

Memory-Only Centerfire LWD

The Memory-Only Centerfire LWD system from Black Diamond sets a new benchmark for high-temperature, resistivity memory logging. Engineered for accuracy and reliability in the harshest environments, it is available in 4.75", 6.91", and 8.25" configurations – each delivering eight borehole-compensated resistivity datasets with integrated gamma capability and a 175 °C standard temperature rating. Centerfire LWD thrives where others fail – in deep, hot, and demanding drilling environments.

Centerfire LWD is a proven system, with hundreds of collars deployed globally in both real-time and memory-only operations. It's recognized for the unmatched reliability and stability of its measurements, and for a robust architecture that consistently excels under extreme downhole conditions. Designed for performance, the system helps operators of all sizes unlock new, lucrative, resistivity markets – including geothermal and high-temperature drilling – with confidence. Supported by Black Diamond's best-in-class service and technical expertise, users can count on Centerfire LWD for continued success, even in the most challenging wells.

Every Centerfire LWD tool is fully assembled, tested, and calibrated in the workshop before deployment, eliminating the risks associated with rigsite assembly and ensuring dependable operation from the first run. With a standard 10-second recording interval, it captures up to 250 hours of high-fidelity data, powered by dual batteries for 220 hours – expandable with a third for extended performance.

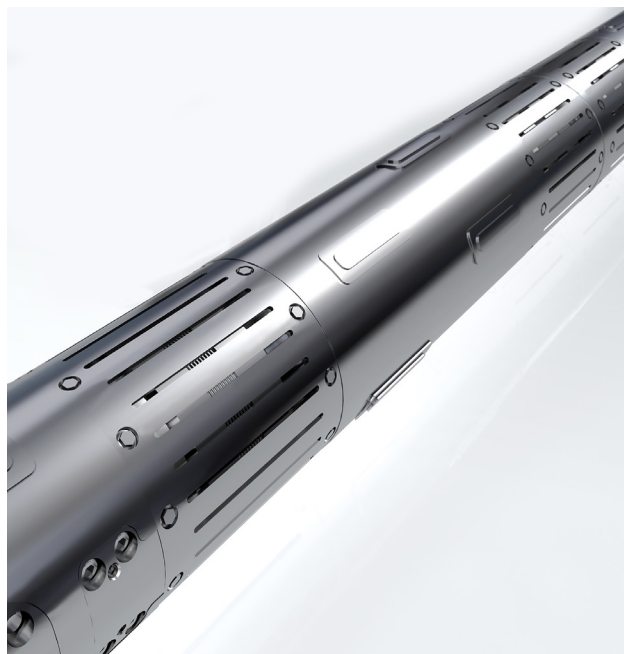
Features and Benefits

Leading Resistivity Measurement Accuracy

- 8 borehole compensated measurements - 19 & 41 in., 400 kHz & 2 MHz, Phase Difference & Attenuation
- Deep-reading 41 in. 400 kHz measurements ideal for geosteering
- 2 MHz measurements offer excellent vertical resolution for thin bed identification

Minimal Rigsite Handling

- Assembled in workshop and shipped as single, collar mounted system
- Rigsite operator error risk mitigated by limiting handling requirements to power control and memory setup/ download
- Single assembly lifted from deck and made to BHA, minimizing impact on rig operations



Smart Power Control

- Powered down when shipped or on standby
- Power switched on by installing Spearpoint
- 2 standard batteries support 220+ hours of operation. 3rd battery can be run if needed.

Simple Data Processing

- Downloaded raw data transformed to time-indexed LAS file within 5 minutes
- 8 x compensated resistivity and gamma data sets
- Automatic environmental corrections
- LAS file can be read by any standard logging package to merge with depth

Proven Robust Architecture

- 175 °C as standard
- Collar design proven by 200+ tools operated globally
- Trusted Black Diamond Rotary Connectors between all modules



Memory-Only Centerfire LWD Specifications

Technical Specifications			
Nominal OD	4.75 in.	6.91 in.	8.25 in.
Tool OD (antennas / wearbands)	5.0 in. / 5.25 in.	6.91 in. / 7.16 in.	8.25 in. / 8.5 in.
Centerfire Collar Length ¹	14.5 ft (174 in.)	14.5 ft (174 in.)	15.16 ft (182 in.)
Battery Module Length	67.7 in.		
Gamma Module Length	47.6 in.	47.6 in.	N/A Internal Sensor
Assembly Length ²	29.9 ft	29.9 ft	26.5 ft
Max. Dogleg Rotation	12°/ 100 ft	8°/ 100 ft	7°/ 100 ft
Max. Dogleg Sliding	25°/ 100 ft	17°/ 100 ft	14°/ 100 ft
Measurement Offset from Bottom of Centerfire Collar	Resistivity	6.08 ft	6.08 ft
	Gamma	-1.9 ft ³	-1.9 ft ³
Max. Pressure	20,000 psi	Max. Temperature	175 °C/ 347 °F
Memory Capacity	14 MB (250 hrs @ 10 second update)		

¹ New collar, before any re-cuts

² Spearpoint, 2 x Battery, Centerfire and Gamma functionality

³ Gamma Module run below the 4.75 and 6.91 in. Centerfire collars

Sensor Specifications					
	Freq.	Spacing	Range	Accuracy	DOI*
Phase Difference	2 MHz	41 in.	0.1 to 2,000 ohm-m	+/- 2% (0.1 to 20 ohm-m) +/- 1 mmho/m (>20 ohm-m)	49 in.
		19 in.	0.1 to 1,000 ohm-m	+/- 1% (0.1 to 10 ohm-m) +/- 1 mmho/m (>10 ohm-m)	32 in.
	400 kHz	41 in.	0.1 to 500 ohm-m	+/- 2% (0.1 to 10 ohm-m) +/- 2.0 mmho/m (>10 ohm-m)	66 in.
		19 in.	0.1 to 250 ohm-m	+/- 3% (0.1 to 5 ohm-m) +/- 6 mmho/m (>5 ohm-m)	42 in.
Attenuation	2 MHz	41 in.	0.1 to 50 ohm-m	+/- 5% (0.1 to 16 ohm-m) +/- 3 mmho/m (>16 ohm-m)	71 in.
		19 in.	0.1 to 50 ohm-m	+/- 5% (0.1 to 8 ohm-m) +/- 6 mmho/m (>8 ohm-m)	47 in.
	400 kHz	41 in.	0.1 to 10 ohm-m	+/- 3% (0.1 to 3 ohm-m) +/- 10 mmho/m (>3 ohm-m)	104 in.
		19 in.	0.1 to 10 ohm-m	+/- 5% (0.1 to 3 ohm-m) +/- 15 mmho/m (>3 ohm-m)	73 in.
Vertical Resolution (Resistivity)			6 in. in conductive beds < 10 ohm-m		
Gamma			0-1023 API	+/- 3%	12 In.

*Diameter of Investigation - Radial diameter, centered on the tool axis, at which the Integrated Geometric Factor is 50%. Data presented relates to a modeled formation with $R_t = 10$ ohm-m and $R_{xo} = 1$ ohm-m

