

Production Array Imager (PAI) horizontal production logging service

Get the complete picture in one run

The Sondex Production Array Imager (PAI) tool delivers accurate

measurements of multiphase flow and fluids, including gas, oil, and water. The PAI is built on a platform that combines micro-spinners to measure flow, biphasic or tri-phasic optical sensors to identify gas and liquid, and resistance sensors to identify hydrocarbons and water. Ongoing evaluation of gas-oilwater ratios and establishing flow rates for each phase helps you make better decisions for your horizontal wells as they mature and can help you develop more effective long-term production plans.

The PAI platform resolves historic production logging challenges such as damage to logging tools in difficult well completions and compromised data quality due to sensor measure points being spread across a long tool string with a reduction in tool string lengths by as much as half, compared to traditional tool strings. An advanced deployment system enables the sensor arms to be positioned from a fully open diameter of 9 in. down to 3 in. accommodating a wide range of completion designs. The deployment arms can close down to an outside diameter of 21/8-in. with all sensors remaining operational.

The PAI tool uses an advanced sensor deployment platform to place an array of sensors across the crosssection of the wellbore. The sensor array accurately measures multiple production fluids along with the corresponding flow rates. There are three independent thresholds for the optical probes, each providing time ratio and bubble counts. The continuous sampling of all resistivity probes includes two independent thresholds, each providing time ratio and bubble counts. The resulting data are then integrated to deliver a complete picture of well production.

Multiple tools can be run in the same tool string for increased wellbore coverage. Independent deployment arms ensure the sensors remain in contact with the wellbore wall, regardless of the borehole shape or tool string decentralization, resulting in better cross-sectional coverage. The PAI platform is compatible with all Sondex wireline tools in the cased hole portfolio.

To learn more about how the PAI tool can improve the accuracy of your wireline production measurements, contact your Sondex representative or visit sondex.com.

Applications

- Horizontal and deviated wells
- Wells where oil, water, and gas identification and flow measurement are critical

Benefits

- Identifies gas-oil-water ratios and establishes flow rates for each
- Confident interpretation with high definition between multiple phases
- Integrates data to provide a complete, high resolution picture of well production
- Enables logging in difficult well completions due to reduced tool string length
- Can be combined with other Sondex Ultrawire[™] production logging tools
- Improves measurement confidence from robust sensor deployment system



Specifications	
	PAI202
Temperature	350°F (177°C)*
Pressure	15,000 psi (103,421 kPa)
Tool diameter	2.125 in. (54 mm)
Tool length	81.6 in. (2073 mm)
Maximum operating diameter	9 in. (228.6 mm)
Minimum restriction	2.375 in. (60.3 mm)
Deployment arms	6 (independent)
	6 x micro spinners
Sensors	6 x resistance probes
	6 x optical probes (biphasic or triphasic)
Data recovery	Surface read-out and memory compatible
Corrosion resistance	Corrosion resistant throughout
	Spinner
Range	140 rev/sec (downhole tested)
Slana	400 rev/sec (lab testing)
зюре	5 to 10 ft/min in water (flow loop testing) – with the
Threshold	tool stationary
Resolution	2 pulses per rev
	Resistivity
Hold up range	0 to 100%
Simultaneous sampling rate	10 kilo samples per second (ksps)
Resolution	16 bit (log scale representing 1 ohm – 1 megohm)
	250 samples @ 1 ksps or 10 ksps
Time series acquisition	Time series snapshots configurable to flow rate: 25 ms @ 10 ksps or 250 ms @ 1 ksps (transmitted every second)
	Optical
Hold up range	0 to 100%
Simultaneous sampling rate	30 ksps
Resolution	16 bit
Time series acquisition	250 samples @ 1 ksps or 10 ksps
	Time series snapshots configurable to flow rate: 25 ms @ 10 ksps or 250 ms @ 1 ksps (transmitted every second)

* Beyond 302°F (150°C), the optical sensor tube and tips may encounter permanent degradation. For more information please refer to the Operating Manual.

