PNI Corporation’s magneto-inductive sensors are not based on traditional fluxgate or magneto-resistive designs. Unlike traditional technologies, PNI's magneto-inductive sensor changes inductance due to variances in ambient magnetic field strengths. Thus, power requirements are far below conventional magnetic sensors. This makes PNI's sensors the preferred choice in a wide variety of applications.

**Electronic Gimbaling**

Unlike mechanically gimbled 2-axis fluxgates, the TCM2 has no mechanical moving parts. The use of 3 single-axis magnetometers and a 2-axis tilt sensor allows the TCM2 to be gimbaled electronically. Electronic gimbaling is a solid-state solution to compass tilt compensation that eliminates all moving parts and mechanical impediments to performance. This advanced electronic gimbaling allows for tilt ranges of up to ±50º and provides superior performance over the entire tilt range in real world conditions.

**Full 3-Axis Magnetometer and 2-Axis Tilt Sensor**

In addition to compass heading, the TCM2 also supplies highly accurate pitch, roll, magnetic field data and temperature information, allowing the TCM2 to replace several sensors within a system.

**Accurate in Any Environment**

Ferrous metals in host systems often magnetize over time, misdirecting magnetic compass readings. In addition, some systems also generate soft iron distortions. Soft iron can either misdirect or magnify existing magnetic fields, making calibration extremely difficult. The TCM2 uses advanced electronics and correction algorithms to counter the effects of hard and soft iron, enabling it to maintain a high degree of accuracy even in the most demanding environments.

**Designed to Work in the Real World**

The TCM2's advanced technology allows you to design your system to cope with the challenges of your application. Plus, the command set is designed with flexibility and adaptability in mind: many of the parameters are user-programmable.
TCM Specifications

**TCM2-20**
TCM2 electronic compass sensor module with tilt compensation of ±20º.

### Heading Information
- Accuracy when level: 0.5º RMS
- Accuracy when tilted: 1.0º RMS
- Resolution: 0.1º
- Repeatability: ±0.1º

### Tilt Information
- Accuracy: ±0.2º
- Resolution: 0.1º
- Repeatability: ±0.2º
- Range: ±20º

**TCM2-50**
TCM2 electronic compass sensor module with tilt compensation of ±50º.

### Heading Information
- Accuracy when level: 1.0º RMS
- Accuracy when tilted: 1.5º RMS
- Resolution: 0.1º
- Repeatability: ±0.3º

### Tilt Information
- Accuracy: ±0.4º
- Resolution: 0.3º
- Repeatability: ±0.3º
- Range: ±50º

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**Performance of the TCM2-20 and TCM2-50**

**Magnetic Field Information**
- Absolute Accuracy: ±1 µT up to 70 µT
- Resolution: 0.01 µT
- Repeatability: ±0.2 µT
- Range: ±80 µT

**Temperature Information (sensor is uncalibrated)**
- Accuracy after calibration: ±1º C, ±2º F
- Resolution: ±1º C, ±2º F
- Range: -20º to 70º C

**Power Requirements**
- Supply Voltage: +5 VDC regulated or 6 to 18 VDC unregulated
- Current: Operating standard mode: 15-20 mA (depending on user configuration)
- Sleep mode: 2.5 mA

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**Characteristics of the TCM2-20 and TCM2-50**

**Physical Measurements**
- Dimensions: 2.50” x 2.00” x 1.25”
- Weight: 1.6 ounces

**Environmental Characteristics**
- Operating Temperature: -20º to 70º C
- Storage Temperature: -30º to 90º C

**Interfaces**
- Digital: RS232C, NMEA0183
- Analog: 0-5 V linear, 19.53 mV resolution (256 discrete levels)
- 0-5 V quadrature (sine and cosine)

**Features of the TCM2-20 and TCM2-50**
- Built-in hard iron distortion correction system with advanced automatic hard iron calibration algorithms. Soft iron correction system available if needed.
- Compass heading, pitch, roll, 3-axis magnetometer and temperature outputs are all available from the TCM2.
- Distortion Detection: raises a warning flag when magnetic disturbances, such as nearby ferrous metals and electrical currents, compromise accuracy.
- User selectable sampling rate of 1Hz to 30Hz.
- Optional heading damping.

Specifications subject to change without notice  
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Developed by PNI America's premier sensor technology company.

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