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 the experienced test professional.

The ultra-small TSR PRO and TSR PRO-HB are portable shock recorders with built-in accelerometers. Easy to use, the TSR records for seconds to hours, writes data directly to flash memory and stores up to 2000 events.

The TSR PRO & TSR PRO-HB are self-powered data loggers with three internal accelerometers. Simple and reliable, the TSR works for both short duration tests and long-term monitoring. Advanced sleep modes help save battery power and events can be triggered by acceleration threshold, contact closure switch input or voltage input. After each event, the unit automatically re-arms and is ready to capture the next event. The TSR is ideal for unattended monitoring of acceleration and vibration for automotive, aerospace, military and transportation applications.

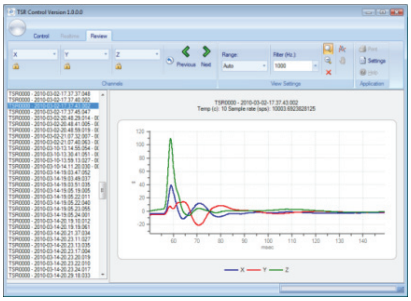
Designed for harsh test environments, all TSR models are IP67 rated.

Features

- Simple, intuitive software for arming, downloading and viewing data. Simple data files can be viewed in Excel.
- Compact size: Easily mounts to test article or can be discretely embedded inside a test device.
- Data writes directly to 1 GB flash memory. Stores up to 2,000 events or 34 hours of continuous recording @ 1k sps
- Two battery options: Built-in rechargeable (via USB) or user-replaceable AA battery.
- Standard range options: ±20, 50, 250, and 500 g
- Sampling: 1000 to 20000 sps/channel
- Built-in 4-pole Butterworth anti-alias filters
- Logs temperature, date and time for each event
- Interface connector gives access to trigger inputs and outputs, USB and external power input option

Software

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



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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	±50 or ±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	Lithium Rechargeable -or- Non-Rechargeable	Lithium Rechargeable -or- Non-Rechargeable
Battery Life Estimate*		
Battery Options	Active Mode System always armed, collects 512 pre-trigger data points	Motion Detect Mode 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:	Programmable level trigger on each axis
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

SOFTWARE

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

Additional TSR models available featuring higher shock and sampling rates, plus expanded sensor options.

Authorized DTS Representative:

Does your application require different sensors ranges or higher shock ratings? Check out the TSR 6DXP and TSR 6DXC.

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