

# TelePacer

## Modular MWD platform

### APPLICATIONS

- Continuous and real-time surveying
- Real-time well placement
- Well-to-well correlation
- Formation dip picking
- Drilling dynamics

### BENEFITS

- Reduces AFE costs
- Improves drilling performance
- Minimizes collision risk
- Maximizes in-zone exposure
- Eliminates wait time for data transmission
- Enables confident geosteering
- Improves completion quality

### FEATURES

- Survey: Six-axis survey, lateral survey optimization, TVD survey optimization, and gravity-based azimuth
- Measurement: Image, spectral, and total gamma ray
- Collar configuration: Single, split, and retrievable
- Stick/slip and three-axis shock and vibration monitoring

Designed for pad and factory drilling operations, the TelePacer\* modular MWD platform addresses the challenges of tight economics inherent to unconventional reservoirs. This platform reduces collision risk, and maximizes sweet-spot exposure with a configurable suite of measurements.

Standard offerings of this single-collar platform are mud pulse telemetry, six-axis survey measurements, continuous inclination, toolface, and monitoring of three-axis shock and vibration, stick/slip, and temperature.

### Survey services for increased certainty and reduced risk

Six-axis survey measurements reduce risk by increasing positional certainty with reliable data. To increase lateral and TVD certainty, survey optimization services can be added to provide wellbore separation assurance for achieving production objectives.

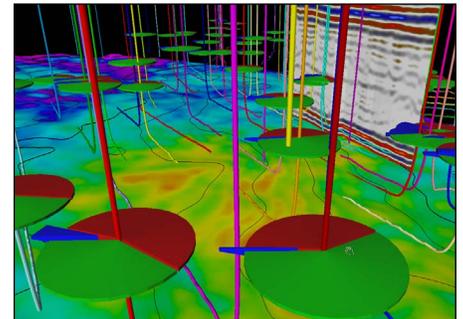
For casing exits and other situations with magnetic interference, gravity MWD provides a nonmagnetic azimuth measurement.

### Measurements for maximized drilling efficiency and sweet-spot exposure

Total, spectral, and image gamma ray (GR) measurements provide additional information for well placement and formation evaluation. These API-calibrated measurements are highly repeatable, and are transmitted with no impact to drilling efficiency using the TelePacer platform's Express configuration. Downhole rpm and shock and vibration monitoring allow rapid response to harmful drilling dynamics by adjusting drilling parameters for better drilling performance and risk mitigation.

Total GR measurements enable well steering and correlation by indicating radioactive content. When more advanced evaluation is needed, spectral GR provides insight into mineral composition and clay content to positively identify stratigraphic laminations, which are necessary for effective completion designs.

When in-zone steering is critical, the TelePacer platform can transmit real-time GR images, which reveal formation dips and enable confident geosteering decisions and subsurface model refinement while drilling.



*The TelePacer platform is ideal for high-intensity horizontal drilling campaigns.*

## Mud Pulse Telemetry Specifications

### General

Collar OD, in	9½	8 (high flow)	8 (low flow)	6¾	4¾
Tool length, ft [m]	30.13 [9.18]	30.26 [9.22]	30.26 [9.22]	30.26 [9.22]	29.92 [9.12]
Max. flow rate, galUS/min [m³/min]	1,500 [5.68]	1,500 [5.68]	900 [3.41]	750 [2.84]	375 [1.42]
Max. pressure drop in water, psi [kPa]	100 [689.4]	100 [689.4]	100 [689.4]	125 [861.8]	150 [1,034.2]

### Directional Sensor<sup>†</sup>

Measurement	Accuracy	Resolution
Azimuth (0° to 360°), °		
At inclination >6°	±1.0	0.1
At inclination of 3°	±2.0	0.1
Inclination (0° to 360°), °	±0.15	0.1
Toolface (0° to 360°), °		
At inclination >6°	±1.5	1.5
At inclination of 3°	±3.0	1.5
Magnetic field strength (0.1 to 65 uT)	±0.2	0.1
Dip angle range, -90° to 90°	±0.3	0.1

### Vibration Sensor

Measurement range, $g_n$ [m/s <sup>2</sup> ]	0 to 50 [0 to 490] (triaxial)
Frequency response, Hz	20 to 400

### Temperature Sensor

Measurement range, degF [degC]	-40 to 302 [-40 to 150]
Accuracy, degF [degC]	1.8 [1]
Resolution, degF [degC]	±3 [±1.7]

### Transmission Time<sup>‡</sup>

Pulse length, s	0.4	0.8
Static survey, s	40	80
Toolface, s	4.0	8.0
Gamma ray, s	4.4	8.8
Toolface and gamma ray, s	7.6	15.2

### Drilling Mechanics

Max. vibration, $g_n$ [m/s <sup>2</sup> ]	20 [200] (rms, random, 5 to 1,000 Hz)
Max. shock, $g_n$ [m/s <sup>2</sup> ]	500 [4,903.3]
Operating temperature range, degF [degC]	-40 to 350 [-40 to 175]
Max. working pressure, psi [MPa]	25,000 [172]
Mud sand content, %	1
Max. bit pressure drop	No limit

Note: To determine the feasibility and risks of using EM telemetry, prejob modeling is conducted as part of a Hazard Analysis and Risk Control process.

<sup>†</sup>Operational accuracy dependent on local geometric field.

<sup>‡</sup>Other data rates and transmission options available.

## Spectral Gamma Ray Sensor Specifications

Detector type	Nal scintillation
Measurement range, <sup>†</sup> gAPI	0 to 1,200

## Measurement Performance

Measurement <sup>†</sup>	Accuracy	Repeatability <sup>‡</sup>	
Collar OD, in		6¾ (2 sensors)	4¾ (1 sensor)
Potassium	Greater of 0.002 (weight fraction) or 5% (relative error)	0.004 (weight fraction)	0.004 (weight fraction)
Thorium	Greater of 0.5 ppm or 5%	1.9 ppm	2.3 ppm
Uranium	Greater of 0.5 ppm or 5%	1.4 ppm	1.5 ppm
GR	Greater of 2 gAPI or 5%	1.5%	1.7%

## Drilling Mechanics

Max. vibration, $g_n$ [m/s <sup>2</sup> ]	20 [200] (rms, random, 5 to 1,000 Hz)
Max. shock, $g_n$ [m/s <sup>2</sup> ]	500 [4,903.3]

<sup>†</sup> Schlumberger GR measurements are calibrated to API standards and are highly repeatable, even in high-temperature environments.

<sup>‡</sup> Standard 100-gAPI shale (2% K, 12-ppm Th, 6-ppm U); 18-s averaging.

## Total Gamma Ray Sensor Specifications

Detector type	Nal scintillation
Measurement range, <sup>†</sup> gAPI	0 to 1,200

<sup>†</sup> Schlumberger GR measurements are calibrated to API standards and are highly repeatable, even in high-temperature environments.