**APPLICATIONS**
- Vertical and deviated wells
- Improved casing seat selection
- Salt navigation
- Optimized coring location
- Ahead-of-the-bit detection of
  - Formation tops
  - Early pressure transition
  - Formation stringers
  - Fluid contact

**BENEFITS**
- Higher drilling efficiency
- Lower risk and reduced contingencies
- Proactive hazard management and avoidance
- Improved casing sections through reduction, optimization, or elimination
- Increased ROP
- Fewer BHA trips out of hole

**FEATURES**
- Deep look ahead of the bit exceeding 100 ft [30 m]
- Cloud-enabled automated solution
- Hole size availability from 5 5/8 in to 16 in

IrิSphere™ look-ahead-while-drilling service combines deep directional measurements with advanced automated inversion to accurately detect formation features ahead of the bit and land wells while managing drilling risks, optimizing casing placement and coring location. The look-ahead capability is delivered while drilling in real time by using multifrequency transmitter and multireceiver directional subs. Electromagnetic (EM) signals are sent from the transmitter into the formation and retrieved by the receivers to enable the enhanced look-ahead sensitivity and resistivity profiles.

Operators can now drill ahead with confidence and reduce drilling uncertainties in real time. Applications include detection ahead of the bit of formation features with potential pressure differentials for integration in a standard pore pressure prediction workflow. Penetrating a high-pressure reservoir might result in stuck pipes, lost circulation, and other potential wellbore instability issues.

IrิSphere service provides drillers with real-time mud properties management and enables optimized casing design and contingencies planning. Unlike the current geostopping technology available in the industry, the IrิSphere service differentiates between a thin high-resistivity stringer and a target reservoir. Consequently, premature casing seating or coring location is avoided.

IrิSphere service enables the driller to see far in front of the bit while drilling, providing enhanced formation tops mapping, improved landing capability, and better drilling hazard avoidance. The same workflow is applied to determine the reservoir bottom, completion optimization, and salt navigation, including salt entry and exit.
IriSphere Service†
Number of transmitters in BHA 1
Number of receivers in BHA up to 3

Measurement Specifications
Azimuthal coverage 360°
Azimuthal resolution 2°

Recorded Data
Recording time while pumping 15 d [360 h]

Power and Combinability
Power supply MWD turbine (no battery)
Combimability Combinable with all Schlumberger technologies§

Mechanical Specifications
<table>
<thead>
<tr>
<th>Hole size</th>
<th>475</th>
<th>675</th>
<th>825</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill collar nominal OD</td>
<td>4.81 API</td>
<td>6.75 API</td>
<td>8.25 API</td>
</tr>
<tr>
<td>Collar length Transmitter</td>
<td>17 ft [5.18 m]</td>
<td>12.8 ft [3.91 m]</td>
<td>13.4 ft [4.09 m]</td>
</tr>
<tr>
<td>Collar length Receiver</td>
<td>17.81 ft [5.43 m]</td>
<td>13.2 ft [4.02 m]</td>
<td>13.6 ft [4.14 m]</td>
</tr>
<tr>
<td>Top thread connection</td>
<td>NC 38 (3½ IF) Box</td>
<td>5½ FH box</td>
<td>6½ FH box</td>
</tr>
<tr>
<td>Bottom thread connection</td>
<td>NC 35 Box</td>
<td>NC-50 (4½ IF) box</td>
<td>5½ IF box</td>
</tr>
</tbody>
</table>

Operating Specifications
| Mud | WBM/OBM/SOBM | WBM/OBM/SOBM | WBM/OBM/SOBM |
| Max. operating temperature | 302 degF [150 degC] | 302 degF [150 degC] | 302 degF [150 degC] |
| Max. tool curvature | 15°/100 ft | 8°/100 ft | 7°/100 ft |
| Max. flow rate | 400 rpm [1,514 L/min] | 800 rpm [3,028 L/min] | 1,200 rpm [4,542 L/min] |
| Max. operating pressure | 25,000 psi [172 MPa] | 25,000 psi [172 MPa] | 25,000 psi [172 MPa] |
| Rotation speed range | 20–200 rpm | 20–300 rpm | 20–300 rpm |

† The IriSphere service requires standard resistivity measurements from EcoScope*, PeniScope*, or arcVISION* services.
§ Note: The transmitter must be placed at least 35 ft [10.7 m] from proVISION* service.

Refer to the Schlumberger shock and vibration references for details regarding axial, lateral, and torsional limits of the tool.

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Other company, product, and service names are the properties of their respective owners.
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