MODEL 1150
DIRECTIONAL SENSOR

FEATURES

- High accuracy: ±0.1° for inclination, ±0.3° for azimuth
- Digital serial input/output
- Small size: 1.36" (35mm) OD and 29.2" (742 mm) long
- Temperature compensated up to 150°C

APPLICATIONS

- Drop-in replacement for Legacy q-bus based Directional Instruments
- EM and Mud Pulse based MWD systems
- Directional Drilling
- Borehole Logging

The Applied Physics Systems Model 1150 Directional Sensor enables high accuracy measurement of the toolface (roll), inclination, and azimuth orientation angles in borehole logging and drilling applications. The unit is a direct replacement for legacy directional sensors that utilize q-bus communications protocol.

The Model 1150 sensor contains both a 3-axis flugate magnetometer and a 3-axis accelerometer. The combination of these two sensor systems enables determination of the toolface, inclination, and azimuth angles of the Model 1150 reference frame. The toolface and inclination angles are calculated from the accelerometer sensor outputs. The magnetometer sensor outputs are used to calculate the system azimuth angle.

To maintain high accuracy over the temperature range of the system, the sensors are temperature compensated. This enables an accuracy of ±0.1° for toolface and inclination and an accuracy of ±0.3° for azimuth to be achieved over the full temperature range of the system.

In addition to A-to-D and flash memory interfaces, the Model 1150 has a digital serial interface. This interface transmits either the magnetometer and accelerometer outputs or the system orientation angles.

Two communication protocols are available, ASCII and binary:

- With the ASCII protocol, the data returned by the Model 1150 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 1150 then responds with a multibyte data packet containing the desired data plus header and checksum.

The Model 1150 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 1150 system is also available in multiple different configurations with custom end caps and electrical interface configurations available.

APPLIED PHYSICS
OIL & GAS

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ELECTRICAL

Input Voltage Range	+12 V to +30 V
Current Draw	40 mA @ +15 V, 40 mA @ -15 V
Power Requirement (max)	1 W
Logic Level	TTL
Baud Rate	User Programmable up to 9600 baud

ENVIRONMENTAL

Operating Temperature Range	-20°C to +150°C
Storage Temperature Range	-55°C to +160°C
Shock	1000 G 1 ms half sine wave
Vibration	20 G RMS random 50 Hz to 500 Hz

PERFORMANCE

Azimuth Accuracy (@ n° inclination)	±0.3°
Inclination Accuracy	±0.1°

PHYSICAL

Outside Diameter (OD)	1.36" (35 mm)
Length	29.2" (742 mm)
Weight	1.5 lb (681 g)
Main Connector	MDM9SH003P (ITT Cannon)
Mating Connector	MDM9PH003L (ITT Cannon)

Specifications are subject to change without notice.