

4200 SERIES SIDE SCAN SONAR SYSTEM

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



EdgeTech 4200-FS Towfish

The *EdgeTech 4200 Series Side Scan Sonar System* provides a unique advantage over conventional dual frequency side scan systems by combining EdgeTech's Full Spectrum and MultiPulse technologies into one unit. The 4200 Series 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)** - MultiPulse 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 Series 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 Series offers **dual simultaneous frequency operation** (either 100/400 or 300/600 kHz) in **High Definition Mode** 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 (see table to right).

The 4200 Series 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) with the following model number designations:

- **4200-FS:** stainless steel, 100/400 kHz
- **4200-FSL:** aluminum, 100/400 kHz
- **4200-HF:** stainless steel, 300/600 kHz
- **4200-HFL:** aluminum, 300/600 kHz

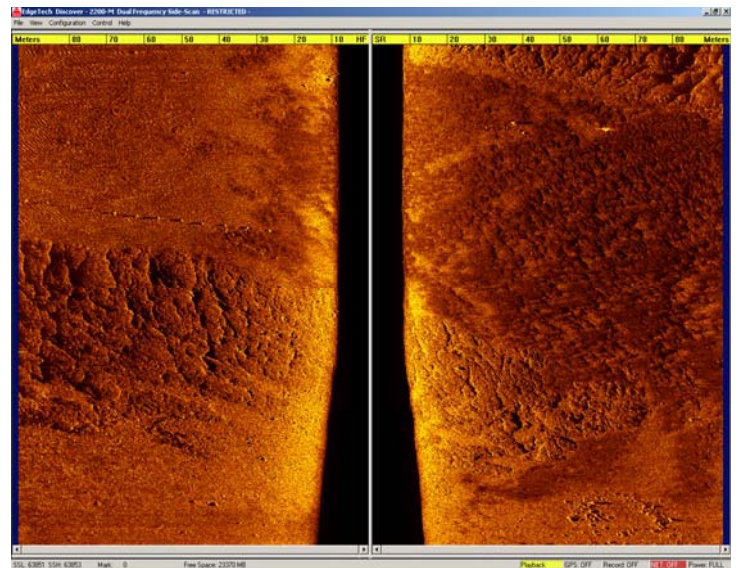
Along with the choice of towfish, the 4200 Series also offers three different topside processor options which again allows the user to customize the system to best suit his needs. All of the topside processors come installed with EdgeTech's DISCOVER software, which serves as the control and data acquisition 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 to 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 ships 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.

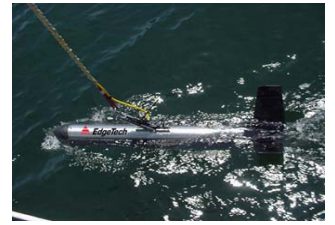
For customers who would prefer to use their own 3rd party topside processor, EdgeTech offers the 701-DL (Digital Link) which acts as the interface between the 4200 Series towfish and the display and acquisition software. With this option the user supplies the PC and runs the 4200 System using EdgeTech's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

The 4200 Series 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

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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

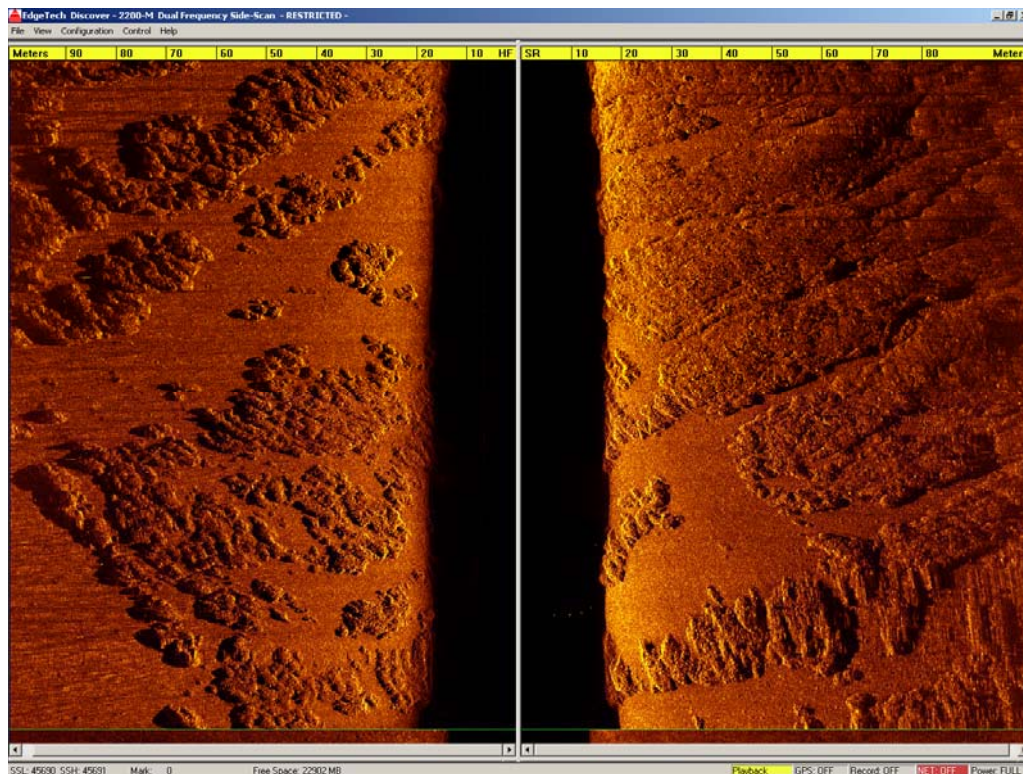


Or



EdgeTech stainless steel towfish with either
100/400 kHz (4200-FS) or 300/600 kHz
(4200-HF) dual simultaneous frequencies.

EdgeTech lightweight aluminum towfish with
either 100/400 kHz (4200-FSL) or 300/600 kHz
(4200-HFL) dual simultaneous frequencies.



600 kHz data image of coral reef



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Key Specifications

System Specifications	100/400 kHz	300/600 kHz
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 Depth (meters)	2000 (SS) / 300 (Alum) tow bodies	
Operating Temperature	0°C to 45°C	
Power In (4200-P portable topside processor)	18-36 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 Specifications	4200-FS/4200-HF	4200-FSL/4200-HFL
Towfish Material	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
System 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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