

Self-compensating Magnetometer (SCM) System for AUVs

The OFG SCM is a robust, reliable magnetometer system that provides real-time compensated and corrected three-component magnetic data. The OFG SCM can be installed inside the hull of an autonomous underwater vehicle (AUV) or strapped directly to the outside of the AUV body to minimise operational risk.

The OFG SCM opens up possibilities for AUV operators and AUV systems integrators to use the 3-component magnetic data for both in-mission decisions regarding magnetic anomalies (e.g. UXO, pipe and cable tracking, ship signatures, mine countermeasures) and post-mission maps (e.g. archaeology, geology, exploration, environmental and geotechnical projects). This is accomplished without the need for a dedicated magnetic survey AUV or an experienced geophysicist to manually remove all of the magnetic vehicle effects.

The OFG SCM system is a combination of a subsea magnetometer sensor, calibration procedure, and proprietary software algorithm that computes a suite of correction coefficients and applies them to calculate compensated and corrected magnetic data in real-time. The SCM software can run on an existing AUV payload computer or an OFG supplied processor with optional pressure housing. The system is available in both 100m and 6,000m depth ratings.

Magnetic surveys using AUVs have been undertaken with either specially configured degaussed or magnetically reduced AUV's or tow magnetic sensors. Both configurations are designed to reduce the magnetic effects of the AUV on the sensor, and require the surveyor to compensate for the effects of heading. Both of these approaches have significant operational challenges and complications, especially if other sensor payloads are required, or if the vehicle is flying at low altitudes through complex terrain or amongst obstacles.

Image: Raw uncorrected magnetic intensity collected on an AUV (left) and same data with the OFG SCM algorithms applied to output corrected magnetic intensity (right).