

Features

- Digital interface
- High sensitivity crystal — Photomultiplier tube design
- Rugged design for use in high shock and vibration environments
- Axial and transverse 50 G 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 is designed to measure the background gamma radiation occurring in well bores. The sensor is used to detect the presence of porous petroleum reservoirs (e.g., sands and limestones), which are generally less radioactive than nonporous strata (e.g., shales).

The 851 sensor can be used as either a standalone system or in conjunction with the Model 850 or other Applied Physics directional sensors. Communication with the 851 is by means of a bi-directional TTL serial port.

To achieve high gamma sensitivity, a .75 inch diameter by 3 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 that can be used 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	17.375" (441.3 mm)
Weight	1.5 lbs (681 g)
Scintillation Crystal	1" dia. x 5" long, in Stainless Steel case
Photomultiplier Tube	Hamamatsu Model R3991A-27

TEMPERATURE RANGE

Operating Temperature Range	0 °C to 150°C
Storage Temperature Range	-25°C to +160° C

POWER

Input Voltage Range	+15V to +30V
Current Draw	40 ma @ 15V, 20 ma @ 30V

DIGITAL INTERFACE

Logic Level	TTL / CMOS
Baud Rate	User Programmable up to 9600 Baud
Protocol	User Selectable, ASCII or Binary

ENVIRONMENTAL PERFORMANCE

Shock	1000 G 1ms half sine wave
Vibration	10G rms, 50 - 250Hz
Accuracy	±0.5%
Thin-Bed Resolution	6" (236 mm), in 8" diameter hole

CONNECTORS

Main Connector	MDM9SH003P (ITT Cannon)
Mating Connector	MDM9PH003L (ITT Cannon)