

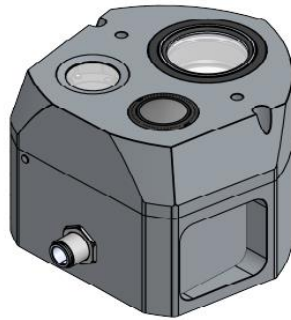
## Accurate GPS Denied Navigation

*Far Target Location | UAVs | Maritime Vessels | Munitions  
Survey Equipment | Hand-Held Weapons | Vehicles | Aircraft*

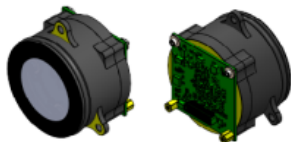
SkyPASS is a digital celestial compass that provides highly accurate attitude information in a low-cost, small, lightweight form factor. The system is passive and well suited to provide mission-critical, accurate attitude regardless of GPS accessibility. Inspired by nature, this technology exploits sky polarization to navigate when traditional celestial tracking methods are unavailable due to clouds and in twilight. SkyPASS uses dual sensing modalities, when available, to provide redundancy and improved accuracy. A figure-of-merit predicts the actual performance of the sensor in both optimal and degraded conditions.



Gen3



Gen3-N



Gen3-P

**Course Position using SkyPASS'**

**Technology is In-development!**

### SkyPASS Features and Benefits

- North finding in challenging conditions
- Less than 2 mil RMS azimuth errors
- Less than 4 mil RMS pitch/roll errors
- Suitable for air, land, sea, weapon platforms
- Low SWaP-C
- Spoof-proof
- Not affected by magnetic disturbances
- Immediate time-to-fix
- No setup or leveling required
- Easy installation and integration
- Customizable solutions available

SkyPASS	Gen3-P <sup>1</sup>	Gen3	Gen3-N
Status	In-Development	<b>Available</b>	In-Development
Optical Sensors	Polarization	Polarization Sun	Polarization Sun/Moon Star
Time of Day	Limited Daytime Civil/Nautical Twilight	Daytime Civil/Nautical Twilight	Daytime Civil/Nautical Twilight Night
Sky Conditions	Full Operation in Clear Skies Limited Operation or Degraded Accuracy in Haze, Fog, and Cloudy Skies		
Environmental	Designed to IP67		
Heading Accuracy (static)	<2 mil (0.11°) 0.2 mil (0.01°) <4 mil (0.23°) <sup>2</sup> <4 mil (0.2°)		
Heading Resolution			
Heading Accuracy (dynamic)			
Roll/Pitch Accuracy			
Size - L x W x H (in)	1.49 x 1.49 x 1.18	3.5 x 1.9 x 2.4	4.1 x 3.9 x 3.2
Weight (oz)	1.76	8	20
Max Measurement Frequency (Hz)	-	1	
Power Draw (W)	-	4.1	
Input Voltage (VDC)	-	5	
Interface	-	RS232, RS422	

Note: Required inputs to calculate heading include position accurate to within 10km and time accurate to within 1s

1. Single optical channel; does not include embedded processor (designed to be integrated in host system with external pitch/roll sensor)
2. SkyPASS' software architecture is being redesigned to improve dynamic performance (in-progress)

\*Specifications subject to change; SkyPASS is Export Controlled

	SkyPASS	INS GNSS	Magnetic Compass	Ring Laser Fiber Optic Gyroscopes	IMU AHRS
Orientation Accuracy	1 - 2 mil	Movement Dependent	> 10 mil	0.5 - 4 mil	Drift Dependent
Small Form Factor	✓	✓	✓		✓
Low Cost	✓	✓	✓		✓
Spoof Proof	✓			✓	✓
Driftless	✓			✓	
Not Sensitive to Magnetic Interruption	✓	✓		✓	✓
Operation in Cloudy Conditions	✓	✓	✓	✓	✓

**Comparison to Alternatives**