
Field Force TCM-XB

Tilt-Compensated Digital Compass with Selectable Calibration Modes

PNI's FieldForce TCM-XB tilt-compensated compass module provides pinpoint accurate compass heading, pitch and roll readings over a wide variety of conditions. This includes anywhere GPS is compromised or unavailable – underwater, under bridges, under roofs, or underground.

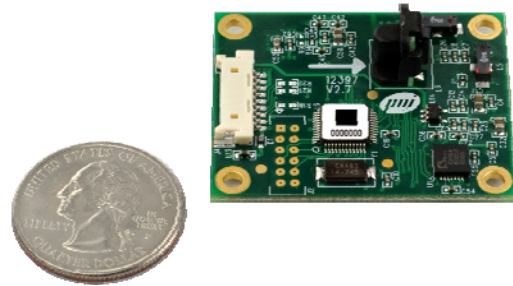
Pinpoint accuracy...

The TCM-XB tilt-compensated digital compass provides industry-leading accuracy. It undergoes PNI's proprietary factory calibration to ensure absolute accuracy and utilizes PNI's SmartSens sensors to achieve high resolution. And the TCM-XB is designed with temperature and noise-stabilization so that it is inherently free of offset drift.

...in real world conditions

Using PNI's advanced hard and soft iron calibration algorithms, magnetic anomalies encountered in the field can be accounted for, resulting in reliable and consistent heading readings. These are implemented using one of four user-selectable calibration modes, including a mode that allows for calibration simply in a horizontal plane. And, electronic gimbaling means the TCM can be mounted in virtually any orientation. So the TCM performs well in the field, not just in the factory.

In real-world conditions, the TCM-XB delivers unmatched performance, making it ideal for applications such as dead-reckoning navigation, far target locating, AUVs, ROVs, object tracking, and more.



Features

- Heading accuracy of $<0.3^\circ$ rms with full range calibration
- Full sphere (360°) measurement capability
- Hard and soft iron correction with quality of calibration score
- 4 different selectable calibration methods
- Low power consumption
- Binary RS232 interface
- Output in Mils or degrees (user selectable)
- Stores multiple, selectable user calibrations
- Heading, pitch and roll output during calibration

Applications

- Physically constrained applications limiting the tilt angles used for calibration
- High-performance attitude measurement
- Dead-reckoning navigation systems
- Surveying equipment
- Robotics systems
- 3-axis magnetic field sensing
- Laser range finders

Parameter	Value
Heading Specifications	
Heading Accuracy ¹	0.3° RMS
Maximum Dip Angle	85°
Repeatability	0.05° RMS
Resolution	<0.1° RMS
Magnetometer Specifications	
Calibrated Field Measurement Range	±125 µT
Magnetic Repeatability	0.1 µT
Magnetic Resolution	<0.1°
Tilt Specifications	
Pitch Accuracy	0.2° RMS
Roll Accuracy ²	0.2° RMS
Tilt Range	Pitch: ±90° Roll: ±180°
Tilt Repeatability	0.05°
Tilt Resolution	<0.01°
Calibration	
Hard Iron	Yes
Soft Iron	Yes
Mechanical Specifications	
Dimensions (L x W x H)	3.5 x 4.3 x 1.3 cm
Mounting Options	Screw mount / standoff, horizontal or vertical
Weight	7 grams
I/O Specifications	
Communication Rate	300 to 115200 baud
Maximum Sample Rate ³	≈30 samples/sec
Time to Valid Data from Power Up ⁴	<210 ms
Time to Valid Data from Sleep Mode ⁴	<50 ms
Power Specifications	
Average Current Draw	At max. sample rate: 20 mA typical At 8 Hz sample rate: 16 mA typical
Sleep Mode Current Draw	0.6 mA
Supply Voltage	3.6 – 5 V (unregulated)
Environmental Requirements	
Operating Temperature	-40C to +85C
Storage Temperature	-40C to +85C

¹ For ≤65° tilt and full range calibration method. See manual for more detail.

² For ≤65° tilt. See manual for more detail.

³ Sample rate dependant on strength of the magnetic field. Normal range is 25-32 Hz.

⁴ FIR taps set to 0.