

STRUCTURAL HEALTH MONITORING SYSTEM (SHMS)

Built for Harsh Environments. Designed for a Digital Future

WISE Group's Structural Health Monitoring System (SHMS) delivers high-fidelity insight into the structural integrity of offshore wind assets. Whether deployed on fixed or floating platforms, SHMS enhances operational safety, supports predictive maintenance, and enables digital twin strategies—all powered by our sophisticated and field-proven Advanced Inertial Measurement (AIM) technology.

Monitor. Predict. Protect.

In the demanding conditions of offshore wind, structural monitoring is essential. SHMS helps owners and operators detect anomalies early, monitor fatigue development, and reduce the risk of unexpected failures—safeguarding both infrastructure and investment.

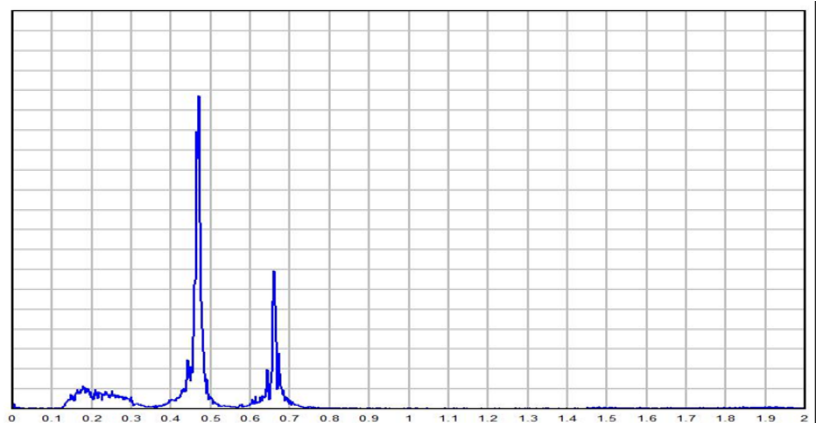
Key Applications

- Bottom-fixed jacket structures
- Floating offshore wind platforms
- Mooring integrity monitoring
- Digital twin integration
- Long-term performance trending

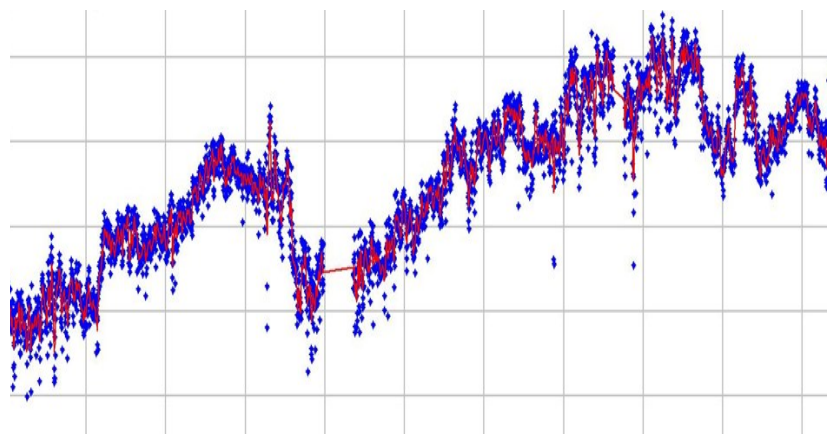
Core Benefits

- **Extended Asset Life**
Detailed vibration, motion and displacement data support better maintenance decisions and fatigue modelling.
- **Improved Safety**
Early identification of structural irregularities reduces risk and improves operational response.
- **Maximised Uptime**
Detect issues before they escalate—minimise downtime and avoid costly interventions.
- **Environmental Resilience**
All components are IP67-rated and engineered to perform in harsh offshore environments.

Typical modal response plot:



Typical modal result trend over time:



Protect your offshore infrastructure with precision monitoring from WISE Group.

Powered by Advanced Inertial Measurement (AIM)

The AIM system forms the backbone of SHMS, offering:

- **High-Precision Vibration and Motion Sensing**
Multiple 6DOF units in matrix configuration using MEMS accelerometers and tilt sensors.
- **Customisable Configuration**
Tailored sampling rates, filtering, and data export options to match client and project needs.
- **Robust Connectivity**
RS485, RS232, Ethernet, and analogue interfaces support seamless integration with control and SCADA systems.
- **High-Fidelity Data Processing**
Displacement and modal response calculations are performed using non-real-time (NRT) methods, ensuring high accuracy for monitoring and assessment.

What Does It Monitor?

- Accelerations and displacements (3 axes)
- Structural sway and torsion (modal behaviour)
- Long-term motion trends
- Phase and amplitude verification
- Overall structural response to environmental inputs

Digital Twin Ready

SHMS supports digital twin modelling by capturing structural deformation and modal behaviour using time-aligned motion data. Outputs are ideal for fatigue modelling, stress estimation, and lifecycle assessments.

System Architecture

Example of a system includes:

- Multiple AIM vibration & motion units in IP67 housings or stainless steel housings
- Tilt and acceleration sensors (several models and accuracies available)
- Stainless steel junction boxes with surge protection
- 19" rack-mounted server with display
- Onboard software for data logging, processing, and presentation
- Remote access capability for monitoring and reporting



Smart, Scalable and Supported

Whether for a single jacket or an entire floating wind farm, SHMS scales to fit. WISE Group provides full commissioning, training, and remote support to ensure reliable operation over the lifetime of your asset.

Let's Talk Structural Insight

Contact WISE Group to configure a monitoring solution tailored to your offshore asset.