



# GeoSwath

## Swath Bathymetry with co-registered Side Scan for the Gavia AUV

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### Introduction

GeoSwath AUV is a wide swath bathymetric sonar designed as a payload sonar for survey class autonomous underwater vehicles (AUV's). The robust and compact GeoSwath AUV is suitable for integration on most vehicle sizes. This datasheet describes the GeoSwath AUV integration into the Gavia AUV from Hafmynd Ltd.

GeoSwath AUV provides the Gavia with the capability to collect co-registered swath bathymetry and side scan data over a very wide swath, enabling the production of accurate high resolution charts and images of the seafloor. As an option the data can also be processed in GeoTexture software to give bottom classification and texture analysis.

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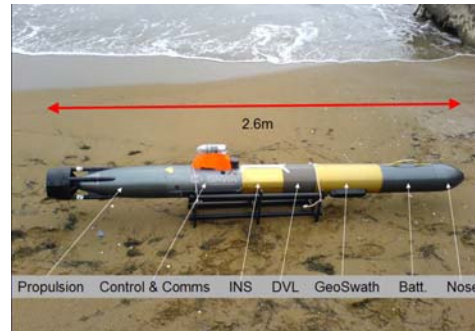
### General Description

GeoSwath AUV is a PC based wide swath bathymetry system offering state of the art performance. Based on the successful bathymetric sonar technology used in the boat mounted GeoSwath Plus, the design emphasis has been to minimise size and power requirement in order to enable full sonar capabilities on a self-powered autonomous platform. The GeoSwath AUV maintains the same high accuracy of bathymetric survey as seen in the GeoSwath Plus, with the advantage of being able to operate autonomously by command from the AUV mission control computer.

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### Fully Integrated Solution

The Gavia AUV is a fully modular, small torpedo shaped vehicle capable of diving down to 2000 metres with long endurance underwater. The GeoSwath AUV has been integrated into a 400mm long modular section of the Gavia vehicle, with 500 kHz transducers mounted on the module's hull.



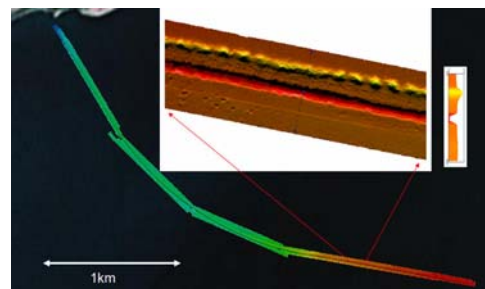
*GeoSwath module on a Gavia AUV  
(one of the two 500 kHz transducers is visible)*

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### System Capabilities

GeoSwath AUV (500 kHz) can autonomously collect data for bathymetric mapping, along with co-registered true digital side scan data, in water depths up to 50 metres under the transducers with a wide swath coverage of up to 12 times water depth, to a maximum swath width of 190 metres.

After AUV retrieval, the data is downloaded via Ethernet to the GeoSwath AUV shore processing computer for data editing, post processing, and chart generation. The result is high resolution bathymetry and co-registered side scan data, enabling full mapping of the sea floor along with feature identification and optional texture classification.



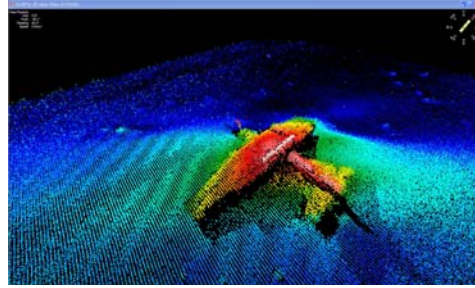
*Pipeline survey with a Gavia mounted  
GeoSwath AUV*

## GeoSwath AUV Post Processing

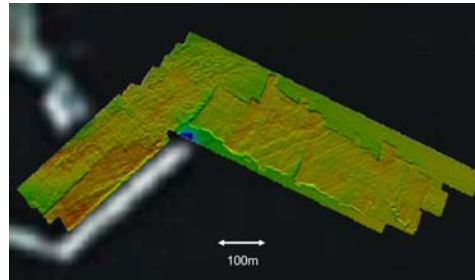
The GeoSwath ROV/AUV post processing software is a fully functional data processing toolset, including:

- Integration of ancillary data (via time stamp).
- Inspection and editing of sonar and ancillary data.
- Generation and filtering of fully corrected swath and side scan data.
- Gridding and mosaicing.
- 2D and 3D visualisation (including fly-through).
- Output of raw data, bathymetry grids, side scan mosaics and combined products.

GeoTexture software, for texture mapping and classification of the GeoSwath side scan data is available as an optional extra.



Aircraft wreckage recorded from a Gavia AUV



Post dredge survey using a Gavia AUV

## System performance

Sonar Frequency	500 kHz
Maximum Water Depth below transducers	50 m
Maximum Swath Width	190 m
Range	Up to 12 x depth
Depth Resolution	1.5 mm
Two Way Beam Width	0.5° Azimuth
Transmit Pulse Length	32 $\mu$ s to 224 $\mu$ s
Swath Update Rate (max)	Up to 30 per second (range dependent)
Transducer Dimensions	270 x 76 x 35mm
Transducer Weight	1.5 kg (in air), 0.5 kg (in water)

## Technical Specification

Data Storage/Retrieval	120 GB hard drive, 10/100/1000 BaseT Ethernet link.
Mission Endurance	12 hour data collection (upgradeable with larger hard drive capacity).
Interface to AUV	Ethernet (2 x 1Gbit Ethernet ports available).
Power Requirements	24VDC, 50W (at max ping rate), 20W (standby).
Max Depth Rating	1000 m (2000 m optional).
Electronics Module Size	200 mm OD x 400mm long, standard Gavia payload module.
AUV Software	GeoSwath AUV, autonomous collection of bathymetry & side scan data. Sonar control and data recording. Generation of QC/QA data subsets and metrics. Time synchronisation, storage and tagging of ancillary data (if available).

Specification sheet subject to change without notice (9-SwathAUVGavia-6900/A 02/2008)



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