

Azimuthal Gamma Module

The Azimuthal Gamma Module delivers performance and results comparable to collar-based systems while realizing all the benefits in handling, set up, maintenance and cost-effectiveness of a probe based system. The result is a system which allows confident, high-accuracy geosteering and well positioning decision making, all achieved for a fraction of the cost of comparable systems.

Features and Benefits

Market Leading Azimuthal Gamma Resolution

By deploying a large crystal with the best-in-class sensor technology the Azimuthal Gamma module realizes accuracy and resolution that is normally the preserve of high-cost collar based systems. On-board, high definition, high sampling frequency directional sensors ensure true 16-sector image clarity under even the most severe rotary dysfunction.

Industry Defining Rock Strength Measurements

A complex suite of high frequency physical measurements is passed through a set of proprietary algorithms providing rock strength measurements which define true at-bit formation characteristics. The enhanced perception of at-bit formation, both up and down, provides unrivaled geosteering foresight.

Robust Architecture

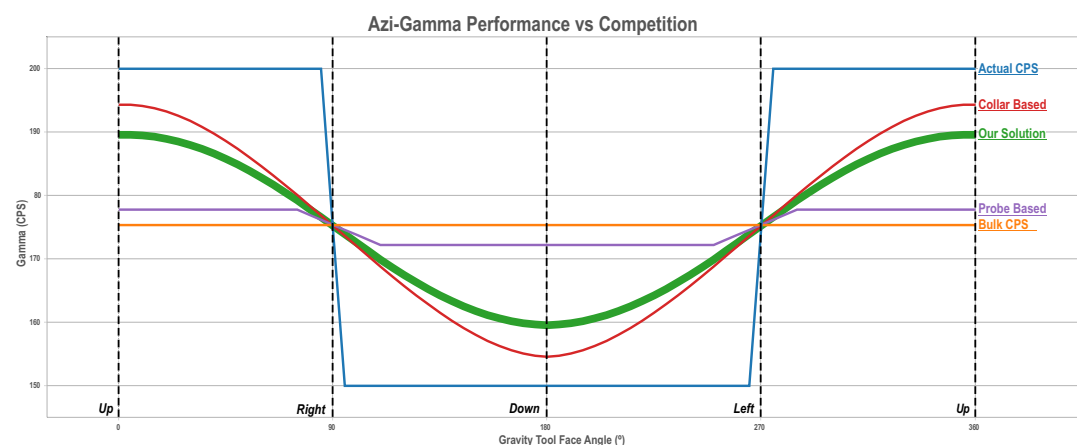
Employing advanced mounting technology to protect the market leading electronics allows continuous operation in the harshest of drilling environments, with 347 °F/ 175 °C operating temperature as a non-price premium standard.

Tensor Elite Compatibility

The Azimuthal Gamma is the module is fully integrated with all offerings in the Tensor Elite platform allowing connectivity to Tensor Elite MWD and Centerfire LWD.

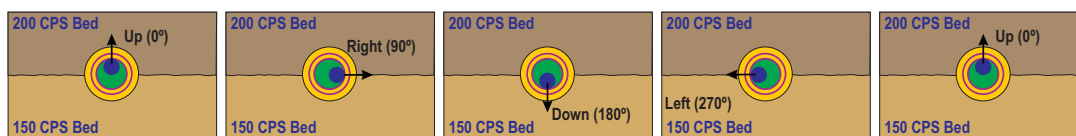
Easily Serviceable

The system has been designed to enable easy service, test and calibration. Service turnaround in less than a day drives effective fleet utilization and so maximizes return on investment.



Traditional probe based tools severely compromise resolution to deliver a pseudo azimuthal response. The market leading sensor technology employed in the Azimuthal Gamma Module delivers resolution and accuracy directly comparable to collar based tools allowing the real application of geosteering and earlier, more reliable decisions to be made.

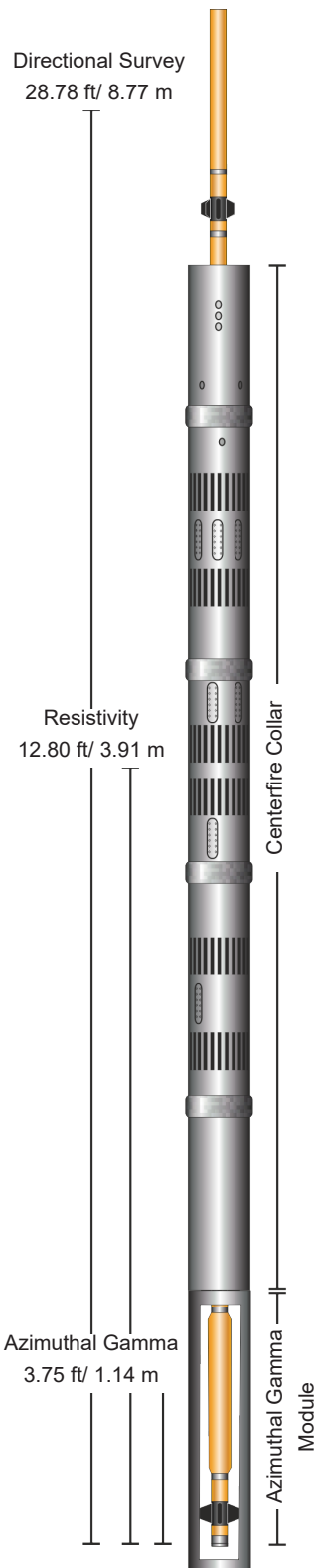
Tool Face Positions



Azimuthal Gamma Module - Specifications

Specifications		
Natural Gamma Ray		
Parameter	Specification	
Range	0 - 900 API	
Accuracy	2 % (0 - 150 °C) 5 % (150 - 175 °C)	
Bed Resolution, Vertical Hole	6 in. @ 180 ft/hr 12 in. @ 360 ft/hr	
Azimuthal Gamma Ray		
Imaging Sectors	Real Time: 4 Memory: 16	
Bed Resolution, Lateral Hole	20 API	
Resolution of Dip Angle	0.01°	
Max. Stick-Slip Tolerance	3 SSI	
Max. Rotary Speed	360 RPM	
Max. Rate of Penetration	360 ft/hr	
Environmental		
Max. Operating Temperature	175 °C/ 347 °F	
Max. Operating Pressure	20,000 psi	
Max. Sand Content	2%	
Max. Shock	500 g, 0.5 ms pulse width	
Max. Vibration	20 grms, 5-500 Hz	
Mechanical		
Bore ID	4.75 in/ 120 mm	3.25 in/ 82 mm
	6.75 in/ 172 mm	3.75 in/ 92 mm
	8.25 in/ 209 mm	4.00 in/ 102 mm
Max. Flow Rate	4.75 in/ 120 mm	375 usgpm/ 1,420 lpm
	6.75 in/ 172 mm	750 usgpm/ 2,840 lpm
	8.25 in/ 209 mm	1,200 usgpm/ 4,540 lpm
Electrical		
Voltage Operating Range	17 - 36 VDC	
Max. Current	35 mA @ 175 °C	
Max. Logging Memory	500 hours	

Centerfire LWD Configuration



Tensor Elite MWD Configuration

