

# FieldForce TCM

High performance compass modules



## SUB-1° ACCURACY IN REAL-WORLD CONDITIONS.



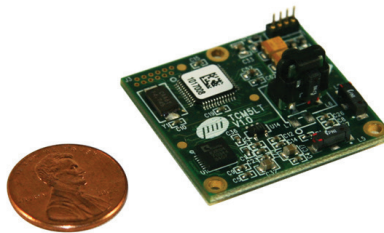
**WHERE GPS IS COMPROMISED OR UNAVAILABLE** — whether underwater or underground, beneath a bridge or inside a building — PNI's FieldForce® TCM tilt-compensated compass modules provide reliable, pinpoint-accurate pitch, roll and compass heading.

The TCMs use advanced algorithms to counter the effects of hard and soft iron interference, providing highly accurate heading information in most any environment and any orientation. PNI's patented magneto-inductive sensors and pioneering measurement technology combine to provide all this performance under a low power budget that extends mission duration.

The TCMs' unmatched performance in real-world conditions makes them ideal for applications that require consistency and accuracy in the field — far target location, object tracking, and more.

## Sub - 1° accuracy...

The TCM is a high-performance, low-power consumption, tilt-compensated electronic compass module that provides industry-leading heading accuracy. The TCM combines PNI's patented magneto-inductive sensors and a 3-axis MEMS accelerometer with PNI's proprietary factory calibration and advanced field calibration algorithms to ensure absolute accuracy.



## ...in real-world conditions

PNI recognizes there's a difference between performing well in the factory and performing well in the field. The TCM's advanced field calibration algorithms account for these differences by correcting for local magnetic distortions. And since applications may have physical constraints for doing calibration, the TCM provides 4 different calibration methods, as well as the ability to recalibrate the accelerometers to ensure long-term accuracy.

The TCM's measurement technology inherently ensures the module is free from offset drift and provides high measurement resolution, which is critically important at high and low latitudes where the dip angle (inclination) limits the usefulness of other compasses. So the TCM performs well in the field, not just in the factory.

## Specifications\*

Heading	Accuracy	< 0.3° rms ≤65° of tilt after full range calibration
		< 2.0° rms ≤5° of tilt after 2D calibration
		< 2.0° rms ≤2 times the calibration tilt angle after limited-tilt calibration
	Repeatability	0.05° rms
	Resolution	0.1°
Tilt	Accuracy	0.2° rms
	Repeatability	0.05° rms
	Resolution	0.01°
Maximum Dip Angle (functional)		85°
Calibrated Field Measurement Range		±125 μT
Maximum Sample Rate		≈30 samples/second
Communication Interface - TCM MB		Binary CMOS/TTL UART
Communication Interface - TCM XB		Binary RS232
Power Requirements	XB Average Current Draw (@ max sample rate)	20 mA
	MB Average Current Draw (@ max sample rate)	17 mA
	XB Current Draw in Sleep Mode	0.3 mA
	MB Current Draw in Sleep Mode	0.1 mA
	Supply Voltage TCM XB	3.6 - 5 V DC (unregulated)
	Supply Voltage TCM MB	3.3 - 5 V DC (unregulated)
Dimensions (l x w x h) - TCM XB		3.5 x 4.3 x 1.3 cm
Dimensions (l x w x h) - TCM MB		3.3 x 3.1 x 1.3 cm

\*subject to change

For ordering information and most current specifications, please visit [www.pnicorp.com](http://www.pnicorp.com)

PNI Sensor

2331 Circadian Way, Santa Rosa, CA 95407 USA Phone: 707-566-2260 Fax: 707-566-2261

## FieldForce TCM

High performance compass modules

	2-AXIS
	3-AXIS
	HIGHEST RESOLUTION / HIGHEST ACCURACY
	HARD AND SOFT-IRON CORRECTION
	INTEGRATED PROCESSOR
	LOW POWER
	3D ORIENTATION

### PNI SENSOR

is America's leader in the exacting science of producing pinpoint heading and orientation modules for the military, scientific and oceanography communities. Building on decades of patented sensor research, PNI offers today's most reliable magnetic sensor systems, including advanced compass modules and AHRS with proven intelligence that virtually eliminates magnetic distortion issues encountered with standard magnetic sensors.

Serving a demanding list of customer needs with highly individual qualifications and specifications, PNI is a specialized magnetic sensor producer with a proven history of meeting the needs of large industries including the US Military, the auto industry and the consumer electronics industry. Nimble and responsive, PNI's U.S. based team of physicists, engineers, and quality control experts offers a multitude of compass and AHRS modules to speed integration into complex systems and end-products.

