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Specifications

Shimmer3
IMU Unit



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 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

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.

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. 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.

All current development tools and enabling applications are compatible with the Shimmer3 platform.

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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

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

Supporting Hardware & Accessories

Straps, Documents, Charging Dock/Base, Case

Calibration Stand

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Technical Specifications

Shimmer3 sensor generations

Function	First generation (from 2013)	Second generation (from 2017)	Third generation (from 2022)
Low noise accelerometer	KXRB5-2042 (Kionix)	KXTC9-2050 (Kionix)	KXTC9-2050 (Kionix)
Wide range accelerometer	LSM303DLHC (STMicroelectronics)	LSM303AHTR (STMicroelectronics)	LSM303AHTR, or ICM-20948 (TDK InvenSense) on boards without it
Magnetometer	LSM303DLHC	LSM303AHTR	LSM303AHTR, or ICM-20948 on boards without it
Gyroscope	MPU-9150 (InvenSense)	MPU-9250 (InvenSense)	ICM-20948
Pressure and temperature	BMP180 (Bosch)	BMP280 (Bosch)	BMP280

Second- and third-generation sensor ranges and sensitivities

Sensor	Generation	Range	Sensitivity	Other
Low noise accelerometer (KXTC9-2050)	Second and third	±2 g	660 mV/g (±20 mV)	Noise density 125 µg/√Hz
Wide range accelerometer (LSM303AHTR)	Second and third	±2 g; ±4 g; ±8 g; ±16 g	1671 LSB/(m/s²) at ±2 g	14-bit; RMS noise 0.6 mg at ±2 g
Wide range accelerometer (ICM-20948, on boards without the LSM303AHTR)	Third	±2 g; ±4 g; ±8 g; ±16 g	1671 LSB/(m/s²) (16384 LSB/g) at ±2 g	16-bit
Magnetometer (LSM303AHTR)	Second and third	±49.152 Ga	667 LSB/Ga	16-bit; RMS noise 3 mGa
Magnetometer (ICM-20948, on boards without the LSM303AHTR)	Third	±49 Ga (±4900 µT)	667 LSB/Ga (0.15 µT/LSB)	16-bit
Gyroscope (MPU-9250)	Second	±250; ±500; ±1000; ±2000 deg/sec	131 LSB/(deg/sec) at ±250 deg/sec	16-bit; RMS noise 0.1 deg/sec
Gyroscope (ICM-20948)	Third	±250; ±500; ±1000; ±2000 deg/sec	131 LSB/(deg/sec) at ±250 deg/sec	16-bit
Pressure (BMP280)	Second and third	300 hPa to 1100 hPa	Resolution 0.16 Pa (pressure), 0.01 °C (temperature)	RMS noise 1.3 Pa

Shimmer3 Specifications

Processor	TI MSP430F5437A (16-bit), up to 24 MHz 16 KB RAM, 256 KB flash
Sampling rate	At most 4096 Hz
Radio	Class 2 Bluetooth: Roving Networks RN-42 (Classic), or Microchip RN4678 (Classic and Bluetooth Low Energy) on later units
Storage	microSD slot: microSD and microSDHC cards up to 32 GB, not microSDXC; an 8 GB SanDisk card is supplied Full-speed transfer to a PC through a *Shimmer Dock* or *Consensys Base*
Battery and power	3.7 V rechargeable lithium battery: 450 mAh, or 400 mAh on current units, with a safety circuit Battery voltage monitoring Soft power control of the Bluetooth radio and the microSD card Designed for EN 60601-1 compliance
Status LEDs	5 single-colour LEDs in 2 locations: green, yellow and red (lower); green and blue (upper)
Dimensions and weight	51 × 34 × 14 mm, 23.6 g

Technical specifications printed 11 November 2026 from the *IMU User Guide* and *Shimmer3/3R User Manual*.

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