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Specifications

Shimmer3R
IMU Unit



Key Features

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

Slide-switch for powering on/off

Connects via Bluetooth Classic and Bluetooth Low Energy

Local storage on a microSDHC or microSDXC card, also readable over USB-C as a removable drive

48 MHz Arm Cortex-M33 processor

Integrated inertial sensing: low-noise, wide-range and ±200 g high-g accelerometers, gyroscope, magnetometer and altimeter

2 RGB LEDs in 2 locations to indicate device status and operating mode

Integrated Li-ion battery management, charged in a Dock or Base or over USB-C

Introduction

Shimmer3R is the latest generation of the Shimmer3 platform. It keeps the Shimmer3's external connector, so it works with the same Dock, Base and Multi Charger, and adds a 48 MHz Arm Cortex-M33 processor and USB-C. Every Shimmer3R has Bluetooth Classic and Low Energy.

Product Overview

The Shimmer3R IMU measures acceleration, angular rate, magnetic field, pressure and temperature, and has a ±200 g high-g accelerometer, for impacts well beyond ±16 g. Its two RGB LEDs indicate device status and operating mode.

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

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

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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

Technical Specifications

Shimmer3R kinematic sensors

Function	Device	Full scale range	Sampling rate
Low noise accelerometer	LSM6DSV (STMicroelectronics)	±2.0 g; ±4.0 g; ±8.0 g; ±16.0 g	Shared with the gyroscope
Gyroscope	LSM6DSV (STMicroelectronics)	±125; ±250; ±500; ±1000; ±2000; ±4000 deg/sec	1.875 Hz to 7680 Hz
Wide range accelerometer	LIS2DW12 (STMicroelectronics)	±2.0 g; ±4.0 g; ±8.0 g; ±16.0 g	12.5 Hz to 1600 Hz (high-performance mode); 1.6 Hz to 200 Hz (low-power mode)
Magnetometer	LIS2MDL (STMicroelectronics)	±49.152 Ga (one range)	10, 20, 50 or 100 Hz
High-g accelerometer	ADXL371 (Analog Devices)	±200 g	320, 640, 1280 or 2560 Hz
Pressure and temperature	BMP390, or BMP581 on later boards (Bosch)	300 hPa to 1250 hPa	0.0015 Hz to 200 Hz

Manufacturers' noise figures for the Shimmer3R sensors

Sensor	Device	Noise (manufacturer's datasheet)
Low noise accelerometer	LSM6DSV	60 µg/√Hz (high-performance mode)
Wide range accelerometer	LIS2DW12	90 µg/√Hz (high-performance mode, ±2 g)
Gyroscope	LSM6DSV	2.8 mdps/√Hz; 60 mdps RMS
Magnetometer	LIS2MDL	3 mGa RMS
High-g accelerometer	ADXL371	6.5 mg/√Hz (5.5 mg/√Hz in low-noise mode)
Pressure	BMP390	0.9 Pa (25 Hz, 32× oversampling)
Pressure (-2 boards and later)	BMP581	0.78 Pa RMS (lowest-power mode)

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Shimmer3R Specifications

Processor	ST STM32U5A5 (32-bit Arm Cortex-M33), runs at 48 MHz 2.5 MB RAM, 4 MB flash
Sampling rate	At most 4096 Hz
Radio	Bluetooth Classic and Bluetooth Low Energy: Ezurio Vela IF820 module (453-00171C), integrated chip antenna
Storage	microSD slot: microSDHC and microSDXC cards, FAT32 or exFAT Read by a PC through a *Shimmer Dock* or *Consensys Base*, or over USB-C as a removable drive Files can be listed, read and deleted over Bluetooth
Battery and power	3.7 V rechargeable lithium battery, 400 mAh, with a safety circuit Battery voltage monitoring, on a converter of its own Soft power control of the Bluetooth radio and the sensor supplies
Status LEDs	2 RGB LEDs, one in each location

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

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