The OmniSphere RGM* slimhole petrophysics evaluation-while-drilling service was developed for directional drilling and formation evaluation applications in slim holes—onshore or offshore. Capable of both continuous and static direction and inclination surveying, gamma ray, and resistivity measurements for 5¾-in hole sizes and larger, the OmniSphere service measures formation resistivities at multiple depths of investigation using an electromagnetic antenna array of five transmitters and two receivers. Measured data is transmitted at physical rates up to 6 bps with the contingency frame set list feature.

Compatible with Schlumberger RSS and LWD services for complete real-time formation evaluation services, the OmniSphere RGM service incorporates the QuikSurvey service that streamlines the well construction process. This patented service acquires surveys while the mud continues circulation because it triggers a survey when pipe rotation ends rather than when mud pumps cease. The QuikSurvey service eliminates the need to alter the flow rate in order to take a stationary direction and inclination survey.

In combination with the QuikSurvey service, shared power through batteries of the VPWD* collar-mounted verified pressure-while-drilling service enables pumps-off direction and inclination surveys to further minimize surveying time. As a result, the OmniSphere RGM service significantly reduces borehole instability risks and stuck pipe incidents while increasing the efficiency in survey time—especially in highly permeable formations.

The OmniSphere RGM service features mechanical and electronic components that improve survey acquisition methodology while further reducing failure rates. Corrosion- and shock-resistant features further extend service reliability in challenging drilling environments, including high-temperature applications.

### Measurement Specifications

<table>
<thead>
<tr>
<th>Direction and Inclination Survey</th>
<th>Static</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0° to 360°</td>
<td>0° to 360°</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1° (above 5° inclination)</td>
<td>±2°</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.5°</td>
<td>1°</td>
</tr>
</tbody>
</table>

#### Inclination

<table>
<thead>
<tr>
<th>Range</th>
<th>0° to 180°</th>
<th>0° to 180°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±0.1°</td>
<td>±0.2°</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.03°</td>
<td>0.10°</td>
</tr>
</tbody>
</table>

**Magnetic toolface (MTF) and gravity toolface (GTF)**

<table>
<thead>
<tr>
<th>Range</th>
<th>0° to 360°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±2°</td>
</tr>
<tr>
<td>Resolution</td>
<td>6°</td>
</tr>
</tbody>
</table>

†Minimum update rate: 3.5 s at 1.5 bps or greater.
### Resistivity Depth of Investigation and Vertical Resolution

<table>
<thead>
<tr>
<th>Spacing</th>
<th>10 in</th>
<th>16 in</th>
<th>22 in</th>
<th>28 in</th>
<th>34 in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase resistivity</td>
<td>0.2–200 ohm.m</td>
<td>0.2–200 ohm.m</td>
<td>0.2–200 ohm.m</td>
<td>0.2–200 ohm.m</td>
<td>0.2–200 ohm.m</td>
</tr>
<tr>
<td>Attenuation</td>
<td>0.2–20 ohm.m</td>
<td>0.2–30 ohm.m</td>
<td>0.2–50 ohm.m</td>
<td>0.2–50 ohm.m</td>
<td>0.2–50 ohm.m</td>
</tr>
</tbody>
</table>

### Accuracy

- **Phase resistivity**
  - Below 60 ohm.m: ±3%; and above 60 ohm.m: ±0.5 mS/m
- **Attenuation**
  - Below 25 ohm.m: ±5%; and above 25 ohm.m: ±2 mS/m

### Vertical Resolution

- **Phase resistivity**
  - At 0.2 ohm.m: 0.7 ft; and at 200 ohm.m: 2 ft
- **Attenuation**
  - At 0.2 ohm.m: 1 ft; and at 50 ohm.m: 8 ft

### Gamma Ray

- **Range** 0–250 gAPI
- **Accuracy** ±3%
- **Statistical repeatability** ±2 gAPI at 100 gAPI and 100 ft/h, 3-point average
- **Vertical resolution** 6 in

### General Specifications

#### Collar Dimensions

- **Nominal diameter, in**: 4.75
- **Top thread connection**: NC-38 (3½-in IF) box
- **Maximum diameter, in**: 5.25
- **Bottom thread connection**: NC-38 (3½-in IF) pin

#### Tool Length and Weight

- **Nominal length, ft**: 32
- **Nominal weight in air**: 1,600 lbm

#### Operation

- **Hole size, in**: 5¾–6¼
- **Power supply**: MWD turbine
- **Maximum operating temperature, degC [degF]**: 175 [347]
- **Real-time telemetry**: Continuous wave (mud siren)
- **Frequency range, Hz**: 0.5 to 12
- **Data rate (physical)**: 0.5 to 6 bps

#### Mechanical Specifications

##### Dogleg Severity

- **Rotary mode**: 15°/100 ft
- **Sliding mode**: 30°/100 ft
- **Bending strength ratio**
  - **Top connection**: 2.04
  - **Bottom connection**: 2.01
- **Equivalent bending stiffness**: 38.5 ft
- **Average moment of inertia**: 20 in^4

##### Axial and Rotational Load

- **Maximum weight on bit**: 30,000 lbf
- **Joint yield torque**: 8,800 ft.lbf
- **Maximum jarring load**: 300,000 lbf

#### Hydraulics

- **Maximum operating pressure**: 20,000 psi (25,000 psi option)
- **Pressure drop constant (C)**: 6,000
- **Full flow range**: 130 to 360 galUS/min

#### Operating Environment

- **Maximum mud sand content**: 3%
- **Maximum solids concentration in mud**: 20%
- **Maximum silicate concentration in mud**: 9%
- **Maximum lost circulation material (LCM) size**: Medium nut plug
- **Maximum salt concentration in mud**: 10%
- **Maximum LCM concentration**: 50 ppb