



Fully integrated multi-rotor UAV with VNIR hyperspectral, LiDAR and software control, brought to you by Headwall Photonics!

This completely integrated package combines Headwall's Nano-Hyperspec[®] VNIR hyperspectral sensor aboard the G4 Skycrane V2 UAV, with Velodyne LiDAR and advanced GPS technology.

Headwall's Nano-Hyperspec sensor covers the crucial Visible-Near-Infrared (VNIR) range of 400-1000nm with aberration-corrected imaging performance, very high spatial and spectral resolution, and a wide field of view. The stability of the G4 Skycrane from Service Drone delivers exceptional safety and performance across a wide range of deployment scenarios. The Nano-Hyperspec sensor attaches easily to the stabilized gimbal on the G4, assuring stable imaging performance while aloft. By precisely managing parameters such as flight altitude, speed, direction and position of the sensor, the G4 Skycrane is perfectly suited for the collection of superb hyperspectral and LiDAR data. The Nano-Hyperspec contains on-board high-speed data-collection capabilities, which makes the integrated package lighter and more stable for increased flight duration. In addition, Headwall's airborne Hyperspec[®] III software manages key tasks such as post-processing and orthorectification.



Nano-Hyperspec [®] VNIR Sensor Specifications						
Wavelength range (nm)	400-1000					
Spatial bands	640					
Spectral bands	270					
Dispersion/Pixel (nm/pixel)	2.2					
FWHM Slit Image	6nm					
Integrated 2 nd order filter	Yes					
f/#	2.5					
Layout	Aberration-corrected concentric					
Slit width (µm)	20					
Lens F/L (mm)	4.8	8	12	17	23	35
Angular FOV (degrees)	51°	33°	22°	16°	12°	7.7°
Per-pixel IFOV (mrad) spatial resolution	1.48	0.91	0.58	0.42	0.33	0.21
weight of lens (g)	90	90	99	85	94	92
Camera technology	Silicon CMOS					
Bit depth	12-bit					
Maximum Framerate (Hz)	300					
Detector pixel pitch (µm)	7.4					
Focal plane array format (pixels)	640 x 480					
Max Power (W)	13					
Storage capacity	480GB (~ 130 minutes at 100 fps)					
Weight without lens, GPS (lb / g)	1.15 / 522					

A complete, mission-ready airborne package combining hyperspectral and other necessary instrumentation aboard a high-performance multi-rotor UAS

UAS Specifications

Service-Drones G4 SKYCRANE	
Payload, including gimbal & flight battery	6500 g (14 lbs.)
Max takeoff weight (ideal)	12,000 g
Max. flight time (ideal)	12 minutes
Max. airspeed	40-50 km/h
Dimensions	Diameter 114cm; height 50cm
Packed size	97 x 97 x 25cm
Wind stability	10-15 meter/second
Flight data log	128-bit
Servo connectors	6
Multicopter flight control	Yes
Redundant flight control	Yes
Autonomous flight planning and control	Yes

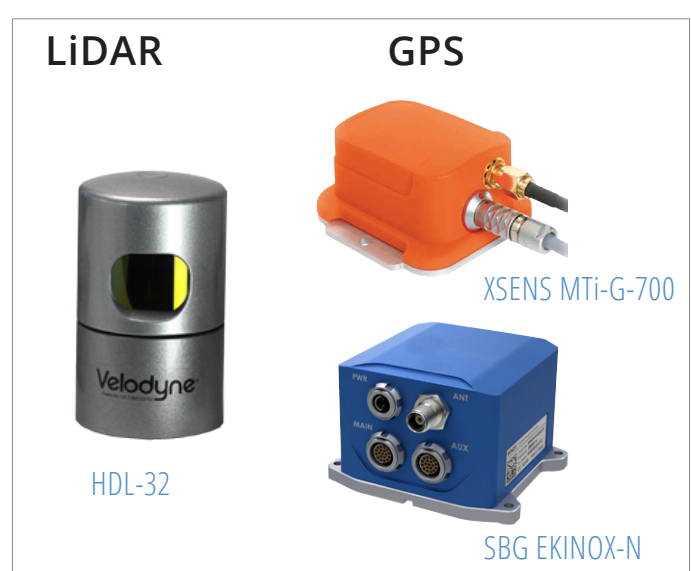
GPS Specifications

XSENS MTi-G-700	
ACCURACY & 3D ORIENTATION	
Roll/Pitch (static)	0.2° typical, 0.25° maximum
Roll/Pitch (dynamic)	0.3° typical, 1.0° maximum
Yaw (in homogeneous magnetic field)	1°
POSITION & VELOCITY	
Horizontal position (1σ STD (SBAS))	1.0 m
Vertical position (1σ STD (SBAS, baro))	2.0 m
Velocity (1σ RMS)	0.1 m/s

Ekinox-N	
ACCURACY & 3D ORIENTATION	
Roll/Pitch (real-time)	0.05°
Roll/Pitch (post-processing)	0.02°
Heading	0.5° Magnetometers
	0.1° GPS
	0.05° Dual-Antenna GPS
	0.03° Post-Processing
GNSS POSITIONING	
Single Point L1	1.5m
SBAS	0.6m
DGPS	0.4m

LiDAR Specifications

High-Definition LiDAR	
Laser (Class 1, eye safe)	905nm wavelength
No. Channels	32 laser/detector pairs
Measurement Range	1m to typ. 80-100 m
Accuracy	< 2cm (one sigma at 25 m)
Vertical Field of View	+10.67° to-30.67°
Vertical angular resolution	1.33°
Horizontal/Azimuth Field of View	360°
Power	12V @ 1A
Rotation rate	5-20 Hz.
Weight	1 Kg (without cabling)
Dimensions	3.4" dia x 5.9" high



About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by OEM and end-user customers around the world for use in critical application environments. As a pioneer in advanced, patented optics technology, Headwall enjoys a market-leading position through the design and manufacture of spectral instrumentation that is customized for application-specific performance.

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