

# TCM<sup>TM</sup> 2.6

## Tilt Compensated 3-Axis Compass Module



The TCM2.6 has all the features of the TCM2.5, but is about half the size and weight, making it ideal for today's size sensitive applications. It uses the same RS-232 interface protocol, which allows for easy integration into existing systems, but has the addition of an extended temperature range of -40° to 85°C.

The TCM2.6 integrates 3-axis magnetic field sensing, 2-axis tilt sensing and compass heading into a single module. Advantages include protocol compatibility with existing systems, low power consumption, large signal noise immunity under all conditions, and a large magnetic field measurement range in a small package. The TCM2.6 combines PNI Corporation's patented Magneto-Inductive (MI) magnetic sensors and a 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.

### Applications

- ROV/AUV's
- Remote terrestrial antenna direction indicators
- Side-scan sonar
- Survey equipment
- Robotics systems
- Vehicle detection
- Weather stations

### Features

- High accuracy compass heading: 0.8°
- High resolution compass heading: 0.1°
- High repeatability: 0.1°
- Wide tilt range: +/- 50°
- Multiple measurement modes: compass heading, magnetic field and 2-axis tilt
- Calibrated magnetic field measurement range: +/- 80  $\mu$ T (+/- 0.8 Gauss)
- High resolution magnetic field measurement: 0.05  $\mu$ T (0.0005 Gauss)
- Extended temperature range: -20° to 70°C
- Small size: 3.5 x 4.3 x 1.3 cm
- Reliable calibration: hard-iron calibration with quality of calibration score
- Low Power: < 20 mA typical current draw
- RS-232 compatible digital interface:

### Ordering Information

NAME	PART NUMBER
TCM2.6 Module	12604
TCM2.6 Interface Kit	90012
TCM2.6 Evaluation Kit	90019

Interface kit includes: module, manual, evaluation software and 18" pigtail cable

Evaluation kit includes: module, manual, evaluation software, 18" pigtail cable and 6ft finished DB-9 cable with power supply



## TCM2.6 Specifications

Parameter	TCM2.6	Units
<b>Heading Specifications</b>		
Accuracy	0.8°	Deg RMS
Resolution	0.1°	Deg
Repeatability (1)	0.1°	Deg RMS
Max Dip Angle	85°	Deg
<b>Magnetometer Specifications</b>		
Calibrated Field Measurement Range	± 80	μT
Magnetic Resolution	± .05	
Magnetic Repeatability	± .1	
<b>Tilt Specifications</b>		
Pitch Accuracy	0.2°	Deg RMS
Roll Accuracy	0.2°	
Tilt Range	± 50°	Deg
Tilt Resolution	0.1°	
Tilt Repeatability (1)	0.1°	
<b>Calibration</b>		
Hard Iron Calibration	Yes	
Soft Iron Calibration	No	
<b>Mechanical Specifications</b>		
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 Interface	9-pin	
<b>I/O Specifications</b>		
Latency from Power-On	< 210	mSec
Latency from Sleep Mode	< 1	
Maximum Sample Rate	8	samples/sec
RS-232 Communication Rate	300 to 115200	baud
Output Formats	TCM2 Protocol NMEA0183	
<b>Power Specifications</b>		
Supply Voltage	3.6 to 5V (Unregulated)	VDC
Typical Current Draw (Continuous Output)	Maximum	22
	Typical	< 20
Idle Mode	18	mA
Sleep Mode	0.6	
<b>Environmental Specifications</b>		
Operating Temperature	-20° to 70°	C
Storage Temperature	-40° to 85°	
Shock	2500 G's, per MIL-STD-810F	
Vibration	Qualified to MIL-STD-810F	
Humidity	Non-condensing/Qualified to MIL-STD-810F	

(1) Repeatability is based on statistical data at ± 3 sigma limit about the mean.

These specifications are preliminary and are subject to change without notice.  
For the most current specifications, please visit our website at [www.pnicorp.com](http://www.pnicorp.com).