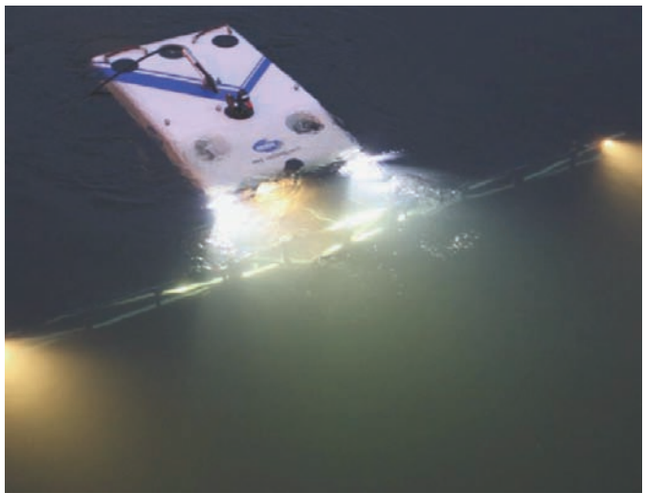
INNOVATUM SMARTSEARCH GRADIOMETER

NEPTUNE



The Gradiometer installed on an ROV

Neptune's Innovatum Smartsearch twelve (12) gradiometer array detects the localised distortion of the earth's magnetic field caused by a ferro-magnetic causative body. By calculating the difference between two vertically collinearly aligned magnetometers separated by 12 inches (one foot; 0.30m), a gradiometer can offer a high degree of immunity from the effects of diurnal variation, micropulsation and minor magnetic storm activity.

When used in an array, gradiometers enhance small, near surface anomalies and improve spatial resolution when compared with measuring the total magnetic field measurement alone.

The horizontal detectability of objects with ferromagnetic content is dependent on a wide range of variables such as object orientation, mass of metallic components, depth of burial, height of gradiometer sensor above object etc.

For the purposes of detecting munitions and munitions related objects the effective coverage from a single pass of the gradiometer array is approximately 9.6m.

The system is composed of three major elements:

- The sensor array, consisting of a combination of twelve magnetic gradiometers, and a fluxgate compass sensor.
- The subsea electronics package, known as the 'Sensor Interface Pod' or SIP.
- The surface personal computer used to operate the system and log data and send data to the Navigation Suite.

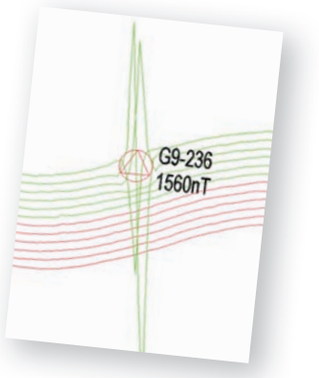
The twelve sensors are mounted on a frame mounted 0.45 m forward of the ROV.

The raw data from the System is collected by the SIP installed on the ROV. The data is then transmitted to a topside personal computer where the Innovatum Smartsearch Software processes the data and displays it in realtime illustrating the magnitude of magnetic influence of a causative body.

A time stamped text string containing the raw data from all twelve gradiometer sensors is broadcast by the gradiometer system and received by the Navigation Suite. Positional data is provided in real time by the Navigation Suite that is logged with the raw gradiometer data allowing accurate positioning of the gradient anomalies.

Data processing and interpretation techniques employed by Neptune provide high sensitivity and accurate and positioning of detected anomalies, with magnetic gradient anomalies in the order of 10nT easily detected over background noise. The gradiometer array offers high confidence that ferro-magnetic objects of interest will be detected within the survey area.

A Corroded tear drop shaped German SPB obstructer mine found by the Gradiometer.



Gradiometer Features	
Type	12 x Vertical Axis Gradiometer Array
Recording Medium	Navigation Software
Positioning/tracking	USBL Beacon Offsets
Width	6.6 m

Address: Hafnarstraeti 20, 600 Akureyri, Iceland | Tel: +354 527 7770 | Fax: +354 527 7777
Aberdeen UK Office: 1 Berry Street, Aberdeen, AB25 1HF | Tel: +44(0)1224 841375
www.neptune.is | E-mail: info@neptune.is