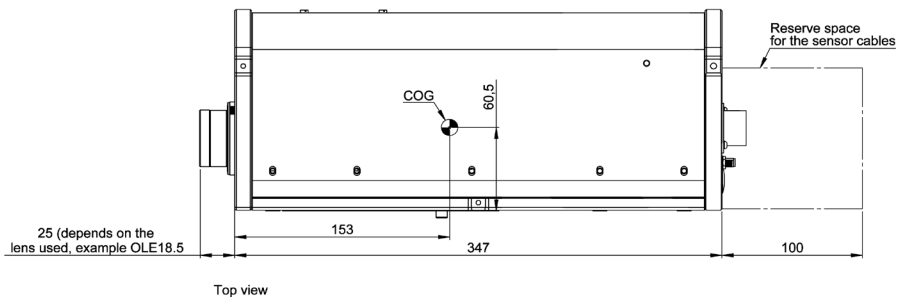
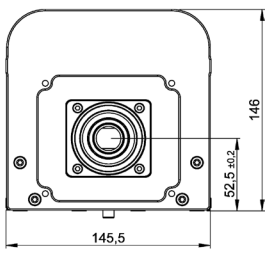


Image rate at aircraft velocity of 60 m/s (120 knots)





AisaEAGLE sensor, side view



AisaEAGLE sensor, front view

More detailed technical drawings available on request.