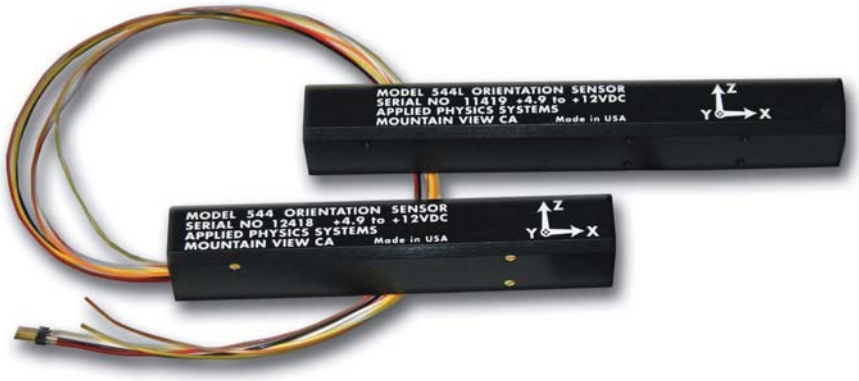
Applied Physics Systems

Model 544

Miniature Orientation Sensor

Features

- High accuracy
- Operational temperature up to:
  70°C (Model 544)
  125°C (Model 544H)
- Calculates and outputs roll, pitch, azimuth data
- Small size: Fits inside a 1" pipe (ID)
- Digital serial input/output



Applications

- Borehole logging
- Directional drilling
- Orientation determination for buoys, sonar systems
- Magnetic compass

The Applied Physics Systems Model 544 contains both a 3-axis fluxgate magnetometer and a 3-axis accelerometer. These sensors output 16-bit digital data representing the magnetometer and accelerometer readings.

This unit can be configured to transmit the roll, pitch, and azimuth orientation angles. These angles are calculated before they are transmitted from the accelerometer and magnetometer sensor output data.

The Model 544 communicates using a bidirectional serial data link, which can be configured to be TTL compatible or RS-232 compatible. The baud rate is user programmable, up to a maximum of 9600 baud. This unit communicates using ASCII characters for incoming commands and output data. A high speed binary communications protocol can also be user enabled.

The Model 544 scale factors, zero bias factors and alignment angles are measured by placing the unit in precision rotational and magnetic field applying fixtures. Scale and offset calibration factors are measured over the 0°C to 70°C temperature range for the standard Model 544 sensor. The Model 544H calibrates the sensor over the temperature range from 0°C to 125°C.

The integral microprocessor corrects for alignment, scale, and offset factors within the temperature range before outputting data. The Model 544 calibration data is stored in the EEROM, which is user accessible.

The magnetometer noise level is 5 μGauss and the accelerometer noise level is 0.2 milligee. The maximum data throughput is approximately 3 readings per second when all 6 outputs are transmitted. The temperature compensated Model 544 roll, pitch, and azimuth sensors have an overall accuracy of ±0.4° for roll and pitch and ±1.2° for azimuth.

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PHYSICAL	
Height	0.75" (19.05 mm)
Width	0.80" (20.32 mm)
Length	4.6" (116.84 mm)
Weight	50 grams
Leads	Flying leads 27" long
ELECTRICAL	
Input Voltage Range	+4.9 V to +12 V
Baud Rate	User programmable up to 9600 baud
Protocol	User selectable: ASCII or binary
Power	+4.9 V to +12 V @ 71 mA
Communications	RS-232 or TTL @ 9600 baud
ENVIRONMENTAL	
Operating Temperature Range	0°C to 70°C (Model 544) 0°C to 125°C (Model 544H)
Magnetometer	5 µGauss
Accelerometer	0.2 milligees
Linearity	±0.1% full-scale
Axis Alignment	±0.2°
Alignment of Axes with Package Reference Frame	±0.2°
PERFORMANCE	
Azimuth Accuracy	±1.2°
Toolface (Roll) Accuracy	±0.4°
Inclination Accuracy	±0.4°

Specifications are subject to change without notice.