Hydrographic Test Result

TEST CONDITIONS

TESTED PRODUCTS

Ellipse-E, inertial navigation system connected to a Hemisphere VS330 GNSS with two antennas.

Ekinox-D, inertial navigation system integrating a bi-frequency GNSS receiver with two antennas.

Both products received RTK corrections during the test.

TESTED PERFORMANCE

Roll, Pitch, Heading, and Heave

DATE, PLACE

October 28th and 29th 2014 in Pornic, France.

The test performed a typical survey path. Each leg of the survey path was about 550 meters long. A warm-up period and sensor calibration was performed during the first minutes before running the survey.

Attitude performance was compared to a reference, a very high accuracy fiber optic gyro compass. This gyro compass provided much higher accuracy roll and pitch than the tested products. Heading accuracy, though, was comparable, so measured heading performance should be considered more as a consistency check than as an absolute accuracy measurement.

Heave performance was compared to a tide compensated RTK altitude outputted from the Ekinox-D.

Special thanks to the CADDEN company who conducted this test.

This test was conducted on a 9 meter survey vessel, equipped with an R2Sonic SONIC 2024 multibeam echosounder.

QINSy software was used for real-time acquisition and data processing.

GET THE FULL REPORT: Send an email to sales@sbg-systems.com to receive the complete version of this test.
TEST RESULTS

Attitude Accuracy

<table>
<thead>
<tr>
<th>RMS error</th>
<th>Ellipse-E test</th>
<th>Ellipse-E specifications</th>
<th>Ekinox-D test</th>
<th>Ekinox-D specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll</td>
<td>0.06</td>
<td>0.2°</td>
<td>0.027°</td>
<td>0.05°</td>
</tr>
<tr>
<td>Pitch</td>
<td>0.066</td>
<td>0.2°</td>
<td>0.021°</td>
<td>0.05°</td>
</tr>
<tr>
<td>Heading</td>
<td>0.16</td>
<td>0.2° with 2 m baseline</td>
<td>0.069°</td>
<td>0.1° with 2 m baseline</td>
</tr>
</tbody>
</table>

The Ellipse-E roll and pitch accuracy is greatly higher than the specifications; heading accuracy is completely within. Low noise gyroscopes and advanced algorithms make the sensor highly reliable. The use of an RTK GNSS receiver additionally improves the sensor’s performance.

The Ekinox-D shows very good results, in the range of 0.03° in roll and pitch. These results are higher than the specified accuracy, and are consistent with a previous test on a Hexapod (June 2013). Heading accuracy is within specifications, given that the baseline on this set-up was 2.4 meters. Higher heading accuracy can be achieved with a longer baseline between the 2 antennas (0.05° with a 3 m baseline).

Heave Accuracy

<table>
<thead>
<tr>
<th>Error in RMS</th>
<th>Heave test result</th>
<th>Heave specifications</th>
<th>Wave Period specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellipse-E real-time</td>
<td>5.9 cm</td>
<td>10 cm</td>
<td>&lt; 15 s</td>
</tr>
<tr>
<td>Ekinox-D real-time</td>
<td>3.9 cm</td>
<td>5 cm</td>
<td>&lt; 25 s</td>
</tr>
<tr>
<td>Ekinox-D delayed</td>
<td>2.3 cm</td>
<td>2.5 cm</td>
<td>&lt; 50s</td>
</tr>
</tbody>
</table>

Ellipse-E real-time heave is well beyond expectations with an average accuracy of 6 cm. Ellipse automatically adjusts heave measurement to the wave period, which greatly enhances its accuracy.

Ekinox-D real-time heave accuracy is much higher than specified. It benefits from automatic adjustment to the wave frequency, integrates high grade accelerometers, and computes heave over large wave period (up to 25 seconds).

Ekinox-D delayed heave accuracy is exceptionally highly accurate. The delayed heave makes use of past and future measurements to further enhance heave accuracy. This computation makes the measurement delayed of 450 seconds.