Introduction

The ShockTrak™ Impact Recording and Tracking System combines advanced tri-axial piezoelectric accelerometer technology with sophisticated electronics and software to offer an advanced shock and vibration data logger with real time tracking. The ShockTrak System is available with three standard program configurations depending on the size and fragility of your shipment. Custom programming is available for specific applications. When a programmed impact level is exceeded, a detailed event curve will be recorded and the ShockTrak System will send a real-time alert letting you know where and when a potentially damaging impact has occurred. Benefit from knowing where your asset is with location messages sent every four hours.

FEATURES
Records impact events; max peaks X, Y, and Z; and internal temperature
Pre-programmed configurations
Sends real-time alert and location when events occur
Delivers asset report location every 4 hours

Contents

ShockTrak™ Impact Recording & Tracking System Key Features

The ShockTrak™ Impact Recording & Tracking System combines the ShockLog® 298 Impact Recorder and a satellite communication module to deliver impact recording, real-time reporting and asset location. The system is preprogrammed with parameters optimized for the user's asset. If necessary, the ShockLog can be programmed with a custom configuration specific to the requirements of the shipment.

The ShockTrak System has been developed to monitor shock based on acceleration measurements and impact frequency, then report unacceptable conditions that are potentially damaging. The web-hosted tracking application allows you to view and generate reports relative to your assets in transit. The ShockTrak System is especially suitable for applications where the cost of exposure to out-of-specification environmental conditions and the need to locate the asset are critical.

When any of the accelerometer signals exceeds the 'wake-up' threshold, the ShockLog processor turns on and checks the sensor outputs at full sampling speed (4096 samples per second per axis). If the output of any sensor exceeds the warning or alarm thresholds, the ShockTrak will record a detailed event. In addition, the detailed time history of the first event to trigger a warning, the first to trigger an alarm and subsequent events will be recorded. Preprogrammed configurations will record up to 108 events and custom configurations can be created to record up to 870 events.

Note: Care must be taken with custom configurations to avoid unacceptable battery drain and/or message overage conditions.

Custom Configurations

With a custom configuration, the ShockTrak System also supports peak recording in fixed time slots. In this mode the highest and lowest signal level present on each input is recorded for each time slot. The ShockTrak System has the ability to set alarm conditions on any of the selected slot data; most parameters have a high and low alarm setting point.

User-Selectable Time Slot Data:

- Peak X,Y, Z
- gRMS
- Tilt & Roll
- Internal Temperature

ShockTrak System Specifications

System Specification	
Operating Temperature Range	-30 to 60°C / -86 to 140°F The unit shall remain operational over the -40 to 85°C / -40 to 185°F range but may experience battery life and RF signal degradation.
Dimensions	320.3 x 239 x 119.1 mm / 12.61 x 9.41 x 4.69 in
Weight	4.4kg / 9.7lbs
Battery	2 x 3.6V AA Lithium (ShockLog) 4 x 1.5V AA Lithium (Satellite Module) 4 x 3.6V C-Sized Lithium (OPTIONAL Battery Pack)
Battery Life	Up to 3 months Additional 3 months with optional battery pack
Case Material	Fiberglass
Sealing	NEMA 1, 3, 4X, 6P, 12
Satellite Technology	Global LEO Satellite operation using the Globalstar Simplex Data Network
ShockTrak Web Hosted Application	Supported on Chrome, IE & Firefox
ShockLog Desktop Software	Functions on Windows XP, Vista, 7, 8
Communications / Interfaces	USB 2 iButton
A-D Converter Resolution	12 bits
Flash Memory for Data	4096 kbytes
Data Collection	
Event Processor Wake-up Delay	2.5ms
Timeslot Interval	600 to 3600 seconds
Samples per Channel per Event	4096 (preprogrammed) 512 to 4096 (custom)
Maximum Number of Events (detailed)	108 (preprogrammed) 108 to 870 (custom)
Event Duration	1 to 128 seconds

Accelerometers	
Low Frequency Cutoff (-3dB 10g – 100g)	0.1 - 0.5Hz
High Frequency Cutoff (-3dB)	250 – 300Hz
Hardware Filters (Programmable)	10Hz, 40Hz, 50Hz, 90Hz, 120Hz and 250Hz
Resolution (% of full scale) 1% for Peaks	0.1%
Scale Factor Accuracy at 5G (event record)	±2%
Additional Error Other Ranges	±2%
Additional Error Peak Capture	±5%
Change of Scale Factor over Temperature	±4%
Acceleration Ranges	±1 to ±200G
Wake-up Threshold (% of range)	5 to 95%
Warning and Alarm Thresholds (% of range)	5 to 95%

Custom Configuration Specifications

Humidity / Temperature Specifications	
Temperature Measuring Range	-40 to 85°C / -40 to 185°F
Temperature Accuracy	±2°C / ±4°F
Temperature Resolution	0.1°C
Humidity Measuring Range	0 - 100% RH
Humidity Accuracy	±3% RH
Humidity Resolution	0.1% RH
Dew Point Measuring Range	-40°C to 85°C / -40°F to 185°F 0 - 100% RH
Dew Point Relative Accuracy (-20 to 70°C, 25 to 75%RH)	±2°C / ±4°F
Dew Point Resolution	0.1°C
Tilt & Roll Specifications	
Tilt Range Monitored	±180°
Resolution	0.1°
Transverse Sensitivity	5%

How to Use the ShockTrak System

To use the ShockTrak System simply mount on the item to be monitored and start the unit with the START iButton provided. When in transit the ShockTrak will report location to a web-hosted application. If desired, once the journey is completed extensive trip data can be downloaded from the unit and analyzed using ShockLog desktop software.

Mounting Instructions

Warning: Magnets can create a pinch hazard. Do not place hands between the unit and the mounting surface. Please see the device for Hold Here points.

Find a suitable mounting location with line of sight to the sky. It is recommended that photos be taken of the mounting orientation for clarity of event data analysis.

Note: The ShockTrak system must have line of sight to the sky in order to communicate with the satellite network.

All required batteries are installed in the ShockLog and ShockTrak satellite module. The ShockTrak System can communicate for a maximum of 90 days.

An optional extended life battery compartment is available for custom configurations or longer trip durations. The extended battery pack adds an additional 90 days of life to the ShockTrak System. No batteries are installed in this compartment for standard configurations.

CAUTION - RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

When mounting the device to your asset, make contact with two magnets and then slowly ease the ShockTrak system onto all four magnets. These magnets are extremely strong and if not handled with care could result in injury.

Note: Magnetic mounts are intended for temporary mounting.

A START ibutton is included inside the ShockTrak enclosure. Remove the black center cap from the ShockLog iButton port. Follow the instructions on the START ibutton to begin operation.
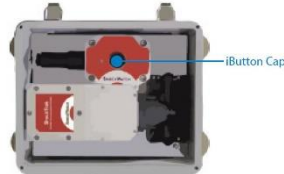
Close and secure the latches before the journey begins.

When an impact event occurs during the journey, an alert will be sent through the web-hosted application and the ShockLog LED Event Alarm will flash red every five (5) seconds for an alarm condition and every ten (10) seconds for a warning condition.

ShockTrak Software

The ShockTrak software is a web-hosted application and so no software is downloaded. Simply log in and access the location of your ShockTrak unit anywhere in the world. Reports may be viewed on screen and selected data exported to other applications. Seven different reports are available: asset location, asset movement, position, event detail, event summary, geofence dwell, and user activity.

Asset Location:

Shows each ShockTrak's location based on the last event or position reported. Contains the asset name, device IMEI, address, locality, near place, inside geofence, time of last report.

Asset Movement:

Used to determine the timeframe in which the ShockTrak units have last reported movement. This report can be filtered by specific timeframe, geofence, and place.

Position Report:

Lists every position reported by a ShockTrak unit, excluding event reports, within a specified date range.

Event Detail:

Provides a detailed list of ShockTrak events reported by a selected unit within a specified date range.

Event Summary:

Provides a summary of number and type of events that have been reported by a selected ShockTrak unit within a specified date range.

Geofence Dwell:

Shows activity within a specified geofence for a specified date range.

User Activity:

Only accessible by an administrator account and shows individual user account activity within a specified date range.

Communications

At the end of a journey, the complete data file from the ShockLog can be downloaded via USB if analysis is required.

For a quick and simple way of setting up, starting or stopping a unit in the field, an iButton interface is available. The iButton interface also supports the download of a 'one page report' giving a condensed view of the journey data gathered.

ShockLog® Desktop Software (Optional)

The ShockLog® software runs on a desktop or laptop PC using the Windows XP, Vista, Windows 7, Windows 8, or Windows 10 operating systems.

The software allows the operator to configure the ShockTrak and to extract and examine data records from the instrument.

Reports may be viewed on screen and selected data exported to other applications. Six different reports are available: download, summary, events summary, event details, time slot, and log data.

Review your ShockTrak device journey through the simple Windows®-based desktop software program. The software allows for configuration of the ShockLog, data extraction, and analysis. The ShockLog Report View provides users with an overview of the entire journey. ShockLog software provides peak acceleration values for all three axes reported on a time basis as well a detailed impact curve. Additional environmental conditions can be monitored and displayed, if desired. Users are able to zoom in for a closer view, or export data into programs such as Excel and MatLab for more detailed analysis.

Download:

This report presents a top-level view of a mission, providing the user with a single page report that can be printed or copied into another document. It contains a Time Slots graph, an Event Summary graph, and the most severe event as well as configuration information. The report start and end time can be adjusted to focus on any part of the mission.

Summary Report:

Data gathered at regular intervals is condensed into summary records. The period over which data is summarized can be set between 10 minutes and 24 hours according to the demands of the application. The summary records can be used to give an overview of a long period of data logging in a conventional spreadsheet format. A maximum of 1,024 summaries can be recorded in any one mission. The typical summary report parameters are date, time, number of warnings, number of alarms, max peak x, y, and z, gRMS x, y, and z, max/min temperature, and range.

Events Summary Report:

All the events are presented in a graphical or spreadsheet form. For each event the following parameters are available: date, time, range, temperature, x/y/z modulus. In addition the maximum modulus of all the events may be displayed graphically.

Event Details Report:

Detailed information for all of the recorded events is available in spreadsheet or graphical form. When the graphical form is used pan and zoom controls are available. The following parameters are available: sample time, sample number, max/min x, y, and z

Time Slot Report:

Data recorded in the timeslot memory can be displayed in graphical form. The standard ShockTrak System configuration is for max peak x, y, z and internal temperature. The following parameters can be available depending on setup and unit specification: date, time, max peak x, y, and z, min peak x, y, and z, gRMS x, y, and z, internal temperature, humidity, external temperature, tilt & roll.

Security Log Report:

The security log data can be displayed in spreadsheet form. The following parameters are available: date and time of, data clearing operations or resets.

Drawings
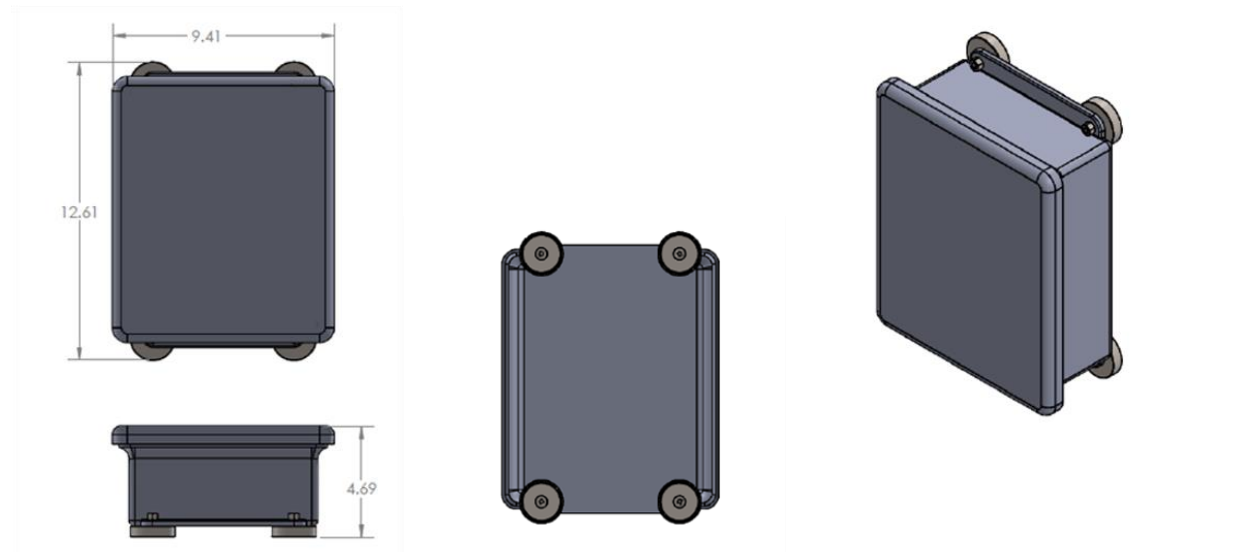
Accessories & Related Products

Batteries are included with each ShockTrak. For journeys longer than 90 days or those requiring location messages more frequent than every four hours, an extended battery compartment is located in the ShockTrak. Four 3.6V C-sized lithium batteries can be installed by the user to double the battery life of the ShockTrak. Saft batteries are recommended. Due to lithium battery flight restrictions, ShockWatch recommends that these batteries be sourced locally by the ShockTrak user.

New users of the ShockTrak may purchase an accessory kit which includes the optional desktop software – needed for post journey analytics and full data set downloading. The kit contains the following items (CD containing desktop software; ShockLog Quick Start Guide; USB Communication Cable; iButton Set: start, stop, download, setup, and clock iButtons; USB Connection BUS and Cable). Additional software licenses, iButtons, and cables can be ordered separately.

Ordering Information

Part Number	Product Description
40600K	ShockTrak Impact Recording & Tracking System – includes ShockLog 298A and 6 month connectivity contract. ***Configuration Required***
40650	Configuration 1 – Asset weight 300,000 – 500,000 lbs. XYZ + temp recording. 3 month journey
40651	Configuration 2 – Asset weight 100,000 – 299,999 lbs. XYZ + temp recording. 3 month journey
40652	Configuration 3 – Asset weight 60,000 – 99,999 lbs. n XYZ + temp recording. 3 month journey
40615	6 month connectivity / access renewal contract

Technical Support

If you are unsure of how to use or interpret the ShockTrak®, please contact ShockWatch Technical Support at (800) 527-9497 or (214) 736-4580.

Warranty

If a product fails to conform to the specifications stated in this document, the product may be returned to ShockWatch at any time prior to the product's specified expiration date or, if no expiration date is specified, within one year from the date of shipment. ShockWatch shall either refund the purchase price (without interest), or repair and/or replace the product (or, in the case of services, re-perform such services) at no additional cost. The warranty is void if the defect has resulted from accident, misuse, abuse or misapplication.   Any product which is identified as defective during the warranty period and is returned to ShockWatch with a Return Material Authorization (RMA) number (which must be obtained from ShockWatch prior to any return) within thirty (30) days after discovery of the defect with a written description of the defect will be replaced by ShockWatch.

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