

## WELL MONITORING

## IntelliFlow™ array production logging service

## FEATURES

- Cross-sectional velocity and phase profiling
- Sensors co-located on the same arms
- Phase measurements of optical, capacitance, and resistivity
- Combinable with all Intelli-portfolio services
- Sensors parallel to flow
- Arm's opening diameter is adjustable
- 1.72-in. maximum closed OD
- Opens to 9 in.
- Short length

## BENEFITS

- Offers in-depth fluid-phase analysis
- Provides volumetric flow rate for each phase
- Identifies gas, oil, and water holdups
- Determines fluid velocities, distribution, and direction
- Flow regime and entry point clarity
- Service past small restrictions
- Can pass through moderate to aggressive doglegs

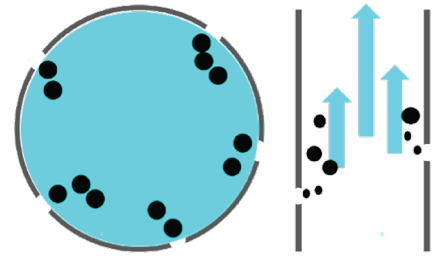
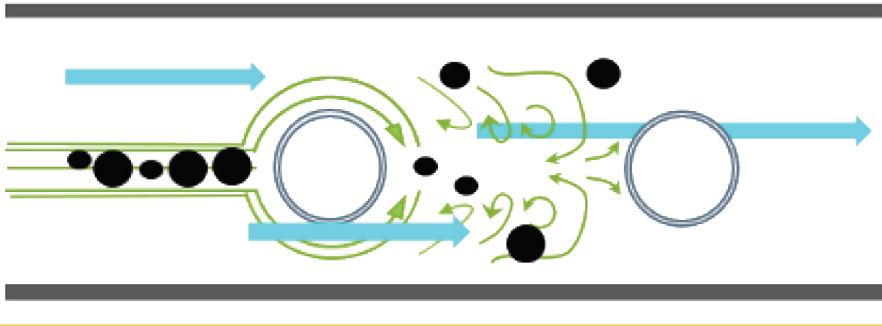
## Overview

The Halliburton IntelliFlow™ array production logging service provides accurate production profile information with co-located sensors placed in the flow stream of the wellbore. This technology measures flow features and captures changes in the production profile where they occur upon entry into the wellbore. The system uses discreet local fluid velocities and phase information circumferential to the wellbore. With multiple miniature sensors deployed on positioned arms, this IntelliFlow production logging service provides fluid velocities and direction along with phase information around the circumference of the wellbore. The co-located sensors measure velocity by means of spinners and phase information with capacitance, resistivity, and optical sensors. This new production array provides clarity to changes in production from flow regimes to entry points. Flow tests verify tool characterization and sensor response. Used in tandem with other Halliburton tools and analysis programs, this tool's inspection capabilities provide a detailed description of the flow downhole.

Phase segregation can occur at any deviation. The lighter phases migrate to the high side of the well and the heavier phases migrate to the low side. The individual phases flow at different velocities and potentially in different directions. Efficient miniature spinners are required to obtain the volumetric flow rate of each phase. These spinners use low-friction jeweled bearings and three wings to reduce the mechanical threshold and improve sensitivity to fluid flow. The tool determines the direction and speed of spinner rotation. Halliburton has incorporated a relative-bearing measurement to indicate the high side of the hole. The volumetric flow rates of phases with co-located sensors are accomplished with a higher degree of certainty to provide dynamic information for reservoir management.



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Sensors placed in unaltered flow are important to achieve a representative measurement.

Sensor placement is crucial to properly measure and capture changes as they occur during production.

### Tool specifications

DESCRIPTION	DATA
Tool size	1.72 in. (43.7 mm)
Maximum borehole diameter	9 in. (228.6 mm)
Pressure rating	15,000 psi (103 MPa)
Temperature rating	350°F (177°C)
Number of arms	6
Number of sensors	24
Co-located sensors	Within 13.1 in. (0.33 m)

### Tool sensor information

DESCRIPTION	DATA
Capacitance (6)	0 to 40% water holdup
Accuracy	1%
Resolution	0.1%
Resistance (6)	0 to 100% water holdup
Type	Galvanic (salinity)
Optical (6)	Gas phase (%)
Secondary	Bubble count
Microspinner (6)	Threshold ≤ 10 ft/min (H <sub>2</sub> O) 4,000 ft/min (5-in. casing)

For more information, contact your local Halliburton representative or visit us on the web at [www.halliburton.com](http://www.halliburton.com)

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