



## Features

- Rugged chassis with Max Temperature Indicator
- Accurate inclination and azimuth while rotating
- Accurate RPM detection from static to 400 RPM
- Real time clock, vibration, and rotation detection
- Device history and log program with variables for max temperature, vibration and shock versus time
- Absolute and resettable counters

## Applications

- EM and pulse based MWD systems
- Directional Drilling
- Borehole Logging

The Applied Physics Systems Model 760 is a directional sensor based on our popular Model 750 platform that incorporates several exciting new features in a more rugged package. Among the new functions added are accurate inclination while drilling (rotating) and real time rotation detection with accurate RPM reporting up to 400 RPM. The new design also uses a stronger chassis and a more durable accelerometer package. Other features also included are a real time clock which enables vibration, shock and rotation data to be reported and/or logged in real time, and a set of absolute and resettable counters to monitor and record operating hours and maintenance intervals.

The Model 760 contains 3-axis fluxgate magnetometer and 3-axis accelerometer packages, both calibrated to operate up to 150°C. The combination of these two sensor systems enables the toolface, inclination and azimuth angles of the 760 reference frame to be determined with an accuracy of  $\pm 0.1^\circ$  for inclination and  $\pm 0.3^\circ$  for azimuth through the entire operating temperature range of the system.

The Model 760 is capable of transmitting instrument temperature and either the magnetometer and accelerometer outputs or the system orientation angles. The maximum transmission rate is 3 times per second for the magnetometer and the accelerometer outputs and 2 times per second for the orientation angles.



The Model 760 communicates over a serial bidirectional TTL interface. The serial-in and serial-out lines operate at TTL/CMOS levels and are normally set to operate at 9600 baud with one stop bit and no parity. The user can change the baud rate, as well as other user-definable settings, using the Directional Sensor Configuration Utility.

Two communication protocols are available, ASCII and binary:

- The ASCII protocol sends ASCII characters to the 760 to obtain data. The data returned by the Model 760 is transmitted as an ASCII data stream, complete with returns and line feeds, so that it can be easily displayed on a video terminal (provided a TTL to RS-232 conversion is made by the user).
- The binary protocol is used for high speed computer to computer interchange. In this case, one byte is sent to request data. The Model 760 then responds with a multibyte data packet containing the desired data plus header and checksum.

The Model 760 can also be configured to continuously send data in ASCII or binary protocol upon power-up.

The 760 system is also available with an extended reach option, which includes an internal modem to enable communication of the data output over a single conductor (plus ground) wireline.

# Model 760

Directional Sensor



Applied Physics  
Systems

PHYSICAL	
Outside Diameter (OD)	1.25" (31.75 mm)
Length	16.66" (423 mm)
Weight	1.4 lb (635 grams)
Main Connector	MDM9SH003P (ITT Cannon)
Mating Connector	MDM9PH003L (ITT Cannon)
ELECTRICAL	
Input Voltage Range	+12 V to +36 V
Current Draw	63 mA @ 15 V, 35 mA @ 28 V
Logic Level	TTL/CMOS
Baud Rate	User Programmable up to 38400 baud
Protocol	User Selectable: ASCII or binary
Logging Size	4 megabytes
ENVIRONMENTAL	
Operating Temperature Range	0°C to 150°C
Storage Temperature Range	-55°C to +160°C
Shock	1000 G 1 ms half sine wave
Rotation Measurement Range	0 to 400 RPM
Vibration	10 G RMS random 50 Hz to 500 Hz
PERFORMANCE	
Toolface (Roll) Accuracy	±0.3°
Azimuth Accuracy	See table below.

AZIMUTH ACCURACY AT 90° INCLINATION	
0 RPM	±0.3°
60 RPM	±0.9°
120 RPM	±1.5°
150 RPM	±3.0°
300 RPM	±5.0°

INCLINATION ACCURACY			
	At 90° Inclination	At 45° Inclination	At 20° Inclination
0 RPM	±0.1°	±0.1°	±0.1°
60 RPM	±0.1°	±0.1°	±0.1°
120 RPM	±0.1°	±0.4°	±0.5°
150 RPM	±0.2°	±0.8°	±1.0°

Specifications are subject to change without notice.