

## innRecord DATA RECORDER

The **SF-DR4-04** is a data recorder with a high-performance piezoelectric accelerometer, a secondary capacitive accelerometer and other environmental sensors.



Polycarbonate

Piezoelectric Accelerometer:  $\pm 100g$

Digital Captative Accelerometer:  $\pm 40g$

Battery: 250 mAh

Storage: 8GB

Its enclosure improves reliability in harsh environments and widens its frequency response.

### **Convenient, Adaptable, and Reliable: Intuitive Operation and Sensors that Can Go Anywhere**

It has been developed for Product & Testing Engineers to quickly and accurately characterize a vibration, shock or environmental profile and uploading the data for analysis thanks to the new and intuitive innSoft-Analyzer software. This information can be used later in the design and optimization of the packaging to guarantee the safety of the goods.

### **Selectable Sensor Packages and Configurable Settings and Software**

Our intuitive software allows our customers with no testing and analysis experience to utilize our sensors to understand their environment. This enables our customers to better develop new and better products and systems.

### **NIST Traceable Calibration. Every Device is Calibrated and Made in the USA to Ensure Quality**

Due to the portability of our devices, many of our customers are using our sensors in applications and environments where they may only have one shot to get the data. This requires our customers to trust that the device will survive, capture all the data they need (not just peak metrics), and capture accurate data. After all, the data our sensors capture will be used to make important decisions.

### **Standalone measurement system with sensors, storage & rechargeable battery**

Handheld form factor with embedded sensors, storage & power.

### **More memory than other devices**

Storage capacity for billions of data points.

## More Embedded Sensors. All included in the unit

- › Primary high performance piezoelectric triaxial accelerometer up to 100g for shock and vibrations measurements with sampling rate up to 20000 Hz.
- › Secondary high performance and low consumption capacitive triaxial accelerometer up to 40G for accelerations measurements with sampling rate up to 4000 Hz.
- › Gyroscope to measure inclination and velocity change on Pitch, Roll, Yaw with sampling rate up to 200 Hz.
- › Magnetometer.
- › Pressure / Temperature / Humidity.
- › Light (Useful to know if the package or vehicle has been opened. This sensor is capable of capturing the intensity of visible and ultraviolet light at a rate of 4 Hz. This sensor is not calibrated and is intended for rough, relative measurements only).

## Longer Recording Time thanks to its Rechargeable Battery Life

- › Life battery, from 12 hours at REAL continuous time monitoring at 1000 hz sampling frequency up to more than 49 days with 99% triggering time. Calculate the life of the battery in your particular case [here](#).
- › Extend battery life with external power.
- › The DR4-04 has the 250 mAh [GMB-602025](#) Li-ion battery (here is the [material safety data sheet for it, MSDS](#)). For shipping and handling of this battery, here is the [UN38.3](#). Report that some carriers may request if shipping via any method besides Ground shipping.

## Triggering from Sensors and/or Time-Based

## Simple USB Interface for Download & Charging

## Two in One Standalone Software Package:

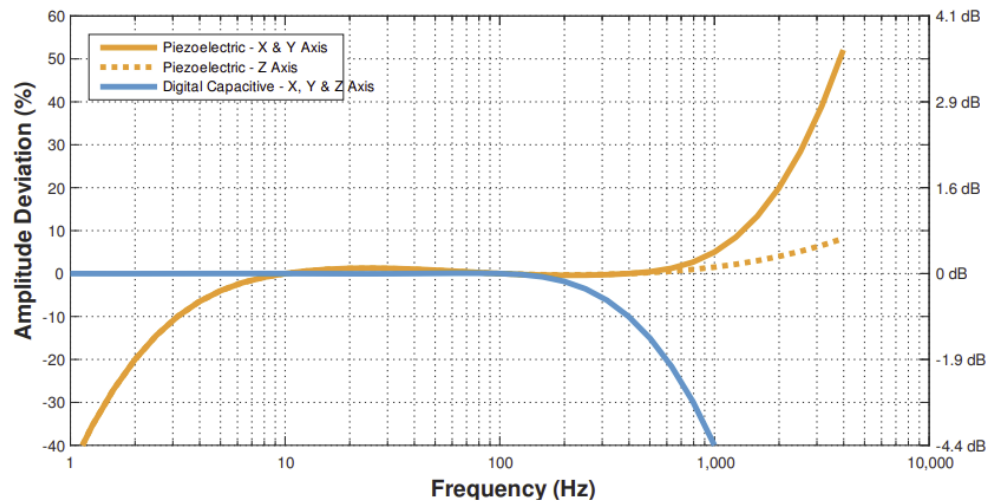
- › First one for configuration, quick analysis and batch file conversion:
  - › FFT analysis, PSD, Spectrogram, Digital filtering.
  - › Export data to CSV and Matlab.
- › Second one more advance and easier for transport simulations analysis (vibration, shocks, pitch&roll).
  - › Fast tool to get PSD breakpoints for shaker simulation.
  - › Automatic report, profile and graphics generation.
  - › PSD for three orthogonal axes for the 100% events of CDF.
  - › PSD for three orthogonal axes for the highest 20% and lowest 80% events of CDF.
  - › Probability PSD overlays at 80%, 90%, 95%, 99% and 100% “at or below” levels.
  - › Statistical distribution of the RMS level.

## Trusted by Over 2000 Different Commercial Customers

## Accelerometer Specifications

Accelerometer Type	Range	Sampling Rate	Bandwidth	Noise	Resolution
Piezoelectric	± 100g	20000 Hz	5 to 1000 Hz	< 0.04 gRMS	0.003 g
Digital Capacitive	± 40g	4000 Hz	0 to 300 Hz	< 0.01 gRMS	0.00008 g

## Frequency Response Plot



## Additional Sensor Specifications

Sensor	Measurement Range	Resolution	Sampling Rate
Gyroscope	2000°/s	0.06 °/s	0 (off) to 200 Hz
Magnetometer	± 1300 μT	0.3 μT	0 (off) to 10 Hz
Temperature	-40 to 85 °C	0.01 °C	0 (off) to 10 Hz
Pressure	1 to 200 kPa	1.6 Pa	0 (off) to 10 Hz
Humidity	0 to 100 %RH	0.04% RH	0 (off) to 10 Hz
Light	0 to > 20 uV	<100 mlx	0 (off) to 4 Hz

## Environmental Specifications

Parameter	Range	Notes
Operating Temperature	-10°C to 80°C (-14°F to 176°F)	
Recommended Storage Temperature	15°C to 30°C (59°F to 86°F)	Recharging Temperature 0°C to 45°C (32°F to 113°F)
Humidity	0 to 95 %RH	Non-Condensing
Pressure	20 kPa to 110 kPa (2.9 psi to 16.0 psi)	Absolute Pressure
Shock Limit	>3000 g	
No Electric Field Susceptibility	2 MHz to 18 GHz	@ 200 V/m
No Magnetic Field Susceptibility	30 Hz to 100 kHz	

## Internal Battery Life Estimation

Battery performance is heavily dependent upon the device configuration (sensor sample rates and triggers), battery age (including charging cycles) and temperature. The following table provides an estimation of the battery life and storage capacity of this device assuming it has a relatively new battery, and it is at room temperature.

Battery Capacity (mAh)	250				
Memory capacity (Gb)	8				
DC Accelerometer	Activate at 800 hz sampling frequency				
Main Accelerometer	Disable	Activate at 1000 hz sampling frequency		Disable	
Inertial Measurement Unit	Disable		Activate at 200 hz sampling frequency	Disable	Activate at 200 hz sampling frequency
Temperature/Pressure	Activate at 10 hz sampling frequency				
Trigger Mode	Continuous time recording			By Triggering (sleep mode 90% of the time)	
Battery Life (days)	0.72	0.50	0.45	10.74	9.30
Data Size Recorded (Gb)	0.32	0.49	0.54	0.48	0.61

## Maximum Life Estimation with External DC Connection

The following table provides an estimation of the maximum battery life to fill the total storage capacity of this device when has been connected to an external power DC battery, assuming it has a relatively new battery and it is at room temperature.

Battery Capacity (mAh)	250 + connected to usb external power dc of 6000	250 + connected to usb external power dc of 3750	250 + connected to usb external power dc of 3500	250 + connected to usb external power dc of 6000	250 + connected to usb external power dc of 4750
Memory capacity (Gb)	8				
DC Accelerometer	Activate at 800 hz sampling frequency				
Main Accelerometer	Disable	Activate at 1000 hz sampling frequency		Disable	
Inertial Measurement Unit	Disable		Activate at 200 hz sampling frequency	Disable	Activate at 200 hz sampling frequency
Temperature/Pressure	Activate at 10 hz sampling frequency				
Trigger Mode	Continuous time recording			By Triggering (sleep mode 90% of the time)	
Battery Life (days)	18.06	8.11	6.64	180.60	121.10
Data Size Recorded (Gb)	8.00				

## Mechanical Specifications

Mass	40 grams
Case Material	Polycarbonate
Mounting - Screw	4-40 Bolts (70 in-oz)
Mounting - Tape (Double Sided)	3M 950 Tape
Length	76.2 mm (3.00")
Width	29.8 mm (1.18")
Thickness	15.0 mm (0.59")
Ingress Protection	IP 50 (Dust Protected)

