

LIGHT STRUCTURES
Passion for Monitoring

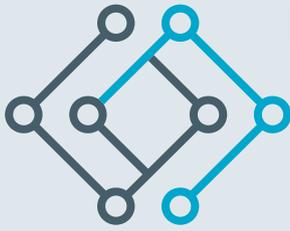


Navy & Coast Guard

SENSFIB COMFORT

Achieve Reliability through Knowledge





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SENSFIB COMFORT

Every Navy and Coast Guard vessel operator has their crew's comfort as a top priority. One of the most common and dreaded problems on board ships is high levels of vibration. The two most noticeable consequences of these vibrations are hull structure fatigue and crew discomfort. Discomfort is mainly caused by motion sickness/ sea sickness and/or human fatigue due to vibrations.

Light Structures is proud to introduce SENSFIB COMFORT, a monitoring and guidance solution to support the navigators in making transits as comfortable as possible. The solution relies on measuring the motions and accelerations the crew experiences at different locations in the vessel, while calculating (VDV-Vibration Dose Value) the risk of increased crew fatigue and discomfort using state-of-the-art methods. The solution is scalable from smaller patrol vessels to the largest navy ships. The increasing level of activity at sea globally, increases the risk for missions encountering demanding weather conditions.

With SENSFIB COMFORT, the operator will gain support to choose the best speed and heading for the least discomfort and occurrence of human fatigue. When discomfort is unavoidable, the crew can be given the heads-up that they are in for a rougher ride.

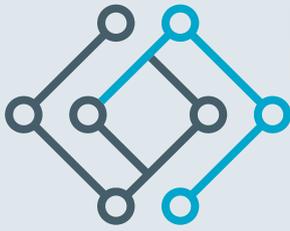
SENSFIB COMFORT can be combined with other monitoring solutions from Light Structures, such as SENSFIB HULL, SENSFIB ICE and SENSFIB GLOBAL FORCES.



Comfort Monitoring Operational Control

- Improved crew comfort
- Dynamic operator guidance
- Balance speed vs comfort during missions





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Effects of vibration

What are the health effects of exposure to vibrations?

There are 2 types of vibrations that are important to monitor in relation to Human Fatigue and health impacts; Whole Body Vibration (WBV) and Hand-Arm Vibration (HAV)

WHOLE BODY VIBRATION (WBV) due to less successful design and/or maintained vessels, platforms or machinery might cause health effects such as:

- ✓ lower back pain (damage to vertebrae and discs, ligaments loosened from shaking)
- ✓ motion sickness
- ✓ bone damage
- ✓ varicose veins/heart conditions (variation in blood pressure from vibration)
- ✓ stomach and digestive conditions
- ✓ respiratory, endocrine and metabolic changes
- ✓ impairment of vision, balance or both
- ✓ reproductive organ damage

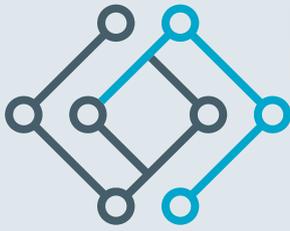
The longer a worker is exposed to WBV, the greater the risk of health effects and muscular disorders.



Fiber optic monitoring

- Fibers not responsive to external disruptions
- High reliability and stability
- Excellent long-term accuracy
- No annual recalibration required
- Flexibility in positioning:
Small size, low weight and high IP grade





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MOTION REFERENCE UNIT MRU-2000

The MRU-2000 unit is based on state-of-the art MEMS technology and is intended for use in marine applications. The combination of MEMS sensors and advanced data processing ensure that the unit provides high accuracy measurements of roll, pitch, yaw, surge, sway and heave.

PERFORMANCE

Outputs Roll, pitch, yaw, surge, sway, heave, xyz accelerations
Roll & pitch $\pm 0.10^\circ$ RMS (Dynamic)
Heave (Real-time) 5.0 cm or 5% Whichever is greater
Rotation speed range ± 200 °/s
Acceleration range ± 3 g
Output frequency 0 - 100 Hz Adjustable setting

POWER AND SIGNAL

Power consumption 6 W
Supply voltage 12 - 36 VDC 24 VDC nominal
Ports Ethernet, RS-232, RS485 (422)
Protocols NMEA, ASCII, Binary, Atlas, Gyrocompass I, I/remer Victor, MDL, SMCA, SMCC, TSS I

PHYSICAL CHARACTERISTICS

Weight 1.2 kg
Footprint (L x W) 154 x 86 mm
Height 67 mm
Depth rating 20 m Marine Aluminium Housing.



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