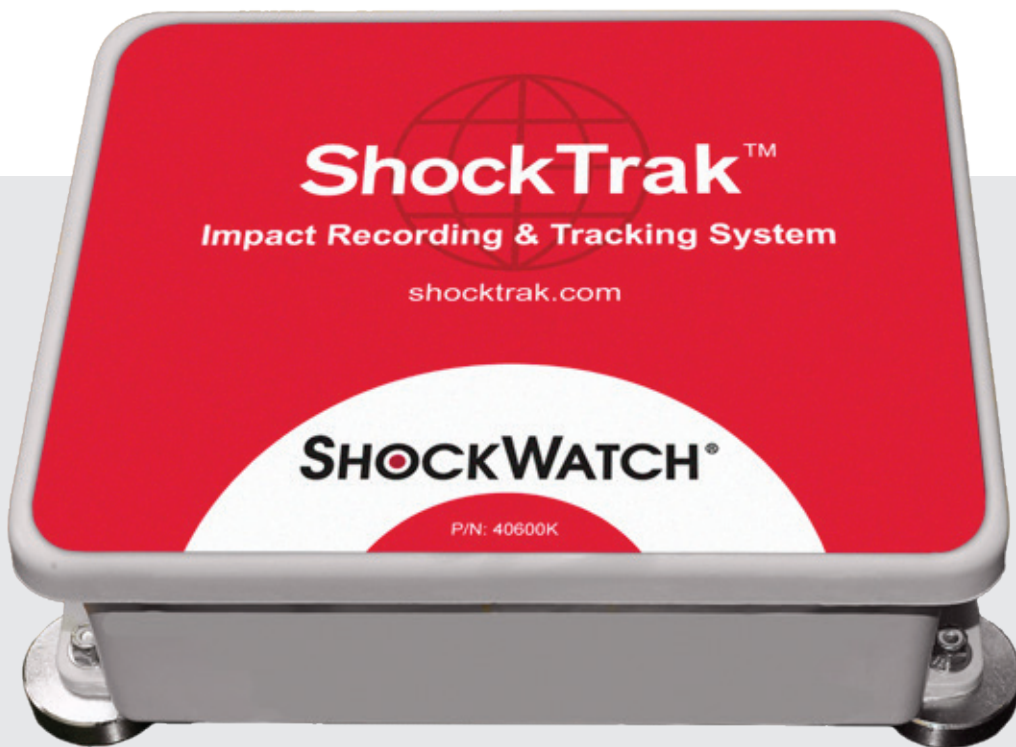




ShockTrak™

USER MANUAL



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1. INTRODUCTION

DESCRIPTION AND FEATURES

The ShockTrak Impact Recording and Tracking System combines the ShockLog 298 impact recorder and a satellite communication module to deliver outstanding impact recording, real-time reporting and asset location. Real-time reporting of impact alerts informs the right people when unacceptable conditions have occurred during a journey.

TECHNICAL SPECIFICATIONS

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.
Acceleration Range	+/- 1 to +/- 200 G
Amplitude Scale (Programmable)	1G, 3G, 20G, 30G, 100G, or 200G
Scale Factor Accuracy at 5G	± 2%
Additional Error Other Ranges	± 2%
Cut-off Frequency Options (Programmable)	10 Hz, 40 Hz, 50 Hz, 90 Hz, 120 Hz and 250 Hz
Wake-up, Warning, and Alarm Threshold (% of Range)	5 – 95%
Enclosure Rating	NEMA 1, 3, 4X, 6P, 12
Size	320.3 x 239 x 119.1 mm / 12.61 x 9.41 x 4.69 in
Weight	4.4kg / 9.7lbs
Satellite Technology	Global LEO Satellite operation using Globalstar Simplex Data Networks

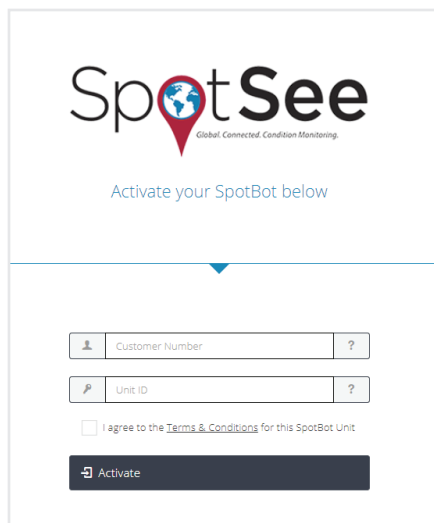
2. INITIAL SETUP

CLOUD ACTIVATION & USER ACCOUNT SETUP

NOTE: Activation of the satellite module can take up to 2 business days. Please plan accordingly.

If this is your first connected device from SpotSee, an Administrator (Admin) Account must be established. The Admin will be responsible for user access for the account.

To begin the process, go to activate.spotsee.io and complete the activation form.



“Customer Number”

Enter the Customer Number found on the ShockTrak packing list, the customer invoice or the order acknowledgement.

“Unit ID”

Enter the Unit ID from your ShockTrak found on the bottom of the device.

Click Activate

Type the ADMIN email address in the popup box and click Enter.

A message will be sent to the ADMIN’s email address from no-reply@shockwatch.com.

NOTE: If this email is not received within five (5) minutes, please check spam or junk folders. If the message cannot be located, please contact SpotSee technicalsupport@spotsee.io.

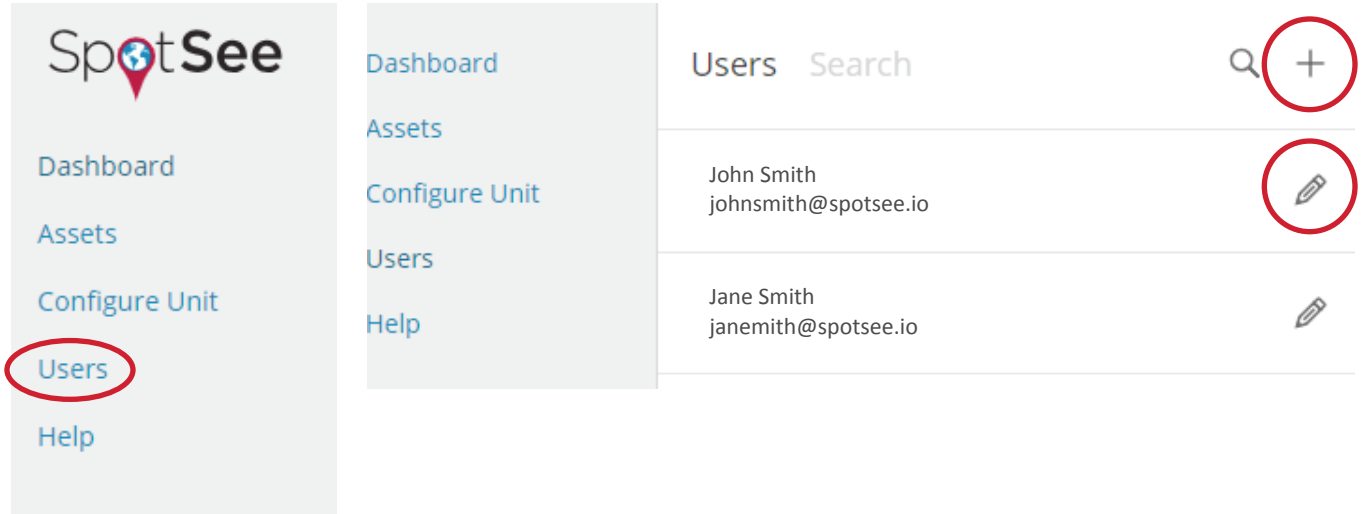
The email will contain a link for creating your password.



Once the administrative account is established, navigate to cloud.spotsee.io and log in with the Admin email and password.

The admin can view and manage other users and assets inside the company. Clicking Users on the left side menu displays a list of all existing users for your account.

Add a user by clicking the plus (+) sign or edit a user by clicking the pencil icon.



SpotSee		Dashboard	Assets	Configure Unit	Users	Help
Dashboard						
Assets						
Configure Unit						
Users						
Help						

Users	Search	+
John Smith johnsmith@spotsee.io		
Jane Smith janemith@spotsee.io		

Add User

Edit User

LOGIN AND PASSWORD RECOVERY

Navigate to cloud.spotsee.io and enter your email and password.

The image shows a login and password recovery interface for SpotSee. On the left, there is a large graphic of a cloud with the SpotSee logo inside it, set against a background of a world map made of blue dots. The SpotSee logo consists of the word "Spot" in black, a red location pin icon with a blue globe inside, and the word "See" in black. Below the logo, it says "Global IoT Connectivity and Cloud". On the right side of the interface, there is a login form. At the top of the form, it says "Log in to access your cloud account". Below this, there are two input fields: "Email" and "Password". Under the "Password" field, there is a checkbox labeled "Remember me". Below the checkbox is a blue "Log In" button. At the bottom of the form, there is a link that says "Forgot Password?".

If you have forgotten your password, click “Forgot Password.” Enter your email and click “Reset Password.”

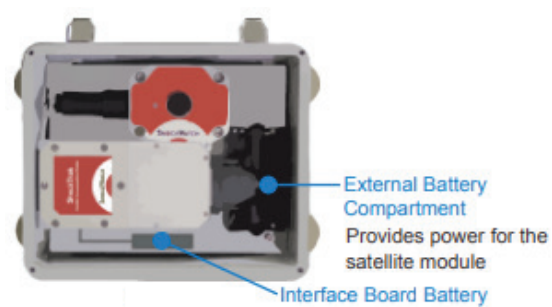
An email will be sent with directions and a link to reset your password.

POWERING THE SHOCKTRAK

All required lithium batteries for the ShockLog and ShockTrak Satellite module are installed at the factory unless otherwise arranged with SpotSee. Batteries included are as follows:

Component	Battery Type	Quantity
ShockLog	3.6V AA Lithium Batteries	2
Interface Board	3.6V AA Lithium Battery	1
ShockTrak Satellite Module (Internal)	1.5V AA Lithium Batteries	4
ShockTrak Satellite Module (External)	3.6V C Lithium Batteries	4

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



NOTE: Operating the ShockTrak in a location without line of sight to the sky will significantly reduce the battery life of the satellite module.



3. SHOCKTRAK - SHOCKLOG® SOFTWARE INSTALLATION

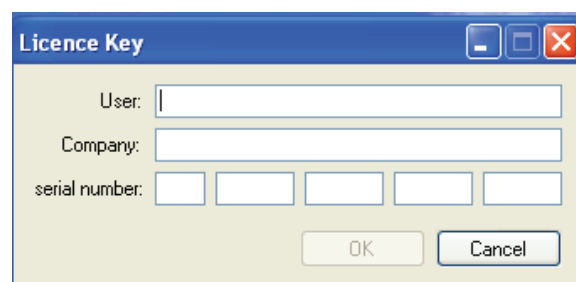
At the heart of the ShockTrak system is the ShockLog impact recorder. The ShockLog must be configured prior to using the ShockTrak. It is possible to order the ShockLog with configuration already loaded into the unit. However, it will be necessary to reprogram the unit after the device has completed its first deployment.

This section will discuss all the programming options of the ShockLog. Some options are not supported on the ShockTrak and are noted in the document.

Many IT systems prevent individual users from installing software on their machines or users may have restricted rights. Therefore, it is essential that you consult your IT Department to ensure you have sufficient rights to install the software. The ShockLog software has been designed to run on a standard PC under Windows XP, Vista, 7, 8, or 10. Each of these operating systems require administration rights to install the software.

To begin the software installation process, insert the USB stick into the USB port on your PC. The set-up process should run automatically. If for any reason the set-up program does not automatically run, go to the Start menu and in Run, enter V:\shocklogsetup.exe (where V:\ is the USB stick) and open the program from there.

Enter your name, company name and the unique serial code supplied with the ShockLog. The code will begin with "SW."
Once the appropriate information and a valid code have been entered, click "OK."

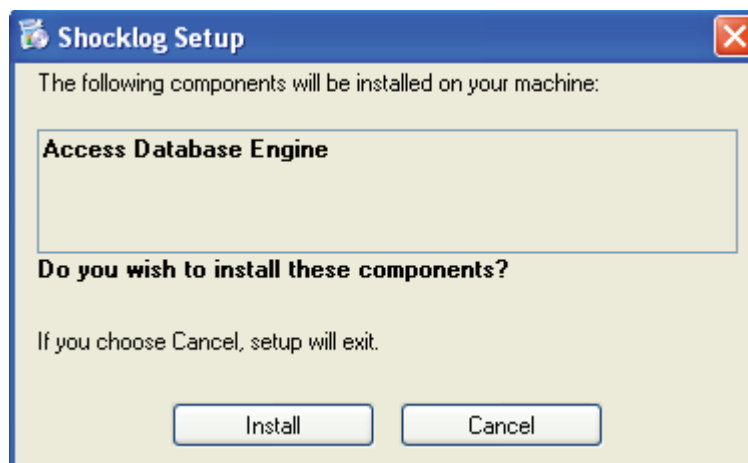
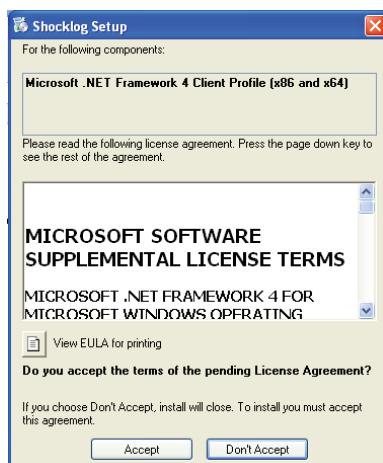


The 'Licence Key' dialog box contains the following fields and controls:

- User:
- Company:
- serial number:
- OK button
- Cancel button

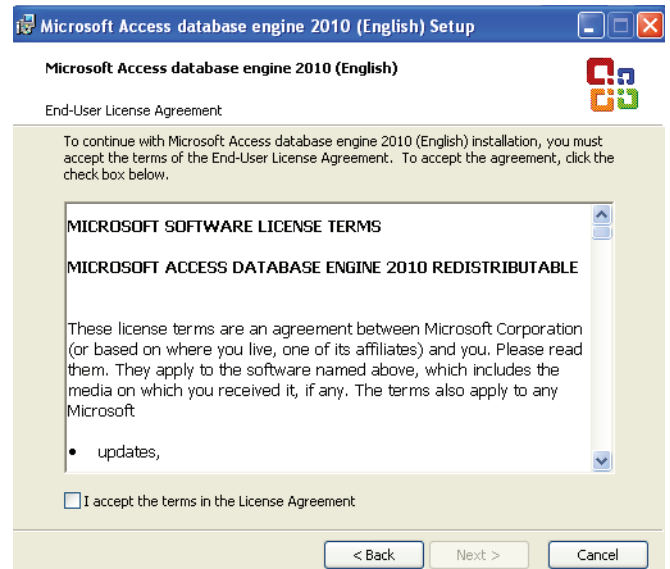
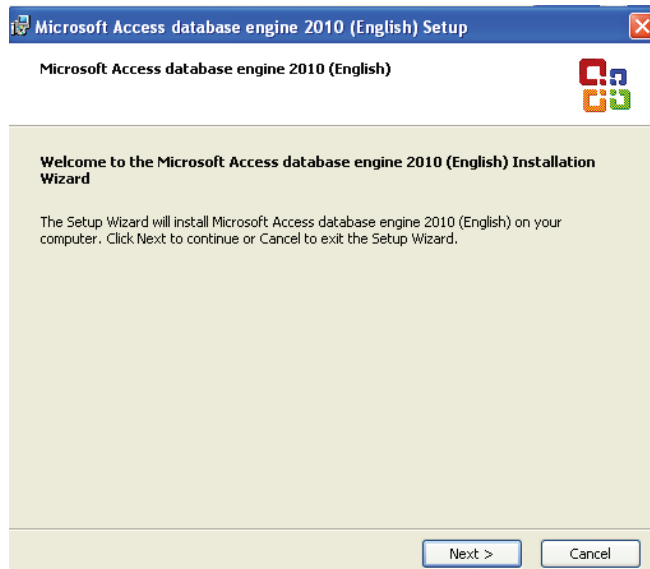
If Microsoft.NET Framework and Microsoft Access are not installed, the following steps will be executed. A new window will appear displaying the Microsoft.NET end user license agreement, click "Accept."

The installation will continue and the system will install components from the CD for the Access Database Engine. Click "Install" to continue.



The Microsoft Access database engine installation wizard will run next. Click “Next” to continue.

Accept the Microsoft Access End User License Agreement terms.

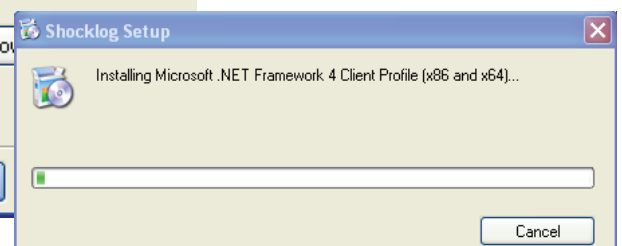
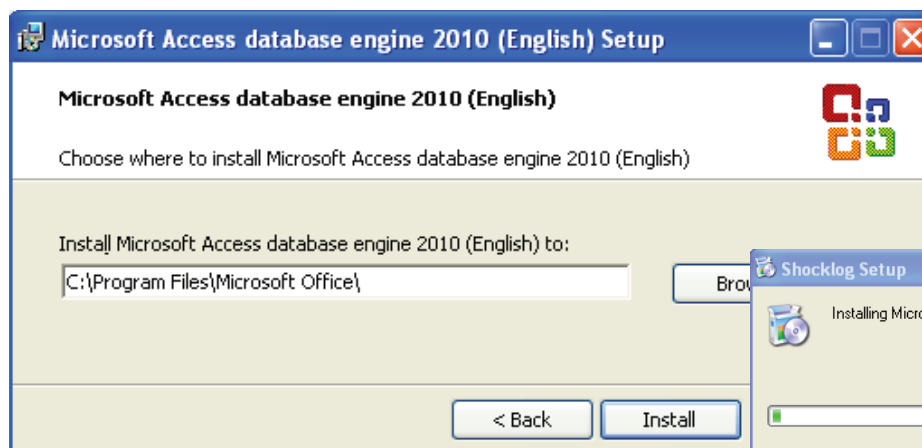
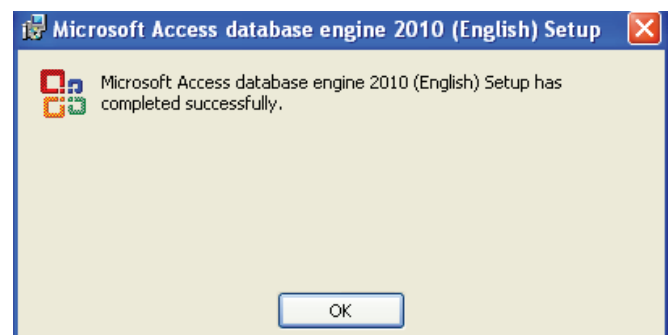


The Access database location is set up next.

Click “Install” to continue.

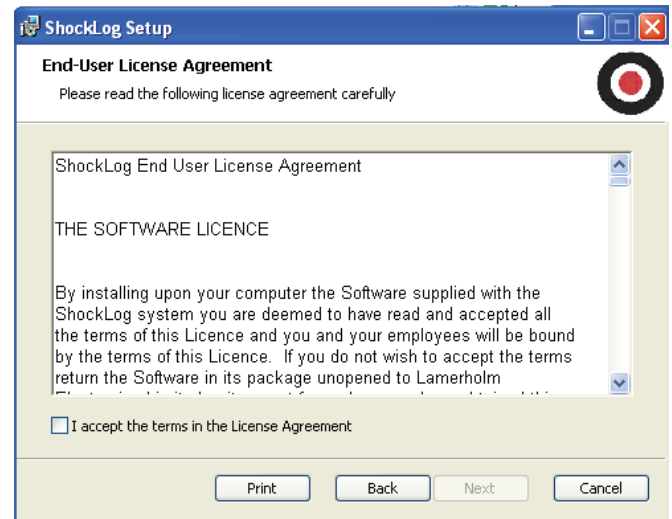
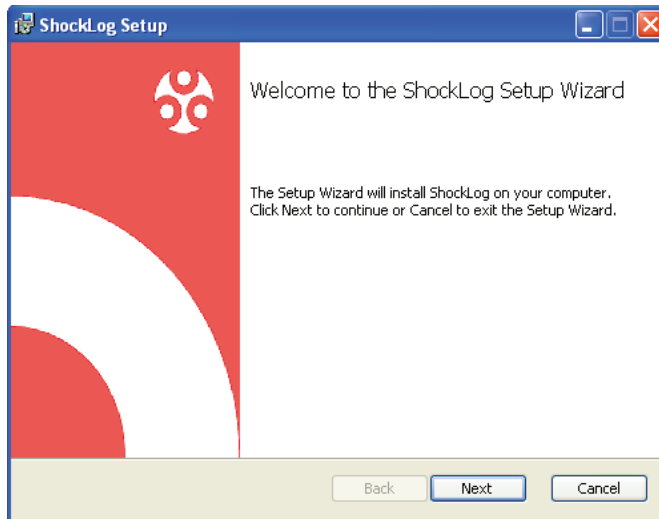
Click “OK” to complete the setup of the Access Database.

Microsoft.net Framework will install next.



After Microsoft.NET Framework and Access have been installed, the installation of the ShockLog software will begin automatically. A ShockLog Setup Wizard will install the ShockLog software on your computer. Click “Next” to start the installation.

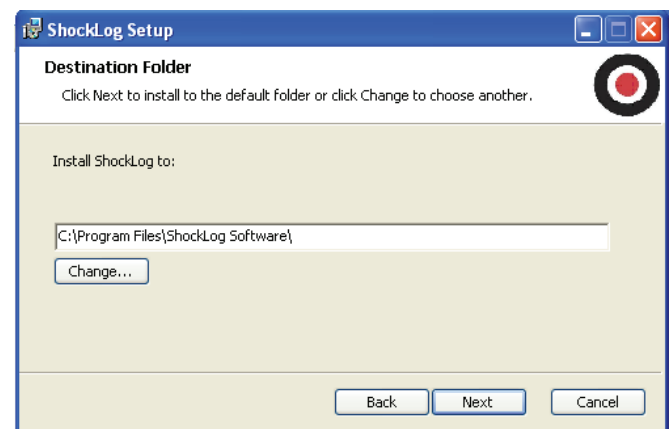
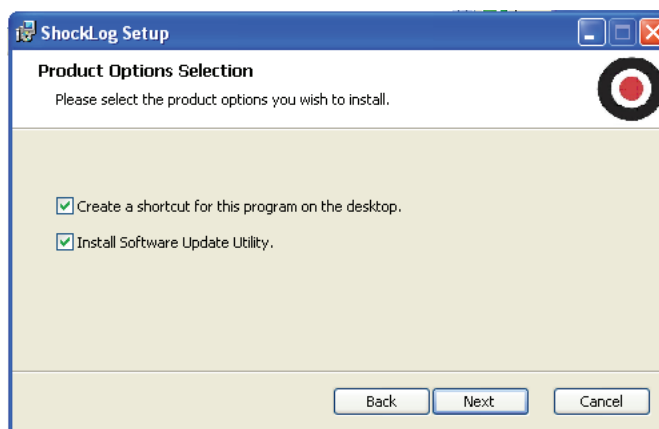
A new window detailing the end user license agreement required to utilize the software will appear. The user must accept the terms of the software by selecting “I accept the terms in the License Agreement.” Click “Next” to continue.



Next, another ShockLog Setup window will prompt the user for the product options to install. Verify that both “Create a shortcut for this program on the desktop” and “Install Software Update Utility” are checked. Click “Next” to continue.

Users can select the location of the software installation. However, it is recommended that the default settings be accepted.

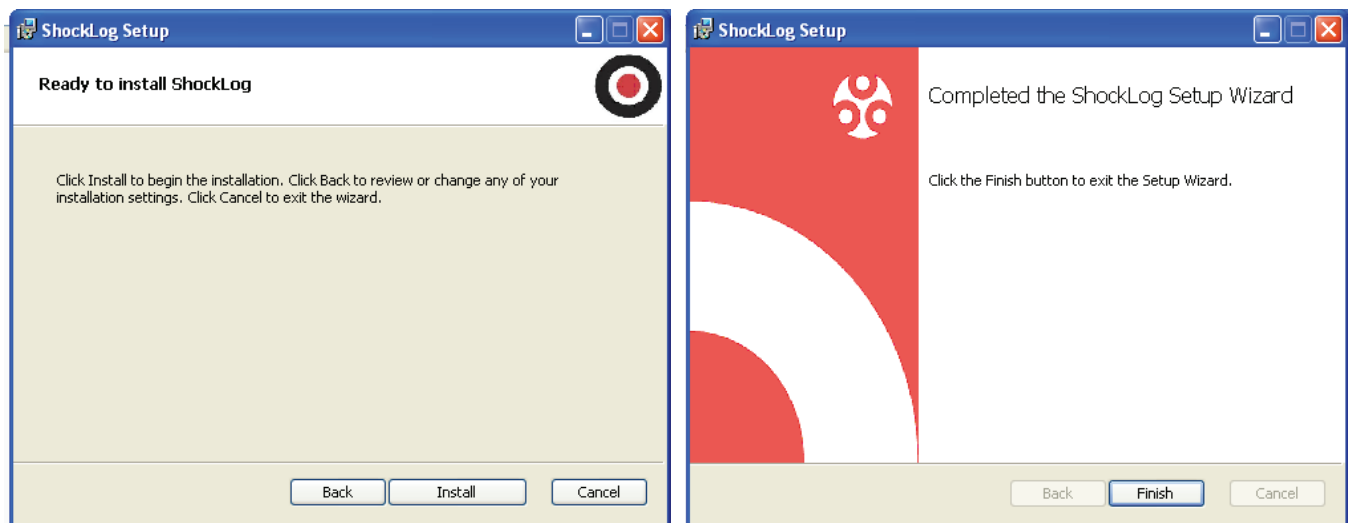
To change the directory address, either type over the information in the box or browse for the desired directory by selecting the “Change” button. Once you have selected the desired directory, click on the “Next” button.



A window stating “Ready to install the ShockLog” software will appear. Click “Install” to continue.

The system will begin the installation of the ShockLog software. At this stage, several progress bar windows will appear. A Microsoft software installation warning stating that the software has not been verified for compatibility to Windows XP will appear. Click on the “Continue anyway” button. The same window will appear a second time. Click on the ‘Continue anyway’ button. When asked to install Maxim and The IMC Group drivers, click “Install.”

Once the system has fully installed, a “Completed the ShockLog Setup Wizard” window will appear. Click “Finish” to complete the installation.



The ShockLog software is now loaded and the computer should be back at the Desktop view. To create a shortcut on the Desktop, right click on the Start menu and select the “Explore” option.

The ShockLog programs will have been copied into the following directory: c:\ProgramData\ShockLogSoftware\ShockLog or it will be installed in the destination directory specified earlier in the setup process.

Right click on the ShockLog program icon and select “Create Shortcut.” Once the shortcut has been created, it can be dragged onto the Desktop.

To open the ShockLog software, double click on the shortcut icon from the Desktop. When first attaching the ShockLog unit to the PC, it will be necessary to install new USB drivers for the PC to communicate with the ShockLog. After connecting the ShockLog to the PC via the USB cable, a “Found New Hardware Wizard” window will appear. To the question, “Can Windows connect to Windows Update to search for software?” it is essential that the user select “No, not this time” to prevent the system from going to the Microsoft website to find the drivers.

Click “Next” and a second “Found New Hardware Wizard” window will appear.

Select “Install the software automatically (Recommended)” and click “Next.”

A window with a Microsoft software installation warning stating that the software has not been verified for compatibility to Windows XP will appear. Click “Continue anyway.”

The appropriate drivers now will be loaded on the PC and will allow the ShockLog device to communicate with the ShockLog Software.

If the drivers do not load correctly, it may be necessary to return to this window and select “Install from a list or specific location (Advanced).” Browse the PC to find the appropriate drivers within the ShockLog directory.

If the ShockLog does not connect after successfully loading the drivers, please check that the communication ports are correct. The port settings are found in the “Tools” menu under Communication Properties. These settings are only relevant to legacy ShockLog products.

SHOCKLOG AUTOMATIC CHECK FOR UPDATES

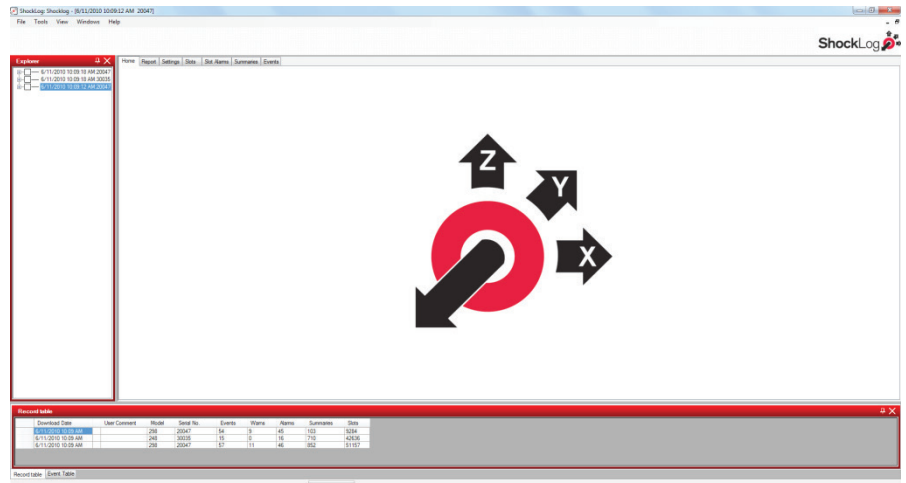
The ShockLog software has a built-in facility to automatically check the internet for the latest version of software. When installing the software, users will be given the option of enabling this feature using a check box. Should you wish to change this option after installation, select the “Help” menu. Users can turn this on or off with the “check for updates” option.

4. CONFIGURE THE SHOCKTRAK / SHOCKLOG RECORDER

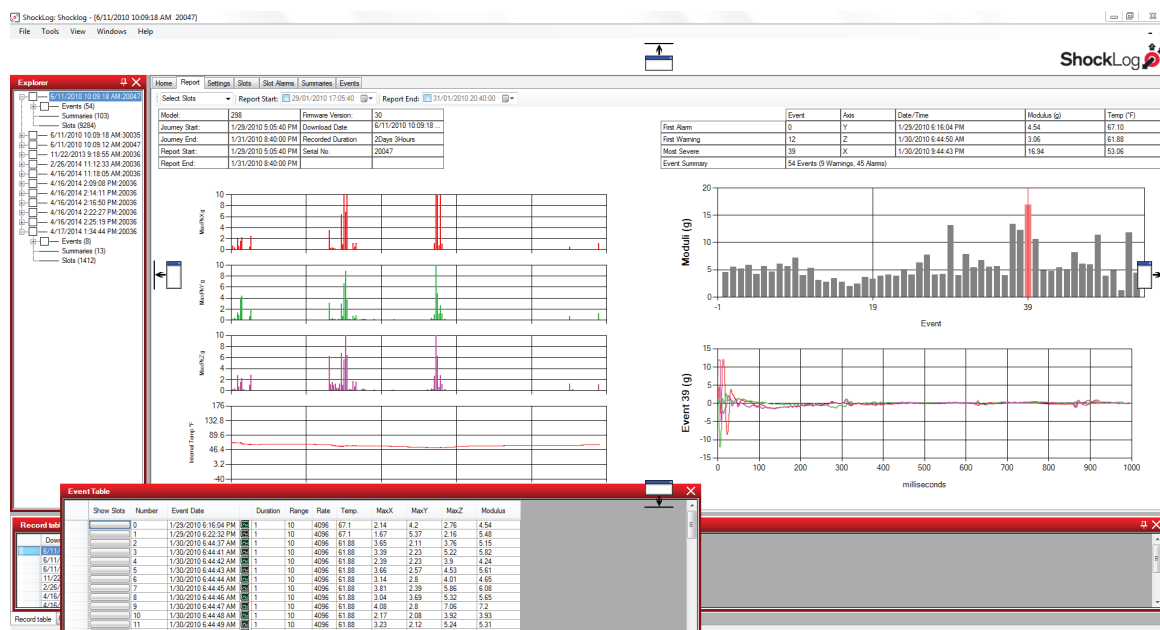
Note: If the ShockTrak is preconfigured by the SpotSee team, the appropriate configuration will have been defined at the time of order. Please contact SpotSee Technical Support with any questions.

To configure the ShockTrak, the ShockLog software can be opened by double clicking the ShockLog shortcut icon or by selecting the ShockLog program from the Start menu.

When the software first opens you will be presented with a “File Viewer” window in addition to a “dockable” Explorer window on the left and another dockable window in the bottom of the screen containing tabs for the Record Table and Events Table.



The ShockLog user interface has a variety of dockable windows that allow the user to view information of interest. These windows make it easy for users to move around in the journey data files. Move each dockable window by clicking the left mouse button and holding. Drag the window around and notice that small window icons appear at the left, right, top and bottom of the screen. As the windows are moved closer to one of these icons, it will highlight in green where the window will sit.



All dockable windows work in any position. However, the Explorer window generally works better in either of the left/right vertical positions, whereas the Record and Event Table windows are better suited to the top/bottom horizontal positions.

It is possible to dock more than one window in the same location. The software displays an additional icon with a series of tabs to move between the windows.

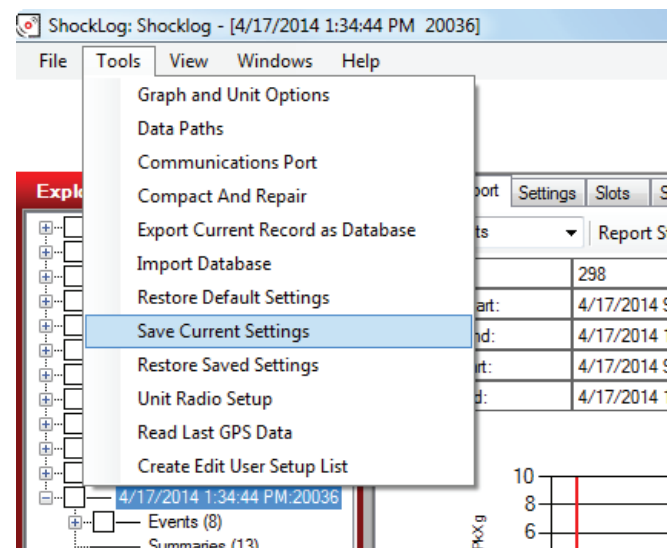
When trying to dock two windows in the same location, icons either left and right or top and bottom of the current window are displayed.

If one of these options is selected, both windows will be displayed side by side. This side by side display is only possible for two windows in any one position. If attempts are made to add additional windows, the tab system must be utilized.

When the dockable windows are in the desired locations, adjust the size of each window by dragging the border of each window. Adjust the window size to maximize the available screen area for the File Viewer. Windows can be moved and adjusted at any time.

The position of the docked windows can be saved so they are in the same location when exiting and entering the ShockLog system. From the Tools menu, select “Save Current Settings.” Once this has been done, a confirmation window will appear.

For demonstration purposes, several files are included in the database installed with the ShockLog software. These files are shown in the Explorer and Record view. Click on one of the available files and the Summary Report will be displayed in the File Viewer. The demonstration files may be deleted at any time.



With a file open, it is possible to explore the information available from the File Viewer screen. Notice the six tabs along the top of the viewer. Each tab links to more detailed information relating to the open file record. The information includes:

- Reports
- Settings
- Slots
- Slot Alarms
- Summaries
- Events

Users can view or hide the Home tab with the “View Home Tab” option in the “View” menu at the top of the screen.

CREATING A SETUP FILE

To create or modify a setup file, go to the “View” menu at the top of the screen and select “Setup.” A new window will appear listing the available ShockLog models.

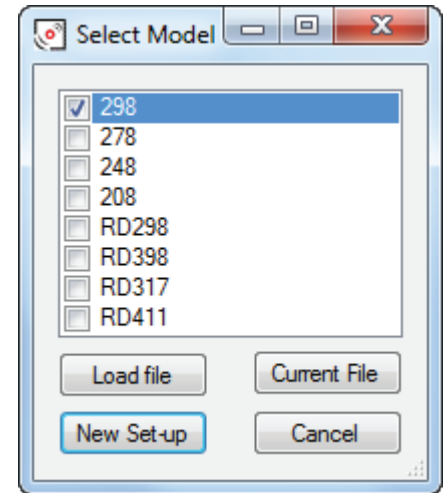
The ShockLog model selected will affect the options available in the setup screens.

It is important that the 298 be selected as it is the only model which supports the ShockTrak functionality.

To open an existing file, select the ShockLog model of interest and click the “Load File” button. A list of available setup files related to the selected model will be shown. Highlight the desired file and click on “Open.”

To create a new setup, click “New Setup.”

The “Current File” button allows you to interrogate a connected ShockLog to determine what setup has been loaded into the unit.

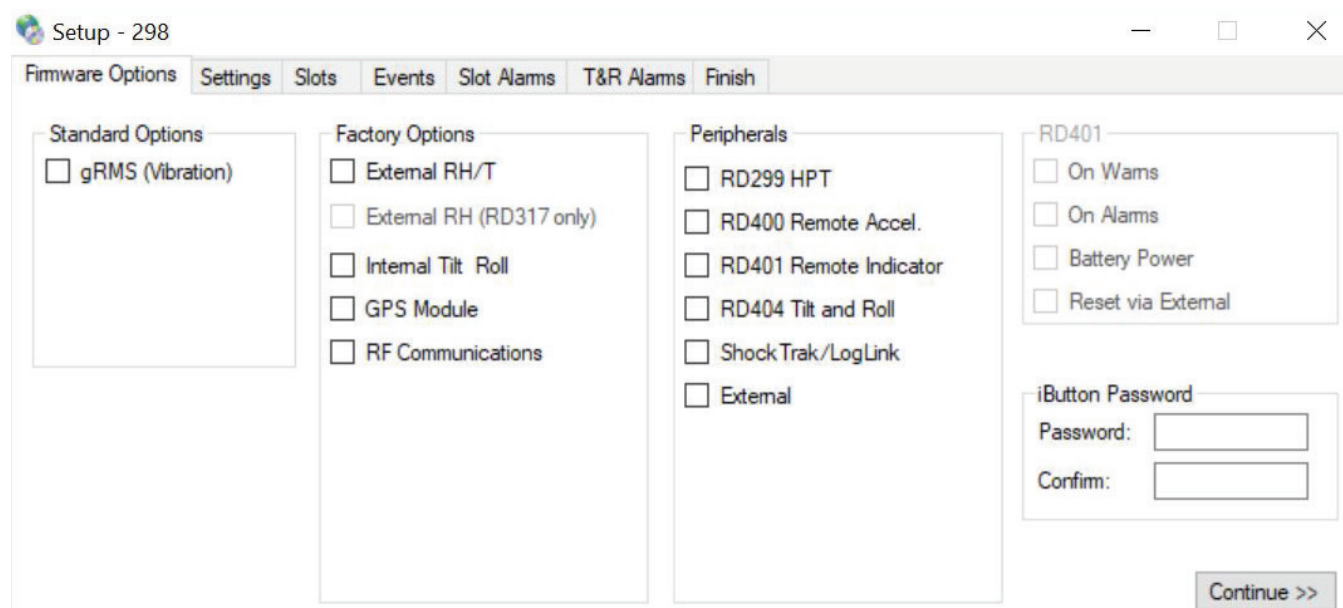


SETUP WINDOW

The setup window displays a series of tabs that guide the user through the ShockLog configuration process. The software requires that the user complete the appropriate areas. For a new setup, the system will adopt a default setting and complete some sections. The user must step through every window and modify the settings or select “Continue.” Guiding the user to step through every window for a new setup ensures that all the options have been considered and reduces the chance for a setup error.

FIRMWARE OPTIONS

The first tab in the Setup screen is “Firmware Options.” This section defines what factory or peripheral accessories are being used with the selected ShockLog. If the options are grayed out and selected, they are default options and cannot be changed. If they are grayed out without being selected, the options are not available for the selected ShockLog.



STANDARD OPTIONS

gRMS (Vibration) – Users have the option to record the gRMS values within the time slot graphs, allowing users to see the vibration levels throughout a given time slot period. When measuring gRMS, it is required that the 250Hz filter be selected. This selection is done automatically by the software. More details on filter settings will follow.

NOTE: It is NOT recommended that vibration be monitored with the ShockTrak unit as it may result in numerous messages being generated and increased connectivity charges.

FACTORY OPTIONS

External RH/T – Relates to the ShockLog 298, 248 and 208 with the factory optional Temperature and Humidity sensor added.

NOTE: This accessory would result in the temperature / humidity inside the ShockTrak case being measured / recorded.

External RH (RD317 only) – Relates to the Legacy RD317 Micro ShockLog with the factory optional Temperature and Humidity sensor added. (Not supported on ShockTrak)

Internal Tilt/Roll – Relates to the ShockLog 298 with the factory optional sensor added to detect tilt & roll.

GPS Module – Refers to ShockLog 298 with optional GPS module to record GPS coordinates of an impact and coordinates when a time slot summary is made. (Not supported on ShockTrak)

RF Communications – Relates to the ShockLog 298 with the factory optional ZigBee radio module being added to transmit data files wirelessly in a stationary environment. (Not supported on ShockTrak)

PERIPHERALS

Optional accessories may be added to the ShockLog setup.

- **RD299 HPT** – Humidity, Pressure, Temperature Sensor (Not supported on ShockTrak)
- **RD400 Remote Accelerometer** – Legacy product supported by ShockLog RD298 – recorded single access acceleration in a location remote from the ShockLog. (Not supported on ShockTrak)
- **RD401 Remote Indicator** – Legacy product supported by ShockLog RD298 – brought alarm warning lights to a location away from the ShockLog. (Not supported on ShockTrak)
- **RD404 Tilt & Roll** – Legacy product – external tilt and roll accelerometer (Not supported on ShockTrak)
- **ShockTrak / LogLink** - Accessory to provide near-real time impact notification and location information.
(SELECT WHEN UTILIZING A SHOCKTRAK)
- **External** – Custom connection; discuss additional input requirements with your ShockWatch representative.
(Not supported on ShockTrak)

Click the box for any options that will be utilized with the ShockLog, then click “Continue.”

RD401

These settings are available for a customized legacy solution from ShockWatch. They are not supported by the ShockLog 298, 248, 208 or ShockTrak.

IBUTTON PASSWORD

It is recommended that iButtons be used to start or stop the ShockTrak.

For additional security, users may create password protection in the iButton system. These passwords prevent unauthorized users from interfering with the ShockLog through the iButton interface. To create password protection on the iButton interface, users program the ShockLog with their own password (up to 8 characters in length and case sensitive). Any iButton used to communicate with the ShockLog must be programmed with the same password. Otherwise, the ShockLog ignores the iButton.

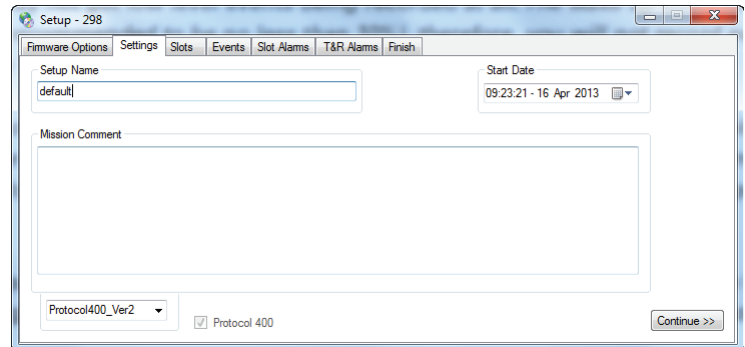
The password is created by clicking in the Password box and typing in the password. The password is confirmed by typing in the confirm box. The confirmation password must be exactly the same as the original password.

SETTINGS

The Settings window allows the user to select the protocol, create setup name, enter mission comment and set start date.

SETUP NAME

Users can name their setup and save it as a unique file for future use. With a new setup, the word “Default” will be in the setup name field. The user must change this name before they are able to save the setup, send it to a ShockLog unit or move onto the next stage of the setup process.



NOTE: If you have a setup you want to use as the preferred setup, make this the user default by going to the options screen, double clicking on the user default setup box and selecting your setup file name.

START DATE

If the user would like the ShockLog unit to begin monitoring at a future date/time, click on the right-hand arrow to bring up a calendar selector and select the desired date. If the unit should start recording at a specific time, it is possible to set the start time as required. The start time will be +/- 10 minutes of the specified start time.

NOTE: The “Start” iButton being applied to the reader port will override any delayed start and begin the recording process. It is recommended that the START iButton be used when starting the ShockTrak. This allows the user to mount the ShockTrak prior to starting the recording process.

It is also possible to start the ShockLog sooner than the Start Date by connecting the ShockLog to the USB port and clicking “Start” in the Communications Window. This action will override the delayed start, and the ShockLog will begin recording immediately.

MISSION COMMENT

Users can add notes to the setup file and these notes will be recorded by the ShockLog. These comments will be displayed on the Report screen when the file is downloaded.

PROTOCOL

Protocol 400 is the appropriate setting unless the RF module is installed and being used. If the ShockLog has an RF module installed, P400 and ZigBee should automatically set. Verify the correct protocol when using the ShockLog 298 RF unit.

ShockTrak uses Protocol 400.

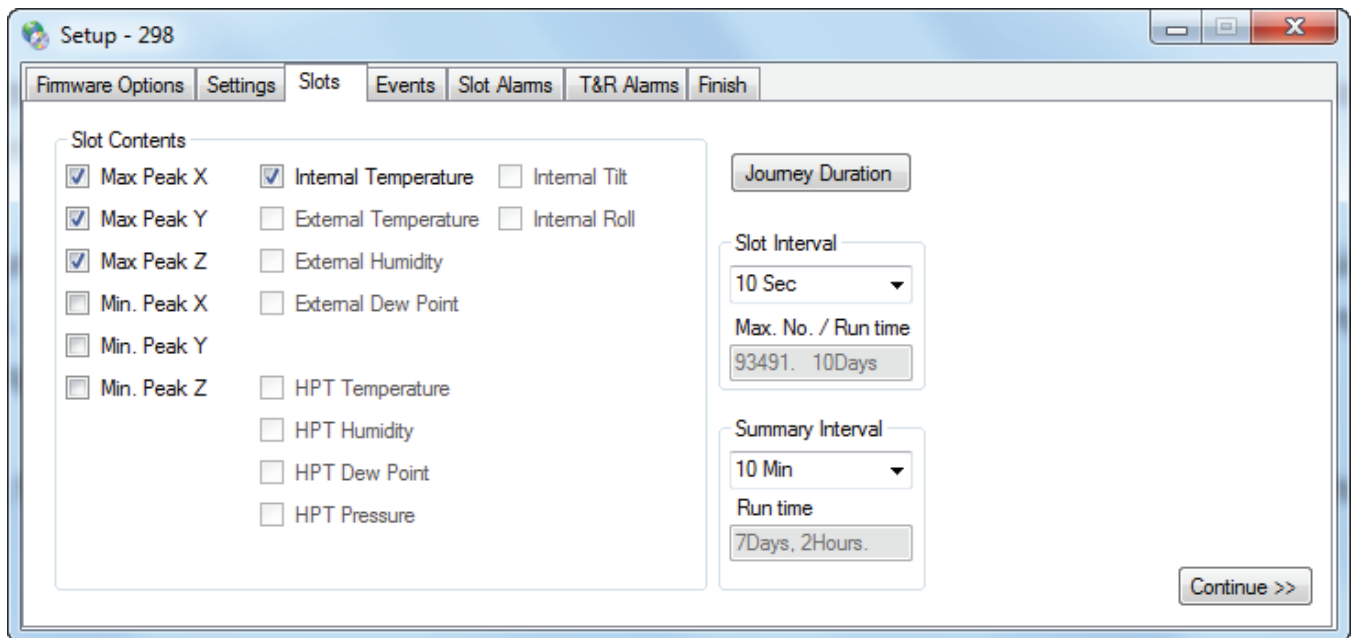
SLOTS

Slots are user-defined periods of time in which various criteria will be recorded.

SLOT CONTENTS

Slot contents define the criteria to be recorded in the Slots graphs. Select the parameters of interest by clicking the appropriate boxes. The four default settings are max peak x, y, z and internal temperature. Depending on the configuration of the ShockLog, the available slots include max/min peak for the three axes, temperature, humidity, dew point, pressure, tilt and roll.

Setting threshold limits for these values will be done in the Slot Alarms and T&R alarms sections.



SLOT INTERVAL

The Slot Interval defines how often a time slot will be recorded. The window below the Slot Interval setting will show how long the maximum number of slots and run time based on the setting.

Battery life is not affected by time slot frequency.

It is advisable to always select a time slot interval that will last longer than the expected journey length.

Selecting additional parameters will decrease the amount of time in which data can be recorded. Only select parameters that are of interest to maximize recording time available.

SUMMARY INTERVAL

Summaries provide an overview of what was recorded by the ShockLog in each time-period (the summary interval). A summary records the number of warnings/alarms and the recorded maximum slot values in the summary interval. The Summary Interval allows the user to set the time-period between each summary period.

Battery life is not affected by summary interval setting.

It is advisable to always select a summary interval that will last longer than the expected journey length.

JOURNEY DURATION

The Journey Duration button allows users to select the expected journey length, and the ShockLog will automatically optimize the slot and summary intervals settings.

When considering journey length, it is important to consider when the ShockLog memory will be full and how long the battery will last. The chart below will allow you to consider the best options for your summary intervals.

Summary Interval	ShockLog Memory Full*	ShockTrak Satellite Module Internal Battery Life	ShockTrak Satellite Module External Battery Life	Interface Board Battery	ShockLog Battery
1 hour	42 days	3 months	60 days	12 months	12 months
2 hours	85 days	3 months	60 days	12 months	12 months
4 hours	170 days	6 months	75 days	12 months	12 months
8 hours	341 days	12 months	90 days	12 months	12 months
12 hours	512 days	18 months	90 days	12 months	12 months

*When the ShockLog memory is full, only alarms will be reported not summaries.

It is important to allow for potential delays during the journey or through customs. The journey duration should always be set slightly longer than the expected journey length to prevent the possibility of not recording the end of the journey.

EVENTS

Impacts above the user-defined threshold are defined as events. The Events section allows the user to define the criteria to be considered when recording a potentially damaging event.

Setup - 298

Firmware Options Settings Slots **Events** Slot Alarms T&R Alarms Finish

Record

Length: 32 Kbytes Number Events: 108

Max. Time: 1 Sec Sample Rate: 4096Hz

☒ Always Max.

☒ Ordered Data

☐ Event Compression

Auto Thresholds

☐ Enable

Interval: Never

Thresholds

Range 'g' or 'Velocity': 10 g

Hardware Filter: 90 Hz

Options: Basic

Warn (%): 40

Alarm (%): 60

Continue >>

RECORD

This section allows users to specify the resolution/memory to be allocated to each event. From the resolution and memory setting, the number of recorded events is calculated by the software.

LENGTH

The more memory allocated to an event, the more points the event graph will display, and the higher the event resolution will be. The ShockLog always records 4096 samples per second. However, the ShockLog will compress saved data according to the how long the event is as defined by the event settings. The peak of an event will not be lost when data is compressed as the ShockLog always keeps the max & min samples of each compressed data section.

NOTE: Generally, it is desirable to log detailed events when damage may have occurred to the shipment. Settings that allow for the maximum number of events are not always advisable. The user must determine if having fewer, more detailed events or more events with less resolution is more desirable. Remember that a time slot graph capturing the max peak in a time slot is produced for the entire journey.

MAX TIME

The maximum length of any recorded event. All events are recorded for at least 1 second. The longer the event, the more the data will be compressed. In certain situations, it may be desirable for the ShockLog to record the full length of an event (potentially up to 128 seconds). If this is the case, the “Always Max” box must be selected. In general, this setting is only used in a test environment, as most impact events are less than 1 second in duration.

Unless there is a specific reason to do so, do not use the Always Max setting. Let the ShockLog decide when the event has finished by the dropout threshold. The dropout threshold is covered in the next section.

ORDERED DATA

Unless Always Max is selected, the ShockLog will record events in an uncompressed format displaying the full 4096 samples per second.

AUTO THRESHOLDS

Enabling this feature allows the unit to function in auto threshold mode. Select the desired reset time interval from the dropdown menu. Thresholds are explained in the next section.

THRESHOLDS

This section is where unacceptable impact events are defined by acceleration level and filter frequency.

RANGE ‘G’ OR ‘VELOCITY’

The range setting sets the maximum g-level to be recorded by the ShockLog. To set the ‘g’ range, click the drop-down menu to view all the possible ranges (1, 3, 10, 30, 100 & 200). The ShockLog 298 has the ability to record in velocity; this will automatically occur if a range in cm/s is selected. However, most users are interested in g-range.

NOTE: Selecting the range is a very important part of the ShockLog setup. Be aware of what impact levels are of interest. Do not assume if the ShockLog is set to the 100g range everything will be recorded. In this scenario, the resolution will be compromised and low-level events may not be recorded at all. The wake-up threshold for a detailed event must be at least 5% of range (and recommended to be no less than 10%). On a 100g range, events lower than 10g with a 10% wake up threshold will not be recorded.

HARDWARE FILTER

After the range is selected, set the frequency cut-off of the hardware filters to be applied to the event data. These filters enable users to reduce the number of unwanted higher frequency events where it is known that this type of event will not cause damage to the object being monitored.

The lower the filter frequency, the more severe it is in eliminating events. The lower frequency filters are generally used for large heavy objects with a high metallic content, especially where the object is prone to high levels of resonance. These resonances will create a “bell-like” ring that a ShockLog can detect as a high g event if the appropriate filters are not applied. Filters are recommended in environments where a high frequency vibration is probable such as rail freight applications. The correct use of filters can eliminate any unwanted events being recorded. If gRMS is to be recorded, the frequency filter must be set to 250Hz.

OPTIONS

The user selects one of four modes for the thresholds.

Basic – The default setting is “Basic.” The Warning level and the Alarm level can be adjusted by the user. The wakeup and dropout levels are set automatically in the software based on the warning level selected.

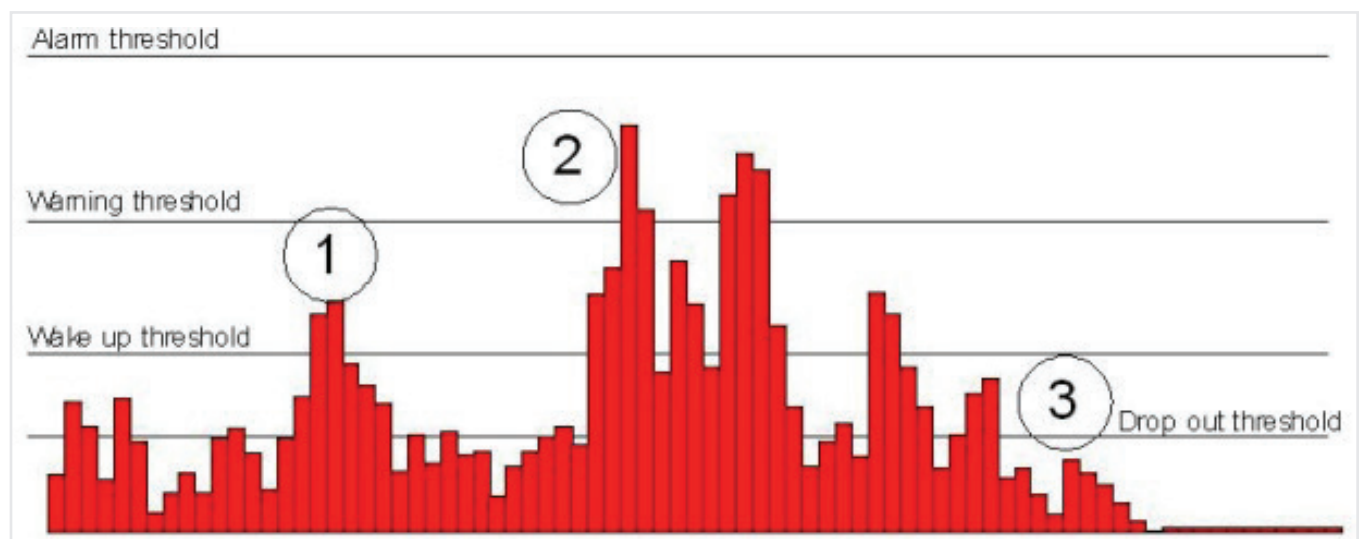
Multiple – Allows the user to set all four thresholds (wake, warning, alarm, and dropout). The user is also able to adjust the thresholds for each axis independently.

Link XYZ - All the axes operate off of the same thresholds.

Timed Events - Allows users to record a detailed event at the end of every summary period. This setting is not dependent on thresholds being breached. Timed Events is an option for the ShockLog 298 only.

UNDERSTANDING THRESHOLD LEVELS

The threshold settings determine what level of impact will cause the ShockLog to wake up, the levels at which a warning or alarm is created, and the dropout level of the event. The simple bar chart below can best explain these thresholds.



It is not desirable for the ShockLog to constantly be awake due to low level vibration caused by the mode of transport. The ShockLog uses 100 times more battery power when it is recording at higher resolutions than when it is monitoring peak time slot values for wakeup thresholds. The ShockLog can easily see 0.5 to 1g of activity when being transported in a car on normal roads.

If any accelerometer activity exceeds the wake-up threshold, the ShockLog will start recording accelerometer data at a faster rate. The ShockLog takes 0.25 msec to start recording higher resolution data once the wake-up threshold has been exceeded. If the activity does not exceed the warning level and drops below the wake-up threshold, the ShockLog will go back to monitoring time slot peaks. An event will not be recorded.

When the wake-up threshold and the warning levels have been breached, the ShockLog will record a detailed event and flag it as a warning. The same logic is applied when the alarm threshold level is breached. The ShockLog will record a detailed event and flag it as an alarm.

Once the event activity has dropped below the drop out threshold (or reached the maximum allowed event length), the ShockLog will stop the dynamic event recording and go back to monitoring peak values during time slots.

“WAKE”

The level at which the ShockLog will wake up and begin recording. The wake-up threshold should be set to approximately 80% of the warning level.

It is not advisable to use wake-up or drop-out thresholds of less than 10%. However, it is possible to set levels down to 5% if necessary.

“WARN AND ALARM”

Warning and alarm events are recorded in the same exact way. The thresholds distinguish how the events are flagged in the ShockLog data file and how the LEDs on the ShockLog unit flash once a threshold has been breached.

Warning and alarm thresholds become more important when the ShockLog LEDs are to be used as part of a shipment’s receiving audit. Example: Set a warning level to indicate the shipment should be quarantined pending further investigation. Set the alarm threshold to indicate the shipment must be inspected without delay.

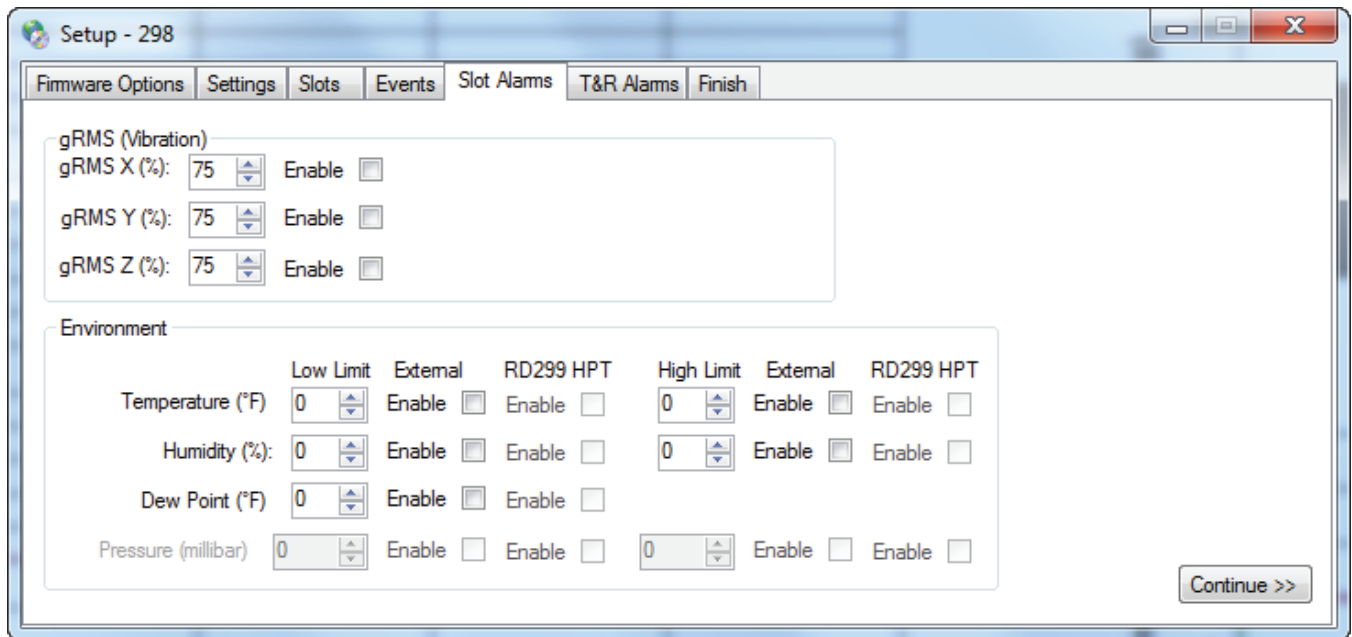
“DROP OUT”

The acceleration level at which the ShockLog will stop recording an event provided it has been set to record for longer than 1 second and the “Always Max” box has not been selected. The drop out level should be no lower than the wake-up threshold and can be as high as the warning.

If you are unsure of how to set your thresholds, please contact your local distributor or SpotSee Technical Support for assistance.

SLOT ALARMS

The Slot Alarms window allows the user to specify alarm settings depending on the factory options and peripherals that have been specified in the Firmware Options tab.



GRMS (VIBRATION)

gRMS alarms allow ShockLog 298 users to set slot alarms for gRMS data. In the setup window, users must select the gRMS option (Firmware Options) for this measurement to be available.

Users should enable the axes for which a gRMS alarm is required and set the level as a percentage of the shock range.
(Not supported on ShockTrak)

ENVIRONMENT

When temperature, humidity, and pressure sensors are to be used, the environment section allows users to set low and high thresholds for these parameters. This section is where settings are made for both factory installed temperature/humidity sensors or the external temperature/humidity/pressure sensor.

NOTE: To monitor temperature, humidity and pressure, please contact SpotSee Technical Support. Measurement of these parameters would require an engineering modification to the ShockTrak system.

TILT & ROLL ALARMS

The T&R Alarm window is used when the Tilt & Roll option (internal) has been purchased as part of the ShockLog 298.

The external tilt and roll option should NOT be selected if using the ShockTrak system as this accessory is not supported by the ShockTrak.

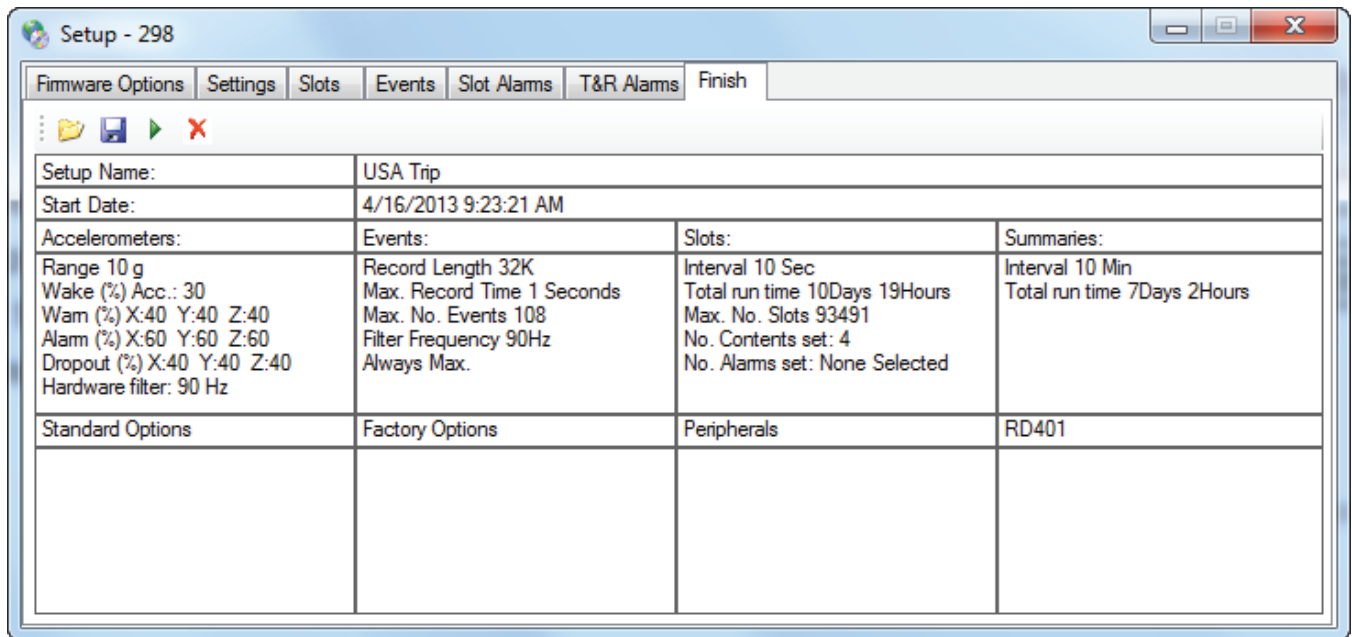
The alarms of interest should be enabled and the degree of tilt / roll should be entered by the user. Alarms can be set for both upper and lower levels for tilt and roll.

Tilt and Roll		Internal <input checked="" type="radio"/>	External <input type="radio"/>
Tilt Upper limit (degree):	0	Enable <input type="checkbox"/>	0
Roll Upper limit (degree):	0	Enable <input type="checkbox"/>	0
Tilt Lower limit (degree):	-2	Enable <input type="checkbox"/>	0
Roll Lower limit (degree):	-2	Enable <input type="checkbox"/>	0

Continue >>

FINISH

The Finish window provides a summary of the settings and provides an opportunity to save the setup file and send it to the ShockLog.



Setup - 298			
Firmware Options	Settings	Slots	Events
Slot Alarms	T&R Alarms	Finish	
Setup Name:		USA Trip	
Start Date:		4/16/2013 9:23:21 AM	
Accelerometers:	Events:	Slots:	Summaries:
Range 10 g Wake (%) Acc.: 30 Wam (%) X:40 Y:40 Z:40 Alarm (%) X:60 Y:60 Z:60 Dropout (%) X:40 Y:40 Z:40 Hardware filter: 90 Hz	Record Length 32K Max. Record Time 1 Seconds Max. No. Events 108 Filter Frequency 90Hz Always Max.	Interval 10 Sec Total run time 10Days 19Hours Max. No. Slots 93491 No. Contents set: 4 No. Alarms set: None Selected	Interval 10 Min Total run time 7Days 2Hours
Standard Options	Factory Options	Peripherals	RD401

SAVING SETUP FILE

After a setup has been defined, it must be saved before it can be sent to a ShockLog.

 Click the disk save icon to save the file.

The system will automatically save the file in the default setup directory and can be retrieved for editing or sending to a ShockLog at any time.

SENDING SETUP TO SHOCKLOG

Once the setup has been created and saved, it can be sent to the ShockLog.

For easiest access, remove the ShockLog from the ShockTrak case by removing the four mounting screws.

- ▶ Remove the silver screw connector on the side of the ShockLog and Connect the ShockLog via the USB cable to the PC and click the “Play” icon.

The status bar at the bottom of the screen will change to “OK” once the file has been successfully sent.

After the setup file has been sent to the ShockLog, the ShockLog should be returned to the ShockTrak case and secured with the four mounting screws.



5. CONNECTING THE SHOCKLOG RECORDER TO THE SATELLITE MODULE

The ShockTrak satellite module and the ShockLog must be connected prior to use. A plug on the satellite module covers the communication port between the module and the ShockLog.



Prior to use, the satellite module will show OFF on the end of the module.

Unscrew the plug and remove.

Connect the black connector / cable to the communication port of the satellite module.

Keep the plug in a safe place as it will be used to turn the device off when not in use.

6. MOUNTING

IMPORTANT: When mounting the ShockTrak hardware, care must be taken to allow for line of sight to the sky. Failure to do so will result in compromised satellite communication.

It is recommended that you mount the unit prior to starting it. This action prevents any impacts being recorded that are a result of the mounting process.

Find a suitable mounting location on the asset with line of sight to the sky.

The ShockTrak has x, y, and z axes noted on the unit. If the mounting of the ShockTrak does not allow you to match the axes of the unit, it is advisable to make a note of the exact mounting in order to correctly analyze the reported impact values.

The ShockTrak uses magnets for mounting. Grasp the unit in the positions noted by “Hold Here.” Position two magnets in place and then carefully roll the last two magnets into position.

Magnetic mounts are intended for temporary mounting.

SAFETY WARNING



MAGNETIC FIELDS PRESENT

The mounting plate described in these instructions has a magnetic field. Do not locate near pacemakers or other equipment that is sensitive to magnets.

PINCH HAZARD

Mounting ShockTrak may cause injury to hands. Exercise caution to avoid pinching hands and fingers when installing the mounting unit.

7. START MONITORING

Once the ShockLog has been programmed and the ShockTrak unit has been mounted, the unit must be started to begin recording.

It is recommended that the START iButton be used to start the ShockTrak. Remove the black center cap from the ShockLog iButton port and insert the START iButton into the port. When the iButton LED on the ShockLog is red and the Slot Alarm LED is green, remove the iButton. The unit will start in one minute.



The ShockLog could also have been preprogrammed to start at a specific time. Refer to Configure the ShockTrak / ShockLog section of this manual for details.

Close the lid of the ShockTrak system and secure the latches.

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.



8. SPOTSEE PLATFORM

DASHBOARD

The SpotSee Cloud allows you to monitor the ShockTrak from any location. After logging into the cloud platform, the dashboard will show you the last known location of your ShockTrak assets, a list of your active assets and the most recent alarm for each asset.

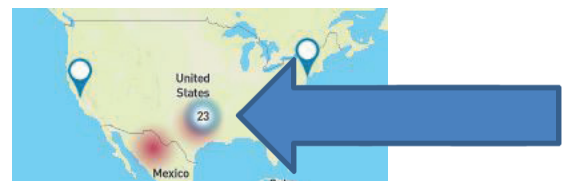
Active Assets

Cody ShockTrak Test	ShockTrak, Unit: 42396
Cody Test #2	ShockTrak, Unit: 53677
Kraigs ShockTrak	ShockTrak, Unit: 49903
Latin America Roberto Pinheiro SIA0508	SpotBot, Unit: SIA0508

Last Alarm Per Unit

Cody ShockTrak Test	() at 5/29/2018 1:50 pm
Cody Test #2	067.75G (XY) at 5/26/2018 12:21 pm
Kraigs ShockTrak	23.67G (Z) at 5/14/2018 7:29 am
Latin America Roberto Pinheiro SIA0508	10.68G (Z) at 3/16/2018 2:10 pm

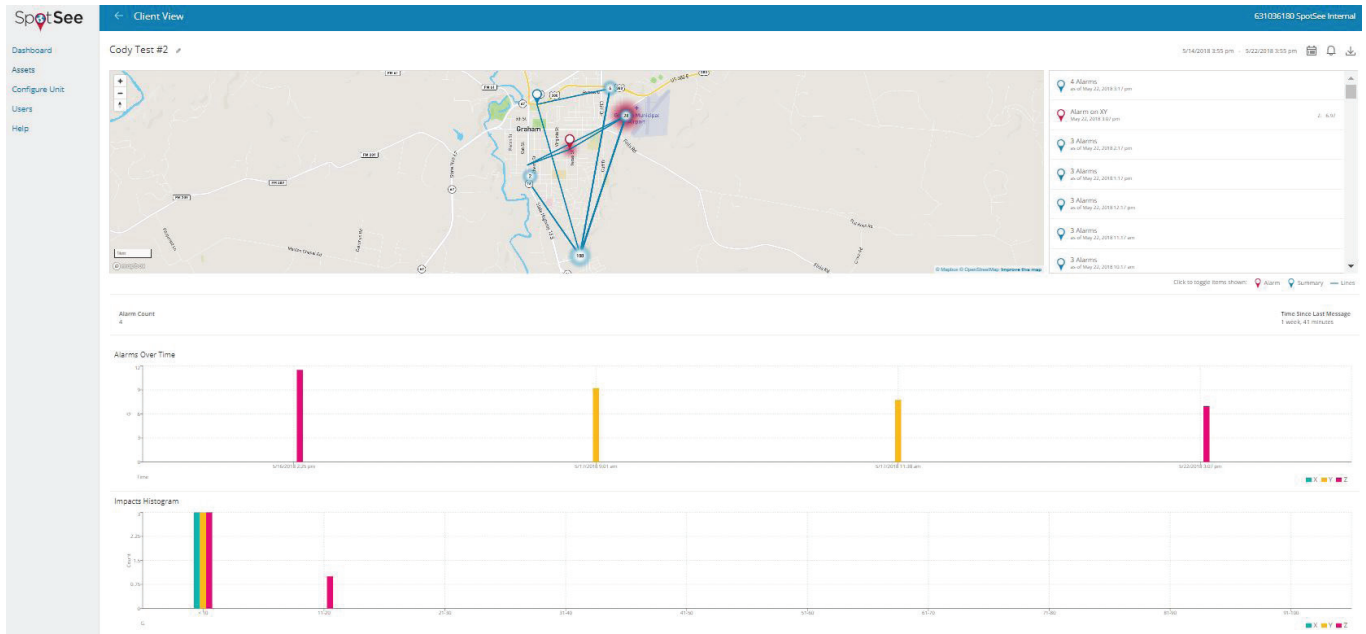
If multiple active assets are positioned in the same location, the number of units in that location will be displayed.



To examine the information for each individual ShockTrak unit, click on the asset name in either the Active Asset or Last Alarm Per Unit lists or click on the location icon on the map.

ASSET PAGE

Once a ShockTrak unit has been selected, more detailed information surrounding that unit will be displayed.



DATE RANGE

By default, the date range for a device in the SpotSee Cloud is the past seven (7) days. The date range is shown in the top right portion of the screen. If a particular date range is of interest, the range can be changed by selecting the calendar icon shown to the right.

5/24/2018 1:01 pm - 5/31/2018 1:01 pm



Clicking the calendar icon will open up a window where the user can set the date range as desired. Click the clock icon, and a calendar will open for the user to select the date. Click Done when the date range has been set. Click Update to set the date range.

The data from that particular date range will be in the dashboard view.

NOTE: When large amounts of data are being loaded, it will take a few minutes for the data to render.

Select Date Range

Start Date
5/24/2018 1:01 pm

End Date
5/31/2018 1:01 pm

Update

Select Date Range

Start Date
5/23/2018 2:00 pm

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Today Done

NOTIFICATIONS

When an alarm occurs, notifications can be sent to interested users. Click on the alarm icon to open the notifications form. Enter the email address of the person(s) who should receive notifications when an alarm occurs. Click the + button to add additional users and the Update button after all email addresses have been entered.

5/24/2018 1:01 pm - 5/31/2018 1:01 pm



Notifications



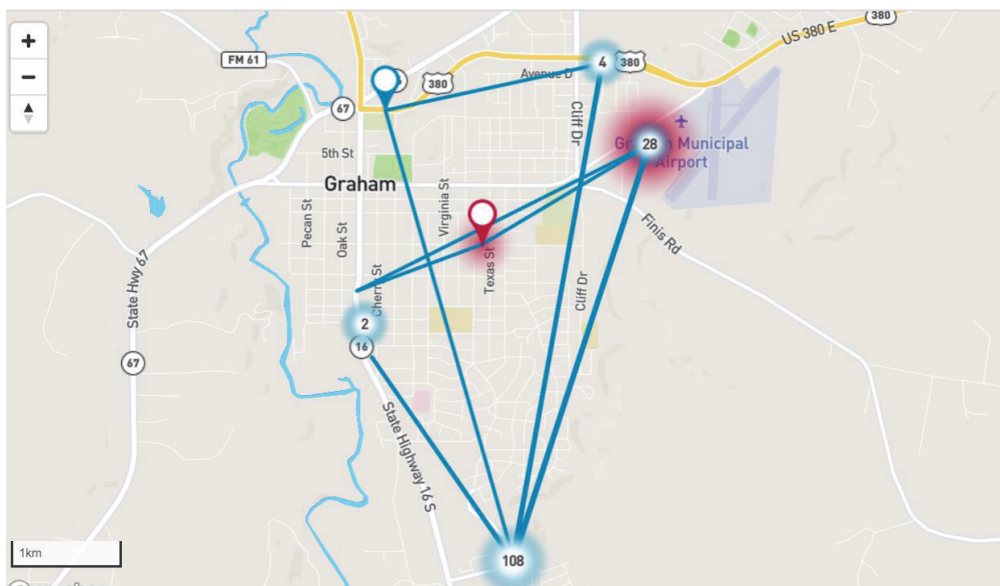
Manage the email addresses you would like notified when an alarm is triggered below. You may select a current user or you can enter a new email address.

+

Update

LOCATION

The map will show the locations of the selected ShockTrak. Alarm and summary location pins will be clustered by proximity. Alarm pins will be displayed in red while summary pins will be displayed in blue. Pins displayed with a number in them can be clicked and the map will zoom in until you can see individual pins. A red heat map around the pins indicates that there is at least one alarm within that cluster.



ALARMS/SUMMARIES

On the right side of the asset page is the list of alarms and summaries for the unit. The alarm shows the axis as well as the value recorded on the axis. Summaries show the total number of alarms reported. If the ShockTrak is in an area where it cannot communicate with the satellites, then the summary alarm count will alert users that an alarm has not been transmitted to the cloud and that the ShockLog should be downloaded at the end of the journey for details regarding any missed alarms.

It is possible to turn off summaries (or alarms) from the cloud view. When doing so, summaries (or alarms) will be removed from the map and the list.

The trip path is traced by default in the SpotSee cloud. If you do not wish to see the journey path, you may remove the Lines from the map.

Click on the item at the bottom of the alarm list to turn parameters off or on. The parameter that has been turned off will change to a gray color.

Alarm on Y

May 17, 2018 11:38 am

Y: 7.75

2 Alarms

as of May 17, 2018 11:17 am

2 Alarms

as of May 17, 2018 10:17 am

2 Alarms

as of May 17, 2018 9:17 am

Alarm on Y

May 17, 2018 9:01 am

Y: 9.22

1 Alarm

as of May 17, 2018 8:17 am

1 Alarm

as of May 17, 2018 7:17 am

Click to toggle items shown:

Alarm

Summary

Lines

It may be desirable to turn off summaries when loading large amounts of data as this will speed the load process. However, you will no longer see all of the trip segments on the map.

UNIT INFORMATION TABLE

Below the map, a snapshot of information regarding the ShockTrak is displayed. The Alarm Count summarizes the number of alarms in the selected time range. The Time Since Last Message is a quick way to determine when the last communication from the ShockTrak has been. From this time, you can determine if a device has been turned off or has a potential connectivity issue.

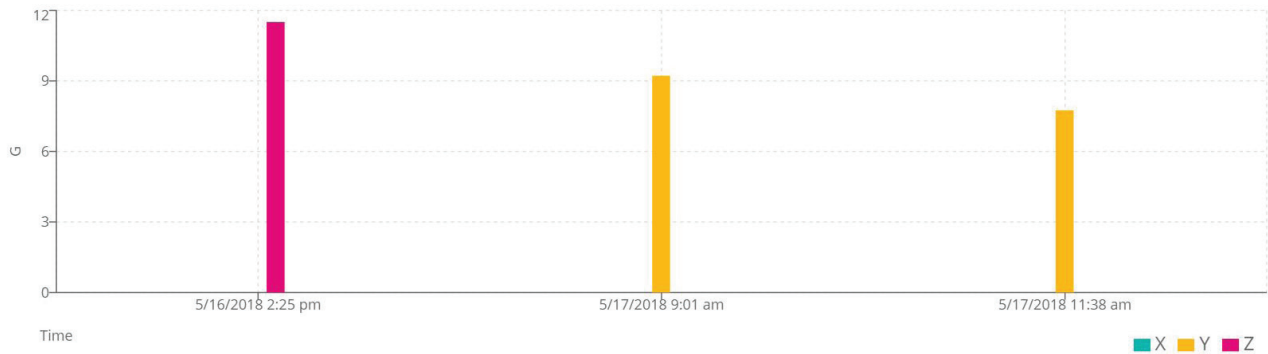
Alarm Count
3

Time Since Last Message
1 week, 1 day, 1 hour, 19 minutes

ALARMS OVER TIME

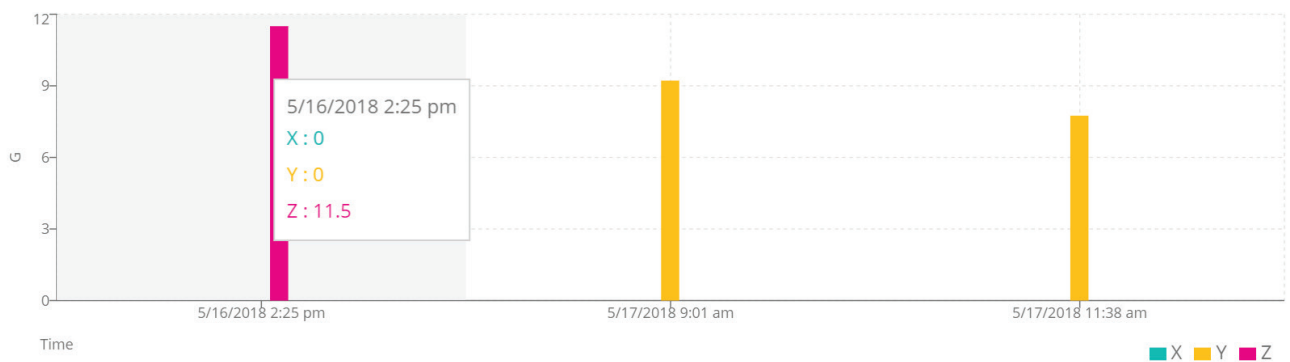
A graph of impact alarms over time is displayed. Each alarm is represented in the x, y, and/or z axis.

Alarms Over Time



Hover the cursor over the bars in the Alarms over Time graph to see the individual impact values.

Alarms Over Time

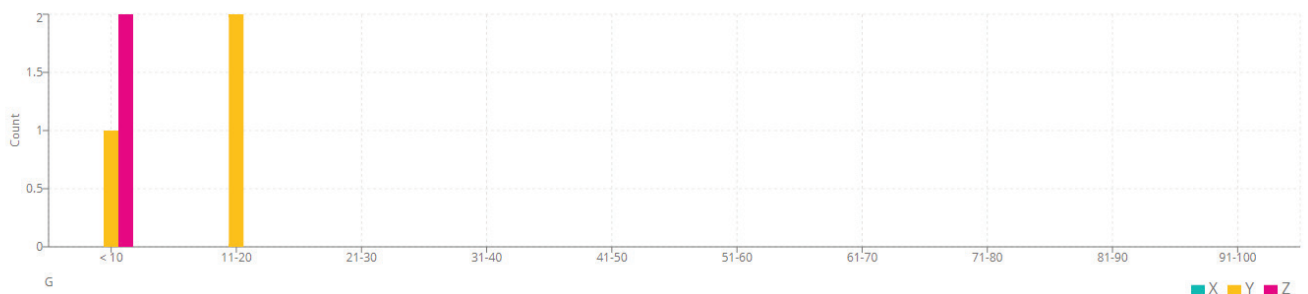


IMPACT HISTOGRAM

Below the Impacts over Time graph, you will find the Impact Histogram. This graph will show you how many impacts occurred over a certain impact threshold. The graph divides the impact values into bins. Each bar on the graph represents the number times an impact occurred over a certain threshold.

In the example below, there was one impact 10G or less in the y-axis, two impacts of 10G or less in the z-axis and two impacts between 11 and 20G in the y-axis.

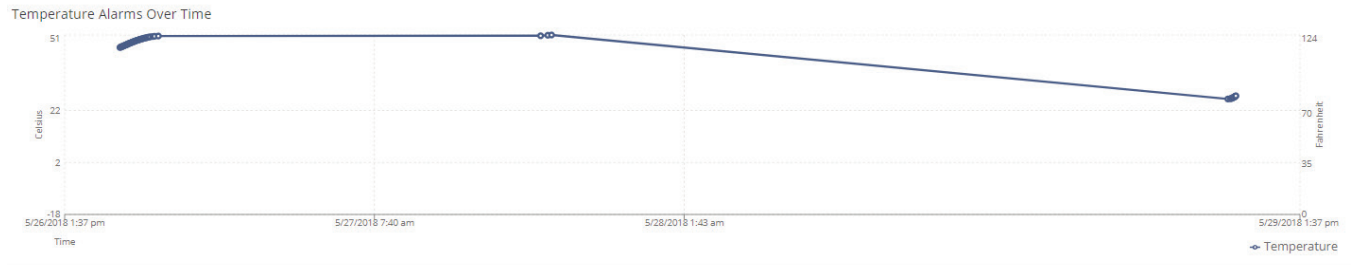
Impacts Histogram



OTHER PARAMETERS

The ShockTrak will also record temperature, humidity and tilt & roll. Each parameter will have a value over time graph associated with it.

The graph below illustrates temperature over time. Hover the cursor over the points in the chart to see the individual temperature values.



CHANGE ASSET NAME

Devices in the cloud can be given names that are meaningful to the user. The asset name appears in the top left portion of the screen. To change the name, click the pencil icon to open the Edit Asset form. Enter the desired asset name and click update.

Cody Test #2   5/24/2018 1:50 pm - 5/31/2018 1:50 pm   

Edit Asset



Asset Name

Cody Test #2

Update

9. STOPPING THE SHOCKTRAK

The ShockTrak can be stopped with the Stop iButton or it can be stopped after connecting the ShockLog to a USB port. To prevent capturing impact events resulting from dismounting the ShockTrak, a best practice is to use the Stop iButton.

Open the ShockTrak case, remove the black plug from the iButton port.

Insert the STOP iButton into the iButton port.

All three LEDs will flash red every ten (10) seconds when the unit has been stopped.



10. DOWNLOADING THE SHOCKTRAK

When the ShockTrak system's journey has ended, the full dataset from the ShockLog can be downloaded through the USB port. This step is recommended if impact data needs additional analysis.

UNDERSTANDING THE STATUS LEDs

ShockLog units have three status LEDs that display the unit's condition:

1. iButton

- Single color LED (red)
- Illuminated when a valid iButton is inserted
- Used in conjunction with the SLOT ALARM LED, which flashes green when the iButton command is accepted

2. Slot Alarm

- Tri-color LED (green, amber & red)
- Flashes every ten (10) seconds when in Waiting State, or every five (5) seconds when in Running State
- Condition
 - No slot alarms - Flashes green
 - One or more slot alarms - Flashes red

3. Event Alarm

- Tri-color LED (green, amber & red)
- Flashes every ten (10) seconds when in Waiting State, or every five (5) seconds when in Running State
- Condition
 - No events - Flashes green
 - Warning event(s) recorded (with no Alarm events) - Flashes amber
 - Alarm event recorded - Flashes red

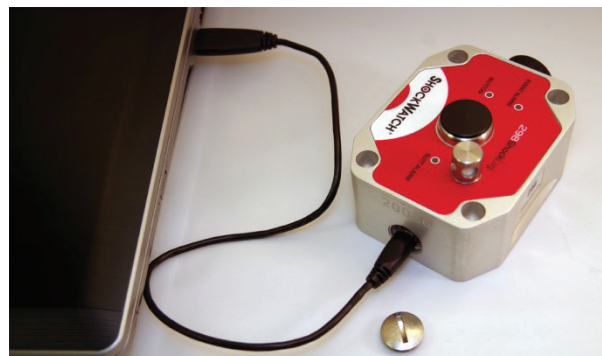
For ShockLog units with firmware v27 and above, All LED's flash red every ten (10) seconds when the unit is in the Stopped state.

USB CONNECTION

The ShockLog USB port is on the side of the ShockLog under a silver screw connector. For easier access to the port, the ShockLog can be removed from the ShockTrak case.

In the ShockLog software, open the Communications Window and connect the ShockLog through the USB to a PC.

The Communication Window information boxes automatically update from the ShockLog.



The Communication window information includes the following parameters:

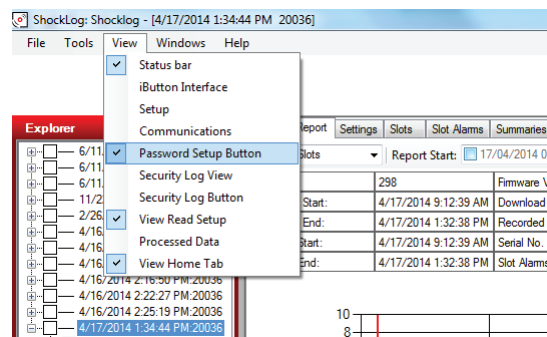
Communications

Download Start Send Setup Setup Passwords Model: 298 Serial Number: 23525 Version: 21 Events: Alarms: 0 Warns: 0 Slot Mem Sum Mem Connection: USB

Set Clock Stop Read Setup Security Log Date / Time: 12/16/2011 9:00:55 AM Range: 10 State: Waiting Slot Alarms: 0 Event Mem Protocol: P400

Model	Variant of the ShockLog attached i.e. ShockLog 298, 248, 208, ShockLog RD298 or RD317. For the ShockTrak, the model will always be the 298.
Serial Number	Serial number of the attached ShockLog.
Version	Firmware code version of the attached ShockLog.
State	Operating state of the ShockLog: Waiting, Running, or Stopped.
Connection	Type of connection currently utilized to communicate with the ShockLog.
Date/Time	Date and time set in the ShockLog unit; this field will update every 10 seconds while the unit is connected.
Range	G range set in the attached unit.

Setup Passwords and Security Log can be activated from the View menu at the top of the screen. Once activated the buttons enable users to set up passwords and view the security log of the attached ShockLog. These capabilities are described in more detail later in this manual.



11. RECOMMENDED STORAGE

When the unit is not in use, it is recommended that the ShockLog be stopped and the satellite module be turned off. To turn off the satellite module, locate the satellite module in the ShockTrak box and disconnect the connector/cable. Locate the plug and insert it into the connector such that the word OFF is visible. NOTE If the word ON is visible, you will be powering the module and draining the battery



12. REDEPLOYING THE SHOCKTRAK

When the ShockTrak is ready for another journey, the ShockLog should be reprogrammed for the new journey. When a new setup is sent to the ShockLog, all existing data is deleted from the device. Refer to Creating a Setup section for instructions on creating a new setup.

13. TECHNICAL SUPPORT / CUSTOMER SUPPORT CONTACTS

If at any time you need assistance with the ShockTrak or ShockLog, please reach out to the SpotSee team for assistance or contact your local SpotSee distributor.

TECHNICAL SUPPORT

Email: techsupport@spotsee.io

North / South America:

214 736-4579 or 800 466-0101

Europe, Middle East, Africa:

+31 55-7370-148

Asia-Pacific

+86 138-1884-4157

CUSTOMER SUPPORT

Email: orders@spotsee.io

North / South America:

214 736-4578 or 800 419-1454

Europe, Middle East, Africa:

+31 55-7370-246

Asia-Pacific

+86 21-6034-7267