

PROMOVE-3D

Product Datasheet



Overview

ProMove-3D is the ultimate wireless inertial sensor node from the ProMove series. It combines the latest advances in MEMS sensor design and low-power wireless communication. Featuring a suite of modern inertial and magnetic sensors, a dedicated microcontroller for application-specific software, and a separate System-on-Chip (SoC) solution for wireless networking, ProMove-3D is a powerful, versatile platform for motion sensing applications.

ProMove-3D samples and communicates wireless motion and orientation information from three-axial, fully-digital sensors: 3-D acceleration, 3-D turn rate (gyroscope) and 3-D magnetic field intensity (compass). The data is transmitted using the low-power 2.4 GHz wireless radio to a central node – the FastGateway, which connects to a computer through USB. Additionally, the data can be stored in the on-board flash memory and retrieved later over USB or wirelessly.

Multiple ProMove-3D nodes can form a network and report the sensor data fully synchronized to the FastGateway. The sampling rates scale with the number of nodes in the network, e.g. 200 Hz for 6 nodes, 100 Hz for 12 nodes.

The ProMove GUI software enables real-time visualization of the sensor data, as well as over-the-air reconfiguration of the sensors and wireless parameters. All data retrieved by the ProMove GUI software is logged for post-analysis and optionally made available for remote TCP/IP connection.

ProMove-3D is carefully designed for simple plug&use and good ergonomics. Through a multi-functional turn&click system, the attachment of the node can be easily changed for different situations: belt clip, strapped attachment or surface mounting.

Optionally, the ProMove-3D can be ordered with an on-board Bluetooth module for direct communication to Bluetooth devices (point-to-point communication only).

Key features & Benefits

- Full 3-D acceleration, turn rate and magnetic field intensity measurements; all 3-D digital sensors with in-plane mounting
- IEEE 802.15.4 compatible RF transceiver in the 2.4 GHz license-free band; optional Bluetooth module on-board
- ProMove GUI software for real-time visualization and configuration control of sensing and wireless parameters
- Synchronized sampling from multiple sensor nodes at high data rates
- Extended coverage and improved sensitivity at low power consumption
- Customized casing designed for easy plug&use and multi-functional attachment
- Integrated USB interface
- On-board Flash memory for data storage
- Internal rechargeable battery

Applications

- Motion capture and 3-D tracking
- Activity monitoring and recognition
- Virtual reality and gaming
- Inertial navigation
- Structural health monitoring

Usage and attachments

Belt clip



Strapped attachment



Surface mounting



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Specifications

Accelerometer	
Range	Selectable ± 2 g / ± 6 g
Resolution	1 mg @ ± 2 g range
Sensitivity	1024 LSb/g @ ± 2 g range
Non-linearity	± 2 %FS
Cross-axis	± 3.5 %
Calibration	On-chip factory calibration
Gyroscope	
Range	2000 $^{\circ}$ /s
Resolution	0.06 $^{\circ}$ /s
Non-linearity	≈ 0.2 %FS
Cross-axis	± 2 %
Calibration	On-chip factory calibration
Compass	
Range	Selectable ± 1 to ± 8 Gauss
Resolution	10 mGauss
Non-linearity	± 0.1 %FS
Cross-axis	± 0.2 %FS/Gauss
Wireless communication	
Frequency band	2.4 GHz / IEEE 802.15.4
Data rate	250 kbps
RX sensitivity	11 dB high-gain, 1 dB low-gain
Range	> 50 m at max. TX power
Data collection	
Sampling rate	Scales with the number of nodes in the network 200 Hz for 6 nodes 100 Hz for 12 nodes
Synchronization	< 10 μ s
Wired interface	USB 2.0 full-speed compatible
Storage	128 Mbit Flash memory
Software and accessories	
Visualization software	ProMove GUI (runs on Windows 7/Vista/XP/2000, Ubuntu Linux)
Gateway	FastGateway, with USB interface to PC for data collection
Bluetooth	v1.2 class 2 (optional)
USB	Integrated USB interface for data sampling, Flash downloading and battery recharging
Attachments	Multi-functional clip holder, belt clip and strapped attachment
Electrical characteristics	
Power consumption in real-time streaming mode	275 mW - max. TX power, high-gain 260 mW - max. TX power, low-gain 230 mW - min. TX power, low-gain
Battery	3.7 V / 950 mAh rechargeable > 10 h operation at max. TX power
Form factor	
Dimensions	62.5x96x16 mm
Weight	67g (with battery and enclosure)