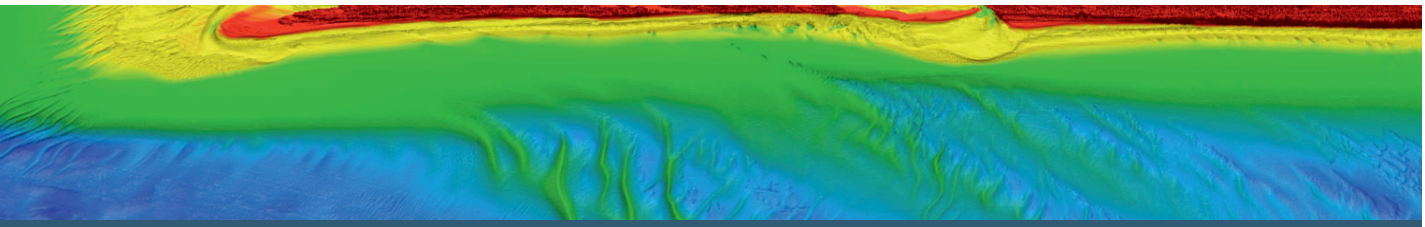
Fugro LADS Mk 3 ALB System

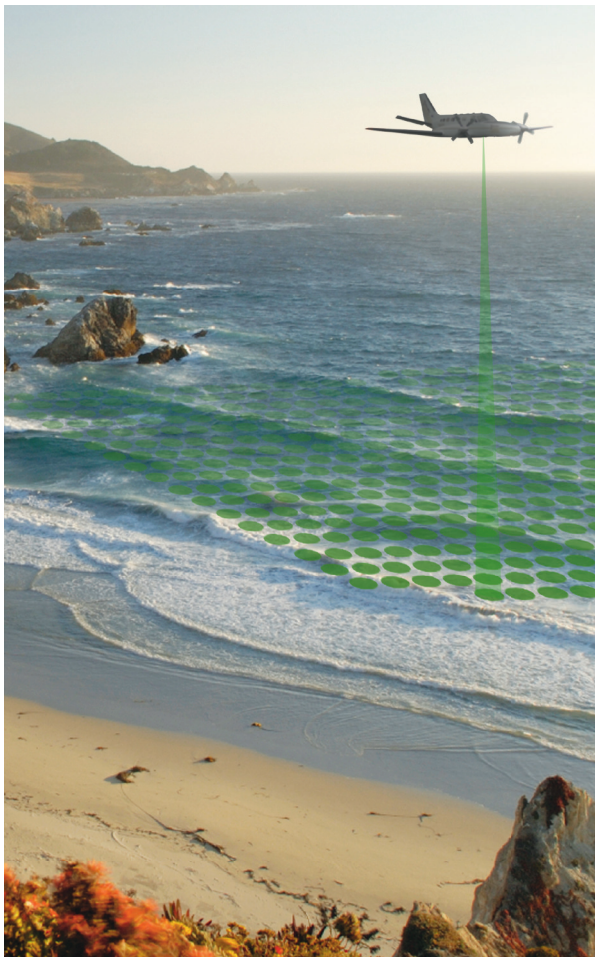


Fugro has the most reliable and efficient tools for accurate bathymetric surveys in shallow waters

Airborne LiDAR Bathymetry

Utilising a sophisticated laser sensor fitted to an aircraft, the Fugro LADS Mk 3 ALB system accurately measures water depth and collects supporting data over both the marine and coastal zone environments. An environmentally friendly design enables the system to operate from a wide range of aircraft, including small turbo props or rotary winged aircraft.

The system has been designed for safe, high speed and cost effective surveys of clean, shallow coastal areas in depths up to 80 metres. Accurate to IHO Order 1a and 1b, data is collected using a 1.5 kHz laser with an efficient swath width up to 585 metres. Fugro has designed the system to enable the coastal zone to be surveyed faster and more cost effectively with the collection of high quality data across a wide range of environmental conditions. Leading edge developments in shallow water performance, seabed reflectivity, target detection, operating altitudes and hyperspectral imagery are also key functionalities implemented within the Fugro LADS Mk 3 ALB system. Deliverables include digital depth and topographic data, digital models, spatial products, seabed relative reflectivity, LiDAR seabed classes, hyperspectral imagery and georeferenced digital mosaic imagery.



Leader in ALB Technology

Fugro designs, builds and operates the world's most accurate and cost effective ALB systems and is recognised as the industry leader in the development and application of bathymetric LiDAR technology. Continuous development of Airborne LiDAR Bathymetry technology by Fugro ensures that emerging customer requirements are met. Fugro's in-house hardware, software, electronics, mechanical and optics engineers provide continuous system improvements and fast response to problem solving.

No other company in the world has as long a history of providing high resolution hydrographic survey, bathymetric systems and seabed mapping services to both industry and government.

Fugro LADS Mk 3 ALB System

Airborne LiDAR Bathymetry is internationally proven as being among the fastest, most cost efficient solutions for safe and accurate charting and bathymetric surveys in shallow water, complex coastal zones and riverine environments.

The Fugro LADS Mk 3 system can be used for the following applications:

- Collection of data for the production of nautical charts to International Hydrographic Organisation (IHO) standards.
- Support of safe, cost-effective offshore oil and gas exploration and field development.
- Support for marine and coastal engineering.
- Support for Coastal Zone Management including the ecological management of fragile coastal zones, climate change adaption and tsunami modelling programs.
- Accurate delineation and mapping of baselines in support of EEZ and territorial sea claims (UNCLOS).

Processing Software

Fugro LADS Ground System (GS) Data Processing Software, used for:

1. Mission Planning, Flight Line Planning, establishing data collection attributes for these lines and allocating flight lines to a Fugro LADS Mk 3 LiDAR sortie
2. Downloading, processing, viewing, cleaning, and editing data collected by Fugro LADS Mk 3

Fugro LADS Airborne System (AS) Data Collection Software
Mosaic Build Tool (MBT) Software designed to create and visualise Mosaics generated from the Fugro LADS Mk 3 Digital Images
QCTools 3D area based data visualisation and editing software used for Quality Control purposes, designed using GMT and VTK software
Fledermaus® Embedded 3D, area-based data visualisation and editing system
POSPac MMS® GNSS/Inertial Post-Processing Software

Technical Specifications

Survey Configuration

Laser Rate:	1.5 kHz
Depth Range:	0 - 80 m dependant on water clarity Nominally 2.5 times Secchi disk depth
Topographic Range:	0 - 50 m above sea level
Operating Altitude:	1200 - 3000 ft
Aircraft Speed:	125 - 175 knots
Scan Pattern:	Rectilinear

Sounding Density and Swath Width (w. Aircraft Speed)

2 x 2 m	79 m (125 kts)
2.5 x 2.5 m	126 m (125 kts)
3 x 3 m	153 m (148 kts)
4 x 4 m	288 m (140 kts)
5 x 5 m	360 m (175 kts)
6 x 5 m	430 m (175 kts)
8 x 5 m	585 m (175 kts)

Note: Sounding density and swath width independent of operating height and water depth.

Survey Accuracy

Vertical:	IHO Order 1 (< 0.5 m, 95% Confidence)*
Horizontal:	IHO Order 1 (< 5.0 m, 95% Confidence)*
Object Detection:	IHO Order 1a (dependant on water clarity and sounding density)*

* IHO, SP44, Standards for Hydrographic Surveys, April 2008

System Configuration

Airborne System:	Sensor Platform Equipment Cabinet Cooling Unit Pilot Display
Operator Interface:	Laptop
Operational Capability:	Full day or night operation (VFR, IFR) 1 operator (observer optional) 1 or 2 pilot capable
Power Requirements:	70 A (system) + 35 A (air conditioner) at 28 VDC

Laser Classification

Green (532nm):	Diode Pumped Nd:Yag
Power:	Nominal 5 mJ beneath aircraft

Positioning Systems

Type:	Applanix POS AV 610 Fugro OmniSTAR WADGPS
Modes:	WADGPS, DGPS and KGPS

Digital Camera

Type:	Redlake® Mega Plus II High Speed, 2MP

Hyperspectral Camera

Type:	HySpex VNIR-1600

Relative Reflectivity

Scaled 8 bit value representing reflectance of seabed for each valid sounding

Note: Specifications subject to change without notice

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