PRODUCT DATASHEET

TSR PRO & TSR PRO-HB

Data Loggers with Internal Triaxial Accelerometer

APPLICATIONS

- Aerospace analysis
- Amusement ride testing
- Automotive safety
- Biomechanics
- Blast testing
- Helicopter & aircraft
- Impact testing
- Motorsports incident recorder
- Parachute deployment
- Transportation monitoring: truck, air, ship & rail
- Ride & handling
- Sports & safety equipment

PRODUCTS

Diversified Technical Systems designs and manufactures data acquisition systems and sensors for experienced test professionals.

The ultra-small TSR PRO and TSR PRO-HB are portable data loggers with built-in triaxial accelerometers. Ideal for both short duration tests and long term monitoring, the TSR time and date stamps each event and stores up to 2,000 events in flash memory.

The TSR PRO & TSR PRO-HB are self-powered data loggers with three internal accelerometers ideal for unattended monitoring of acceleration and vibration. An advanced sleep mode helps save battery power and the module “wakes” for an event, which can be triggered by acceleration threshold, contact closure switch input or voltage input. After each event, data writes to non-volatile flash memory, then the unit automatically re-arms and is ready to capture the next event. Both the TSR PRO & TSR PRO-HB are available with a USB-rechargeable battery or a user-replaceable AA battery.

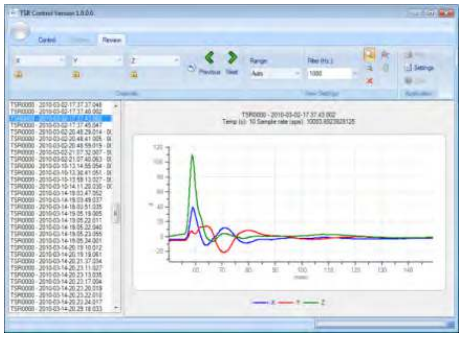
The interface connector makes it easy to access trigger inputs/outputs, USB and an external power input option.

Features

- Compact and rugged, the data logger easily mounts on or can be embedded inside a test article
- Stores up to 2,000 events or 34 hours of continuous recording @ 1K sps; data writes directly to flash memory
- Battery options: Built-in rechargeable (via USB) or user-replaceable AA battery
- Sensor range options from ±20 g to ±500 g
- Variable sampling rates from 1,000 to 20,000 sps/channel
- Logs temperature, date and time for each event
- IP67 rated for dust protection and immersion in water
- Complies with ISO 6487 and SAE J211 recommended practices, as well as NHTSA and FAA requirements
- Intuitive software for arming, downloading and viewing data; simple data files can be viewed in Excel

Software

TSR Control software provides easy-to-use tools for test setup and viewing events. With a focus on speed and simplicity, TSR Control lets users configure the recorder, view real-time sensor output and review time-history data.



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SERVICES

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Specifications

MODEL	 TSR PRO	 TSR PRO-HB
Internal Accelerometer	MEMS Triaxial (DC response)	MEMS Triaxial (DC response)
Sensor Range Options	±20, ±50 or ±250 g	±500 g
Frequency Response	DC to 300 Hz 4-pole Butterworth SAE/ISO Class 180	DC to 1650 Hz 4-pole Butterworth SAE/ISO Class 1000
Sampling Rate	1,000 to 20,000 samples/sec/channel 16-bit ADC	5,000 to 20,000 samples/sec/channel 16-bit ADC
Battery Options	Lithium Rechargeable -or- Non-Rechargeable	Lithium Rechargeable -or- Non-Rechargeable

POWER / Battery Life Estimate*	ACTIVE MODE	MOTION / MAGNET MODE
BATTERY TYPE	System always armed, collects 512 pre-trigger data points	Internal low-g motion sensor, detects motion and arms within 1 second
Lithium Rechargeable (900 mAh)	24 hrs**	Up to 3 months***
Lithium Non-Rechargeable (2400 mAh)	72 hrs**	Up to 6 months***
External Battery (via 15-pin D-Sub connector)	Depends on customer battery size	Depends on customer battery size
	*NOTE: Battery life will vary based on type, application, duty-cycle and sampling rate. Contact a DTS sales engineer to determine the best product and estimated battery life for your specific application. ** Estimate based on potential low temperature operation and/or older battery (actual may be longer). *** Depends on XML settings for motion sensor timeout and actual duty-cycle of motion. See TSR Battery Life article available on DTS Help Center	

PHYSICAL

Size:	72 x 72 x 22 mm (2.83 x 2.83 x 0.87")
Mass:	237 g (8.37 oz)
Enclosure Material:	Anodized Aluminum

ENVIRONMENTAL

Operating Temperature:	-20 to 60°C (Rechargeable) -20 to 85°C (Non-Rechargeable)
Humidity:	95% RH non-condensing
Shock:	500 g operating; 2000 g survivable
IP Rating:	IP67

MEASUREMENT CHANNEL OVERVIEW

Sensors:	Three MEMS DC response accelerometers
Filters:	4-pole Butterworth
Data Conversion:	16-bit ADC, one per channel
Sampling Rate:	1,000 to 20,000 samples per sec. per channel
Pre-Trigger Data:	512 samples available
Memory:	1 GB direct-write flash

POWER SAVING FEATURES (Software Enabled)

Motion Sense:	Detects slight movement to bring unit from deep sleep to ready mode.
Magnet Detect:	Hall-effect sensor can be used to bring unit in/out of deep sleep when magnet is present
Max Battery Life:	Depends on application, duty cycle and use of power saving features. Operational life can be greatly extended by using external power.

TRIGGERING

Software Trigger: Level triggering on each axis

TSR g Range ±	Approx. Actual g Range ±	Programmable Level Trigger Range
20	35	±0.7 <> ±3.5
50	70	±1.4 <> ±7.0
250	350	±7 <> ±35
500	700	±14 <> ±70

Hardware Trigger:	Contact closure or isolated voltage input Voltage or contact-closure output
Status:	Voltage or contact-closure output

POWER

External:	6-36 VDC
Battery Options:	USB-rechargeable lithium polymer -or- Non-rechargeable lithium primary

CALIBRATION

Calibration Supplied:	NIST traceable
ISO 17025:	ISO 17025 (A2LA Accredited) available
Service Options:	Factory, On-site & Service Contracts available

SOFTWARE

Product Name:	TSR Control
Data Management:	Date/Time/Temp recorded for each event
Post-Processing:	SAE Filters, View multiple channels/tests, Head Injury Criteria (HIC)
Operating Systems:	Windows® 7/8/10 (32- and 64-bit)
Communication:	USB

Additional DTS data logger models are available with a variety of sensor options, shock ratings, sampling rates and more.

Does your application require different sensors ranges or higher shock ratings? Ask about the TSR 6DXP and TSR 6DXC

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