

Weapon Orientation Module WOM™



The **Inertial Labs Weapon Orientation Module - WOM™** provides a level of performance previously unseen in the world of miniature 3DOF orientation sensors. WOM employs the use of three axes each of gyroscopes, accelerometers, and magnetometers to track both slow and fast movements of weapons in real-time. With fully embedded capabilities to calibrate against soft- and hard-iron interference present within different weapons, the unit is able to be mounted to the weapon and calibrated by soldiers in the field. Orientation output can either be pulled on command or provided automatically as a result of a weapon firing events.



WOM™ is designed to operate on a multitude of weapons from small arms weapons like M16 and M4 to mortar systems and towed artillery. For each weapon system WOM has specific functions to best fit the operational utilization of that weapon. In operation WOM™ has embedded intelligence that allows it to assess each operational situation and determine the best means of providing accurate orientation output. When operating in a poor magnetic environment, WOM™ identifies this and adjusts its algorithms accordingly to maintain accuracy even in the presence of long-term magnetic disturbances. When in a static position, WOM™ identifies this and adjusts its operation to both maintain accuracy and minimize power consumption at the same time.

KEY FEATURES AND FUNCTIONALITY

- Real-time weapon orientation tracking
- Highly accurate, sensitive, and temperature stable Fluxgate magnetometers (in-house technology)
- Gyro-Stabilized Slaved Magnetic Heading
- Advanced, extendable, embedded Kalman Filter based sensor fusion algorithms
- Embedded 2D and 3D magnetic calibration on hard and soft iron
- All solid state components (no moving parts)
- Full temperature calibration of all sensing elements
- Up to 100Hz data update rate
- Tested to MIL-STD-810F, MIL-STD-461D and DO-160D standards
- Environmentally sealed (IP67)
- Compact design

Applications

- Weapon aiming systems
- Fire control systems
- Weapon orientation tracking
- Real-time casualty assessment
- High accuracy head tracking
- Unmanned air & ground vehicle navigation
- Pedestrian Navigation



WOM™ specifications

Parameter	Units	Value
Output signals		Azimuth/Heading (deflection), Pitch & Roll (elevation); Accelerations, Angular Rates
Update rate	Hz	1 ... 100 (user settable)
Start-up time	sec	< 1
Full Accuracy Data (Warm-up Time) ⁽¹⁾	sec	30
Azimuth/Heading (deflection)		
Range	deg	0 to 360
Angular Resolution	mils	0.8
Static Accuracy in whole Temperature Range ⁽²⁾	mils	<3
Noise (at 100 Hz output)	deg RMS	0.03
Pitch & Roll (elevation)		
Range: Pitch, Roll	deg	0 to 360
Angular Resolution	mils	0.8
Static Accuracy in whole Temperature Range	mils	1.7
Noise (@100 Hz)	deg RMS	0.02
Angular Rate		
Gyroscopes measurement range	deg/sec	±450 / ±950
In-run Bias Stability (RMS, Allan Variance)	deg/hr	1
Linear Acceleration		
Accelerometers measurement range	g	±8 / ±15
In-run Bias Stability (RMS, Allan Variance)	mg RMS	0.005
Environment		
Operating temperature	deg C	-40 to +75 degC
Vibration	g, Hz	MIL-STD-810G, DO-160
Shock	g, ms	1500 g, 0.1 ms
MTBF (G _M & +65degC)	hours	100000
Electrical		
Supply voltage	V DC	9 - 36
Interface		
Standard	-	RS-232/RS-422
Baud Rate	Bps	115200
Physical		
Size	mm	90 x 27 x 26
Weight	gram	84