

SHENKAI

Tensor Rro MWD is an ultra-high temperature MWD system compatible with Tensor standards, which is mainly used to measure such downhole parameters as well deflection, azimuth, gravity tool surface, magnetic tool surface, gravity sum, magnetic field sum, temperature, gamma (optional), and azimuth gamma (optional). It is suitable for high temperature wells of unconventional oil and gas exploration and development.

Tensor Pro system adopts a modular design to accurately measure the well deflection and azimuth, and provide real-time vibration and impact data, which can be transported in an easy and efficient manner, and can be assembled on the drilling site.

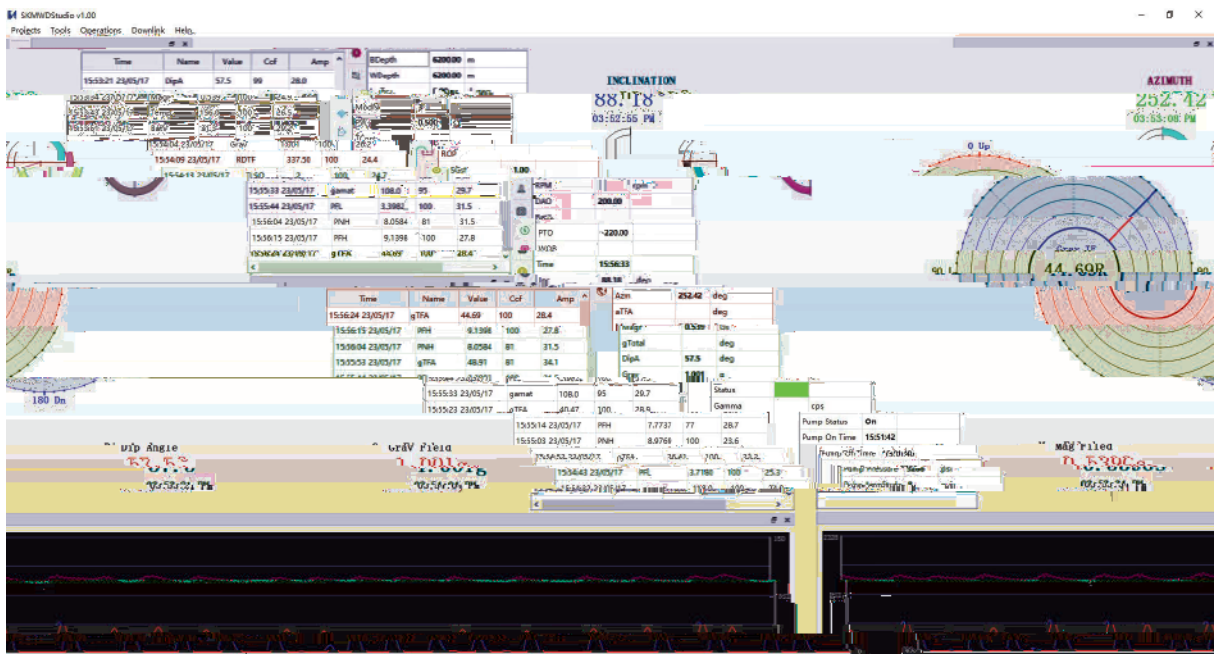
Product Features

- Suitable for high temperature, high pressure, and ultra-deep wells
- Optimized decoding performance for deep and ultra-deep well conditions
- Flexible interface: QDT pulser, Top mounted pulser
- High-precision orientation Modular to ensure precise trajectory
- Integrated dynamic directional survey to reduce pump stop time during directional survey
- Meticulously optimized process and design for high reliability
- Strong expandability: combined applications including compensated resistivity, azimuth resistivity, Azimuth gamma annular pressure, near-bit, etc.

°C

Max. working temperature

Max. working pressure



Mechanical Specifications

Outer diameter of probe tube	1.875 in.				
Outer diameter of drill collar	3.5 in.	4.75 in.	6.75 in.	8.25 in.	9.5 in.
Drill collar buckle type	2 ^{3/8} in. IF	3 ^{1/2} in. IF	4 ^{1/2} in. API IF	6 ^{5/8} in. API Reg	7 ^{5/8} in. API Reg
Equivalent stiffness of drill collar	2.96 in. x 2.25 in.	4.75 in. x 2.81 in.	6.71 in. x 3.25 in.	7.93 in. x 4.00 in.	9.42 in. x 4.00 in.
Makeup torque	3,500lbf-ft	9,600lbf-ft	30,000lbf-ft	54,000lbf-ft	62,000lbf-ft
Working displacement	75-165usgpm	100-300usgpm	150-800usgpm	400-1200usgpm	400-1200usgpm
Max. overall angle change rate rotation	50°/100 ft	15°/100 ft	10°/100 ft	8°/100 ft	4°/100 ft
Max. overall angle change rate slip	100°/ 100 ft	30°/ 100 ft	21°/ 100 ft	14°/ 100 ft	7°/ 100 ft
Max. working temperature	185°C				
Max. withstand temperature	200°C				
Max. working pressure	20,000/25000 psi				
Max. sediment content	≤1%				
Max. plugging material content	40-50 lb/bbl evenly mixed, any size				

Directional Sensor Characteristics

Directional Sensor	Three-axis fluxgate quartz accelerometer		
Directional survey	Range	Resolution (MWD)	Accuracy
Well deflection	0–180°	0.1°	± 0.1°
Azimuth	0–360°	1.0°	± 0.5°
Magnetic tool surface	0–360°	1.0°	± 0.5°
Gravity tool surface	0–360°	1.0°	± 0.5°
Magnetic field sum	0–100 μT	0.01 μT	± 0.075 μT
Dip	-90–90°	0.1°	± 0.15°
Gravity sum	0–1.000 g	0.001 g	± 0.001 g
Temperature sensor	Internal integration		
Temperature measurement range	-20 – 200 °C	0.1 °C	±1 °C

Gamma sensor characteristics

Storage update rate	7.2 sampling/ft at 50 ft/hr
Real-time update rate	3.6 sampling/ft at 50 ft/hr
Gamma resolution	1 API
Gamma sensitivity	2.5 counting/API (installed on pressure cylinder)
Gamma storage	4 MB (allocation of directional probe memory)
Minimum sampling period	Downhole storage for 10s, mud transmission: 20s for rotating state, 30s for sliding state
Data storage	800+ hours