Multi Array Production Suite –Spinner Array Tool (SAT)

The Spinner Array Tool features six miniature turbines deployed on bowspring arms, enabling discrete local fluid velocities to be measured at 60 degree intervals around the wellbore.

Phase segregation occurs in many wells, even those with little deviation. Lighter phases migrate to the high side of the well, the heavier phases to the low side. The individual phases flow at different velocities and potentially in different directions. Historically, correlations have been used to estimate individual phase velocities from the total fluid velocity log. The SAT provides direct measurement of individual phase velocities.

The turbines use low friction jewelled bearings to reduce the mechanical threshold of the spinner and improve sensitivity to fluid flow. The tool outputs the direction and speed of spinner rotation. A relative bearing measurement is incorporated to indicate the high side of the well.

Combined with hold up data from the Resistance Array Tool (RAT) and Capacitance Array Tool (CAT), this forms the Multiple Array Production Suite (MAPS), which makes it possible to provide quantitative estimates of the volumetric flow rate of each phase with a much higher degree of certainty and thus provide vital information for reservoir management.

Features and benefits

- Array of 6 radial capacitance sensors
- Greater tolerance to well debris
- Reduced tool diameter
- Cross-sectional velocity profiling
- 3D imaging of velocity profile with MAPview software
- Phase velocities in segregated fluid streams in deviated and horizontal wells
- Memory and surface read out operation
- Simultaneous operation with other Sondex Ultrawire* tools
- Compatible with other MAPS tools

Technical specification	
Temperature rating	350°F (177°C)
Pressure rating	15,000 psi (103.4 MPa)
Tool diameter	2.125 in (53.98 mm)
Tool length	45.5in (1.156m)
Tool weight	17.2 lb (7.8kg)
Toolbus	Ultrawire*
Current consumption	25 mA
Maximum opening	7-inch casing
Number of sensors	6
Sensor measure point	16.5 in (419 mm)
Relative bearing accuracy	5°
Relative bearing dev range	5° to 175°
Materials	Corrosion resistant throughout