

EM[®]2042 BNS

Multibeam

Mapping Sonar



KONGSBERG



The acoustic advantage in naval applications

The force multiplier for Underwater Domain Awareness

The EM2042 Bottom Navigation System (BNS) is a flexible, high-resolution, wide-band multibeam mapping sonar optimized for naval applications, including Critical Undersea Infrastructure Protection (CUIP), Rapid Environmental Assessment (REA), Mine Warfare (MW), submarine and Uncrewed Underwater Vehicles (UUV) operations.

Built for robustness and reliability in extreme operational environments, the EM2042 BNS features reinforced titanium housings and subsea-qualified electronics. It delivers high-accuracy geophysical data across the underwater battlespace, enabling Terrain Referenced Navigation and Seabed Classification over a wide survey corridor. In addition, the system supports change detection and target tracking on the seabed and within the water column, enhances temporal analysis and overall situational awareness.

Advanced Capabilities

- Co-registration of high-resolution bathymetry and backscatter imaging for accurate modeling of the seabed and man-made features.
- Nearfield focusing and pulse compression to improve small target detection.
- Real-time processing using Machine Learning algorithms and data fusion techniques for improved accuracy and object discrimination.
- Dynamic beam steering with motion compensation, ensuring data accuracy even on fast-moving or unstable platforms.
- Platform Flexibility:
 - Unmanned Systems Ready: Modular design for an easy installation aboard Uncrewed Surface Vehicles (USV), Remote Operated Vehicles (ROV), and Remote Operated Towed Vehicles (ROTV).
 - Suitable for use on large surface vessels, fast combatants, submarines, and for temporary deployment on vessels of opportunity.
- Secure data workflow integration into naval consoles and bespoke solutions.
- Interoperable with naval GIS, mission planning, and sonar suites.

When the Mission Demands Precision—Deploy the EM2042 BNS

KEY FEATURES (default deliveries)

- High resolution multi-frequency bathymetry and seabed backscatter
- Reinforced transducers to withstand harsh conditions
- Depth rated to 600 m
- Pitch, Roll and Multitransmitter, Yaw stabilization
- Dual Swath for an enhanced sounding density (Single RX)
- Water column backscatter logging
- Seamless integration with WECDIS and custom solutions to enhanced situational awareness
- Data format compatible with 3rd party software providers (EIVA, CARIS, HYPACK, PDS, QPS, Beamworx and others)

OPTIONS

- EM[®] HighFrequency mode
- Enhanced EM[®] MultiFrequency Backscatter mode
- QuadSwath[™] (Single RX)
- Extra detections
- Dual RX / Dual TX configurations
- Hydrographic Workstation (HWS), maritime certified for data acquisition
- Easy upgrade for EM2040 users

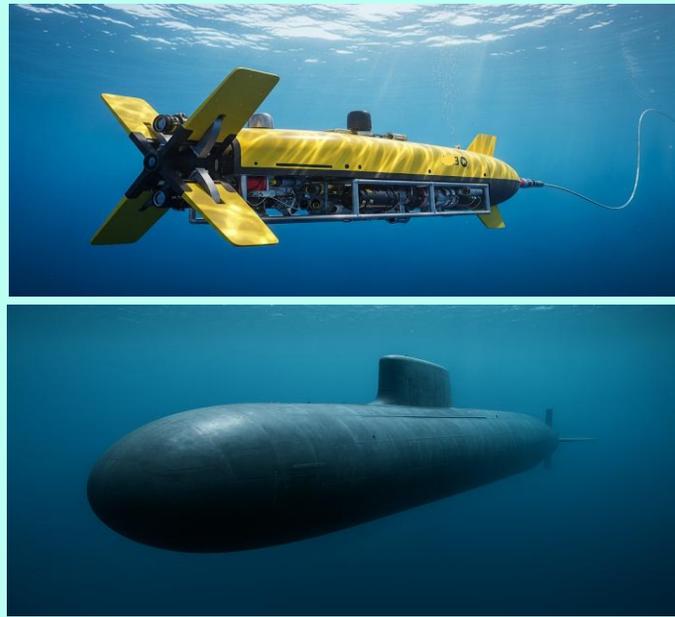
Mission-Ready Frequency Versatility

The EM2042 BNS delivers exceptional versatility with a 150–700 kHz wideband frequency range, enabling tailored performance across diverse naval missions:

- 300 kHz – Primary mapping mode, balancing range and resolution for general seabed surveys and target detections in the water column.
- 400 kHz – Inspection-optimized, ideal for hull and infrastructure assessments.
- 600 & 700 kHz – High-resolution seabed object detection, supporting mine countermeasures and port security.
- 200 kHz – Extended range, reaching depths up to 600 meters for submarine navigation and anchoring.
- 150 kHz – New low-frequency band, enhancing EM® MultiFrequency for single-pass seabed classification.

New Feature – Ready for QuadSwath™

The EM2042 BNS delivers up to four swaths per ping, dramatically increasing sounding density and enhancing seafloor feature definition, which is crucial for high-speed, high-precision naval operations.



Technical specifications

Frequency range	150 – 700 kHz
Ping rate	Up to 50 Hz
Number of soundings	Up to 1024 per swath 4096 for Single RX QuadSwath or Dual RX Dual Swath
Swath coverage	Up to 170° (Single RX) / 220° (Dual RX)
Depth range	0.5 m to max 600 m below transducers
Depth rating	600 m
Beam stabilization	Roll ($\pm 15^\circ$), pitch ($\pm 10^\circ$), yaw ($\pm 10^\circ$)
Pulse form	CW / FM (CHIRP modulation)
Bandwidth	>120 kHz
Shortest pulse length	14 μ s
Depth accuracy	Up to 5.5 mm
Power requirements	From 93 W
Environmental resilience	Engineered for high-vibration and mechanical shock loads, maintaining transducer storage limits of -20 °C to +60 °C and an operating range of -5 °C to +40 °C.



Beamwidth							Physical dimensions (excluding connectors, and extra hardware)		
	150 kHz	200 kHz	300 kHz	400 kHz	600 kHz	700 kHz	Dimensions (W x D x H)	Weight (in air)	Weight (in water)
TX 04	1°	0.7°	0.5°	0.4°	0.25°	0.225°	691 x 120 x 150 mm	27.0 kg	17.5 kg
TX 07	2°	1.5°	1°	0.7°	0.5°	0.45°	372 x 120 x 150 mm	16.5 kg	11.0 kg
RX 07	2°	1.5°	1°	0.7°	0.5°	0.45°	364 x 134 x 136 mm	15.3kg	11.2 kg
Processing Unit (2U for 19" rack)							482.5 x 424 x 88.6 mm	10.5 kg	
Portable Processing Unit (IP67)							370 x 390 x 101 mm	9.5 kg	
OEM Processing Unit (USV)							329.4 x 220.2 x 71 mm	3.1 kg	