

# MODEL 533

## MAGNETOMETER SENSOR

### 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

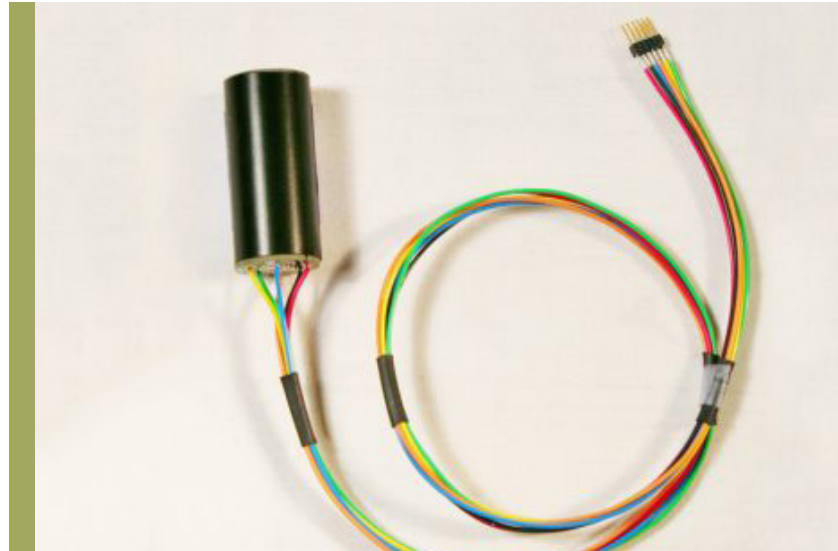
As a magnetic compass, the Model 533 provides direction accuracy to better than  $0.1^\circ$ . Some applications combine the Model 533 with a precision 3-axis accelerometer to provide roll, pitch and yaw angles accurate to  $0.1^\circ$ .

In magnetic anomaly detection situations, the low noise level of the Model 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

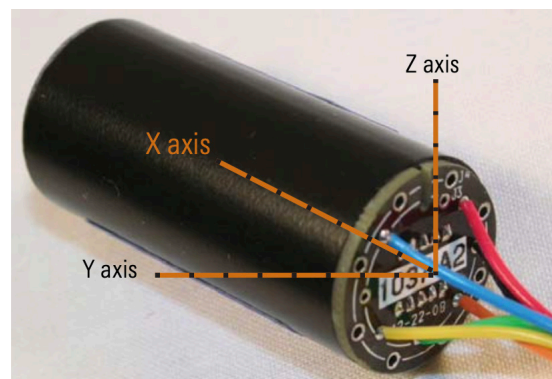
Before shipment, we calibrate the Model 533 System in our set of mu metal shields (to determine zero offset) and precision Helmholtz coils (to measure scale and axis alignment factors). As an option, a calibration sheet can be provided with each unit giving data on zeros, scale factors and orthogonality 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  $\pm 4.0$  volts; this voltage represents a magnetic field of  $\pm 1.00$  Gauss. Output scale factor is adjusted to an accuracy of  $\pm 0.2\%$ .



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.



**ELECTRICAL**

Input Voltage	±5 VDC
Current Draw	30 mA @ ±5 VDC
Total Power Consumption	300 mW

**ENVIRONMENTAL**

Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-55°C to +160°C

**PERFORMANCE**

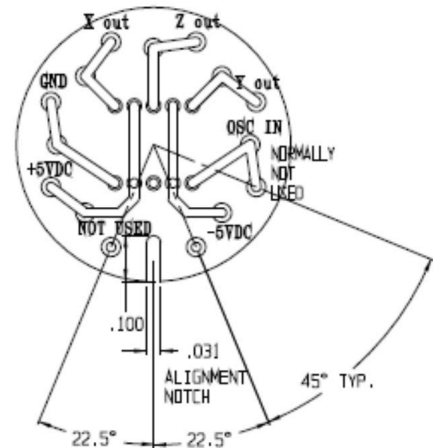
Range	1.0x10 <sup>5</sup> nT (1.0 Gauss)
Noise Level	0.3 nT RMS/√Hz 3 μG RMS/√Hz
Linearity	±0.1% full-scale
Sensitivity	± 4 V/G
Frequency Response	DC to 400 Hz (-3 db)
Orthogonality between axis	±2°
Alignment of sensor package with sensor reference surfaces	±2°
Offset versus Temperature	< 5 nT/°C (<0.05 mG/°C)
Temperature Scale Factor	<± 0.02% Full Scale/°C

**PHYSICAL**

Outside Diameter (O.D.)	0.725" (18.4 mm)
Length	1.5" (38 mm)
Weight	20 g
Input connections	six #26 gauge insulated wires 6" long

PAD	FUNCTION	WIRE COLOR
1	No connection	None
2	+5 VDC	Red
3	Ground	Black
4	X output	Orange
5	Z output	Green
6	Y output	Yellow
7	OSC output	White (wire option**)
8	-5 VDC	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 are subject to change without notice.*