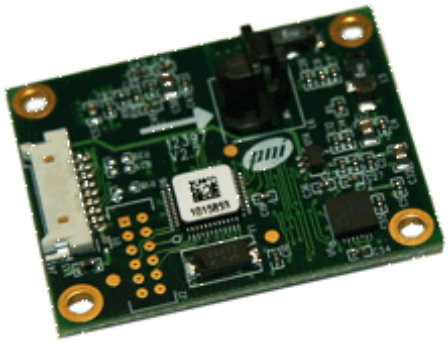
TCM™ 5

Tilt Compensated 3-Axis Compass Module

The TCM5 is the ultimate in compass modules, providing ultra precise heading information in any orientation. The first of its kind, this small, compact module provides for a full 360° rotation and complete flexibility, allowing it to be mounted in multiple orientations and positions. These advantages make the TCM5 the choice for applications that require the highest accuracy and performance anywhere in the world.

The TCM5 combines 3-axes of PNI Sensor Corporation's patented Magneto-Inductive (MI) magnetic sensors and a 3-axis MEMS accelerometer in a single module, offering unparalleled cost effectiveness and performance. MI sensors change inductance by 100% over the wide field measurement range. This variable inductance property is used in a cost and space efficient ASIC, incorporating a temperature and noise stabilized oscillator/counter circuit which is inherently free from offset drift.



Features

- Ultra precise compass heading accuracy: 0.3°
- High resolution compass heading: 0.1°
- High repeatability: 0.05°
- Full 360° rotation: ±90° pitch; ±180° roll
- Multiple measurement modes: compass heading, magnetic field and 2-axis tilt
- Calibrated magnetic field measurement range: ±80µT (±0.8 Gauss)
- High resolution magnetic field measurement: 0.05µT (0.0005 Gauss)
- Extended temperature range: -40° to 85°C
- Low Power: <20 mA typical current draw
- Small size: 3.5 x 4.3 x 1.3 cm
- Advanced users calibration: hard-iron, soft-iron and tilt compensation
- Flexible mounting options: horizontal or vertical

Applications

- High performance solid state navigation equipment
- IMU system integration
- 3-Axis magnetic field sensing
- Drilling applications
- Laser Range Finders
- Robotics systems

Ordering Information

Description	Part Number
TCM5 Module	12608
TCM5 Interface Kit	90014
TCM5 Evaluation Kit	90021

Interface kit includes module, evaluation software and pigtail cable
Evaluation kit includes module, evaluation software and pigtail cable and finished DB-9 cable with power

Specifications

Parameter		Typical	Units
Heading Specifications			
Accuracy with <70° of tilt		0.3°	Deg RMS
Accuarcy with >70° of tilt		0.5°	Deg RMS
Resolution		0.1°	Deg
Repeatability [1]		0.05°	Deg RMS
Max Dip Angle		85°	Deg
Magnetometer Specifications			
Calibrated Field Measurement Range		±80	µT
Magnetic Resolution		±0.05	
Magnetic Repeatability		±0.1	
Tilt Specifications			
Pitch Accuracy		0.2°	Deg RMS
Roll Accuracy		0.2° for pitch <65° 0.5° for pitch <80° 1.0° for pitch <86°	
Tilt Range		±90° pitch ±180° roll	Deg
Tilt Resolution		<0.01°	
Tilt Repeatability [1]		0.05°	
Calibration			
Hard Iron Calibration		Yes	
Soft Iron Calibration		Yes	
Mechanical Specifications			
Dimensions (L x W x H)		3.5 x 4.3 x 1.3	cm
Weight		12	grams
Mounting Options		Screw Mounts/Standoffs horizontal or vertical	
Connector for RS-232		9-pin	
Latency from Power-On		<50	mSec
Latency from Sleep Mode		<1	
Maximum Sample Rate		20	samples/sec
RS-232 Communication Rate		300 to 115200	baud
Output Formats		Binary High Performance Protocol	
Power Specifications			
Supply Voltage		3.6 to 5 V (unregulated)	VDC
Current Draw (continuous output)	**Max:** **Typ:**	22 <20	mA
Idle Mode[2]		14 – 18	
Sleep Mode		0.6	
Operating Temperature		-40° to 85°	°C
Storage Temperature		-40° to 125°	

[1] Repeatability is based on statistical data at ±3 sigma limit about the mean
[2] Based on user settings