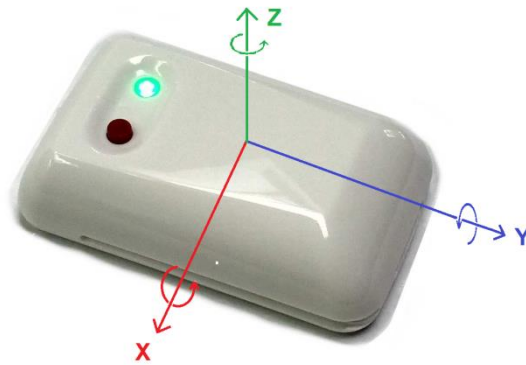




ADVANCED TECHNOLOGY

# EXLs3

*Miniature Wireless  
Inertial Measurement Unit*



**PRODUCT BRIEF**

## EXLs3

### Miniature Wireless Inertial Measurement Unit

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#### ■ 1. GENERAL DESCRIPTION

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The **EXLs3** is a miniaturized electronic device with the function of real-time *Inertial Measurement Unit* (IMU).

It features a complete MEMS sensor set, which is composed of a tri-axial **accelerometer**, **gyroscope** and **compass**, a 32-bit Cortex microprocessor for data processing and a Bluetooth radio to send real-time data.

The unit can be used for real-time motion measurement and transmission in particular in the medical field as a wearable device for biomechanical analysis, such as posture assessment, rehabilitation, gait monitoring, joints' functionality analysis, activity monitoring, etc.

The **Bluetooth™** radio allows easy interfacing to a wide range of devices (PC, Tablets, Smartphones) without the need of additional hardware so that data can be transmitted wirelessly up to 10 meters.

The unit is also equipped with an embedded **1 GB flash drive** which allows data logging to CSV files and USB interface for file transfer.

The on board 32-bit CPU provide algorithms for **orientation** estimation with Kalman filtering in order to give high quality measurement.

The integrated rechargeable Litium battery allows continuous data acquisition and streaming up to 3 hours and can be recharged by means of a dedicated docking station.

#### ■ 2. FEATURES

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- Module size 54 mm x 33 mm x 14 mm
- Module weight 22 g
- 32-bit MCU, Cortex-M3 @72 MHz
- 3-axis accelerometer with selectable full-scale range ( $\pm 2 / \pm 4 / \pm 8 / \pm 16$  g).
- 3-axis gyroscope with selectable full-scale range ( $\pm 250 / \pm 500 / \pm 1000 / \pm 2000$  dps)
- 3-axis magnetometer
- Orientation estimation with Kalman filtering and quaternion output.
- Sampling rate up to 200 Hz for raw data and 100 Hz for orientation data.
- Various data packet format available
- Bluetooth™ 2.1 class 1.
- Indicator LED
- Up to 7 nodes at the same time can stream data to the same host.
- 1GB Flash Memory (USB Mass Storage) for data storage
- Docking station with micro-USB connector for battery recharging and log-file downloading.
- Minimum battery operating time 2 h
- Full battery recharge in 2 hours
- Firmware upgradable by means of bluetooth connection.

### ■ 3. HARDWARE OVERVIEW

On the front side of the IMU the **ON/OFF button** and an **indicator LED** are located.



The **Docking-station** allows the sensor to be interfaced to a PC via USB cable, for *battery recharging* and data-log file transfer.

By connecting the docking-station to a PC it is possible to access the IMU's internal storage flash disk, in order to retrieve data-log files.

The **Multiple Docking-Station** allows more units to be recharged at the same time. It also acts as USB *hub* which allows more units to be seen as multiple distinct flash disks where log files can be found.

The IMU is provided with a special **holder** which allows easy fixing to a Velcro-strap or similar.

