

# MODEL AP230

## MAGNETOMETER SENSOR

### FEATURES

- Complete 3-axis system
- Low noise level
- Measures up to  $\pm 0.65$  G
- Compact size, rugged construction
- Noise Level:  $3.0 \mu\text{G RMS}/\sqrt{\text{HZ}}$

### APPLICATIONS

- Laboratory Instrumentation
- Compassing and Navigation
- Attitude Reference
- Anomaly Detection
- Material Testing

AP230 is an all-in-one 3-axis fluxgate magnetometer with high accuracy ( $\pm 6.5$  mG). Unlike other fluxgate magnetometers, AP230 does not require any external Data Acquisition Unit (DAQ) or analog circuitry. To help engineers and researchers with rapid development and testing, AP230 is fully compatible with the demo software provided by Applied Physics Systems.

AP230 delivers up to 145 samples per second from all three axes placing it among the fastest fluxgate magnetometers. AP230 and fluxgate magnetometers, in general, do not experience hysteresis error as much as other types of magnetometers. As a result, they provide more accurate and reliable measurements.

AP230 has a measuring range of  $\pm 0.65$  G ( $\pm 65 \mu\text{T}$ ), slightly above the earth's total magnetic field in most places to provide the highest sensitivity possible. AP230 has a very low offset and noise level while offering exceptionally high linearity and temperature stability, making it suitable for a wide range of applications. AP230 supports a voltage range of 6VDC to 9VDC, and its specified operating temperature is  $0^\circ\text{C}$  to  $70^\circ\text{C}$  (for wider operating temperatures, please contact Applied Physics Systems).



The AP230 simplifies and reduces the cost of the magnetic data acquisition system by eliminating the cumbersome A to D board. The system uses three separate 16-bit sigma delta converters to achieve high throughput. The scale factor is set so that a full scale input of  $10\text{-}4\text{T}$  ( $1\text{G}$ ) represents 32768 counts on the system Analog-to-Digitals. The least count represents about  $3\text{nT}$ . Noise of the system is 1 – 2 counts.

PIN	FUNCTION
1	Not used
2	RS232 TXD
3	RS232 RXD
4	Not used
5	Ground
6	Reserved - Must be Floating
7	Reserved - Must be Floating
8	Configure - Must be Floating
9	+Voltage In

**ELECTRICAL**

Input Voltage Range	+7 to +9 VDC
Current Consumption	under 90 mA
Digital Output Protocols	RS232
Baud Rate (User Selectable)	300, 1200, 2400, 4800, 9600 (default), 19200, 38400
Maximum Output Sample Rate at 38400 Baud (in 'Auto-Send' mode)	145 transmissions/sec
Analog to Digital	16-bit

**ENVIRONMENTAL**

Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-55°C to +160°C
Shock	1000 G 1 ms half sine wave
Vibration	10 G RMS random 50 Hz to 500 Hz

**PERFORMANCE**

Range	±65 mG (±65 μT)
Accuracy @ full scale	± 1%
Linearity @ full-scale	± 65 μG
Offset Error (at 0mG)	± 2 mG
Offset Drift versus Temperature	< 50 μG/°C
Noise Level	3.0 μG
Orthogonality between axis	Better than ±0.5°
Alignment of sensor package with sensor reference surfaces	Better than ±0.5°

**PHYSICAL**

Width	1.60" (40.64 mm)
Height	1.13" (28.70 mm)
Length	4.14" (105.16 mm)
Weight	150 g
Connector on the Sensor	9-pin D-sub Male/Plug Connector
Mating Connector	9-pin D-sub Female/Receptacle Connector (Non-Magnetic)

*Specifications are subject to change without notice.*

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