APPLIED PHYSICS SYSTEMS

MODEL 539

HIGH-SPEED DIGITAL 3-AXIS FLUXGATE MAGNETOMETER SYSTEM

APPLICATIONS

- High speed magnetic sensing
- Magnetic anomaly detection
- Guidance/Compassing
- Laboratory measurements
- Magnetic field mapping
- Materials testing

DESCRIPTION

The Model 539 is the first high speed digital output 3 axis fluxgate magnetometer to be commercially available. The system can convert and transmit over its serial port (at 38400 baud) all three axes outputs at a rate of 250 samples per second. Slower data rates can also be selected; transmission rate and baud rates are user programmable.

The Model 539 uses 3 separate 16 bit sigma delta converters to achieve the high throughput. The scale factor is set so that a full scale input of 10^{-4}T (1G) represents 32768 counts on the system A to D's. The least count represents about 3nT. Noise of the system is 1 - 2 counts.

The Model 539 system is ideally suited to situations where high speed magnetic data must be acquired and analyzed. In the past, such systems have normally used a combination of an analog output fluxgate and an A to D board in a PC. The Model 539 simplifies and reduces the cost of the magnetic data acquisition system by eliminating the cumbersome A to D board.

The Model 539 can be used in either a command mode or autosend mode. In the command mode, the Model 539 responds to commands to transmit data issued by an external computer. In the autosend mode, the Model 539 commences sending data as soon as power is applied to the unit.

The Model 539 can be supplied with an optional connection cable and breakout box which allows easy powering and connection to an external computer. A Windows compatible configuration and data acquisition and display program is supplied with the 539. This program enables the user to acquire and graphically display data as well as configure the Model 539 send rate, baud rate, output format and other features.

In addition to the standard RS232 interface which is normally employed when communicating with a PC, the Model 539 is also equipped with a TTL interface for communication with a microprocessor.

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SPECIFICATIONS

Accuracy	±1% FS
Noise level	±3 nT (±0.03 mG)
Range	±100 µT (±1 G)
Scale stability	±.05% FS/°C
Initial offset	< ±200 nT (±2 mG)
Offset vs. temp	< 5nT/°C (<0.05 mG)
Orthogonality of axes	better than ±0.5°
Alignment of axes with package	better than ±0.5°
Linearity	±0.1% full scale
Maximum data transfer speed (38,400 baud)	250 3-axis samples/sec
Power	100ma @ +6 to +15 VDC
A to D	16 bit Sigma Delta
Baud rate (user selectable)	300, 1200, 2400, 4800, 9600, 19200, 38400, 72800
Operating temperature range	-25 to 70º C
Size	1.60" W x 4.08" L x 1.125" H
Connector	9 pin nonmagnetic "D"

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