

ANELLO MARITIME INS

Navigation for Autonomous Maritime Operations in GPS-Denied Environments

Equipped with three ANELLO Silicon Photonics Optical Gyroscopes (SiPhOG™), the ANELLO Maritime INS is redefining precision and reliability for navigation in demanding maritime environments.



The ANELLO Maritime INS integrates the company's groundbreaking SiPhOG™ technology with its advanced sensor fusion engine to deliver unparalleled precision and reliability for autonomous surface vessels (ASVs) and autonomous underwater vessels (AUVs). The innovative design of the ANELLO Maritime INS combines the high-performance capabilities of optical gyroscopes with the compact form factor and low power consumption of silicon photonics. This results in a versatile Inertial Reference System (IRS) that delivers exceptional performance in GPS-challenged maritime environments.

The ANELLO Maritime INS can output data using Ethernet, RS-232 or CAN. The all-digital ANELLO Maritime INS also provides high-speed calibrated inertial measurements including 3-axis SiPhOG optical gyroscopes, triple redundant 6-axis MEMS IMUs, and a 3-axis magnetometer. The dual triple-frequency GNSS receivers ensure that the ANELLO Maritime INS provides customers superior accuracy, reliability, and performance in challenging environments while providing faster convergence times and improved resistance to interference. Time synchronization is possible using PPS with high accuracy clock as holdover when GNSS time fix is lost.

FEATURES

Reference-grade 100Hz position, velocity and attitude

Highly accurate dead reckoning solution

3-axis SiPhOG™ with < 0.5°/hr unaided heading drift

ANELLO AI Sensor Fusion Engine with GNSS spoofing detection

Dual triple-frequency GNSS receivers with static heading capability

Compact and lightweight design with low power consumption < 6 W

Resilience in heavy shock and vibration environments

IP68 – waterproof, resistant to corrosion, salt spray and chemicals

TECHNICAL SPECIFICATIONS

Solution Accuracy¹

Horizontal Position Accuracy	
SPS	1.2 m rms
RTK ²	0.01 m rms
Velocity Accuracy	0.03 m/s rms
Heading Accuracy ³	0.2° rms
Attitude Accuracy (Roll/Pitch)	0.05° rms

IMU Performance

Optical Gyroscope (3-Axis)		
Range	+/-400°/s	
Bias Instability	< 0.5°/hr	
Angle Random Walk	< 0.05°/√hr	
MEMS IMU (6-Axis)	Accelerometer	Gyroscope
Range	16g	up to 400°/s
Bias Instability	10ug	1.5°/hr
Random Walk	0.03m/s/√hr	0.3°/√hr

GNSS & Timing

Constellations	GPS, GLONASS, Beidou, Galileo, QZSS, Navic, SBAS, On module L-band
RTK Initialization Time	< 1 min, using RTCM3 corrections
PVT Output Data Rate	up to 100 Hz
Synchronization	PPS Out, PPS Sync In

Environment

Operating Temperature ⁴	-10 to +50°C
Vibration	5g rms
Shock Survival	40g

Electrical

Input Voltage	5 to 30 VDC
Power Consumption	< 6 W typical
Digital Interface	Ethernet, RS-232 (2 Ports), CAN

Physical

Size	4.4" x 3.4" x 1.9"
Weight	1 lbs.

Notes:

1. After Initialization
2. < 40km Baseline from Base
3. Properly Installed Antennae
4. Option for -20 to +70°C extended range upgrade