



Features

- Digital interface
- High sensitivity crystal — Photomultiplier tube design
- Rugged design for use in high shock and vibration environments
- Axial and transverse 50 Gee accelerometers for vibration monitoring

Applications

- Evaluation of downhole strata in drilling and logging applications
- Evaluation of downhole vibration and shock magnitudes

The Model 851 Natural Gamma Sensor measures the background gamma radiation occurring in well bores. The sensor detects the presence of porous petroleum reservoirs (for example, sands and limestones), which are generally less radioactive than nonporous strata (such as shales).

The Model 851 gamma sensor can be used as either a standalone system or in conjunction with Model 850 directional sensors:

- When used as a standalone system, communication with the Model 851 gamma sensor is by means of a bi-directional serial port operating at TTL logic levels. An ASCII command language is used to send commands to the Model 851 and data from the Model 851 is sent out in ASCII format.
- When the Model 851 is used in conjunction with a Model 850 directional sensor, a NET interface is used for communication. For the NET configuration, data from the Model 851 gamma sensor is continually requested by the Model 850 directional sensor and is combined with directional data and transmitted out the Model 850 main serial data interface.

To achieve high gamma sensitivity, a .75-inch diameter by 6-inch long scintillation crystal is used to detect gamma rays. The sensitivity (in a 1-7/8" beryllium copper pressure barrel) is .5 count per API.

The 851 sensor also has two 50 Gee vibration sensors to monitor drilling-induced vibration and shock. The vibration sensors are oriented to measure axial and lateral shock and vibration.



Model 851

Narrow Diameter Natural Gamma Sensor



Applied Physics
Systems



PHYSICAL	
Outside Diameter (O.D.)	1.040" (26.4 mm)
Length	17.185" (436.5 mm) with standard connectors
Weight	1.1 lbs (499 g)
Scintillation Crystal	0.9" dia. (22.86 mm) and 5.55" (140.9 mm) in length, mounted in a Stainless Steel Case
Photomultiplier Tube	Hamamatsu
Main Connector	MDM9PH003P (ITT Cannon)
Mating Connector	MDM9SH003L (ITT Cannon)

ELECTRICAL	
Input Voltage Range	+15 V to +30 V
Current Draw	90 mA @ 15 V, 45 mA @ 30 V
Logic Level	TTL / CMOS
Baud Rate	User Programmable up to 9600 Baud
Protocol	User Selectable, ASCII or Binary

ENVIRONMENTAL PERFORMANCE	
Shock	1000 g 1 ms half sine wave
Vibration	10 g rms, 50 - 250Hz
Accuracy	±0.5%
Thin-Bed Resolution	6" (152.4 mm), in 8" (203.2 mm) diameter hole
Operating Temperature Range	0 °C to 150°C
Storage Temperature Range	-25°C to +175° C

Specifications within this document are subject to change without notice.