

TCMTM 2.5

Tilt Compensated 3-Axis Compass Module



The TCM2.5 is a **replacement** for PNI's original TCM2 family of products. It offers improved accuracy and performance for compass heading, tilt and magnetometer measurements. It is the **same size**, has the **same 10-pin RS-232** interface connector and is **compatible** with the original TCM2 ASCII protocol. These features make the TCM2.5 the choice for existing applications that require compatibility the TCM2 family of products.

The TCM2.5 integrates 3-axis magnetic field sensing, 2-axis tilt sensing and compass heading into a single module. Advantages include compatibility with existing systems, low power consumption, large signal noise immunity under all conditions, and a large magnetic field measurement range. The TCM2.5 combines PNI Corporation's patented Magneto-Inductive (MI) magnetic sensors and a MEMS accelerometer for 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
- Buoys

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 μ T (+/- 0.8 Gauss)
- High resolution magnetic field measurement:
0.05 μ T (0.0005 Gauss)
- Reliable calibration:
hard-iron calibration with quality of calibration score
- Low Power: < 20 mA typical current draw
- RS-232 compatible digital interface
- Backwards compatible footprint:
TCM2 hole spacing

*The TCM2.5 was designed as a transitional product to replace the original TCM2 family. For any new applications, the TCM2.6 is highly recommended.

Ordering Information

NAME	PART NUMBER
TCM2.5 Module	12603
TCM2.5 Interface Kit	90011
TCM2.5 Evaluation Kit	90018

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



TCM2.5 Specifications

Parameter	Typical	Units
Heading Specifications		
Accuracy	0.8°	Deg RMS
Resolution	0.1°	Deg
Repeatability (1)	0.1°	Deg RMS
Max Dip Angle	85°	Deg
Magnetometer Specifications		
Calibrated Field Measurement Range	± 80	
Magnetic Resolution	± .05	μT
Magnetic Repeatability	± .1	
Tilt Specifications		
Pitch Accuracy	0.2°	Deg RMS
Roll Accuracy	0.2°	
Tilt Range	± 50°	
Tilt Resolution	0.1°	Deg
Tilt Repeatability (1)	0.1°	
Calibration		
Hard Iron Calibration	Yes	
Soft Iron Calibration	No	
Mechanical Specifications		
Dimensions (L x W x H)	6.4 x 5.1 x 1.4	cm
Weight	20	grams
Mounting Options	Screw Mounts/Standoffs horizontal	
Connector for RS-232 Interface	10-pin	
I/O Specifications		
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	
Power Specifications		
Supply Voltage	5 V (Regulated) 6 to 18 V (Unregulated)	VDC
Typical Current Draw (Continuous Output)	Maximum	22
	Typical	< 20
Idle Mode	18	mA
Sleep Mode	0.6	
Environmental Specifications		
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.