

# MODEL 751

## NATURAL GAMMA SENSOR

### 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

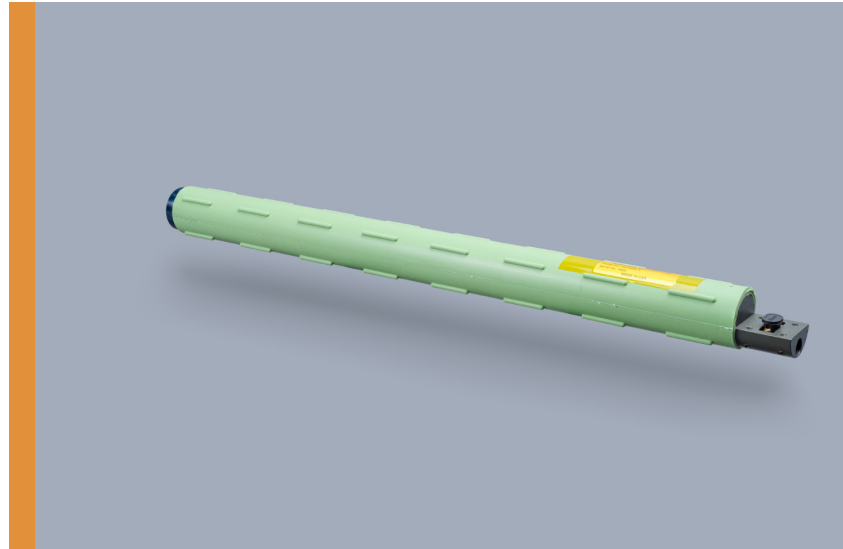
- Evaluation of downhole strata in drilling and logging applications
- Evaluation of downhole vibration and shock magnitudes

The Applied Physics Systems Model 751 Natural Gamma Sensor measures the background gamma radiation occurring in well bores. The sensor detects the presence of porous petroleum reservoirs (sands and limestones), which are generally less radioactive than nonporous strata (shales).

The Model 751 can be used either as a standalone system or with the Model 760 or Model 760 Directional Sensors. Communication with the Model 751 is accomplished using a bidirectional TTL serial port. To achieve high gamma sensitivity, a scintillation crystal is used to detect gamma rays.

The sensors are calibrated to the American Petroleum Index (API) and temperature calibrated to ensure that it is accurate throughout the range.

The Model 751 also has a two-axis 50 gee vibration sensor to monitor drilling induced vibration and shock. The vibration sensor is oriented to measure axial and lateral shock and vibration.



Two communication protocols are available over a bidirectional serial data link to the surface: ASCII and binary at up to 9600 baud. An ASCII data stream can be easily displayed with a terminal program while binary is used for high speed sensor to host interchange.

#### Related Products (others available)

**Model 751** Standard

**Model 751F** Focused Gamma Sensor with Vibration and Shock Detection

**Model 751AZ** Azimuthal Gamma Sensor with Vibration and Shock Detection

**Model 851** Narrow Diameter Gamma Sensor with Vibration and Shock Detection

**ELECTRICAL**

Input Voltage Range	+15 V to +30 V
Current Draw	90 mA @ 15 V 45 mA @ 30 V
Power Requirements	1.5 W (max)
Logic Level	TTL
Baud Rate	User Programmable up to 9600 baud
Protocol	User Selectable: ASCII or binary

**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
Vibration	10 G RMS random 50 Hz to 500 Hz

**PERFORMANCE**

Accuracy	±5°
Thin Bed Resolution	6" (152.4 mm) in an 8" (203.2 mm) diameter hole
Range	0 - 511 API counts/second (30 second intervals)
Vibration and Shock Detection	2 axis ± 50 gee 400 Hz

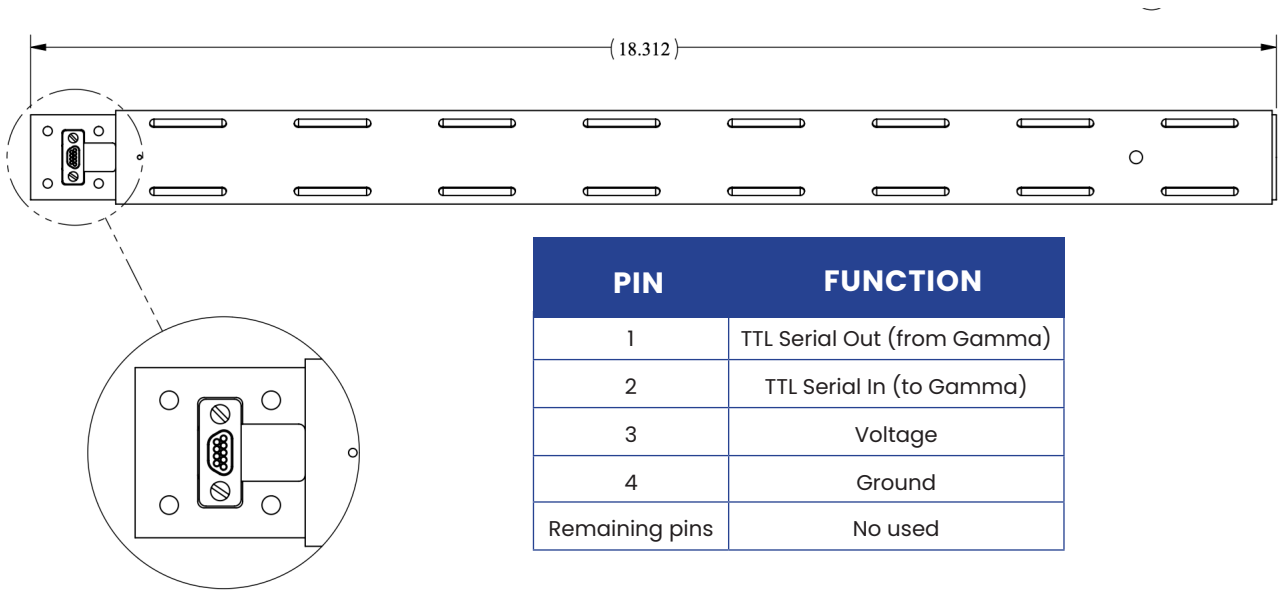
**PHYSICAL**

Outside Diameter (OD)	1.25" (31.75 mm)
Length	18.312" (465.12 mm) with standard connectors
Weight	1.95 lb (884.50 grams)
Photomultiplier Tube	Hamamatsu Model 3991A
Main Connector	MDM9
Mating Connector	MDM9

**OPERATIONAL GUIDANCE****SHOCK AND VIBRATION LEVELS**

LEVEL	SHOCK	VIBRATION
GREEN	< 17 g	< 4 g
YELLOW	17 to <26 g	4 to <6 g
ORANGE	26 to <36 g	6 to <5 g
RED	+35 g	+ 8 g

*Specifications are subject to change without notice.*



PIN	FUNCTION
1	TTL Serial Out (from Gamma)
2	TTL Serial In (to Gamma)
3	Voltage
4	Ground
Remaining pins	No used