Overview

ProMove-mini is a wireless inertial motion sensor node specifically designed for multi-person, multi-object motion capture. A network comprises tens of devices that sample and transmit motion and orientation information at high data rates in a fully synchronized manner.

ProMove-mini features a complete set of 3-D digital sensors, offering 10 DOF sensor data: acceleration, turn rate (gyroscope), magnetic field intensity (compass), high-g acceleration and barometric pressure. Full 3-D orientation information, expressed as quaternions and Euler angles, is also made available to the user.

The sensor data is transmitted using the low-power 2.4 GHz wireless radio to a central node, Inertia Gateway, which connects to the computer through USB. Optionally, the sensor data can be stored on the on-board flash memory and retrieved later over USB or wirelessly.

The number of nodes in the network scales with the sampling rates, e.g. a network can have 39 nodes that sample at 200 Hz, or 19 nodes that sample at 500 Hz.

ProMove-mini is carefully designed for good ergonomics. The curved design makes mounting and wearing on body parts comfortable, without affecting stability in case of surface mounting.

Alternatively, ProMove-mini can be equipped with a Bluetooth module for direct communication to PCs, smartphones and tablets. The GPS option allows localization and tracking of the ProMove-mini sensor node on a map.

Key features & Benefits

- Supports large networks (tens of devices)
- Fully synchronized sampling (<100 ns)
- Up to 1 kHz sampling and communication rate per sensor axis
- Full 3-D acceleration, turn rate and magnetic field intensity measurements
- Full 3-D orientation information (quaternions and Euler angles)
- High-g accelerometer up to 400 g
- Barometric sensor
- GPS
- RF transceiver in the 2.4 GHz band or Bluetooth
- Customized casing for good ergonomics
- Integrated USB interface
- On-board flash memory for data storage
- Internal rechargeable battery

Inertia Studio

The Inertia Studio software enables real-time visualization and configuration of sensors and wireless parameters. All data retrieved by the Inertia Studio software is logged for post-analysis.
### Applications
- Multi-person, multi-object 3-D tracking
- Fine-grained, synchronized motion capture
- Activity monitoring and recognition
- Virtual reality and gaming
- Inertial navigation

### Design
The ergonomic design of ProMove-mini allows for easy strap attachment and body mount.

### Specifications

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Range</th>
<th>Resolution</th>
<th>Non-linearity</th>
<th>Cross-axis</th>
<th>Noise power spectral density</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accelerometer</strong></td>
<td>Selectable: ±2, ±4, ±8, ±16 g</td>
<td>62 µg @ ±2 g range</td>
<td>±0.5 %</td>
<td>±2 %</td>
<td>300 µg/√Hz</td>
</tr>
<tr>
<td><strong>Gyroscope</strong></td>
<td>Selectable: ±250, ±500, ±1000, ±2000 °/s</td>
<td>0.007 °/s @ ±250 °/s range</td>
<td>±0.1 %</td>
<td>±2 %</td>
<td>0.01 (°/s)/√Hz</td>
</tr>
<tr>
<td><strong>Compass</strong></td>
<td>±4912 µT</td>
<td>0.15 µT</td>
<td>100 Hz</td>
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<tr>
<td><strong>Barometer</strong></td>
<td>260 to 1260 hPa</td>
<td>0.02 Pa</td>
<td>25 Hz</td>
<td>0.01 hPa RMS</td>
<td></td>
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<tr>
<td><strong>High-g accelerometer</strong></td>
<td>Selectable: ±100, ±200, ±400 g</td>
<td>49 mg @ ±100 g range</td>
<td>1000 Hz</td>
<td></td>
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</tr>
<tr>
<td><strong>Inertia Wireless Network Protocol</strong></td>
<td>Frequency band: 2.4 GHz</td>
<td>Data rate: 4 Mbps</td>
<td>TX power: 10 dBm</td>
<td>Range: 30 m line-of-sight</td>
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<tr>
<td><strong>Data collection and storage</strong></td>
<td>Maximal number of nodes in a single network: 39 nodes at 200 Hz each 19 nodes at 500 Hz each 9 nodes at 1 kHz each</td>
<td>Inertia Gateway: Central hub for synchronized data collection</td>
<td>Synchronization: &lt; 100 ns</td>
<td>Wired interface: USB 2.0 full-speed compatible</td>
<td>Storage: 2 GB flash memory</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td>Inertia Studio: Real-time visualization, data acquisition and configuration; runs on Windows 10, 8, 7, Vista, Ubuntu Linux</td>
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<tr>
<td><strong>Electrical characteristics</strong></td>
<td>Battery life: 7 h in full streaming mode</td>
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<tr>
<td><strong>Miscellaneous</strong></td>
<td>Bluetooth: 4.0 dual-mode BR/EDR/BLE (optional)</td>
<td>GPS: 1 Hz / 5 Hz update rate (optional)</td>
<td>Attachments: Strap attachment</td>
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<tr>
<td></td>
<td>Dimensions: 51 x 45.5 x 15.86 mm</td>
<td>Weight: 22 g (including battery)</td>
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</tbody>
</table>

### Contact Information
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