

### High performance at a low cost



#### The highest performance 3-axis compass module in its price range provides heading, pitch and roll even when GPS is compromised or unavailable.

The low-power, low-cost Prime module provides all-digital compass heading outputs accurate to one degree, can be calibrated to account for magnetic distortion and offers several user-programmable parameters – including output damping rates, reporting measurement unit selection and sampling rate configuration.

PNI's advanced hard- and soft-iron correction algorithms allow for compensation of magnetic distortions inherent in the user's system, resulting in reliable and consistent readings. Systems and devices have varying limitations on motion during user calibration. PNI's Prime is the only compass that incorporates multiple user calibration algorithms available to the user to achieve effective calibration with limited system or device movement. For example, it is difficult to position a ground robot at tilt angles greater than 20 or 30 degrees without tipping it over. A designer can use PNI's Limited Tilt Calibration method (one of many calibration options) to perform a user calibration within the natural movement of the ground robot.

#### Features & Benefits

- PNI's magneto-inductive sensors combined with a 3-axis MEMS accelerometer provide accurate heading and tilt readings, even at high and low latitudes.
- With the combination of PNI's magneto-inductive sensors and intelligent power-saving algorithms, Prime consumes less than half the power of magneto-resistive compasses.
- Designed for flexibility and adaptability, Prime is optimal for sonobuoys, robotics, ROVs, UGVs, and cost-sensitive applications that require a full-featured 3-axis digital compass.



## Performance Specifications\*

Heading	Accuracy	1° rms
	Repeatability	0.05° rms
	Resolution	0.1°
Tilt	Range	±90° of pitch ±180° of roll
	Accuracy	1° rms
	Repeatability	0.05° rms
	Resolution	0.1°
I/O Characteristics	Communication Interface	Binary RS232
	Maximum Sample Rate	10 samples/second
Weight	5 gm	
Mechanical Characteristics	Dimensions (l x w x h)	33 x 31 x 13 mm
Power Requirements	Supply Voltage (unregulated)	3.6 – 5 VDC
	Average current draw	18 mA
	Sleep mode current draw	0.25 mA
Temperature Range	Operation	-40°C to +85°C
	Storage	-40°C to +85°C



With over 30 years of experience, PNI is the world's foremost expert in precision location, motion tracking, and fusion of sensor systems into real-world applications.

PNI's sensors and algorithms serve as the cornerstone of successful IoT projects and other mission-critical applications where pinpoint location, accuracy, and low power consumption are essential.

Building on decades of patented sensor and algorithm development, PNI offers the industry's highest-performance geomagnetic sensor in its class, location and motion coprocessors, high-performance modules, sensor fusion algorithms, and complete sensor systems.

To learn more, please visit [www.pnicorp.com](http://www.pnicorp.com).

PNI Sensor  
2331 Circadian Way  
Santa Rosa, CA 95407 USA  
Phone: +1 707 566 2260

\*Specification are subject to change.  
© 2020 PNI Sensor. All rights reserved.  
Prime 4/27/2020