

SeaQuest

3-Axis Gradiometer

SeaQuest is the only commercially available marine gradiometer platform able to measure gradients in all three axes simultaneously, accurately and in real time. Our unique sensor technology ensures that the information you collect is accurate. Our rugged and sleek platform is designed to deflect impact rather than absorbing it while maintaining perfect separation between the sensors.

Why SeaQuest?

You get more information

SeaQuest measures the gradient in all three axes simultaneously, so no matter how your heading changes no information is lost. Horizontal gradiometers, on the other hand, are limited by the fact that they can only measure the gradient in one axis (direction) at a time. When surveying with a one axis gradiometer and your heading changes by even a few degrees you are no longer measuring the same gradient.

See what you want to see

SeaQuest suppresses geology and enhances small nearby targets, enabling you to see more of what you want to see, while suppressing what you don't want to see. Single-axis gradiometers and arrays enhance targets and geological features within the direction of their axis. Since SeaQuest measures the complete 3-dimensional gradient it enhances small targets and suppresses geological features, making small targets that would have been obscured in the total field become obvious.

The Overhauser Effect

Marine Magnetism is the only marine magnetometer company in the world that can produce stable Overhauser sensors that do not degrade with time. Marine Magnetism's SeaQuest magnetometer measures the ambient magnetic field using a specialized branch of nuclear Magnetic Resonance technology, applied specifically to hydrogen nuclei.

Highest Absolute Accuracy

SeaQuest, like Marine Magnetism's SeaSPY marine magnetometer, has the best absolute accuracy of any marine magnetometer available: 0.2nT

High Sensitivity

SeaQuest sensors deliver high-resolution output with a noise level of $0.01\text{nT}/\sqrt{\text{Hz}}$; counter sensitivity is 0.001nT. In other words, SeaQuest is orders of magnitude more sensitive than proton sensors, and is on par with optically pumped sensors.

Worldwide Operation With No Restrictions

SeaQuest is entirely omnidirectional, meaning you never have to orient your sensor, because it is already optimized to work around the world. As a result, regardless of where you are in the World and no matter what the magnetic field strength is, your SeaQuest sensors will continue to provide a strong signal and accurate data.



SeaQuest is Ideal For

- Cable and pipeline tracking
- UXO and mine Detection
- Environmental Survey
- Archaeology

Maintenance-Free Sensors, No Realignment and No Consumable Parts

SeaQuest Overhauser sensors are entirely maintenance free and most importantly, SeaQuest's specifications do not degrade over time. As a result, SeaQuest sensors, unlike optically pumped sensors, never have to be realigned or recalibrated in order to meet the manufacturer's specifications at the time of shipping.

On-Board Sensors

In addition to our Overhauser sensors, accuracy is further improved by the integrated tilt sensor, which continuously monitors the tiniest platform movements caused by rough seas, telling the operator exactly how 'horizontal' and 'vertical' the gradient measurements are.

The echosounder/altimeter measures bathymetry with 0.1m precision, which provides a precise reference for the vertical gradient measurement, and allows continuous compensation for magnetic variation caused by igneous bedrock.

SeaQuest is the next evolution in gradiometer technology.

Stability and Durability

The SeaQuest platform is constructed with a hard-anodized aluminum frame that provides superb strength and rigidity, while keeping weight down. Most of this frame is covered with an ultra-tough and flexible composite that forms the surface area of the wings, and protects the frame from impact.

All cables are contained within the pressurized sub-housings, or within the hollow free-flooded wings. This, coupled with its sleek, swept design minimizes the ability to snag foreign objects and debris. The entire structure is designed to deflect impact rather than absorbing it. We know that accidents frequently happen in the real world, and SeaQuest is designed with that criteria in mind.

The bottom-wing ballast weight keeps SeaQuest's center of gravity lower than the towing axis, keeping pitching and rolling motion to a minimum. The large surface area of the wings ensures that the platform will tow straight and smooth, even in high sea states. All this comes together to produce the highest quality data possible in a towed marine gradiometer.

Specifications

Worldwide operation: no restrictions or dead zones

Highest absolute accuracy: 0.2nT

High Sensitivity: 0.01nT

Resolution: 0.001nT

Power consumption: 2W standby, +1W per sensor, +2W per altimeter

Maintenance free sensors: no realignment and no consumable parts

No heading error: eliminates the need to level your data

No drift: a complete lack of 1/f noise providing a totally flat noise spectrum

No temperature dependence: Data accuracy does not change through a temperature range of -40C to +60C

Altimeter: 0-100m range, 0.1m step

Heading: 3-axis magnetoresistive compass, 0.1 degree step

Tilt sensor: two-axis, 0.1 degree step

Pressure sensor: 300m range, 0.1m step (others optional)

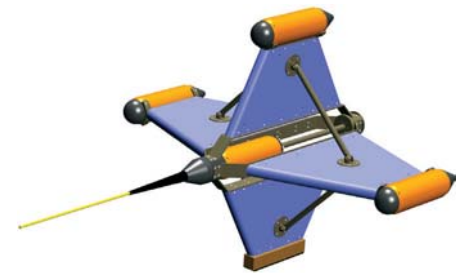
SeaQuest Configurations



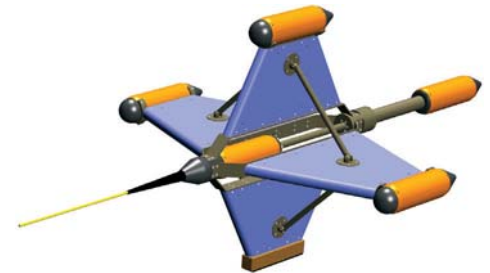
2-sensor transverse gradiometer



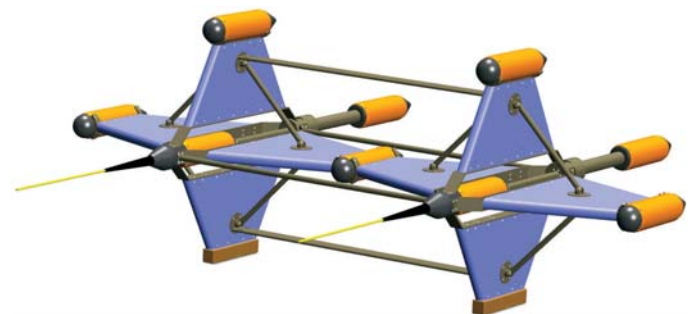
3-sensor biaxial gradiometer for very shallow water



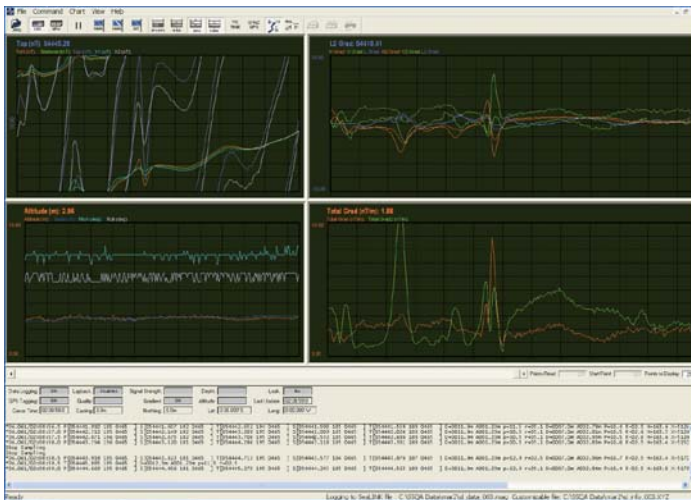
3-sensor biaxial gradiometer with altimeter



4-sensor triaxial gradiometer



2 (or more) unit SeaQuest-array



EXAMPLE SEA LINK SCREEN CAPTURE FOR 2-UNIT SEAQUEST ARRAY.

Top left window shows total field, top right shows cartesian gradient, and bottom right shows two analytic signal traces in real time, allowing instant target identification and positioning. Note the fine resolution of two nearby targets in the center of the analytic signal plot.

Customer Feedback

I have been using a complete 2-unit SeaQuest array and have found the magnetic data delivered to be excellent, with less than one nano-tesla of variability in the total gradient (analytic signal).

— Richard Funk, Geophysicist



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