

xBolt

Accelerated drilling service

APPLICATIONS

- Performance drilling
- Pad and batch drilling operations
- Horizontal wells with long lateral sections

BENEFITS

- Drives drilling performance, efficiency, and well construction effectiveness
- Delivers best-in-class data transmission rates through dual telemetry, electromagnetic (EM), or mud pulse configurations
- Optimizes reservoir delivery with maximum in-zone exposure
- Decreases flat time and unwanted trips
- Transmits data reliably, even during heavy lost circulation material (LCM) pumping (EM and dual-telemetry configurations)

FEATURES

- Three distinct telemetry configurations: dual telemetry, EM, and mud pulse
- High-density data transmission rates
 - Up to 16 bits/s with EM telemetry
 - Up to 4 bits/s with mud pulse telemetry
- Expands mud pulse operating window to 330 degF [165 degC]
- Multiple real-time measurement capabilities
 - High-resolution azimuthal image gamma ray
 - Shock and vibration
 - Stick/slip
- Novel electronics packaging increases reliability by reducing the impact of downhole vibration and temperature
- Offline surveying when EM telemetry is enabled
- Six-axis survey with optional lateral and TVD survey optimization
- Real-time LWD communication available

The xBolt* accelerated drilling service is designed to maximize drilling efficiency through robust reliability and high-speed communication rates, enabling operators to deliver wells faster while positioning the wellbore accurately within the reservoir.

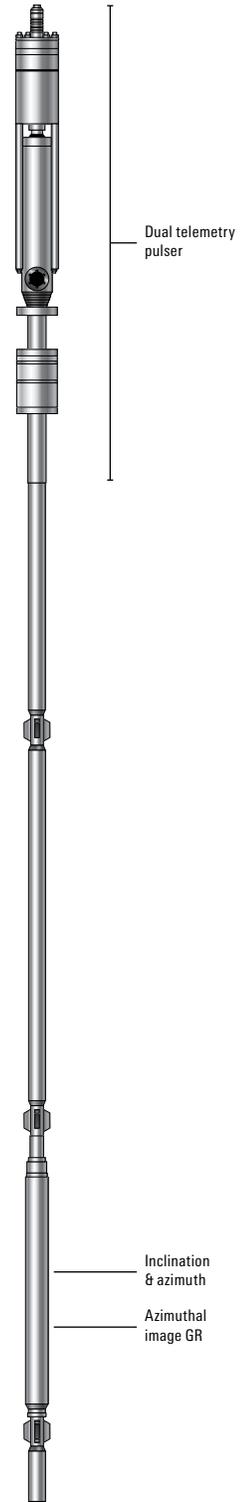
The xBolt service is available in three configurations to provide multiple data transmission options in a single collar. Operators can leverage high-speed EM telemetry in signal-friendly zones, robust mud pulse telemetry at deeper intervals, or either mode in a dual-telemetry configuration. Switching between telemetry modes is accomplished in less than a minute, avoiding costly trips out of hole and lost rig time.

The fit-for-purpose multitelemetry service provides superior demodulation rates to completely eliminate surveying time when EM telemetry is deployed, achieving data transmission rates up to 16 bits/s. The EM telemetry configuration takes surveys offline during connections, contains no moving parts, and withstands high LCM concentrations without jamming. In the mud pulse telemetry configuration, the multitelemetry service enables surveying speeds up to four times faster than conventional methods through increased data transmission rates up to 4 bits/s. The dual-telemetry configuration provides full flexibility throughout drilling by providing ultrafast EM telemetry speeds when possible and reliably accurate mud pulse telemetry transmission at deeper depths—all without the need to trip out of hole.

In addition to the multitelemetry capabilities, the xBolt service features novel electronics component packaging with nitrogen-purged probes enabling reliable operation in temperatures up to 330 degF. The electronics package leverages advanced self-testing and diagnostics to facilitate the identification of issues within the electronics between runs, improving overall tool reliability.

The xBolt service uses total and azimuthal image gamma ray functionality to reveal bed crossings and boundaries, enabling confident geosteering decisions and subsurface model refinement while drilling. With better imaging, operators experience improved steering and minimized sliding for increased ROP and reduced well porposing, resulting in a smoother, less tortuous well profile. By revealing formation dips while drilling, the xBolt service enables increased footage per day and improved well placement accuracy.

In any of the multiple telemetry configurations, the service enables operators to experience both while-drilling efficiency gains and optimal future production.



xBolt Accelerated Drilling Service

Mechanical Specifications		Mud Pulse	EM	Dual Telemetry
Tool size	475	675	675	675
Length, ft	23.4	23.8	23.6	26.4
Maximum dogleg (rotating, slick), °	17	8	7.5	7.5
Maximum dogleg (rotating, flex), °	--	15	15	15
Maximum dogleg (sliding, slick), °	34	16	15	15
Maximum dogleg (sliding, flex), °	--	26	25	25
Maximum torque, ft.lbf	10,000	28,000	28,000	28,000
Maximum speed, rpm	250	250	250	250
Maximum temperature, degF [degC]	330 [165]	330 [165]	302 [150]	302 [150]
Maximum pressure, psi	20,000	20,000	20,000	20,000
Maximum flow rate, galUS/min	375	750	750	750
Direction and inclination distance from bottom, ft	7.5	7.41	8.15	8.14
Azimuthal gamma ray distance from bottom, ft	4.2	4.1	4.84	4.83
LCM tolerance, lbm/bbl	40	40	--	40 (mud pulser)

Telemetry

Maximum data transmission rate (EM), bits/s	16
Maximum data transmission rate (mud pulse), bits/s	4
Maximum data transmission rate (dual telemetry), bits/s	16 on EM, 4 on mud pulse
Downlink method, EM	EM downlink (7.5 bits/s)
Downlink method, mud pulse	RPM or flow
Downlink method, dual telemetry	EM, RPM or flow

Directional Sensor

Measurement	Accuracy	Resolution
Azimuth at inclination > 6, °	±1.0	0.1
Azimuth at inclination of 3, °	±2.0	0.1
Inclination, °	±0.15	0.1
Toolface at inclination > 6, °	±1.5	1.5
Toolface at inclination of 3, °	±3.0	1.5
Magnetic field strength (0.1–65 uT)	±0.2	0.1
Dip angle of -90–90, °	±0.3	0.1

Gamma Ray Sensor

Detector type	Nal scintillation
Measurement range	0–1,200 gAPI
Accuracy	Greater of 2 gAPI or 5%
Repeatability	5% [†]

[†]Repeatability in a standard 100-gAPI shale (2% potassium, 12 parts-per-million thorium, 6 parts-per-million uranium) with 18-s averaging.

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Schlumberger