Precision Cost Effective Inertial Reference Units for Land Navigation

9181 Series Inertial Reference Units

Attitude, heading, pointing, navigation. Delivered.

GE Aviation Avionics
GE Aviation is a leading global provider of aircraft engines, integrated avionics systems, and service solutions to the military, commercial, and general aviation markets.

One of the innovative solutions that GE provides is a navigational grade Inertial Reference Unit (IRU), that can be utilized for platform navigation, system stabilization, and pointing applications. This IRU is based on a proprietary inertial gyroscope technology that reduces size, weight, power, and cost (SWaP-C), when compared to units with similar performance. GE Aviation’s IRUs are utilized on land, maritime, and airborne applications, with over 5,300 units fielded worldwide. This product family is scalable to the customer’s specific needs. Options include standard or enhanced microprocessors, and embedded military Selective Availability Anti-Spoofing Module (SAASM) GPS or embedded commercial GPS receivers. Future enhancements include M-Code and Global Navigation Satellite System (GNSS) solutions. Standard data ports include RS-422, RS-232, and 10/100 Ethernet that can be utilized by multiple clients on a given platform. Optional interfaces include ARINC 429, MIL-STD-1553, and others upon request.

A unique benefit of the IRU is the ability to statically align in 3 to 5 minutes and navigate in a GPS-denied environment, providing Assured Position, Navigation, and Timing (A/PNT). When GPS aiding is available, the IRU can dynamically align within 1 to 3 minutes. Other advantages of this IRU include the ability to provide high accuracy continuous pitch, roll, true heading (non-magnetic), location, and targeting information in any environment.

The IRU can be configured with two software loads. This feature allows it to be a spare LRU for different platforms, which simplifies maintenance logistics.

GE Aviation delivers solutions backed by a worldwide network of service and support. GE stands committed to our customers by providing the highest quality products, at the best value. For additional information on GE Aviation Systems Inertial Reference Products, please contact us at reference.products@ge.com.

**Inertial Reference Unit with Embedded GPS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Standard IRU</th>
<th>Enhanced IRU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded GPS</td>
<td>None</td>
<td>SAASM Commercial</td>
</tr>
<tr>
<td>Static Alignment Heading Accuracy (x: +/- 65° latitude)*</td>
<td>3 - 5 mils RMS</td>
<td>3 - 5 mils RMS</td>
</tr>
<tr>
<td>Static Alignment Time</td>
<td>3 to 5 minutes</td>
<td>3 to 5 minutes</td>
</tr>
<tr>
<td>Dynamic Alignment Heading Accuracy</td>
<td>2 mils RMS</td>
<td>2 mils RMS</td>
</tr>
<tr>
<td>Dynamic Alignment Time</td>
<td>1 to 3 minutes</td>
<td>1 to 3 minutes</td>
</tr>
<tr>
<td>Position Accuracy with GPS</td>
<td>10 meters CEP</td>
<td>10 meters CEP</td>
</tr>
<tr>
<td>Position Accuracy without GPS</td>
<td>0.25% - 0.5% of distance traveled RMS</td>
<td>0.25% - 0.5% of distance traveled RMS</td>
</tr>
<tr>
<td>Elevation Accuracy without GPS</td>
<td>1% (typical &lt; 0.5%) of distance traveled RMS</td>
<td>1% (typical &lt; 0.5%) of distance traveled RMS</td>
</tr>
<tr>
<td>Pitch and Roll Accuracy</td>
<td>1 mils RMS</td>
<td>1 mils RMS</td>
</tr>
<tr>
<td>Environmental Qualification</td>
<td>MIL-STD-810</td>
<td>MIL-STD-810</td>
</tr>
<tr>
<td>EMI Qualification</td>
<td>MIL-STD-461</td>
<td>MIL-STD-461</td>
</tr>
<tr>
<td>Qualified Operating Temperature</td>
<td>-32°C to 60°C</td>
<td>-32°C to 60°C</td>
</tr>
<tr>
<td>Size (W x D x H)</td>
<td>7.5 in x 7.5 in x 4.75 in</td>
<td>7.5 in x 7.5 in x 5.36 in</td>
</tr>
<tr>
<td>Weight</td>
<td>7.5 lbs</td>
<td>8.5 lbs</td>
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<tr>
<td>Supply Voltage / MIL-STD-1275</td>
<td>18VDC to 32VDC</td>
<td>16VDC to 32VDC</td>
</tr>
<tr>
<td>Nominal Power</td>
<td>16W</td>
<td>18W</td>
</tr>
<tr>
<td>Platforms</td>
<td>Air, Land, Sea</td>
<td>Air, Land, Sea</td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS-422</td>
<td>RS-422, Ethernet</td>
</tr>
<tr>
<td>Update rate</td>
<td>61 Hz</td>
<td>244 Hz</td>
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<tr>
<td>GPS Wing Certified for Optional Embedded SAASM GPS</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>External DAGR Compatible</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>MTBF MIL-HDBK-217</td>
<td>16,100</td>
<td>13,200</td>
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<tr>
<td>Optional interfaces</td>
<td>None</td>
<td>RS-232, MIL-STD-1553, ARINC 429, CAN</td>
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<tr>
<td>Processor</td>
<td>68360™</td>
<td>PowerPC™</td>
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</tbody>
</table>

*Heading accuracy improves with lower latitude*