

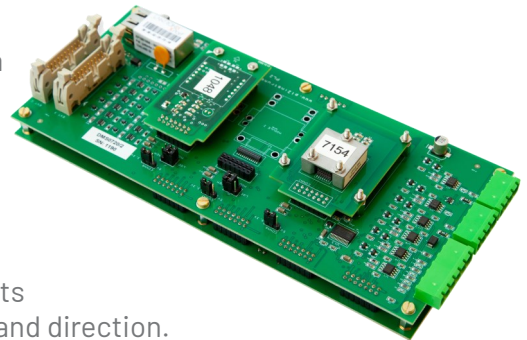
WISE AIM WAVE BUOY SENSOR

The **WISE AIM Wave Buoy Sensor** sets new standards in marine environmental monitoring.

Crafted with groundbreaking MEMS technology, this sensor is designed to provide unparalleled data accuracy and robustness in wave and motion measurements.

Enhanced from our standard AIM motion sensor, the Wave Buoy version delivers extended capabilities, making it indispensable for accurate wave analysis, maritime safety, and environmental research.

Its robust construction ensures consistent operation in the most demanding sea conditions, enabling long-term deployments with minimal maintenance.



Key Features:

- **State-of-the-Art MEMS Sensors:** Featuring the latest advancements in micro-electromechanical systems, the AIM Wave Buoy Sensor offers precise measurements for critical marine data, including wave height, period, and direction.
- **Comprehensive Data Analysis:** Equipped with advanced processing algorithms, the sensor provides detailed wave statistics in real-time and non-real-time formats, supporting critical maritime operations and research activities.
- **Customizable Output Options:** Data output formats are tailored to meet varied user requirements, ensuring compatibility with existing systems and facilitating easy integration into maritime operations.
- **Exceptional Durability:** Designed to withstand harsh oceanic environments, the sensor ensures reliable data collection under extreme conditions, enhancing maritime safety and operational efficiency.
- **Sensor Flexibility:** The provision of the three serial inputs allows connection of secondary devices such as GPS, air and sea temperature, barometric pressure, etc.. with data streamed to the optional data logger.

General Specifications:

- **Sensor Type:** High-accuracy MEMS-based multi-axis
- **Data Analysis:** Real-time (RT) and Non-real-time (NRT)
- **Output Formats:** Customizable, multiple formats
- **Power Requirement:** 12V $\pm$ 2V, 100 mA (1.2Watts)
- **Firmware:** Upgradable
- **Environmental:** Waterproof, corrosion-resistant
- **Connectivity:** 3x Serial ports (RS-232/485) / 6*16 bit analogue inputs
- **Storage:** Optional SD card data logger, up to 256 GB



EOLOS FLS200 © EOLOS Floating Lidar Solutions S.L

Wave Data Redefined: Clarity in Every Measurement

Wave Buoy Analysis Enhanced by AIM Technology

The standard measurement of waves derives from the time history of wave surface profile measured at a suitably high sampling rate; for wave buoys the measurement of the buoy motion is related to the wave surface profile through the buoy transfer function. The primary measurement requirement is the buoy heave, with measurement of additional motion parameters surge, sway, roll, pitch and yaw, plus local magnetic field. From these 9 degree of freedom (9dof) measurements industry standard wave parameters are calculated using both traditional deterministic (cycle by cycle), and spectral analysis.

Note that the use of a deterministic analysis is important in establishing accepted wave parameters; with spectral analysis alone some parameters can only be estimated. For example, significant wave height (1/3 highest waves) is typically approximated using the formula $4 \times \text{area under the heave energy spectrum}$. However, the factor 4 is only valid under certain conditions with waves containing a dominant single frequency and direction. In contrast, the deterministic analysis calculates the value explicitly as defined by major oceanographic authorities. This also applies to other deterministic parameters such as significant wave period, 1/10 highest wave parameters, etc..

In parallel, spectral analysis identifies the distribution of wave energy in terms of frequency and direction, with analysis achieved by analysing the coupled motion parameters together with buoy heading measurement, then presented as an energy spectrum defined at multiple frequencies by amplitude, mean direction, and distribution about the mean direction, termed directional spread. From the spectrum additional standard wave parameters are obtained, plus the identification of amplitude and direction of wind and swell wave components. Spectra are calculated with a resolution of approximately 0.002Hz.

Sensor Specifications:

Measurement	Resolution	Range
Acceleration	0.00025g	+/- 5g
Rate Gyro	0.005 deg/sec	+/- 100 deg/sec
Magnetometer	0.5 mgauss	+/- 8 gauss

Wave Parameter Specifications:

Parameter	Range	Resolution	Accuracy
Height	+/- 30 metres	0.01 metres	Typically better than 2%
Period	1.5 to 30 seconds	0.1 seconds	Typically better than 2%
Direction	0 to 360 degrees	0.1 degrees	+/- 1 degree

The WISE Applied Inertial Measurement (AIM) is a family of unique hardware and software product modules that can be adapted to particular customer needs.

The **WISE AIM Wave Buoy Sensor** can be delivered as a standard wave sensor package or tailor-made to fit with customer specifications for hardware and software.

Local storage unit and analogue output can also be included as an option.

Encapsulations are available in hard-anodized aluminium or plastic housing for integration into other systems or buoys. Different materials or configurations are available on request.

*Unlock the Full Potential of Your Marine Operations.
Contact Us Today to Experience the Precision of the WISE AIM Wave Buoy Sensor.*