SeaSPY

Marine Magnetometer

Surveyor's best friend

The most reliable magnetometer you'll ever meet. Unfailing data, durable hardware, and an easy-going disposition make SeaSPY a mag you can count on.

Light to Use

Apart from our Explorer Mini Marine Magnetometer, SeaSPY is the lightest mag available. All of its accessories, 50m (164ft) of tow cable, weigh 18kg (40 lbs), making it truly a one man operation.

Sleek Design

SeaSPY's new sleek design, resists snags and minimizes impact. The new polyurethane coated tail with molded fins acts as a bumber, while creating a stable towing platform.

3W Power Requirement

1 car battery = 150 hours of continuous use.
2 lantern batteries (26Ah) = 104 hours of continuous use.

Integrate With Side Scans, AUVs and ROVs

A single 10m tow cable is terminated with everything you need. Modifications to your mag or grad are not required.

See our Side Scan Integration brochure for more details.

Marine Magnetics

Reliability

Save Hours of Frustration

A quick glance self diagnostic LED sytem, on our isolation transceiver, has saved our customers hours of frustration.

A **green** light = all connections are hooked up properly

A **yellow** light = a problem with one of the connections

A **red** light = a short. Within micro seconds, the transceiver will safely shut down the output power

A **blue** LED flashes with every mag reading

Protecting Your Assests

A warning sounds when even a drop of water gets inside the mag, giving the operator plenty of time retrieve it, and investigate the cause, before the mag is damaged. For another level of security, should water get into the mag, the electronics are enclosed in an o'ring sealed polycarbonate housing.

Overhauser Effect

SeaSPY is a pulsed Overhauser magnetometer that measures the ambient magnetic field using a specialized branch of nuclear Magnetic Resonance technology, applied specifically to hydrogen nuclei.

See our Technical Application Guide for more information about your technology.

Better Data

World Wide Operation with No Restrictions

SeaSPY will collect accurate data no matter where you are or in which direction you are surveying. This is not the case with optically pumped magnetometers which have dead zones and must be oriented at a specific angle relative to the earth's magnetic field. This issue can be particularly problematic in equatorial regions where you cannot collect data in every direction.

Eliminate Shifts In Your Data

'Heading error' is a noticeable offset in the magnetometer output caused by changing the heading of the magnetometer within the Earth's magnetic field. Since SeaSPY's Overhauser technology does not display heading error, no matter how the sensor is oriented in the Earth's magnetic field, successive survey lines taken in opposite directions will match up perfectly.

The benefits to the user are:

1. Targets will not be missed because they fall between mismatched survey lines.
2. A magnetic map of an area will look the same, regardless of the direction in which the survey lines were conducted.

Works Instantly On Power-Up

SeaSPY works equally well in cold, deep waters as tropical waters, starting instantly on power-up without requiring warm up. Data collected at -40°C will be identical to data recorded at +60°C.

Maintenance Free Sensors

SeaSPY sensors don't degrade with time, so you'll get the same quality data after 10 years of use as you did the first time you used it.

In addition SeaSPY sensors contain no consumable parts, so you won't have to replace anything, like the expensive lamps that wear out in optically pumped mags.

Proven Sensitivity Specs

Don't just take our word for it. We put our sensors under scrutiny, through rigorous independent testing by a world authority belonging to INTERMAGNET. Intermagnet is the global network of observatories, monitoring the Earth's magnetic field. Tests confirm our specifications.

Highest Absolute Accuracy

If you want good data you have to start with the most accurate sensor.

SeaSPY sensors are orders of magnitude more accurate than any other magnetometer: 0.1nT ensuring that you are always getting the best possible data.

Gradiometer Configurations

Our sensors are highly accurate and repeatable, making them ideal for gradiometers

A gradiometer measures magnetic gradient in one dimension by subtracting the difference between two independent sensors. Since the Earth's magnetic field is three dimensional, up to three independent gradient directions can be measured. For information on how to collect data in all 3 gradients simultaneously, see our SeaQuest Gradiometer.

All SeaSPY magnetometers are compatible, enabling existing SeaSPY customers to upgrade their mag to the gradiometer configuration of their choice, as they need to.

Horizontal or Vertical Transverse Gradiometer

Only one tow cable is used to tow this gradiometer. This saves our clients' money and valuable deck space. The readings from both mags are also taken simultaneously, improving the accuracy of the gradient calculation. These gradiometers are well suited for close-in precision surveys, for small ferrous targets where short sensor separation is needed.

Applications

UXO Detection of Small Ferrous Targets – Short baseline gradient measurement in any direction (longitudinal, horizontal, or vertical) is useful for eliminating geological interference and diurnal variation.

Cable and Pipeline Survey – A horizontal transverse gradiometer can be used to track cables or pipelines in real time from relatively high towing altitudes.

Longitudinal Gradiometer

Longitudinal gradiometers provide the largest variation in available baselines, from 1.5m to 500m+. Long baselines provide superior gradient measurement sensitivity and increased detection range. They are also extremely hydrodynamically stable when deployed.

Applications

Shipwreck, Search and Salvage – Medium baseline measurement with a longitudinal gradiometer eliminates interference by geological bodies, while highlighting massive magnetic sources like steel hulls, boilers or engines. Smaller sources such as anchors or cannons will require a shorter baseline, and lower towing altitude.

Environmental Survey – Medium baseline measurement with a longitudinal gradiometer can highlight shallow magnetic sediments, while eliminating deeper geological influences. The baseline should be on the order of magnitude of the expected towing altitude.

Exploration Geophysics – Long-baseline measurement with a longitudinal gradiometer is ideal since the bodies of interest are often far from the sensor, and produce very small gradients. The baseline should be on the order of magnitude of expected depth-to-source.

"We have now completed the first full Antarctic season using our SeaSPY magnetometer and can report that we are delighted with its performance.
It has proved to be very robust and trouble free in operation and has delivered consistently good data. There is no doubt that we chose the right instrument."

Peter Morris
British Antarctic Survey

A SeaSPY Magnetometer System consists of:

SeaSPY Magnetometer

- Overhauser Sensor
  Omnidirectional sensor that does not contain any consumable parts.
- Electronics Module
  Contains all of the driving electronics and Larmour counter.
- Leak Detector
  A visual queue and alarm sound when even a drop of water gets inside the mag.
- Depths Available
  1000m (1500psi), 3000m (5000psi), 6000m (9000psi)

Tow Cable

The cable is made up of one twisted pair of conductors, a Vectran strength member, water block and yellow poly-urethane jacket. Length determined by customer.

Isolation Transceiver

Provides the complete interface between the PC and the mag. It provides two-way digital communication along the same conductors that power the mag. It also conditions the mag's power supply.
Dims: 11 x 6 x 3 cm (4 x 2 x 1") Weight: 130g (0.28 lbs)

Power Supply

Accepts any AC line 48V power, from 100-240VAC and 50/60Hz to provide conditioned and clean 24V DC power.
Dims: 11x 6 x 3.5cm (4 x 2 x 1") Weight: 165g (0.36 lbs)

Battery Clip Cable

Use this cable instead of the power supply. The mag's total power consumption is only 3W. A single 12V car battery can power it for days.

RS232 Cable

Connects the mag and PC.

BOB

Data acquisition and visualization software.

Reusable Aluminum Shipping Case

Holds all accessories listed above.

Options

- Pressure Sensor
- Altimeter
- Transponder
- Side Scan , ROV & AUV Integrations
- Deck Cable
- Tow Cable Termination Kit
- FreeWheel Wireless Cable Spool

Specifications

Performance

Operating Zones	NO RESTRICTIONS SeaSPY will perform exactly according to spec. throughout the entire range
Absolute Accuracy	0.1nT
Sensor Sensitivity	0.01nT
Counter Sensitivity	0.001nT
Resolution	0.001nT
Dead Zone	NONE
Heading Error	NONE
Temperature Drift	NONE
Power Consumption	1W standby, 3W maximum
Range	18,000nT to 120,000nT
Gradient Tolerance	Over 10,000nT/m
Sampling Range	4Hz - 0.1Hz
Communications	RS-232, 9600bps
Power Supply	9V-30V or 100-240 VAC

Towfish

Towfish Length	119 cm (47 inches)
Towfish Diameter	7.6 cm (3 inches)
Towfish Weight in Air	12kg (27 lbs)
Towfish Weight in Water	4kg (9 lbs)

Tow Cable

Conductors	Twisted pair
Breaking Strength	2,500 kg (5,500 lbs)
Outer Diameter	1 cm (0.4 inches)
Weight in Air	125 g/m (84 lb/1000 ft)
Weight in Water	44 g/m (29.5 lb/1000 ft)
Cable Termination	Field Replaceable

Floatation Cable

Outer Diameter	1.9 cm (0.74 inches)
Weight in Air	125 g/m (0.084 lbs/ft)
Weight in Water	-20 g/m (0.03 lbs/ft)

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