

# LMCS

## LITTORAL MINE COUNTERMEASURE SONAR SYSTEM

### FEATURES

- Ultra high resolution
- Long range search capability
- High speed data collection
- Multi-Pulse Technology
- Dynamically Focused transducers
- Dual frequencies
- Real-time target recognition
- Precise target positioning
- Steady platforms
- Maneuverable and Powered Tow Bodies
- Unmanned Underwater Vehicles
- Upgradable systems
- One man deployments

### APPLICATIONS

- Mine Countermeasures
- Mine-like Target Detection and Classification (Underwater IED's)
- Change Detection
- Q Route Surveys
- High Speed/Long Range Surveys



Photo Courtesy Vehicle Control Technologies, Inc. (VCT)

### Overview

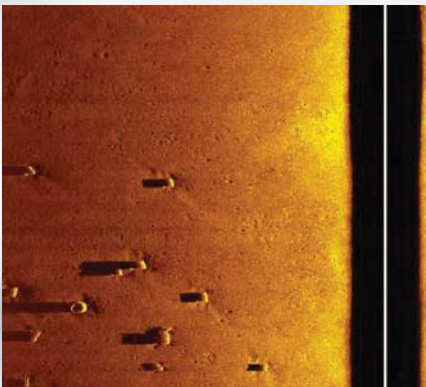
The Littoral Mine Countermeasure SONAR (LMCS) System by EdgeTech is an advanced mine and underwater IED hunting solution. The LMCS is a complete system that combines state-of-the-art sonar technology with automated target detection and classification software by Seebyte on innovative platforms developed by VCT that are affordable, easy to use, and provide exceptional performance. With its flexible design, the system can be configured for use on a variety of host vessels including small boats, Unmanned Surface Vehicles (USV's) and larger patrol craft.

### Sonar

The LMCS System employs EdgeTech's proprietary Dynamically Focused and Multi-Pulse side scan sonar technologies that provide exceptional swath coverage and ultra high resolutions. The LMCS System is outfitted with a 600/1600 kHz dual frequency sonar. The 600 kHz frequency utilizes both the Multi-Pulse technology and Dynamically Focused transducers for high resolution mine detection at ranges up to 125 meters per side for a 250 meter swath at speeds up to 14 knots. The 1600 kHz frequency uses Dynamically Focused transducers for detailed classification and identification of mine- and IED-like targets with resolutions down to .8 cm.

#### SONAR SPECIFICATIONS

	1600 kHz Dynamically Focused	600 kHz Multi-Pulse Dynamically Focused
Frequency	1600 kHz Dynamically Focused	600 kHz Multi-Pulse Dynamically Focused
Pulse Type	Frequency Modulated Pulse (CHIRP)	
Pulse Length	0.5 to 2 ms	2 to 10 ms
Resolution (along track)	< 6 cm to < 17m 7 cm @ 20m 8 cm @ 25m 9 cm @ 30m 10.5 cm @ 35m	< 20 cm to 80 m then increasing to 28 cm at 125 m max. range
Resolution (across track)	0.8 cm	1 pulse 1.5 cm / PL 2 msec 2 pulse 3.0 cm / PL 4 msec 3 pulse 4.5 cm / PL 6 msec 4 pulse 6.0 cm / PL 10 msec
Max Operating Range	35 m/side (70m swath)	125 m/side (250m swath)
Operating Speed Envelope	2-6 knots typical	2-14 knots
Sonar Digitization	16 Bits	
Power	115/230 VAC at 200W max	



For more information please visit [EdgeTech.com](http://EdgeTech.com)

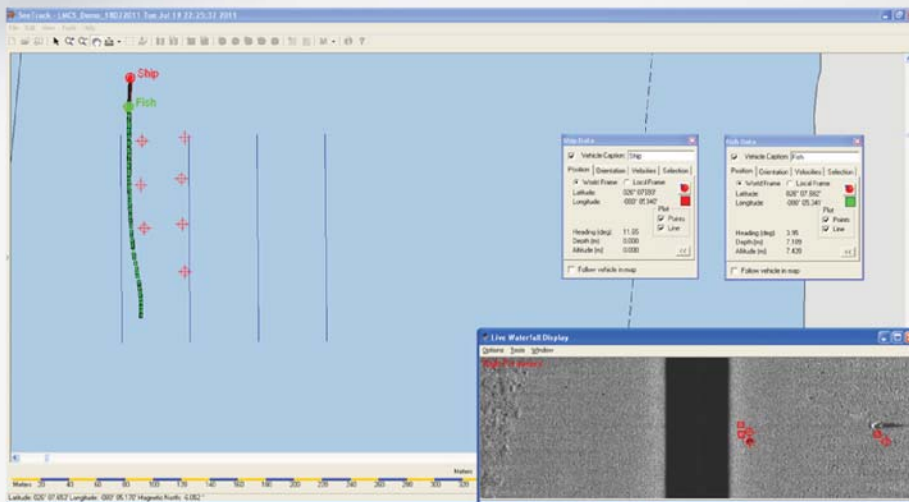
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### ATR

Targets are identified using SeeByte's Automated Target Recognition (ATR) software. ATR is used for detecting and labeling targets that are observed on a sequence of sonar frames in both real-time and in post processing. The system's ATR is comprised of Automatic Target Detection (ATD) and Automatic Target Classification (ATC) components. As targets are detected and classified, they are marked, labeled and precisely positioned on charts for later use.



### Vehicles

The LMCS is available on a variety of platforms configured to user requirements. The Basic System comes mounted on standard tow fish. The Maneuverable Tow Body (MTB) version is an active, towed platform with actuated fins and control VCT's software that maintains the sonar at optimal altitudes with precise steadiness for the finest sonar imagery. VCT's Powered Tow Body variant is a 'towed UUV' that provides the maximum decoupling of the sonar from the motions of the surface vessel and actually allow the system to "fly" directly below. With optional modules from VCT, the Powered Tow Bodies can be converted quickly aboard ship to true autonomous systems (UUV's), able to collect mine and terrain imagery remotely. MTB, PTB, and UUV variants were all developed by Vehicle Control Technologies, Inc. The system can also be supplied as electronics and arrays for incorporation into other vehicles.



LMCS Towfish - Standard Configuration



LMCS MTB - VCT's Maneuverable Tow Body



LMCS PTB - VCT's Powered Tow Body (UUV Convertible)

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