Measurement Data Viewer

The **Measurement data viewer** is used to display **measurement graphs**. Measurement data can be displayed from the following file formats: DIAdem (DAT), ISO-Crash (ISO), Dats (DOK) and PIAS work file (*.*).

There is no limit on the number of open diagram windows and the number of graphs within a window, other than the RAM resources of your computer.

As a rule, the measurement channels contain time graphs. Therefore, the following assignments will generally apply:

X-axis of the diagram = Abscissa = Time

Y-axis of the diagram = Ordinate = measurement values

The viewer for data in the (new) ISO Multimedia Data Exchange Format (MME) is explained in a separate chapter.

The chapter "MovBag Airbag Analysis" contains the description of the dedicated file type for Multi-D measurement data (BAG).

The File Menu

In the **File** menu you can create new documents, open existing ones, close and save picture documents, create a printout, set up the printer or exit the program. Please note that only the additional menu items corresponding to the document type under discussion are explained in this section.

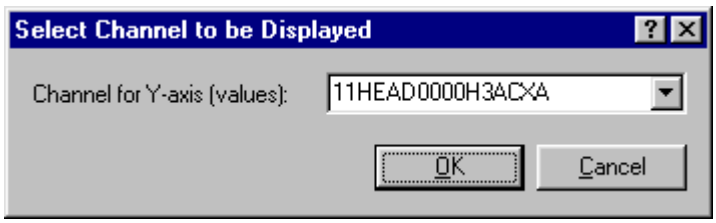
Open

Use this command to open an existing document in a new window. Multiple windows can be opened at the same time.

If you open a measurement data file containing multiple **measurement channels**, you must indicate to FalCon eXtra which graph is to be displayed. The entry dialog box depends on the individual file format:

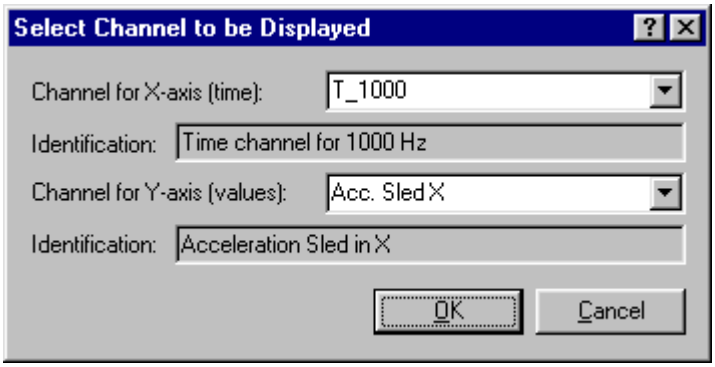
Example: ISO Crash format

X-axis implicitly = time



Example: DIAdem format

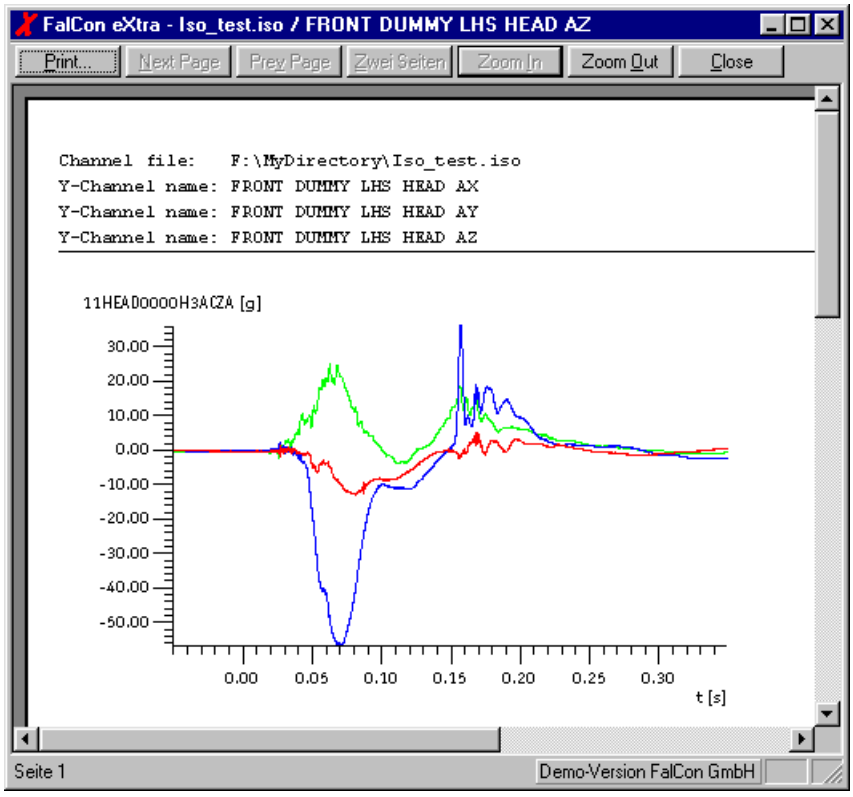
Select X- and Y-axis



To the extent they are available, all monotonic ascending channels are displayed for you for the X-axis (time axis). This channel is used for synchronization with AVI files. The channel for the Y-axis (values axis) can be freely selected.

The **Identification** output fields provide you with additional information on the respective channels.

Page Preview

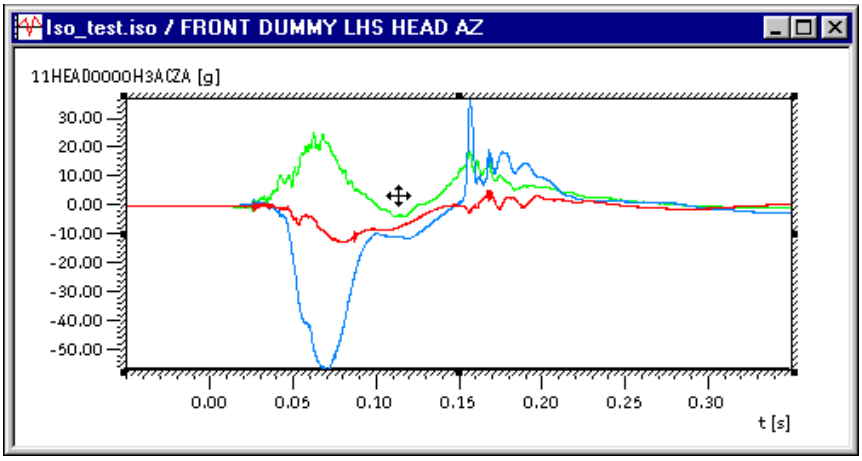


Use this menu entry if you want to be able to evaluate the appearance of the printout.

Graph: Document Window

Changing the Diagram Output Area

By **double-clicking** on the graph (within the rectangle defined by the axes) you can move the effective output area or adjust its size.

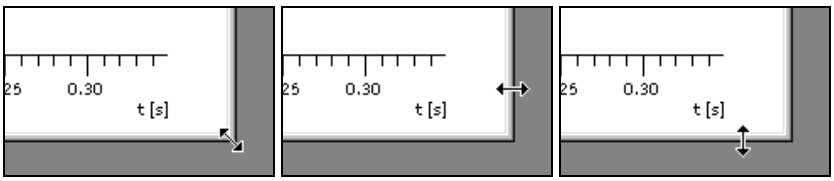


If you position the cursor in the rectangle that is now selected (“cursor with 4 arrow heads”), press and hold down the mouse button, you can move the output area. If you click on one of the black edge points of the selected rectangle (“cursor with 2 arrow heads”) and hold it down, you can change the size of the output area.

As soon as you have changed the size or position, the program returns to its normal display mode. To leave change mode without making any changes, simply click anywhere outside the graph.

Changing the Document Window Size

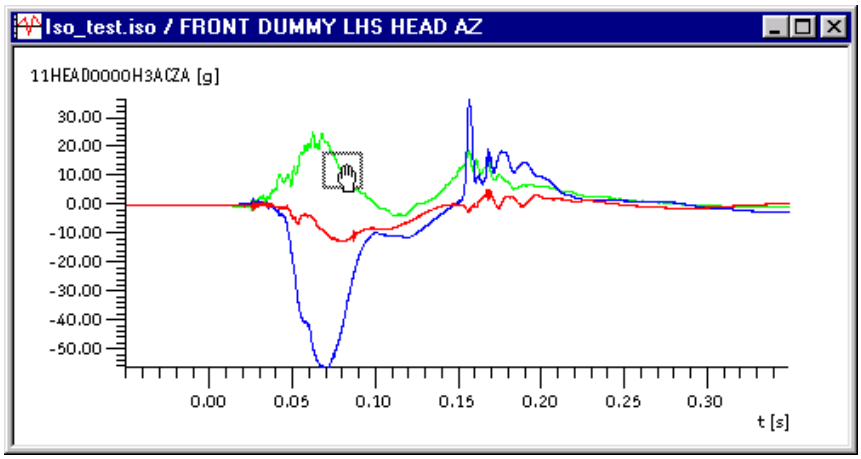
Move the cursor up to the edge of the window: The cursor changes into a “cursor with 2 arrows”. If you press the mouse button and hold it down, you can change the area of the document window to the desired size by dragging the edge.



Access to Graphs via Mouse

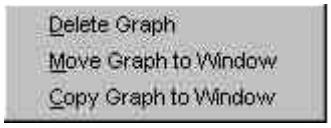
If a document window contains more than one graph, you can use the mouse to access the **active graph** (= graph in the “foreground”):

Press down the right mouse button. A “hand cursor” appears. Now while you are holding the button down, you can drag the (active) graph **out** of the diagram window.



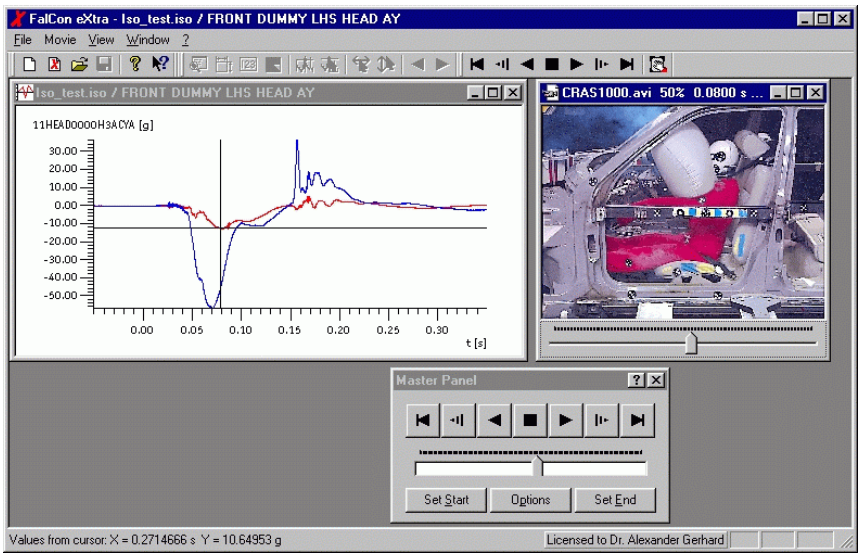
If you release the mouse button **outside of the diagram window**: A pop-up menu appears in which you can choose to delete the graph (in other words to remove it from the diagram), or to copy it and enter it in a new diagram window:

On the other hand, if you release the mouse button **in another diagram window**: A pop-up menu appears in which in addition to deleting the graph, you can move it into the new window, which means it will be deleted in the source window, or copy it there (in which case it will remain intact in the source window).



Synchronizing Graphs and AVIs with Master Panel

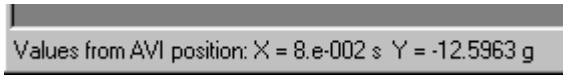
As soon as the **master panel** of the **AVI viewer** is activated, a **movie marker** appears in the graph diagram: Cross-hairs mark the spot on the graph where the time value corresponds to the picture position of the AVI:



If playback of picture sequence(s) is running, movie marking automatically follows along synchronously! At the same time, all displayed AVI and measurement data windows are synchronized through the master panel.

The time and the corresponding measurement value appear in the status bar.

Status bar



Time values (unit of measures!)

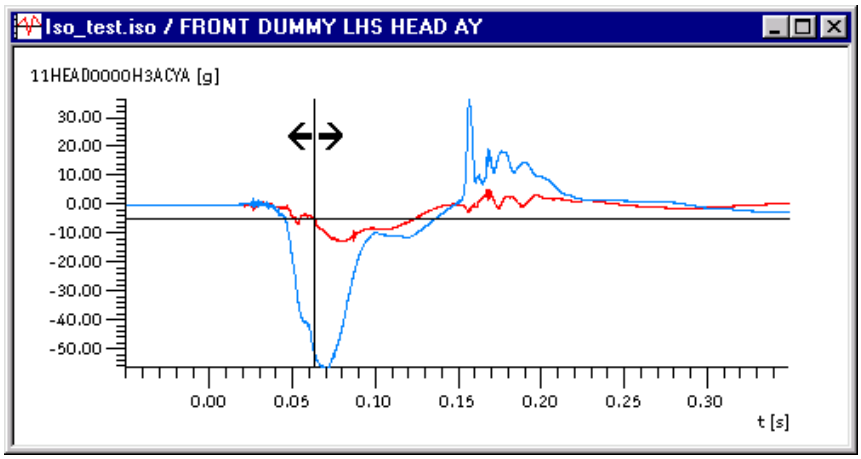
Requirement: The time values of the graph must be available in the **SI unit s** (seconds). For the measurement values to be correctly assigned to pictures, the corresponding time intervals of graph and sequence must agree, or must at least overlap.

Synchronizing Graphs and AVIs with the Mouse

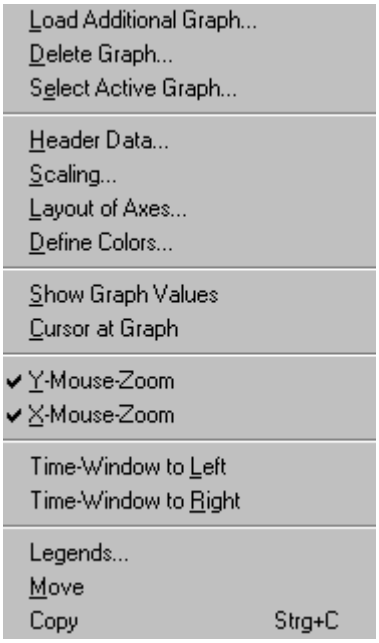
Cursor to move movie marker:

It is also possible to move the movie marker using the mouse. When you do this, the program positions automatically to the corresponding picture in the AVI file or files.

Move the cursor up to the vertical bar in the movie marker. A prominent “cursor with two arrows” then appears. If you press and hold down the mouse button, you can control synchronous playback of the AVI at the same time by moving the horizontal cross hair.



The Graph Menu



The **Graph** menu contains the following menu entries/commands:

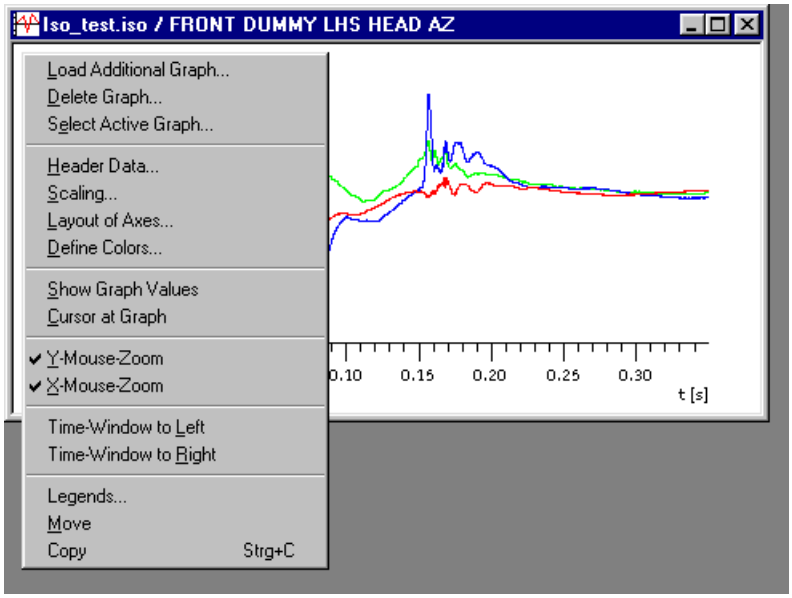
Load additional graph	Makes it possible to display for additional graphs in the diagram.
Delete graph	Deletes a graph from the display list.
Select Active Graph	Specifies the active graph.
Header Data	General information about the graph.
Scaling	Determines the section of the graph to be displayed.
Layout of Axes	Determines the display form of the axes.
Define Colors	Specifies the colors for the graph and the movie marker.
Show Graph Values	Displays the measurement values at the cursor position.
Cursor at Graph	Allows the cursor to run along the measurement

value graph.

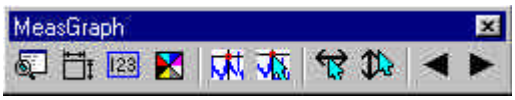
Y-Mouse-Zoom	Makes it possible to enlarge a section within the range of values through mouse entry.
X-Mouse-Zoom	Makes it possible to enlarge a section within the range of times through mouse entry.
Time Window to Left	Moves the X-axis around the display range to the left.
Time Window to Right	Moves the X-axis around the display range to the right.
Legends	Entry dialog box for descriptive captions.
Copy	Copies the content of the window to the clipboard.

Tip

You can reach the **Graph** menu by clicking with the right mouse button within the graph document



An additional tool bar is available to you for frequently required menu entries:




Header Data


Scaling


Layout of Axes


Define Colors


Show Graph Values


Cursor at Graph


X-Mouse Zoom

 X-Mouse Zoom

 Time Window to Left

 Time Window to Right

Load Additional Graph

You can use this menu entry to add additional channels to your diagram, thus making it possible to display multiple measurement data graphs in a window. The dialog box **Load Additional Graph** appears (equivalent to opening a new document), except that no new window is opened here. Instead the graph appears in an existing window. The same scaling is used to display all graphs.

The number of graphs you can display in a diagram is limited only by the resource of your computer.

Delete Graph

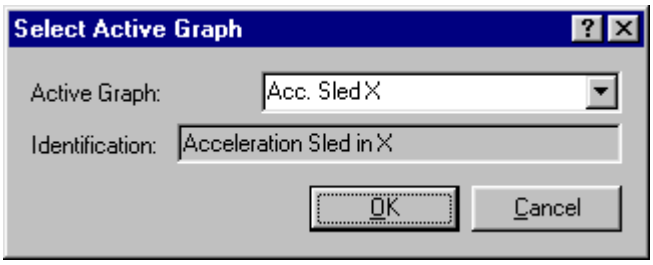
Use this menu entry to delete graphs from the diagram again. The deletion here refers only to the display within the diagram. The files remain intact on the hard disk.

Select the channel to be deleted (additional information is available in the **Information** output field) and then **Delete** by clicking on the appropriate button.

As soon as only one graph is displayed, this dialog box closes automatically.

Select Active Graph

As soon as multiple graphs are displayed within a diagram, you can use this dialog box to determine on which of the graphs the following commands or functions will take effect.

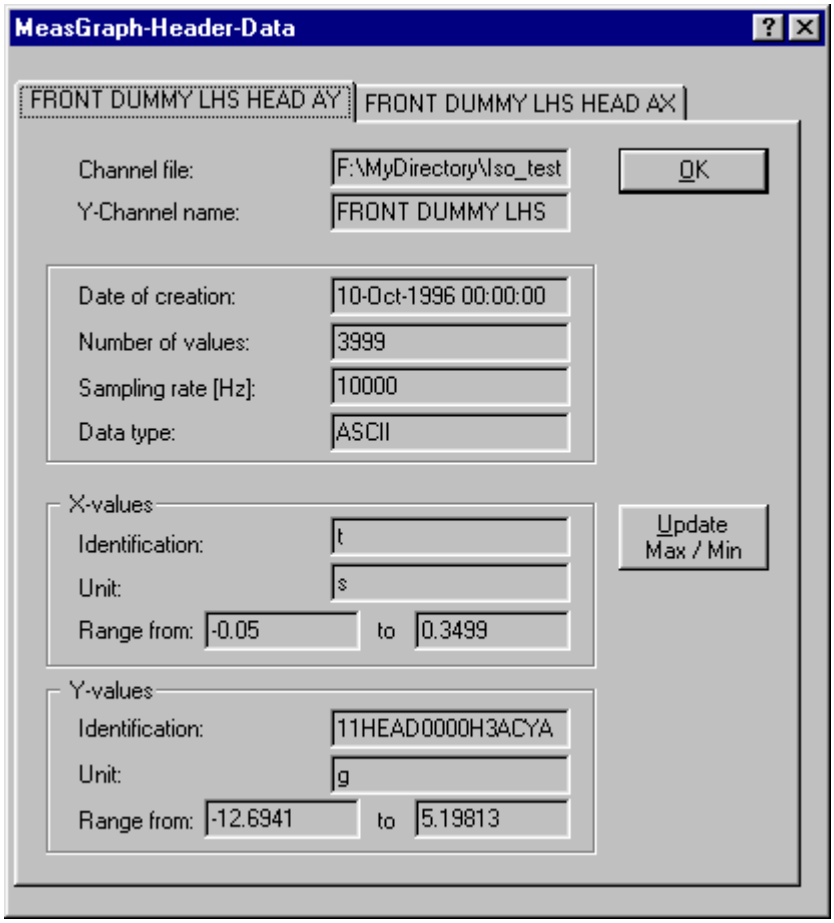


The **Identification** output field provides you with additional information on the respective channels. The active graph is so to speak in the “foreground”. The graph’s file and channel name are displayed in the title line of the diagram window.

The graph also determines the source for the measurement values selected by mouse and for the values that will be generated during synchronization with AVI files.

Header Data

Icon: 



This dialog box contains information about the graphs contained in the diagram.

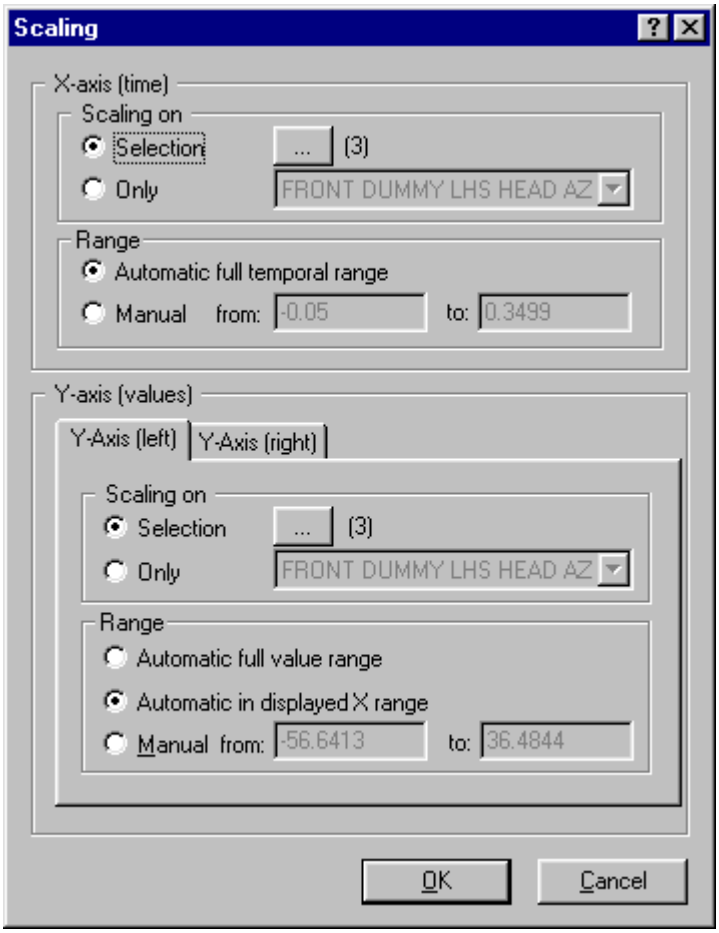
Channel file:	The file name of the measurement values.
Y-Channel name	Output of the channel name (ordinate values).

Date of creation	The date when the graph was created.
Number of values (total)	Indicates how many measurement points are stored in the file.
Sampling rate (Hz)	The sampling rate of the graph, given in the unit of measure Hz = values/s
Data type	The storage type of data in the file.
X and Y:	*For both axes:*
Identification	The "label" of the axis.
Unit	The unit of measure.
Range from	The lower limit of the range of values.
Range to	The upper limit of the range of values.

The command **Update Max/Min** causes the program to recalculate the range limits (maximum and minimum). The result is not saved.

Scaling

Icon: 



In this dialog box you can specify which section of the measurement data file should be displayed. You can also change the scaling of the diagram axes.

The following choices are available as settings for the **X-axis** scale.

Scaling on	A **Selection** of the measurement channels displayed or scaling **Only** on one individual measurement channel.

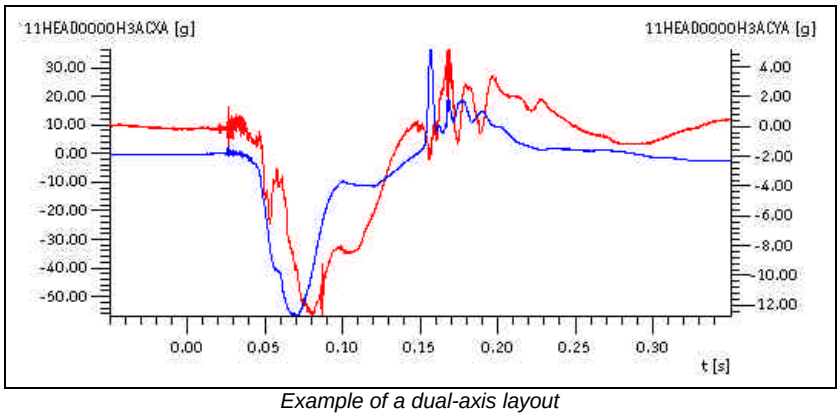
Automatic	Displays the entire (i.e. **full time range**) or the selected graph(s).
Manual	Displays an interval between the limits **from** and **to**.

The following choices are available as settings for the **Y-axis** scale (for both axes).

Scaling on	A **Selection** of the measurement channels displayed or scaling **Only** on one individual measurement channel.
Automatic full value range	Automatic scaling to the full range of values of the selected graph(s).
Automatic in displayed X-range	Performs auto-scaling using the displayed X-range (= time interval).
Manual	Displays an interval between the limits **from** and **to**.

You can also change the segment that is displayed by clicking and dragging with the mouse if the X/Y-mouse zoom has been activated by using the tool bar.

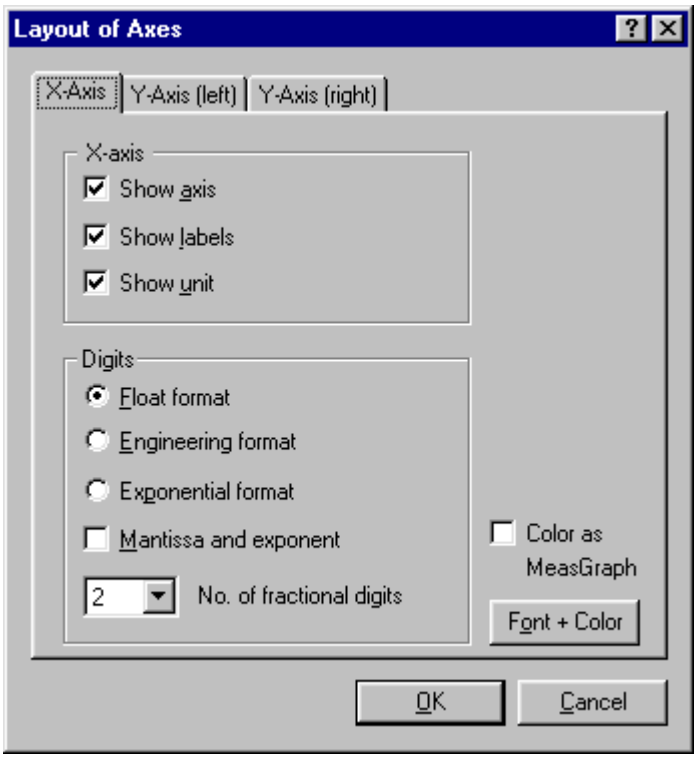
You can configure a dual-axis layout by selecting different graphs in the **Y-axis (left)** and **(right)** as the basis of scaling:



Example of a dual-axis layout

Layout of Axes

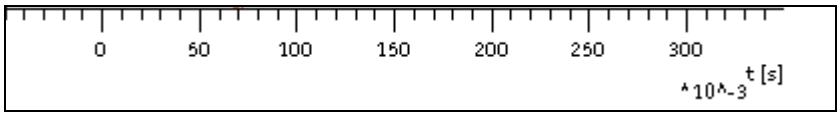
Icon: 



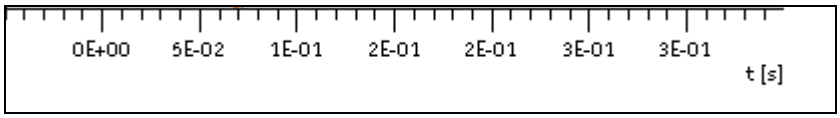
In this dialog box you can specify how the axes are displayed and labeled: The X- and Y-axes have their own separate tabs available for these settings:

Show axis	Determines whether the axis will appear on the graph.
Show labels	Determines whether the numeric entries should appear on the axis.
Show unit	Determines whether the unit of the axis should be displayed.
Float format	Floating decimal point display of numbers on the axis.
Engineering format	Numeric display in engineering format (exponent always in steps of 3).
Exponential format	Numeric display in exponential format.
Mantissa and exponent	Numeric entry on the axis with exponent and mantissa together.
No. of fractional digits	Determines the number of digits after the decimal point.
Color as MeasGraph	Uses the color of the graph as the axis color.
Font + Color	Selection of the font and the color for labeling of the axis.

Mantissa and exponent separate

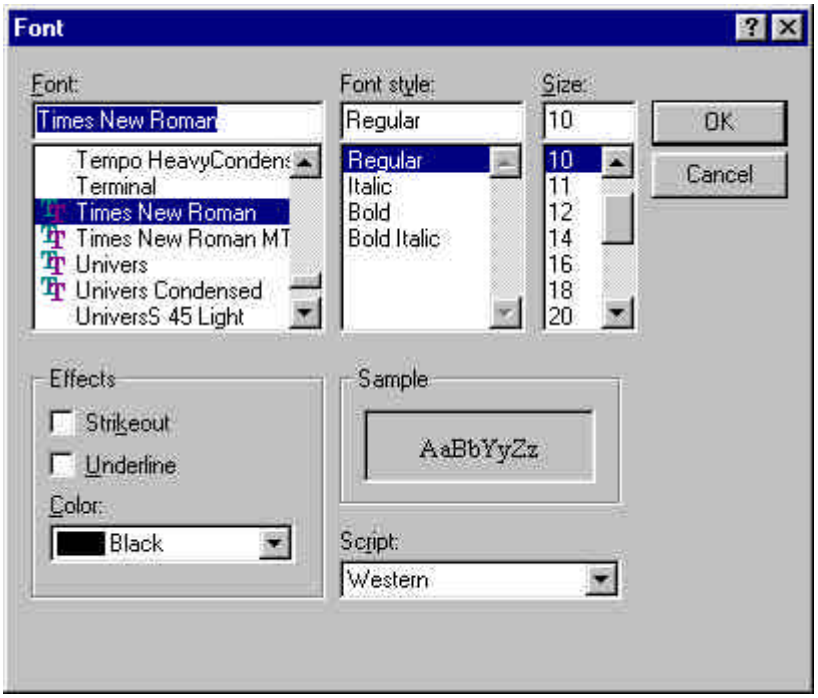


Mantissa and exponent together



Examples of X-axis labeling

Font and Color for Labeling of Axis



All fonts that are installed in Windows are available to you to display numbers. The “Sample” output field provides you with a preview of your selection.

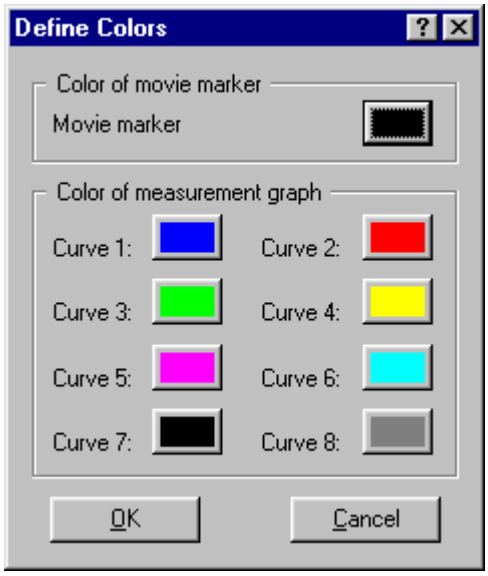
Tip

A smaller font size, for example *“8”*, is recommended for clarity and readability even in small diagrams.

You can specify the color of the axis and captions here at the same time. It is also possible to select the **axis color** and the **graph** by using the check box in the axis layout dialog box.

Icon: 

Define Colors



Here you can specify the color of the movie marker and the colors for displaying the graph. To distinguish between multiple graphs in the same diagram, you should select colors that contrast as much as possible amongst themselves to represent graphs that will appear together.

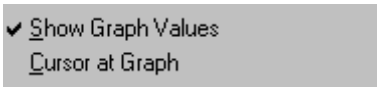
You can adjust the specific color values by clicking on the “Color of Graph” button.

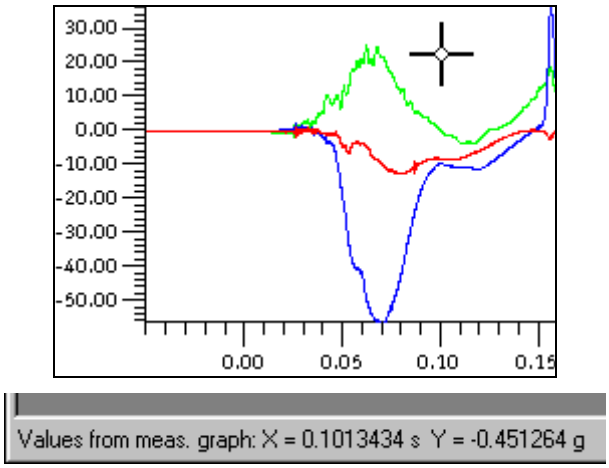
Show Graph Values

Icon: 

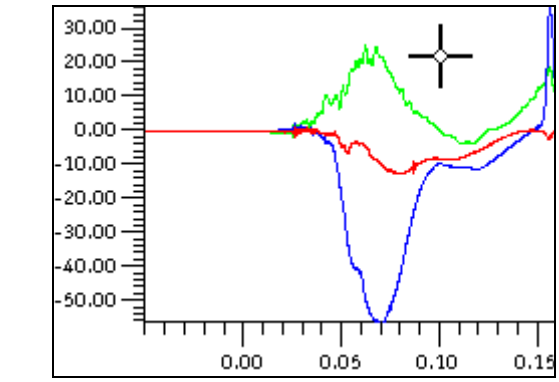
If a check mark is displayed next to the setting **Show Graph Values**, the X- and Y-values of the measurement channel will appear in the **status bar**. In this case you will only be able to determine the value on the X-axis (generally the time) with the cursor position.

The following examples show the cursors and the output for the cases of measured value display marked “with” and “without”. (The *green* graph is the active graph):





Show Graph Values
Cursor at Graph

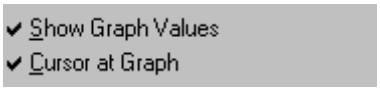


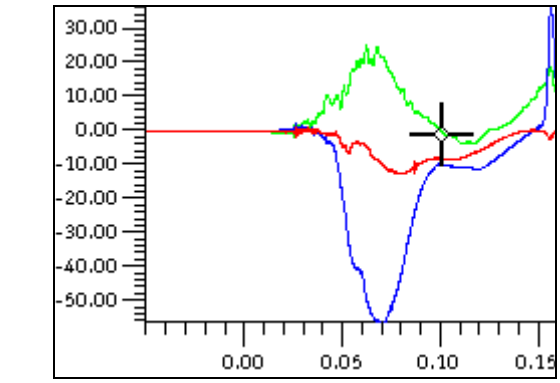
Values from cursor: X = 0.1013434 s Y = 22.15258 g

Cursor at Graph

Icon: 

If a check mark appears in the menu next to the setting **Cursor at Graph**, the X- and Y-values of the measurement channel will appear in the **status bar** and the cursor will follow precisely along the course of the active graph as the mouse is moved.





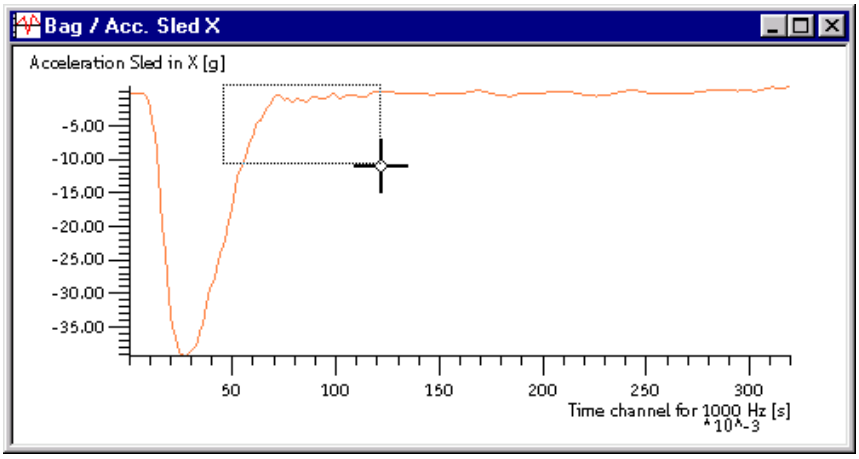
Zoom with Mouse

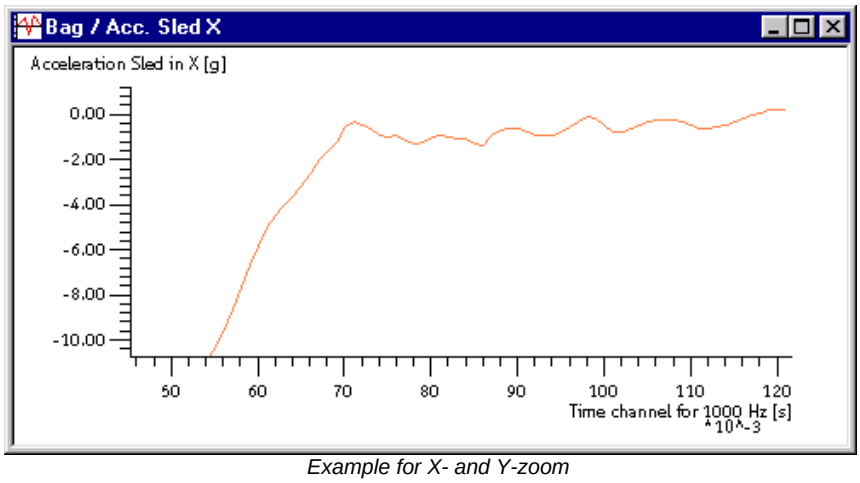
Icons: 

If you want to enter the range using numbers, select ***Scaling***

You can select the option Zoom with Mouse in the X- and/or Y-range either in the tool bar or in the menu. As soon as one of these options is active (the button on the tool bar remains depressed or there is a check mark next to the menu entry) you can use the mouse to select a range along which an adjusted scaling will automatically take place.

Click on the left limit of the desired segment, hold the mouse button down and drag to form a rectangular area.





Example for X- and Y-zoom

Moving the Time Window

Icons: 

To move the X-axis (usually the time axis), click on the corresponding buttons in the tool bar. The window will also be move so that it displays the area around the selected area.

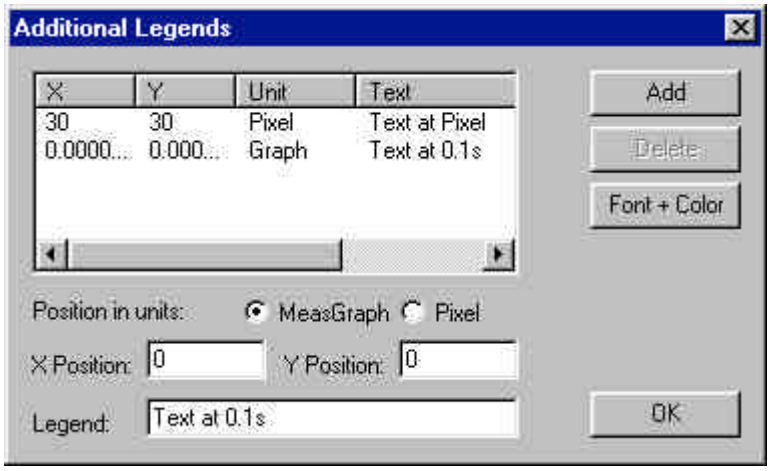
In the example above, a zoom in the X-interval from about 50 to 120 ms is shown (a segment of 70 ms). The **Time Window to Right** command displays the graph from 120 to 170 ms while **Time Window to Left** shows the interval from -20 to 50 ms.

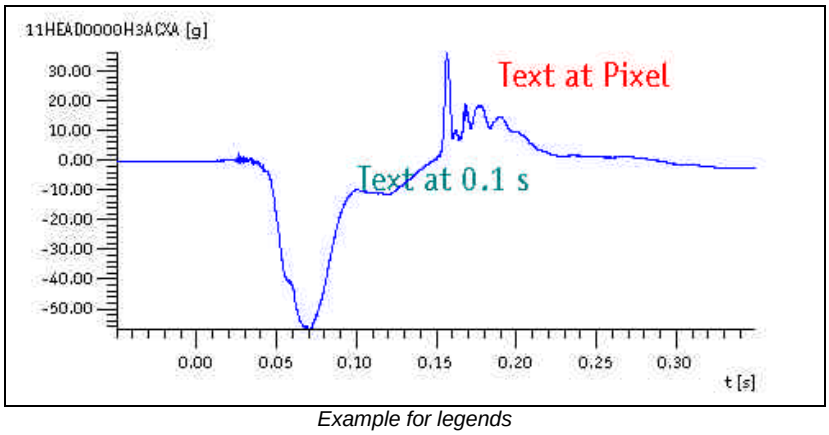
Please note: This function is only practical if the entire time range is not already being displayed! As long as the entire time range is being displayed, running this function will result in an empty window!

Legends

You can enter descriptive captions or “legends”. In this manner you can use brief references to expand on the graphic output for a log or for a customer view layout.

Use the following dialog box to enter these captions or legends. You can select positioning based on **Units** in the graph or **Pixels** (points on the screen):





Example for legends

Copy

Keyboard shortcut:

Ctrl + C

The **Copy** menu item copies the currently displayed diagram to the clipboard. This makes it possible for other Windows applications to read the material and to insert it into a WinWord document, for example.