

Angular Orientation Sensor WOS-120

Order-No: WOS-120-100, WOS-120-110 Series/Model: WOS-120, WOS-120-H



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3 Axis Fluxgate Magnetometer and 3 Axis Accelerometer in one unit

Main Product Features

- **High accuracy - operates to 70°C**
- **Option to operate to 125°C (WOS-120H)**
- **Calculates and outputs roll, pitch, yaw data**
- **Miniature size 19,05mm (0.75") x 20,32 mm (0.80") x 116,84 mm (4.6")**
- **Digital serial data output**
- **Contains both a 3-axis magnetometer and a 3-axis accelerometer**

The Miniature Angular Orientation Sensor system Model WOS-120 contains both a 3-axis fluxgate magnetometer and a 3-axis accelerometer. These sensors are sampled by an internal A to D converter and microprocessor subsystem which outputs 16 bit digital data representing the magnetometer and accelerometer readings. The system can also be configured to transmit the roll, pitch and azimuth orientation angles of the Model WOS-120 system. These angles are calculated before transmission from the accelerometer and magnetometer sensor output data.

The accelerometer and magnetometer sensors and all of the system electronics are mounted in a rectangular package of dimensions 20,32 mm (0.80") x 19,05 mm (0.75") x 116,84 mm (4.6"). The package corners are rounded so that the unit will fit inside a cylinder with an inside diameter of 25,4 mm (1"). Input power range is from +4.9V to +12V.

Communication with the Angular Orientation Sensor WOS-120 system is accomplished by means of a bi-directional serial data link which can be configured to be TTL compatible or RS232 compatible. The system baud rate is user programmable up to a maximum of 9600 baud.

Commands to the WOS-120 and data from the WOS-120 are both in the form of ASCII characters. A high speed binary communications protocol is also available, and can be enabled by the user.

The Angular Orientation Sensor Model WOS-120 scale factors, zero bias factors and alignment angles are measured by placing the system in precision rotational and magnetic field applying fixtures. Scale and offset calibration factors are typically measured over the 0°C to +70°C temperature range for the standard Angular Orientation Sensor Model WOS-120 sensor. In addition, the Model WOS-120H is available which calibrates the sensor over the temperature range of 0°C to +125°C. The integral microprocessor corrects

for alignment, scale and offset factors at any given temperature before outputting data. The system calibration data is stored in the system EEROM and is directly accessible to the user.

The magnetometer noise level is 5×10^{-6} Gauss and the accelerometer noise level is 2×10^{-4} Gee. The maximum data throughput is approximately 3 readings/sec if all 6 outputs are transmitted. When viewed as a roll, pitch and yaw sensor, the temperature compensated WOS-120 system has an overall accuracy of $\pm 0.5^\circ$ for roll and pitch and $\pm 1.0^\circ$ for azimuth.

Applications

- OEM and Sstemintegration
- Borehole logging and drilling
- Orientation determination for buoys, sonar systems, etc.
- Camera Angular calibration
- Magnetic compass



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