



## Orientation & Heading Without GPS

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



### *GPS Denied Accurate Navigation*

The Sky Polarization Azimuth Sensing System, SkyPASS®, provides highly-accurate localization information in a low-power, low-cost, small, lightweight form factor. The system is passive and well suited for any man or vehicle platform to provide mission-critical, accurate localization information regardless of GPS accessibility.

SkyPASS has a demonstrated heading accuracy of 1 mil ( $.05^\circ$ ) and can operate from before sunrise to after sunset in good sky conditions. SkyPASS detects the polarization map of the sky and uses it to calculate localization information. Sky polarization is observable from any point on Earth (including from air vehicles).

#### Features and Benefits

- North finding in challenging conditions
- Works without GPS
- **1 mil accuracy in good conditions**
- Spoof proof, driftless
- Low SWaP-C
- Immediate time-to-fix; no setup or leveling
- Not affected by magnetic disturbances
- Easy installation and integration
- Suitable for any platform: air, land, sea, person, weapon
- Works from before sunrise to after sunset

SkyPASS is configured to use sky polarization tracking as well as sun tracking for the hours when the sun is high in the sky. The switch between sun and polarization tracking occurs automatically. SkyPASS also uses both sensing methods, when available, to provide redundancy and improved accuracy.

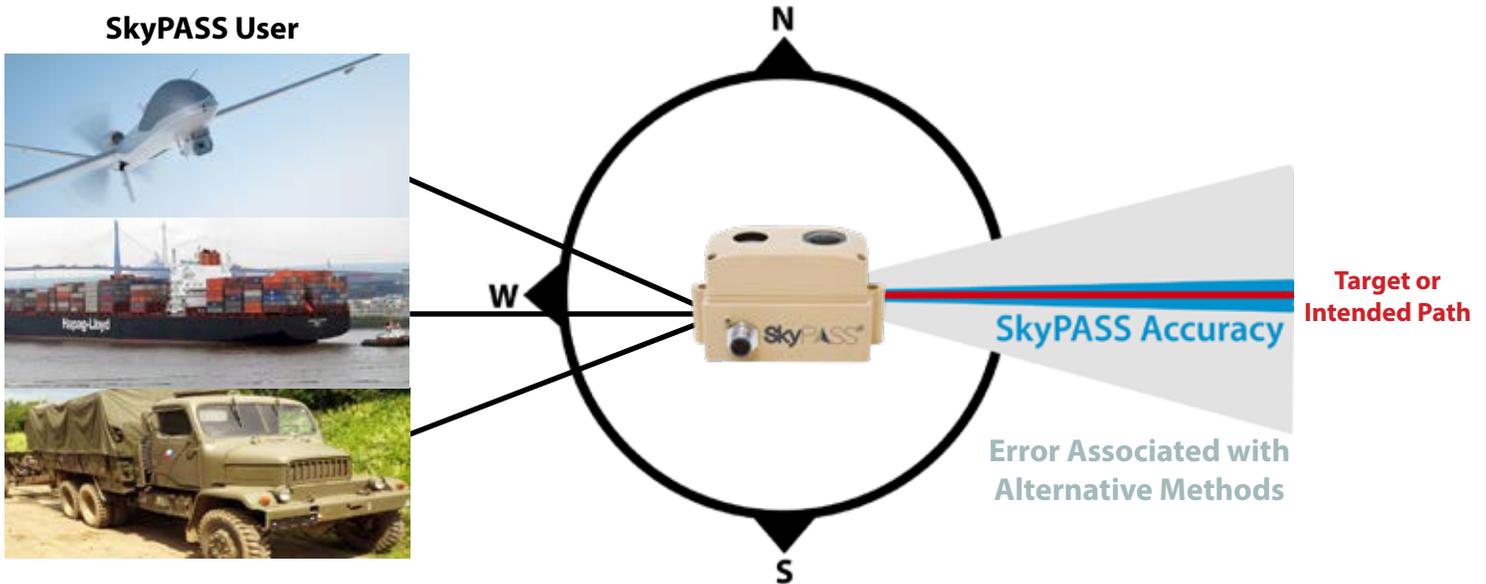


\* Specifications subject to change

# GPS Denied Navigation & Localization

- Accurate heading without Precise GPS Position
- Accurate to within a Fraction of a Degree
- Stationary or Dynamic Platforms

## SkyPASS Provides Accurate Heading Eliminating Large Errors Associated with Alternative Devices



## Far Target Location & Surveying

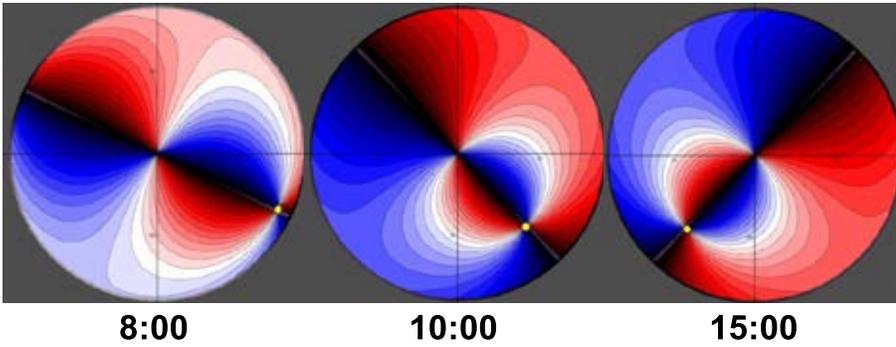
- Provides 3 DOF Orientation to Target
- Accurate to within a Fraction of a Degree

SkyPASS can provide accurate 3DOF orientation for stationary platforms. For targeting, surveying applications or navigation. SkyPASS provides heading, roll, and pitch to within a fraction of a degree in a small, lightweight form factor which can be easily integrated into a variety of static or dynamic platforms.

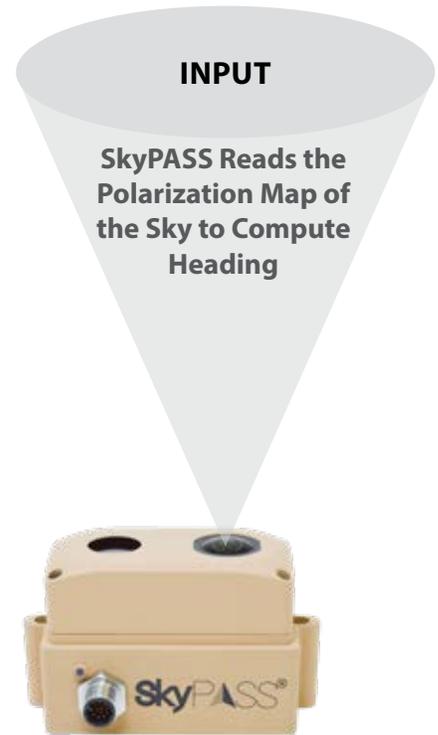


SkyPASS Gen 2 has been fully integrated into a Far Target Locator (FTL) platform designed by NTA, Inc.

# How It Works



Sky polarization is an upper atmosphere phenomenon observable from any point on earth or from any aerial platform. In the figure above, the time of day is displayed at the bottom of each polarization map, the sun is shown as a small, yellow disc, and the center of each plot is the zenith. Using advanced algorithms and optics, SkyPASS detects the polarization map of the sky and uses it to compute highly-accurate orientation or heading.



**SkyPASS Gen3**

Part Number	SkyPASS-3.0
Heading Accuracy	1 mil (0.05°) <sup>1</sup>
Resolution	0.2 mil (0.01°)
Max Measurement Frequency (Hz)	1
Roll/Pitch Accuracy	4 mil (0.2°) <sup>2</sup>
Size (in.) (LxWxH)	3.5x1.9x2.4 <sup>2</sup>
Weight (oz.)	13
Power Draw (W) (Measure)	4.1
Power Draw (W) (Idle)	3.1
Input Voltage (VDC)	4-10
Interface	RS232, RS422
Environmental	Designed to IP67
Time of Day	Daytime + civil twilight <sup>3</sup>
Sky Conditions	Full operation in clear, limited operation or degraded accuracy in haze and partly cloudy
Availability	10-12 week lead time
Highlights	<ul style="list-style-type: none"> <li>- For stationary and dynamic<sup>4</sup> platforms</li> <li>- Requires position<sup>5</sup> and time<sup>6</sup></li> <li>- Surveying, targeting applications</li> <li>- Vehicle navigation applications</li> </ul>

1. RMS error, good conditions 2. Main housing body, not including mounting dog-ears 3. Operation during parts of civil twilight 4. Non-jittering platforms 5. Position accurate to within 10km 6. Time accurate to within 10s

**\* Specifications subject to change**



## **About Polaris Sensor Technologies, Inc.**

Polaris Sensor Technologies, Inc. is a dynamic commercial and prime government supplier providing innovative designs, unique products, and state-of-the-art analyses of optical systems. We have a team of optical experts who have extensive experience in designing high-performance optical systems. Our portfolio includes polarization-based imaging systems, sensors, seekers, light scattering modeling, and measurement services.

Located in Huntsville, Alabama, our engineering facility features an extensive laboratory. Holding many national and international patents, Polaris creates custom hardware and unique software solutions providing our customers with the ability to meet mission objectives.

# **See More. Know More.®**