Inertial Labs
Attitude is Everything

Optically Enhanced Weapon Orientation Module

OptoWOM™-II

The **Inertial Labs O**ptically enhanced **W**eapon **O**rientation **M**odule **– OptoWOM™-II**, is Inertial Labs' second generation of its Optically Enhanced Weapon Orientation Module. **OptoWOM™-II** combines technologies of inertial sensors with optical image tracking resulting in a robust and reliable 3DOF orientation module capable of operation in virtually any environment. With the addition of optical image tracking the system is now able to mount directly to a device under measure and operated immediately without any magnetic calibration whatsoever. During operation, the device's magnetometer calibrations are able to be derived on-the-fly allowing for the device to operate with both optical and magnetic heading determination as a result of normal operation of the device.

OptoWOM™-II optical tracking works through the use of reference images. A reference image is literally a picture of the horizon in a given direction. Within the reference image the system identifies a constellation of identifiable features. Then, from any subsequent image collected by the camera, heading is determined by comparing those images back to the most appropriate reference. As long as the system can identify 20% of the features of a previously collected reference, it can provide an accurate assessment of the change in heading.

Additionally, when the system is operating with good optical data, it uses the information it collects to continuously check results against magnetic heading information and dynamically calibrates the device against magnetic interferences present in the environment.

KEY FEATURES AND FUNCTIONALITY

- Hybrid Inertial Weapon Orientation System
- Real-time optical and inertial sensor weapon orientation tracking
- Optically Enhanced, Gyro-Stabilized Slaved Magnetic Heading
- Advanced, extendable, embedded Kalman Filter based sensor fusion algorithms
- Embedded calibration on hard and soft iron
- All solid state components (no moving parts)
- Full temperature calibration of all sensing elements
- Environmentally sealed (IP67)

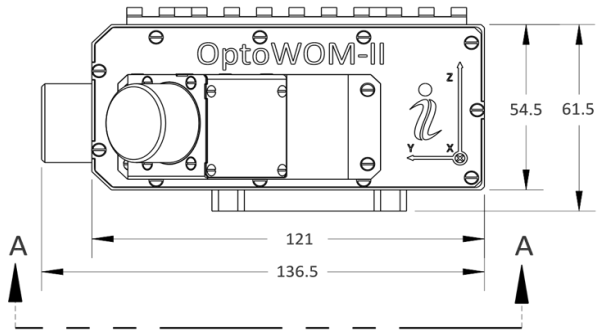
OptoWOM™-II is a compact, reliable, low power, light weight, and affordable tactical North seeking and North keeping device, which was developed as an alternative Azimuth solution to expensive and high power DTG, FOG, HRG or RLG based Gyrocompasses.

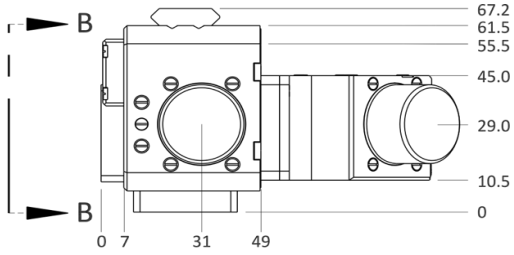
OptoWOM™-II, a hybrid inertial and optical Azimuth and Elevation measurement solution, eliminates the large errors inherent with classical Digital Magnetic Compass technology.

OptoWOM™-II specifications

Parameter	Units	Value
Output signals		Azimuth/Heading (Deflection) Pitch, Roll (Elevation)
Update rate	Hz	200
Start-up time	sec	<10
Heading/Pointing accuracy		
Angular resolution	mils	0.8
Accuracy (0 to 360 deg, relative to the 1st reference)	mils	<3
Noise (at 100 Hz output), RMS	mils	0.3
Pitch and Roll accuracy		
Angular resolution	mils	0.8
Accuracy in whole temperature range	mils	1.7
Noise (@100 Hz), RMS	mils	0.3
Environment		
Operational Temperature		MIL-STD-810G MIL-STD-461D DO-160D
Vibration		
Shock		
Electrical		
Supply voltage	V DC	12 to 36
Power consumption	W	3.5
Interface		
Standard	-	USB
Rate	Mbit/sec	480
Physical		
Size	mm	136.5 × 67.2 × 110.5
Weight	gram	570

OptoWOM™-II Mechanical Interface Drawing





Notes:

- All dimensions are in millimeters.
- All dimensions within this drawing are subject to change without notice. Customers should obtain final drawings before designing any interface hardware.