



## HUGIN<sup>®</sup> Superior

The HUGIN Superior Autonomous Underwater Vehicle (AUV) System is the most advanced and capable commercially available AUV. Rated to 6000 metres it generates a superior data set coupled with the best position solution possible.

Designed as the most capable AUV, HUGIN Superior carries a comprehensive suite of payload sensors enabling it to be used for geophysical, hydrographic, environmental and defence applications.

It is the only vehicle to carry the new HISAS 1032 Dual Receiver that generates synthetic aperture sonar imagery and bathymetry across a 1000 metre swath.

The introduction of the improved EM<sup>®</sup> 2040 multibeam echosounder, wide aperture colour UHD camera and laser profiler, sub-bottom profiler, magnetometer and environmental sensors combined with HISAS increases options for a wide variety of mission types from a single platform.

Updated on-board data processing and a faster network allow for rapid access to the entire dataset after recovery.

Value is added to the data by ensuring the positioning solution is the best it can be. HUGIN Superior builds on the class leading performance of the HUGIN AUV by adding extra in situ navigation performance. Autonomous navigation performance is now better than 0.04% of distance travelled.

Terrain navigation and autonomous pipeline tracking are standard capabilities for HUGIN Superior. These provide yet further performance improvements for unsupervised operations.

HUGIN Superior generates a greater data volume, positioned more accurately and requires less supervision. The result is lower operational cost for the same data volume with improved accuracy.

HUGIN Superior is available alongside the existing HUGIN and MUNIN AUV Systems, increasing our product portfolio to cover all market segments and performance requirements.

## FEATURES

- Superior data coverage
- Superior position solution
- Superior endurance
- Multirole platform for all applications
  - Geophysical Survey
  - Hydrography
  - Marine Archaeology
  - Environmental, Leak and Seep Detection
  - Defence including REA, MCM and more.



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## TECHNICAL SPECIFICATIONS

### HUGIN SUPERIOR PERFORMANCE DATA

#### Depth rating

- 6000 meters

#### Weight and dimensions

- Ø875 mm, ~6.6 m length, ~2200 kg

#### Vehicle speed

- Useful speed range: 2-5.2 knots
- Typical operating speed range: 3-4 knots

#### Energy and endurance

- Pressure tolerant Lithium polymer battery
- 62.5 kWh energy capacity
- 72 (52) hours endurance @ 3 (4) knots, payloads running 90% of the time
- Charge time: 5-8 hours
- Hot-swappable batteries for fast turn-around
- Battery blocks UN 38.3 certified for transport by air, sea and land

#### Navigation

- Kongsberg Sunstone INS
- Navigation grade IMU
- Doppler Velocity Log (DVL) with bottom and water track
- SAS micro-navigation (DPCA)
- Surface GPS with L2 and SBAS options.
- High accuracy depth sensor
- 0.04% of distance travelled (CEP50), DVL and DPCA aided INS, straight line
- USBL positioning and aiding using Kongsberg HiPAP systems
- Single-transponder positioning
- Terrain-referenced navigation
- Forward Looking Sonar (FLS) with advanced terrain following, collision avoidance and under-ice functionality

#### Communication

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

#### Payload sensors

- Kongsberg HISAS 1032 Dual-Rx Synthetic Aperture Sonar (SAS)
  - High resolution: 5x5 cm SAS imagery, 20x20x20 cm SAS bathymetry @ 200 m
  - Long range: 500 m @ 2.5 knots, 300 m @ 4 knots
  - High area coverage rate: ~4.5 km<sup>2</sup>/h
- EM 2040 mkII multibeam echo sounder
  - Triple frequency: 200/300/400 kHz
  - Wide swath: Up to 150 degrees on flat bottom
  - Dual swath (dual ping), multiple detections and water column data logging options
- EdgeTech sub-bottom profiler
- CTD sensor
- Digital still image color camera
- Laser profiler
- Magnetometer and turbidity sensor
- Acoustic Doppler Current Profiling (ADCP)
- Methane (CH<sub>4</sub>) sensor

#### Software

- HUGIN Operator Station (HOS)
- Kongsberg Control Processor (CP), Payload Processor (PP) and Sunstone navigation system
- Autonomous pipeline tracking using HISAS and EM multibeam
- Kongsberg Sunstone Postea for navigation post-processing (builds on two decades of NavLab experience and development in collaboration with FFI)
- Reflection post-mission visualisation package available
- SITAR in-mission automatic target recognition available

#### Data handling

- 10 GbE swappable Network Attached Storage (NAS)
- In-mission processing options available

#### Topside equipment

- Operator and payload computers
- Post-mission analysis computer
- Vehicle battery charger
- Maintenance trolley and lifting spreader
- Portable installation options
- GNSS navigation system (option)
- HiPAP acoustic positioning and communication system (option)

#### Containers and launch and recovery system

- Launch and recovery stinger for deck and container installation
- DNV 2.7-1 certified offshore containers for mobile systems

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