



EASTERN DRILLING SERVICES

MWD Gamma Sensor

The gamma sensor employs a rugged scintillation counter and photomultiplier mounted in a specially-designed package which provides protection against the high levels of shock and vibration encountered in the drilling environment. Natural gamma ray sensor module is an add-on to our Measurement-While-Drilling (MWD) system. The gamma sensor is calibrated to API-standard units, and a well site check source is available to verify tool performance in the field or maintenance repair shop. The easy-to-use surface system scales natural gamma ray data to API units; corrects for borehole size, mud weight and drill collar effects; assigns each point a depth from the depth tracking system; and plots both real-time displays and configurable hard copy logs. Data can be exported in standard industry formats (WITS and LAS). The MWD downhole system can be programmed to send a combination of gamma ray and tool face data transmissions to allow logging while steering and sliding. A rotation sensor in the directional package enables the tool to optionally transmit only gamma ray data while rotating.

MWD Gamma Ray Features

Features	Advantages	Benefits
Modular addition to MWD system	Gamma ray service can be easily added	Reduced inventory cost and service flexibility
Ruggedized industry-standard design	Reliable	Low cost of maintenance
Calibrated to the API Standard	Direct correlation to wireline logs using API units	Improved geologic correlation
Electronic data export and import	Gamma ray and other log data can be shared with other packages or transmitted to	Services can be easily integrated with other wellsite services and data can be transmitted to decision makers quickly
Depth tracking using depth tracking system, WITS-based rig site or 3rd-party system	MWD system is flexible and can receive depth from various WITS-based systems	Depth tracking hardware usually not needed on rigs with a 3rd-party, WITS-based depth system
Standard module	Same module used in BHAs for 3.5 to 8 in. (89 to 203 mm) and larger collar sizes	Reduced inventory cost and service flexibility



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MWD Gamma Ray Specifications

Physical Parameters	
Length	46 in. 117 cm
Outside Diameter	1.875 in. 48 mm
Measurements	
Measurement Range, Accuracy, (Apparent API Units)	API-calibrated 0 - 800 API; ± 0.16 API, (based on typical API corr. factor of 1.35 API counts/sec)
Vertical Resolution	6 in. 152 mm
Max. Data Sampling	Every 5 sec
Update Resolution	2.5 to 3.5 points/ft at 50 ft/hr;
(real time)	0.8 to 1.2 points/ft at 150 ft/hr
Memory	2 MB / 8 MB
Environmental	
Operating Temperature	0° to 347°F 0° to 175°C
Pressure	20,000 psi 137.9 MPa
Shock	500 g, 1 ms, 5,000 shocks per axis
Vibration	25 g RMS, 20 - 500 Hz bandwidth