HUGIN® 6000

KONGSBERG

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The HUGIN® 6000 Autonomous Underwater Vehicle (AUV) is the deep-water workhorse of the HUGIN family of vehicles. It offers a customizable solution covering a variety of applications and performance without compromise.

HUGIN is the most successful commercial Autonomous Underwater Vehicle (AUV) platform available. It combines IHO quality positioning with the highest resolution sensors on the market. HUGIN collects data from many different sensors at the same time, providing a comprehensive geophysical dataset from a single mission. HUGIN is equipped with swappable batteries and removable data storage enabling quick turn-around times.

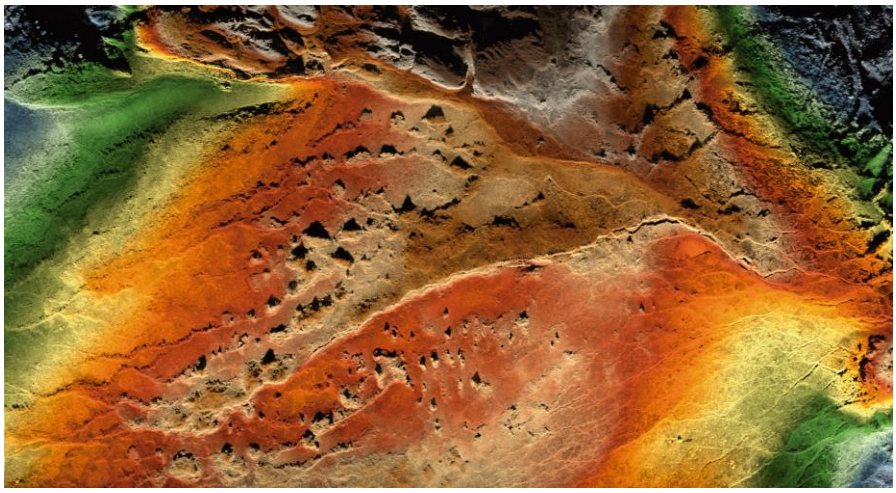
The HUGIN AUV System is a flexible multi-role vehicle capable of collecting high-resolution data for commercial, scientific, and defence applications. The AUV can carry a wide array of sensors including synthetic aperture sonars, multi-beam echo sounders, optical cameras, laser profilers, sub-bottom profilers, and environmental/scientific sensors. HUGIN also processes data in-mission, providing autonomous features such as advanced obstacle detection and avoidance, pipeline tracking, terrain navigation, and target recognition. This makes the HUGIN a flexible and productive platform for everything from geophysical surveys to mine countermeasures.

HUGIN has been continuously evolving since development began in 1991. From the first commercial survey in 1997, KONGSBERG and our partners at the Norwegian Defence Research Establishment (FFI) have been at the forefront of underwater robotic technology. HUGIN continues to deliver world-class performance and new capabilities, and features are added through software updates and vehicle upgrades. Since the introduction in the 1990s, HUGIN AUVs have completed more commercial survey work than any other AUV.

HUGIN can be deployed from dedicated vessels, vessels of opportunity, or from shore. The complete HUGIN system including operator consoles, launch and recovery system and the AUV itself can be delivered in DNV certified offshore containers. The containers allow for transport by sea, air, and land. Mobilization is easy with only an external power connection required. Various container sizes are available to meet the customer needs.

HIGHLIGHTS

- World class navigation performance
- IHO compliant
- Proven track record
- 6000 m depth rating
- Large-diameter body allowing for up to 6 swappable batteries and more sensors
- Advanced autonomy with in-mission data processing
- Sunstone INS with external aiding from USBL, underwater transponder or terrain navigation
- Available in two standard variants or custom configuration
  - HUGIN 6000 HISAS
  - HUGIN 6000 Scientific (HISAS and Environmental sensors)



Technical Specifications

Depth rating
- 6000 m

Weight and dimensions
- Diameter 875 mm
- Length typically ~6.2 m
- Weight in air typically ~2000 kg

Vehicle speed
- 2–5 knots
- Typical operating speed 3-4 knots

Energy and endurance (typical numbers)
- Lithium polymer batteries, swappable for fast turn-around
- 67 kWh energy capacity
- 65-76 hours endurance @ 3 knots with all sensors running
- 6-9.5 hours charge time
- Battery blocks are UN 38.3 certified for transport by air, sea, and land

Navigation
- Kongsberg Sunstone Aided Inertial Navigation System (AINS)
- Navigation grade IMU
- Doppler Velocity Log (DVL) with bottom and water track
- Surface GPS with L2 and SBAS options
- High accuracy depth sensor
- 0.08% of distance travelled (CEP50) straight line
- USBL positioning and aiding using Kongsberg HiPAP systems
- Single-transponder positioning
- Terrain-referenced navigation
- Imaging forward-looking sonar (FLS) for advanced terrain following, collision avoidance, and under-ice functionality

Communication
- cNODE acoustic communication (low and medium frequency options)
- UHF 2-way radio link
- Iridium emergency localization beacon, including battery backup
- Iridium over the horizon (OTH) 2-way satellite link
- Wi-Fi (IEEE 802.11g - Optional)

Payload sensors

Standard payload sensors:
- Kongsberg HISAS 1032 Synthetic Aperture Sonar
  - Resolution: 5x5 cm SAS imagery
  - Range: 240 m @ 3 knots, 185 m @ 4 knots
  - Area coverage rate: 2-2.5 km^2/hour
  - HISAP real-time full-swath SAS imagery generation
- EM 2040 multibeam echo sounder
- EdgeTech sub-bottom profilers (1-6, 2-16, 4-24 kHz options)
- CTD sensor
- Direct time-of-flight sound speed sensor
- Digital still image colour camera with LED lighting
- Laser profiler
- Magnetometer
- Turbidity sensor

HUGIN 6000 Scientific variant:
- Environmental sensors: Turbidity, CO_2, CH_4 and O_2

Optional payload sensors:
- EdgeTech dual or triple frequency side-scan sonars
- Environmental sensors

Software options
- HUGIN Operator System (HuginOS) software
- AUV Control Processor and Payload/Autonomy Processor
- Sunstone navigation software
- Autonomous pipeline tracking using HISAS and EM multibeam
- Sunstone Postea navigation post-processing
- Reflection post-mission visualisation package
- SITAR in-mission and/or post-mission automated target recognition (special export license required)
- HISAP post-mission SAS imagery and bathymetry processing
- APEX advanced GPU based SAS data manipulation

Topside equipment compatibility (see separate datasheets)
- Operator and payload control computers
- Mobile Mission System
- Post-mission analysis computer
- Vehicle battery charger
- Maintenance trolley and lifting spreader
- GNSS navigation system
- HiPAP acoustic positioning and communication system
- DNV 2.7-1/2.7-3 certified offshore containers available for mobile/deployable systems
- Launch and recovery stinger for deck and container installation

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