

# MODEL 750

## DIRECTIONAL SENSOR

### FEATURES

- Small size: 1.25" OD and 15" long
- Static survey measurement sensor
- High accuracy:  $\pm 0.1^\circ$  for inclination,  $\pm 0.3^\circ$  for azimuth
- Digital serial input/output

### APPLICATIONS

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

The Applied Physics Systems Model 750 Directional Sensor is our flagship survey instrument that enables high accuracy measurement of the toolface (roll), inclination, and azimuth orientation angles in borehole logging and drilling applications. Because of its small size, it is particularly well suited for use with completion systems.

The Model 750 contains 3-axis fluxgate magnetometer and 3-axis accelerometer packages, both are temperature calibrated to operate through the entire operating temperature range of the system. The combination of these two sensor systems enables determination of the toolface, inclination, and azimuth angles of the directional sensor.

The Model 750 transmits the instrument temperature along with magnetometer and accelerometer outputs or the system can provide data in orientation angles. The maximum transmission rate is 3 times per second for magnetometer and accelerometer outputs and 2 times per second for orientation angles.

The Model 750 communicates over a serial bidirectional TTL interface. The serial-in and serial-out lines operate at TTL 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:

- With the ASCII protocol, the data returned by the Model 750 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 sensor to computer interchange. In this case, two bytes are sent to request data. The Model 750 then responds with a multibyte data packet containing the desired data plus header and checksum.

The Model 750 can also be configured to either end data when queried or can be run in an "autosend" mode that continuously sends data in ASCII or binary protocol upon power-up.

The Model 750 system is also available in multiple different configurations with some versions including an internal modem to enable communication via wireline for applications involving logging or Horizontal Directional Drilling (HDD).

#### Related Products

- 750 (optional internal modem for extended reach)
- 750HT High temperature
- 750PB Pressure barrel

**ELECTRICAL**

Input Voltage Range	+12 V to +36 V
Current Draw	63 mA @ 15 V, 35 mA @ 28 V
Power Requirement (max)	1 W
Logic Level	TTL
Baud Rate	User Programmable up to 38400 baud (default 9600 baud)
Protocol	User Selectable: ASCII or binary
Extended Reach Modem Voltage	2025 to 2225 Hz @ 300 baud 1 to 4 V peak to peak on top of input voltage

**ENVIRONMENTAL**

Operating Temperature Range	0°C to +150°C (Model 750) 0°C to +175°C (Model 750HT)
Storage Temperature Range	-55°C to +160°C
Shock	1000 G 1 ms half sine wave
Vibration	10 G RMS random 50 Hz to 500 Hz

**PERFORMANCE**

Azimuth Accuracy (@ n° inclination)	±0.3° @ 90° ±1.0° @ 10° ±2.0° @ 5°
Inclination Accuracy	±0.1°
Offset versus Temperature	< 5 nT/°C (<0.05 mG)
Linearity	±0.1% full-scale

**PHYSICAL**

Outside Diameter (OD)	1.25" (31.75 mm)
Length	15.0" (4381 mm)
Weight	1.4 lb (635 grams)
Main Connector	MDM9SH003P (ITT Cannon)
Mating Connector	MDM9PH003L (ITT Cannon)

*Specifications are subject to change without notice.*