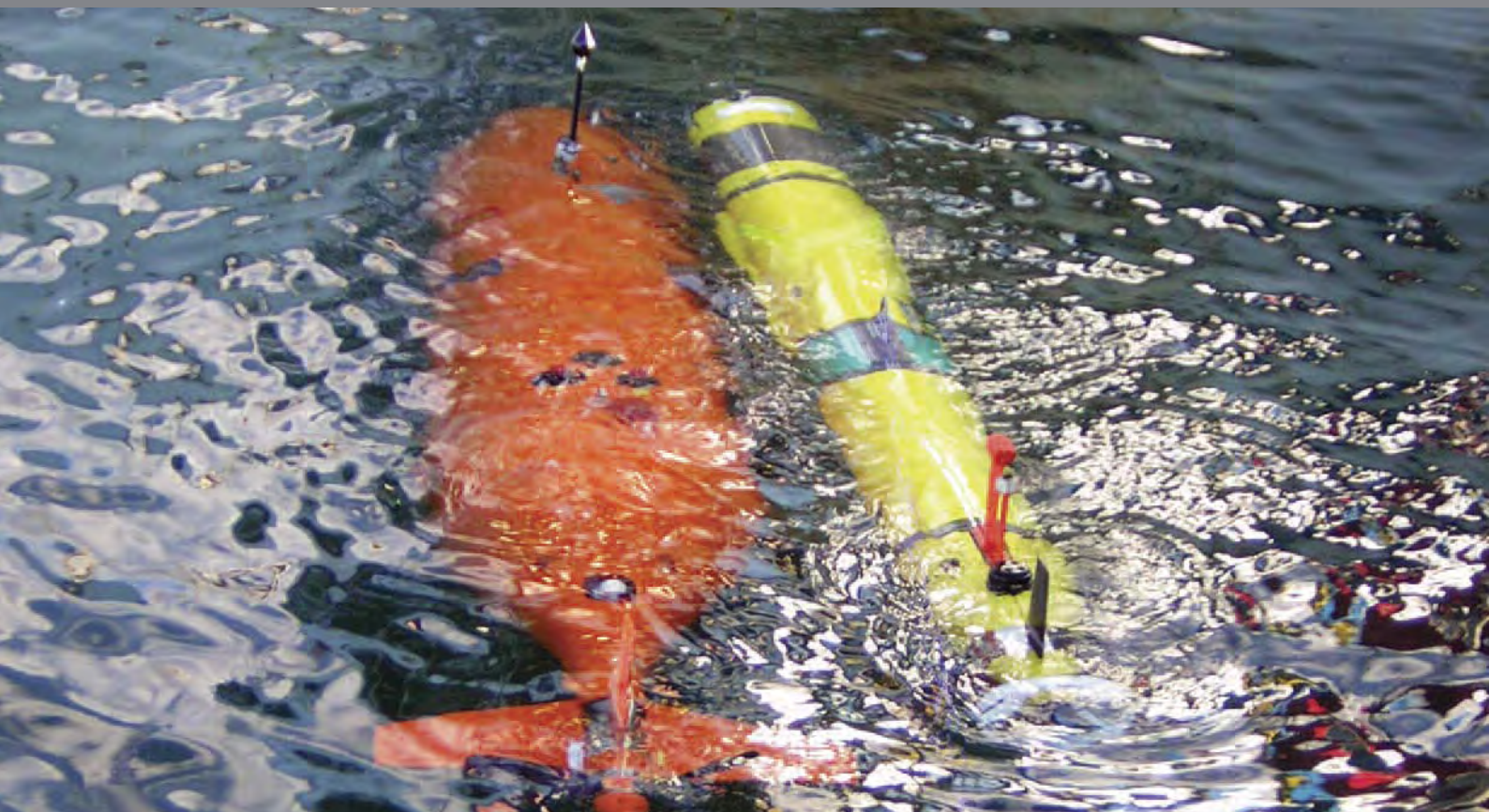




KONGSBERG

Naval AUV product range
The HUGIN & REMUS Family



Kongsberg Maritime AUV product line:

- REMUS 100
- REMUS 600
- REMUS 1500
- REMUS 6000
- HUGIN 1000 (1000 m version)
- HUGIN 1000 (3000 m version)
- HUGIN 3000
- HUGIN 4500

HUGIN 1000



HUGIN 3000



HUGIN 4500



REMUS 100



REMUS 600



REMUS 6000



Maximizing performance by providing The Full Picture

Our mission

We shall earn the respect and recognition for our dedication to provide innovative and reliable marine electronics that ensure optimal operation at sea. By utilising and integrating our technology, experience and competencies in positioning, hydroacoustics, communication, control, navigation, simulation, and automation, we aim to give our customers The Full Picture. The Full Picture yields professional solutions and global services that make a difference enabling you to stay ahead of the competition.

Our philosophy

Our success depends on the success of our customers. Actively listening to our customers and truly understanding their needs, and then translating these needs into successful products and solutions is central to achieving our goal. Our people are the key to our success and we empower them to achieve. Working together in a global network of knowledge, guided by our values, engenders innovation and world class performance. Every day we have to think a little differently, because every client is unique.

We aspire to translate the imagination and dedication of our staff into successful technologies and solutions. Our commitment is to add value to your operations by providing you with The Full Picture.

COMMERCIAL OFF THE SHELF

Kongsberg Maritime is one of the major suppliers of high quality marine electronics in the world, with products ranging from underwater sensor systems, complex ship and process control systems for commercial vessels and oil rigs, autonomous underwater vehicles, sonars and instrumentation systems for fisheries, naval and scientific research vessels. The products are designed, tested and produced to be reliable over a long time in the tough marine environment.

Kongsberg Maritime designs and manufactures commercial off the shelf (COTS) autonomous underwater vehicles (AUV) and related equipment. We support and strengthen REMUS and HUGIN product lines. REMUS has been a tremendous success with more than 170 vehicles (2008) delivered to customers around the world. REMUS vehicles are in operational use in a wide number of applications including navies, hydrography and marine research. HUGIN AUVs boast exceptional operational experience from commercial and naval operations. HUGIN operations have taken place in all parts of the world, in shallow water to deep water, in arctic waters and tropical waters. REMUS and HUGIN vehicles have different capabilities and thus different applications and roles. The vehicles are COTS products in serial production, available with short delivery times.

The vast operational experience is continually used to improve the quality and robustness of the vehicles, ensuring that customers benefit from the latest improvements and developments.

REMUS and HUGIN product lines allow Kongsberg Maritime to offer customers a full AUV product range, full picture AUV system solutions, strong world wide customer support, product commonalities and the benefit of strengthened research and development through product synergies.

As a COTS manufacturer, Kongsberg Maritime runs a 24 hour on-site support service all year round. Our first priority is to support our AUV customers and ensure that the Kongsberg AUVs are always operational. We also offer operational support and training programs.

This brochure defines the Kongsberg Maritime product line for naval application. Kongsberg Maritime is a committed, reliable, dependable and long term partner for navies seeking superiority in the underwater battlespace.



AUV ADVANTAGES IN NAVAL OPERATIONS

Modern navies must be able to operate expeditionary capabilities in distant waters in the early stages of regional hostilities to enable the mobilization of major forces into the theater of operations. Operating Autonomous Underwater Vehicles (AUV) as part of organic REA (REA) and Mine Countermeasure (MCM) capabilities can avoid the risks associated with manned operations in unknown waters during the early stages of entering the battle space. AUV operations lead the efforts of arriving dedicated forces that may be required to clear routes and enemy mines allowing operations to continue with assured access.

AUVs supplement the dedicated forces to ensure deployed forces faced with a potential mine problem have a capability to begin conducting battle space surveillance and reconnaissance ahead of dedicated MCM forces arrival. The littoral threat includes obstacles, anti invasion measures, buried, influence, moored and floating mines. AUVs can quickly survey large areas to enable identification of access routes, potential mine threats, and safe working areas for transition zones and shore access lanes.

Legacy platforms and systems are slow, heavy and have a large footprint. AUVs provide an automated approach to accelerate the timeline enabling distributed expeditionary systems to operate from a variety of host platforms. AUVs are organic modular systems that are fast, light, and precise. AUV systems remove the sailor from the minefield and can be operated as organic systems.

AUVs are an ideal tool for near real time coastal environmental assessments, facilitating discreet or covert operations, and providing a highly reliable and stable platform that can acquire vital environmental data. They are used to gather spatial and temporal data that allows an operator to characterize the ocean and seabed properties. AUVs are low noise platforms that bring advanced sensors in optimal position and geometry for mapping of underwater threats.

AUV operations may be in very shallow water (VSW) for beach approaches, shallow water to assess transition zones and deep water to survey routes ahead of dedicated forces. In areas where tide differentials permit, the AUV may also be used to gather surf zone data.



REMUS 100 in military operations

AUV OPERATIONS

- Dedicated MCM – Large area hunting / clearance
- Organic MCM – Expeditionary force clearance
- Contingency MCM forces – EOD, Special forces
- Maritime reconnaissance, Intelligence & Surveillance Operations
- REA
- Ports Survey
- Undersea search & survey
- Harbour protection tasks and port clearance
- Communication/navigation aid
- Anti Submarine Warfare (ASW)
- Clearing beach head - amphibious operations

Benefits:

- Reduce tactical timelines from slow, diver-centered operations to multi-tasked, AUV-centered area operations.
- Eliminates manned search operations in the minefield.
- Increases margins of safety for divers
- Significant battlespace coverage. Enables maneuver space from narrow linear lanes to tactical flexibility along the coast
- Quick mission completion; timely accurate information feedback
- Covert and low observable operations
- Reduces military assets required to perform mission evolutions.
- High resolution accurate information.



HUGIN 1000 in operation onboard KNM Karmøy

FIELD EXPERIENCES

REMUS 100

It is now several years since the first recognised use of unmanned underwater vehicles (AUVs) as part of a live operation. That milestone occurred in March 2003, when US Navy mine warfare elements deployed as part of Operation 'Iraqi Freedom' took the Hydroid REMUS 100 systems into the warm, shallow waters of the Northern Arabian Gulf and used its sidescan sonar to systematically map the approaches into the port of Umm Qasr.



REMUS 100 operated by the Norwegian Naval EOD Commando (NORNAVEODCCDO)

REMUS 600

REMUS 600 system is presently being used for a range of military and academic applications. REMUS 600 is ideally suited for a variety of applications since it has an entire payload section dedicated to customer defined sensors. The sensor suite is often extensive, and varies tremendously depending on the customers' specific mission requirements.

REMUS 600 can be deployed using standard shipboard cranes, or via a Launch & Recovery System (LARS) specifically designed to be used with the vehicle. REMUS 600 has even been regularly deployed from small crafts of opportunities, and Rigid Hull Inflatable Boats (RHOB), as shown at left.



REMUS 600 provides a detailed maritime survey and mine detection and classification capability in the 30m to 200m depth range, although the vehicle can operate down to 600m. It is fitted with a range of sensors and runs on re-chargeable batteries

HUGIN 1000

HUGIN 1000 builds on the field experience obtained from the Royal Norwegian Navy since 2001 – including deployment in the standing NATO MCM force and participation in dozens of NATO and other exercises and operations. HUGIN 1000 also builds on the extensive experience with commercial HUGIN versions, HUGIN 3000 and 4500 which have been in commercial use for the offshore oil and gas industry, accumulating more than 180.000 km (per 2008) of survey data since 1997, surveying most of the major deep water offshore oil and gas fields world wide.

For naval applications HUGIN 1000 has introduced a new performance level with respect to data resolution, accuracy and efficiency. The high resolution data from the High Resolution Synthetic Aperture Sonar (HISAS) operated close to the sea bottom significantly improves the object detection and classification performances. Additionally, operating HUGIN AUV autonomously and at a remote distance provides a high level of safety for the vessel and its personnel.



HUGIN 1000 on board the RNoN mine hunter HNoMS Karmøy

PRODUCT LINE

How to select?

The HUGIN and REMUS family comprise a wide range of vehicles with varying capabilities. REMUS 100 is a man portable system capable of being quickly, and covertly, deployed from small rigid hull inflatable boats (RHIB). On the opposite end of the product line are the HUGIN 4500 and REMUS 6000 vehicles that are capable of reaching the deep regions of the world's oceans with a range of sensors to accomplish diverse mission objectives.

The Kongsberg AUVs are ideally suited for wide ranging applications from very shallow water mine countermeasures to search and survey applications in the deep ocean. All AUVs can be equipped with a wide selection of sensors – for acoustic and optical imaging, bathymetry, and environmental data collection. The more advanced sensors are only available on the larger vehicles. Larger vehicles also have longer endurance, superior navigation, and allow simultaneous operation of more sensors. The smaller vehicles are cheaper, easier to transport and deploy. The small and medium sized REMUS 100 and 600 carries high frequency Side Scan Sonar (SSS) and bathymetric sensor. The larger REMUS 6000 carries SSS and high dynamic range Electronic Still Camera.

HUGIN 1000 carries, Multibeam Echo Sounder (MBE) and very high resolution Synthetic Aperture Sonar (HSAS).

The smaller systems can be deployed using standard shipboard handling equipment.

The larger systems are deployed with Launch & Recovery Systems (LARS) specifically designed for the system.

The LARS enables AUVs to be deployed in open water and rough weather conditions, without the need to put a small boat in the water. The LARS also enables operations on vessels of opportunity.

REMUS 100

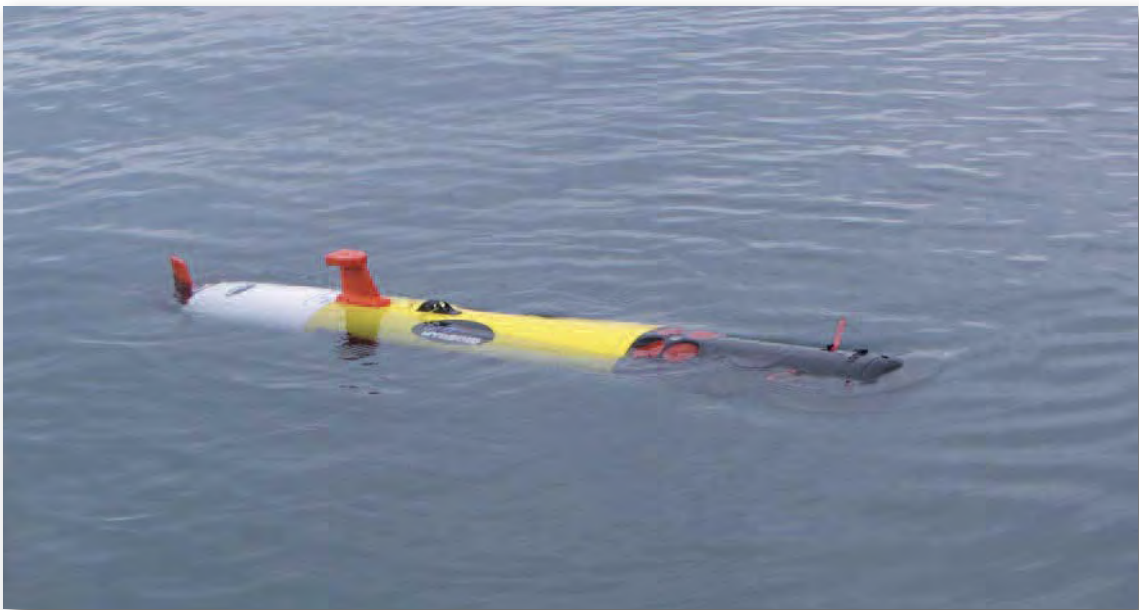
Affordable, man-portable AUV for shallow MCM

REMUS 100 is the culmination of years of leading edge research and development, combined with a proven track record for highly reliable and repeatable field operations.

The compact size of REMUS 100 allows for economical overnight shipping and two-man deployment and operation capability. REMUS 100 also eliminates the need for larger vessels and costly special handling equipment. An intuitive Vehicle Interface Program (VIP) allows anyone to become an AUV operator with minimum of training.

REMUS 100 contains a full suite of standard sensors, with new sensors being integrated on a continuous basis. The main sensor is the sidescan sonar designed specifically for the demanding AUV environment. The capabilities of REMUS 100 make it ideally suitable for scientific, commercial and military operations. The vehicle is small enough to be carried by two people, yet contains enough sophisticated sensor, navigation, and power resources to enable it to perform intricate sonar and oceanographic surveys.

REMUS 100 navigates during a mission using Long Baseline (LBL) and Dead Reckoning (DR). The on-board computer automatically determines the preferred method, and can vary it through the mission. Alternatively REMUS 100 can navigate combining dead reckoning (DR) assisted with Doppler Velocity Log (DVL) and surfacing at regular intervals for GPS fixes. Optionally, Inertial Navigation System can be added enabling non LBL navigation, eliminating the need to place bottom transponders.



REMUS 100

REMUS 600

The mid-range solution for rapid mobilisation from crafts of opportunity

REMUS 600 has been designed to operate to depths of 600 meters, allowing for greatly increased operational scope compared to the smaller REMUS 100. This highly versatile system can also be configured for 1500 meter operations.

REMUS 600 provides extended mission duration capability of up to 45 hours @ 4 knots with all payload sensors running (actual mission time dependent on power consumption of configured sensor suite). Upon mission completion, the internal battery is charged, or swapped out with a ready charged battery section. REMUS 600 has been designed with modularity in mind. The vehicle can be easily reconfigured for a wide variety of customer configured payloads. The vehicle is comprised of a series of hull sections that are quickly separated for vehicle reconfiguration, maintenance, and/or shipping.

REMUS 600 incorporates the same proven Vehicle Interface Program (VIP) used in the complete family of REMUS vehicles. The highly refined VIP makes vehicle maintenance, checkout, mission planning, and data analysis fast and easy. Windows® operation, quick look indicators, quality control checks, and a sophisticated data export capability all add to the user friendly nature of this software package.

REMUS 600 navigates during a mission using Long Baseline (LBL) and Dead Reckoning (DR). The vehicle is also be equipped with an advanced DVL (Doppler Velocity Log) aided Inertial Navigation System (AINS). The AINS system also integrates position information from acoustic positioning system and GPS. Communication takes place via acoustic, radio or satellite linked systems.

The basic payload suite consists of dual frequency Side Scan Sonar (SSS), MBES, CTD (Conductivity, Temperature and Depth) and pressure sensor. Optionally profiling sonar and Synthetic Aperture Sidescan Sonar (SAS) can be installed, sub-bottom profiling, Electronic Still Camera (ESC) and associated illumination, and video cameras.



REMUS 600

REMUS 6000

The deep water solution for environmental assessment, search and survey

REMUS 6000 has been designed to enable operations to water depths as great as 6000 meters. Typical mission duration is 22 hours subject to speed and sensor configuration.

REMUS 6000 is based on the same leading edge technology that has brought REMUS 100 and REMUS 600 to the forefront of autonomous operations. REMUS 6000 incorporates the same proven Vehicle Interface Program (VIP) used in the complete family of REMUS vehicles. The highly refined VIP makes vehicle maintenance, checkout, mission planning, and data analysis fast and easy. Windows® operation, quick look indicators, quality control checks, and a sophisticated data export capability all add to the user friendly nature of this software package.

REMUS 6000 Launch and Recovery System (LARS) is designed to function off the stern of a ship and can be set up for shipboard operations within a few hours. The LARS is a roll on/roll off system and can be installed easily on ships of opportunity.

REMUS 6000 is equipped with an advanced DVL (Doppler Velocity Log) aided Inertial Navigation System (INS). The INS system integrates also position information from acoustic Long Base Line (LBL) and satellite (GPS) positioning systems. Communication takes place via acoustic, radio or satellite linked systems. The basic payload suite consists of Sidescan Sonar, video or electronic still camera, CTD (Conductivity, Temperature and Depth) and pressure sensor. Optionally dual frequency Sidescan Sonar, multi-beam sonars or sub-bottom profilers can be installed.



REMUS 6000

HUGIN 1000

High resolution and high area coverage in mine hunting and REA operations

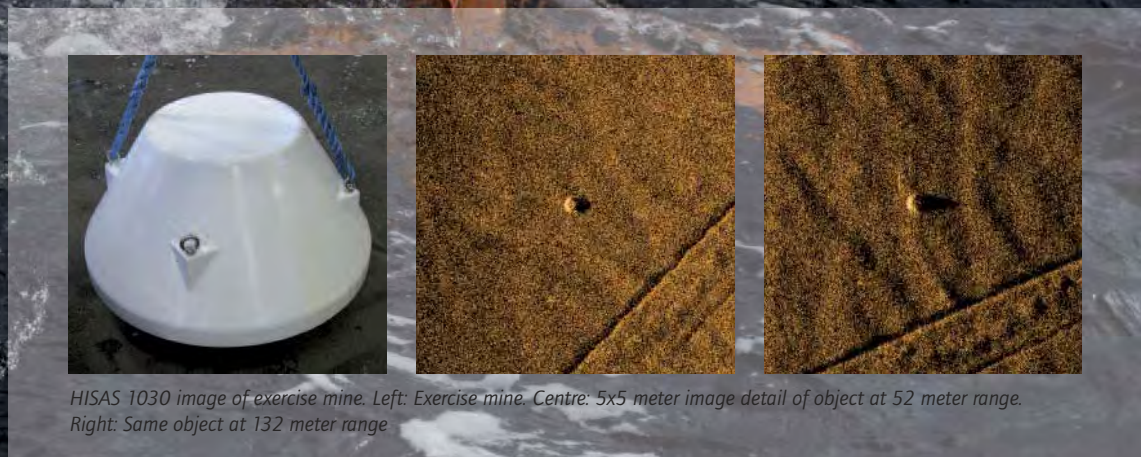
HUGIN 1000 MR is the result of more than 15 years of AUV development in Kongsberg Maritime and the Norwegian Defence Research Establishment (FFI).

The vehicle has a depth rating of up to 3,000 metres (1,000 metres with HISAS 1030), and an mission endurance of around 24 hours @ 4 knots (17 hours with HISAS 1030) with pressure tolerant, rechargeable lithium polymer batteries. The vehicle can operate in fully autonomous, semi-autonomous or supervised mode. Acoustic, RF and satellite links are available for communication with the AUV whether submerged or at the surface.

A state of the art aided inertial navigation system developed specifically for HUGIN integrates data from a high end inertial measurement unit, a Doppler Velocity Log (DVL), pressure sensor, GPS receiver, and other position sources such as HiPAP ultra-short baseline (USBL) positioning, underwater transponder positioning (UTP) and terrain referenced navigation. For increased sustainability, the vehicle is equipped with a range of redundant and fail-safe systems.

The basic payload sensor suite consists of the HISAS 1030 interferometric SAS, multi-beam echo sounder, CTD, turbidity sensor, current profiling from the DVL and a high-performance optical imaging system.

HUGIN 1000 is also available in a civilian/survey version with standard side scan sonar instead of HISAS 1030.



Why SAS?

Transformational changes in warfare over the last two decades have increased the need for very high resolution imagery and high area coverage rates in MCM operations. The shift towards expeditionary warfare means that route survey data will often not be available. Being able to separate mines from mine-sized rocks is thus crucial. Also, modern mines and improvised explosive devices (IEDs) are difficult to classify (or even detect) with traditional sonars.

HUGIN 1000 can fill many of the gaps identified in mine countermeasures. HUGIN 1000 will speed up MCM operations, and can extend the reach of mine hunting into previously unhuntable areas.

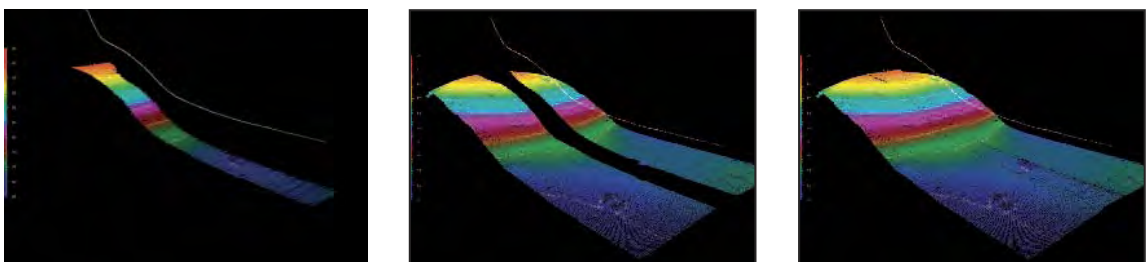
HUGIN 1000 can also speed up and improve REA (REA) operations. The vehicle can be equipped with a large set of sensors, allowing simultaneous collection of a very rich data set, for rapid and extensive documentation of the seabed and water volume. Products can include very high resolution imagery, bathymetry, lists of small and large bottom objects, seabed classification, sound speed profiles, currents, temperature, salinity, and turbidity.

HISAS 1030: Co-registered imagery and bathymetry

In addition to high-resolution sonar images out to 200 m range, HISAS also produces co-registered bathymetry. As all side scan and SAS systems, HISAS has limited performance near nadir (i.e., directly under the vehicle). However, by combining HISAS bathymetry data with data from the onboard multi-beam echo sounder, a continuous swath of up to 400 m width or 20 times AUV altitude can be created from a single pass.



*Left: A section of HISAS 1030 on port swath with exercise object (2 m long, 53 cm diameter cylinder)
Water depth 10-13 meters, HUGIN 1000 depth 3 meters, range 15-95 meters. Right: 10x10 meter detail around the exercise object*



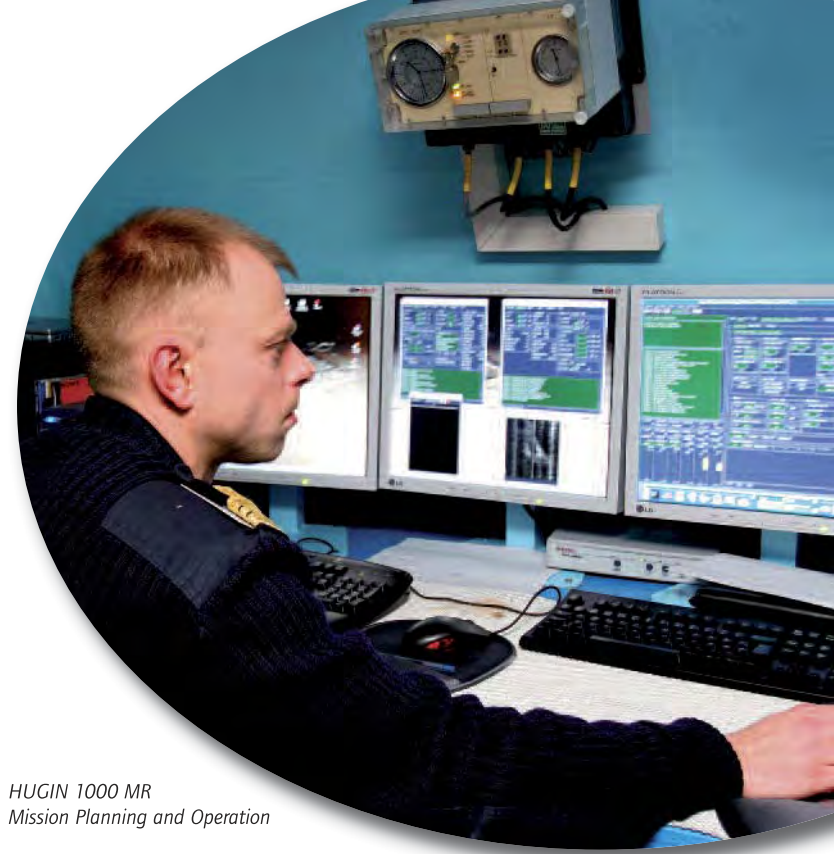
*Example of bathymetry from HUGIN 1000 MR. Left: EM 3000 multibeam bathymetry. Centre: HISAS 1030 bathymetry
Right: Merged EM 3000 and HISAS 1030 bathymetry. Water depth 10-45 meters*

AUV SYSTEM

System overview

Kongsberg offers full system solutions. This include:

- Mission planning systems
- Launch and recovery systems
- Communication and localization equipment
- Navigation equipment
- Docking systems
- Post-mission analysis
- System interfaces
- Spare part package
- Maintenance equipment
- Training systems



*HUGIN 1000 MR
Mission Planning and Operation*

Mission Planning and Operation Systems

All HUGIN and REMUS AUVs are equipped with highly intuitive Mission Planning and Operation Systems which greatly simplifies, mission planning, vehicle checkout, vehicle operation and data analysis.

Key functionality included is:

- Integrated text editor for construction of the mission file.
- Map view that illustrates the planned mission for review.
- Automatic error checking performed on all aspects of the planned mission, with warning messages that appear if any mission parameters are incorrect.
- Testing of important sub-systems such as the propulsion motor, rudders, and emergency systems.
- Monitoring and display of data from the vehicle and support systems.
- Input, sanity check and transmission of operator commands.
- Training simulation mode.
- Mission replay mode.



REMUS 100 System Package

Post mission analysis

Some navies have preferred systems for payload processing and post mission analysis. The Kongsberg AUVs can interface these systems.

Kongsberg Maritime offers a post mission analysis system. The Post Mission Analysis (PMA) software suite provides a wide range of options, essentially covering:

- Navigation post-processing for increased position accuracy (NavLab)
- Bathymetric processing, quality control, mosaicing, layering to charts, 3D view generation
- Side scan sonar processing
- Synthetic aperture sonar processing
- Automatic target recognition and other specialized functions for naval mine counter measures and REA applications

The figure illustrates the PMA system and its environment. The AUV file server stores all relevant data, raw and processed in standardised file formats and makes data available through authorised users through standardised file transfer protocols. This makes integration with, for instance, a naval command data handling system simple and straightforward.



Fig. PMA system



Launch and recovery systems

One of the main challenges with AUV operations is recovery in open and rough seas. REMUS 600/6000 and HUGIN 1000 have dedicated Launch and Recovery Systems (LARS) that have proved their efficiency and reliability in harsh operations over the years.

REMUS 100 - Two man deployment and operation capability

LAUNCH AND RECOVERY SYSTEMS

HUGIN LARS

During launch, the hydraulically operated stinger with HUGIN AUV is tilted down into the water and the vehicle is released by a disconnect mechanism while the ship is heading against the wind with a speed of 2-3 knots. During recovery, the ship is positioned 50-100 meters from where the AUV surfaces. The vehicle drop nose with the recovery nose is hooked and connected to the L/R system winch. The vehicle is then pulled onto the stinger and the stinger is lifted and retracted. During recovery the ship moves forward at 1 to 2 knots.

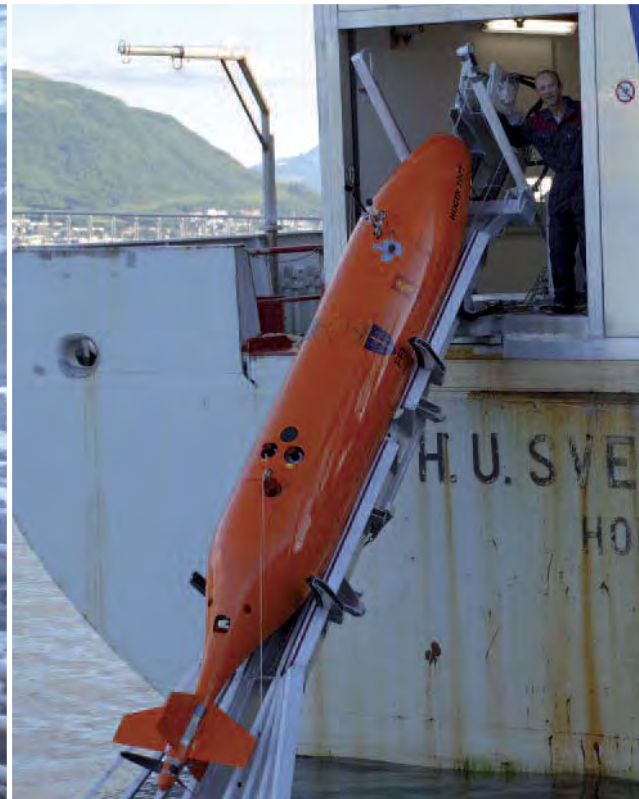


Figure above left:
HUGIN on stage stinger LARS

Figure above right:
HUGIN two stage stinger LARS



REMUS LARS

The LARS shown at left is a scaled down version of the field proven LARS used with the larger REMUS 6000 vehicle. LARS can be provided as integral components of either a REMUS 600 or a REMUS 6000 system.

The REMUS 600 LARS is a self contained unit that provides a means of extending the operational weather window of the REMUS vehicle by permitting vehicle launch and recovery in sea state, while retaining the flexibility to operate from ships of opportunity. When mounted on the stern of a ship, the LARS has a 5.5 ft by 10 ft. footprint, and requires less than 15 HP when operational.

MAIN SPECIFICATIONS

Table 1 below shows main specifications for REMUS and HUGIN AUVs. Payload and navigation sensor and configurations listed are the most frequent used for Naval Applications. Other sensors are available for the different vehicles and can be configured for special applications.





	REMUS 100	REMUS 600	HUGIN 1000	REMUS 6000
Imaging Sonars Frequency Type	VHF, HF DAS, PCS, SSS	VHF, HF SAS, FSSS, DAS, PCS	MF HISAS, SSS, FLS	VHF, H DAS, SSS
Bathymetry		MBES	MBES, HISAS	MBES
Optical Imaging	Video	Video, ESC	ESC	ESC
Environmental	CTD, OBS	CTD, OBS	CTD, OBS	CTD, OBS
Navigation	ADCP, GPS, PGPS, USBL, LBL HiPAP	ADCP, GPS, PGPS, USBL, LBL HiPAP	ADCP, GPS, USBL, UTP(LBL), HiPAP, TERRAINAV	ADCP, GPS, PGPS, USBL, LBL HiPAP
Navigation Modes	DR, IN, LBL, Homing and docking	DR, IN, LBL, Homing and docking	DR, IN, LBL, Homing and docking	DR, IN, LBL, Homing and docking
Communication Modes	Acoustic, WiFi, Iridium	Acoustic, WiFi, Iridium	Acoustic, WiFi, Iridium	Acoustic, WiFi, Iridium
Endurance (hours) All sensors operational @ 2.1 m/s	6 to 10	20-45	17 with HISAS 24 with SSS	28
Depth Rating (m)	100	600	1000	6000
Physicals Diameter (m)/ Length (m)/Weight (kg)	0.19/1.6/37	0.32/3.2/272	0.75/4.5/850	0.67/3.94/863
				

Table 1

CTD: Conductivity Temperature Depth
 OBS: Optical Backscatter Sensor
 ESC: Electronic Still Camera
 ADCP: Acoustic Doppler Current Profiler
 GPS: Global Positioning System
 P-GPS: code GPS
 USBL: Ultra Short Base Line

LBL: Long Base Line
 HIPAP
 VHF: Very High Frequency > 600 kHz
 HF: High Frequency: 300 - 600 kHz
 MF: Mid Frequency 50 - 300 kHz
 TERRAINAV: Terrain referenced navigation

Table 2 provides approximate values for resolution and area coverage rate for different imaging sonars.

Along track resolution of synthetic aperture sensors is constant with range.

For side scan sonar type of systems, along track resolution increase with range. In the table, the quoted along track resolution match the range for the area coverage rate.

Sonar System	Abbreviation	Frequency (kHz)	Along Track Resolution (cm)	Instantaneous Area Coverage Rate (Sq-km/hour)
Synthetic Aperature (Interferometric)	HISAS 1030	50-120	2.5-5	2.7
Synthetic Aperature Sonar	Other Types	MF	2.5-15	1.2
Dynamic Focused Sonar	DFS	850	15	0.5
Dynamic Aperature Sonar	DAS	850	15	0.5
Interferometric Sidescan Sonar	ISSS	MF		
Conventional Sidescan Sonar	SSS	MF, HF, VHF	20-30	0.25
Multibeam echo sounder	MBES	MF		

Table 2



Autonomous operations make rooms for all sort of activities!

SUPPORT AND SERVICE

We are always there, wherever you need us

KONGSBERG customer services organisation is designed to provide high-quality, global support, whenever and wherever it is needed. We are committed to providing easy access to support and service, and to responding promptly to your needs. Support and service activities are supervised from our headquarters in Norway, with service and support centres at strategic locations around the globe – where you are and the action is.

As part of our commitment to total customer satisfaction, we offer a wide variety of services to meet individual customers' operational needs. KONGSBERG support 24 is a solution designed to give round-the-clock support. For mission-critical operations, Kongsberg support 24 can be extended to include remote monitoring. We can adapt the level of support needs by offering service agreements, on-site spare part stocks and quick on-site response arrangements.

Global and local support

We provide global support from local service and support facilities at strategic locations world wide. Service and support work is carried out under the supervision of your personal account manager, who will ensure that you receive high-quality service and support where and when you need it. Your account manager will ensure continuity and work closely with your personnel to improve and optimise system availability and performance. Under the direction of your account manager, and with a local inventory of spare parts, our well-qualified field service engineers will be able to help you quickly and effectively.



Solid competence reduces cost

We have always recognised the importance of supporting our products and systems with professional training.

A wide range of courses are therefore offered to ensure that you achieve the goal of full system utilisation with safe and efficient operation.

Upgrading that pays

Product and system upgrades can improve your vessel's operations and reduce your overall maintenance costs. We will ensure that existing products and systems can be extended or upgraded based on standard upgrade kits.



Support 24

Tel: +47 8153 5355

Direct Tel: +47 9920 3830

Email: km.auv.support@kongsberg.com

www.kongsberg.com

E-mail: subsea@kongsberg.com
Telephone: +47 33 03 41 00