solve products

LogView

Getting Started

V2.01

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1 Introduction

This short guide to the g-log series data logger and the related PC-software «LogView» will help you to get started with your g-log device.

All basic steps to program the data logger, to read out and to analyze the recorded data are described.

However, this document only covers the basic topics of LogView. For further information, please consult the online manual.

Thank you for purchasing a g-log data logger.

2 Applications and Safety Regulations

2.1 Operating Temperatures
- The loggers can be used in the temperature range between -30° and +85°C.
- Battery self-discharging increases above 45°C and continuous operation above 45°C can reduce the serviceable life by approximately 1/3.
- We cannot guarantee proper functioning below -40°C. Experience has shown that the batteries freeze at approx. -50°C and it is no longer possible to perform measurements.
- A gas explosion can occur with the lithium batteries if temperatures exceeding 100°C are reached.

2.2 Precautionary Measures for Handling Units with Lithium Batteries
- Do not short-circuit batteries: Danger of explosion.
- Do not throw units which contain batteries into fire: Danger of explosion.
- Do not subject the batteries to mechanical stress and do not dismantle them. The leaking battery fluid is highly corrosive and lithium can generate intense heat when it comes into contact with moisture or it can ignite.
- Do not heat battery-powered units above 100°C: Danger of explosion.
- Avoid subjecting the unit to violent knocks and blows.
- Follow the manufacturer's specifications for battery storage.
- Return the batteries to the supplier for correct waste disposal.
- Do not subject the batteries to microwaving: Danger of explosion.

2.3 Serviceable Life
Battery life-span is approximately 1.5 years for non USB devices and 2 years for USB-devices, depending on measurement interval and the number of recorded events and data readouts.

2.4 Battery Level Display
An energy consumption count monitors the life-span of the logger battery. For this reason, only the specific batteries recommended by the manufacturer should be used in the logger.
You must reset the battery change time after you have replaced the batteries, otherwise the energy counter will not function properly! If you reset the battery change-time without replacing the batteries, the calculation of state of charge will give you invalid data. The state of charge will be displayed as too high.

2.5 Technical Alterations
In the interests of our customers, we reserve the right to perform alterations resulting from subsequent technical developments. For this reason, diagrams, descriptions and the information concerning the scope of delivery are subject to change.

3 Installing LogView

To install LogView you must carry out the following steps:

Attention: **When using an operating system featuring user-rights management, Log/View can only be installed using an account with administrator rights.**

1. Start Windows (if not already started). As a precaution, close any other applications.
2. If you have a previous version of LogView installed on your system, make sure you uninstall it before proceeding with the new installation.
3. Insert the LogView CD into a CD drive of your computer. The installation program will start automatically.
   If the installation program does not start automatically, use Windows Explorer to run the SETUP.EXE program from the LogView CD.
4. Follow the instructions in the installation program.

To start LogView, double-click the LogView icon on your desktop or use the start menu.

Hints for operating systems with user administration

When using an operating system featuring user-rights management the software can only be installed using an account with administrator rights.

Hints for installing under Windows Vista

1. The first time that LogView is run it requires administrator rights in order to install the licence key. This can be done by right clicking on the LogView.exe icon and choosing the *Run as Administrator...* menu option.
2. The first time that a USB logger is connected to the system, the driver files will automatically be downloaded from the Windows Update website. This can take a couple of minutes.

3.1 Minimum Requirements
- Pentium Processor with Windows 2000, XP or Vista
- CD-ROM Drive
- 20 MByte Hard Drive Capacity
- Serial Port (RS-232) or USB-Port

3.2 Removing LogView
To remove LogView from your system, run the automated uninstall program included with the product. Use the *Add/Remove Programs* icon located in the Control Panel.

4 Programming a new Mission

LogView is designed for use with g-log data loggers. With integrated tools for programming your logger, advanced analysis and report capabilities LogView has everything you need for a complete analysis and documentation of your measurements. Whether you want to display long data rows or events, graphical representations or a spreadsheet, with LogView you are able to analyze and present your collected data fast and easily.

4.1 Connecting your data logger

For programming data loggers and for upload of your measurements, a data logger needs to be connected to the computer.

4.1.1 Connection

Connect the data cable to a free COM- or USB-Port on your PC and connect the other end to the data logger. Make sure that no other program or device is already using this port.

Figure 1: Connecting your data logger

4.1.2 Communications Settings USB

No communication settings have to be made, g-log USB data loggers will be recognized automatically by LogView

4.1.3 Communications Settings RS-232

For the old series of g-log data loggers with RS-232 interface, the COM-port has to be set. To change the communications settings:
On the *Options* menu, click *Communication Settings* or, in the *Com Port* list box, specify the new communications port. Click *OK* to confirm your selection. If no Com Port is displayed, all Ports are in use or disabled.
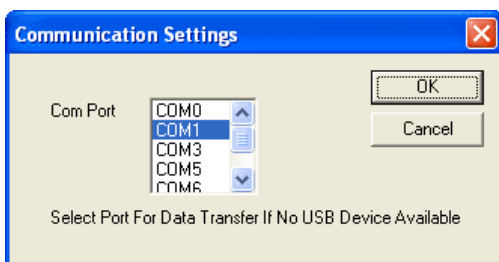

Figure 2: Communication Settings

Note: Before you start data transmission for the first time, you have to specify the desired communication port. Subsequent data transmissions will then be based on this setting.

4.2 Setting up new measurements

Before you can start using your g-log data logger for measurements, you must program the device according to your requirements.

LogView offers a convenient means of setting up the various features of your data logger. A series of measurements including the programmed settings is referred to below as the 'Mission'.

4.2.1 The Mission Wizard

The LogView Mission Wizard guides you step by step through the process of device setup:

To start the Mission Wizard:

1. On the *Mission* menu, click *Programming Wizard* or click the *New Mission Wizard* button on the toolbar. The first screen of the Mission Wizard is displayed.
2. Follow the instructions on the following wizard pages, using the *Next* and B*ack* buttons to navigate.
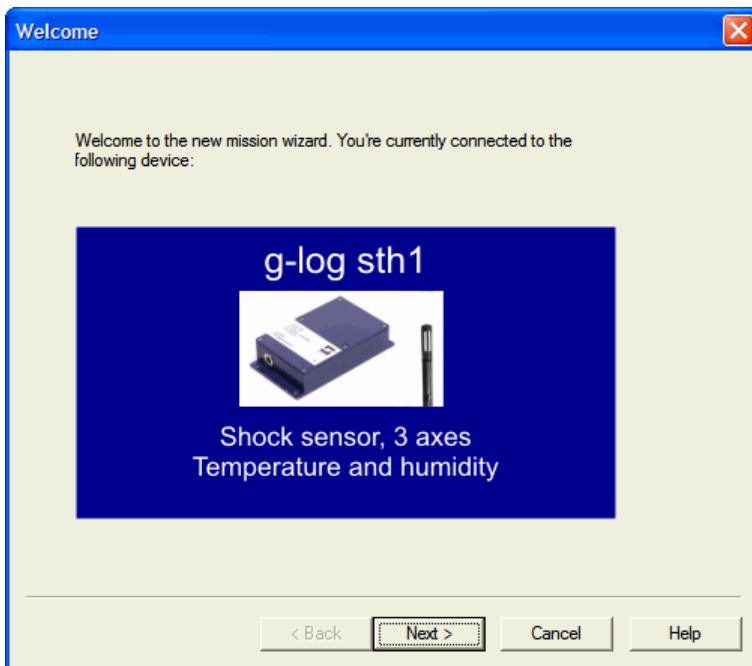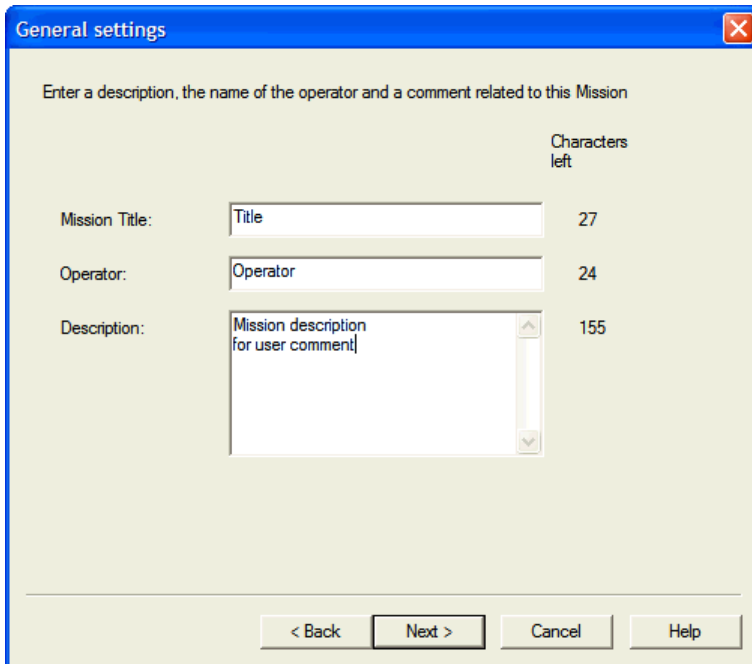
Welcome

Figure 3: Mission Wizard - Welcome

This page displays the currently connected device.

General Settings

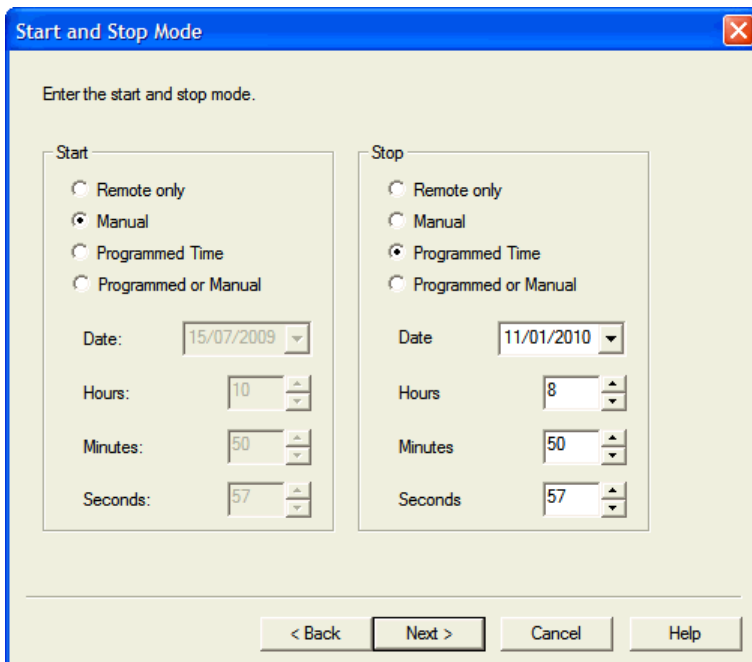**Figure 4: Mission Wizard - General Settings**

Use this page to enter all mission-related information, such as a brief description of the mission or the operator name.

Note: The maximum number of characters entered into the edit boxes is limited. The counters on the left side show you the number of characters left for each box.

Start / Stop Mode

Figure 5: Mission Wizard - Start and Stop Time

Table 1: Start/Stop Modes

| Mode	Description
Remote only	The data logger can only be started/stopped using LogView.
Manual	The data logger can be started either with the manual buttons on the device or using LogView.
Programmed Time	The data logger starts/stops automatically at the specified date and time.
Programmed or Manual	The data logger can be started or stopped manually. If this is not the case, it starts/stops at the specified date/time.

Shock Sensor Configuration (g-log sX, sthX)
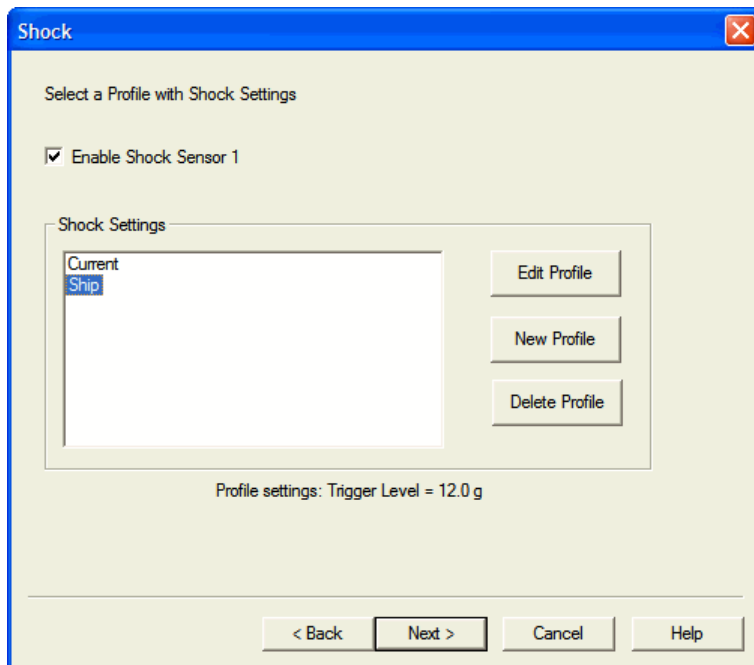
Figure 6: Mission Wizard - Sensor configuration

The upper part of this window displays the sensors which should be activated during a mission (checked = activated).
Note: Disabled sensors will record no data.

The lower part of this window displays which shock profiles are available. Existing profiles are listed and can be chosen by mouse-click. The selected profile is marked in blue.

What is a profile?

A shock profile defines the operating threshold of the acceleration sensors, which means the minimum acceleration and frequency at which to record an event. In addition, when using a Vibra logger device, there is an Event Interval entry. This specifies the length of a single Vibra logger event.

To set up a new shock profile or to change an existing profile:
1. Click the *New Profile* button or the *Edit Profile* button.
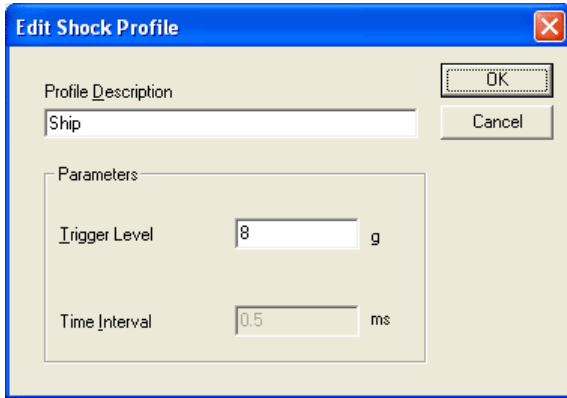2. Enter your settings in the *Edit Shock Profile* dialog.

Figure 7: Edit Shock Profile Dialog

Table 2: Shock Profile Settings

Parameter	Description
Profile Description	Description of the current profile. Tip: use meaningful names!
Trigger Level [g]	Recording threshold. Events exceeding this level will be recorded. The unit for this parameter is g (acceleration due to gravity).[2] Note: 1g = 9.81 m/s^2
Corner Frequency [Hz] (Non-USB devices only)	Value which defines the minimum frequency of an event to be record. Vibrations with a frequency below this value will not be recorded. Use this setting to suppress undesired vibrations in your measurements. (Technical detail: Adjustable 2nd order high pass-filter.) Use this setting to suppress undesired vibrations in your measurements.
Time Interval [ms]	(Read only) Sampling rate during acquisition of a shock event
Event Interval (Vibra logger only)	A continuous Vibra logger measurement is split into events of this length. The default value is 10 seconds.

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[2] The acceleration will be recorded until the maximum log time for an event is reached or the amplitude of acceleration falls below the value in "Trigger Level".
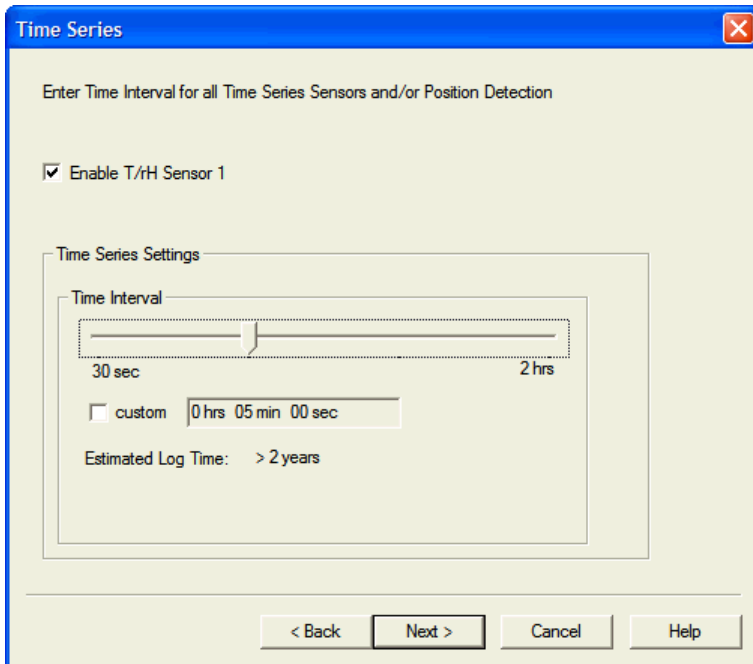
Time Series Settings (g-log sthX)

Figure 8: Mission Wizard – Summary

Use this dialog to enable/disable and to configure the time series sensors connected to your g-log data logger.

Note: Time Series measurements can be disabled by unchecking the box *Enable T/rH Sensor.* Disabled sensors will record no data.

Settings

You can either use the slider to select the sampling rate (time interval) from predefined values or enter a custom value if you check the *Custom* check box.

Estimated Log Time indicates the possible log time for the current sample rate.

Caution!

Specifying short time intervals (< 5 minutes) will decrease battery lifetime. Check battery level regularly.
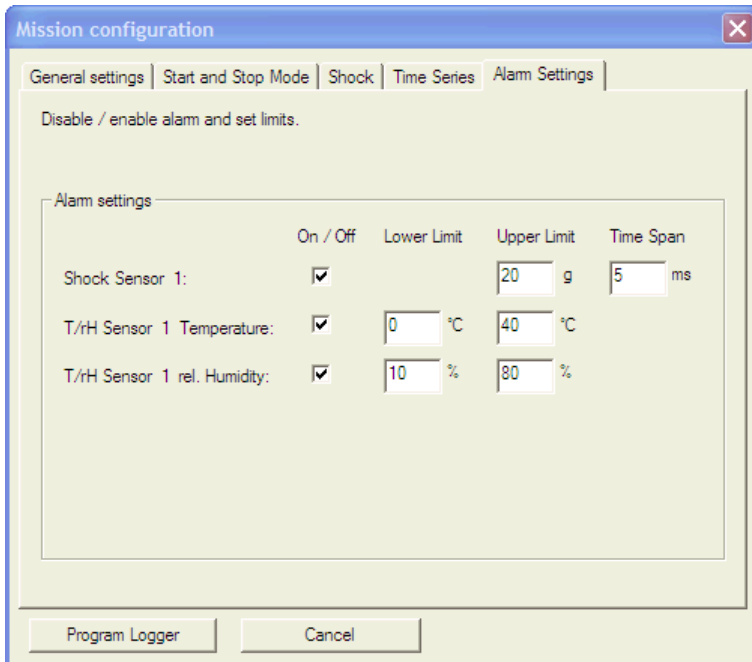
Alarm Settings (not for Vibra logger)

Figure 9: Mission Wizard - Alarm Settings

The g-log data loggers provide alarm capabilities for every connected sensor. An event which exceeds the user-defined limits will be indicated on the device (flashing red LED) and documented in the mission report.

To enable alarms:
In the Alarm Settings Dialog, mark the *On/Off* checkbox to enable the alarm function. In the *Upper Limit* and *Lower Limit* edit fields, enter the alarm thresholds. There is an additional *Time Span* field for shock sensors. This value specifies the time during a shock event that the upper limit must be exceeded before an alarm event is recorded. If an alarm event should be recorded immediately when the alarm level is exceeded, then the value 0 can be entered here. More information about this setting can be found in Chapter 11 (About Shock Measurement).

Important note
The Upper alarm limit for shock sensor is the maximum acceleration value on all three axes (not a Norm value!).
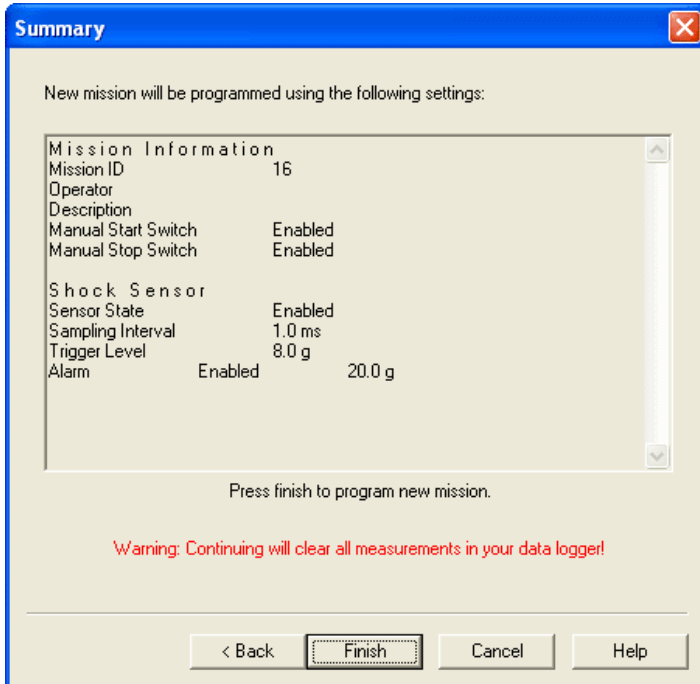
Summary

Figure 10: Mission Wizard - Summary

This page shows a summary of the new data logger configuration.

If the settings match your requirements:
Click *Finish* to apply the settings to the device.
To change some of the settings, click *Back* to return to the previous screens.
To discard all changes, click *Cancel*.

4.3 Multi Programming

Log/View supports programming more than one logger with identical settings.
After a g-log is successfully programmed, the following dialog box appears:
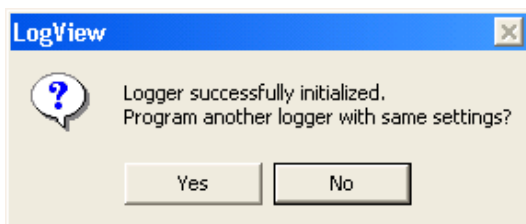

Figure 11: Multi Programming

If you want to program another logger with the same settings, click *Yes*. LogView will ask for the next g-log to be connected and the Mission Wizard starts anew, where the last settings remain.

5 Analyzing a Mission

5.1 Data transmission

To analyze and document the measurements, the recorded data need to be transmitted from the data logger to the computer.

Transmission of recorded data:

1. Connect the data logger to a free serial port on your computer, using the data cable supplied with LogView.
2. Click on the *Transmit* button on the Toolbar (or, on the *Mission* menu, click *Transmit*). The data will be transmitted and displayed in the Mission Explorer on the left hand side of the LogView screen.

5.2 Navigating in LogView

LogView organizes measurements in so-called missions. A mission contains all relevant information such as the name, times of start and stop as well as all the other events and measurement values. To navigate in these missions, LogView provides the Mission Explorer:
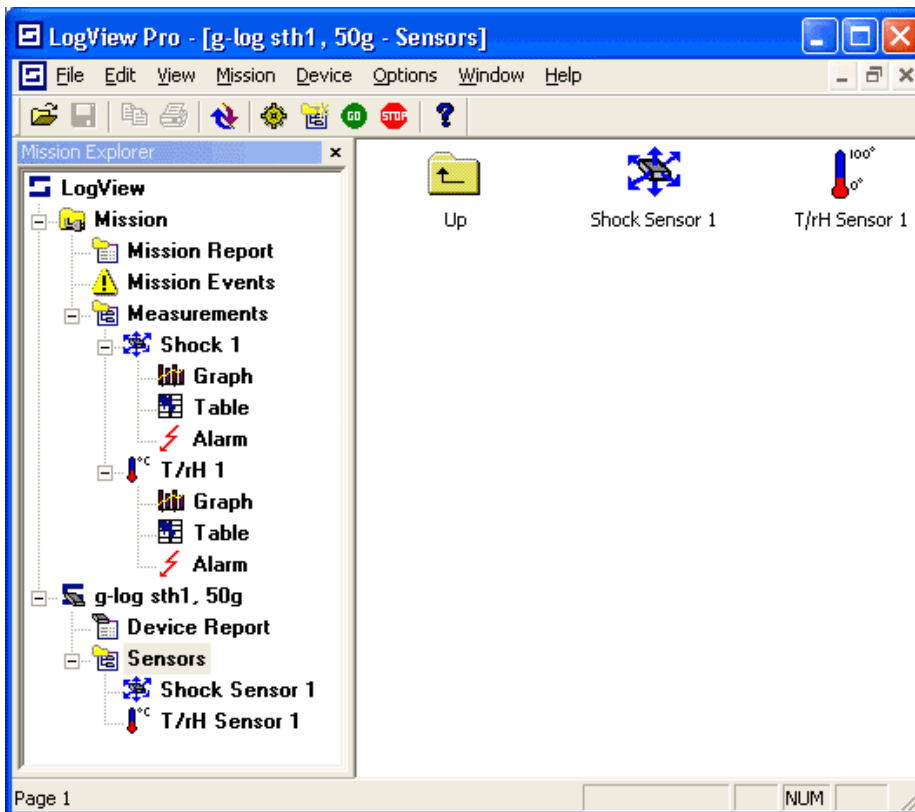
Mission Explorer

Figure 12: Mission Explorer

The Mission Explorer consists of two views:

Mission Tree View (Figure 12, left hand side)

All open missions and the connected device are displayed in the Mission Explorer Tree View. Click on a tree item to open the corresponding window.

Mission List View (Figure 12, right hand side)

The Mission List View is an additional navigation window. The content of the window corresponds with the current selection in the Mission Tree View.

Mission Explorer Icons

Table 3: Mission Explorer Icons

	Current online mission (connected with logger, not yet stored)		Table view of the recorded sensor data
	Mission stored on disk		Table view of the recorded sensor alarm data
	Measurements (folder which contains the measurement data)		Mission events, a list of events which occurred during a mission (e.g. start, stop, readout, ...)
	Shock measurements containing all recorded shock data		Mission report, a summary report of the mission events and data
	Temperature and humidity measurements containing all temperature/humidity data		Device report, a summary of the currently connected device
	Graph view of the recorded sensor data		Currently connected device

5.3 Data analysis

Depending on the sensors connected to your g-log data logger, LogView provides different ways of analyzing the recorded data.

To analyze measurement data:

1. In the Mission Explorer, expand the *Measurements* node by clicking on the plus sign on the left of the icon or double-clicking the icon.
2. Select from either graphical or tabular view of your data by clicking on the corresponding icon.

5.3.1   Graph View shock (g-log sX, sthX)

The Graph View is split in two screens. The upper screen displays the summary of the mission. The lower screen shows the details of a selected event.

Figure 13: Graph View - Shock

Summary View (upper part of Window)

The Summary View shows all recorded events between mission start and mission stop. If the mission has not yet ended, it shows all the recorded events to date.
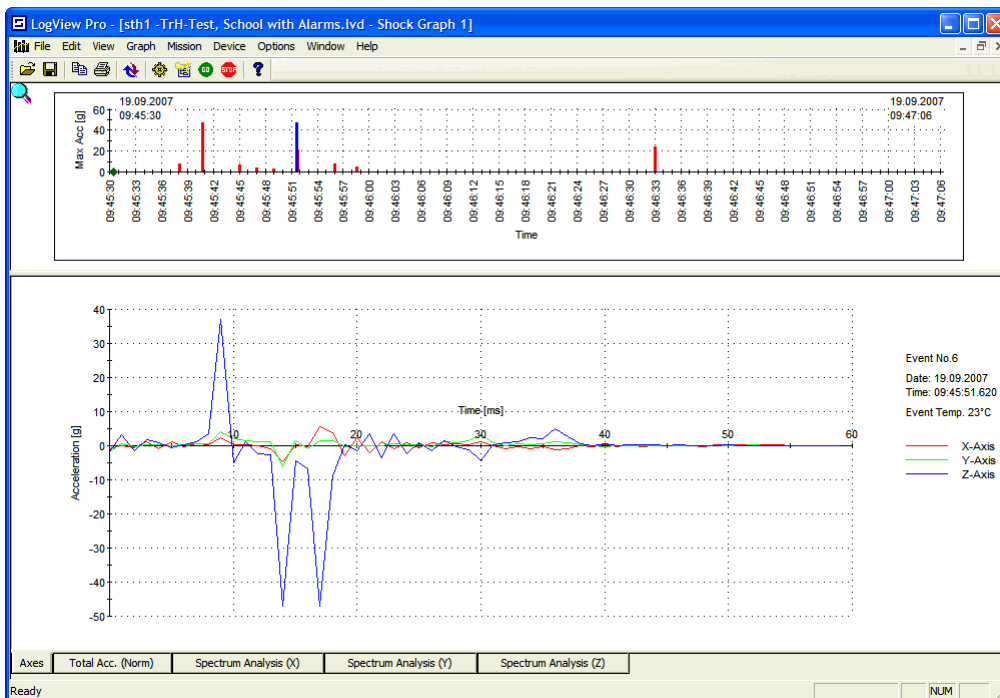
Note: Overlapping events

Especially on long missions, it may happen that different shock events displayed in the Summary View appear as one single event. These overlapping events are drawn with a label above the bar, specifying the number of overlapping shock events. To show/hide these labels, select *Label Events* on the *Graph* menu.

Important: The amplitude of an event displayed in the Summary View is the maximum absolute acceleration value on all three axes (not Norm values!)

Table 4: Events in the Summary View

Shock events	Vertical line. The height of the lines corresponds to the intensity of the events (max. acceleration).
System events (e.g. start/stop of mission)	Diamond

To select an event

1. Make sure that the summary view is active (Border line around the graph). If the graph is not active, left click in the graph to activate the view.
2. If necessary, zoom in to the area of interest.
   Note: A zoomed graph is marked with a lens symbol in the upper right corner.
3. Select an event by a left click.
4. The event details are displayed in the lower screen (Details View).

Details View (lower part of Window)

The Details View shows the details of the event selected in the Summary View. You can choose from two display options:

Table 5: Details View Display Options

Axes Displays all three axes	To see all three axes, click on *Axes* Tab below the Details screen.
Total Acc. (Norm) Displays the total acceleration	To analyze your data by the norm value of the acceleration vector click on the *Total Acc. (Norm)* Tab below the Details screen. **Note:** The norm value of the acceleration is defined by: Norm = $\sqrt{x^2 + y^2 + z^2}$
Spectrum Analysis (LogView Professional only)	To analyze the frequency spectrum of your data click on the *Spectrum Analysis* Tab below the Details screen. This is split into separate tabs for the X, Y and Z axes.

5.3.2 Graph View temperature/humidity (g-log sthX)

The T/rH Graph View displays recorded temperature, humidity and dew point data.

Note: The dew point is the temperature at which the air can just hold on to the contained water vapour. If the temperature drops below the dew point, moisture condenses.
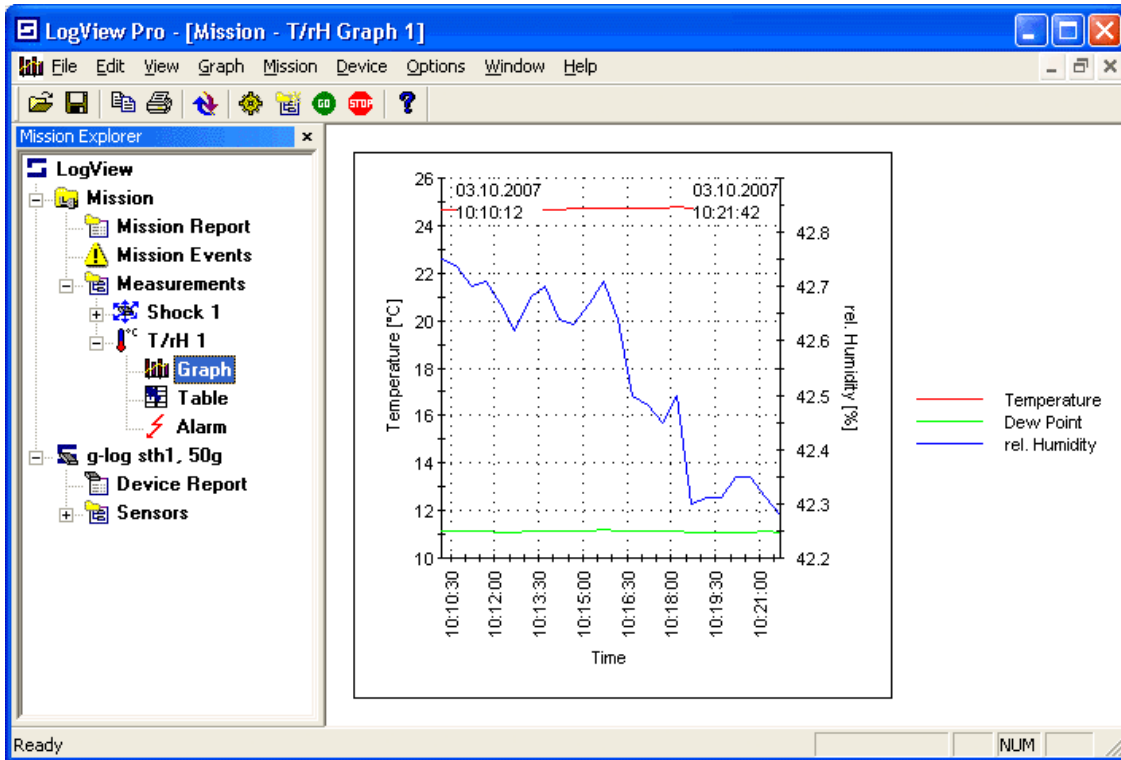

Figure 14: Graph View – T/rH

Show/Hide Data

LogView offers the possibility of hiding lines of the temperature/humidity chart.

To show/hide a specific line:
1. Right click in the graph and select *Show/Hide Lines* from the context menu.
2. Select/deselect the line to show/hide.

5.3.3 Additional Graph Functions

Grid Lines

Every Graph displayed in LogView can display grid lines.

To show/hide the grid lines

Right click in the graph to show/hide the grid lines and select/deselect *Grid Lines* from the context menu

or

on the *Graph* menu, select/deselect *Grid Lines.*

Zoom functions

Every Graph View can be zoomed.

To zoom in on a Graph:

Select the area of interest by holding the left mouse button pressed while dragging the zoom rectangle. After releasing the mouse button, the chosen area is zoomed in.

To zoom back a Graph (previous zoom):

Right click in the zoomed graph and select *Zoom Back* from the context menu.

or

on the *Graph* menu, select *Zoom Back*

or

press B on the keyboard.

To zoom out of a Graph:

Right click in the zoomed graph and select *Reset Zoom* from the context menu.

or

on the *Graph* menu, select *Reset Zoom*

or

press R on the keyboard.

5.3.4 Customize a graph

Right click in the graph and select *Customize* to change line color, style and width.

Display Range of Y-Axis

The display range of the Y-axis can be set manually or automatically in the *Axis Settings* tab**:**

On the *Graph* menu select *Auto*

or

deactivate *Auto* and enter the values for minimum and maximum.
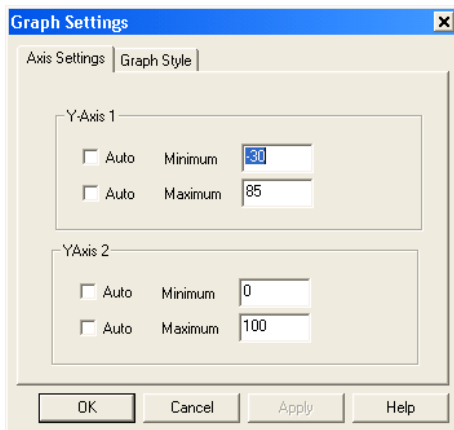
Figure 15: Set Display Range of Y-Axis

Line Style

The colour, width and style of each line can be adjusted individually in the *Graph Style* tab**.**
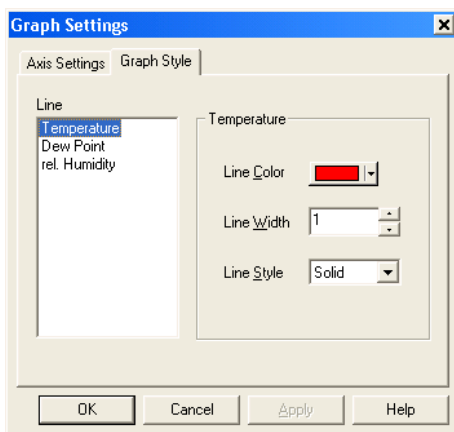
Figure 16: Adjusting Line Style

5.3.5 Filter Functions (LogView Professional Only)

To enable or disable the filter:
Right click in the graph and select *Filter Data* from the context menu
Or
on the *Graph* menu, select *Filter Data*
Or
press F on the keyboard.

Note: The filter type and parameters can be set using the *Options / Filter Settings* item in the main menu.

5.3.6 Tabular View Shock (g-log sX, sthX)

The Tabular View is split in two screens. The upper screen displays the summary of the mission. The lower screen shows the details of a selected event.

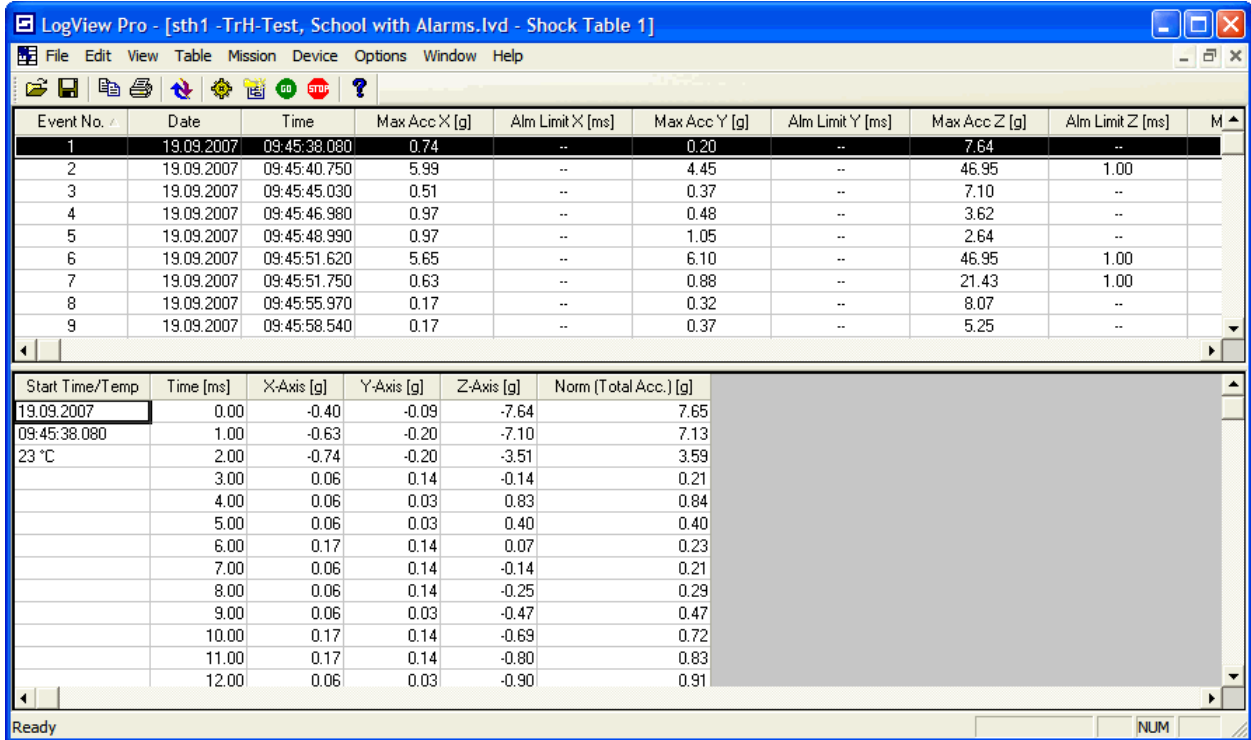| Event No.	Date	Time	Max Acc X [g]	Alm Limit X [ms]	Max Acc Y [g]	Alm Limit Y [ms]	Max Acc Z [g]	Alm Limit Z [ms]	M
1	19.09.2007	09:45:38.080	0.74	--	0.20	--	7.64	--	
2	19.09.2007	09:45:40.750	5.99	--	4.45	--	46.95	1.00	
3	19.09.2007	09:45:45.030	0.51	--	0.37	--	7.10	--	
4	19.09.2007	09:45:46.980	0.97	--	0.48	--	3.62	--	
5	19.09.2007	09:45:48.990	0.97	--	1.05	--	2.64	--	
6	19.09.2007	09:45:51.620	5.65	--	6.10	--	46.95	1.00	
7	19.09.2007	09:45:51.750	0.63	--	0.88	--	21.43	1.00	
8	19.09.2007	09:45:55.970	0.17	--	0.32	--	8.07	--	
9	19.09.2007	09:45:58.540	0.17	--	0.37	--	5.25	--	

Start Time/Temp	Time [ms]	X-Axis [g]	Y-Axis [g]	Z-Axis [g]	Norm (Total Acc.) [g]
19.09.2007	0.00	-0.40	-0.09	-7.64	7.65
09:45:38.080	1.00	-0.63	-0.20	-7.10	7.13
23 °C	2.00	-0.74	-0.20	-3.51	3.59
	3.00	0.06	0.14	-0.14	0.21
	4.00	0.06	0.03	0.83	0.84
	5.00	0.06	0.03	0.40	0.40
	6.00	0.17	0.14	0.07	0.23
	7.00	0.06	0.14	-0.14	0.21
	8.00	0.06	0.14	-0.25	0.29
	9.00	0.06	0.03	-0.47	0.47
	10.00	0.17	0.14	-0.69	0.72
	11.00	0.17	0.14	-0.80	0.83
	12.00	0.06	0.03	-0.90	0.91

Figure 17: Table View - Shock

Summary View (upper screen)

The Summary View shows all recorded shock events between mission start and mission stop. If the mission has not yet ended, it shows all the recorded events to date. The columns Alarm Limit X, Y and Z show the time, for which the given axis has a shock value greater than the alarm limit. If this time is greater than the value given for Alarm Time Span then this event is recorded as an alarm event.

To select an event:
1. Left-click on the desired event in the Summary View.
2. The event details are displayed in the lower screen (Details View).

Sorting:
By clicking on the table header of the summary view (Event Number, Date/Time, Total Acc.) the table may be sorted according to the selected header (ascending or descending).
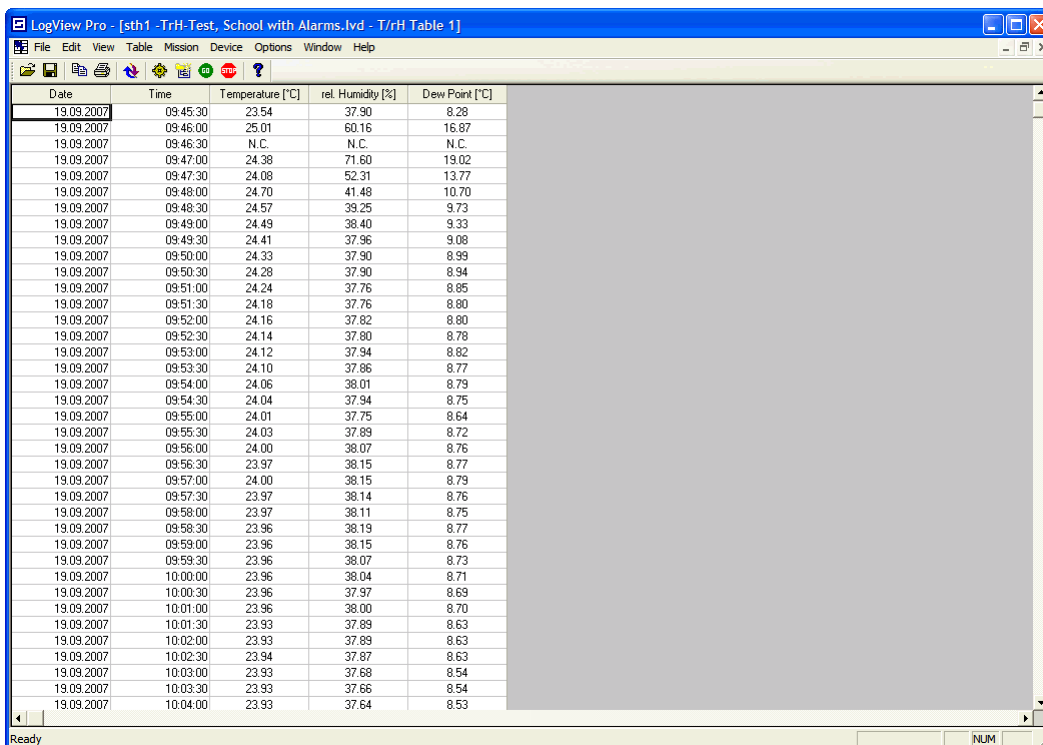
Details View
The Details View shows the numerical data of an event according to the Graph View.

5.3.7 Tabular View temperature/humidity (g-log sthX)
The Tabular View displays the detailed data of the mission (Temperature, humidity and dew point).

Note: If the tabular view displays a N.C. instead of the values, the sensor was not connected or the acquisition has been interrupted by shock events.

Figure 18: Table View - T/rH

5.3.8 Tabular View alarms shock / temperature/humidity (g-log sthX only)
The Alarm Tabular View displays the detailed alarm data of the mission (Shock, Temperature, humidity and dew point).

5.3.9 Data export

LogView provides data export either in Microsoft Excel, HTML or in Tab-delimited file format. Only table view allows data export

To export data from LogView:
1. Ensure that the table containing the data you want to export is activated. (A mouse click in the window activates the window.)
2. On the *Table* menu, select *Export* and choose the required export format
   or
   right click in the table and select *Export*.
3. Choose the required file format. For an export directly into Excel (without saving data in a file) choose the function *Excel / Open…*
4. Follow the instructions on the screen.

Note: Exporting large Data columns in Excel or HTML format may take several minutes. Alternatively, data can be exported in tab-delimited file format, which proceeds much faster. Afterwards, this file can be imported to Excel.

5.3.10 Bulk Export

LogView's Table View provides a means to export all the events portrayed in a single bulk export action. The data can be exported as Excel Spreadsheets, HTML tables or tab-delimited text files.
A menu of bulk export options is available on the *Table* menu. Click *Bulk Export* to access this menu and select the file format required for export:
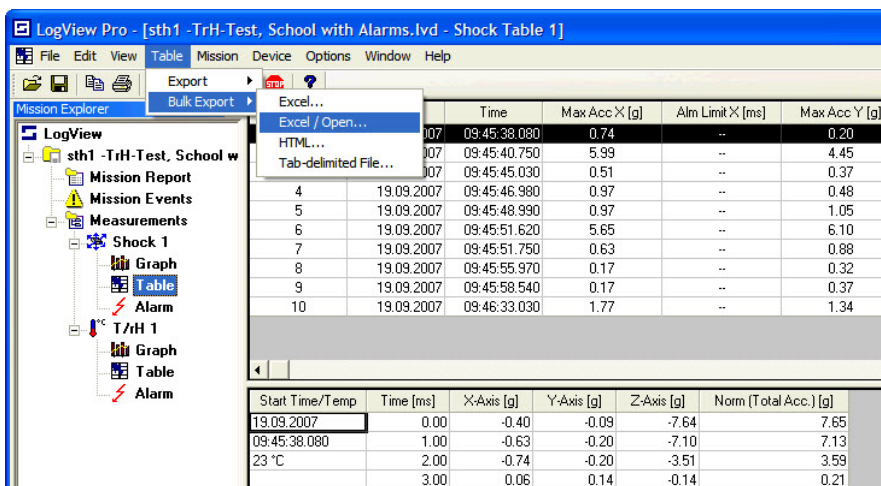

Figure 19: Bulk Export

Alternatively, a menu of bulk export options is available on the context menu associated with the table. Right-click on the table to see this menu, or ensure that the table has the focus by clicking on it and then press the Windows Context Menu key.

Formats

Supported formats are Microsoft Excel Spreadsheet, HTML Tables and Tab-delimited Text.

Bulk Export to Excel spreadsheets is directed to a set of separate files. Merged export to a single file is only supported in *Excel / Open...* One file is generated containing a table of events, corresponding to the events list in the Table View. (Uppermost grid.) The remaining files contain the data of the individual events.

5.4 Analyzing Mission Events

All g-log data loggers record events occurring during a mission, e.g. programming, on/off etc. The mission event list contains a list of all events which occurred during this mission. The following events are recorded and displayed in the event list:

Table 6: Mission Events

Event	Description
Started at programmed time	The logger started recording at the programmed time
Stopped at programmed time	The logger stopped recording at the programmed time
Started manually	The logger was started manually using the start button at the given time
Stopped manually	The logger was stopped manually using the stop button at the given time
Started by remote	The logger was started remotely by LogView
Stopped by remote	The logger was stopped remotely by LogView
Unallowed try to start logger, Button disabled	It was attempted to start the logger manually, but the start button was disabled for this mission.
Unallowed try to stop logger, Button disabled	It was attempted to stop the logger manually, but the stop button was disabled for this mission.
Power fail	A power failure occurred, possibly caused by a battery change or empty batteries
Read out of recorded events	Mission was read out at the given time
Programmed new mission	A new mission was programmed at the given time
Unknown event	An unknown Event has been recorded. Most possibly caused by an old LogView version reading out the logger

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Table 7: Additional Mission Events for Vibra Logger

Event	Description
Measurement started by trigger	The measurement was started automatically after the logger detected a shock greater than the trigger level.
Measurement started manually	The measurement was started manually using the start button.
Measurement stopped manually	The measurement was stopped manually using the stop button.
Measurement stopped, memory full	The measurement was stopped because the logger memory was full.
Unallowed try to start measurement, memory full	It was attempted to start the measurement manually, but the logger memory was full.
Unallowed try to start measurement, button disabled	It was attempted to start the measurement manually, but the start button was disabled for this mission.
Unallowed try to stop measurement, button disabled	It was attempted to stop the measurement manually, but the stop button was disabled for this mission.
Measurement stopped by communication	The measurement was stopped because it was connected to a PC and data was read from the logger.

Example:

Mission Events   Title

Mission Information

Mission ID	39719
Operator	Operator
Description	Mission Description for user comments
Manual Start Switch	Enabled
Manual Stop Switch	Disabled
Stop Time	10.10.2001 / 12:00:00.000

Recorded Events

Date	Time	Event
13.04.2001	14:32:28.690	Programmed new mission
13.04.2001	14:32:29.200	Started by remote
13.04.2001	14:32:36.830	Read out of recorded events

Figure 20: Mission Events (Example)

5.5 Data Filters (LogView Professional Version Only)

The shock data can be filtered before it is displayed using a number of different signal filters.

To configure the filter parameters:
1. On the *Options* menu, click *Filter Settings***.**
2. Enter the filter settings in the dialog.
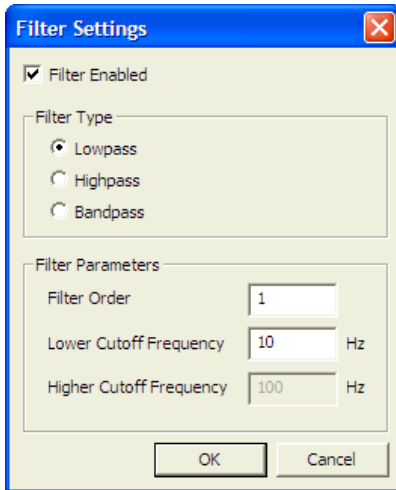
Figure 21: Filter Settings

The following parameters can be set:

Filter Enabled	Enables or disables the filter in all shock graph views.
Filter Type	The type of the filter: • Lowpass • Highpass • Bandpass
Filter Parameters	The filter parameters: • Filter order • Cutoff Frequencies

Table 8: Filter Settings

Example

The following are example values which can be used for a lowpass filter:

Weak filter : Order = 1, Lower Cutoff Frequency = 10Hz
Strong filter : Order = 5, Lower Cutoff Frequency = 10Hz

Hint

The filter can also be enabled or disabled using the chart context menu (see section 5.4.3).

6 Reporting functions

LogView is able automatically to generate the reports needed for documentation of your measurements. After the mission data is transferred to LogView, the program will automatically generate a mission report and a device report.
Also, all graph- and table views can be printed out for documentation purposes.

6.1 Printing

To print out a report:
Make sure you have selected the report, graph or table you want to print in the Mission Explorer. (In the shock graph or table view, also select the view you want to print.)
1. Click on the printer symbol in the toolbar list or on the *File* menu, click *Print* (to preview the printout, click *Print Preview*).
2. The report will be printed to the selected printer.

6.2 Mission Report

6.2.1 Report content

The mission report gives a summary of the current mission. This contains information about the mission, the logger and the configuration as well as a list of the recorded impacts and the minima and maxima of the climate values.

User comment

An additional user comment can be inserted for further documentation purposes.
To insert a user comment:
Make sure you have selected the Mission Report window in the Tree View.
1. On the *Mission* menu, click *User Comment*
2. Enter comment
3. User comment will be displayed at the bottom of the mission report.

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Example

Mission Report   Test   LogView

| g-log sth1, 50g | Serial# : 65010 | Mission ID : 1045 | Page 1 / 2 |

Mission Information

Operator	He
Description	
Manual Start Switch	Enabled
Manual Stop Switch	Enabled
Mission Begin [Date/Time]	03.10.2007 / 10:10:12
Mission End [Date/Time]	03.10.2007 / 10:53:07

Shock Configuration

Sensor State	Enabled	
Corner Frequency	20 Hz	
Sampling Interval	1 ms	
Trigger Level	1.0 g	
Alarm	Enabled	20.0 g

Shock Event Summary

No. of events recorded	9	
Alarm Level exceeded / times	Yes	8

Highest Shock Events (Ordered, Highest First)

Date / Time	Max Acc [g]	Temperature [°C]
03.10.2007 / 10:32:02.490	62.3	24
03.10.2007 / 10:21:46.770	47.0	24
03.10.2007 / 10:32:07.260	43.8	24
03.10.2007 / 10:21:51.910	41.3	24
03.10.2007 / 10:32:12.320	40.0	24
03.10.2007 / 10:32:04.120	34.2	24
03.10.2007 / 10:32:16.650	31.4	24
03.10.2007 / 10:32:10.360	24.6	24
03.10.2007 / 10:31:58.870	16.2	24

T/rH Configuration

Sensor State	Enabled
Sampling Interval	30 sec
Sensor Sensitivity	±0.3°C / ±1.5 rH

Mission Report   Test   LogView

| g-log sth1, 50g | Serial# : 65010 | Mission ID : 1045 | Page 2 / 2 |

Temperature Alarm	Enabled	<-10.0°C / >20.0°C
Humidity Alarm	Enabled	<0.0% rH / >20.0% rH

T/rH Summary

No. of samples recorded	86	
Temp. Alarm Level exceeded / times	Yes	86
Humidity Alarm Level exceeded / times	Yes	86

Min/Max Values

Temperature	Value [°C]	Date / Time
Min	24.6	03.10.2007 / 10:10:12
Max	25.3	03.10.2007 / 10:50:42
rel. Humidity	Value [%rH]	Date / Time
Min	41.6	03.10.2007 / 10:52:42
Max	42.8	03.10.2007 / 10:10:12

Figure 22: Mission Report (Example)

6.3 Device Report

The device report displays information about the device currently connected to LogView. To retrieve the current device information, select *Update Device Info* on the *Device* menu.

6.3.1 Report content

The report contains information such as battery level, serial number, date of last calibration, etc.

Example

Device Information	g-log sth1, 50 g	LogView
Serial# : 65010		Page 1 / 1

Device Information

Device State	Off	
Firmware Version	1.02.07	
Battery Level / Approx. Lifetime	86%	1421d 5h
Last Battery Change	18.09.2007	
Memory Size (Shock)	960kB	
Memory Size (T/rH)	64kB	

Device Events

Date	Event
01.01.2001	First activation of device
01.01.2001	Calibration of device

Figure 23: Device Report (Example)

6.4 Sensor reports

The current sensor settings can be viewed by selecting the corresponding sensor element in the mission explorer.

Shock sensor

Shock Sensor

Configuration

Sensor State	Enabled	
Corner Frequency	100 Hz	
Sampling Interval	1 ms	
Trigger Level	12.0 g	
Alarm	Enabled	20.0 g

Figure 24: Sensor Configuration - Shock

T/rH sensor

T/rH Sensor

Configuration

Sensor State	Enabled
Sampling Interval	1 hrs 0 min 0 sec
Sensor Sensitivity	±0.3°C / ±1.5rH
Temperature Alarm	Disabled
Humidity Alarm	Disabled

Figure 25: Sensor configuration - T/rH

7 Working with your data logger

7.1 Configuration

To configure data logger settings like password or time settings:
1. On the *Device* menu, click *Settings***.**
2. Enter the data logger settings in the different dialog pages.

7.1.1 Logger Time

Use this dialog to change the time settings on the data logger.

Caution: Please ensure you enter the correct time. Wrong time settings will result in measurements containing incorrect time stamps.
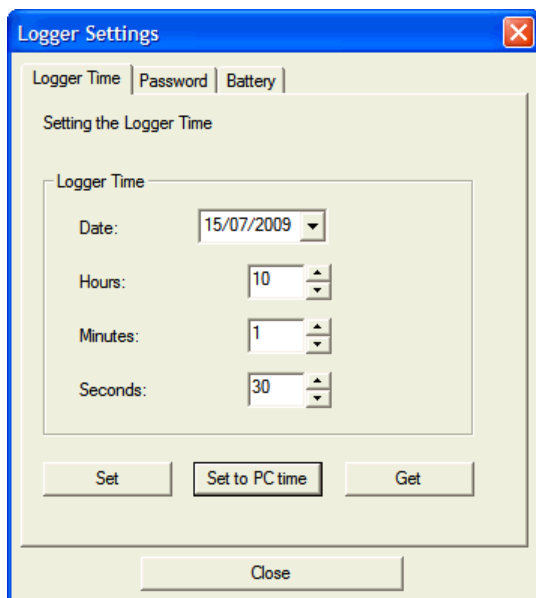

Figure 26: Logger Settings – Logger Time

To read out the current logger time, click *Get*.
To enter a new logger time, enter the date and time and click *Set* or click *Set to PC time* to set the time to the PC-time.

7.1.2 Password

To protect the data logger against tampering attempts, password protection can be enabled.
If you forget this password, you must contact your g-log data logger partner to unlock your device.
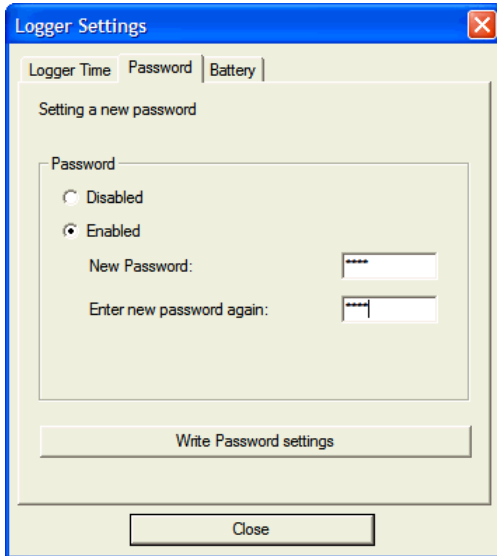

Figure 27: Logger Settings - Password

Password protection logic

Overview

Each data logger provides password protection against unauthorized manipulation. Data of a password-protected device can be read out. However, it is not possible to start/stop a logger, to set up a new mission configuration or to change data logger settings without entering the correct password first.

Note: The password is stored in the data logger, so you have to remember the password for every device.

Password protected areas

Table 9: Password protection logic

	Password protection enabled	
	Yes	No
Data transmission		X
Data analysis and report generation		X
New mission setup	X	
Changing logger settings	X	
Remote Start/Stop	X	
Reset Alarm	X	

7.1.3 Battery

This Dialog shows the state of charge and the date of the last battery change. If you change the battery, you should press the button to set the new values.

Caution: **If you reset the battery change-time without replacing the batteries, the calculation of state of charge will give you invalid data. The state of charge will be displayed as too high!**

To set the battery change time:

1. Click *Set Battery Change Time* on the battery dialog.
2. The Battery change date will be set immediately to the actual date and the Battery Level will change to 100%.
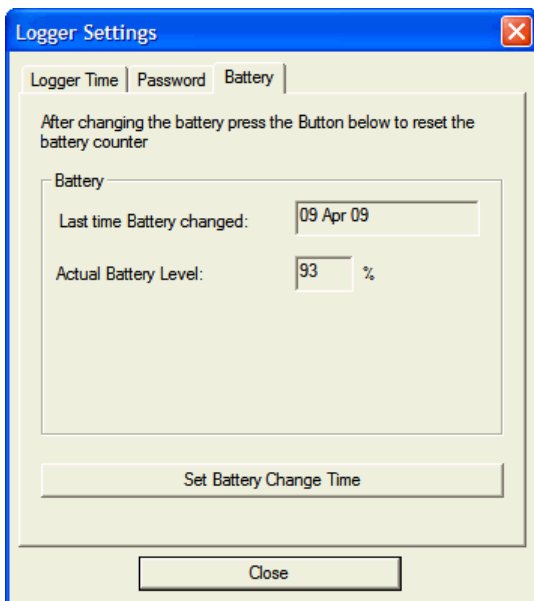
Figure 28: Logger Settings - Battery

7.2 Operating the data logger via LogView

The following data logger functionalities can be accessed via LogView:

7.2.1 Remote Start / Stop of the device

To start/stop the connected data logger remotely:
On the *Device* menu, select *Start* or *Stop*
or
use the toolbar buttons.

Note: The device report containing the information about the logger state is not updated until you select *Update Device Info* from the *Device* menu or the complete data is transmitted anew (Transfer).

7.2.2 Alarm Reset

To reset the alarm indicator on the data logger
On the *Device* menu, select *Reset Alarm*.

7.2.3 Device Info Update

To update the device information displayed in the Device Report:
On the *Device* menu, select *Update Device Info*.

7.3 Manual operation

The most important operating states of the g-log data logger are shown by two LEDs. Also, the data logger can be turned on and off by using the start and stop buttons. For security reasons the start and stop buttons can be deactivated by the software. See also chapter 4.2 Setting up new Measurements – Start / Stop Mode.

7.3.1 Set-up of Control Buttons

The control and display elements of the g-log standard series are internal. The g-log E-series has additional control elements on the cover which allows one to start and stop the device without opening the device.

7.3.2 Buttons and Indicators s1/sth1

The data loggers have a green and a red indicator lamp which show the actual device state and the alarm state.

Figure 29: Buttons and indicators s1/sth1

7.3.3 Buttons and Indicators s1-E/sth1-E

The E-series data loggers have a green and a red indicator lamp integrated within the housing. The button next to the green indicator lamp is equivalent to the ON-button; the button next to the red indicator lamp is equivalent to the OFF-button,

Figure 30: Buttons and indicators s1/sth1

Tip: Protected against tampering

The design of the controls and indicators allows one to cover the buttons with a tag or just simply hide them behind a label. This way you can ensure very easily that only insiders are able to recognize the controls and indicators in order to switch the device on or off.

7.3.4 Operating and Indicators

Device State indication

If the data logger is active, the green lamp will flash every third second.

Data recording indication

A shock event recording is indicated if the green indicator flashes for a short time.

Alarm

If alarm levels have been exceeded, the red lamp will flash synchronously to the red lamp.

Start / activating the data logger

1. Press and hold on the *on* button for more than 1 second.
   The green lamp will flash to indicate activation.
2. Release the button.

Stop / deactivating the data logger

1. Press and hold on the *off* button for more than 1 second.
   The red lamp will flash to indicate deactivation.
2. Release the button.

7.4 General Settings

General settings, which are used throughout the application, must be set in the menu *General Settings.*
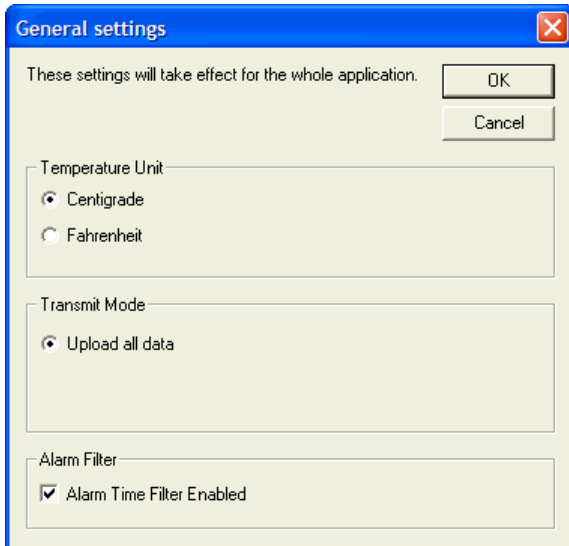Click *General Settings* on the *Options* menu.

Figure 31: General settings

7.4.1 Temperature Unit

Use the Centigrade/Fahrenheit control elements to change the temperature unit used in LogView.

7.4.2 Transmit Mode

In this version of LogView, no dynamic upload is supported. All recorded data is transmitted at the time the user selects the **Transmit** function.

7.4.3 Alarm Filter

Enabling the alarm time filter will reduce the amount of events displayed when using a logger which has an alarm time span parameter set. Shock events which exceed the alarm upper limit for less than the given time span will not be displayed.

8 Using the g-log data logger

The g-log data loggers are tri-axial shock recorders. The coordinate system of the built-in acceleration sensor is displayed on the device.

Figure 32: Coordinate system

8.1 Mounting

The g-log data loggers are designed for use under difficult conditions. The measurement electronics is protected by a solid and hose-proof aluminum case (IP 65).

Mounting Guidelines Shock (g-log sX, sthX)

The data logger must be rigidly connected to the goods that are to be supervised. Normally the device will be screwed to the goods using M5 screws.
Attach the data logger tightly to the goods and avoid any cushioning materials in between. Otherwise, measurements could be compromised. Inadequate or loose mounting can also compromise measurements, caused by vibrations between the goods and the data logger.

Mounting Guidelines Hygroclip (g-log sthX)

Ensure there is adequate air circulation to ensure the sensor reports the true climate of the goods to be monitored.

9 Dimensions

See drawings below (all dimensions in mm).
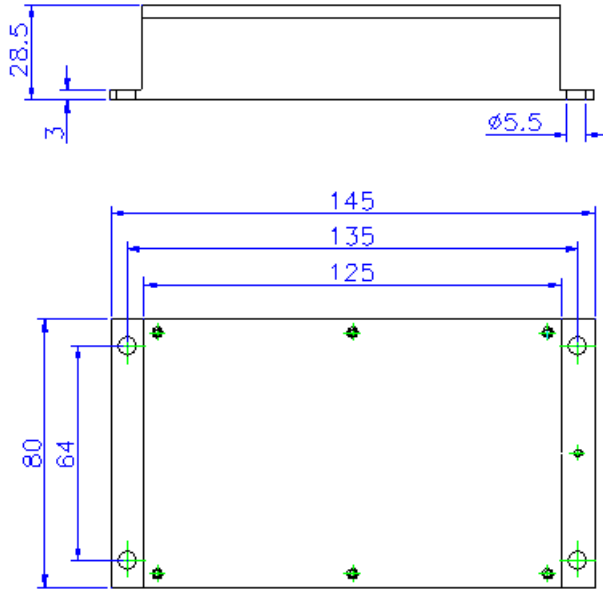
Figure 33: Dimensions g-log
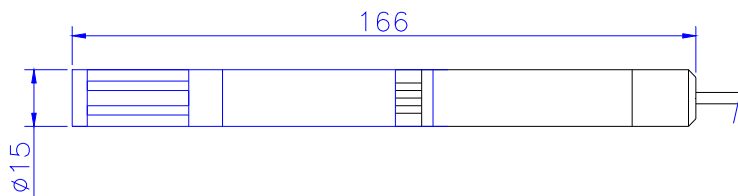
Figure 34: Dimensions Hygroclip

10 Maintenance

Like every measurement device, the g-log data loggers need maintenance. The g-log data logger complies with the EN 15433-6 standard documents. To comply with the EN directives, a recalibration of the device every two years must be conducted.
Please contact 'solve gmbh', Switzerland or your local agent for further information.

10.1 Calibration

Calibration Service

The calibration service includes battery replacement, inspection, adjustment and certification of the data logger.

Check-up

A check-up includes an electrical check-up of the device and a battery replacement.

11 About shock measurement

11.1 Shock basics
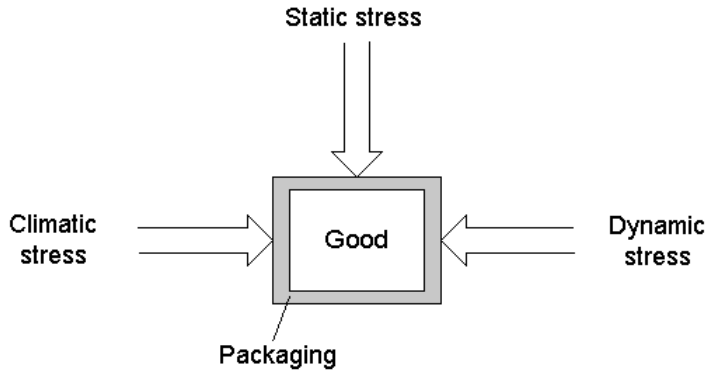
Figure 35: Stress factors

Table 10: Stress factors

Climatic stress	Temperature, Humidity, Wind, etc.
Static stress	Mechanical, e.g. stack pressure.
Dynamic stress	**Mechanical, e.g. impacts, vibrations.**

The g-log shock recorders acquire acceleration and, optionally, climatic conditions. Therefore, they are able to record dynamic stress acting on objects.

11.1.1 Dynamic stress

Dynamic stress can be divided in the following categories:

Table 11: Dynamic Stress

Category	Definition	Examples
Impacts	Mechanical-dynamic stress, arising out of mass acceleration. Occurring sporadically and in varying intensity during transportation.	Horizontal or vertical impacts (Dropping, toppling, crashing into other objects).
Vibrations	Periodically-occurring stress resulting from vehicle movement. The vibrations are transferred to the object in form of horizontal and vertical impacts.	Horizontal and vertical impacts (Engine vibrations, scrubbing, friction, badly conditioned transportation route).

Impacts

An impact is identified by its amplitude (max. acceleration value) and its duration. During an impact the acceleration increases, reaches a maximum value and decreases again.
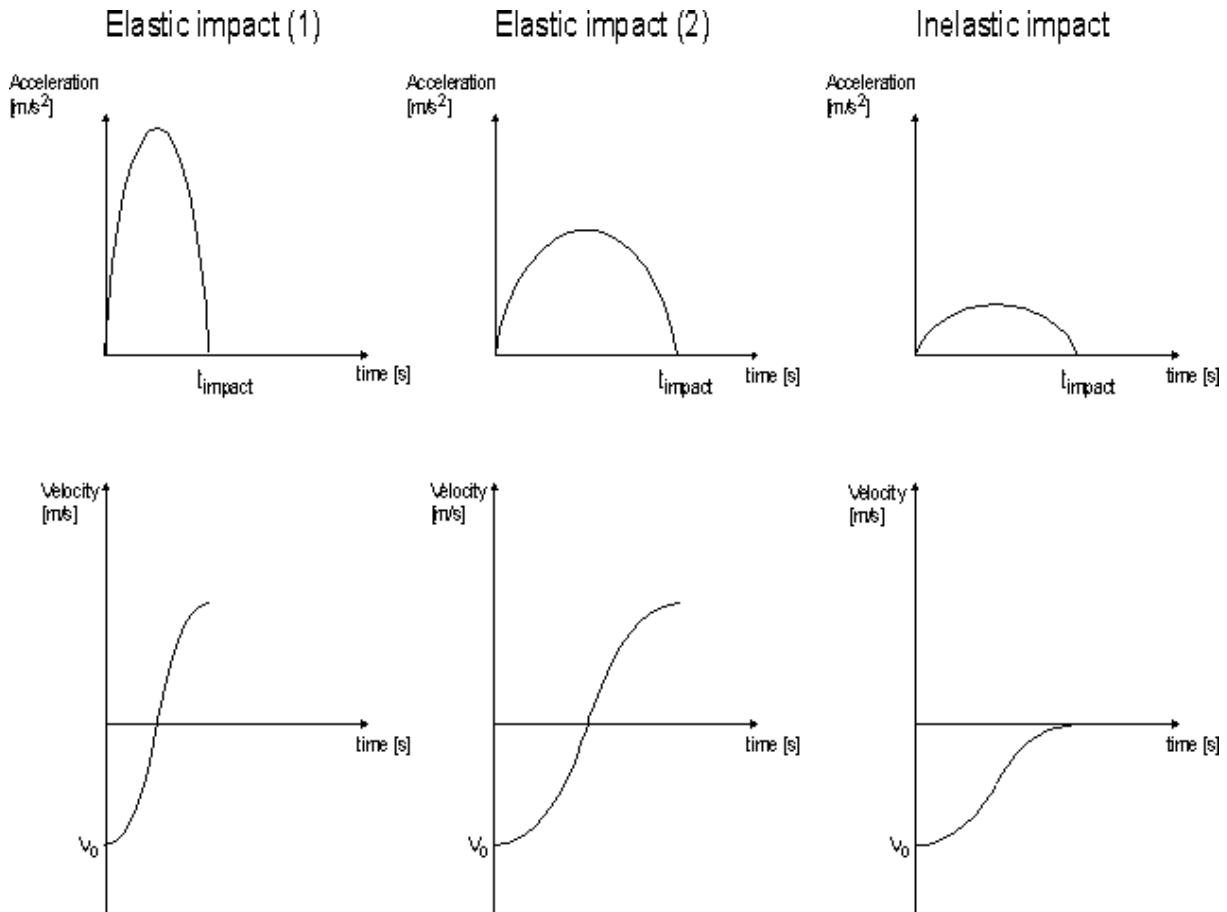
Figure 36: Impact modes

Elastic impact

The shorter the duration of the impact with a given velocity, the higher is the acceleration. In an elastic impact, the object maintains its kinetic energy.

Inelastic impact

At the end of the impact, the velocity of the object is zero. The entire kinetic energy of the object is transformed into deformation and heat.

In practice, impacts are a mixture between elastic and inelastic impacts.

11.1.2 Typical stress values*

Road transport	Impacts (app.): 1g
	Natural frequency (app.): 10..15Hz
Rail transport	Impacts (app.): 4g (shunting)
	Natural frequency (app.): 120Hz
Sea transport	Impacts (app.): 2g
	Natural frequency (app.): 30Hz

* The above values are reference values only and heavily dependent on competent handling and the condition of the transportation route.

11.1.3 Damage Boundary Curve (DBC)

What decides whether an object is damaged by an impact is not the amplitude, nor the maximum shock. Instead it is the length of time for which the shock is greater than a given value. The boundary of the curve in a shock-time diagram, which shows the values which must be exceeded for an object to be damaged is called a **Damage Boundary Curve.**
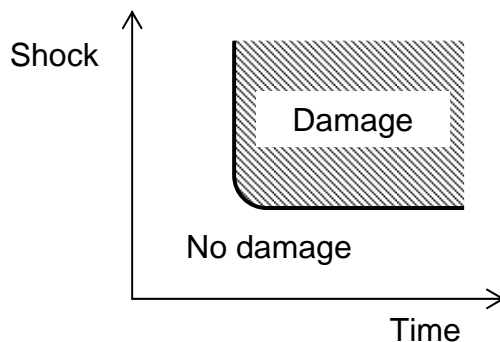
So that the logger can only record alarm events when the impact meets these conditions, the alarm configuration contains parameters for both the alarm threshold and the minimum time span.

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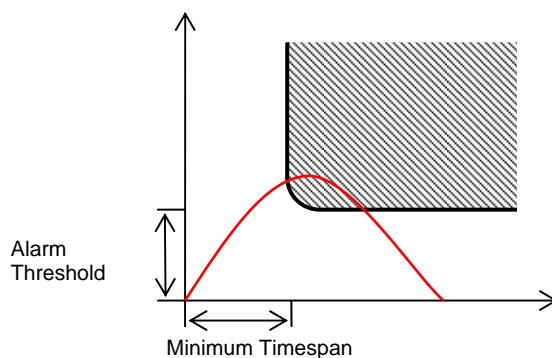
12 About Temperature / Humidity Measurements

Dew Point and Relative Humidity explained

Relative Humidity and Dew Point are closely related, and are based upon the amount of water vapor in the air and the total amount of water vapor that the air can hold at a given temperature. The warmer the air, the more water vapor it can contain, and the cooler the air, the less vapor it can contain. This is the reason moisture will condense on a cold glass or other cold object: as the air near the object cools, it reaches the point where cannot contain all the water which it held at a warmer temperature, and some moisture "falls out" of the air.
The Relative Humidity expresses how much moisture is in the air, as a percentage of the total moisture the air can contain at the current temperature. For example, if the air has all the water vapor that it can contain at a given temperature, the relative humidity is 100%; if the air has only half of the vapor that it can contain at a given temperature, the relative humidity is 50%.

The dew point is the temperature where the air can contain exactly the amount of vapor the air currently holds. If the temperature falls below the dew point, moisture will condense.

13 Appendix

13.1 Tables

13.2 Figures