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Specifications

Shimmer3 (IMU)
Wireless Sensor Platform

Key Features

Very low power consumption, light weight, and small form factor

Slide-switch for powering on/off

Readily connects via Bluetooth

Local storage via an 8GB microSD card (supports up to 32GB)

SD data bypass

24MHz MSP430 CPU

Best data quality - Integrated 10 DoF inertial sensing via accelerometer, gyroscope, magnetometer, and altimeter, each with selectable range

Two accelerometers give choice between ultra-low noise or wide range measurements

Integrated motion processor for on-board 3D orientation estimation

5 coloured LEDs across 2 locations to indicate device status and operating mode

Integrated Li-ion battery management

JTAG debugging mode available

Expansion header for alternative radio

Introduction

Shimmer3 is the smallest, slimmest and most robust wearable wireless sensor created by Shimmer to date. The module boasts a 24MHz CPU with a precision clock subsystem, making it three times faster than its predecessor, Shimmer2r.

Product Overview

In developing Shimmer3, we have focused on creating a powerful and elegant wearable wireless sensor which will provide superior data quality, adding value to your data collection process. We've created a smarter enclosure which allows for straps to be quickly clicked into place for a range of wearable applications.

Shimmer3 offers best data quality with integrated 10DoF inertial sensing via accelerometer, gyroscope, magnetometer and altimeter, each with selectable range. Shimmer3 also boasts an integrated motion processor for on-board 3D orientation estimation. 5 coloured LEDs indicate device status and operating mode, as well as indicating Bluetooth streaming functionality.

For existing customers, Shimmer3 modules are backward compatible with the Shimmer2r Dock and Multi Charger. All current development tools and enabling applications are compatible with the Shimmer3 platform.

Technical Specifications

Microcontroller	TI MSP 430
A/D Resolution	11 Channels of 12-bit A/D: 7 free for expansion
RAM	16KB
Flash	256KB
Frequency	24MHz
Wide Range Accelerometer	ICM-20948 Accelerometer
Range	±2g, ±4g, ±8g, ±16g
Sensitivity	16 384 LSB/g at ±2g
Numeric Resolution	16-bit
Typical Operating Current	68.9 µA
Low Noise Accelerometer	Kionix KXTC9-2050
Range	±2g
Sensitivity	660 mV/g (±20mV)
Typical Operating Current	240 µA
Noise Density	125 µg/√Hz
Digital Magnetometer	ICM-20948 Magnetometer
Range	±4900 µT
Sensitivity	0.15 µT / LSB
Numeric Resolution	16-bit
Gyroscope	ICM-20948 Gyroscope
Range	±250; ±500; ±1000; ±2000 dps
Sensitivity	131 LSB/dps at ±250 dps
Numeric Resolution	16-bit
Typical Operating Current	1.23 mA
Pressure/Temperature Sensor	Bosch BMP280
Range	300 - 1100 hPa
Pressure/Temperature Resolution	0.16 Pa / 0.01°C
Typical Operating Current	≤ 24.8 µA at 1 Hz
RMS Noise	1.3 Pa

Applications

Shimmer is designed for wearable and remote sensing applications. The Shimmer unit is designed to be highly flexible and adaptable, easily integrating into existing systems and technologies. The Shimmer platform is generally application agnostic and is currently used in the following areas:

• Human Health Monitoring

• Activities of Daily Living

• Connected Health Solutions

• Sports Science

• Structural Monitoring

• Intelligent Buildings

• Environmental and Habitat Monitoring

• Market Research and Biofeedback

Wearable Wireless Sensing

Dimensions: 51mm x 34mm x 14mm

Weight: 23.6 grams

• Improved straps and quick snap clips provide full mobility, unrestricted movement and comfort for the wearer

• Highly flexible and adaptable sensor platform can be applied to specific end user requirements

• Highly accurate and scientifically reliable raw or calibrated data offers complete control over capture and interpretation of signals in real-time

Supporting Software

Shimmer ConsensysPRO & ConsensysBASIC

Shimmer LabVIEW Instrument Driver

Shimmer MATLAB Instrument Driver

Shimmer Java / Android API

Shimmer C# API

Shimmer 9DoF Calibration

Supporting Hardware & Accessories

Straps, Documents, Charging Dock/Base, Case

Shimmer3 Calibration Stand