



Finding Sub-sea Remnants of War

- Locating UXO below the sea bottom is a difficult and expensive problem. In 2017, Gap EOD developed the **UltraTEM Marine** system to improve efficiency of target detection for dredging operations and offshore construction projects, as well as for marine cable tracking.
- **UltraTEM Marine** offers deeper detection and higher resolution than other geophysical technologies. It is also able to detect aluminium objects, which are invisible to magnetometers.
- **UltraTEM Marine** has proven its value in open sea and more noisy and cluttered inner harbours.
- The combination of the latest technology with custom software from Black Tusk Geophysics has improved object discrimination and drastically lowered the number of required excavations.

Capabilities and Performance

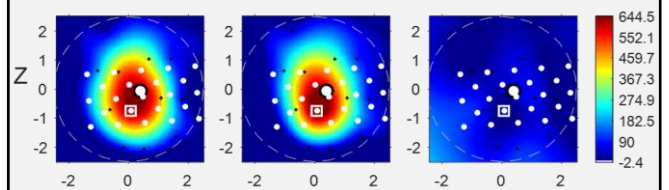
- Distinguish closely spaced targets.
- Accurate details on object position & depth.
- Detect aluminium objects & mines.
- Confidently separate items of concern from clutter.



UltraTEM Marine Components

- Five transmitters ensure multiple independent looks of each target.
- A series of three-component EM sensors (receivers) allow for high spatial resolution and optimal target characterization.
- The system can be housed in a towed vessel or on a remotely operated vehicle (ROV).

On-board processing of data produces dig targets in near real-time. Below is the anomaly of a SC-500 German bomb below the seabed (Left: observed data. Middle: inversion result. Right: residual).





Technical Specifications

Dimensions Array (L x W)	System Dependant
Dimensions Electronics Box Cylindrical (L x W)	425 x 262 mm
Depth Rating	100 m
Data Acquisition & processing Software	BTField by Black Tusk Geophysics

Weight (sensors & electronics) Approximate.	96 kg (in air) 9 kg (in water)
Number of Electronics Boxes	1 x Transmit 1 x Receive
Positioning	Customizable for Vessel Configuration
Detection swath	System Dependant

Transmitter Technical Specifications

Transmitter	EODTx50 Marine
Power Supply	90 - 240 V
Powerline Frequency	50 or 60 Hz
Transmitter Frequency	25, 30, 75 & 90 Hz
Transmitter Duty Cycle	50%

Number of Transmitter Loops	Up to 5
Transmitter Loop Dimensions	1.8 x 1.8 m
Loop Wire	2.5 mm ² Copper wire
Transmitter Current (max.)	50 Amps
Detection Capabilities	81 mm to 2.5 m

Receiver Technical Specifications

Receiver Coils (3-component)	6 per enclosure
Coil Effective Area	104.5 m ²
Receiver Noise Level @ 1 ms	757.25 nV
Receiver Dynamic Range @ 1 ms	122 dB
Output Signal Range	± 9626.74 µT/s
Coil Noise Level @ 1 ms	0.060134 µT/s

System Noise @ 1000 Hz	< 4 nT/s/VHz
Receiver Sampling Frequency	800 kHz
Output Decays	5 to 15 per second 45 log-spaced time-channels
Samples per Decay	
Decay Range	0.05 to 10 ms



UltraTEM Marine installed on Tetra-Tech TEMA platform

