



Features

- Digital interface
- High sensitivity crystal
- Photomultiplier tube design
- Two gamma outputs
 - API calibrated count pulse output
 - Q-Bus Output using GV0 (General Variable Zero)
- Extensive vibration statistics output
- Available using GV0 – 7

Applications

- Evaluate downhole strata when drilling and logging
- Evaluate downhole vibration and shock magnitudes
- Function in high shock and vibration environments
- Laboratory measurements
- Materials testing



The Applied Physics Systems Model 1151 Natural Gamma Sensor measures the background gamma radiation occurring in well bores. This sensor detects the presence of porous petroleum reservoirs (sands and limestones), which are generally less radioactive than nonporous strata (shales).

The 1151 can be used as either a stand alone system or together with the Model 1150 Directional Sensor. To achieve high gamma sensitivity, a 1-inch diameter by 5.75 inch long scintillation crystal is used to detect gamma rays.

The Model 1151 has two gamma outputs:

- TTL Level negative going count pulse
- Q-bus output (counts per second) using the general variable (GV0). The count output is generated by the system microprocessor, enabling this output to be API calibrated.

One advantage of using the Q-bus to collect gamma data is that it avoids using the gamma count pulse channel, which is sometimes subject to noise (for example, from the pulse line in Tensor MWD Systems), resulting in high erroneous count rates. The 1151 vibration data is collected at 200 samples/second over 20 seconds (total of 4000 samples) and is analyzed to produce the following Q-bus data using general variables GV0 - GV7:

- GV0: Gamma
- GV2 and GV5: Axial and transverse highest bin number (1 – 5) with greater than 5% of counts
- GV3 and GV6: Axial and transverse maximum vibration measurement during the sampling period
- GV7: Temp °C

The 1151 Sensor also has a digital serial COM interface (TTL level) that can be used to retrieve gamma and vibration data. This interface can be configured to respond to external commands requesting data or can be configured to auto send data. Both binary and ASCII data transfer protocols can be used to retrieve data from the digital serial interface.

Model 1151

Natural Gamma Vibration Sensor



Applied Physics
Systems



PHYSICAL

Outside Diameter (OD)	1.250" (31.75 mm)
Length	18.36" (466.34 mm) (without mating connectors)
Weight	1.5 lb (681 grams)
Scintillation Crystal	1" diameter (25.4 mm) x 5.75" (146.05 mm) long in a stainless steel case
Photomultiplier Tube	Hamamatsu
Main Connector	MDM9SH003P (ITT Cannon) or Kentec 10 pin
Mating Connector	MDM9PH003L (ITT Cannon) or Kentec 10 pin

ELECTRICAL

Input Voltage Range	+15 V to +30 V
Current Draw	40 mA @ +15 V, 20 mA @ +30 V
Logic Level	TTL/CMOS
Baud Rate	User programmable up to 9600 baud
Protocol	User selectable: ASCII or binary
Count Interface	Pulse, ~1 microsecond long at gamma count - TTL 5 V to 0 V

ENVIRONMENTAL PERFORMANCE

Shock	1000 g 1ms half sine wave
Vibration	10 g rms, 50 Hz to 250 Hz
Accuracy	±5%
Thin Bed Resolution	6" (152.4 mm) in an 8" (203.2 mm) diameter hole
Sensitivity	1 Count per API (in a 1.875" Beryllium Copper pressure barrel, user calibratable)
Operating Temperature Range	0°C to 150°C
Storage Temperature Range	-25°C to +160° C

Specifications are subject to change without notice.