

ShockLog

SHOCKWATCH™

Define your Shipping and Storage Environment With Shocklog - A Low Cost Tri-axial Shock and Vibration Monitor



The ShockLog combines advanced tri-axial piezo electric accelerometer technology with sophisticated electronics and software to offer an advanced shock and vibration-monitoring instrument.

Key Features

- Three built in accelerometers
- Built in temperature sensor
- Optional external sensors
- Velocity or acceleration measurements
- Detailed record of significant events
- Date and time stamping
- Non volatile memory records 500 day history
- Adjustable warning and alarm thresholds
- LED operation, warning & alarm indicators
- Tamper proof; factory & user passwords
- IP67 sealed and RF screened
- Completely self contained (battery operated)
- 12 month battery life
- Uses std. C size battery: lithium or alkaline

Features

The Shocklog has been designed to monitor shock and vibration based on acceleration or velocity measurements. It has several unique features, which make it specially suitable for applications where the cost of exposure to out of specification environmental influences is very high. The instrument is equally convenient for protecting high value fixed or mobile installations or characterizing shock and vibration during transportation.

In normal operation the device checks the output of the sensors (the three built in accelerometers, the built in temperature sensor and any external sensors) once every 10 seconds. The information from the sensors is merged into a record for each recording period and recorded in non-volatile memory. The length of the recording period can be set between 10 minutes and 24 hours with sufficient memory for 512 periods.

If any of the accelerometer signals or the first external input exceeds the 'wake up' threshold the processor will be turned on and will check the sensor outputs at a much faster rate (up to 4000 samples per second). If the output of any sensor exceeds the warning or trip thresholds, the Shocklog will flash its status lamps accordingly. In addition the detailed acceleration time history of the first event to set a warning, the first to set an alarm and subsequent severe events up to the installed memory capacity will be recorded. The Shocklog will adjust the sample rate during the event recording (within parameters set up by the user) to make the most efficient use of memory and capture the full extent of any events. Due to each axis being monitored independently a full shock profile can be developed.

The external inputs are intended for use with low bandwidth devices such as pressure or humidity sensors and, in addition, the first external input can be used to trigger the Shocklog.

The Shocklog 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 time slot length may be set between 10 seconds and 1 hour and as many as 262,144 slots may be recorded.



Security

The Shocklog stores all data and status information in high performance sector erase FLASH memory. This memory requires no power to retain data and offers special hardware protection against accidental erasure.

The instrument can be configured by connecting it to a PC running the data analysis and set up software supplied free with each Shocklog. During the configuration process the operator can set the levels for warnings and alarms, determine the sensor types to be used and set up user passwords for subsequent access to data.

Before the software will communicate with the Shocklog the user must supply the factory password for the individual instrument and any user passwords that may have been set to restrict access to data, resetting, calibration or other functions.

Casing, Mounting & Environment Conditions For Use

The complete electronic and transducer package is enclosed in a robust metallic case and encapsulated in polyurethane compound & emdash; it is completely impossible to tamper with the hardware without leaving clear evidence of such action.

The securing bolts pass right through the body of the instrument to guarantee a reliable mechanical installation.

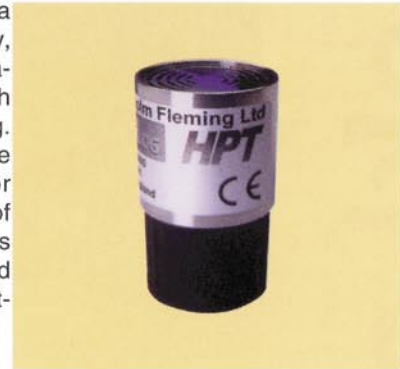
The Shocklog has been designed to function reliably in difficult environments. The electronic components are assembled using surface mount technology and the latest automatic assembly equipment.

This construction technique, in combination with the absence of cables for power or sensors (unless additional external sensors are used) results in a very high immunity to electrical interference and very low levels of RF emission. The Shocklog may safely be used in close proximity to sensitive instruments or in difficult electrical environments.

The Shocklog is sealed to IP67 (including connectors) and is capable of operating at temperatures between -20° and +158°F (70°C). [-40 to +185°F (85°C) to special order.]

RD298HPT - Humidity, Pressure and Temperature

The RD298HPT is a combined humidity, pressure and temperature sensor for use with the RD298 ShockLog. It enables the ShockLog to monitor an extended range of environmental factors and is fully supported by the ShockLog software.



- Direct connection to RD298 ShockLog
- Built in calibration memory independent of ShockLog calibration
- Fully supported by ShockLog software
- Extended temperature range
- Robust stainless steel housing
- Obtains power from ShockLog
- No installation – plug and play operation
- Fast temperature response

RD298HPT SPECIFICATIONS

	Min	max	units
Complete Instrument			
Operating temperature range	40	+85	C
Drop test survival	1		m
Size	60 long x 32 diameter		
Case material	stainless steel + plastic		
Weight	0.09	kg	
Power	obtained from ShockLog		
EMC	EN50081-1, EN50082-1		
Humidity			
Measuring range	0	100	% RH
Accuracy (@25C, 25-75%RH)	-3	+3	% RH
Resolution	0.5		% RH
Pressure			
Measuring range	0	1.1	Bar
Accuracy (@0.2 – 1.1 Bar, 25C)	-10	+10	mBar
Accuracy(@0.0 – 0.2 Bar, 25C)	-30	+30	mBar
Resolution	2		mBar
Temperature			
Measuring range	-40	+85	C
Accuracy (-20 to +70C)	-2	+2	C
Resolution	0.5		C

This data sheet describes a product in development and is subject to revision without notice. Purchasers should confirm the specification before ordering. Aspects of the design of this product may be the subject of one or more British or International patents or patent applications.

Software

The Shocklog is supplied with software that runs on a desktop or portable PC using either the Windows 95/98 or Windows NT4 operating systems.

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

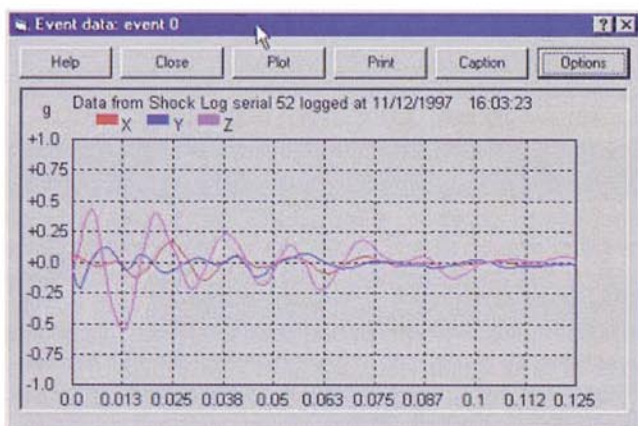
Download Date & Time	User comment	Serial no	Events	Warnings	Alarms	Summaries	Sbits
28/11/1997 08:17:30	7505	00081	0	0	0	491	1
28/11/1997 08:24:38	7502	00081	0	0	0	512	1
28/11/1997 08:33:39		00081	0	0	0	512	1898
28/11/1997 08:36:49	7502	00081	0	0	0	512	1907
28/11/1997 08:43:19	7506	00081	0	0	0	512	1953
28/11/1997 08:47:14	7465	00081	0	0	0	495	1490
28/11/1997 15:00:02		00052	0	0	0	3	25
28/11/1997 15:02:12		00052	0	0	0	3	30
28/11/1997 15:31:20		00052	0	0	0	3	25
28/11/1997 15:32:48		00052	0	0	0	3	29
28/11/1997 15:53:08		00052	0	0	0	10	90
10/12/1997 08:22:39		00052	4	1	3	512	8023
11/12/1997 16:04:42		00052	1	0	0	5	42
12/12/1997 09:25:52		00081	0	0	0	51	457

Reports

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

Summary report parameters: date, time, number of warnings, number of alarms, max x|y|z, min x|y|z, humidity, pressure, max pk x|y|z, min pk x|y|z, rms x|y|z, max/min temperature, range

- Events summary report parameters: date, time, duration, significance, range, temperature
- Event Details report parameters (text or graphical): sample time, sample number, max/min x|y|z
- Time slot report parameters (graphical): date, time, max pk x|y|z, min pk x|y|z, max ext1|ext2, min ext1|ext2, internal temperature, humidity, pressure, external temperature
- Log report parameters: date and time of: password changes, setup changes, battery changes, data clearing operations or resets.



Graphs

Any set of report parameters may be graphed against time and detailed graphs of individual events may be plotted on screen, printed or saved as files.

The Shocklog software can be downloaded free in the Technical Support area of the Shockwatch web site at www.shockwatch.com or can be ordered through an authorized Shockwatch dealer.

Hardware Specifications

Complete Instrument	min	max	units	Details
Operating temperature range (extended range available)	-20	+70	°C	
Drop test survival		1	m	
Size (over connectors)			mm	180 x 84x 42
Case material				aluminum
Weight		0.85	kg	
Dimensions				178mm x 84mm x 42mm
A-D converter resolution	10		bits	
Flash memory	32		k bytes	(for code)
	1920		k bytes	(for data)
Battery - (main full temperature range)	8000		mAh	1 x 3.6V lithium C size
Battery - (main reduced temperature range)	5500		mAh	1 x 1.5V alkaline C size
Indicators				Red and Green LED's
Interface				RS232 levels, Rx and Tx Baud rate: 19200
External power source option	4.75	18	V	
External power source average current (run - download)	20	250	mA	
External power source startup current		500	mA	
EMC				EN50081-1, EN50082-1, FCC CFR (July '96) Part 1 Limit B
Accelerometers				
Low frequency cut off (-3dB)	0.1	0.3	Hz	
Low frequency cut off (-3dB, 1g, 3g range)	1	2	Hz	
High frequency cut off (-3dB, all ranges)	150	250	Hz	
Resolution (% of full scale)	0.3			
Scale factor accuracy at 5g	-2	+2	%	
Change of scale factor over temperature	-4	+4	%	
Acceleration range	±1	±100	g	
Velocity range	±1	±100	cm/s	
Wake up threshold (% of range)	5	100	%	
Warning and alarm thresholds (% of range)	5	100	%	
Wake up time		1.5	mS	
Other ranges available as factory installed option up to 250g				
External Sensors				
Number of external inputs		2		
Independent thresholds for wake up etc		1		
Input voltage range	0	4.5	V	
Low frequency cut off	0	0	Hz	
High frequency cut off (-3dB)	40	80	Hz	
Resolution	5	4.5	mV	
Scale factor accuracy at 4V	-2	+2	%	
Change of scale factor over temperature	-2	+2	%	
Wake up threshold (ext 1)	0	5	V	
Warning and alarm thresholds (ext 1)	0	5	V	

Options

Please note that we are happy to discuss your specific needs and requirements. In certain circumstances, modified units may be manufactured to suit your OEM applications.

Included Accessories

- Serial communications lead to PC
- Molded plastic carrying case for ShockLog and accessories
- Software on CD ROM
- Operators Manual
- Spare alkaline battery

About SHOCKWATCH

Shockwatch develops, manufactures and markets a broad range of impact, tilt and environmental monitoring products built for damage prevention and the enhancement of safety standards. Shockwatch products, known for high quality, excellent reliability and leading technology, are distributed worldwide by a network of strategic partners and resellers. Founded in 1974, the company is headquartered in Dallas, Texas and is privately owned.

More information about the company and its products can be found at:

www.shockwatch.com

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