

Nearshore Survey Equipment





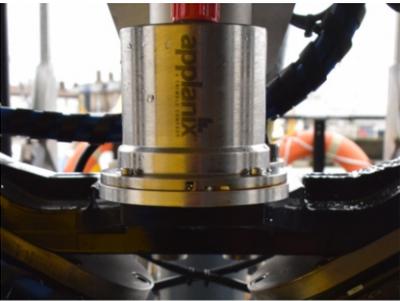
Reson Dual Head Seabat 7125 & T20-P MBES Systems

Titan utilises two Reson Multibeam echosounder systems, the Seabat 7125 system and Seabat T20-P. These systems allow simultaneous output of bathymetry, sidescan, snippets, backscatter and raw water column data. Producing ultra-high along track and across track beam resolution of, $1^\circ (\pm 0.2^\circ)$ and $0.54^\circ (\pm 0.03^\circ)$, with a depth resolution of 6mm. 200/400kHz operating frequencies. Maximum swath coverage of 140° ($5.4 \times$ Water Depth) with a single head and 165° ($15 \times$ water depth) with a dual head configuration. 256 and 512 equi-angle or equi-distant beam modes with a single head configuration; this increases to 512 or 1024 with dual head configuration. Maximum data density (pings per m²) is 200 p per m².



GeoAcoustics GeoSwath 4

The Geoacoustics Geoswath 4 is a shallow water wide swath Interferometric bathymetry system operated in water depths of up to 100meters at 250kHz. Geoswath is accurate to IHO Special Order standard at 6 x times water depth, with a resolution of 3mm at beam width of 0.75 azimuth.



Applanix PosMV Wavemaster

The Applanix PosMV Wavemaster system is a GNSS aided INS built to provide accurate attitude, heading, heave, position, and velocity data to the vessel and onboard sensors. The PosMV system contains a highly accurate IMU which adheres to IHO standards of high specification. The system is used in post-processing to determine PPK tidal elevations.



Trimble SPS852 and SPS751 RTK and PPK System

The Trimble SPS systems are used for land and marine RTK positioning. For marine surveys the SPS systems are used in conjunction with Trimble VRS internet radio to provide RTK accuracy without traditional base station setup. Post-processing of the SPS systems are used to determine PPK tidal elevations. The SPS751 contains an internal UHF radio for Base Station Land Survey activities.



Sonardyne Mini Ranger USBL System

The Sonardyne Mini-Ranger 2 used by Titan is a sixth generation Ultra-Short Baseline underwater target tracking system. It offers a standard operating range of 995 meters and the ability to simultaneously track up to 10 subsea targets at very fast update rates.



Gardline Magnetometer Platform

The Gardline Magnetometer Platform (GMP) is a semi-automated fixed array designed to acquire high density magnetometer data for UXO surveys with low ferrous content requirements. The fixed array with precise positioning, stable altitude and wide coverage provides a cost effective solution with vertical gradiometry capability to the highest industry specifications.

Edgetech 4200FS Dual Frequency SSS

Titan Surveys own and operate two aluminium 4200FS sidescan towfish, a low frequency (100/400kHz) and a high frequency (300/600kHz). Titan Surveys have operated the 100/400kHz towfish in a number of operations for OWF, Cable Route surveys and for Habitat Mapping operations. The 300/600kHz towfish has also been operated in a number of high resolution Sabellaria and Maritime Archaeology surveys



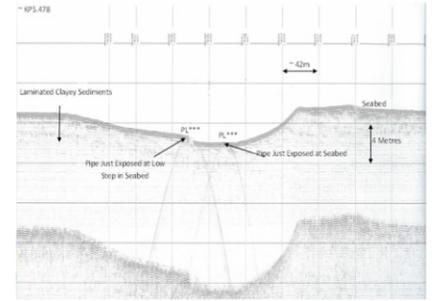
Applied Acoustics Surface Tow Boomer System

Titan own and operate two Applied Acoustics Surface Tow Boomer Systems with the CSP300 Bang Box and Applied Acoustics 20 Element Hydrophone. This system is able to offer clients good resolution sub bottom data in a number of coastal and estuarine environments. The CSP300 BangBox is able to provide a maximum of 300J per shot, enabling good penetration in harder substrates. Titan Surveys often operate the boomer system with a Coda Octopus 760D Seismic Processing unit providing high-resolution signal processing during data collection.



Sub-Bottom Profiler: Chirp

The Chirp system used by Titan Surveys is a wide band Frequency Modulated (FM) sub bottom profiler utilising Edgetech's proprietary Full Spectrum Chirp technology. This provides higher resolution imagery of the sub bottom structure than a boomer system. Frequency Range: 2-16kHz



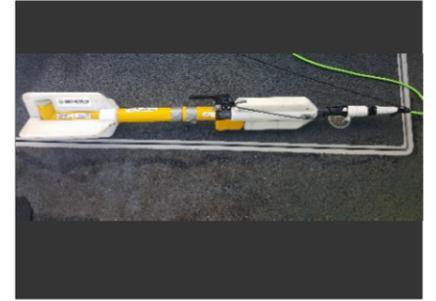
Sub-Bottom Profiler: Pinger

The system comprises of a deck unit, surface unit plus a receiver module and a 4 transducer array, mounted in a towed transducer vehicle. It applies band pass filtering, time-varied filtering (TVF), time-varied gain (TVG) amplification and simple stacking routines online. Frequency Range: 2-12kHz



Geometrics G882 Caesium Vapour Magnetometer

The Geometrics G882 magnetometer is a self-oscillating split beam Caesium vapour magnetometer with an absolute accuracy of $<3\text{nT}$ throughout its operating range. The G882 has a counter sensitivity of $<0.004 \text{ nT}/\sqrt{\text{Hz}}$ rms with typically 0.002 nT at a 1 second sample rate.



Sensefly eBee Plus RTK Unmanned Survey Aircraft

The UAV system used by Titan is fitted with an ultra-high resolution camera that is specifically designed for photogrammetry applications and incorporates integrated RTK/PPK capable of 3cm horizontal and vertical accuracies. Data outputs include high resolution, georeferenced DTMs and orthomosaics.





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