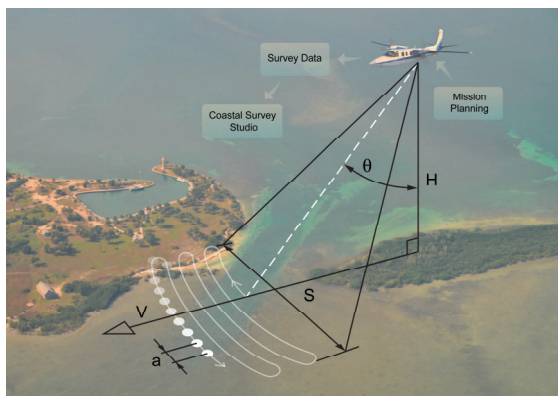


### HawkEye description

HawkEye is a turn key airborne combined bathymetric and topographic LiDAR system capable of surveying both land and sea-floor simultaneously. It is hence the optimal tool coastal and shallow water surveys.



HawkEye simultaneously collects 4000 bathymetric measurements (full waveform) 64000 topographic measurements (up to four returns per shot), which makes the system to the most efficient airborne bathymetric LiDAR survey system available at the world market. With the maximum swath of 330 meters and a typical aircraft speed of 75 meter per second, the system surveys up to 350 square km per day, including transit and turning time of the aircraft.

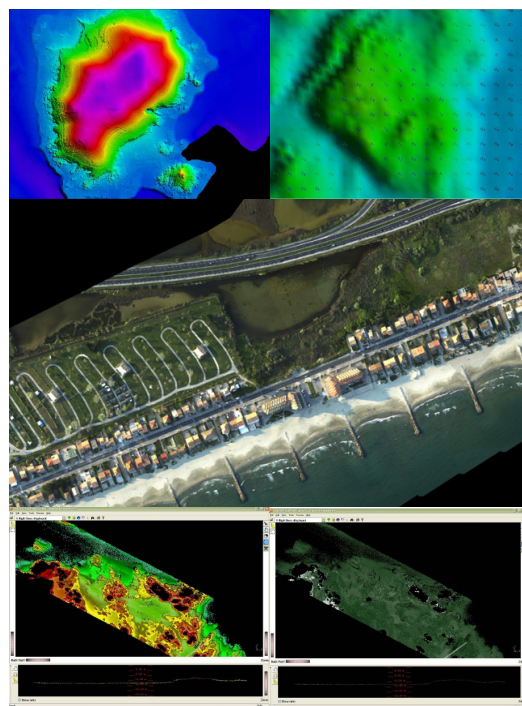


HawkEye typically deliver bathymetric LiDAR data with a density ranging from 1,7 x1,7 meters up to 3,5 x 3,5 meters. The accuracy fulfils the IHO order 1b for sea charts, <25 cm rmse. Depths ranging from 0,3 meter to about 3 times the secchi depth. The topographic data

is normally captured with a data density ranging from 4 points per square meter to 1 point per square meter. The topo data accuracy is typically within 15 cm rmse. In addition geo-referenced digital images are captured.

Examples of HawkEye end products are

- X,Y,Z point cloud including both topo and bathy
- Digital elevation models including surface model, bare earth model and features classification
- Sea charts (X,Y,Depth) including tidal corrections and cleaning to IHO standards
- Ortho mosaic images
- Shoreline vector
- Sea-bed reflectance and sea-bed classification



HawkEye is the natural choice for large scale mapping projects of the coastal zone.

**Capable, flexible and efficient – That's AHAB!**

**AHAB – Stretching the limits!**

### HawkEye II Specification

Function	Capability	Comments
Bathymetric soundings per second	Nominal 4000 Full waveform range capture	Hydrographic and topographic soundings are simultaneous
Topographic soundings per second	Nominal 64 000 Up to 3 range captures/sounding	Hydrographic and topographic soundings are simultaneous
Digital camera	1600 x 1200 pixel, one image per s	Optional: 16 MPixel camera
Altitude	Nominal 250 to 500 m	Optimized to survey requirements
Swath width	Nominal 100 to 330 meters	Optimized to survey requirements
Flight deviation compensation	Roll $\pm$ 5degrees Pitch $\pm$ 7degrees Yaw $\pm$ 20 degrees Speed $\pm$ 10 % Altitude $\pm$ 10 % Side slip $\pm$ 5 %	Compensations are created by two axes servo controlled scanner mirror. References are based on the position navigation system
Position orientation system	Applanix 410	Optional: Other POS nav systems are available on request.
Scanner pattern	Evenly distribution over survey area (except at swath limits)	Generated by 2 axes servo controlled scanner mirror
Sounding density Hydrographic data	Typical 1,7 x 1,7 to 3,5 x 3,5 m Optionally others can be supplied	Optimized to survey requirements
Sounding density topographic data	Typical 4 points per square meter to 1 point per square meter	Hydrographic and topographic data are joint seamless
Hydrographic accuracy	IHO order 1 or better, Nominal Horizontally x/y = $\pm$ 2,5 m Vertically z = $\pm$ 0,25 m	Dependent of survey parameters (optimization to survey requirements)
Sea floor objects det.	IHO Order 1 or better	See above
Depth range	Nominal 3 x secchi depth North sea 35-40 m France 25-30 m Caribbean islands: 50 m	Dependent on water turbidity and sea bed reflectance. Theoretical limit 70 m
Minimum depth	0,3 m	Hydrographic and topographic data are joint seamless
Topographic accuracy	Horizontally X/Y = $\pm$ 0,5 m vertically Z = $\pm$ 0,15 m	
Total system weight	< 190 Kg	Including AC installation kit
System power Consumption.	< 50 Amp on 28 V power supply	
Data storage	> 4 hours	Rugged portable hard disks
Man-machine interface	Real time presentation of Depths, Altitudes, Covered areas.	System settings and mission planning can be optimized during flight
Post processing	Toolbox delivered with system	

Note: to meet its stated accuracy, the Hawk Eye II must receive GPS data of sufficient quality.  
The specification is subject to change without notice.

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## HawkEye II Flight Cases

Flight case	Altitude [m]	Velocity [m/s]	Average data density Hydro	4 adjacent points within distance hydro 2 sigma	Average data density topo (Points / m2)	Swath width [m] / effective swath width [m]
A	250	76	1,7 x 1,7 m	2,0 m	5 / m2	110 / 80
B	300	74	1,9 x 1,9 m	2,3 m	4 / m2	135 / 100
C	400	74	2,2 x 2,2 m	3,4 m	2 / m2	180 / 150
D	401	80	2,4 x 2,4 m	3,6 m	1,5 / m2	230 / 200
E	403	80	2,7 x 2,7m	3,7 m	1,3 / m2	270 / 240
F	451	80	3,0 x 3,0m	3,8 m	1,2 /m2	300 / 270
G	501	80	3,2 x 3,2m	4,0 m	1,0 / m2	330 / 300

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