

innRecord DATA RECORDER

The **SF-DR4-03** is a recorder with a high performance piezoresistive accelerometer, a secondary capacitive accelerometer and other environmental sensors.



Aluminium 7075

Piezoelectric Accelerometer: $\pm 2,000g$

Digital Captative Accelerometer: $\pm 40g$

Battery: 4000 mAh

Storage: 16GB

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

The SF-DR4-01 offers an impressive 4,000 mAh battery to allow for the longest recording times of our sensors.

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 Wireless Measurement System

Embedded sensors, storage, WiFi connectivity, & power

More memory than other devices

Up to 8 Billion data points of Memory for a more in-depth and accurate representation of the test environment.

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 3200 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).
- › GPS (can record: Latitude and Longitude; Speed in m/s; Epoch time).
- › Microphone (records at same rate as the other channels (up to 20 kHz)).

Longer Recording Time thanks to its Rechargeable Battery Life that Lasts for Many Days

- › Long life battery, from 7 days at REAL continuous time monitoring at 1000 hz sampling frequency up to more than 2 years with 99% triggering time. Calculate the life of the battery in your particular case [here](#).
- › Extend battery life with external power.
- › The DR4-03 has a Li-ion 4,000 mAh battery from Saft, the [MP 174565 xtd](#). This battery is much more stable at low-temperature than other batteries.

Triggering from Sensors and/or Time-Based

Simple USB Interface for Download & Charging

Free Two in One Standalone Software Package:

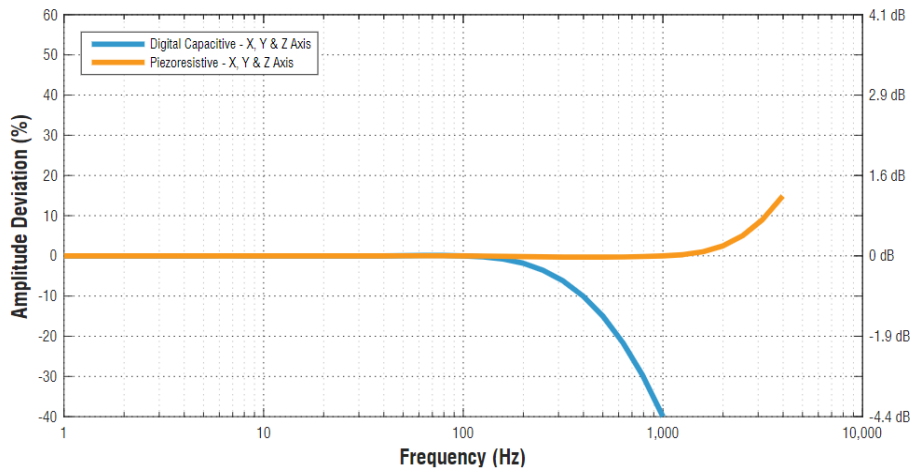
- › First one for configuration, quick analysis and batch file conversion:
 - › FFT analysis, PSD, Spectrogram, Digital filtering.
 - › Export data to CSV and Matlab.
- › Second one more advance and easier for transport simulations analysis (vibration, shocks, pitch&roll).
 - › Fast tool to get PSD breakpoints 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 2000 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 |
|--------------|-------------------|------------|----------------------|
| Microphone | 105 dB | | 0 (off) to 20,000 Hz |
| GPS Location | | 2.5 m | 0 (off) to 1 Hz |
| GPS Time | | 60 ns | 0 (off) to 1 Hz |
| Gyroscope | 2000°/s | 0.06 °/s | 0 (off) to 3,200 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 | -40°C to 80°C (-40°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) | 4000 | | | | |
| Memory capacity (Gb) | 16 | | | | |
| DC Accelerometer | Activate at 800 hz sampling frequency | | | | |
| Main Accelerometer | Disable | Activate at 1000 hz sampling frequency | | Disable | |
| Inertial Measurement Unit | Disable | | Activate at 400 hz sampling frequency | Disable | Activate at 400 hz sampling frequency |
| Temperature/Pressure | Activate at 10 hz sampling frequency | | | | |
| Trigger Mode | Continuous time recording | | | By Triggering (sleep mode 90% of the | |
| Battery Life (days) | 10.00 | 12.00 | 6.30 | 171.82 | 148.81 |
| Data Size Recorded (Gb) | 4.43 | 11.84 | 7.59 | 7.61 | 9.83 |

Maximum Life Estimation with External DC Connection

The following table provides an estimation 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) | 4000 + connected to usb external power dc of 10250 | 4000 + connected to usb external power dc of 5250 | 4000 + connected to usb external power dc of 4500 | 4000 + connected to usb external power dc of 10250 | 4000 + connected to usb external power dc of 7250 |
| Memory capacity (Gb) | 16 | | | | |
| DC Accelerometer | Activate at 800 hz sampling frequency | | | | |
| Main Accelerometer | Disable | Activate at 1000 hz sampling frequency | | Disable | |
| Inertial Measurement Unit | Disable | | Activate at 400 hz sampling frequency | Disable | Activate at 400 hz sampling frequency |
| Temperature/Pressure | Activate at 10 hz sampling frequency | | | | |
| Trigger Mode | Continuous time recording | | | By Triggering (sleep mode 90% of the | |
| Battery Life (days) | 36.13 | 16.21 | 13.28 | 361.40 | 242.20 |
| Data Size Recorded (Gb) | 16.00 | | | | |

Mechanical Specifications

| | |
|--------------------------------|----------------------------------|
| Mass | 250 grams |
| Case Material | Aluminum Base, Polycarbonate Top |
| Mounting - Screw | 10-32 Bolts (23 ft-lb) |
| Mounting - Tape (Double Sided) | 3M 950 Tape |
| Length | 99.8 mm (3.93") |
| Width | 58.6 mm (2.31") |
| Thickness | 45.6 mm (1.80") |
| Ingress Protection | IP 50 (Dust Protected) |

