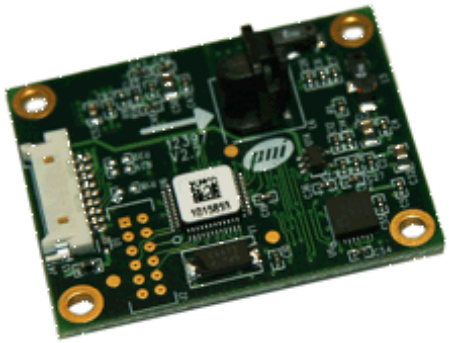
TCM™ 3

Tilt Compensated 3-Axis Compass Module

The TCM3 is a step up from the TCM2.6, offering increased accuracy, extended tilt ranges of up to ±80° and a binary digital interface. Along with hard-iron calibration, the firmware also includes soft-iron correction algorithms, which allow for calibrating out most all magnetic anomalies, and thereby providing highly accurate compass heading in any environment. Improved built-in tilt calibration software makes it easier and faster to integrate the TCM# into your system without sacrificing any accuracy or performance.

The TCM3 combines 3-axes of PNI Sensor Corporations 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 a 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

- Improved compass heading accuracy: 0.5°
- High resolution compass heading: 0.1°
- High repeatability: 0.05°
- Extra wide tilt range: ±80°
- Multiple measurement modes: compass heading, magnetic field, and 2-axis tilt
- Calibrated magnetic field measurement range: ±80 µT (±0.8 Gauss)
- High resolution magnetic field measurement: 0.05 µT (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 user calibration: hard-iron, soft-iron and tilt compensation
- Binary digital interface: RS-232

Applications

- High performance ROV navigation
- GPS system integration
- Vehicle sensing and tracking
- Remote terrestrial antenna direction indicators
- Sonar targeting systems
- Survey Equipment

Ordering Information

Description	Part Number
TCM3 Module	12606
TCM3 Interface Kit	90013
TCM3 Evaluation Kit	90020

Interface kit includes module, pigtail cable and evaluation software
Evaluation Kit incluces module, pigtail cable, powered DB-9 cable with power supply and evaluation software

Specifications

Parameter	Typical	Units
Heading Specifications		
Accuracy with <70° of tilt	0.5°	Deg RMS
Accuracy with >70° of tilt	0.8°	Deg RMS
Resolution	0.1°	Deg
Repeatability [1]	0.05°	Deg RMS
Max Dip Angle	85°	Deg
Magnetometer Specfications		
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	±80°	Deg
Tilt Resolution	<0.01°	
Tilt Repeatability [1]	0.05°	
Hard Iron Calibration	Yes	
Soft Iron Calibration	Yes	
Limited tilt User 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	
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 **Max:**	22	mA
(continuous output) **Typ:**	<20	
Idle Mode[2]	14 – 18	
Sleep Mode	0.6	
Operating Temperature	-40 to 85°	°C
Storage Temperature	-40 to 125°	

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