## HRI™ High Resolution Induction Tool

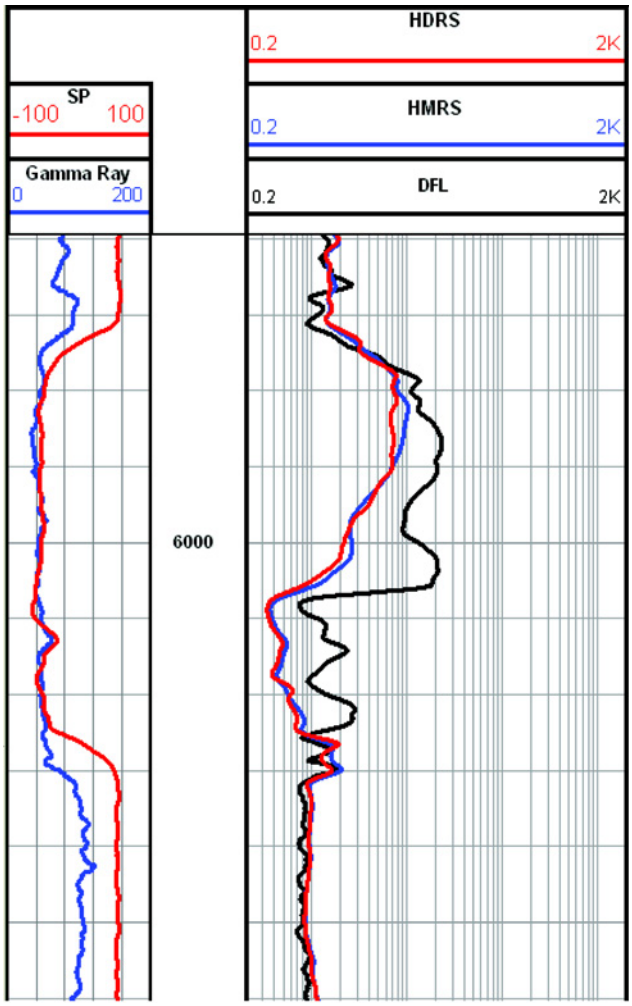
The HRI™ high resolution induction tool is an electrical wireline tool that belongs to the induction logging family of tools. It records apparent conductivity of the subsurface formations. Data processing converts the measured conductivity into resistivity. The HRI tool works well in boreholes drilled with water, air, or oil. Standard HRI tool presentation includes deep and medium resistivities derived from the raw conductivities. In conductive muds, a digitally focused resistivity log (DFL) and SP measurements are available.

### Applications

- Reliable $R_t$ in resistivity environments from 0.2 to 2,000 ohm-m provides improved estimates of water saturation
- Quantitative moveable hydrocarbon volumetric analysis and radial fluid distribution around the borehole when DFL is available
- High vertical resolution deep, medium conductivities and DFL logs enhance analysis in finely laminated reservoirs
- Distinguishes between conductive water-bearing and hydrocarbon-bearing formations
- Provides estimate of invasion diameter and $R_{xo}$

### Features

- Sonde architecture consists of four transmitters and one receiver. The transmitter operates at 20 kHz
- The single receiver is a “three-coil” configuration for enhanced vertical resolution
- The tool measures both R and X components of the conductivities. X signals are used for skin effect correction
- The signal processing chain includes corrections for formation skin and shoulder bed effects to produce the deep (HDRS) and medium (HMRS) resistivities
- The DFL provides a shallow focused resistivity measurement with a radial investigation of 15 in. The vertical resolution of the DFL closely matches that of the HRI tool induction curves
- A 1-ft vertical resolution improves estimates of $S_w$ and the hydrocarbon reserves in thinly laminated pays




*Standard HRI™ log example showing deep and medium resistivities (Track 2) computed by correcting the raw conductivity data for skin, shoulder bed, and borehole effects.*

## HRI™ High Resolution Induction Tool Specifications

| Length ft (m) | Diameter in. (mm) | Operating Pressure psi (bar) | Operating Temperature °F (°C) | Weight lb (kg) |
|---|---|---|---|---|
| 33.3 (10.2) | 3.63 (92.2) | 20,000 (137.9) | 350 (176.7) | 455 (206.4) |

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HALLIBURTON