



# Model 534

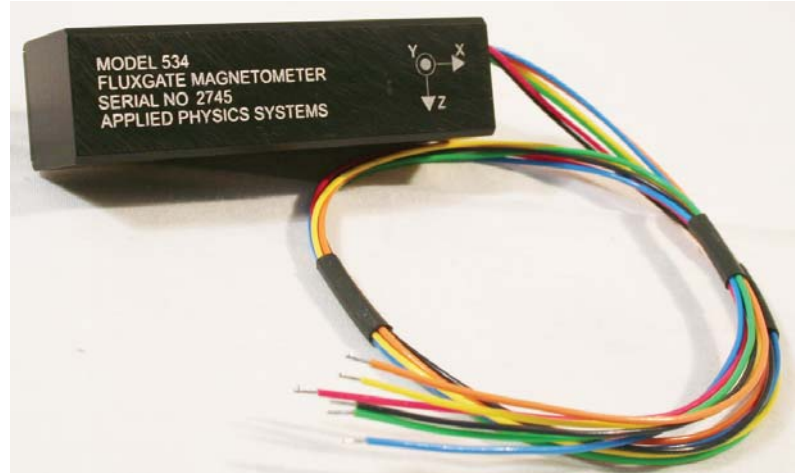
## Miniature 3-Axis Fluxgate Magnetometer

### Features

- Complete 3-axis system
- Compact size, rugged construction
- Operates from  $\pm 5$  VDC at  $\pm 30$  mA
- Low noise level
- Measures up to 1 Gauss
- Low temperature coefficient

### Applications

- Fluxgate compass systems
- Magnetic fuses
- Measurement of magnetic signatures and magnetic fields generated by power lines



As a magnetic compass, the Model 534 can provide direction accuracy to better than  $0.1^\circ$ . Some applications combine the Model 534 with a precision 3-axis accelerometer to provide roll, pitch and yaw angles accurate to  $0.1^\circ$ .

In magnetic anomaly detection situations, the low noise level of the Model 534 enables very small magnetic signatures to be measured. This enables large-distance spacing between the Model 534 and the anomaly being measured; use several Model 534s to record both field and field gradient. Range is proportional to the quotient of these quantities.

### System Calibration and Connection

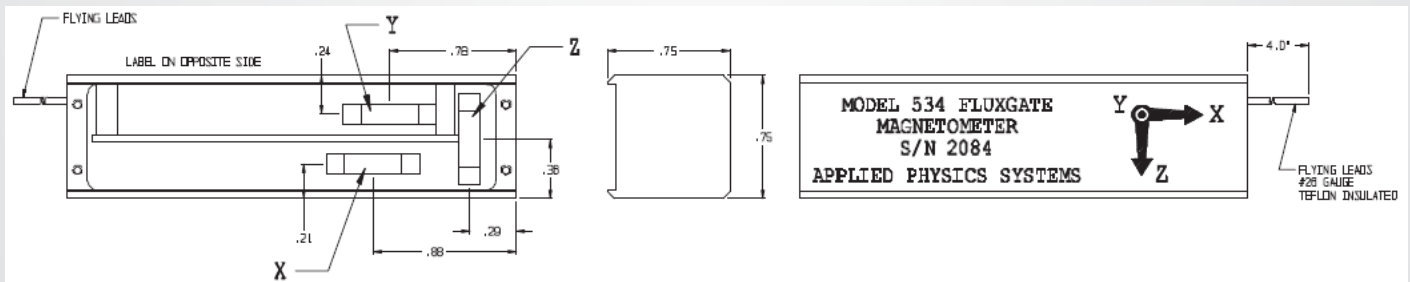
Before shipment, we calibrate the 534 system in our set of mu metal shields (to determine zero offset) and precision Helmholtz coils (to measure scale and axis alignment factors). As an option, a calibration sheet can be provided with each unit to enable external correction of these system parameters if desired. In addition, cali-

bration of offset and scale factor variation can also be obtained over any temperature excursion in the  $-55$  to  $+125^\circ\text{C}$  range.

The system provides 3 analog output voltages proportional to the magnetic field in three orthogonal directions. Full scale output is  $\pm 4.0$  volts; this voltage represents a magnetic field of  $\pm 1.00$  Gauss. Output scale factor is adjusted to an accuracy of  $\pm 0.1\%$ .

For sensor alignment, the X axis is aligned parallel to the package long dimension. The Z axis is aligned so that it projects through the center of a  $0.067''$  hole in the bottom of the system. The system Y axis is orthogonal to the X and Z directions. The system coordinate system is right handed.

The output polarity sense of the axes is such that a field increase in the direction of the arrows produces an increase in the voltage output for that axis. In general, the magnetic axis of the 534 systems is orthogonal and aligned within  $\pm 0.2^\circ$  of the right-handed coordinate system specified by the outer package alignment surface and alignment holes.



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Miniature 3-Axis Fluxgate Magnetometer



Applied Physics  
Systems

## PHYSICAL

Width/Height	.75" (19.05 mm)
Length	2.75" (69.85 mm)
Weight	30 g
Input connections	six #26 gauge insulated wires 6" long

## ELECTRICAL

Input	+5 VDC at 30 mA, $\pm 7$ to $\pm 12$ VDC at 20 mA
Total power consumption	200mW

## ENVIRONMENTAL

Orthogonality between axis	$\pm 0.2^\circ$
Alignment of sensor package with sensor reference surfaces	$\pm 0.2^\circ$
Linearity	$\pm 0.1\%$ of full scale
Temp. Coefficient Zero Output	$< \pm 5$ nT/ $^\circ\text{C}$ ( $< \pm 50$ $\mu\text{G}/^\circ\text{C}$ )
Temp. Scale Factor	$< \pm 0.02\%$ Full Scale/ $^\circ\text{C}$
Noise Level	0.3 nT RMS/Hz <sup>1/2</sup> 3 $\mu\text{G}$ RMS/Hz <sup>1/2</sup>
Frequency Response	DC to 400 Hz (-3 db)
Sensitivity	$\pm 4$ V/G

WIRE COLOR	FUNCTION	PIN CONNECTOR
Red	+ V in	H
Blue	- V in	K
White	OSC input	A
Yellow	Y output	D
Green	Z output	F
Orange	X output	E
Black	Ground	B, G

The input connections for the Model 534 consist of six #26 gauge Teflon insulated wires with a nominal length of 6". The system is powered by connection to the 7 flying leads. The oscillator (OSC) input is only used when an external 25 KHz TTL oscillator is supplied to the system.

Specifications within this document are subject to change without notice.

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281 East Java Drive, Sunnyvale, CA 94089 USA • 650.965.0500 • Fax: 650.965.0404 • email: [service@appliedphysics.com](mailto:service@appliedphysics.com)