SnapShock

P L U S

Transportation & Handling Data Recorder

From The World's Leading Supplier Of

Environmental Shock & Vibration Recorders

IST Instrumented Sensor Technology

We've Just Set A New Standard In Capabilities Monitoring For Your Shipments . . . Shock by Shock, Bump by Bump, Day by Day

SnapShock PLUS

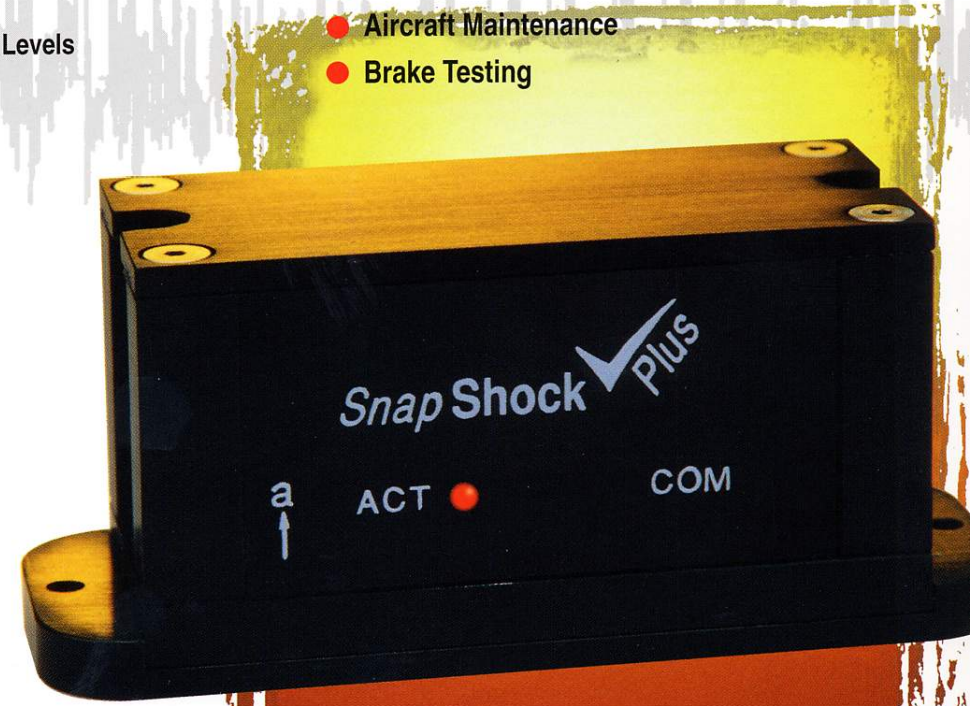
SnapShock-PLUS Series Acceleration Recorders

Models SSP-2000, SSP-2000/3D SSP-4000, SSP-4000/3D

- Self Contained Acceleration Event, Date, Time Recorder
- Single Axis and Triaxial Models
- Measures & Records Peak Shock Level, Duration, Velocity Change , Date, Time, and Temperature
- Programmable G-Trigger Levels
- Programmable Velocity-Change Trigger Levels
- Drop Height Measurement Mode for Package Test Shipments
- Stores up to 5900 Readings
- Rugged, Moisture Resistant Housing
- Mode Cycle Push Button for Easy Manual Activation/De-activation
- Battery-Powered, 7-27 days
- Very Small Size: 1.625"x 3.2"x 1.5", 7oz.
- Built-In Piezoresistive Accelerometer
- Excellent Low Frequency Response
- Automatic Offset Correction
- Programmable Low Pass Filters
- 12 Bit A/D for Improved Accuracy
- 1200 Hz Digitization Rate
- IRDA Wireless Data Interface
- Windows95 Setup & Analysis (Software Included)

Applications:

- Railcar Coupling/Humping Impact
- Drop Testing
- Package Shipment Monitoring
- Package Drop Height Measurement
- Transportation Monitoring
- Crash/Impact Testing
- Aircraft Turbulence
- Elevator/Escalator Monitoring
- Aircraft Maintenance
- Brake Testing



IST Instrumented Sensor Technology

The Sensor

The **SnapShock-PLUS** utilizes an internal piezoresistive (PR) accelerometer sensing element. This solid state sensing element offers excellent low frequency response capability, enabling accurate measurement of low frequency phenomenon such as rail car impact, freight handling impacts, packaging drop and impacts, aircraft turbulence and landing impacts, etc. Two standard measurement ranges are available: ±10g and ±100g. Other ranges may be available on special order.

Easy Calibration Checks

Since the **SnapShock-PLUS** accelerometer offers DC response capability the recorder's calibration can easily be checked against Earth gravity, without requiring any additional test equipment. A simple 90 degree rotation produces a 1g change in acceleration level, and a 180 degree rotation produces a 2g change. This is a simple and easy technique for introducing a reference input into the recorder prior to sending the unit out for field recording.

Programmability

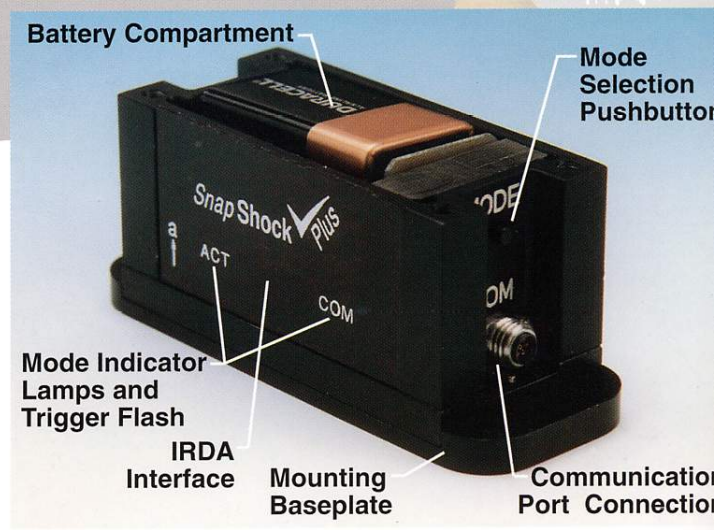
The programmable parameters for the **SnapShock-PLUS** include the g-trigger levels-(x,y,z,), velocity trigger thresholds (x,y,z,), 3dB cutoff frequency for signal filtering (Hz), and pre-set start and stop dates/times. The user may select either Shock Event or Drop Height mode, for which the triggering parameters are automatically selected for optimal analysis results.

Interfacing Other Transducers

The **SnapShock-PLUS** can be factory-modified to support data recording from transducers other than accelerometers. Examples of other measurements possible include pressure, strain, load, temperature, and humidity. Contact IST for specific information in these areas.

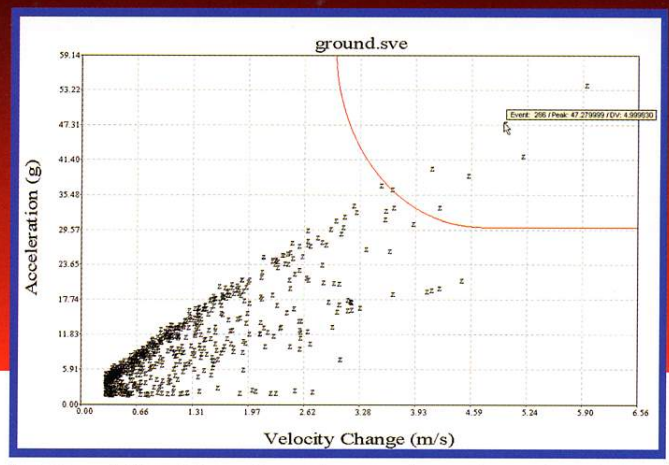
ShockView32 for Windows95

Data from the **SnapShock-PLUS** series recorders may be uploaded and analyzed using IST's new ShockView32 (SV32) software package operating under Windows95/NT. ShockView32 is a 32bit application which takes full advantage of all features of the Windows95 operating system. In designing SV32 the customer's ease-of-use has been the #1 priority. You'll find the familiar scroll bars, dialog boxes, buttons, file navigation features, etc., all there just like you would expect in a full featured Windows95/NT application.

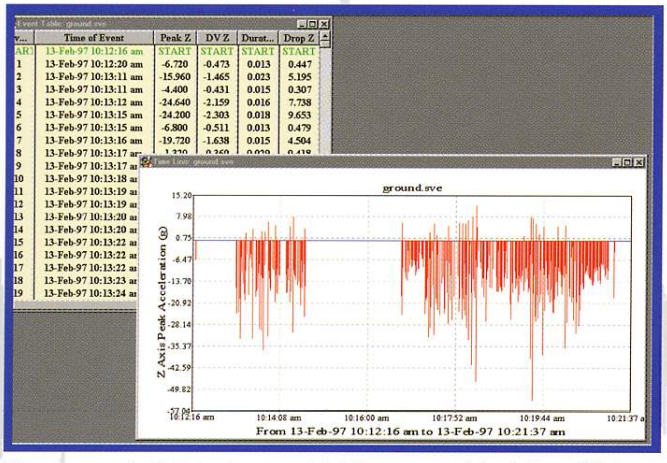


Transportation & Handling Data Recorder

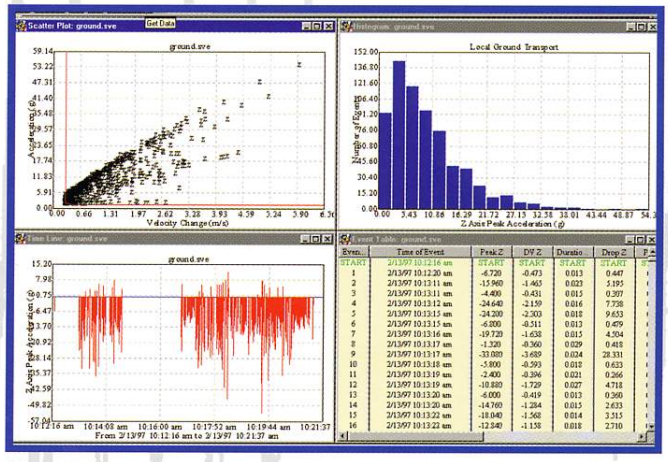
The SnapShock-PLUS is the most compact acceleration recording instrument of its kind.



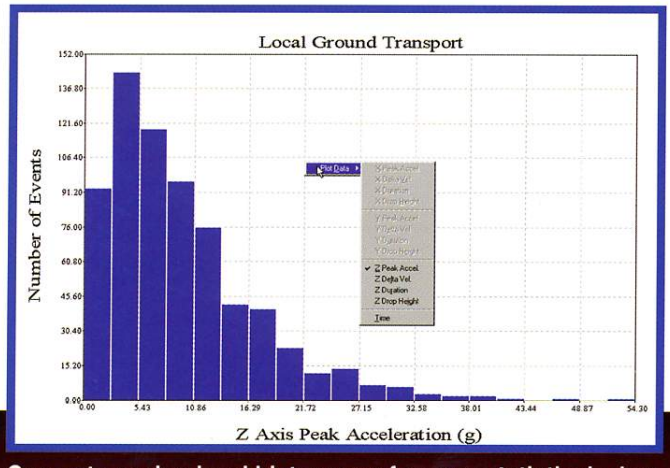
Let ShockView32's unique damage boundary curve format tie in recorded field data to product fragility specifications. Peak G-level versus velocity change plots put field data in a format for which packaging engineers are accustomed.



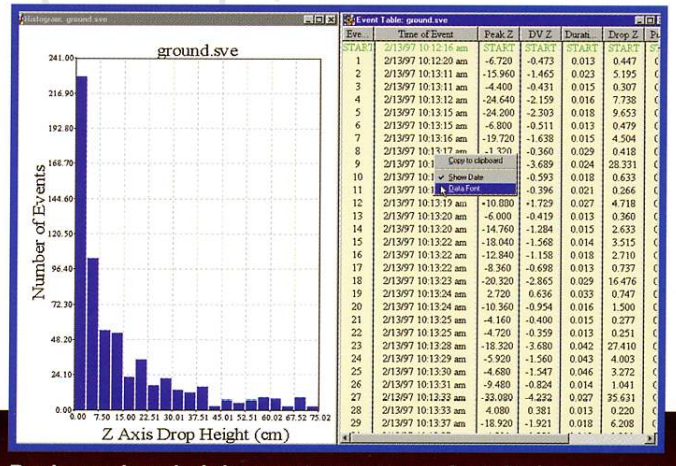
View recorded data in event table or graphical time-history charts for ease of analysis.



ShockView32 enables you to see different views of a file simultaneously as well as different data files on the screen at the same time for comparison.



Generate peak-g level histograms for easy statistical characterization. Quickly identifies the largest shocks and frequency of occurrence for specific routes or shipments.



Package drop height measurement and analysis is simplified with the new SnapShock-PLUS/3D series recorders. The recorder automatically classifies the event as a free fall drop or equivalent (impact). Drop height calculations are performed accordingly.

Overview

The **SnapShock-PLUS (SSP)** series data recorders are compact, battery powered acceleration event recorders. The new generation devices offer several improved capabilities over the standard SnapShock model. In addition to measuring peak-g shock levels with a built-in accelerometer, the SSP also measures and records shock duration and velocity change for all events which exceed user defined thresholds. In addition the SSP is now available in a triaxial version referred to as the **SnapShock-PLUS/3D (SSP/3D)**. The SSP/3D offers all features of the SSP with the benefit of 3-dimensional measurement capability. Each instrument measures and records the peak acceleration (shock or impact) levels to which it is exposed along with shock duration and velocity change, and the exact date and time of occurrence. The user may specify recording thresholds in g-level as well as velocity change, so that only those events which exceed g-level and velocity change thresholds of interest are actually recorded into non-volatile memory. The SSP series recorders utilize a low power design, enabling operation for weeks at a time while running on a single 9-volt lithium battery.

Applications

The **SnapShock-PLUS** is designed for documenting dynamic environments such as moving vehicles, trains, planes, packaged products and containers, ships, etc. The device is also useful in characterizing environments such as production and assembly lines of delicate electronics, IC fabrication, communications and computer components, as well as shock sensitive active pharmaceuticals.

The Instrument

The **SnapShock-PLUS** incorporates a single-axis or triaxial accelerometer, microprocessor controlled data acquisition, user-selectable filtering and signal conditioning, solid-state non-volatile data memory, and an external activation pushbutton. For setup and data recovery the SSP is connected with a host PC running IST's new ShockView32 user interface software running under Windows95/NT.

The SSP uses a standard serial data communications port to communicate with a host PC, or through an IRDA wireless interface, which is standard on most laptops.

During operation the **SnapShock-PLUS** can measure and record up to 1475 time-tagged peak acceleration levels. With the optional extended data memory this can be increased to 5900 readings. The storage medium is non-volatile solid state EEPROM, providing maximum data security even if the battery becomes completely discharged. The SSP may be activated for recording under either computer control or by the manual pushbutton control. The unit may be cycled repeatedly in and out of recording mode during a single test session without requiring a host PC.

Once activated the **SnapShock-PLUS** triggers and records only those acceleration events which exceed the trigger criteria. This technique is illustrated below.

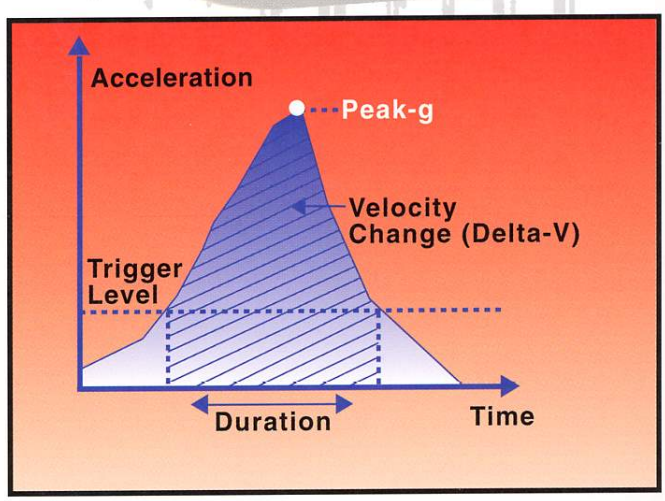


Illustration of Triggered Recording

Transportation & Handling Data Recorder

SnapShock PLUS

Performance History

The industry-standard **SnapShock** recorder series has been in widespread use for many years. The **SnapShock** has been the recorder of choice for most U.S. and Canadian railroads, as well as numerous transportation service providers in the U.S. and abroad. The recorder has also been widely used in various industrial test and measurement projects ranging from production line monitoring to automotive vibration level characterization. The new features of the **SnapShock-PLUS** series now offer the user more advanced measurement capabilities while maintaining the same compact size and low cost associated with the standard **SnapShock** recorder.

Ordering information for the SnapShock-PLUS:

MODEL SSP - XOOO - XD - XX

Range:
10g, 20g, 50g,100g

Number of Axes:
1D, 3D

2000 (1475 events in 1D, 680 events in 3D)
4000 (5900 events in 1D, 2600 events in 3D)

Other ranges available by special order; consult the factory for details.

In addition to the **SnapShock-PLUS** recorders, users may need to purchase a IC-SSP smart interface cable or IR-WAND if their computer does not have an IRDA port.

Other optional accessories include:
IC-SSP Serial Port Reader Cable
IR-WAND Infrared Wand For PC Desktop Communications
MMB-SS Magnetic Mounting Bracket
AMB-SS Angular Mounting Bracket

Specifications

Acceleration Recording:

Resolution	.08%, typical
Accuracy	+/-5% of meas. signal or .08% FS, whichever is greater
Accelerometer type	Uni-axial or triaxial, piezoresistive
Sample rate	1200 Hz
Auto-zero correction rate	1% fs/sec (approximate)
Frequency response (to-3dB)	DC to 179 Hz
Temperature Sensor	-15 to 55 deg C
Data memory	
Type	Non-volatile EEPROM
Capacity-uni-axial	
Standard	1475 date, time, peak-g, duration delta-V readings
Optional	5900 date, time, peak-g, duration, delta-V readings
Capacity-triaxial	2600 date, time, peak-g, duration, delta-V readings
Recording modes	Event, drop height
Filter selections	
Standard	4th order from 10 Hz to 179Hz, +/- 10% user selectable
Shock Recording	
Minimum duration	5.6 msec.
Maximum duration	0.85 sec to 54 sec. (user selectable)
Minimum time between shock events (dead time)	40 msec.
Threshold selections (g)	0.6% of fs (g's) to fs, in steps of 0.08% fs
Threshold selections (delta-V)	0 to 2,000+ meters/sec.
Clock resolution	1 sec.
Accuracy	+/- 1 min/month
Data communications	standard RS-232, or infrared (IRDA)
Connectors	7-pin mini-AMP:COM/PWR/TRIG
Switches	Mode select pushbutton

Physical Characteristics

Size	1.625" x 3.2" x 1.5" (4.1 x 8.1 x 3.8 cm)
Construction	Black anodized aluminum, gasket sealed
Weight	7 oz. (204 gm) uniaxial, 10 oz. triaxial
Power consumption	1.6mA (typical, recording), 3.4mA triaxial
Battery type	Lithium 9 volt
Battery life	7-27 days (typ.) depending on battery type, system configuration
Temperature range	(operational) 5 to 131 deg F (-15 to 55 deg C)
Fragility	500g
Mounting	Two #6 holes in baseplate, or MMB-SS bracket

Standard Data Analysis of ShockView.32 Software

Tabular report	Event number, date, time, peak-g level (x,y,z) duration (x,y,z), delta-V (x,y,z), drop height, drop type classification. Recorder start & stop date & times
Graphical display	Time line plots (x,y,z) selectable of peak-g, duration, or delta-V Histogram plots (x,y,z) selectable of peak-g, duratic or delta-V Scatter plots peak-g versus delta-V (x,y,z) selectable. Damage boundary curve insertion Configurable event balloons. Histogram plots of drop height

Tabular and graphical hardcopy printout
Data file export capability via clipboard
Full help screen files and user support

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