Datasheet

SPRINT OEM INS

Description

SPRINT OEM is an Aided Inertial Navigation System (AINS) highly optimised for cost, size, weight, and power (C-SWaP).

The selected inertial sensors are the standard for commercial aviation with a proven 20+ year track record. These sensors have a highly desirable characteristic being insensitive to vibration, temperature changes and having very limited initial errors. The result is a system which is highly suitable for the marine environment where performance, robustness and data integrity need to be available from initialisation, even during the harshest conditions.

SPRINT’s dual AHRS & INS algorithm capability is unique in the market and allows for on-board integrity checking between both orientation solutions. Furthermore, the SPRINT INS algorithm can instantaneously start with north alignment from the on-board AHRS. This negates the need for specific dynamics to ‘align’ standalone INS products to north.

The AHRS requires no external aiding and can settle in 5 minutes or less in dynamic conditions. INS adds advanced aided inertial navigation that runs concurrently with the AHRS algorithm.

SPRINT INS supports a wide range of aiding including: USBL, Depth, DVL, Zero Velocity, Manual Position, LBL Position and GNSS to support most autonomous vehicle requirements. Optional tight coupling is supported for Sonardyne’s Syrinx and 6G+ LBL acoustics products, also available in OEM form.

On-board data storage allows for post-mission diagnostics checking with the supplied Janus QC software. An optional software upgrade allows for reprocessing and optimisation of the navigation solution.

The lightweight aluminium housing is one of the smallest form factor high performance OEM INS/AHRS units available.

Sonardyne provides a dedicated integration development kit and service for SPRINT OEM.

Applications Include

- Any subsea autonomous platform including AUV, AIV, ROV, tow fish and ROTV
- Manned submersibles
- Surface autonomous vehicles (ASV)

Key Features

- Turn-key OEM solution
- Development kit included
- Integration service with on-site or remote engineers
- SPRINT provides concurrent AHRS and INS capability for dual use
- Up to 0.02° (sec lat) heading accuracy
- 0.01° roll and pitch accuracy
- Fast follow up speed of 900°/sec
- MTBF inertial sensors (RLG and Accelerometer) > 400,000 hours
- Lightweight aluminium housing
- Transport approved rechargeable li-ion battery back-up option
- Dedicated connection for optional Sonardyne supplied pressure sensor
- 8 GB internal memory allows post processing and remote diagnostics
- Ethernet and serial interfaces
## Specifications

### SPRINT OEM INS

<table>
<thead>
<tr>
<th>Performance</th>
<th>SPRINT 300 OEM</th>
<th>SPRINT 500 OEM</th>
<th>SPRINT 700 OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heading</td>
<td>0.05º Secant Latitude</td>
<td>0.04º Secant Latitude</td>
<td>0.02º Secant Latitude</td>
</tr>
<tr>
<td>INS initialisation</td>
<td>Instantaneous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll and Pitch</td>
<td>0.01º</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INS Aiding Supported</td>
<td>USBL, DVL, Zero Velocity, Manual Position, LBL (position), GNSS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USBL/LBL Aided</td>
<td>3x precision improvement</td>
<td>3.5x precision improvement</td>
<td>4.5x precision improvement</td>
</tr>
<tr>
<td>USBL/LBL and DVL Aided</td>
<td>3 to 7x precision improvement</td>
<td>4 to 10x precision improvement</td>
<td>6 to 13x precision improvement</td>
</tr>
<tr>
<td>LBL/DVL Aided</td>
<td>3 cm confined area, 20 cm wide area (dynamic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVL Aided1 Typical Survey</td>
<td>0.05%</td>
<td>0.03%</td>
<td>0.02%</td>
</tr>
<tr>
<td>Distance From origin</td>
<td>0.15%</td>
<td>0.10%</td>
<td>0.08%</td>
</tr>
<tr>
<td>DVL Aiding Loss/Drift1</td>
<td>1.2 m over 1 min, 5 m over 2 mins</td>
<td>0.8 m over 1 min, 3.2 m over 2 mins</td>
<td>&lt;0.5 m over 1 min, 2 m over 2 mins</td>
</tr>
<tr>
<td>Station Keeping</td>
<td>&lt;1 m over 24 hours (Syrinx DVL)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Power

- **Power Requirement**: 20–50 V dc, 15 W nominal [35 W max with optional external battery]
- **Power Pass Through**: 3 x for external aiding sensors [up to 3A per sensor]
- **Back Up Battery Type/Life**: Li-ion/5 minutes (optional back-up battery available)

### Data/Comms

- **Data Storage**: 8 GB internal memory
- **Serial Ports/Protocol**: 4x RS232 or RS485
- **Other Ports**: 1 x Ethernet, 4 Triggers
- **Output Rate**: Up to 100 Hz
- **Output Telegrams2**: Industry standard AHRS/INS telegrams including acceleration and rotation rates

### Mechanical

- **Mechanical Construction**: Aluminium
- **Dimensions**: Ø188 x 155 mm
- **Weight in Air3**: 7.0 kg
- **Connectors**: 4 x Molex Microfit

### Environmental

- **Temperature Range**: 20 to +55°C (operating), -20 to +60°C (storage)
- **Shock Rating**: 22 g, 11 ms half sine

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1. CEP50 (Assumes use of a high performance DVL such as the Sonardyne Syrinx 600).
2. Specific outputs may be limited below quoted performance for reasons of export classification and control and should not be used as IMU data
3. Estimated Weights

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Specifications subject to change without notice - 01/2020

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