

Knock Sensor v1.0

Product Datasheet

Wireless Vibration & Shock Detection Instrument

Document ref:	KS-DS-001
Version:	1.2
Date:	2026-06-18
Manufacturer:	RSensing
Website:	rsensing.uk
Email:	rsensinguk@gmail.com

Product Overview

The Knock Sensor is a self-contained, battery-powered Bluetooth Low Energy instrument that detects and quantifies mechanical vibration and shock events. Its piezoelectric sensing element captures impact data at high resolution, while an onboard signal processing algorithm distinguishes genuine knock events from background noise.

Originally developed for automotive suspension diagnostics, the Knock Sensor is a general-purpose instrument suited to any application requiring detection and quantification of mechanical impulse events — including industrial machinery condition monitoring, structural inspection, and manufacturing quality control.

Up to 8 sensors can be deployed simultaneously, enabling multi-point comparison to pinpoint the exact source of a vibration anomaly in a single test session.

Key Features

- Wireless Bluetooth LE 5.0 connectivity — no cables, no wiring
- 12-bit piezoelectric sensor with 500 Hz sampling rate
- Automatic baseline self-calibration on power-up
- Up to 8 simultaneous sensors with live multi-point comparison
- On-demand PDF report generation with one-tap sharing
- CR2032 coin cell power — theoretical ~8 days continuous use
- Compact, fully sealed enclosure — mounts with straps or ties, no drilling
- App available on the App Store for iPhone, iPad, and Mac

Electrical Specifications

Parameter	Value
Power source	CR2032 lithium coin cell, 3 V, 220 mAh

External power	Not required — self-contained
Current — deep sleep	~3 μ A
Current — advertising	150–300 μ A average
Current — connected + streaming	Up to ~1 mA average, with TX peaks
Battery life	Theoretical ~8 days continuous connected operation

Sensor Specifications

Parameter	Value
Sensing element	Piezoelectric, internally mounted
Resolution	12-bit ADC (0–4095)
Sampling rate	500 Hz
Input range	0–3.6 V (internal reference)
Calibration	Automatic baseline calibration, 5-second warm-up on power-up
Detection method	Exponential moving average with adaptive threshold; 200 ms debounce

Wireless Communication

Parameter	Value
Technology	Bluetooth Low Energy 5.0
Frequency band	2400–2483.5 MHz
TX power	0 dBm (1 mW)
Typical range	~10 m (indoor, line of sight)
Maximum simultaneous sensors	8
Radio module	Laird BL654 (Nordic nRF52840), pre-certified

Physical Specifications

Parameter	Value
Dimensions (L × W × H)	58 × 28 × 18 mm
Enclosure	Fully sealed housing, no externally accessible conductive parts
Mounting method	Velcro straps, cable ties, or wire — no drilling or permanent fixing required
Indicators	Single status LED (3 flashes on power-on; 2 flashes/5 s advertising; 1 flash/5 s connected)
Controls	Physical ON/OFF slide switch

Battery access	Removable bottom cover, 4 retaining screws
-----------------------	--

Environmental Specifications

Parameter	Value
Operating temperature	−20 °C to +60 °C
Storage temperature	−20 °C to +60 °C, dry environment

Companion App Requirements

Parameter	Value
iPhone / iPad	iOS 16.0 or later
Mac	macOS 13 (Ventura) or later
Availability	App Store (iPhone, iPad, Mac)
Permissions required	Bluetooth, Location (for BLE scanning)
Key app functions	Live waveform display, knock event logging, multi-sensor comparison, PDF report generation and sharing

Compliance & Certification

Standard / Mark	Detail
UKCA	UK Conformity Assessed — UK Radio Equipment Regulations 2017 (S.I. 2017/1206)
EMC	BS EN 55032:2015+A1:2020 (emissions), BS EN 55035:2017+A11:2020 (immunity)
Radio module	Laird BL654 — UKCA / CE RED 2014/53/EU, FCC Part 15.247, IC RSS-247, Bluetooth SIG QDID 119506

A full UK Declaration of Conformity is available on request.

Ordering Information

Item	Description
Knock Sensor v1.0	4 × sensor units (batteries pre-installed), 8 × Velcro mounting straps (2 per sensor), quick start card. Full user manual available to download at rsensing.uk .

App available free on the App Store for iPhone, iPad, and Mac. Contact RSensing for bulk / fleet pricing.

KS-DS-001 v1.2 · RSensing · rsensinguk@gmail.com · rsensing.uk