



Features

- Complete 3-axis system
- Compact size, rugged construction
- Operates from ± 5 VDC at ± 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 533 can provide direction accuracy to better than 0.1° . Some applications combine the Model 533 with a precision 3-axis accelerometer to provide roll, pitch and yaw angles accurate to 0.1° .

In magnetic anomaly detection situations, the low noise level of the Model 533 enables very small magnetic signatures to be measured. This enables large-distance spacing between the Model 533 and the anomaly being measured. Range is proportional to the quotient of these quantities.

System Calibration and Connection

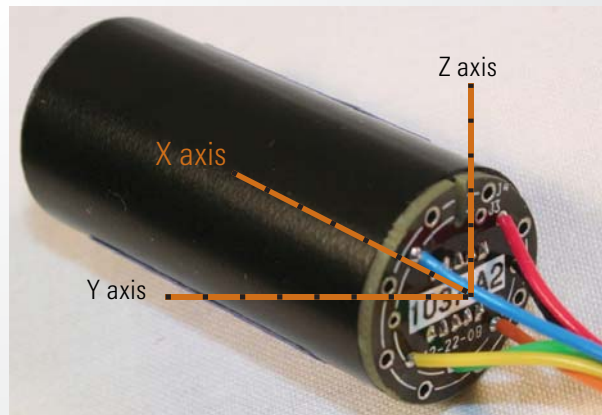
Before shipment, we calibrate the 533 System in our set of mu metal shields (to determine zero offset) and precision Helmholtz coils (to measure scale and axis alignment factors). As an option, a calibration sheet can be provided with each unit giving data on zeros, scale factors and orthogonality constants for each axis. This data enables external correction of the output voltages to increase overall system accuracy.

The system provides 3 analog output voltages proportional to the magnetic field in three orthogonal directions. Full scale output is ± 4.0 volts; this voltage represents a magnetic field of ± 1.00 Gauss. Output scale factor is adjusted to an accuracy of $\pm 0.2\%$.



For sensor alignment, the X axis is aligned parallel to the cylindrical outer housing. The Z axis is aligned so that it projects through the center of a 0.031 " wide notch in the top (output printed circuit board). The system Y axis is orthogonal to the X and Z directions. The coordinate system is right handed.

The output polarity sense of the axes is such that a field increase in the direction of the arrows (outwards from the unit) produces an increase in the voltage output for that axis. In general, the magnetic axis of the Model 533 is aligned within $\pm 1^\circ$ of the right-handed coordinate system specified by the outer cylindrical package and top alignment notch.



Model 533

Miniature 3-Axis Fluxgate Magnetometer



Applied Physics
Systems

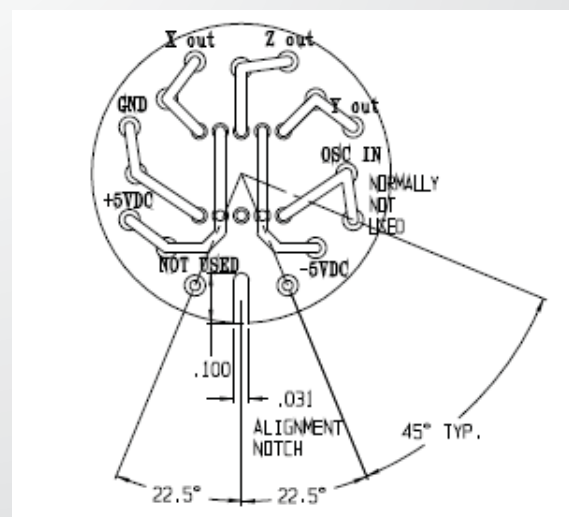
PHYSICAL	
Outside Diameter (O.D.)	.725" (18.4 mm)
Length	1.5" (38 mm)
Weight	18 g
Input connections	six #26 gauge insulated wires 6" long

ELECTRICAL	
Input	+5 VDC at 30 mA, -5 VDC at 30 mA
Total power consumption	300mW

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

FUNCTION	PAD	WIRE COLOR
No Connection	1	None
+5 VDC	2	Red
Ground	3	Black
X output	4	Orange
Z output	5	Green
Y output	6	Yellow
OSC input	7	White (wire option**)
-5 VDC	8	Blue

**The system can be powered by connection to the 7 flying leads (wire option) or by using an array of spring loaded contacts (pogo option). 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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