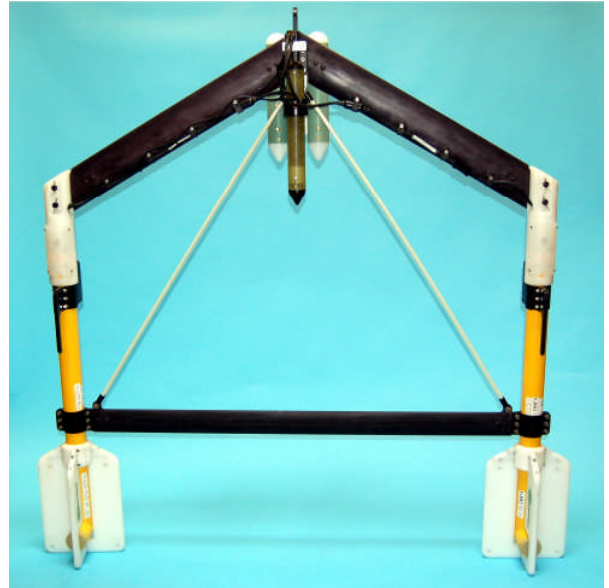


Manufacturer Specifications

G-882TVG CESIUM MAGNETOMETER & TRANSVERSE GRADIOMETER

- **Marine Search Applications for UXO, pipelines, lost objects with Multi-Sensor Array Capability**
- **High Sensitivity – 0.004 nT/sq-rt-Hz RMS with dual CM-221 Larmor Counters**
- **Very Low Heading Error – ± 0.25 nT over 360° equatorial and polar spins**
- **Versatility – CM-221 counter includes 8 channel 12 bit A to D converters for real time internal diagnostics, digital data stream concatenation, and short, long or telemetry over coax options**
- **Reliability and Ruggedness – Cesium magnetometers never need be returned to factory for calibration or tuning. Designed for tough environmental conditions and high “G” loads**
- **Gradiometer arrays offering simultaneous operation of up to 8 separate sensors using the designed-in multi-sensor data concatenation of the CM-221 internal counter**
- **Geometrics offers complete turnkey systems including tow cables, gradiometer wing, digital data acquisition systems with real time anomaly detection, GPS navigation and post acquisition data processing software and training.**



The Geometrics Model G-882TVG Transverse Gradiometer system mates the well-proven high-performance cesium sensor with dual high sensitivity and high speed CM-221 Larmor Counters. This advanced integrated magnetometer system provides unmatched versatility in performance, with a wide sensor separation for maximum target detection efficiency and survey cost effectiveness.

The system comprises a transverse wing and two G-882 Cesium Vapor magnetometer fish with stabilizer weights and fins. Tow cables may be up to 150m in length with standard power supply or up to 700m with a high capacity voltage sense supply. Depth sensors provide gradiometer attitude and depth information to the operator depth and an echo-sounder altimeter provides height above sea floor for proper system flight control.

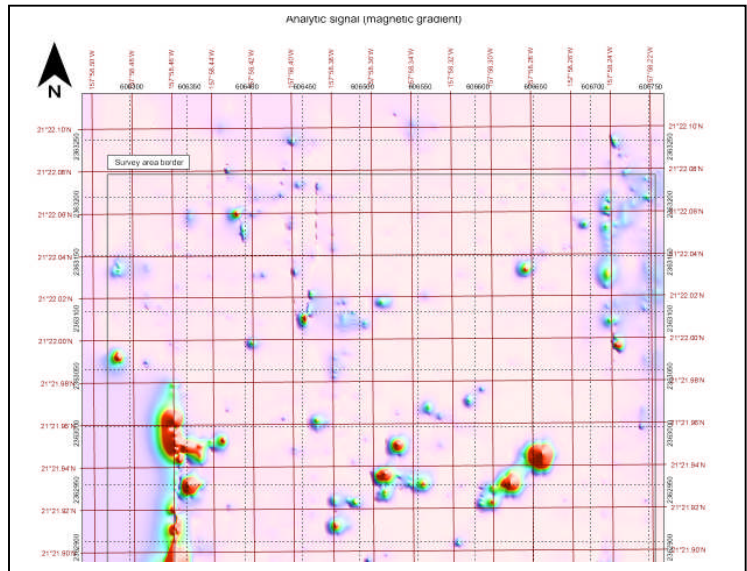
Dual sensors are synchronized to 1ms sampling and data is transmitted via RS-232 for recording by any standard PC computer using our industry standard MagLogLite software. High sample and data transmission rates (up to 40 samples per second) are standard.

The G-882G provides sensitivities of 0.004 nT/ $\sqrt{\text{Hz}}$ RMS or approximately 0.01 nT P-P at 10 Hz, selectable via software command for detection of the smallest anomalies. MagLog software computes the transverse difference for display and analysis in real time, using the customer supplied GPS for interpolation and target positioning.

The system's high performance is excellent for the detection and delineation of cables, pipelines, environmental, archaeological or military UXO and EOD targets.

Software

Geometrics supplies MagMap2000 and MagPick with each system for analysis and interpretation of total field and gradient data. Analytical signal is computed from the transverse gradient, longitudinal time gradient and computed vertical gradient to give a time-variation free data set for contouring and plotting of anomaly targets. Simultaneous dual inversion routines in MagPick produce a located target worksheet with models including object latitude-longitude position and depth of burial. Download <ftp://geom.geometrics.com/pub/mag/Software/Posters.zip> for more information



MODEL G-882TVG MARINE CESIUM GRADIOMETER SPECIFICATIONS

OPERATING PRINCIPLE:	Self-oscillating split-beam cesium vapor (non-radioactive)
OPERATING RANGE:	20,000 to 100,000 nT
OPERATING ZONES:	The earth's field vector should be at an angle greater than 10° from the sensor's equator and greater than 10° from the sensor's long axis. Automatic hemisphere switching.
SENSITIVITY WITH CM-221 COUNTER:	<0.004 nT/sq-rt-Hz RMS. Typically 0.01 nT P-P at a 0.1 second (10 Hz) sample rate (90% of all readings falling within the P-P envelope)
SAMPLE RATE:	Up to 40Hz in 100ms increments
HEADING ERROR:	<0.25 nT over entire 360° equatorial and polar spins
ABSOLUTE ACCURACY:	<3 nT throughout range
OUTPUT:	Cycle of Larmor frequency = 3.498572 Hz/nT, RS-232 data at 115K baud, concatenated data streams from 2 to 8 sensors depending on sample rate
MECHANICAL:	Total weight including 70kg (155 lbs) including two fish, wing and tow cable. Sensor separation is 1.5m for maximum gradient
CABLES:	Vectran Reinforced multi-conductor tow cable. Breaking strength 3,600 lbs, 0.48 in OD, 500 ft standard maximum. Up to 2100 ft with variable voltage supply. 200 ft (60m) weighs 17 lbs (7.7 kg).
OPERATING TEMPERATURE:	-30°F to +122°F (-35°C to +50°C)
STORAGE TEMPERATURE:	-48°F to +158°F (-45°C to +70°C)
ALTITUDE:	Up to 30,000 ft (9,000 m)
DEPTH RATING:	Depth rated to 4,000 psi (2,700m)
POWER:	115/220 VAC, 60 watts at turn-on and 40 watts thereafter
ACCESSORIES:	
Standard:	Power/RS-232 multiconductor cable (electronics to power/data junction box with 9 pin RS-232 connector and power lugs), lengths to be specified, operation manual and reusable shipping and storage containers
Optional:	
Logging Software	MagLog (Logs GPS and Mag, shows trackplot, mag profile, other data)
Processing software	MagMap2000, MagPick

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

05/09



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4205

TRI-FREQUENCY / MOTION TOLERANT SIDE SCAN SONAR SYSTEM

FEATURES

- Tri frequency side scan sonar
- Motion tolerant mode
- Improved target positioning
- Crisp, high resolution CHIRP imagery
- Increased towfish power to support wider range of 3rd party sensors
- Single pulse high resolution mode

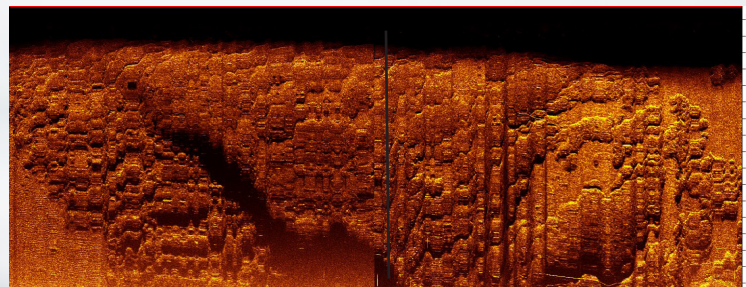
APPLICATIONS

- Cable & pipeline surveys
- Geological/geophysical surveys
- Mine countermeasures (MCM)
- Geohazard surveys
- Channel clearance
- Search and recovery
- Archeological surveys



The next generation 4205 is a versatile side scan sonar system that can be configured for almost any survey application from shallow to deep water operations. The 4205 utilizes EdgeTech's Full Spectrum® CHIRP technology to provide crisp, high resolution imagery at ranges up to 50% greater than non-CHIRP systems; thus allowing customers to cover larger areas and save money spent on costly surveys. In addition to the high-resolution imagery that EdgeTech is known for, the 4205 comes with a number of new features which makes the system even more flexible and powerful in offshore operations. The 4205 is available in either a tri-frequency side scan sonar configuration or motion tolerant and multi-pulse configuration. The tri-frequency version allows surveyors the option to operate any two frequencies simultaneously from the tri-frequency system. Long range operations for example can be achieved with a selection of 230/540 kHz combination. Then, on-demand the system can be changed to a 540/850kHz system for an even higher resolution survey. The 4205 motion tolerant configuration with multi-pulse provides surveyors the ability to operate either at faster survey speeds or in more adverse weather conditions while still obtaining high quality underwater imagery. Additionally, this configuration can be operated in a single pulse high-resolution mode for those operations that require an even more finite view of the seafloor.

In both the tri-frequency and motion tolerant/ multi-pulse configurations, towfish and target positioning has been improved with the integration of a more accurate heading sensor. Additionally, all systems now come with increased towfish power to support a wider range of additional 3rd party sensors. All EdgeTech 4205 systems are comprised of a topside system and a reliable stainless steel towfish. Topside processors are rack mountable and come with easy-to-use GUI software that can be installed on the optional industrial workstation, laptop or customer provided PC.



Motion Tolerant Mode Sonar example: During turbulent conditions, the data on the left of side of this image was recorded using the EdgeTech 4205 Motion Tolerant mode. The right side of the image, depicting motion induced striping was captured without the Motion Tolerant mode for comparison.

For more information please visit EdgeTech.com



4205

TRI-FREQUENCY / MOTION TOLERANT SIDE SCAN SONAR SYSTEM

KEY SPECIFICATIONS

SONAR SPECIFICATIONS	4205 TRI-FREQUENCY	4205 MULTI-PULSE/MOTION TOLERANT (MP/MT) AND HIGH DEFINITION MODE	
Frequency	Choice of either 120/410/850 kHz or 230/540/850 kHz	Choice of either 120/410 kHz, 230/540 kHz, 540/850 kHz or 230/850 kHz	
Operating Range (meters/side)	120 kHz: 600m, 230 kHz: 350m, 410 kHz: 200m, 540 kHz: 150m, 850 kHz: 90m		
Horizontal Beam Width		MP/MT	HDM
	120 kHz: 0.70°	120 kHz: 0.95°	0.70°
	230 kHz: 0.44°	230 kHz: 0.62°	0.44°
	410 kHz: 0.28°	410 kHz: 0.40°	0.28°
	540 kHz: 0.26°	540 kHz: 0.36°	0.26°
	850 kHz: 0.23°	850 kHz: 0.33°	0.23°
Resolution Along Track		MP/MT	HDM
	120 kHz: 2.4m @ 200m	120 kHz: 3.3m @ 200m	2.4m @ 200m
	230 kHz: 1.2m @ 150m	230 kHz: 1.7m @ 150m	1.2m @ 150m
	410 kHz: 0.5m @ 100m	410 kHz: 0.7m @ 100m	0.5m @ 100m
	540 kHz: 0.45m @ 100m	540 kHz: 0.6m @ 100m	0.45m @ 100m
	850 kHz: 0.20m @ 50m	850 kHz: 0.26m @ 50m	0.20m @ 50m
Resolution Across Track	120 kHz: 8cm; 230 kHz: 3cm; 410 kHz: 2 cm; 540 kHz: 1.5cm; 850 kHz: 1cm		
Vertical Beam Width	50°		
Depression Angle	Tilted down 25°		
TOWFISH	STAINLESS STEEL		
Diameter	12cm (4.75 inches)		
Length	140cm (55 inches)		
Weight in Air	52 kg (115 pounds)		
Depth Rating (Max)	2,000m		
Standard Sensors	Heading, pitch & roll		
Optional Sensor Port	(1) Serial – RS 232C, Bi-directional & 28 VDC +/- 4%		
Options	Pressure Sensor, Magnetometer interface, USBL Responder interface, Depressor, Power Loss Pinger and Custom Sensors		
TOPSIDE PROCESSOR	4205 INTERFACE		
Hardware	19" rack mount interface (150 watt or 400 watt)		
Display & Interface	Optional industrial workstation, laptop or customer provided PC		
Power Input	115/230 VAC		
File Format	Native JSF or XTF		
Sensor Interfaces	Ethernet, RS 232		
TOW CABLE			
	Coaxial Kevlar or double-armored up to 6,000m, winches available		

For more information please visit EdgeTech.com

info@EdgeTech.com | USA 1.508.291.0057

4200-MP SIDE SCAN SONAR SYSTEM

Technologically advanced digital Dual Mode high-resolution side scan sonar system.



EdgeTech Stainless Steel Towfish

The *EdgeTech 4200-MP Side Scan Sonar System* provides a unique advantage over conventional dual frequency side scan systems by combining EdgeTech's Full Spectrum and Multi-Pulse technologies into one unit. The 4200-MP comes available with a choice of two dual simultaneous frequency sets; either 100/400 kHz or 300/600 kHz, and offers two software selectable modes of operation:

- **High Definition Mode (HDM)** - conventional dual simultaneous frequency operation with extra long array for superior resolution; excellent tool for Mine Countermeasures (MCM).
- **High Speed Mode (HSM)** - Multi-Pulse operation on either selected frequency for speeds up to 10 knots, while meeting NOAA and IHO-44 requirements for Hydrographic Survey for "hits on target" compared to conventional systems at 4 knots. This is an additional feature for high-speed navy patrol vessels.

Features:

- Either 100/400 or 300/600 kHz dual simultaneous frequencies
- Selectable dual mode of operation: High Definition Mode (HDM) or High Speed Mode (HSM)
- 2000 meter depth rating for stainless steel towfish
- 300 meter depth rating for lightweight aluminum towfish
- Data transmitted over long single coaxial cable lengths
- Integrated with other sensors
- Full Spectrum CHIRP processing
- Able to interface with customer supplied PC and 3rd party software

Applications:

- Mine Countermeasures (MCM)
- Hydrographic surveys
- Geo-hazard surveys
- Geological/geophysical surveys
- Route surveys
- Archeological surveys
- Search and recovery
- AUV/ROV adaptable

The array configuration for these two modes of operation is dynamically reconfigured by the system to suit the user's immediate application. Real time selection of the 2 modes allows the user to choose the mode best suited to his task at hand.

The 4200-MP uses EdgeTech's Full-Spectrum CHIRP technology to deliver wide band, high energy transmit pulses, coupled with high-resolution and superb signal to noise ratio echo data. The system employs wide band, low noise front end electronics which reduce system induced phase errors and drift to negligible levels. The sonar data is also available as a complex, fully coherent data set suitable for advanced user applied post processing.

The 4200-MP offers dual simultaneous frequency operation (either 100/400 or 300/600 kHz) in both HDM and HSM and is designed to allow efficient integration of other optional sensors.

The EdgeTech telemetry link allows the sonar signals that are digitized in the towfish to be transmitted over long coaxial cable lengths with no loss of signal quality.

The 4200-MP offers two towfish options based upon the user's desired applications; a stainless steel or lightweight aluminum version. The stainless steel towfish is heavier and ideal for deeper water operation of up to 2000 meters and the lightweight aluminum towfish for shallower water operation of depths up to 300 meters. Both towfish are available with either frequency set (100/400 or 300/600 kHz).

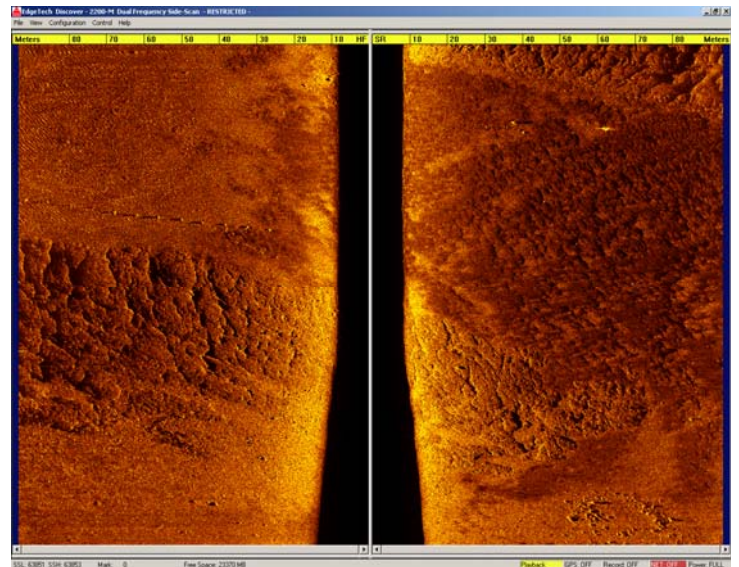
Along with the choice of towfish, the 4200-MP also offers three different topside processor options which again allows the user to customize the system to best suit his needs. All of the topside processors come installed with EdgeTech's DISCOVER software, which serves as the control and data acquisition sub-system for display, storage and printing of sonar data. You also have the option of configuring the system for third-party interface and or utilizing your own PC / laptop.

The EdgeTech Model 4200 Topside Processor is a standard 19" rack mountable topside that is ideal for use on larger vessels or when portability is not a main concern. In this configuration, all of the electronics are housed within a 19" rack mounted Windows© based PC System and the data is displayed on a high resolution flat screen color monitor.

The EdgeTech Model 4200-P Topside Processor is a portable unit that is ideal for smaller vessels or when operating outside of a protected area. All of the electronics are mounted within a waterproof "suitcase-style" housing and the data is displayed on a laptop computer via a wired or wireless Ethernet connection.

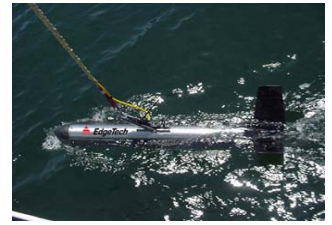
For customers who would prefer to use their own 3rd party topside processor, EdgeTech offers the 701-DL (Digital Link) which acts as the interface between the 4200-MP towfish and the display and acquisition software. With this option the user supplies the PC and runs the 4200-MP using EdgeTech's DISCOVER software.

The 4200-MP sets new standards in the industry for seafloor mapping by integrating key performance and safety features, the dual mode feature along with EdgeTech's Secondary Recovery System, Standard Heading, Pitch & Roll, optional Depth, Magnetometer interface and Acoustic responder for accurate towing positioning at a price which is commercially sensitive.



600 kHz data image of hydrophones

4200-MP SIDE SCAN SONAR SYSTEM



Configuration Options:

Model 4200 Rack Mount
Topside Processor with
EdgeTech's DISCOVER
Software

Model 4200-P Portable Topside
Processor with EdgeTech's
DISCOVER Software

Model 701-DL to interface
to 3rd Party Topside
Processors



Or



Or

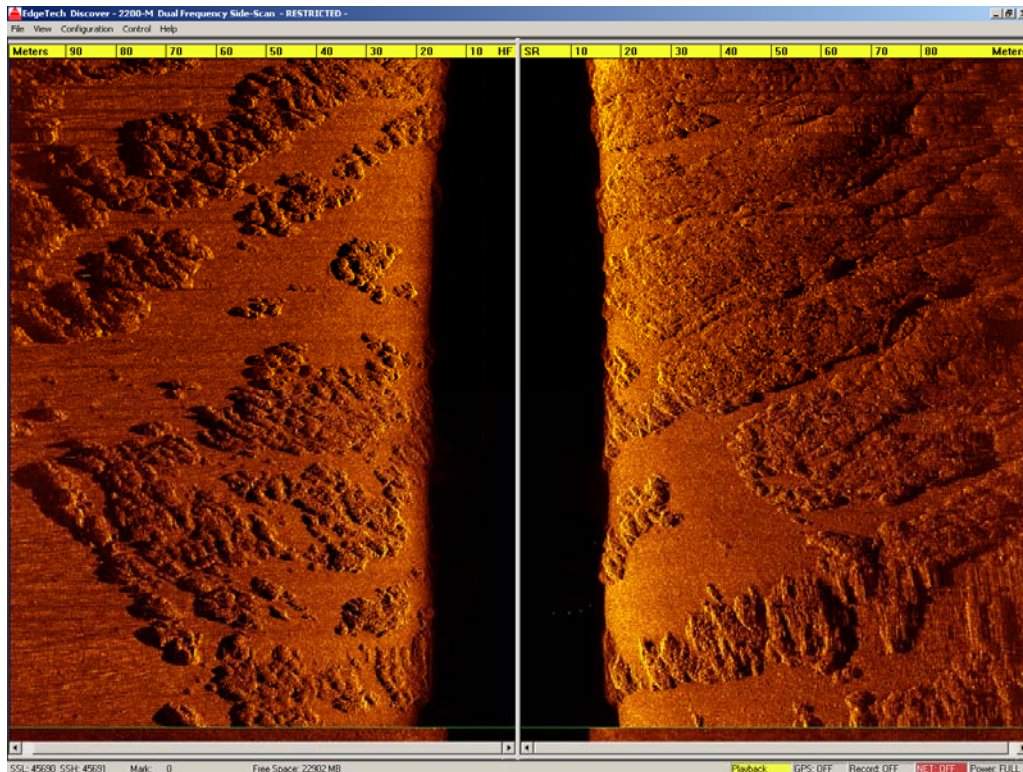


Or



EdgeTech stainless steel towfish with either
100/400 kHz or 300/600 kHz dual
simultaneous frequencies.

EdgeTech lightweight aluminum towfish with
either 100/400 kHz or 300/600 kHz dual
simultaneous frequencies.



600 kHz data image of coral reef



4200-MP SIDE SCAN SONAR SYSTEM

Key Specifications

Frequency	100/400 kHz	300/600 kHz
Modulation	Full Spectrum CHIRP frequency modulated pulse with amplitude and phase weighting	
Operating Range (typical maximum with good imagery)	100 kHz: 500 meters/side 400 kHz: 150 meters/side	300 kHz: 230 meters/side 600 kHz: 120 meters/side
Towing Speed (max safe)	12 knots	
Towing Speed *	4.8 knots in HDM, 9.6 knots in HSM	
Output Power	100 kHz: 4 joules, 400 kHz: 2 joules	300 kHz: 2 joules, 600 kHz: 1 joule
Pulse Length	100 kHz up to 20 ms 400 kHz up to 10 ms	300 kHz up to 10 ms 600 kHz up to 5 ms
Resolution Across Track	100 kHz: 8 cm, 400 kHz: 2 cm	300 kHz: 3 cm, 600 kHz: 1.5 cm
Resolution Along Track	100 kHz: 2.5m @ 200 meter range 400 kHz: 0.5m @ 100 meter range	300 kHz: 1.0 m @ 200 meter range 600 kHz: 0.45 m @ 100 meter range
Horizontal Beam Width (HDM)	100 kHz: 0.64°, 400 kHz: 0.3°	300 kHz: 0.28°, 600 kHz: 0.26°
Horizontal Beam Width (HSM)	100 kHz: 1.26°, 400 kHz: 0.4°	300 kHz: 0.54°, 600 kHz: 0.34°
Optional CW Pulse Short Range	Yes	
Digital Link	4 Mbits/sec (typical), 4 channels of side scan data + sensor data	
Dynamic Range	24 Bits	
Depression Angle	Tilted down 20°	
Vertical Beam Width	50°	
Operating Temperature	0°C to 45°C	
Power In (4200-P portable topside processor)	24-30 VDC or 110/240 VAC (auto-ranging); 300 Watts maximum	
Power In (4200 rack mount topside processor)	80-140 VAC or 175-265 VAC (auto switching); 300 Watts maximum	
Optional Sensor Port	(1) Serial - RS 232C, 9600 Baud, Bi-directional & 27 Vdc	
Heading/Pitch/Roll	Heading Accuracy: < 1.5° RMS Heading Resolution: 0.1° Roll, Pitch Angle Accuracy: ± 0.4° Roll, Pitch Angle Repeatability: 0.2° Roll, Pitch Angle Resolution: 0.1°	
Towfish Physical Specifications	Stainless Steel	Aluminum
Diameter	11.4 cm (4.5 inches)	
Length	125.6 cm (49.5 inches)	
Weight in Air/Saltwater	48 / 36 kg (105 / 80 pounds)	30 / 18 kg (66 / 40 pounds)
Tow Cable Length	6,000 meters typical	
Tow Cable Type	Co-axial	
Operating Depth (maximum)	2000 meters	300 meters
Options	Pressure, Temperature, Magnetometer, USBL Acoustic Tracking System, Acoustic Responder, Depressor and Custom Sensors	

* Meets NOAA Shallow Water Survey Specification - Min 3 pings on a 1 meter target

Other EdgeTech Products

✓ Side Scan, Sub-bottom, Integrated and Modular Imaging Systems for Deep Towed, AUV, ROV and Other Applications utilizing Full Spectrum, MultiPing or Synthetic Aperture Acquisition and Processing Techniques.

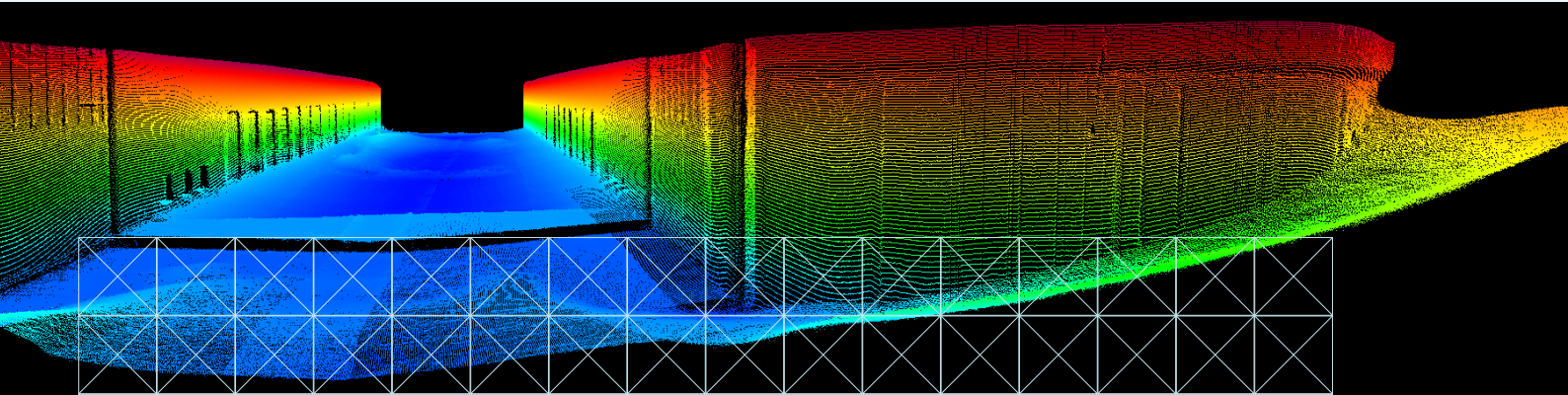


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EM[®] 2040 MKII



KONGSBERG



MULTIBEAM ECHO SOUNDER

The EM 2040 MKII is a true wide band high resolution shallow water multibeam echo sounder, an ideal tool for any high resolution mapping and inspection application. With the release of the EM 2040 MKII series Kongsberg Maritime has upgraded the hardware and software to increase the swath and improve the data quality of our EM 2040 series.

Key facts

The operating frequency range of the EM 2040 MKII is 200 to 400 kHz. The operator can on the fly choose the best operating frequency for the application: 300 kHz for near bottom, 200 kHz for deeper waters and 400 kHz for very high resolution inspection. Due to the large operating bandwidth, the system has an output sample rate up to 60 kHz. The system can effectively operate with very short pulse lengths, the shortest pulse being 14 microseconds giving a raw range resolution (CT/2) of 10.5 mm.

By utilizing both CW and FM chirp pulses, the system can achieve long range capability with a high resolution giving the system a maximum depth range in cold ocean water of 600 m at 200 kHz and a swath width up to 900m.

The angular coverage for the 200 and 300 kHz is up to 170°, with coverage up to 7.5 times water depth on a flat bottom. For a dual transducer system, 200° angular coverage or 10 times the water depth is achieved on a flat bottom.

As an option the EM 2040 MKII can be delivered with dual swath capability, allowing a sufficient sounding density to meet survey coverage standards along track while maintaining a high vessel speed.

Components

The EM 2040 MKII is a modular system, fully prepared for upgrading to cater for more demanding applications. The basic system has four units: a transmit transducer, a receive transducer, a processing unit and a hydrographic workstation.

The EM 2040 MKII receiver is 0.7° and is delivered with a 0.4° or 0.7° transmitter(s). The transmit fan is divided into three sectors pinging simultaneously at separate frequencies ensuring a strong and beneficial dampening of multibounce interference.

A single transmitter with dual receiver setup fully exploits the unique angular coverage of our three-sector transmitter for full 200° angular coverage per ping. The specialised dual transmitter and receiver setup is ideal where mounting requires a large separation of receivers, where mounting the transmitter at the keel is not an option or for ROV pipeline surveying and free span detection. This configuration transmits on a single sector per transmitter with selectable frequency in steps of 10 kHz from 200 to 400 kHz.

The standard depth rating of the EM 2040 MKII transducers is 6000 m, making it ideal for operation on subsea vehicles such as ROVs or AUVs.

FEATURES

- High resolution
- Wide frequency range
- FM chirp
- Roll, pitch and yaw stabilisation
- Nearfield focusing - both on transmit and receive
- Short pulse lengths, large bandwidth
- Seabed image
- Depth rated to 6000 m
- Easy to install
- Water column logging
- Water column display
- Extra detections
- Dual swath
- Dual RX
- Dual TX



TECHNICAL SPECIFICATIONS

Frequency range	200 to 400 kHz
Max ping rate	50 Hz
Swath coverage sector	Up to 170° (single receiver) / 200° (dual receiver)
Beam patterns	Equiangular, equidistant high density and ultra high density
No. of beams per ping	512 (Single RX)/1024 (Single RX, Dual Swath)/1600 (Dual RX, Dual Swath)
Roll stabilised beams	± 15°
Pitch stabilised beams	± 10°
Yaw stabilised beams	± 10°

Coverage example for EM 2040 with bottom type rock (BS = - 10 dB), NL = 45 dB, FM mode

Operating mode	Cold ocean water			Cold fresh water		
	Max depth	Max coverage single RX	Max coverage dual RX	Max depth	Max coverage single RX	Max coverage dual RX
EM 2040-04:						
200 kHz	635 m	920 m	980 m	1360 m	1990 m	2110 m
300 kHz	480 m	670 m	760 m	740 m	1100 m	1270 m
400 kHz	315 m	410 m	430 m	430 m	570 m	610 m
EM 2040-07:						
200 kHz	600 m	880 m	930 m	1300 m	1870 m	2000 m
300 kHz	465 m	640 m	725 m	700 m	1050 m	1200 m
400 kHz	300 m	385 m	410 m	375 m	540 m	570 m

Pulse lengths	200 kHz mode		300 kHz mode		400 kHz mode	
	CW	FM	CW	FM	CW	FM
Normal mode	38, 108 & 324 µs	3 & 12 ms	38, 108 & 324 µs	2 & 6 ms	27, 54 & 108 µs	N/A
Single sector mode	19, 38 & 81 µs	1.5 ms	19, 38 & 81 µs	1.5 ms	14, 27 & 54 µs	N/A
	200 - 400 kHz CW in 10 kHz step			200 - 400 kHz FM in 10 kHz step		
Dual TX model	14, 27, 54, 135, 324 & 918 µs			3 & 12 ms		

Max no. of beams per ping	Single swath	Dual swath
Single RX	512	1024
Dual RX	800	1600

	Beamwidth			Physical dimensions (excluding connectors and mounting arrangements)	
	200 kHz	300 kHz	400 kHz	Dimensions	Weight
TX EM 2040-04	0.7°	0.5°	0.4°	727 x 142 x 150 mm (LxWxH)	45 kg
TX EM 2040-07	1.5°	1°	0.7°	407 x 142 x 150 mm (LxWxH)	23 kg
RX	1.5°	1°	0.7°	407 x 142 x 136 mm (LxWxH)	22 kg
Processing Unit (2U for 19" rack)*				482.5 x 424 x 88.6 mm (WxDxH)	10.5 kg
Portable Processing Unit (IP67)				370 x 390 x 101 mm (WxDxH)	10.5 kg

Laptop, HWS and monitor can be delivered on request.

Specifications subject to change without any further notice.

EM® is a registered trademark of Kongsberg Maritime AS in Norway and other countries.

Front page: Courtesy of Port of London.

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KONGSBERG

NORBIT - iWBMS TURNKEY MULTIBEAM SONAR SYSTEM

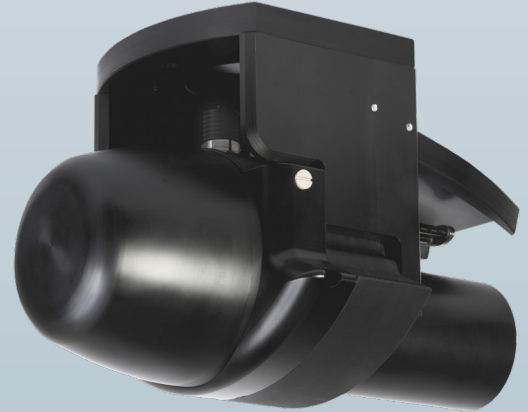
For High Resolution Bathymetry

Compact and high-resolution curved array bathymetric mapping system by NORBIT.

This all-in-one tightly integrated broadband multibeam turnkey solution offers high resolution bathymetry over a wide swath. The high-end sonar with Applanix WaveMaster II (globally leading GNSS/INS system) embedded into the unit ensures fast and reliable mobilisation and highest quality sounding for surveys in all conditions.

The WBMS-series are based on a flexible sonar platform that utilizes the latest in analogue and digital signal processing. With broad R&D expertise, NORBIT has developed, from the ground-up, exciting new technology that allows existing and new applications to benefit from the advantages offered by a compact wideband curved-array multibeam sonar.

Supported by DCT (NORBIT Integrated Data Acquisition Software) for efficient survey data acquisition.



Features

- ✓ Multibeam Sonar with Integrated Inertial Navigation System & Integrated NTRIP Client
- ✓ 80kHz Bandwidth
- ✓ Roll-stabilisation
- ✓ Backscatter outputs (Intensity, Sidescan, Sidescan Snippets, Snippets, Water Column)
- ✓ Multidetect
- ✓ Simple Ethernet Interface
- ✓ Integrated Sound Velocity Probe
- ✓ Hydrodynamic Fairing
- ✓ Mounting Bracket Included
- ✓ FM & CW Processing
- ✓ Flexible Power
- ✓ Exceeds IHO *Special Order*, CHS *Exclusive Order* & USACE *New Work*

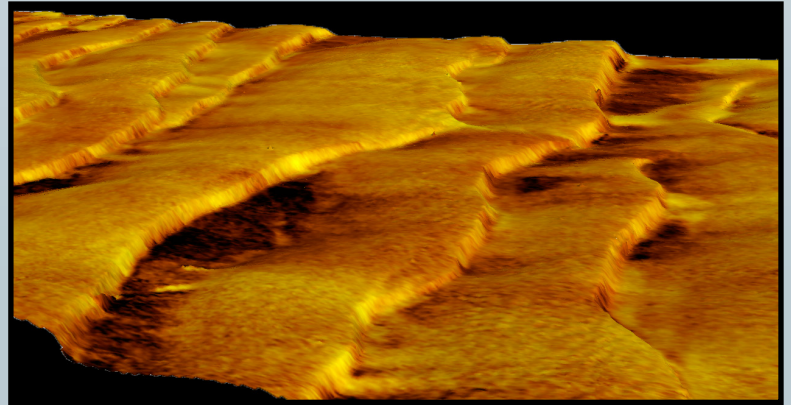
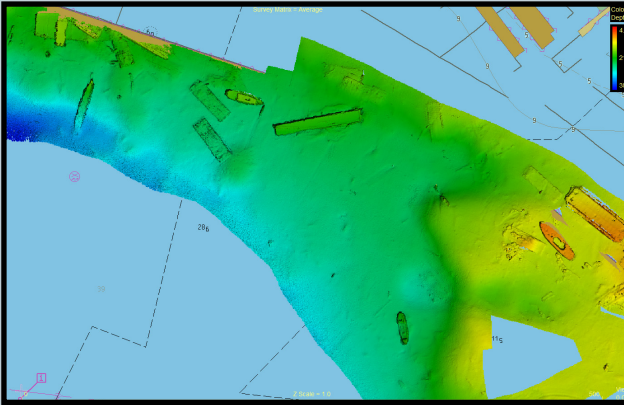
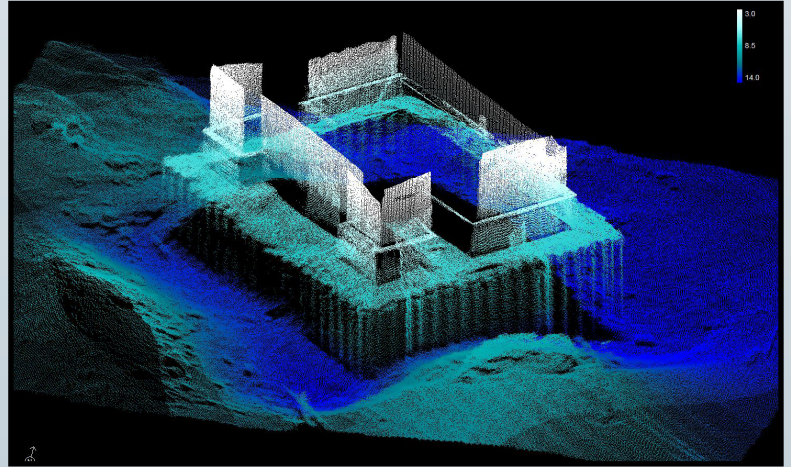
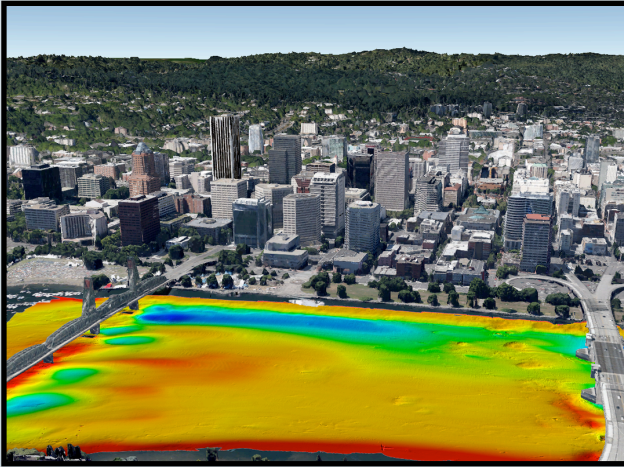
Applications

- ✓ Shallow Water Bathymetry
- ✓ Pipeline Surveys
- ✓ Pond, River and Estuary Surveys
- ✓ Harbor and Lake Surveys
- ✓ Unmanned Surface Applications (AUV or ASV)
- ✓ Coastal Surveys

Options

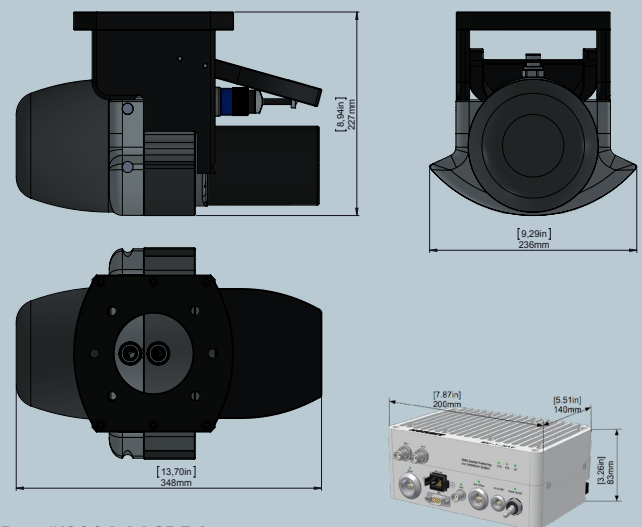
- ✓ Sound Velocity Profiler
- ✓ Data Acquisition Software (DCT)
- ✓ Turnkey Survey Solutions
- ✓ Permanent Hull Mount Option
- ✓ Pole Mount and Travel Option
- ✓ 200kHz Version
- ✓ Backscattering Strength Output
- ✓ Narrow Beam Option
- ✓ High-end INS
- ✓ Acquisition, Navigation and Post Processing Software
- ✓ 1024 HDS
- ✓ Can be Delivered with Software Packages e.g. DCT, HYPACK, Qinsy, EIVA, CARIS and Others

NORBIT iWBMS Wideband Multibeam Sonar For High Resolution Bathymetry



TECHNICAL SPECIFICATION

SWATH COVERAGE	5-210° FLEXIBLE SECTOR (SHALLOW WATER IHO SPECIAL ORDER >155°)
RANGE RESOLUTION	<10mm ACOUSTIC w. 80kHz BANDWIDTH
NUMBER OF BEAMS	256-512 (1024 HDS) EA & ED
OPERATING FREQUENCY	NOMINAL FREQUENCY 400kHz (FREQUENCY AGILITY 200-700kHz)
DEPTH RANGE	0.2-275m (>300m WITH 0.9° X 0.9° OPTION)
PING RATE	UP TO 60Hz, ADAPTIVE
RESOLUTION (ACROSS X ALONG)	STANDARD: 0.9° X 1.9° @400kHz AND 0.5° X 1.0° @700kHz. NARROW OPTION: 0.9° X 0.9° @400kHz AND 0.5° X 0.5° @700kHz
POSITION	HOR: ±(8mm +1ppm X DISTANCE FROM RTK STATION) VER: ±(15mm +1ppm X DISTANCE FROM RTK STATION) (ASSUMES 1m GNSS SEPARATION)
HEADING ACCURACY	0.03° (RTK) WITH 2m ANTENNA SEPARATION
PITCH/ROLL ACCURACY	0.02° INDEPENDENT OF ANTENNA SEPARATION
HEAVE ACCURACY	2 cm OR 2% (TRUEHEAVE™), 5 cm OR 5% (REAL TIME)
WEIGHT	8.5kg (AIR) 3.5kg (WATER)
INTERFACE	ETHERNET
CABLE LENGTH	STD 8m, OPT: 2m, 25m AND 50m
POWER CONSUMPTION	60W (10-28VDC, 110-240VAC)
OPERATING TEMP.	-4°C to +40°C (TOPSIDE -20°C to +55°C)
STORAGE TEMP.	-20°C to +60°C
ENVIRONMENTAL	TOPSIDE: IP67: DUST TIGHT, PROTECTED AGAINST THE EFFECT OF IMMERSION UP TO 1m/WET-END (SONAR): 100m



Part #12004-AACDB4