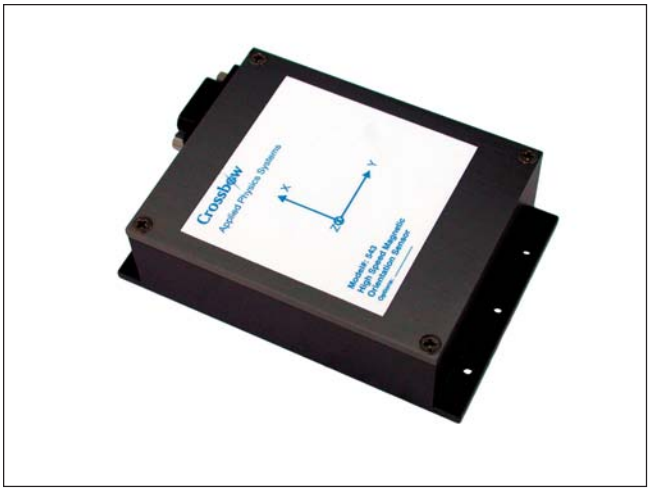
Magnetometers

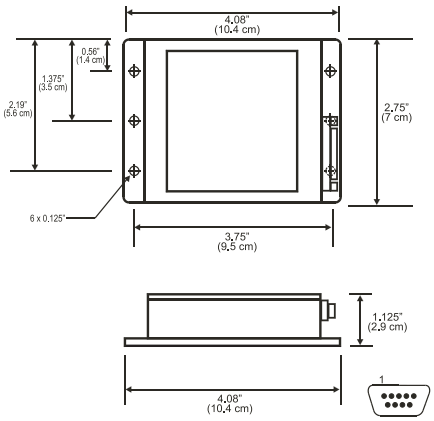
HIGH SPEED DIGITAL ORIENTATION SENSOR



- High Resolution Flux Gate Magnetometers
- MEMS Accelerometers
- ± 1.5° Accuracy in Azimuth (Heading)
- ± 0.5° Accuracy in Inclination and Roll
- Accurately Senses Through All Orientations
- Computes Heading, Roll, & Pitch

Applications

- Magnetic Compassing for Land or Marine Use
- Vehicle Orientation
- Remotely Operated Vehicles
- Magnetic and Gravity Field Measurements



CXM543

The CXM543 Orientation Sensor is designed to measure the orientation (roll, inclination, and azimuth angles) of a platform or vehicle to which it is attached. The CXM543 determines the inclination and roll angles by using a 3-axis micro-machined accelerometer to measure the direction of earth's gravity. The azimuth angle is determined by measuring the earth's magnetic field using a 3-axis magnetometer subsystem.

The CXM543 employs a high-speed serial digital output for transmitting data. Both RS-232 and TTL level interfaces are present. Baud rate is user selectable over the range 300 baud to 72,800 baud.

The CXM543 has an internal hard-iron calibration firmware program. This allows the CXM543 to measure heading in the presence of hard-iron interference.

The CXM543 can be configured to operate in either a command (polled) mode (where an external computer requests data) or an auto send (continuous) mode (where data is automatically sent repeatedly after power up). Output data can be set to ASCII format (ideal when using a PC) or in binary format (more suited to a microprocessor interface).

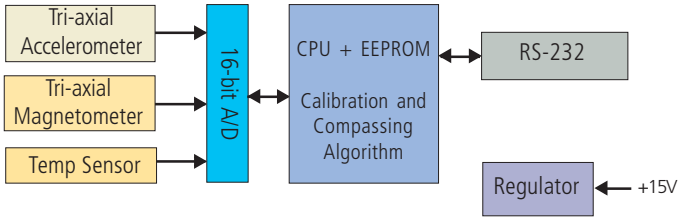
The CXM543 can be configured to output either orientation angle data (roll, inclination, and azimuth) or sensor data (AX, AY, AZ, MX, MY, MZ). When used in orientation mode, the accuracy of the transmitted angles is ± 1.5° for azimuth and ±0.5° for roll and inclination. Angular resolution is better than ± 0.1°. When used as a gravity sensor, accuracy is ±8.5 mg and resolution is better than 1 mg. As a magnetic field sensor, the CXM543 fluxgate magnetometers have an accuracy of ±0.1µT and a resolution of ±0.005 µT.

A Windows compatible program is available with the CXM543 to enable system configuration (e.g., baud rate, sample rate, mode, etc.), data acquisition, and display.

Document Part Number: 6020-0017-01 Rev B

Specifications	CMX543
Performance	
Angular Accuracy	
Inclination & Roll (°)	± 0.5
Azimuth (°)	± 1.5
Accelerometer Bias (mg)	± 8.5
Magnetic (µT)	± 0.1
Angular Range	
Inclination (°)	± 90
Roll (°)	± 180
Azimuth (°)	± 180
Gravity Range (g)	± 1
Magnetic Range (µT)	± 100 (± 1 Gauss)
Linearity (% full scale)	± 0.1
Sensor Axes Alignment to Case (°)	± 0.5
Data Output Rate (angles mode) (Hz)	25
Environment	
Operating Temperature Range (°C)	0 to + 50
Data Levels	RS-232 and TTL
Electrical	
Baud Rate (user selectable)	300 - 72,800
Power Input	100 mA @ +7.5 to +15 VDC
Physical	
Size	2.75" W x 4.08" L x 1.125" H
	(7 cm x 10.4 cm x 2.9 cm)
Connector	9-pin non-magnetic "D"
Weight (grams)	200

Specifications subject to change without notice



543 Digital Orientation/Compass Sensor

Pin	Function
2	RS 232 out
3	RS 232 in
5	Ground
6	TTL serial out
7	TTL serial in
8	Configure
9	+7.5 to +15V DC

Pin Diagram

Ordering Information

Model	Description
CMX543	High Speed Digital Orientation Sensor