HYDRO*com6*

*Software for the processing of measuring data
from Hydrotechnik measuring instruments and systems*

Software Manual

Revision 1.3EN
Software version 6.2
TKZ L8874-19-01.01EN

Contents

1 Introduction

1.1 Range of validity

PROFESSIONAL | FULL | BASE

The manual on hand is valid for software packages named "HYDROcom 6" and are manufactured by Hydrotechnik GmbH, Limburg, Germany. The manual is valid for software with the revision number 6.1, only. Please contact the Hydrotechnik homepage or your local Hydrotechnik partner or representative, if you do not have the manual suited for your software version.

This software is sold in three versions differing in their range of contained functions:

basic version with the most important functions to download and present measured data of the Hydrotechnik measuring devices of the MultiHandy families

full version with a complete range of functions

professional version with a lot of additional functions and expandations

At the top of each help page you can see, for which version the corresponding function is available (completely or with restrictions).

1.2 Scope of this manual

PROFESSIONAL | FULL | BASE

This manual shall support the user in his daily work with HYDROcom6. It contains information on the windows, dialogs, commands and buttons of the software and explains certain procedures and operation. Please contact our service staff or your local Hydrotechnik partner for support like individual trainings or troubleshooting hints. Trainings can be held in customer's location, or the Hydrotechnik training center.

1.3 Copyright

PROFESSIONAL | FULL | BASE

The software package and this manual are protected on copyright. Manufacture without license will be prosecuted by law. All rights reserved on this manual, even the reproduction and/or duplication in any thinkable form, e.g. by photocopying, printing, on any data recording media or translated. Reproduction of this manual is only permitted with a written approval of Hydrotechnik GmbH.

The technical state by the time of delivery of software and manual is decisive, if no other information is given. Technical changes without special announcements are reserved. Earlier manuals are no longer valid. The general conditions of sale and delivery of Hydrotechnik GmbH are valid.

1.4 Limitation of liability

PROFESSIONAL | FULL | BASE

We guarantee the faultless functioning of our product in accordance with our advertising, the product information edited by Hydrotechnik GmbH and this manual. Further product features are not guaranteed. We take no liability for the economy and faultless function if the product is used for a different purpose than that described in the chapter „Use as agreed".

Compensation claims are generally impossible, except if intention or culpable negligence by Hydrotechnik GmbH is proved, or if assured product features are not provided. If the product is used in environments, for which it is not suited or which do not represent the technical standard, we are not responsible for the consequences.

We are not responsible for damages at installations and systems in the surroundings of the product, which are caused by a fault of the product or an error in this manual. We are not responsible for the violation of patents and/or other rights of third persons outside the Federal Republic of Germany. We are not liable for damages, which result from improper operation according to this manual. We are not liable for missed profit and for consecuting damages due to non regardance of safety advice and warning hints.

The products of Hydrotechnik GmbH represent the standard of technique and science. Hydrotechnik GmbH is doing product and market research for the further development and permanent improvement of their products. In case of faults and/or technical trouble please contact the Hydrotechnik GmbH service staff. We assure that

suitable measures will be taken immediately. Hydrotechnik GmbH guarantee regulations are valid, which we will send to you on demand.

1.5   Use as agreed

PROFESSIONAL   FULL   BASE

The software package "HYDROcom 6" is used to download measurement data from Hydrotechnik measuring instrument, or the direct data collection in online mode. Downloaded and collected data can be evaluated and presented in various ways, e.g. as tables, curves or histograms.

The software version on hand is compatible with the Hydrotechnik measuring instruments:

- series MultiHandy 2020
- series MultiHandy 3020
- series MultiHandy 3050
- series MultiBox 306x **(from firmware version 2.3)**
- series MultiSystem 5000 **(from firmware version 2.9)**
- series MultiSystem 5050
- series MultiSystem 5060 **(from firmware version 4.8m)**
- series MultiSystem 8050 **(from firmware version 2.9c)**
- series Compare

Please do not hesitate to contact our service staff in any case of question, or if you want to use the software for a different purpose.

2 Installation and program launch

2.1 System requirements

PROFESSIONAL   FULL   BASE

Installation and execution of the software "HYDROcom 6" is possible on most of the current computer systems:

- Operating systems WindowsXP SP2, 32/64 Bit, WindowsVista 32 Bit
- Processor 1.0 GHz, 2.0 GHz recommended
- RAM 1 GB, 4 GB recommended
- .NET Framework from version 3.5 (contained on installation CD, will be installed automatically, if required)

2.2 Software installation

PROFESSIONAL   FULL   BASE

1. Put the CD containing HYDROcom6 into the CD player of your computer.
2. Double-click the file „Setup.exe" to start the installation.
3. Wait until the installation is terminated.
4. Now you should find a link „HYDROcom6" on the desktop of your PC.

2.3 Start the software

PROFESSIONAL   FULL   BASE

Double-click the HYDROcom6 icon on your desktop. You may also start the software (under Windows XP) with the command "Start – Programs – Hydrotechnik – HYDROcom6 – Start HYDROcom6".

3 Description of the application window

3.1 After program start

PROFESSIONAL   FULL   BASE

Note

Here the elements of the application window are described. The functions of the software will be explained in the subsequent chapters.

This window will be opened after HYDROcom has been started:
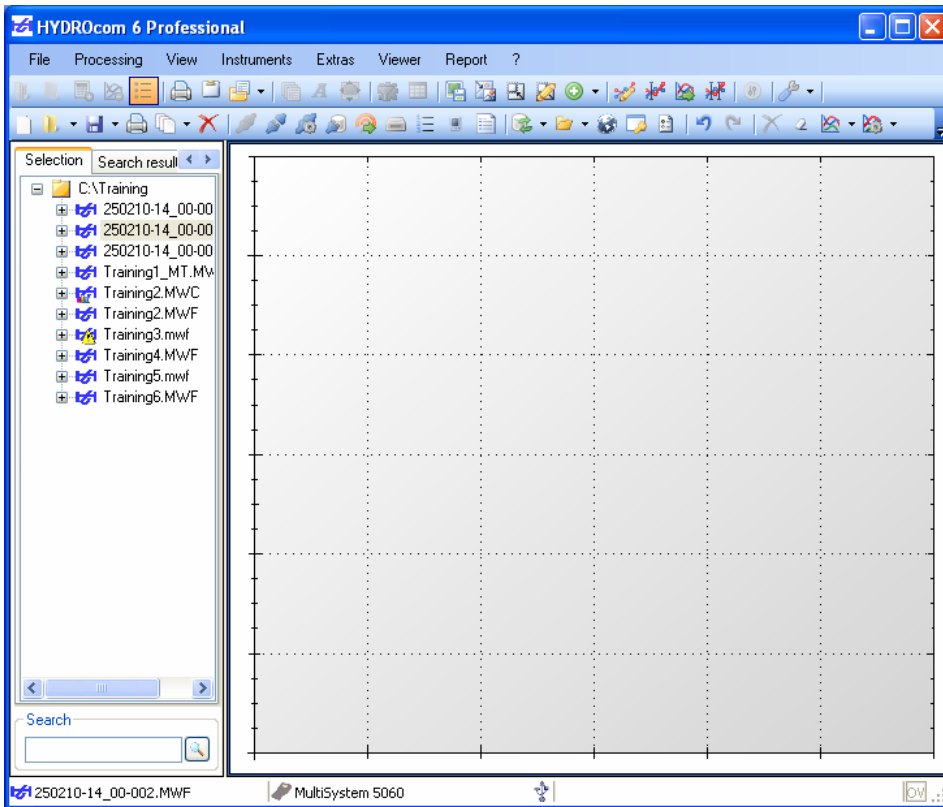
Seven areas can be distinguished in the program window:

At the top the title bar with application name and standard buttons of the operating system.

The available operation menus are shown in the menu bar. Click on a menu to expand it. If menus or functions are displayed in grey color, then they are temporarily inactive and the function is not available.

Many functions of the operation menus can be triggered with buttons. These are contained in the main and the work icon bar. Icons displayed in light grey are inactive and their function is not available.
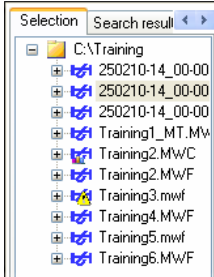
The HYDROcom explorer is the central element of the operation friendliness of HYDROcom 6. It gives access to the saved measurement data, and on measurands (channels) within the measurement series. It manages search results and shows all available information and statistics for the measurement data.

The viewer is used to display the measurement data and other elements of a presentation. The look of the viewer can be configured freely. If a measurement series is displayed in the viewer that has been modified in any way (e.g. smoothed, moved, a.s.o.), a star icon will be displayed in the left lower corner of the viewer.

You may use the search box to search for arbitrary elements in the current folder, even within channels of measurement series. The search results are displayed in the HYDROcom explorer under the register 'Search results'.

Several status information is shown in the status bar. During HYDROcom 6 is connected with a measuring instrument, its name will be shown here.

3.2   Menu bar

The operation menus are contained in the menu bar. There you get access to most of the HYDROcom functions.

3.2.1 Menu File

`PROFESSIONAL`   `FULL`   `BASE`

New	creates a new presentation; this will close the current presentation
Open	opens a file (only active if a layout section is highlighted where a measurement series can be placed)
Measurement	places a measurement series into the highlighted layout section
Presentation	opens a saved presentation (not for `BASE`)
Configuration files	opens a file with formatting information for presentation elements
Save	saves either a presentation of a measuement file (not for `BASE`)
Measurement	saves the measurement data from the highlighted layout section as a mwf file
Presentation	saves the current presentation as a file
Print	prints the current presentation
Recent measurements	shows a list of the measurement series opened recently; click on a file to display it in the HYDROcom explorer (if the file is still available)
Shutdown	closes the current presentation and HYDROcom

3.2.2 Menu Processing

`PROFESSIONAL`   `FULL`   `BASE`

The contents of this menu varys dependant on the type of the highlighted layout section:

- Line diagram
- Histogram
- Classification
- Table
- Text
- Picture

3.2.2.1 ... for Line diagrams

`PROFESSIONAL`   `FULL`   `BASE`

If a layout section "Line diagram" is active, the following commands are included:

Format	here you can manage the line diagram configuration files
New	creates a new configuration file
Edit	opens an existing configuration file for modification
Select	assigns a configuration file to the layout section
Delete	deletes a configuration file
Save as graphic	saves the line diagram as picture file
Save as …	saves the measured values of the line diagram as mwf or xmwf file
Print	prints the line diagram on a printer connected to your computer

Copy	copies the line diagram into the clipboard, from where it can be pasted (as pixel image) into other applications
Original	zooms out until original dimensions are displayed
Automatic scaling	determines scaling values for all measurands of the line diagram automatically
Manual scaling	opens a dialog where you can enter scaling values for each measurand of the line diagram
Add element	allows you to add texts, images of arrows to the line diagram
Delete element	deletes the selected element
Smooth	allows you to smooth measurands by filtering or calculating average values
Spot	display a vertical line and a window, where the values of the measurands are displayed where the vertical line crosses their curve
Move	moves measurands on the x-axis
Difference	displays two vertical lines and displays the differences of all measurands between these lines
Clear content	deletes the line diagram
Help	shows the HYDROcom help

3.2.2.2   ... for Histograms

PROFESSIONAL   FULL

If a layout section "Histogram" is active, the following commands are contained:

Format	here you can manage the histogram configuration files
Edit	opens a configuration file for modification
Select	allows you to open a configuration file and apply it to the layout section
Save as graphic	saves the histogram as picture file
Print	prints the histogram on a printer connected to your computer
Copy	copies the histogram into the clipboard, from where it can be pasted (as pixel image) into other applications
Original	displays the original size of the histogram
Automatic scaling	applies automatic scaling values to the measured values used in the highlighted histogram
Add element	allows you to add texts, images of arrows to the histogram
Delete element	deletes the selected element from the histogram
Clear content	deletes the histogram
Help	display the HYDROcom help

3.2.2.3   ... for Classifications

`PROFESSIONAL`

If a layout section "Classification" is active, the following commands are included:

Format

   Edit   opens the Dialog for configuration

   Select   allows you to open a configuration file and assign it to the selected layout section

Save as graphic   saves the classification as a picture that can be used in many other applications; but the saved image cannot be modified anymore

Save as mwc   saves the classification in a file with a very small size; you can use this file later to build a classification, but cannot create a line diagram, table or histogram

Print   prints the classification

Copy   copies the classification into the clipboard, from where it can be pasted (as pixel image) into other applications

Show trackbar   display two sliders beneath and right of the classification that can be used to hide axes in the foreground to make hidden columns visible

Clear content   deletes the classification

Help   displays the HYDROcom help

3.2.2.4   ... for Tables

`PROFESSIONAL`   `FULL`

If a layout section "Table" is active, the following commands are included:

Format   here you can manage the table configuration files

   New   defines a new configuration file

   Edit   opens an existing configuration file for modification

   Select   assigns a configuration file to the active layout section

   Delete   deletes a configuration file

Save as …   saves the measured values of the table as mwf or xmwf file

Print   prints the table on a printer connected to your computer

Copy   copies the table into the clipboard, from where it can be pasted into other applications (e.g. word processors, calculation programs, ...)

Filter options   allows quick access to the filter settings of the table

Statistics   adds the statistical information of the current series of measurements to the table

Spot   adds the spot values of an open line diagram into the table

Compact table   creates a compact table from the current series of measurements

Clear content   deletes the table

Help   displays the HYDROcom help

3.2.2.5   ... for Texts

PROFESSIONAL   FULL

If a layout section "Text" is active, the following commands are contained   :

Format	here you can manage the text configuration files
New	creates a new configuration file
Select	selects a configuration file to be assigned to the layout section
Delete	deletes a configuration file
Print	prints the active layout section on a printer connected to your computer
Copy	copies the contents of the text layout section into the clipboard, from where it can be pasted as text into other applications
Font	opens a dialog for the modification of font and style of the text
Align left	do left alignment of the text
Align center	do center alignment of the text
Align right	do right alignment of the text
Paste	pastes either the statistical data or detail information on the current series of measurements into the text section
Clear content	deletes the text
Help	displays the HYDROcom help

3.2.2.6   ... for Pictures

PROFESSIONAL   FULL

If a layout section "Picture" is active, the following commands are contained:

Format – Select	opens a dialog where you may open the desired picture
Print	prints the active layout section on a printer connected to your computer
Copy	copies the contents of the active layout section into the clipboard, from where you may paste it into other applications
Stretch	stretches the picture that it fills the complete layout section
Clear content	deletes the picture
Help	opens the HYDROcom help

3.2.3   Menu View

PROFESSIONAL   FULL   BASE

Main icon bar	toggles the visibility of the main icon bar
Work icon bar	toggles the visibility of the work icon bar
Status bar	toggles the visibility of the status bar
Explorer	toggles the visibility of the HYDROcom explorer

3.2.4 Menu Instruments

PROFESSIONAL | FULL | BASE

Connect	initiates the connection to a measuring instrument connected to the PC
Disconnect	ends the connection between HYDROcom and the measuring instrument
Options	opens a dialog with connection parameters
Read memory	reads the memory of the connected instrument and shows the measurement series for download
Online mode	initiates the online mode with the connected instrument for live measuring
Linearisation	function for Hydrotechnik Compare measuring instruments
Instrument parameters	displays some important parameters of the connected instrument
Instrument list	shows all instruments currently connected with HYDROcom
Help	shows the HYDROcom help

3.2.5 Menu Extras

PROFESSIONAL | FULL | BASE

Data exchange	here you may export measurement data into other formats, or import other formats; additionally you may modify parameters of the import/export filters
Combine	combines two mwf files and saves them as one file
Folders	select the folders where configuration files and presentations shall be saved
Language	select the desired operation language
License	information on the current HYDROcom license and functions to receive a license
Options	fundamental options of HYDROcom
Use log file	important information is collected in the log file that may be important for troubleshooting
Overwrite	switches overwriting on/off; if enabled, an existing element will be overwritten, if a measurement series or channel is dragged into the layout section; if disabled, the measurement series or channel will be added to the existing element; you may switch this function on/off by pressing the key [Ins] on your keyboard
Help	shows the HYDROcom help

3.2.6 Menu Viewer

PROFESSIONAL | FULL | BASE

Undo	undoes the last commands "Add" or "Delete"
Redo	undoes the last "Undo"-steps
Delete	deletes the highlighted layout section
Clear content	deletes the content of the highlighted layout section
Line diagram	places a line diagram at the desired position into the presentation
... with configuration file	places a line diagram at the desired position and uses a configuration file to format it

Table	places a table at the desired position into the presentation
... with configuration file	places a table at the desired position and uses a configuration file to format it
Text	places a text at the desired position into the presentation
Picture	places a picture at the desired position into the presentation
Histogram	places a histogram at the desired position into the presentation
Classification	places a classification at the desired position into the presentation
Layout	opens a dialog where you may select a pre-defined layout for your presentation
Help	shows the HYDROcom help

3.2.7 Menu Report

`PROFESSIONAL`

Opens the applications „Report".

3.2.8 Menu ?

`PROFESSIONAL` `FULL` `BASE`

Show help	displays the HYDROcom help system
Hydrotechnik online	opens the Hydrotechnik homepage
Info	shows information on the HYDROcom software version

3.3 Icon bars

`PROFESSIONAL` `FULL` `BASE`

HYDROcom offers two icon bars that can be switched on and off in the "View" menu:

- Main icon bar
- Secondary icon bar

3.3.1 Main icon bar

`PROFESSIONAL` `FULL` `BASE`

The icon bar allows a fest access to many menu functions. It can be configured individually, you can include and exclude icons by clicking on 🔧 and checking the commands/functions that you want to be shown. Icons displayed in grey colors are inactive, they cannot be used at the moment. Due to the current situation or operation, or to your licence grade, icons may be active or inactive.

All icons and their meanings are shown in section 11.1.1 on page 123.

3.3.2 Secondary icon bar

This icon bar gives fast access to many menu functions. It can be configured individually, you can add and hide icons by clicking on and checking the commands/functions that shall be displayed with icons. Icons displayed in grey colors are inactive, they cannot be used at the moment. Icons can be inactive or active due to the current situation or operation, or depending on your licence level.

All icons and their meanings can be seen in section 11.1.2 on page 124.

3.4 HYDROcom explorer

The HYDROcom explorer is the central tool for the management of files, search results and other information. Its display can be toggled in the menu „View".

3.4.1 Explorer views

There are four registers at the upper edge of the explorer used to display the explorer views:

Register Selection
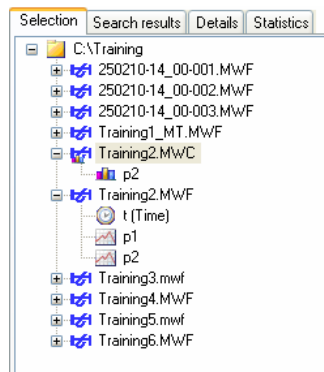
Here the measured value (mwf), classification (mwc) and presentation files (hyw) are shown that can be used in the presentation. Here the view is reduced to the folder „C:\Training", but you can also display the complete directory structure of the computer. Click on a series of measurements to highlight it and show a tool tip box with several information on this series.

The files and symbols shown in the list have the following meanings:

250210-14_00-001.MWF	normal measured values file; click on the "+" to display the channels of the file
250210-14_00-003.MWF	highlighted measured values file; a tool tip box will show information for this file
Training3.mwf	file that is damaged or cannot be read out of other reasons
Training2.MWC	mwc file that had been created with a classification
p2	channel of a mwc file
t (Zeit)	time channel of a measured values file
p1	measuring channel of a measured values file

Register Search results

File	Found	Value
250210-14_0...	Channels	p1 p2
250210-14_0...	Variable	p1
250210-14_0...	Channels	p1 p2
250210-14_0...	Variable	p1
250210-14_0...	Channels	p1 p2
250210-14_0...	Variable	p1
Training1_M...	Channels	p1 p2
Training1_M...	Variable	p1
Training2.M...	Channels	p1 p2
Training2.M...	Variable	p1
Training3.mwf	Channels	p1 p2 ...
Training3.mwf	Variable	p1
Training4.M...	Channels	p1 p2 ...
Training4.M...	Variable	p1
Training5.mwf	Channels	p1 p2 ...
Training5.mwf	Variable	p1

The results of a search executed in a folder or a file are displayed here. We searched for "p1", the item has been found in several channels and measurands.

Register Details

Register Statistics

Here you can see details to the highlighted series of measurements. The upper section contains general information to the series, beneath you can see specific information for all measurands. Use the scroll bars to show hidden information.

Several statistical information is displayed for all measurands of the highlighted series of measurements. If a line diagram is contained in the presentation, where you have added spot or difference measurement lines, their current values will also be shown here.

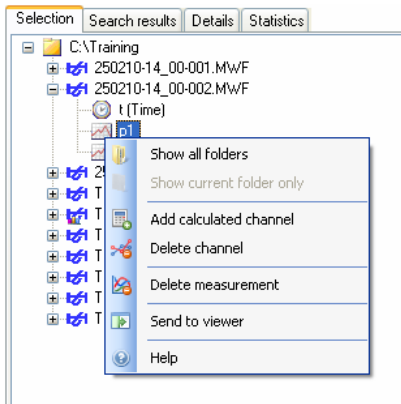## 3.4.2   Explorer functions

PROFESSIONAL   FULL   BASE

Drag and drop

You may click complete series of measurements, or single measurands from one or several series and pull them with pressed mouse button into a layout section of the active presentation. Dependant on the format of the layout section, the data will be shown as line diagram, histogram, classifiction, table, or text.

If you want to display a function f(x), you can drag and drop a measurand on the x-axis of a line diagram. To display the function f(t), again, you will have to drag and drop the variable "Time" on the x-axis.

Context menu of the register 'Selection'

Do a right-click on a series of measurements or a measurand, to display this context menu:

| Selection | Search results | Details | Statistics |

- C:\Training
  - 250210-14_00-001.MWF
  - 250210-14_00-002.MWF
    - t (Time)
    - p1

	Show all folders
	Show current folder only
	Add calculated channel
	Delete channel
	Delete measurement
	Send to viewer
	Help

Show all folders	displays the complete directory structure of the computer
Show current folder only	reduces the structure to the highlighted folder with all sub-folders
Add calculated channel	adds a virtual channel that results from a calculation with the existing channels
Delete channel	deletes the highlighted channel (= measurand) from the internal structure of HYDROcom; the measuring data remain in the series of measurements, but it cannot be used for presentations and calculations anymore
Delete measurement	moves the complete series of measurements into the tray
Send to viewer	inserts the highlighted series of measurements or the highlighted channel into the active layout section (only with line diagram, histogram, classification and table)
Help	shows the HYDROcom help

## Context menu of the register 'Search results' PROFESSIONAL

Do a right-click on a line of the search results to view the context menu:
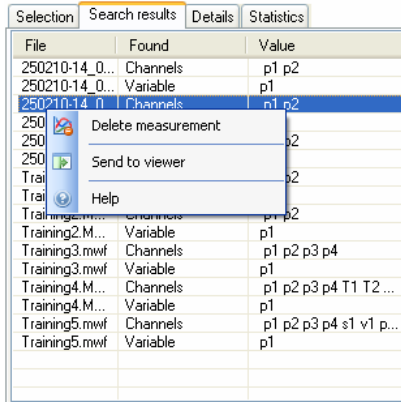
Delete measurement	moves the highlighted series of measurement into the tray
Send to viewer	inserts the highlighted series of measurements or the highlighted channel into the active layout section (only with line diagram, histogram, classification and table)
Help	shows the HYDROcom help

Context menu of the registers 'Details' and 'Statistics'

Do a right-click on a line of the details or statistics to view the context menu:
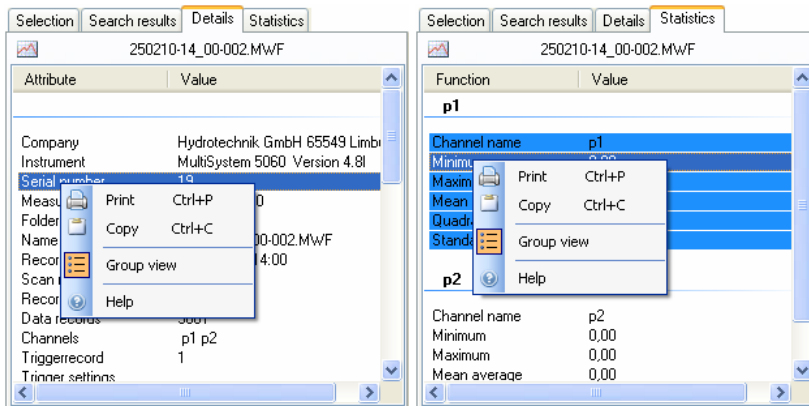
Print	prints the highlighted area of the page 'Details' or 'Statistics'; press Ctrl-A to highlight the complete register page
Copy	copies the contents of the register into the clipboard, from where it can be pasted into other applications
Group view	switches the information grouping on and off
Help	shows the HYDROcom help

3.5 Viewer

`PROFESSIONAL` `FULL` `BASE`

In the viewer you arrange all elements that you want to use for the presentation of your measuring results. You may create different layout sections and arrange them as desired. A viewer containing four layout sections could look like this:
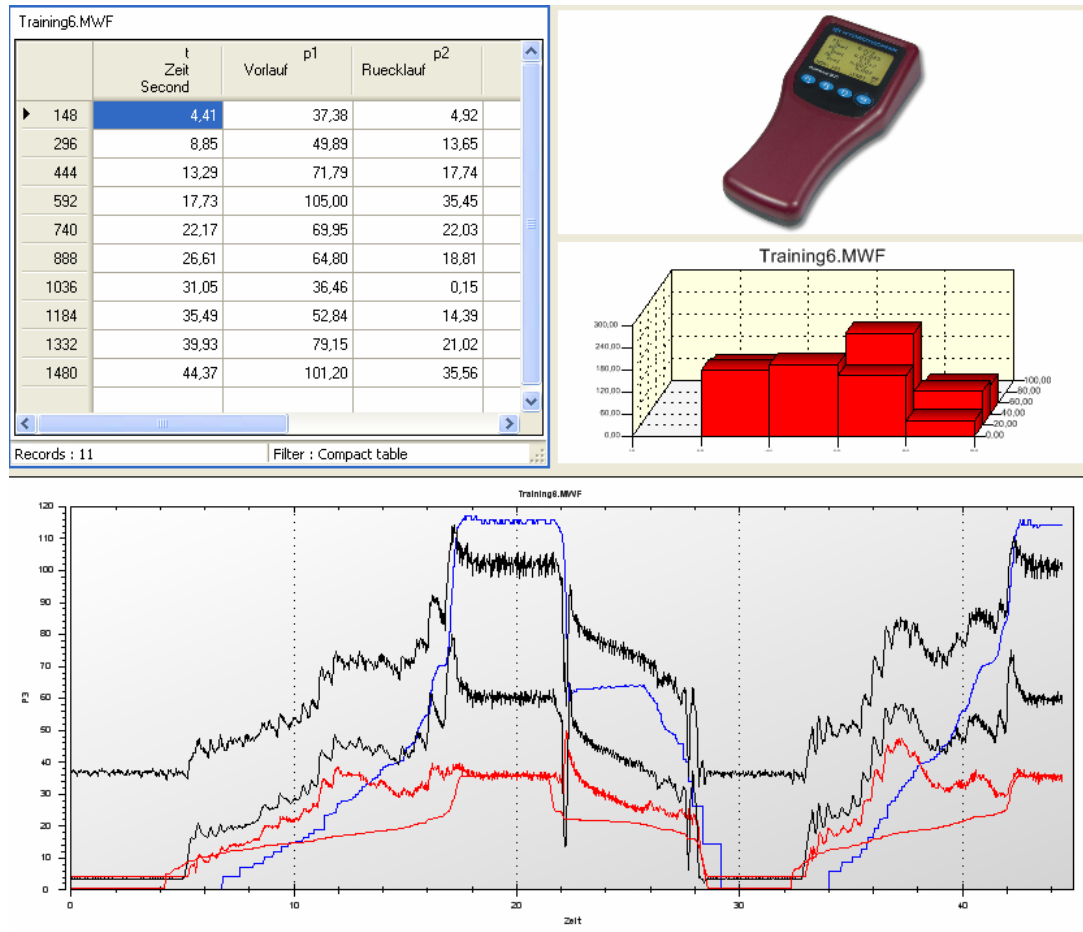
The layout section in the upper left corner contains a compact table, at the upper right corner you see a picture and below that a classification. The large layout section at the bottom is used for a line diagram.

If you position the mouse pointer on the border between two layout sections, the pointer turns into a double-arrow and you can pull the layout sections larger or smaller. Do a right-click to open a context menu with useful functions and commands, depending on the type of layout section.
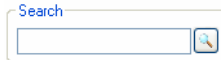
If measurement series had been modified in the viewer (e.g. by smoothing, moving, a.s.o.) a star symbol 🌟 will be displayed in the left lower corner of the viewer.

In the program version `BASE`, the viewer supports one layout section, only.

3.6   Search box

`PROFESSIONAL`

You can see a search box beneath the HYDROcom explorer:

Enter an arbitrary text into the box and then click on 🔍. All files in the highlighted folder are searched for the text. The result will be displayed on the register „Search results" of the HYDROcom explorer.

3.7   Status bar

`PROFESSIONAL` `FULL` `BASE`

A status bar is displayed at the lower edge of the program window. The visibility can be toggled in the menu "View":

| Training6.MWF | MultiSystem 5060 | Line element : N1 (N1) x= 15,95 s y= 1496,33 | OV |

The element currently highlighted in the HYDROcom explorer is shown at the left. To the right you see the connected measuring instrument and the icon of the connection type (here USB). At the right the element is shown where the mouse is currently positioned. Addtionally system incidents (e.g. 'Measurement series loaded completely') will be reported. At the very right side you see, whether the function 'Overwrite' from the menu „Extras" is enabled.

---

4   Program settings

4.1   Program options definition

PROFESSIONAL   FULL   BASE

Select the command "Extras – Options" to display a dialog with four registers:
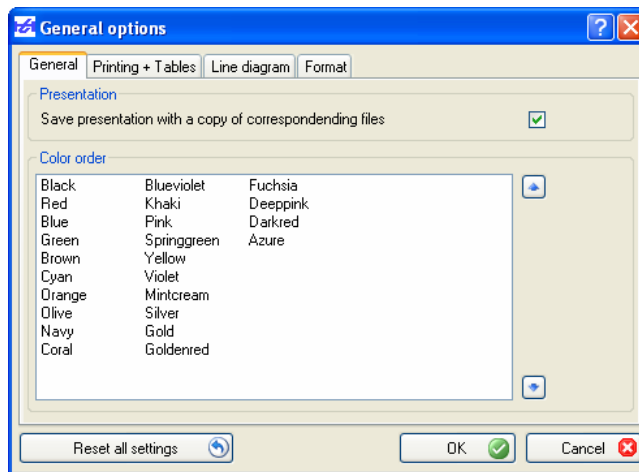
- General options
- Options for printing and tables
- Options for line diagrams
- Format options

Click on the button "Reset all settings" to delete all configuration files and HYDROcom is resetted to factory settings.

Note

Changes to the options described here will partly need a restart of HYDROcom6 before they become active, since these settings are loaded during the program launch.

4.1.1 General options

PROFESSIONAL　　　FULL　　　BASE
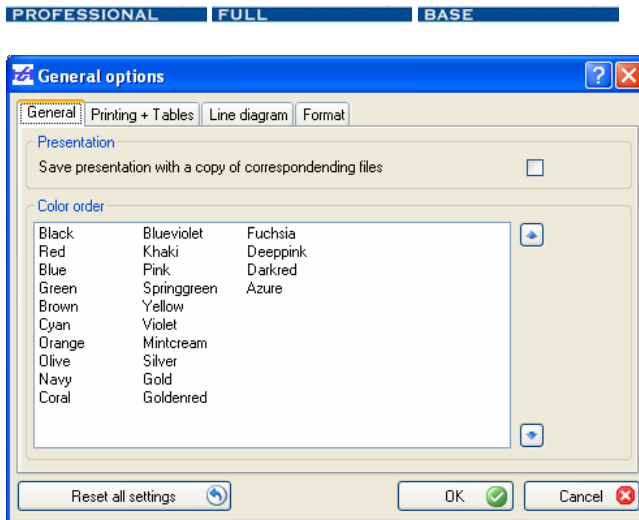
If you enable the option "Save presentation with a copy of correspondig files", a folder will be created for each presentation, where the presentation file and all used measurement, picture or other files will be saved. This eases the moving of a presentation from one computer to another.

Here you may change the order of the colors that can be used to format elements. Click on a color and then on the arrow keys to move the color up/down in the list. Deleting or adding colors is not possible.

Click on [OK] to save the modifications and close the dialog.

4.1.2 Options - printing and tables

PROFESSIONAL　　　FULL　　　BASE
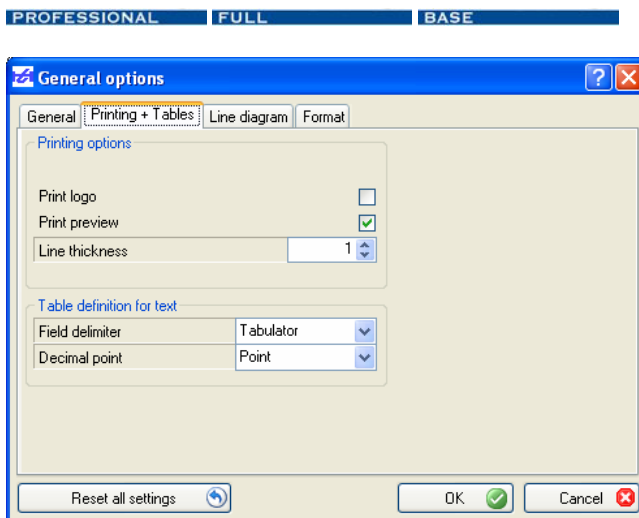
|	
Print logo	enable to print the company name entered on the license form
Print preview	shows a preview before printing starts

<table>
<tr><td>

Line thickness
</td><td>

select the line width for the printing of graphics, diagrams, tables, statistical information, a.s.o.
</td></tr>
<tr><td>

Field delimiter
</td><td>

select how the channels shall be separated during the text output of tables; choose between tab, blank, comma and word-wrap
</td></tr>
<tr><td>

Decimal point
</td><td>

select whether comma or point shall be used as decimal point
</td></tr>
</table>

Click on [OK] to save the settings and close the dialog.

4.1.3   Options - line diagram
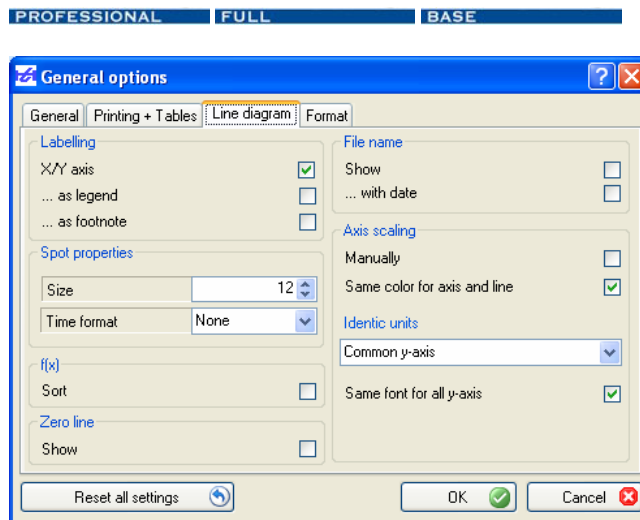
X/Y axis	select whether the x- and y-axis shall be labelled
… as legend	select whether the information 'Measuring channel' and 'Scaling' shall be displayed above the diagram
… as foot note	select whether the information 'Measuring channel' and 'Scaling' shall be displayed beneath the diagram
Spot properties – Size	here you may set the size of the 'grips' at the ends of the spot lines and the difference measuring lines
Time format	select how the time values of spot lines shall be displayed
None	no time values will be displayed
Only time	only the time will be displayed
Date and time	date and time will be displayed
Offset	the distance of the time value from the zero point will be displayed
f(x) sort	sorts measurands automatically, if a channel is displayed at the x-axis instead of the time
Show zero line	displays the zero line in the diagram
File name: Show	displays the file name as title of the line diagram
… with date	displays the creation date together with the file name as diagram title
Axis scaling: Manually	requests entry of scaling limits when a line diagram is created

| **Same colors for axes and lines**	assigns identic colors to axes and lines of a diagram, keeps identic colors even if you change only one of the colors
Identic units	sets the reaction of HYDROcom if several measurands of a line diagram have identic units
Own y-axis	each measurand gets its own y-axis with individual scaling
Own y-axis, identic scaling	each measurand gets its own y-axis, all with identic scaling defined by the minimal and maximal value over all measurands
Common y-axis	one y-axis is displayed for all measurands with identic units
Same font for all y-axes	the same font is used for all y-axis labels; if one label is edited, the labels of all other y-axes will be edited correspondingly

Note

The option 'Identic units' may cause that several measurands use the same y-axis. If the option 'Same color for axis and line' is enabled and you change a line color, the axis color will be changed appropriately. If you change the axis color, the color of the first line will be changed, but the colors of all other lines remain unchanged.

Click on [OK] to save the settings and close the dialog. Some modifications become active after HYDROcom has been restarted.

4.1.4 Options – format
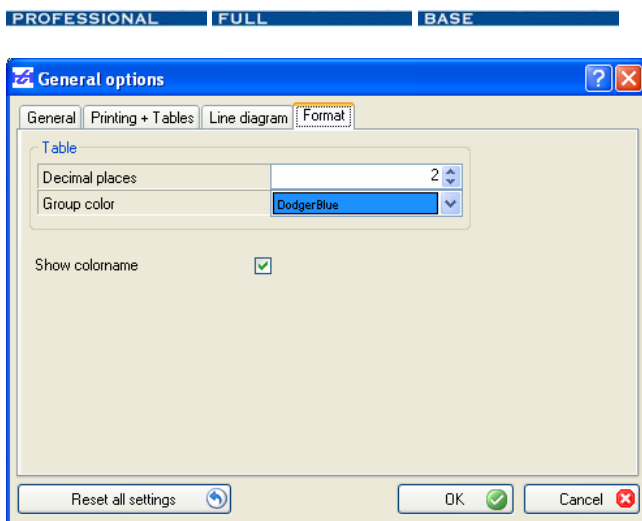
Decimal places	select the number of places behind the decimal point
Group color	select the color used to highlight groups in a table; this color will also be used on the registers 'Details' and 'Statistics' of the HYDROcom explorer
Show color names	enable to display the color names

Click on [OK] to save the settings and close the dialog.

4.2 Configure data exchange

PROFESSIONAL FULL

You may use HYDROcom to export measurement files into the txt- or xml-format to later use them in other applications (e.g. table calculation programs). Select the command "Extras – Data exchange – Format" to configure the export function:
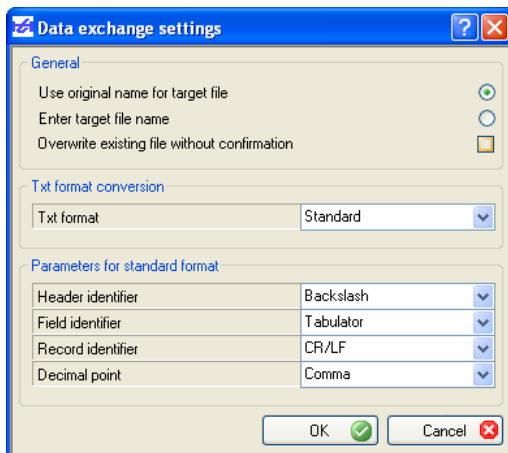
| **Use original name for target file**	the name of the original file will be used for the exported file; the file extension is changed due to the selected export format, the file will be saved in the same directory like the original file
Enter target file name	a dialog will be opened during export, where you may enter a name and select a directory for the exported file
Overwrite existing file without confirmation	when enabled a possibly existing file will be overwritten in case of a file with the same name shall be exported; if not enabled, a warning message will be displayed before overwriting the file
TXT format	select the desired txt format from the list box: Standard (suited for most applications and the re-import to HYDROcom); Special; DiaDem
Parameters for standard format	here you may set four parameters for the txt format "Standard": please obtain the requirements of the desired target application for the import of txt files

Click on [OK] to save the settings and close the dialog.

4.3 Folder selection

PROFESSIONAL FULL BASE

Format definitions and presentations are saved in defined folders. If you do not like to use the standard folders, you may use this functions to select different folders. Use the command "Extras – Folders – Format definitions" or "... – Presentations" and this dialog will be displayed:
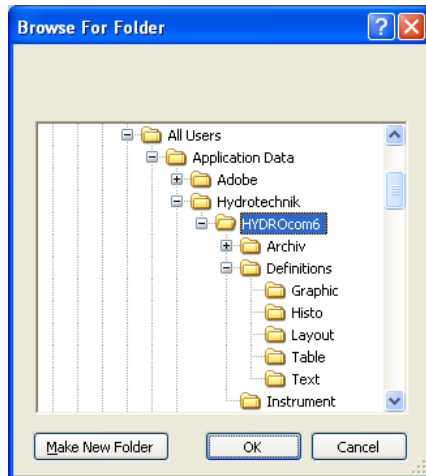
Navigate to the desired folder and highlight it, or make a new folder. Click on [OK] to save the selection.

4.4 Operation language selection

PROFESSIONAL   FULL   BASE

Select the command "Extras – Language" to change the operation language:

Click on the flag symbol of the desired operation language and then on [OK]. The new operation language will be available after a re-start of **HYDRO***com*6.

If no language is selected, the software will use the standard language of the operation system automatically. If this language is not available, "English" will be used.

4.5 Licensing

PROFESSIONAL   FULL   BASE

In this chapter you find all information how to display license information, order a license and transfer a purchased license to HYDROcom. Select the command "Extras – License":

Current version	the licensed program version and variant are displayed; here the professional version 6.1 is licensed
License request	
… Email	click here to make an eMail with your standard eMail application, where the information required for licensing are contained automatically; enter personal remarks as desired and then send the mail
… Print	click here to make a document containing the information requested for licensing; this will be send to the standard printer of your PC
Name	the computer name will be entered here automatically; this field must be filled in
Company	company where the license shall be issued for (entered automatically, if possible); this field must be filled in
Email	eMail address where the license key shall be sent to; this field must be filled in
Phone	optional phone number for further inquiries
New serial number	serial numbers are delivered together with Hydrotechnik measuring instruments or software CDs that can be used once; enter a serial number here; licensing without serial number is not possible
Current serial number	if a license has already been given for the computer, the used serial number is displayed here; this is required e.g. for a version upgrade
Hard disc ID	automatically entered number required for individual licensing
License	
… Check	click here after a license key has been imported or manually entered; the key will be checked and the licensed software version will be unlocked
… Open file	you receive the license key in a xml file (HTLicense.xml) that should be saved on your PC; click here to import the key: navigate to the saved file and then click on "Open"; the license key will be imported and displayed, then click on "Check"
License key	the imported/entered license key will be displayed here

---

Click on [OK] to save the settings and close the dialog.

4.6 Log file

PROFESSIONAL | FULL | BASE

The troubleshooting in case of problems and errors is distinctly eased if you keep a log file. The most important operations and incidents will be recorded there. Select the command "Extras – Use log file":

The function is activated if a checkmark is displayed beside the stroke. The log file is created in the working directory as „HT_log.txt". You will normally find the working directory here
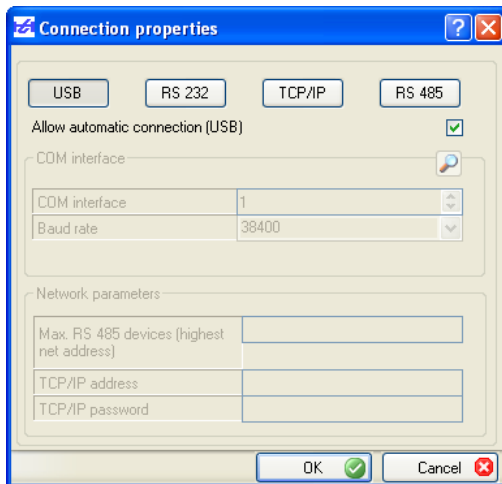
C:\Documents and Settings\All Users\Applications data\Hydrotechnik\Hydrocom6

On some PCs the folder structure may differ.

4.7 Connection settings

PROFESSIONAL | FULL | BASE

You may connect HYDROcom with various Hydrotechnik measuring instruments. This can be done using different interfaces. Select the command "Instrument – Options" to display the dialog with connection settings:

The upper part of the dialog contains four buttons that you use to select the desired connection method:

USB	connection via the USB interface
RS232	connection via the RS232 interface
TCP/IP	connection via network
RS485	connection via the RS485 interface

Dependant on the selected connection method, different options have to be set.

4.7.1   USB connection

PROFESSIONAL   FULL   BASE

No settings are required here, but you may enable the function "Allow automatic connection". Then HYDROcom will be connected to a measuring instrument, after this has been detected at the USB port. Click on [OK] to save the settings and close the dialog.

4.7.2   RS232 connection

PROFESSIONAL   FULL   BASE
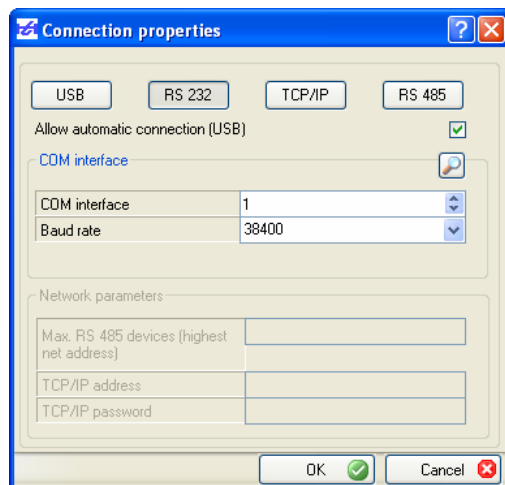
Here you select the COM interface where the measuring instrument will be connected to. If it is already connected, you may click on 🔍 to automatically detect the used COM interface and baud rate. If this fails, a corresponding message will be displayed. The you will have to determin the COM interface using the device manager of the operating system and select it here. Then choose the desired data rate from the drop-down list 'Baud rate'. Click on [OK] to save the settings and close the dialog.

4.7.3   TCP/IP connection
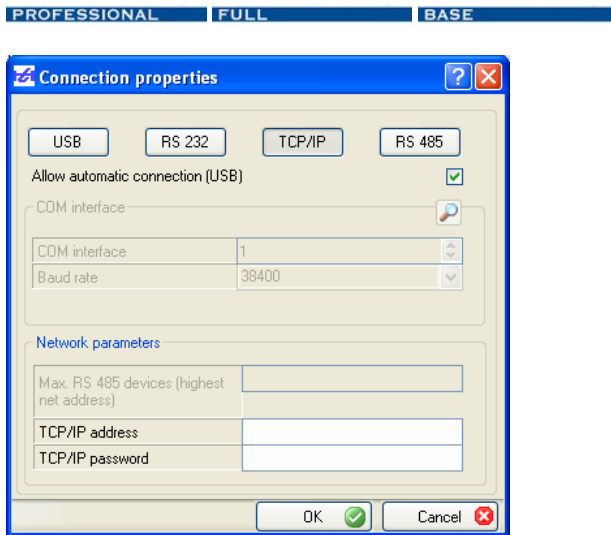
Enter the network address that is assigned to the connected measuring instrument into the box "TCP/IP address". Enter the network password into the box „TCP/IP password". Click on [OK] to save the settings and close the dialog.

4.7.4   RS485 connection
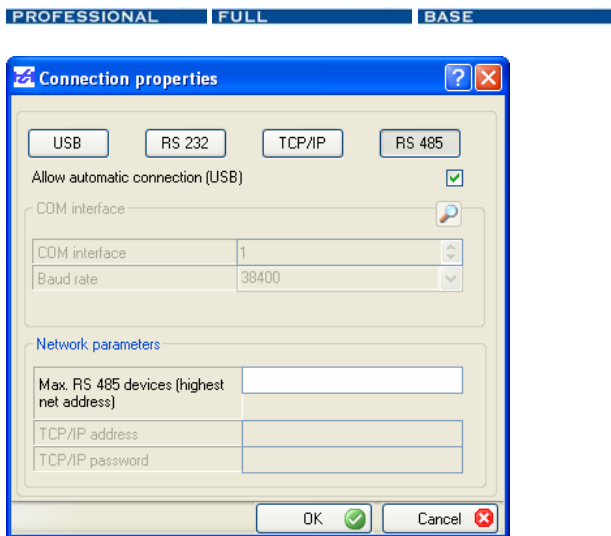
Enter the highest network address. Click on [OK] to save the settings and close the dialog.

4.8 Measuring instrument – settings

`PROFESSIONAL` `FULL` `BASE`

You may use three functions to view/edit the settings of the measuring instrument:

- Linearisation
- Instrument parameters
- Instrument list

4.8.1 Linearisation

`PROFESSIONAL` `FULL` `BASE`

This function is reserved for the communication with Hydrotechnik measuring devices of the Compare series.

4.8.2 Device parameters

`PROFESSIONAL` `FULL`

If a measuring instrument is connected with HYDROcom, you may display important instrument parameters. Select the command "Instruments – Instrument parameters":
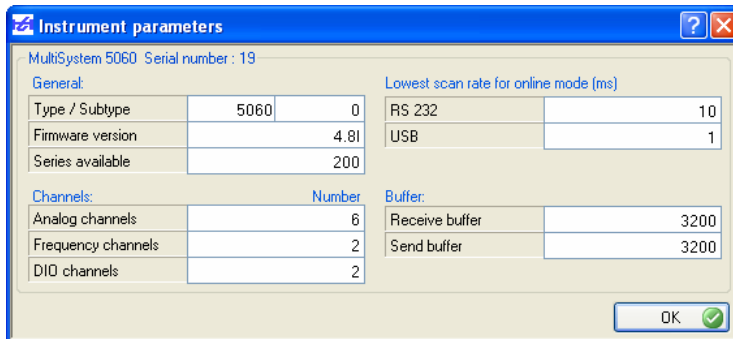
General	type and subtype of the instrument with firmware version and available memory capacity (number of possible series of measurements)
Channels	number and type of the instrument channels
Lowest scan rate	minimal possbile scan rate via the different interfaces
Buffer	used data buffer for the connection with HYDROcom

Click on [OK] to close the dialog.

4.8.3 Device list

`PROFESSIONAL` `FULL`

You may connect several Hydrotechnik measuring instruments with HYDROcom simultaneously, but only one can be operated. The desired measuring device can be selected in the device list. Choose the command "Instruments – Device list":

Click on the device that you want to operate. Then click on [OK] to confirm the selection and close the dialog.

5 Measurement data acquisition

5.1 Measuring instrument - read data

PROFESSIONAL   FULL   BASE

Note

You will have to configure the connection before you can connect HYDROcom with a measuring instrument.

Three steps are required to read data from measuring instruments:

- Connect measuring instrument to you computer
- Connect HYDROcom with the measuring instrument
- Read the memory
- Combine measurement files

5.1.1 Measuring instrument – physical connection

PROFESSIONAL   FULL   BASE

Connect the measuring instrument to your computer. Using the USB connection requires the installation of a driver:

- „HT_USBIO.inf" for operating systems XP and Vista (32 bit version)
- "HT_USBIO_x64.inf" for the operating system XP (64 bit version)
- "CDM 2.04.06.exe" for the measuring instrument MultiHandy 2020

Please obtain the corresponding information in the operating instructions manual of the measuring instrument.

Hints for the installation of measuring instruments at a COM interface

There can be problems with the detection of measuring instruments by HYDROcom 6 when using COM interfaces with index numbers > 9. Please check with the device manager, which COM interface had been assigned to the instrument during installation. If COM10 or higher is used, you will have to edit the index number manually to a single-digit value.

Please see the manual of your operating system regarding information on how to edit the index number of a COM interface. Für Windows XP gilt folgender Ablauf:

1. Select "Start – Settings – Control Panel".
2. Double-click on "System".
3. Select the register "Hardware" and then click on "Device Manager".
4. Expand the entry "Ports" and double-click on the entry "USB serial port (COMxx)"; xx stands for the ordinal number of the COM port.
5. Select the register "Port Settings" and then click on "Advanced".
6. Open the list "COM Port Number" and select the desired entry.
7. Click on "OK".

5.1.2 Measuring instrument – connect with HYDROcom

PROFESSIONAL   FULL   BASE

Note

The measuring instrument must be connected properly to and detected by the computer, before you can connect it with HYDROcom. Please obtain the remarks in the operating instructions of the measuring instrument.

Select the command "Instrument – Connect", or click on 🔌. If the instrument could be connected, the buttons 🔌🔍🌐 (cut connection / read memory / online mode) will be activated and the name of the measuring instrument is shown in the status bar.

If the connection failed, you should check the connection settings. Another reason migt be that the instrument has not been installed or it is switched off. At many measuring instruments it is necessary that they are in the basic menu (display of measured values). Please obtain the hints in the operating instructions of the instrument.

5.1.3 Measuring instrument - read memory

PROFESSIONAL   FULL   BASE

Select the command "Instrument – Read memory" or click on 🔍 to display the list of measurement series contained in the measuring instrument:
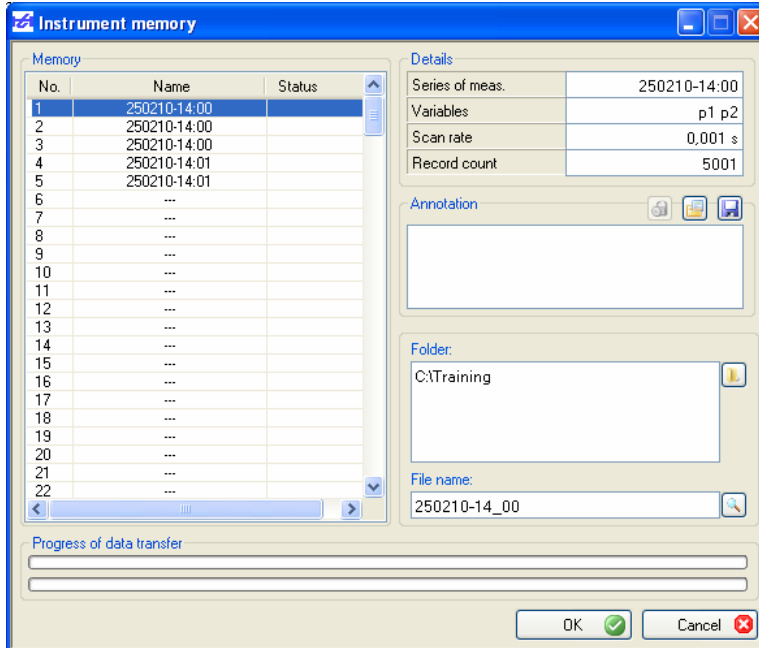
The left list contains all measurement series contained in the instrument. There are five in the example shown above. If you click one, the most important information on this series are shown in the upper right part of the dialog.

Enter or load annotations

If a comment has been saved in the instrument together with the measurement data, it will be shown in the box "Annotation". You may enter a text here, or load an inf file (saved boiler plate). Click on 🖼 and select the desired file. Click on 🖼 to delete the loaded inf file. Click on 💾 to save the annotations for later use as an inf file. The entered or loaded annotation will be saved together with the measurement series and is available during evaluation.

Set folder and file name

The folder where downloaded files will be saved is shown in the box "Folder". If you want to change it, click on 📁 and select the desired folder.

As standard, the name of the measurement series will be used as name of the measurement file. But you may overwrite the suggested name or click on 🔍 to load a file name. If several measurement series are downloaded, they will all be named like entered and a consecutive number will be added. If a name has been entered for a series in the measuring instrument, this name will be taken without any changes.

Entered folders and file names are checked for validity. If a folder is not present, or the file name contains illegal characters, a hint will be displayed and the "OK" button will be disabled.

Highlight measurement series

Only highlighted measurement series will be downloaded from the instrument. Use these functions to highlight:

|	
Click	click on a series to highlight it
[Ctrl]-Click	keep the [Ctrl]-key pressed and highlight several series
[Shift]-Click	highlight one series; keep the [Shift]-key pressed and click on another series above or below the highlighted one; this and all series between the two will be highlighted
[Ctrl]-A	press [Ctrl]-A to highlight all measurement series

Note

If you want to highlight all measurement series but one, you may first use [Ctrl]-A to highlight all and then [Ctrl]-Click to unmark the unwanted series.

Download measurement series

1. Highlight one or several measurement series.
2. Enter or load an annotation, if desired.
3. Select a folder for the measurement files.
4. Enter a file name.
5. Click on [OK] to download the highlighted measurement series.

When the download is started, the dialog will be minimized and the download progress is shown as percentage in the task bar. After the download the HYDROcom explorer will be updated and shows the new measurement series.

When you maximise the dialog during download, the progress will be shown:
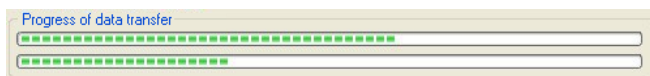
The upper bar shows the download progress of the current measurement series, the lower the overall progress (all highlighted series). The dialog will b e closed automatically after the download has been completed.

Errors during download

If measurement series cannot be downloaded, or an error occurs during transfer, you may view status information beside the measurement series in the list. If an error occurs, the dialog will be maximised and an error code is displayed in the status column. Place the mouse on the error code to display an error description. If a series could be transferred completely, a checkmark will be displayed in the status column.

5.1.4   Measurement files – combine

`PROFESSIONAL`   `FULL`   `BASE`

 Note

Measurement files can only be combined if they have identic scan rates and trigger settings, and contain the same number of data records.

You may combine two measurement files and save them with a new file name:

1.   Select the command "Extras – Combine" or click the button .
2.   Select the first mwf file in the opened dialog.
3.   Select the second mwf file in the second dialog.
4.   Select the desired directory in the save dialog and enter the desired file name.

5.2   Online measurement

`PROFESSIONAL`   `FULL`   `BASE`

 Note

The measuring instrument must be connected to and detected by the computer properly, before you can use the HYDROcom online mode. Please refer to the operating instructions of the measuring instrument for more information.

During online mode you may display the measuring data on your computer that come live from the instrument and execute recordings. To do so, you will first have to configure the online mode, then start it and finally save the measurement series.

5.2.1   Online mode configuration

`PROFESSIONAL`   `FULL`   `BASE`

Select the command "Instrument – Online mode" or click on . A dialog with the registers „General" and „Display style" will be displayed:
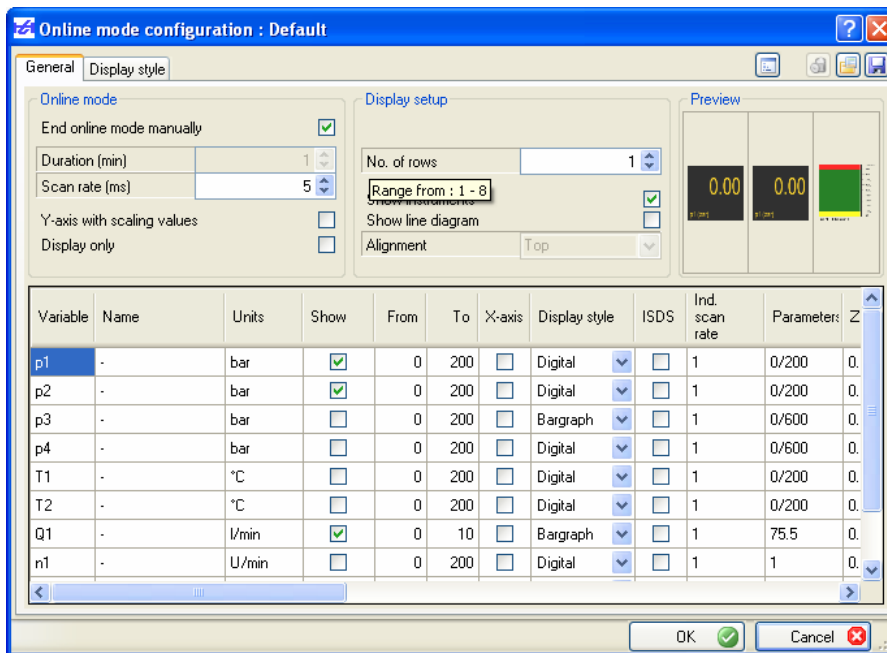
5.2.1.1   Online mode configuration – general

PROFESSIONAL   FULL   BASE
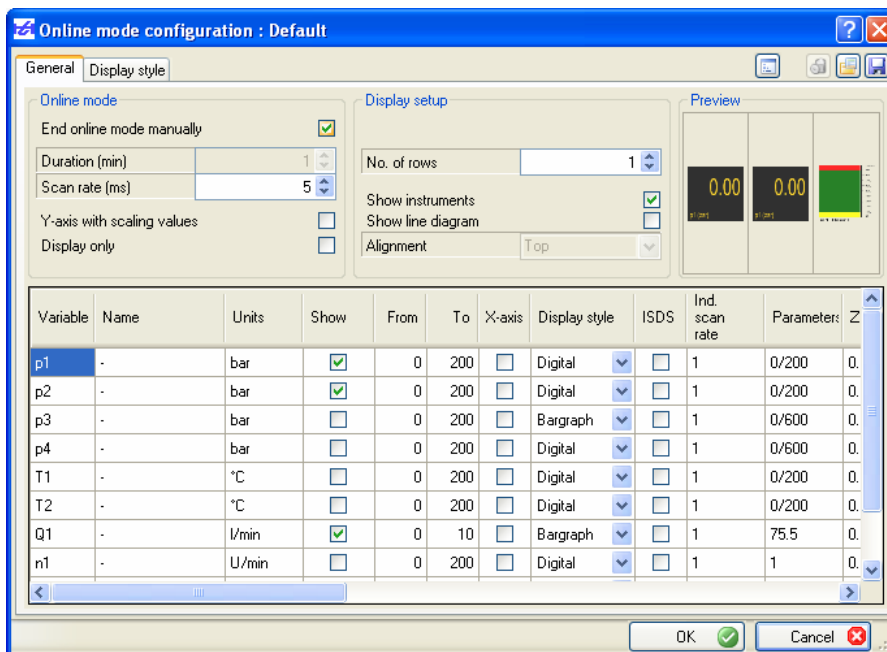
The dialog contains three sections. In the upper left part you see several options, beside that a preview of the online mode. Beneath you can see a list of all channels of the connected measuring instrument. The loading of the channels may last some moments, the progress is indicated.

End online mode manually	the online mode will be active until it is ended manually
Duration	if "End online mode manually" is disabled, you may enter a time interval in minutes to define, how long the online mode shall be executed
Scan rate	decide how often measured values shall be sent from the measuring instrument to the computer
Y-axis with scaling values	if enabled, the manual scaling will be applied that you may enter in the channel list (see below)
Display only	if enabled, saving of measured values is impossible during online mode
No. of rows	decide in how many rows the online displays shall be arranged; example: if you want to display nine channels and set 3 rows, a window with 3 x 3 displays will be used for the online mode
Show instruments	if enabled you may use display instruments to display the measured values
Show line diagram	if enabled, the measured values will be displayed as line diagram
Alignment	this option defines, where the line diagram is displayed in relation to the display instruments

Options in the channel list

Show	check all channels that shall be shown in online mode; in the screenshot, the channels p1, p2 and Q1 are selected
From To	here you may enter a manual scaling for the line diagram; then only those values will be displayed that lie within the entered values; this is only possible, if the option 'Y-axis with scaling values' is enabled
X-axis	select which channel shall be displayed at the x-axis of the line diagram; if no channel is selected, the time will be displayed there
Display style	select which display style shall be used for the channel (see here)

General options

Four buttons are displayed in the upper right corner that can be used to save and load configurations of the online mode:

🖳   saves the current configuration as standard that is loaded automatically when the dialog is opened

🗑   deletes the loaded configuration file (*.onl)

📂   opens a dialog to open a configuration file (*.onl)

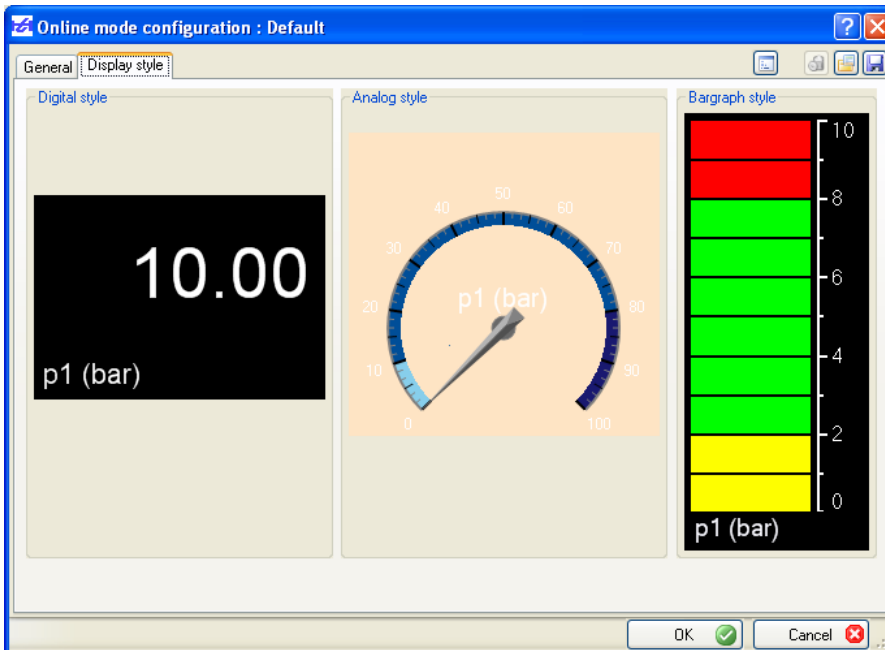💾   opens a dialog to save the current configuration as a file (*.onl)

Click on [OK] to start the online mode.

5.2.1.2   Online mode configuration - display styles
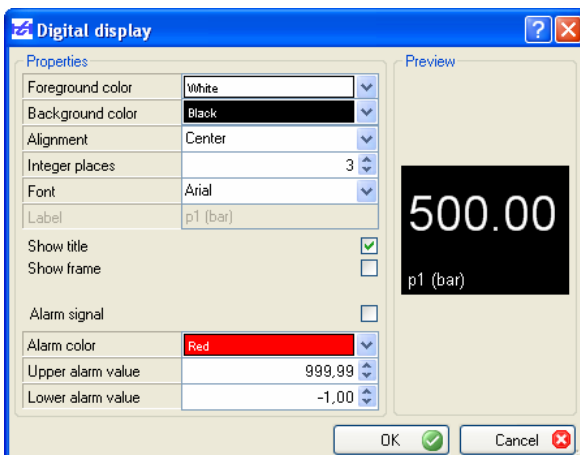
PROFESSIONAL   FULL   BASE

Click on the register "Display styles" in the online mode configuration dialog. The available display styles will be displayed:

Here you may select the display styles "Digital", "Analog" and "Bargraph". Double-click a style to open the corresponding configuration dialog.

5.2.1.3   Configure digital display

PROFESSIONAL   FULL   BASE

Here you may modify the look of the digital display and configure an alarm. All changes are shown in the preview area.

Foreground color	select the color for values, title and frame
Background color	select the color for the background of the value display
Alignment	select how the title shall be positioned
Integer places	select the number of places left of the decimal point; the more places, the smaller will be the font size of the display
Font	select a font for values and title
Label	enter the desired title
Show title	select whether the title shall be displayed
Show frame	select whether a frame shall be displayed
Alarm signal	select whether an alarm shall be emitted when the upper/lower alarm value is exceeded/fallen below
Alarm color	select the color for the value display in case of an alarm
Upper alarm value	enter the upper threshold for an alarm; if this is exceeded, an alarm will be emitted
Lower alarm value	enter the lower threshold for an alarm; if this is fallen below, an alarm will be emitted

Click on [OK] to save the modifications and close the dialog.

5.2.1.4 Configure analog display

PROFESSIONAL
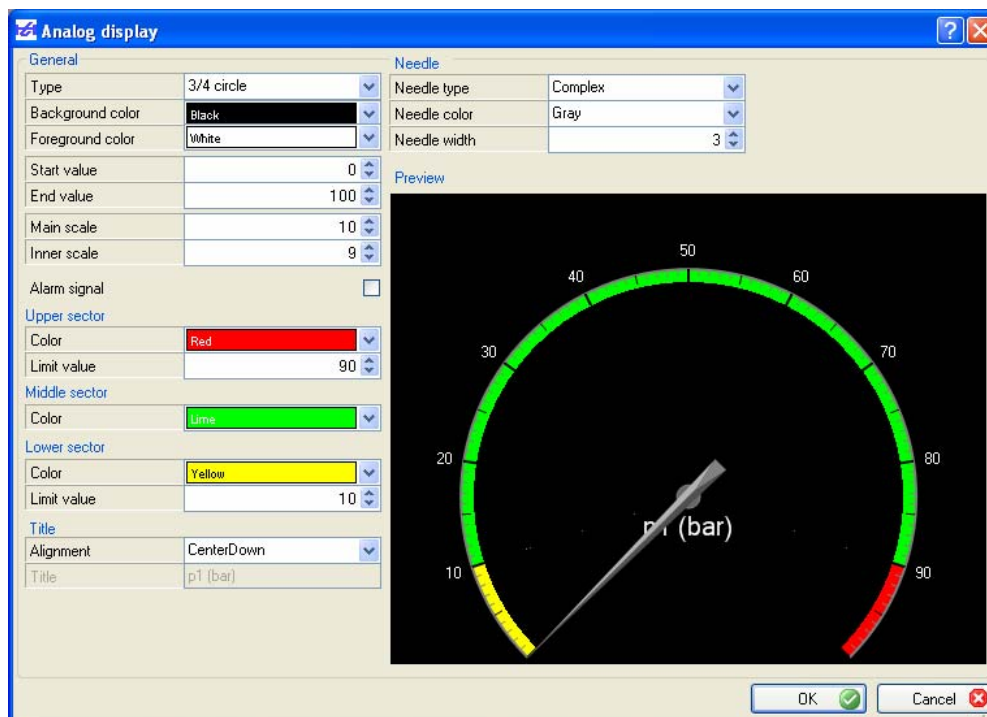
Here you can modify the look of the analog display and configure an alarm. All changes are shown in the preview area.

Type	select the desired display type (1/4 / 1/2 or 3/4 circle)
Background color	select the color for the background of the display
Foreground color	select the color for title and labels
Start value	enter the start value of the display (smaller measured values will not be displayed); the start value should correspond with the value "From" in the channel list
End value	enter the end value of the display (bigger measured values will not be displayed); the end value should correspond with the value "To" in the channel list
Main scale	enter the distance between markers and labels of the main scale
Inner scale	define in how many parts a main scale segment shall be separated
Alarm signal	select whether an alarm signal shall be issued if the upper/lower limit value is exceeded/fallen below
Upper sector	
Color	select the color for the upper sector of the display
Limit value	enter the value where the upper sector shall start
Middle sector	
Color	select the color for the middle sector of the display
Lower sector	
Color	select the color for the lower sector of the display
Limit value	enter the value where the lower sector shall end
Alignment	select where the title shall be displayed
Title	enter the desired title
Needle – Type	select the type of the gauge needle
Needle – Color	select the color of the gauge needle
Needle – Width	select the width of the gauge needle

Click on [OK] to save the modifications and close the dialog.

HYDRO*com*6 Manual HYDROTECHNIK

5.2.1.5 Configure bargraph display

PROFESSIONAL
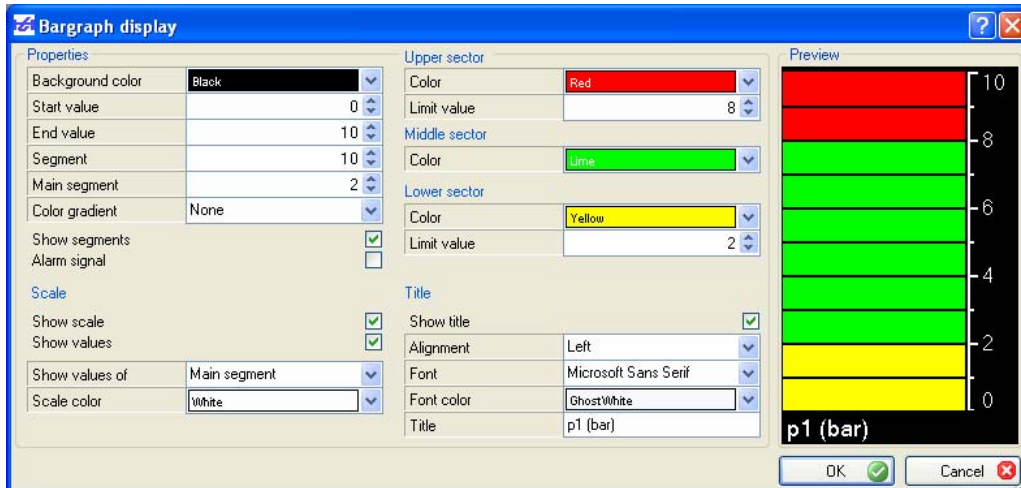
Here you may set the look of the bargraph display and configure an alarm. All modifications are shown in the preview instantly.

Background color	select the color for the background of the display
Start value	enter the start value for the display (measured values smaller than this value will not be shown); the start value should correspond with the "From" value in the channel list
End value	enter the end value for the display (measured values bigger than this value will not be shown); the end value should correspond with the "To" value in the channel list
Segments	select in how many segments the bar shall be separated
Main segment	select how many segments shall be combined to a main segment; each main segment gets a label beside the bargraph
Color gradient	select the desired color gradient
Show segments	select whether the segments shall be indicated with separating lines
Alarm signal	select whether an alarm signal shall be given if the upper/lower threshold has been exceeded/fallen below
Show scale	select whether the scale shall be displayed
Show values	select whether the values shall be displayed on the scale
Show values of	select where the displayed values shall be related to
Scale color	select a color for the scale
Upper sector	
Color	select the color for the upper sector of the bargraph
Limit value	enter the value where the upper sector shall start

Middle sector

   Color   select the color for the middle sector of the bargraph

Lower sector

   Color   select the color for the lower sector of the bargraph

   Limit value   enter the value where the lower sector shall end

Show title   select whether the title shall be displayed

Alignment   select where the title shall be displayed

Font   select font type and size for the title

Font color   select a color for the title

Title   enter the title here

Click on [OK] to save the modifications and to close the dialog, or on [Cancel] to close the dialog without saving.

5.2.2 Start online mode

PROFESSIONAL | FULL | BASE

Click on [OK] to start the online mode after terminating all configurations:

Here you see the defined display styles, but there is no data transfer, yet. Click on ▶ to start live measuring:
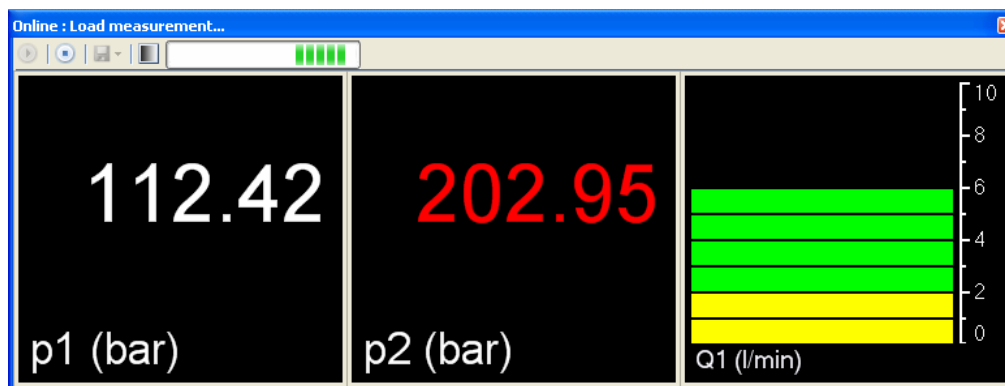
The current measured values are displayed, now. For p2, the defined alarm area is exceeded, the measured value is displayed in red color. Since "End online mode manually" is enabled, a green segment is moving through the progress bar to indicate that data are transferred.

Now you may click on ⊙ to end the online mode, or on ▣ to enable the transparent mode (PROFESSIONAL only):
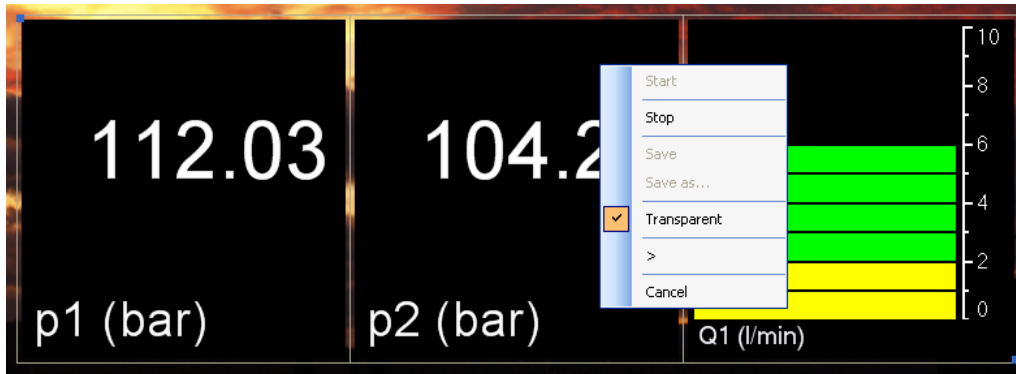
Window frame and menu bar are hidden during transparent mode. Click and pull the blue square in the upper left corner to move the window to a different position, it will always be in the foreground. Click and pull the square in the right lower corner to change window size.

Do a right-click to open a context menu with the available functions. These had been explained before, or are contained in the coming chapter.

After the measurement

If the duration of the online mode has been defined and has expired, the menu bar will flash in green color and will turn solid green, then. In transparent mode, the blue squares start flashing and will then be displayed solid green.

5.2.3   Save online measurement

PROFESSIONAL   FULL   BASE

The online mode may either be configured endless (until it is stopped manually) or with automatic stop after a pre-defined duration (see here). After termination you may save the measured data as a mwf file to use them in a presentation.

Either use the context menu, or click on 💾 and then on

Save   to save the mwf file with an automatically generated name in the current explorer folder, or on

Save as   to enter an individual name for the mwf file and select the folder as desired.

5.3 Import measuring data

You may use two formats to import data, but you will have to obtain some requirements to the data structure:

XML   please contact the Hydrotechnik customer service and request the xml reference file; you may use this to export structured xml files from your application

TXT   please contact the Hydrotechnik customer servcie and request the txt format requirements

Select the command "Extras – Data exchange – Import":
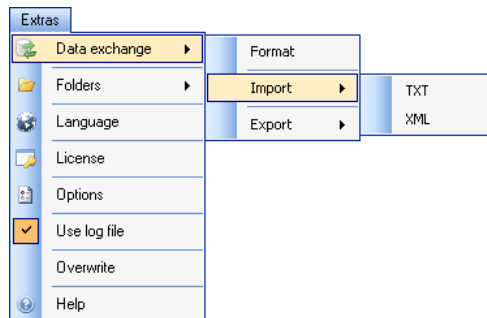
Click on the desired file format. This will open a dialog where you may select the desired import file. Confirm the import with "OK" and a mwf file with the same file name like the original file will be saved in the standard folder. You may import txt files that had been exported in the import/export format "Standard".

The import of xml files is reserved to the **PROFESSIONAL** version.

6   Create a presentation

6.1   Edit the viewer

`PROFESSIONAL` `FULL` `BASE`

When creating a new presentation, you will first select a viewer layout, where the required layout sections are contained. While working with the presentation, you may always add new layout sections, exchange the positions of layout sections or delete them.

6.1.1   Select viewer layout

`PROFESSIONAL` `FULL`

Select the command "Viewer – Layout":
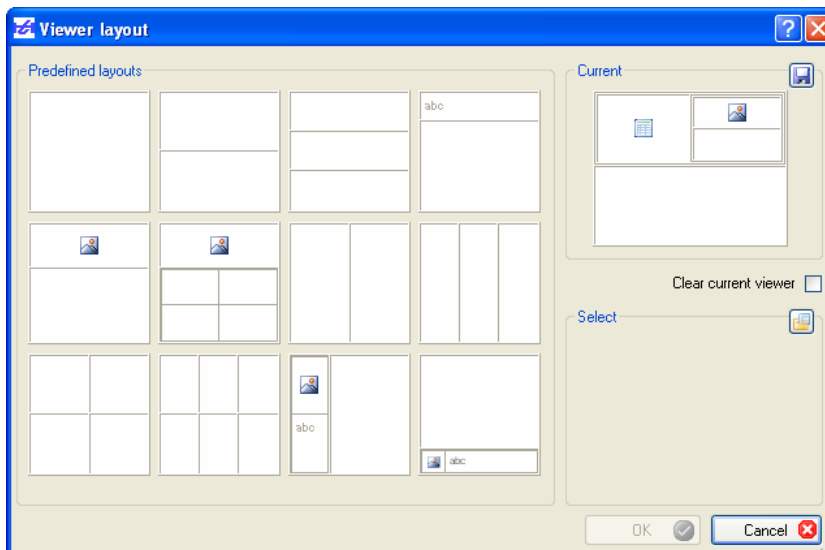
In the upper right corner of the dialog you can see a preview of the current viewer layout. At the left side, you can see twelve pre-defined layouts. Click on one to display it in the section "Select" and then click on [OK] to apply this layout to the viewer.

If the option "Clear current viewer" is enabled, the contents of the presentation will be deleted when the new layout is applied. Otherwise, the existing contents will be distributed over the sections of the new layout.

You may use two buttons to manage the pre-defined layouts:

- saves the current layout; a dialog will be opened where you may enter a name for it
- loads a saved layout; a dialog will be opened where you may choose the desired layout file

---

6.1.2   Edit layout section

`PROFESSIONAL` `FULL`

The layout of the viewer is very flexible and can be modified at any time. You may

- add layout sections
- interchange layout sections
- change the type of a layout section
- scale a layout section
- delete layout sections

6.1.2.1   Add layout section

`PROFESSIONAL` `FULL`

New layout section are always added in relation to an existing one, either to its right, left, above or below. This will always downsize the layout section, beside that the new layout section is added. You can add a new layout section either with the corresponding command from the "View" menu, or by clicking the respective button.

Click on the layout section, where the new section shall be added, and then on the small black arrow on the button, or on the correspondig menu command:

-    "View – Line diagram"
-    "View – Table"
-    "View – Histogram"
-    "View – Classification"
-    "View – Picture"
-    "View – Text"

The buttons have two function. If you click on the icon in the button, you change the type of the active layout section (see here). If you click on the small black arrow, you add a new layout section beside the active. A context menu will be displayed, where you may choose the position for the new layout section:
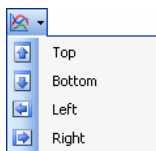
The position is always relative to the active layout section that is indicated with a thick blue frame.

The different program versions can handle different numbers of layout sections:

- `PROFESSIONAL`   24 layout sections
- `FULL`   6 layout sections
- `BASE`   1 layout section

6.1.2.2   Interchange layout sections

`PROFESSIONAL` `FULL`

If a presentation has several layout sections, you may change their positions:

1.   Click in a layout section to highlight it; a thick blue frame is displayed around it.
2.   Press and hold the <Ctrl>-key.
3.   Position the mouse pointer on the highlighted layout section.
4.   Press and hold the left mouse button.
5.   Drag the layout section to the desired position.
6.   Release mouse button and <Ctrl>-key.

The positions of both layout sections will be interchanged.

6.1.2.3   Change layout section type

`PROFESSIONAL` `FULL`

Each layout section has a certain type (line diagram, table, histogram, classification, picture, test), only content of the respective type can be placed in it. Do a click on the icon of the respective button to change the type of the active layout section:

- ▪   Line diagram
- ▪   Table
- ▪   Histogram
- ▪   Classification
- ▪   Picture
- ▪   Text

Please click on the icon of the button and not on the small black arrow. This would insert a new layout section. The content will be deleted by changing the type of a layout section.

6.1.2.4   Scale layout section size

`PROFESSIONAL` `FULL`

Click on the layout section that you want to scale. It will be highlighted with a thick blue frame. Position the mouse pointer on the frame until it looks like this: ┼.

Press and hold the left mouse button and draw the frame to the desired position. This enlarges or downsizes the layout section. Repeat this at all edges of the frame.

6.1.2.5   Delete layout section

`PROFESSIONAL` `FULL`

Click on the layout section that you want to delete. It will be highlighted with a thick blue frame. Then click on

- ▪   "View – Delete" – to delete the layout section with content
- ▪   "View – Delete content" – to keep the layout section but clear its content

---

6.2 Place data in layout sections

PROFESSIONAL   FULL   BASE

A presentation comprises elements that can be arranged in the viewer individually. Six elements can be distinguished:

Line diagram presentation of measurement data as line diagram, either related to the time (function f(t)), or related to an arbitrary measurand of the measurement file (function f(x))

Table presentation of measurement data as a table

Histogram presentation of the cumulative distribution of measurement data

Classification presentation of measurement data as three-dimensional cumulative distribution

Text presentation of an arbitrary text

Picture presentation of image files of several formats

6.2.1 Create line diagram

PROFESSIONAL   FULL   BASE

7. Create a layout section of the type "line diagram".
8. Use the HYDROcom Explorer to navigate to the measurement file that you want to show as line diagram.
9. Drag either the measurement file, or a single channel into the layout section:
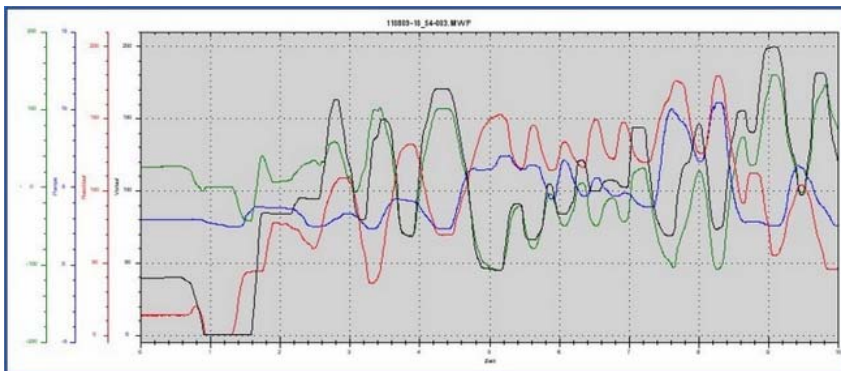
The line diagram will be calculated using the standard configuration file and then displayed. Now you may drag further channels (even from other measurement files) into the diagram (then a yellow star will be displayed in the lower left corner to indicate the diagram as "edited"), or use the various editing functions (e.g. zoom, scroll, spot lines). The adding of channels is only possible, if the function "Overwrite" is disabled. Otherwise the existing channels will be replaced by the newly added.

More possibilities

You have three more possibilities to create line diagrams beside that described above. For all you will need a layout section of the type "Line diagram":

- Select the command "File – Open – Measurement", or
- drag a *.mwf file from the Windows explorer, or
- do a right-click in the HYDROcom explorer on a *.mwf file or a channel and select the command "Send to viewer" from the context menu.

HYDROTECHNIK

Interactive operations using the mouse

- When moving the mouse over the line diagram, the element at the mouse position is shown in the status bar; do a right-click to show the context menu for this element.
- If the mouse is positioned on a curve, the current x- and y-values are displayed in the status bar.

Limitations

The different program versions can handle different numbers of channels in a line diagram:

- PROFESSIONAL   24 channels
- FULL   12 channels
- BASE   12 channels

6.2.2   Create a table

PROFESSIONAL   FULL

1.   Create a layout section of the type „Table".
2.   Use the HYDROcom Explorer to navigate to the measurement file that you want to show as a table.
3.   Drag the file and drop it into the layout section:

110809-10_54-002.MWF					
	t (Zeit) ▲	p1 (Vorlauf)	p2 (Ruecklauf)	Q1 (Pumpe)	dp1 (-)
▶ 1	0,00	133,24	52,66	4,55	80,59
2	0,01	133,19	52,66	4,55	80,53
3	0,01	133,19	52,66	4,55	80,53
4	0,02	133,19	52,66	4,55	80,53
5	0,02	133,19	52,66	4,55	80,53
6	0,03	133,19	52,66	4,55	80,53
7	0,03	133,19	52,66	4,55	80,53
8	0,04	133,24	52,66	4,55	80,59
9	0,04	133,24	52,66	4,55	80,59
10	0,05	133,19	52,66	4,55	80,53
Datensätze : 2001				Filter :	

The table will be calculated using the standard configuration file. Now you may drag and drop further channels (even from different measurement files) into the table (then a yellow star will be displayed in the lower left corner to indicate the table as "edited"), or use an editiing function (e.g. filtering). The adding of channels is only possible, if the function "Overwrite" is disabled.

Table with special data

You may fill tables with statistical data or spot values.

Furhter possibilities

You may use further methods to create tables. For all you will need a layout section of the type "Table":

- Select the command "File – Open – Measurement", or
- drag and drop a *.mwf file from the Windows Explorer into the layout section, or
- make a right-click on a *.mwf file or a channel in the HYDROcom Explorer and select the command "Send to viewer" from the context menu.

Limitations

The different program version can handle tables of different numbers of columns:

- PROFESSIONAL   25 columns (24 channels + time)
- FULL   13 columns (12 channels + time)
- BASE   no table possbile

6.2.2.1 Table with statistical data

PROFESSIONAL   FULL

1.   Click on a measurement series in the HYDROcom explorer, to have the statistical data calculated.
2.   Create an empty table layout section.
3.   Right-click into the dark-grey area and select the command "Statistics" from the context menu.
4.   The statistical information on the measurement series that are displayed in the register "Statistics" of the HYDROcom explorer, are now displayed in the table, too.

Spot : Training6.MWF

	p1	p2	P3	P4	N1
Minimum	32,23	0,15	1,84	3,69	0,00
Maximum	114,10	35,67	79,81	49,63	3.212,00
Mean average	65,82	16,60	34,08	23,61	1.118,26
Quadratic mean	69,87	19,81	40,08	27,04	1.572,90
Standard deviation	23,45	10,82	21,10	13,18	1.106,13

Records : 5

Data will be displayed in the register "Statistics", after you have clicked on a measurement series to load it completely.

6.2.2.2 Table with spot values

PROFESSIONAL   FULL

1.   Create a presentation with at least one line diagram, where you have placed a measurement series.
2.   Insert at least one spot line into the line diagram.
3.   Create an empty table layout section.
4.   Right-click into the dark-grey area and select the command "Spot" from the context menu.
5.   The spot values that are contained in the register "Statistics" of the HYDROcom explorer are now shown in the table, too:

Spot : Training6.MWF

	t	p1	p2	P3	P4	N1
Spot 5	16,66	86,55	22,83	52,04	36,98	1923,00
Spot 4	10,10	53,39	14,54	28,38	22,12	412,02
Spot 3	3,62	36,65	0,15	3,46	3,88	0,00
Spot 2	6,72	47,11	11,28	20,18	12,08	0,00
Spot 1	21,85	101,60	24,48	55,88	34,35	3143,00

Records : 5

In this case, five spot lines were contained in the line diagram.

6.2.3   Create a histogram

PROFESSIONAL   FULL

1.   Create a layout section of the type „Histogram".
2.   Navigate in the HYDROcom Explorer to the measurement file that you want to use in the histogram.
3.   Drag the file into the layout section and drop it there:
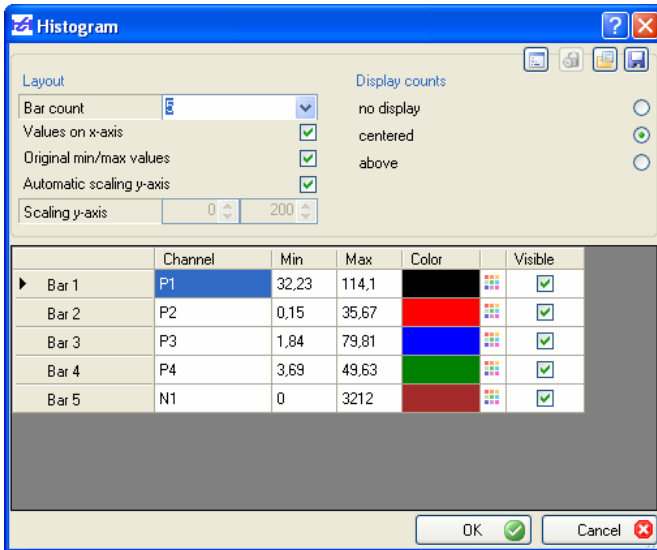
Bar count	select the number of sections for that the cumulative distribution shall be displayed
Values on x-axis	enable to display the section numbers at the x-axis; otherwise the real value ranges will be displayed
Original min/max values	enable to determine the minimal and maximal values from the measured data and use them to build the histogram automatically; otherwise you may enter minimal and maximal values into the table, but then it is possible that not all measured values are represented in the histogram
Automatic scaling y-axis	enable to do automatic scaling for the y-axis; otherwise you may enter the scaling value manually
Display counts	choose whether the values of each bar shall be displayed in its center, above it, or not at all

Beneath the options you can see a list of the histogram bars with each assigned channel. You may select (drop-down list), which channel shall be assigned to which bar and which color (button ⊞) shall be used. Additionally you may alter the visibility of each bar. If the option "Original min/max values" is disabled, you may enter the minimal and maximal values for each channel.

Click on [OK] to display the histogram:
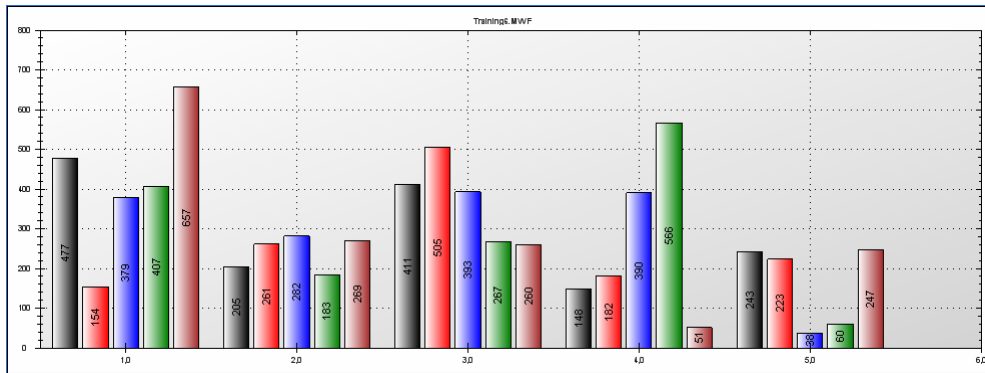
Interactive operations using the mouse

- Move the mouse over the histogram to display the element in the status bar, where the mouse pointer is positioned; do a right-click then to display a context menu for this element (contains other functions, too).
- The name of a bar is displayed in the status bar, as long as the mouse pointer is positioned on it.

Limitations

The different program versions are able to handle different numbers of histogram bars:

- PROFESSIONAL   8 bars
- FULL   4 bars
- BASE   function not available

6.2.4   Create a classification

PROFESSIONAL

Just like for histograms, classes are created at the classification and then the number of measured values per class is counted. By separating each class into time classes, another dimension is added, resulting in a three-dimensional histogram, where only one measuring channel at a time can be displayed.

Mwf and mwc files can be used for classifications. The second is a new type of measurement files, where not the single measured value is stored, but the number of measured values in defined value ranges. This results in a marked decrease of the saved amount of data, but mwc files can only be displayed as classifications. (Information on mwc files)

mwc files will be generated by future measuring instruments to reduce the amount of generated data (that must be evaluated). Today these files can only be created with **HYDRO**com6 to convert a large measurement file into a small classification file.

Types of Classifications

You may use three methods to classify measured values:

3D histogram	cumulative distribution in a x-y-matrix
Mean value deviation	cumulative distribution in classes defined as "distance from mean value"
Markov chain	here the consecutive relative extreme values are collected in a matrix

Insert classification

1. Create a layout section of the type „Classification".
2. Use the HYDROcom explorer to navigate to the measurement file that you want to use in the classification.
3. Drag the file into the layout section and drop it there.

The classification will be calculated using the standard configuration file. If there is no configuration file, or if you use a mwc file, the dialog for the configuration of a classification will be opened, where you can do all required settings. When the classification is displayed, you can use a context menu that you can open with a right-click.

More possibilities

You may use three other ways than that described above to create a classification. For all you need a layout section of the classification type:

1. Select the command "File – Open file – Measurement", or
2. drag and drop a *.mwf or *.mwc file from the Windows explorer into the layout section, or
3. make a right-click in the HYDROcom explorer on a *.mwf file or a channel and select the command "Send to viewer".

6.2.4.1   Configure a classification

PROFESSIONAL   FULL   BASE

After placing measurement data in a layout section "Classification", or after double-clicking such a layout section, the dialog for the configuration of the classification will be opened:
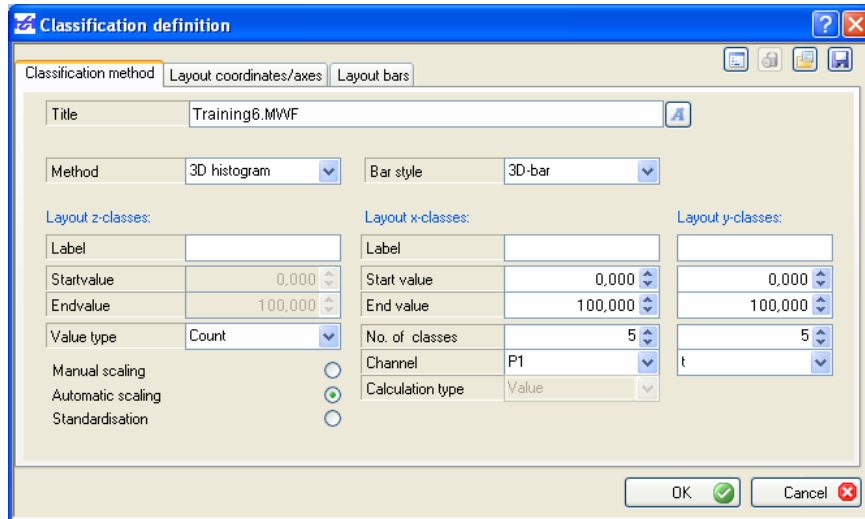
Four buttons are displayed in the upper right corner of the dialog:

saves the classification settings in a file and uses this as a standard; future classifications will be calculated with these settings

deletes the opened configuration file (only active if a configuration file has been opened before)

loads a saved configuration file

saves the configuration file

The dialog is separated in three parts, accessible via the registers:

Classification method	configure the three dimensions (x-, y- and z-axis) of the classification
Layout coordinates/axes	here you can configure the look of the three-dimensional coordinates system of the classification
Layout bars	here you may configure the look of the classification bars

Classification method

Here you define how the classification shall be calculated:

Title	enter the title that shall be displayed above the diagram; if nothing is entered, the name of the measurement series will be used
A	click here to format the title
Method	choose the desired classification method: 3D histogram (options for x-, y- and z-axis are active); Mean value deviation (options for x-, y- and z-axis are active); Markov chain (options for x- and z-axis are active; y-axis is inactive since both axes must have the same values)
Bar style	select the graphical style for the bars
Label	enter the text for the x-, y- and z-axis labels; if nothing is entered, the name of the measurand is used automatically
Start value	start value for the smallest class; can only be set for the z-axis, if the option "Manual scaling" is enabled
End value	end value for the biggest class; can only be set for the z-axis, if the option "Manual scaling" is enabled
Value type	Count: the frequency of the values within a class will be displayed at the z-axis; mean value: the average of all values within a class will be displayed
Manual scaling	allows the manual entry of start and end values for the z-axis
Automatic scaling	uses automatically determined values for the z-axis scaling
Standardisation	uses a percental scaling of the z-axis instead of values
No. of classes	select in hom many classes the channel values shall be separated
Channel	select which channel shall be displayed on the x- or y-axis
Calculation type	when the 'Range-mean counting' is chosen, you may select here how the calculation shall be executed; 'Value': the real values will be taken for the cumulative distribution; 'Percent': the percental distribution will be displayed

Layout coordinates/axes
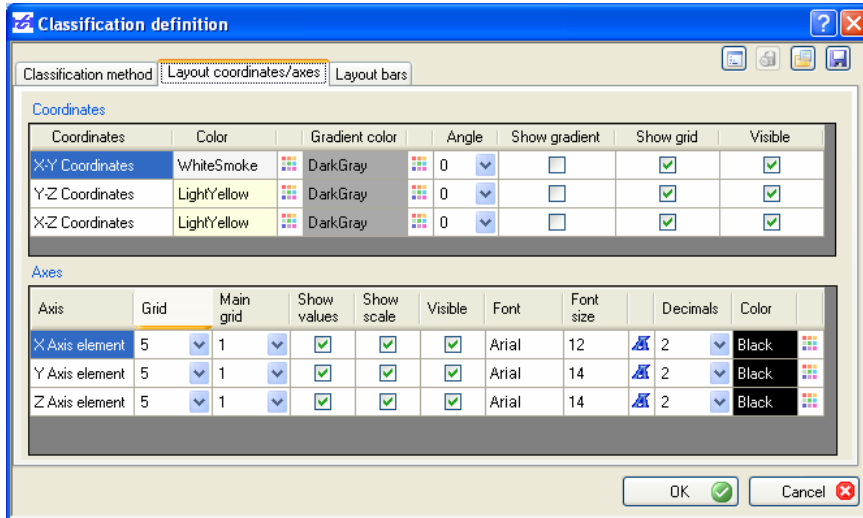
You may configure coordinate system and axes individually:

Coordinate system

Color	click on ⊞ and select the colors for the three dimensions of the coordinate system
Gradient color	click on ⊞ and select the second color, if you want to use a color gradient; then the option "Show gradient" must be enabled
Angle	set the angle of the color gradient
Show gradient	enable this option if you want to use a color gradient
Show grid	toggles the visibility of the grid
Visible	toggles the visibility of the dimension
Axes	
Grid	define how many grid lines shall be displayed for the axis
Main grid	define how many grid lines shall be labelled (grid = 10, main grid = 5: every second line will be labelled)
Show values	select whether the axis shall be labelled with the values
Show scale	select whether the scale shall be displayed
Visible	toggles the visibility of the axis
Font and font size	click on 𝐀 and define the formatting of the axis labels
Decimals	select how many decimal places shall be displayed at the axis labels
Color	click ⊞ and select the color for the axis

Layout bars
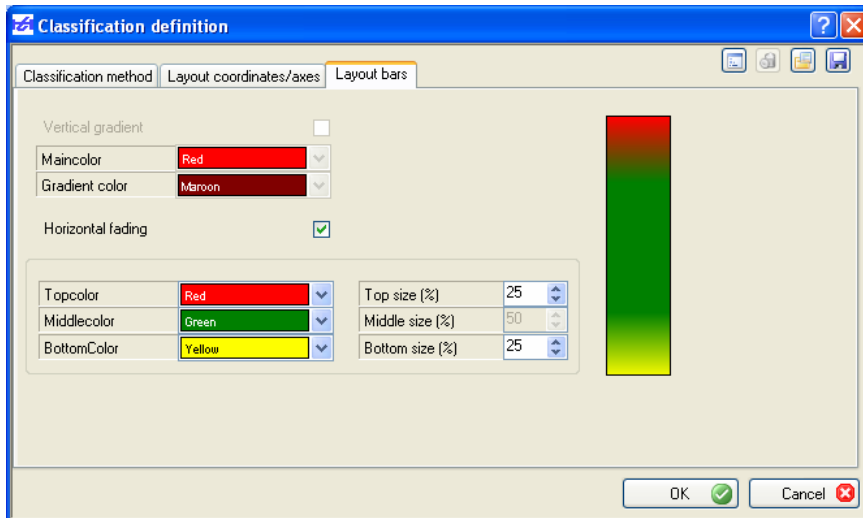
Vertical gradient	enable this option to use a vertical gradient
Main color	select a color for the bars; if both gradient options are disabled, this color will be used to display solid bars
Gradient color	select the second color for the gradient
Horizontal gradient	enable this option to use a horizontal gradient
Top/center/bottom color	select the colors for the three sections of the bars
Top/center/bottom size	select the percentages used to create the three sections of the bars

6.2.4.2   Classification context menu

PROFESSIONAL

After placing a classification into a layout section you may do a double-click to display the configuration dialog. But you may also do a right-click to display the context menu:
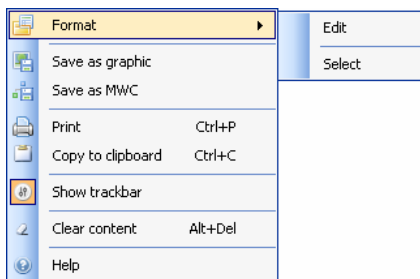
Format

Edit	opens the configuration dialog
Select	opens a dialog to assign a saved configuration file to the classification

---

Save as graphic	saves the classification as a graphic that can be used in many other application; format changes at the graphic are not possible anymore
Save as mwc	saves the classification in a file that can be used later to create a classification; these data cannot be presented as line diagram, table or histogram
Print	prints the layout section
Copy to clipboard	copies the layout section as a picture into the clipboard, from where it can be pasted into other applications
Show track bar	displays sliders beneath and right of the classification that can be used to hide bars in the foreground what makes hidden bars visible
Clear content	deletes the content of the layout section
Help	shows help to the classification

6.2.5   Place a picture

`PROFESSIONAL`   `FULL`

1.   Create a layout section of the "Picture" type.
2.   Position the mouse pointer within this layout section.
3.   Do a right-click and select the command "Format – Select" from the context menu:
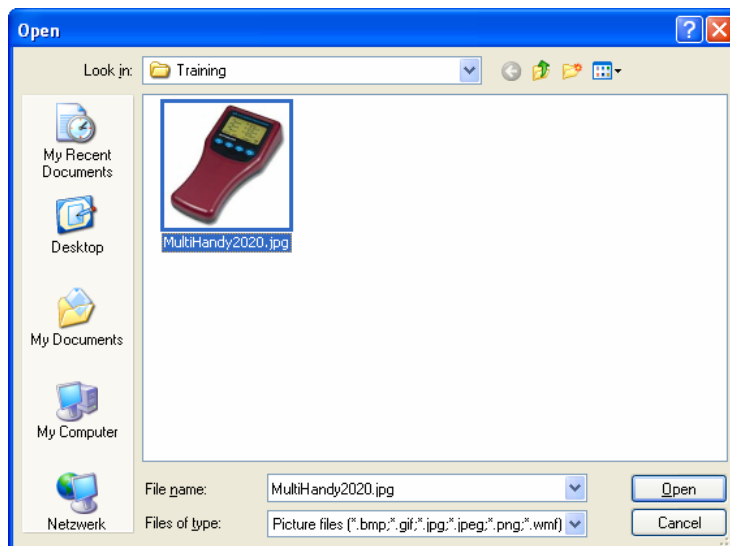
4.   Navigate to the picture that you want to place.
5.   Highlight the desired picture file and click on "Open":

HYDROcom supports the picture formats *.bmp, *.jpg, *.gif, *.jpeg, *.png and *.wmf

6.2.6   Place text

PROFESSIONAL   FULL

There are many possibilities to place text in a layout section:

- enter directly
- enter a boiler plate
- place text from the explorer via the context menu
- drag text from the explorer

6.2.6.1   Enter text directly

PROFESSIONAL   FULL

1. Create a layout section of the type „Text"; the cursor flashes in the left upper corner.
2. Enter text as desired.

Use the editing functions to format the text.

6.2.6.2   Save text as boiler plate

PROFESSIONAL   FULL

To save entered text for later use as boiler plate, you may right-click into the layout section containing the text and select the command "Format – New" from the context menu. Enter a name for the boiler plate in the dialog and click on "Save".

6.2.6.3   Enter boiler plate text

PROFESSIONAL   FULL

1. Create a layout section of the type „Text".
2. Right-click into this layout section.
3. Choose the command "Format – Select " from the context menu.
4. Navigate to the desired boiler plate, highlight it and then click on "Open".

6.2.6.4   Paste text from explorer via context menu

PROFESSIONAL   FULL

You may easily place text contained on the registers „Details" and „Statistics" of the HYDROcom explorer into a text layout section. Do a right-click into the layout section and choose the commands "Paste – Statistics" or "Paste – Details" in the context menu. This can only be done after the measurement series had been loaded completely. This is done after the registers "Details" and "Statistics" has been opened at least once.

6.2.6.5   Drag text from HYDROcom explorer

PROFESSIONAL   FULL

You may drag all texts displayed in the HYDROcom explorer into a text layout section. This is helpful if you want to use details on measurement series and channels, or statistical information in your presentation.

In the following procedure you will have to highlight text in the HYDROcom explorer. This can be done this way:

- click with the left mouse button to highlight one line
- press the [Ctrl]-key while clicking on several lines to highlight them
- highlight a line; press the [Shift]-key and click on another line above or below the highlighted; this and all lines between the two will be highlighted
- if you want to highlight all lines beside one (or several), you may first highlight all with [Shift]-click and then do [Ctrl]-clicks on the lines you do not want to highlight

This is how to drag text from the HYDROcom explorer into a text layout section:

- Create a layout section of the type „Text".
- Highlight the desired text in the HYDROcom explorer.
- Drag the highlighted text and drop it in the layout section.

If you drag a measurement series into a text layout section, its name will be displayed there.

7   Edit functions

7.1   General edit functions

`PROFESSIONAL` `FULL` `BASE`

The following functions are explained in this chapter:

- ▪   Delete channels and series of measurements
- ▪   Add calculated channel
- ▪   Use search function
- ▪   Export parts of the presentation
- ▪   Expand layout section

7.1.1   Delete measurement series and channels

`PROFESSIONAL` `FULL` `BASE`

You may use the HYDROcom explorer to delete complete measurement series or channels from a series:

1.   Highlight the measurement series or the channel that you want to delete.
2.   Do a right click on the highlighted item:
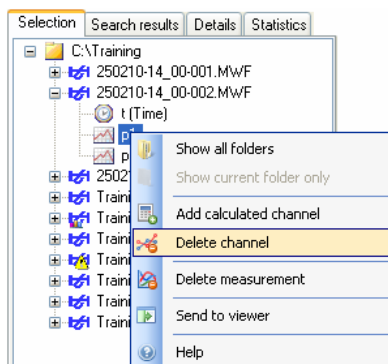
3.   Click on the command "Delete channel" to delete the highlighted channel from the measurement series, only. The other channels will not be affected.
4.   Click on the command "Delete measurement" to move the complete measurement series into the tray.

Note

When you delete a channel from a measurement series, it will be removed from the internal structure of HYDROcom, but it remains within the measurement series. If you want to delete the channel completely, you will have to save the measurement series.

7.1.2   Add calculated channel

`PROFESSIONAL` `FULL` `BASE`

You may add a calculated channel to series of measurements that can then be used in presentations like any 'normal' channel. You may also repeat this procedure and add several calculated channels to a series of measurements.

---

1. Highlight the series of measurement, where you want to add a calculated channel.
2. Do a right click on the highlighted channel.
3. Select the command "Add calculated channel" from the context menu:
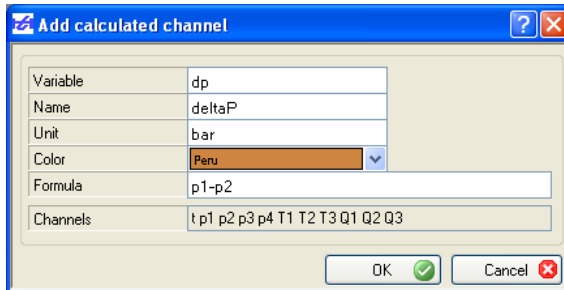
4. Enter the required information:

Variable define the variable that results from the calculation

Name enter a name for the calculated channel

Units define the units of the calculated channel

Color select the color that shall be used to display the channel in a line diagram

Formula enter the formula of the desired calculation

Channels the channels that can be used for the calculation are displayed here

5. Click [OK] to add the calculated channel.

Hints for the use of formulas

You use mathematical operators to link the variables in the series of measurements with other variables or constants. Variables are always described with a letter and a number. The variables that can be used in the formula are shown in the box "Channels".

You may use the mathematical operators „+" (addition), „–" (subtraction), „*" (multiplication), „/" (division), „lg(a)" (logarithm to the base 10), „ln(a)" (natural logarithm) and „sqrt(a)" (square root), and one bracket level.

Note

It is not possible to use a calculated channel in another calculation. If you save a series of measurements with a calculated channel, this can be used in the new file for other calculations.

Frequently used formulas

Important hint

We have checked the formulas shown here thoroughly, but cannot take any responsibility for their correctness and the realization of the desired result. Please check whether the formula brings the intented result.

Name	Formula	Remarks
Power	p1*Q1/600	p1 = pressure (bar), Q1 = volume flow rate (l/min)
Cylinder force	p1*A	p1 = pressure (bar), A = piston area of the cylinder (cm²)
Force of a double-acting cylinder	(p1*A1)-(p2*A2)	p1 = pressure (bar) on side 1 of the piston, A1 = piston area (cm²) of side 1; p2 = pressure (bar) on side 2 of the piston, A2 = piston area (cm²) of side 2
Speed	f'(s1)	1. derivation of the way, measured either on an analog or a frequency channel
Motor power	2*3.141592654*n1*M1	n1 = rotational speed (U/min), M1 = torque
Piston speed in cm/min	Q1/A	
Piston speed in cm/s	Q1/60/A	Q1 = volume flow rate (l/min), A = piston area of the cylinder (cm²)
Piston speed in mm/s	Q1/6/A	
Square root	sqrt(p1)	p1 = pressure (bar)

7.1.3   Use search function

PROFESSIONAL   FULL   BASE

Use the search function to search for arbitrary texts in the headers of measurement files. The contents of the headers are also displayed under the register „Details" of the HYDROcom explorer:

| Selection | Search results | Details | Statistics |

Training2.MWF

Attribute	Value
Company	Hydrotechnik GmbH 65549 Limburg
Instrument	MultiSystem 5060
Serial number	826
Measurement name	110809-10_54-001.MWF
Folder	C:\Training
Name of source file	110809-10_54-001.MWF
Recording from	11.08.2009 10:54:00
Scan rate	5 ms
Recording time	10 sec
Data records	2001
Channels	p1 p2 Q1 dp1
Triggerrecord	1
Trigger settings	
Comment	

Use the search function, e.g. to find all measurement series that had been recorded at a certain day or by a certain measuring instrument (serial number).

1. Highlight the desired folder in the register "Selection".
2. Enter the desired text into the search box at the lower edge of the HYDROcom explorer:

Search
MultiSystem 5060
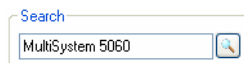
3. Click on 🔍 to run the search.
4. The search result will be displayed under the register „Search results".

7.1.4 Export parts of the presentation

PROFESSIONAL | FULL | BASE

Line diagrams and tables can be exported as measuring files after being placed and formatted in a presentation:

1. Create a line diagram or a table.
2. Execute the desired modifications (e.g. add or delete channels, filtering, smoothing, ...).
3. Select the command "Processing – Save as ...":
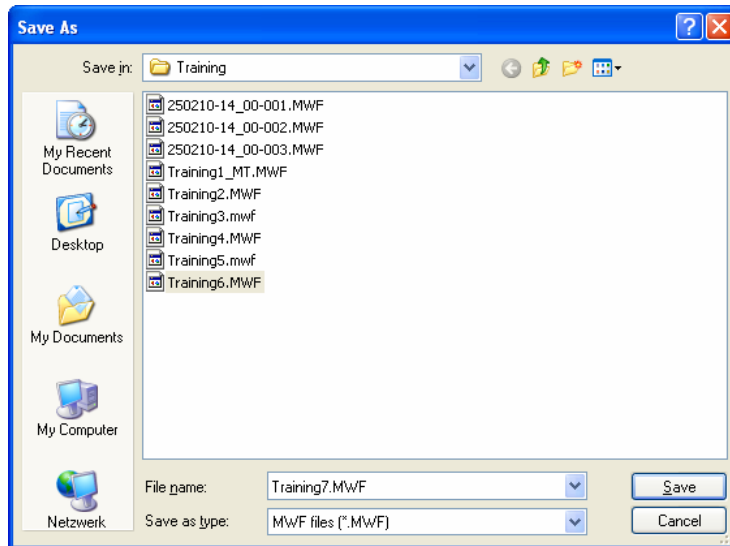
4. Select whether you want to save a standard mwf-file, or a mwf-file in the new XML-format (both can be read with HYDROcom 6, only).
5. Select the folder for the file.
6. Enter a file name and then click on [Save].

7.1.5 Expand layout section

PROFESSIONAL | FULL | BASE

It is possible to expand the current layout section to the size of the application window. Then it might be easier to estimate details, but the editing functions are nearly completely disabled.

1. Highlight the layout section that you want to expand.
2. Click the button 🔍 to expand the layout section.
3. Click the same button again to reduce the size of the layout section, again.

7.2 Edit line diagram

PROFESSIONAL   FULL   BASE

You may use a broad range of tools to edit a line diagram:

Format	modifies the look of the line diagram (background, axes, curves, labels)
Scaling	change the scaling automatic or manually
Add elements	adds texts, pictures or arrows to the diagram
Smooth	smoothes the curves by calculating averages
Spot	shows a vertical line to read measured values from the curves
Zoom	enlarges the display of diagram areas
Move	moves curves along the x-axis
Difference measurement	shows two vertical lines to determine the differences between arbitrary curve positions

If you modify a series of measurement (e.g. by smoothing, moving), a star symbol will be displayed in the left lower corner of the layout section. This indicates measurement series that are not original series from a measuring instrument.
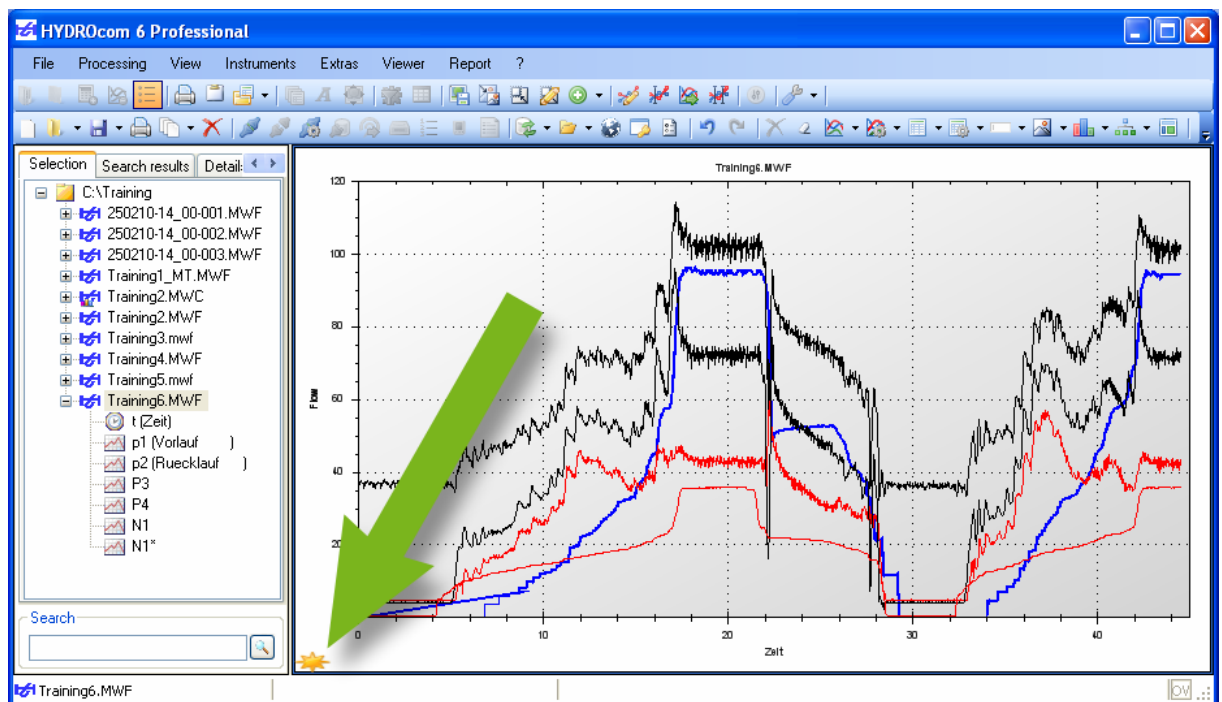
7.2.1   Edit line diagram format

PROFESSIONAL   FULL   BASE

You may modify the look of these elements of a line diagram:

- Line diagram
- Axis elements
- Line elements

7.2.1.1   Format a line diagram

PROFESSIONAL   FULL   BASE

Double-click into the data area of the line diagram. Pay attention not to double-click on a curve or axis:
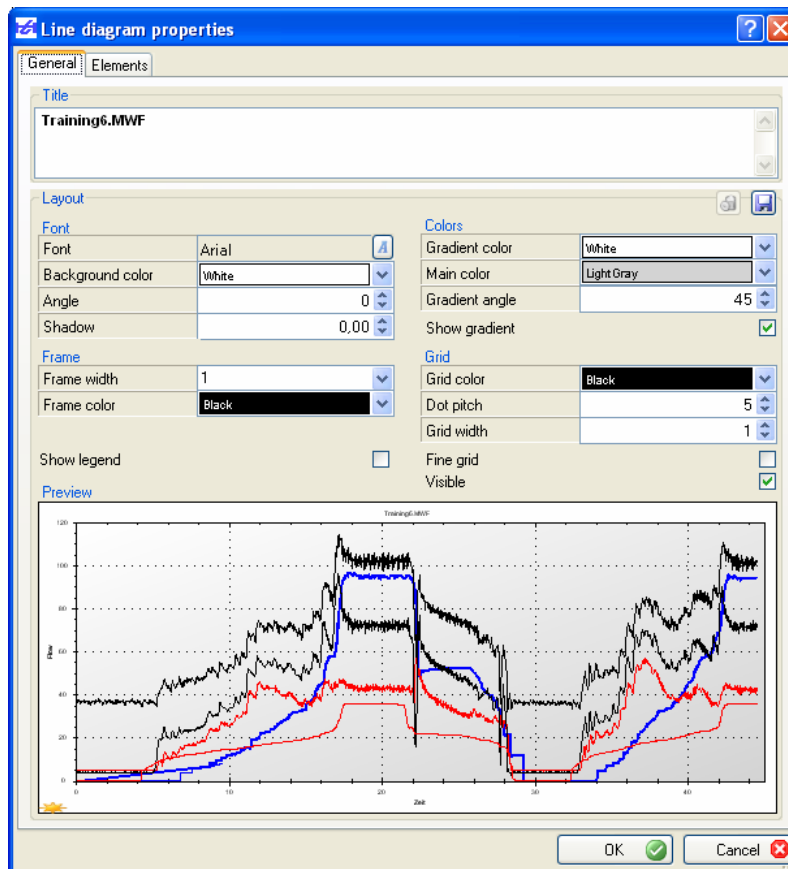
Register general

Here you may modify the look of the diagram. The upper part of the dialog contains the formatting options, the preview below shows the effects of changes instantly.

Title   the name of the measurement file is used as standard; you may enter any text as title

Font   the font of the title; click on ⓐ to select a different font or size

Background color	select the background color for the title
Angle	enter a value to rotate the title
Shadow	enter a value to display a shadow beneath the title in the entered distance
Frame width	set the width of the frame around the diagram; set 0 if you do not want a frame
Frame color	select the color for the frame
Show legend	select whether a legend with all curves and elements shall be displayed
Gradient color	select a color for the gradient in the data area of the diagram
Main color	select a color for the background of the data area
Angle	set the angle for the gradient
Show gradient	select whether a gradient shall be displayed as background of the data area
Grid color	select a color for the grid lines
Dot pitch	the grid is drawn with dotted lines; set the distance between two dots; entering "0" will result in solid grid lines
Dot width	set the thickness of the grid line dots
Fine grid	enable this option to display a close-meshed grid
Show grid	toggles the visibility of the grid
🖫	saves the current settings as standard
🔄	resets the standard properties to factory settings

Click on [OK] to save the settings and close the dialog.

Register Elements
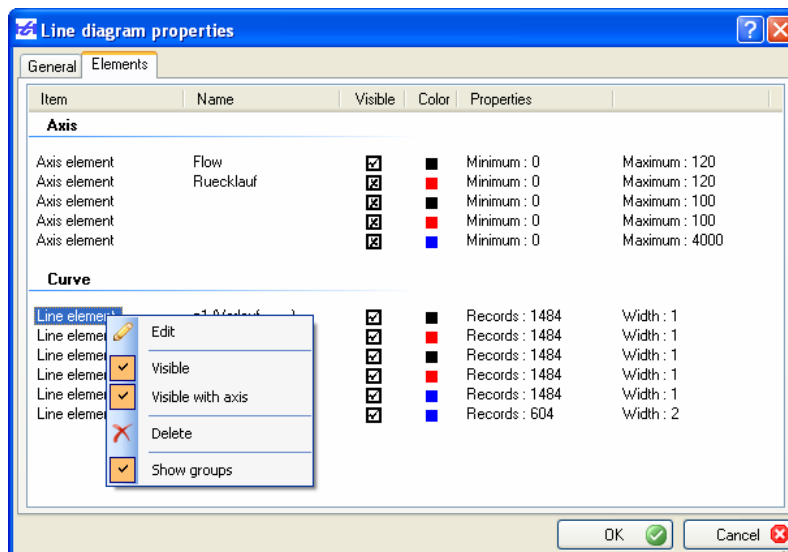
Here you may format axes, lines and all placed elements (text, picture, arrow) of the diagram. Right-click an element to display the context menu. Here you may choose one of up to four commands:

Edit	opens a dialog to modify the element properties
Visible	toggles the visibility of the element
Visible with axis	toggles the visibility of element and scaling; to display the curve, only, you should disable this option and then enable the option 'Visible'
Delete	deletes the element
Show groups	toggles the group view of the elements on/off

Note

Double-click the first column of each element to toggle its visibility.

7.2.1.2   Format line diagram axes

PROFESSIONAL   FULL   BASE

You may edit label, color and scaling for all axes. Double-click the desired axis:
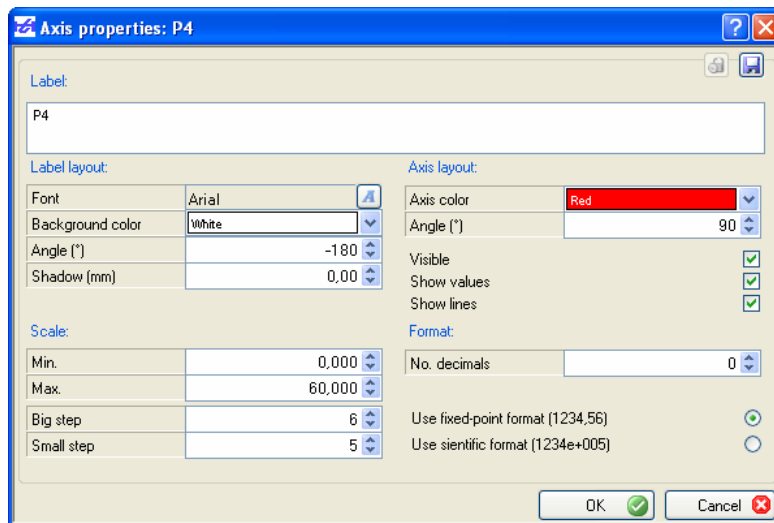
Here you may set the look of the axis element.

Label	the channel name from the measurement file is used as a standard; you may edit it as desired
Font	the current font of the label; click on the icon to select a different font and size
Background color	select the background color of the label
Angle	you can rotate the label by setting an angle
Shadow	enter a value to display a shadow beneath the label in the entered distance
Scale – Min	enter the start value of the axis
Scale – Max	enter the end value of the axis

Main segments	set the number of main segments for the scale (main segments can be labelled)
Sections	set the number of sections within one main segment
Axis color	select a color for the axis and the labels
Angle	you can rotate the axis label by setting an angle
Visible	toggle the axis visibility on/off
Show values	toggle the visibility of the main segment labels on/off
Show lines	toggle the visibility of the axis lines on/off
Decimals	set the number of decimal places for the main segment labels
Use ... format	select the style for the main segment labels (fiexed-point or scientific)
🖫	saves the current axis settings as standard
🗑	deletes the saved standard settings and uses factory settings

Click on [OK] to save the changes and close the dialog.

7.2.1.3   *Format line diagram lines*

PROFESSIONAL   **FULL**   **BASE**

The look of all curves (lines) in a diagram can be modified. Double-click on the desired line:
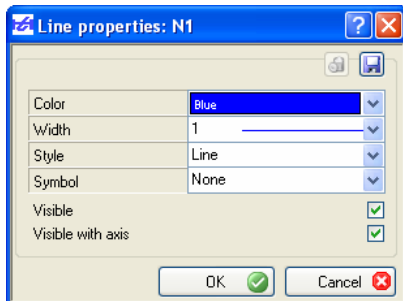
Color	select the line color
Width	select the line width
Style	select the line style
Symbol	select a symbol that shall be displayed on the line
Visible	toggle the visibility of the line
Visible with axis	toggles the visibility of line and scaling; disable this option and then enable "Visible" to display the line without its scaling
🖫	saves the current settings as standard
🗑	resets the standard properties to factory settings

Click on [OK] to save the properties and close the dialog.

7.2.1.4 Change line diagram scaling

`PROFESSIONAL`   `FULL`   `BASE`

Scaling is the dimensioning of the line diagram that means the "length" of the x- and y-axes. If the scaling is reduced, the display of a part of the corresponding axis is enlarged. Changing the scaling effects the presentation of the values, only. Values outside the scaling limits remain in the file, but will not be shown.

You may choose one of two scaling options:

Automatic   the minimum and maximum values of each axis are rounded and used as scaling limits; all values will be displayed

Manual   you may enter the upper and lower scaling threshold for each axis; possibly not all values will be displayed; if the scaling has been changed, the entered values will be displayed when the dialog is opened again

Do a right-click into the line diagram, where you want to change the scaling. Select "Automatic scaling" (the diagram will be scaled instantly), or "Manual scaling" (or click on 🖼️):

Manual scaling

Channel	Name	Min. value	Max. value	Start value	End value
t	Time	0,00	44,49	0,00	45,00
p1	Flow	32,23	114,10	0,00	120,00
p2	Reflow	0,15	35,67	0,00	120,00
P3	Pump	1,84	79,81	0,00	100,00
P4	Cylinder	3,69	49,63	0,00	100,00
N1	-	0,00	3.212,00	0,00	4.000,00

OK ✓   Cancel ✗

The minimal and maximal data value are displayed for each channel. You may enter the desired scaling thresholds into the boxes "Start value" (lower threshold) and "End value" (upper threshold). Click on [OK] to save the modifications and close the dialog.

7.2.2   Add an element

`PROFESSIONAL`   `FULL`

You may add elements to a diagram, e.g. to indicate special areas:

- Text element
- Picture element
- Arrow element

You can add elements by doing a right-click in the diagram and then select "Add element – Text/Picture/Arrow" from the context menu, or click on the small black triangle in the button 🔵▾ and then on the corresponding entry in the submenu. Added elements can be formatted later.

HYDROcom6 | HYDROTECHNIK

7.2.2.1 Add text element

PROFESSIONAL   FULL

Do a right-click in the diagram and select the command "Add element – Text":
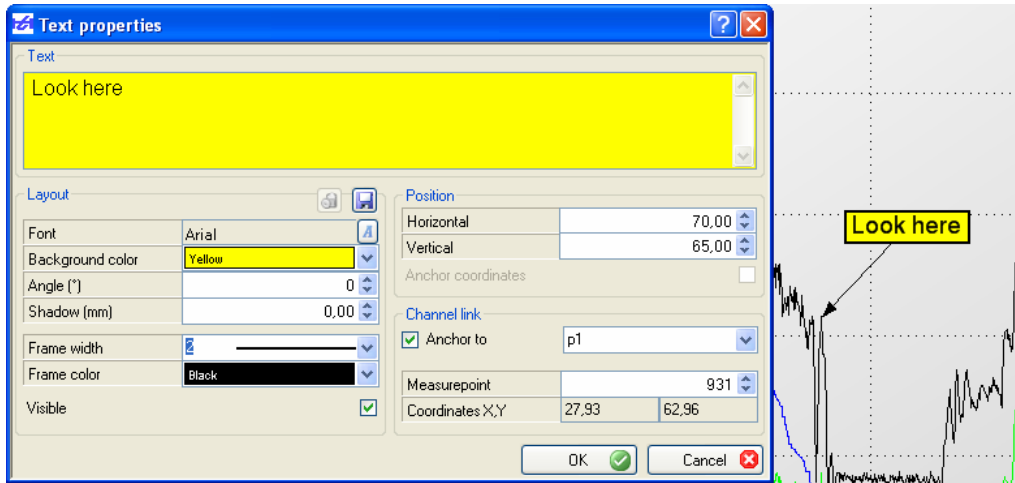
Font	click on ⍟ and select font and font size
Background color	select the color for the background of the text element
Angle	enter an angle to rotate the text element
Shadow	enter a value to display a shadow beneath the text in the entered distance
Frame width	select the line thickness of the frame around the text element; enter 0 to display no frame
Frame color	select a color for the frame
Visible	toggles the visibility of the text element; if it is invisible, you may open the register "Elements" of the line diagram formatting dialog to make it visible
Position	enter values for the horizontal and vertical distance of the text element from the diagram origin (you can move the text element later, too)
Anchor coordinates	if enabled, the text element will be moved if the line diagram is zoomed or moved; a channel link is not possible, then
Channel link	draws an arrow from the text element to the curve of a channel; select the channel from the drop-down list
Measure point	select the measured value of the selected channel where the arrow shall be positioned on
x/y coordinates	the coordinates of the selected measured value are shown here
🖫	saves the layout settings as standard that is used for all future text elements
⍟	deletes the saved standard settings

All modifications will be applied to the text element instantly, you can see a preview in the line diagram. Click on [OK] to save the settings and close the dialog.

7.2.2.2 Add picture element

`PROFESSIONAL` `FULL`

Do a right-click within the diagram and select the command "Add element – Picture" from the context menu:
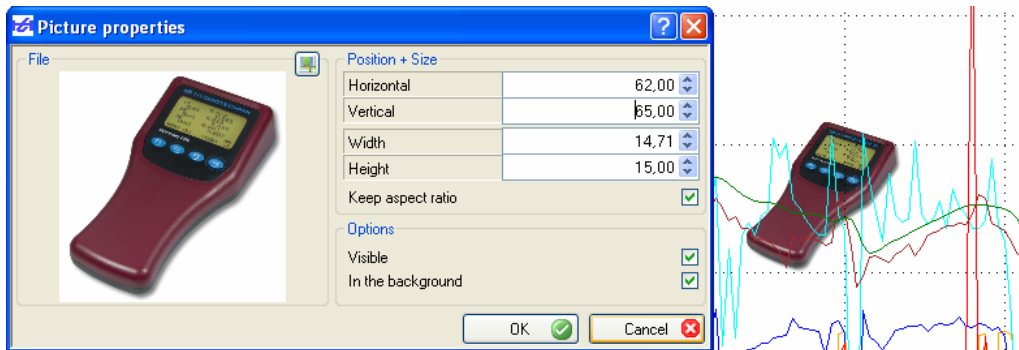
	click here and select the desired picture then
Horizontal / Vertical	enter values for the horizontal and vertical distance from the origin of the diagram (you can move the picture element later, too)
Width / Height	set the desired dimensions of the picture in the diagram
Keep aspect ratio	enable this option to keep the width-height relation when changing the picture size; otherwise the picture can be distorted when the size is changed
Visible	the picture is only visible if this option is enabled; if it is invisible you may open the diagram properties and see the register "Elements" to make it visible, again
In the background	enable this option to place the picture behind the curves of the diagram

All changes done in this dialog will be executed immediately in the diagram. Click on [OK] to place the picture element and close the dialog.

7.2.2.3 Add arrow element

`PROFESSIONAL` `FULL`

Do a right-click in the diagram and select the command "Add element – Arrow" from the context menu:
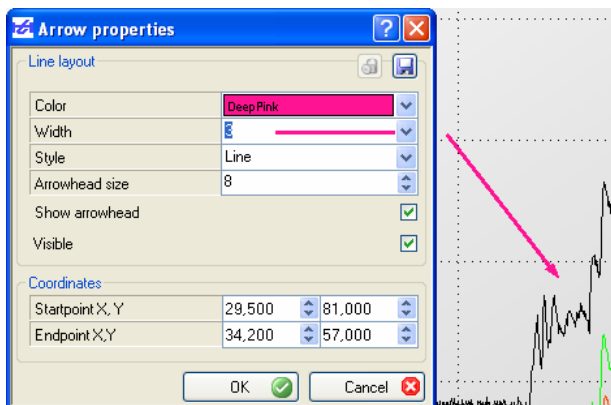
Color	select the color of the arrow
Width	set the line thickness

Style	select the desired line style
Arrow head size	set the size of the arrow head
Show arrow head	toggles the visibility of the arrow head
Visible	toggles the visibility of the arrow; if it is invisible, you can make it visible on the register "Elements" of the dialog for the formatting of line diagrams
Coordinates	set the corrdinates for the start and end point of the arrow; the arrow head will be displayed at the end point

All modifications will be executed instantly. You can see a preview of the arrow in the diagram. Click on [OK] to save the settings and close the dialog.

7.2.2.4   Modify elements

`PROFESSIONAL` `FULL`

Placed elements can be

- formatted
- moved
- deleted

Format an element

Double-click on an element to open the dialog with element properties:

- Text element (see section 7.2.2.1 on page 73)
- Picture element (see section 7.2.2.2 on page 74)
- Arrow element (see section 7.2.2.3 on page 74)

Execute the desired modifications and then click on [OK].

Move an element

Click on an element. Move the mouse and the element will follow. Click again (keep the mouse button pressed for about 0.5 seconds) to drop the element at the desired position.

Delete an element

Do a right-click on an element and select "Delete element" from the context menu. The element can be restored using the "Undo" function.

7.2.3   Smooth line diagram curves

If a measurement curve appears to be noisy, you may smooth it using an averaging method. These types are available:

Arithmetic average	the arithmetic mean value is calculated by adding a number of values and then dividing the sum by the number of values; the amount of data is reduced by that
Floating average	the mean value of a defined number of values distributed around it is calculated for each data value; the amount of data is not reduced (PROFESSIONAL only)
Median average	the mean value is calculated from a defined number of values after cutting the minimal and maximal values; it is used to eliminate peaks; compared with the arithmetic average it is more stable against outliers (PROFESSIONAL only)

Examples for the effects of the different averages are shown in section 7.2.4 on page 77. Right-click into the diagram and select the command "Smooth" in the context menu:
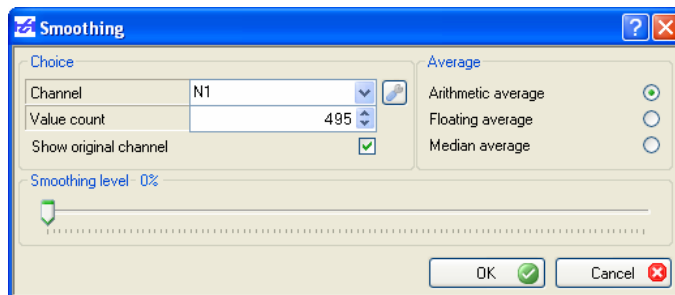
Channel	select the channel to be smoothed, it will be highlighted with a thick line; click on 🖉 if you want to edit the channel properties
Value count	the maximal possible filter is displayed here; this is the number of values that can be used to calculate the average; you may decrease the value
Show original channel	select whether the original curve shall be shown together with the smoothed curve
Average	select the desired averaging method (see above); the calculation of the floating and median average may cause an increased processor load and may take some time, especially with large measurement files; the calculation process is indicated by a bar diagram
Smoothing level	pull the slider to the right to increase the filtering strength; the displayed percentage is the amount of values (related to the maximum number) used for the averaging; the filter effect will be displayed in the curve instantly

Click on [OK] to save the modifications and close the dialog.

7.2.4 Effects of the different mean value calculations

PROFESSIONAL | FULL

Arithmetic mean value

The height of exisiting pressure peaks is minimzed, but you will see a phase delay. The new minimized pressure peak is visible at a time value before or after the original pressure peak. The delay depends on the number of values used for smoothing.

Floating mean value
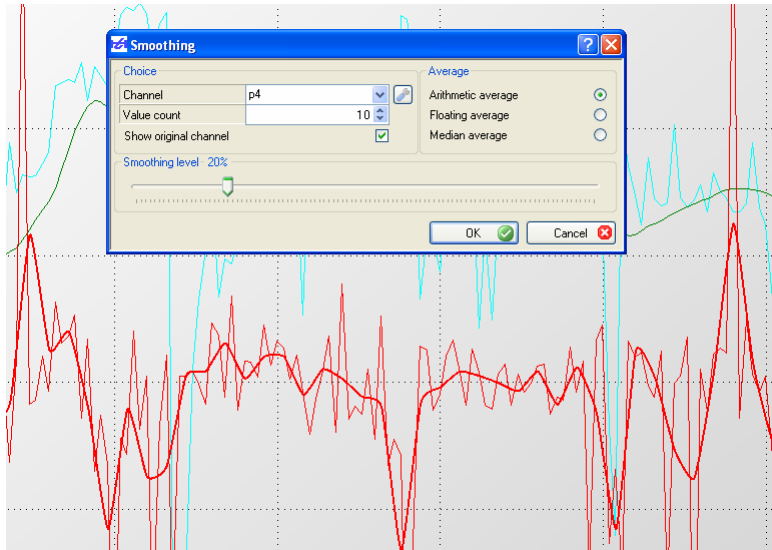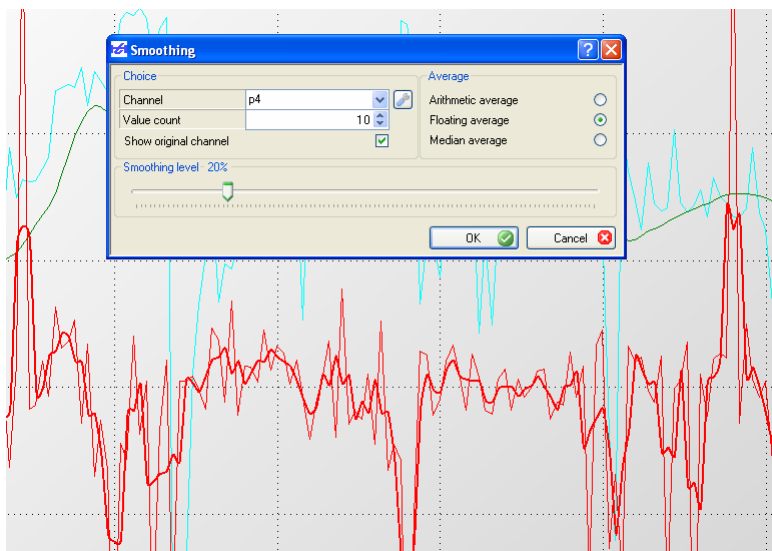
The height of existing pressure peaks is minimized like at the arithmetic mean value, but there is no phase delay. The new minimzed pressure peak is at the same time value like the original pressure peak.

Median mean value
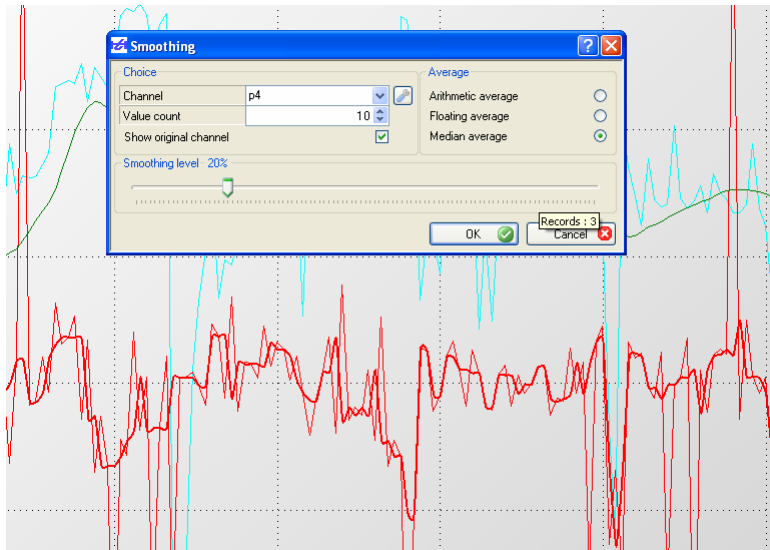
Existing pressure peaks are eliminated from the image without any phase delay.

7.2.5   Spot line

PROFESSIONAL   FULL

Use the spot line to analyse measuring data. Do a right-click into the line diagram and select the command "Spot" from the context menu. A vertical line and a box with measured values will be displayed:
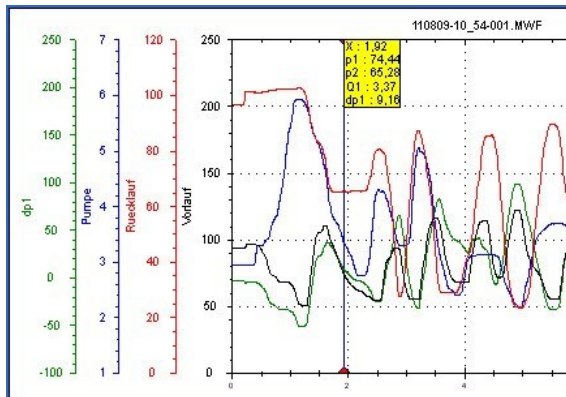
The measured values of all visible channels, where the spot line crosses their curves, are shown in the yellow box (formatted for better visibility).

Move spot line	position the mouse on the spot line value box (here colored in yellow), or on one of the red triangles, press and hold the left mouse button and pull the line to the right or left; the measured values in the box will be updated continuously; you may edit the size of the triangles in the dialog "Extras – Options – Line diagram"
Delete spot line	position the mouse on the spot line; do a right-click and select the command "Delete element" from the context menu

Show spot line values in a table	the values of one or several spot lines are contained under the register "Statistics" of the HYDROcom explorer; you may insert these values in a table
Shift value box	as a standard, the value box is positioned to the left of the spot line; position the mouse pointer on the value box and press the keys "Arrow left/right" on your keyboard to shift the values box cfrom left to right and vice versa
Configure value box	double-click in the spot line value box:
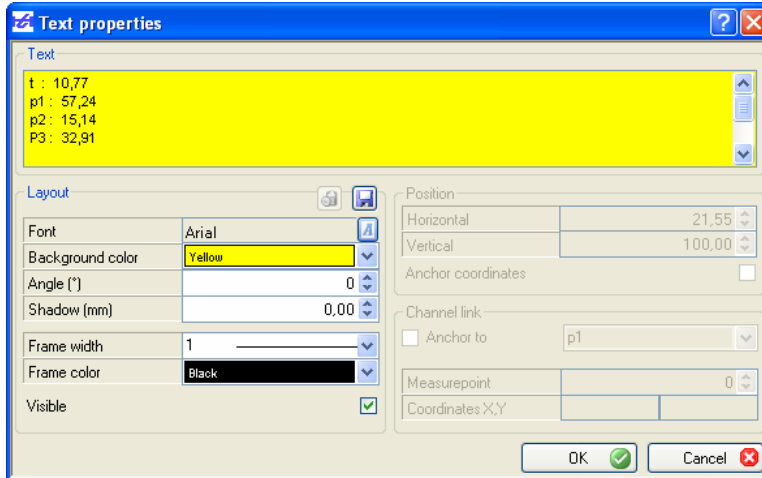
Font	click on [A] and select font and size
Background color	select a color for the background of the box
Angle	enter an angle to rotate the box
Shadow	enter a value to display a shadow beneath the characters in the entered distance
Frame width	select the thickness of the line around the box; enter 0 to display no frame
Frame color	select a color for the frame line
Visible	the box is only visible if this option is enabled
Position	the current position of the box is displayed here

All modifications will be applied instantly. View the diagram to see the preview of the box. Click on [OK] to save the settings and close the dialog.

7.2.6 Zooming

PROFESSIONAL   FULL   BASE

You may enlarge areas of a line diagram for better visibility. Choose one of two ways to do so:

Scroll wheel

- Turn the scroll wheel of your mouse to zoom in or out.
- Press and hold the scroll wheel to move the zoomed details.

[Alt] + pull

- Position the mouse in the diagram.
- Press and hold the [Alt]-key.
- Press and hold the left mouse button and draw a rectangle around the area that shall be zoomed.
- Release key and mouse button to apply the zooming.

Move zoomed detail

- Zoom into the line diagram.
- Position the mouse in the diagram.
- Press and hold the middle mouse button and pull the zoom detail to the desired position.

Undo zooming

Choose one of three ways to zoom out:

- turn the scroll wheel
- click the button ("Undo")
- click the button ("Original")

7.2.7   Move line diagram curves

PROFESSIONAL   FULL   BASE

You may shift curves of the line diagram on the x-axis. Do a right-click into the diagram and select the command "Move":
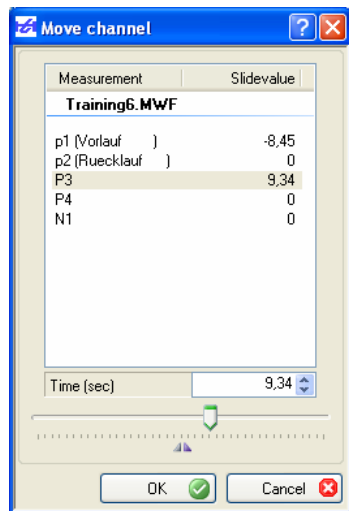
All channels of the line diagram are shown in the list. Now you may move a single, several, or all channel to the right and left. First you will have to highlight the desired channel(s):

Click   a left-click highlights a single channel
Ctrl-click   keep the Ctrl-key pressed and click all channels consecutively that you want to highlight
Shift-click   highlight a channel, press the Shift-key and highlight another channel; both channels and all between them will be highlighted

After highlighting at least one channel you may

- enter a time value
- set a time value by clicking the arrow keys
- use the slider

to shift the channel(s) along the x-axis. Click on [OK] to save the modifications and close the dialog.

If you want to move the complete diagram, press the middle mouse key and move the mouse. The diagram will be moved, too.

7.2.8 Difference measurement

PROFESSIONAL

For data analyses you may overlay line pairs that show the difference between two curve positions of each channel automatically. Do a right-click in the diagram and select "Difference" from the context menu:
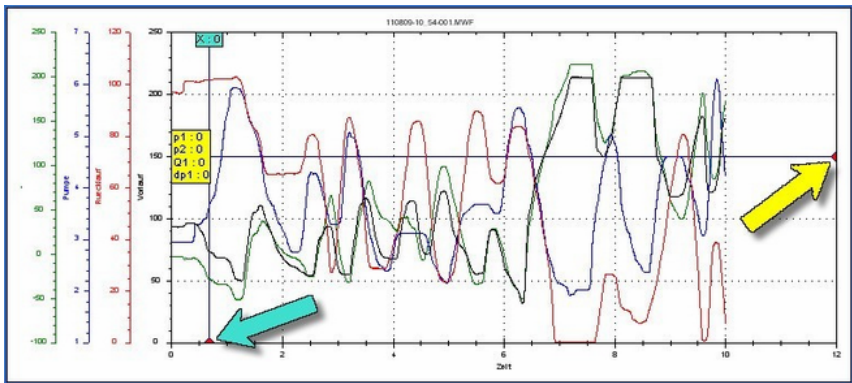
Note

For a better visualisation, the text boxes of the lines have been formatted and colored arrows were positioned in the diagram.

Position the mouse pointer on the red triangles of the horizontal and vertical line and pull the difference measurement lines to the desired positions:
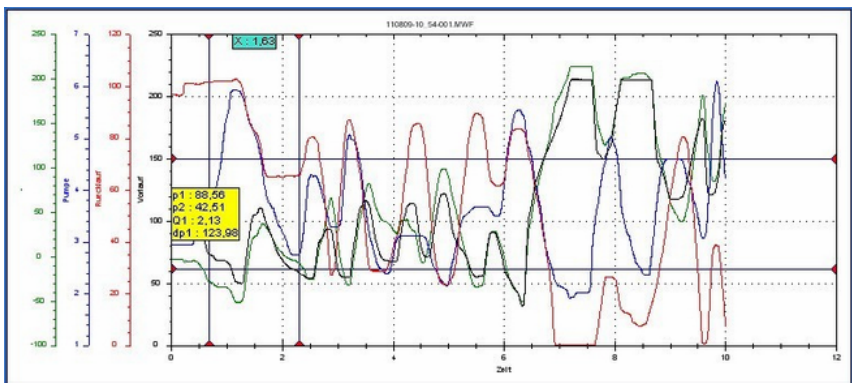
For all channels, the differences between the two positions, where the difference measurement lines cross the channel curves are shown in the text boxes. You may pull the red triangle of each line as desired. You may change the size of the triangles in the dialog "Extras – Options – Line diagram".

Delete difference measurement lines

Do a right-click on the text box of the difference measurement lines. Select the command "Delete element" from the context menu and confirm with "Yes".

Format text box of the difference measurement lines

Please see the section „Format text box of the spot line".

Show values of the difference measurement lines in a table

If one or several difference measurement lines are positioned, their values are shown beneath the register "Statistics" of the HYDROcom Explorer. These values can be placed in a table.

7.3   Edit table

PROFESSIONAL   FULL

You may use four functions to edit tables:

- filter and smooth a table
- add statistical data
- set print options
- create a compact table

7.3.1   Filter a table

PROFESSIONAL   FULL

Use filtering to edit a table, e.g. to display a certain range, only, or smooth the values. Do a right-click into the table and select the command "Filter options" in the context menu:
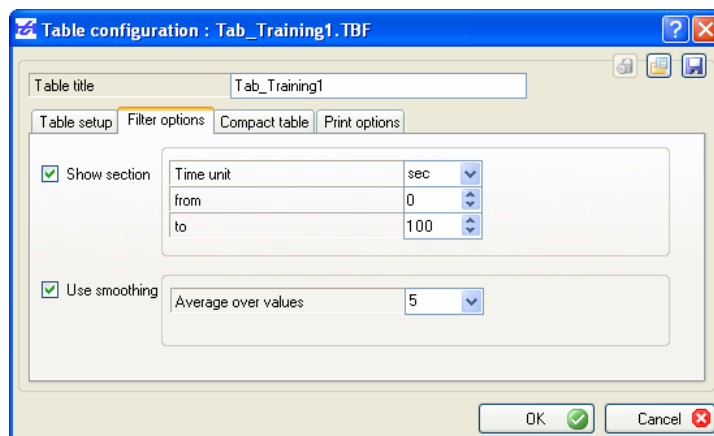
If you did not assign a configuration file to the table, you will first have to select one in the corresponding dialog. Then you will see the dialog shown above.

Enable the option "Show section" if you want to display a certain range of the table. Then select time unit, start (from) and end time (to) of the desired range. Enable the option "Use smoothing" if you want to smooth the table values using arithmetical averaging. Set the number of table values that shall be averaged at the option "Average over values". Click on [OK] to apply the filter to the table and close the dialog.

7.3.2 Table with statistical data

PROFESSIONAL   FULL

You may place statistical data in a table. Right-click into the table and select the command "Statistics" from the context menu. The calculated statistical data of the highlighted measurement series are added to the bottom of the table. If there are data in the table and the function "Overwrite" is disabled, these data will be overwritten after a corresponding confirmation. If "Overwrite" is enabled, the data will be overwritten without confirmation.
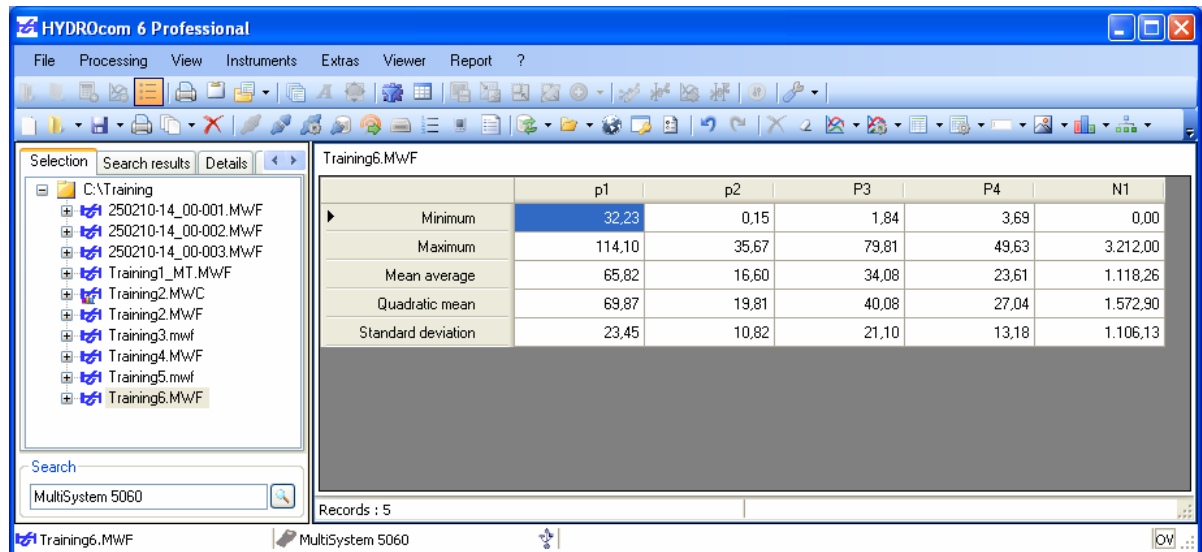
You may also place the values of spot lines in line diagrams into a table.

7.3.3 Table print options

PROFESSIONAL   FULL

Do a right-click into a table and select the command "Format – Edit" from the context menu. Click on the register „Print options":
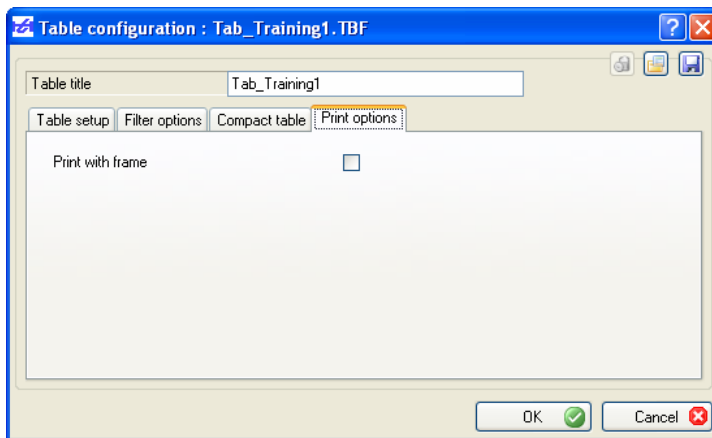
Here you may select, whether a frame shall be printed around the table. Click on [OK] to save the settings and close the dialog.

7.3.4 Create compact table

PROFESSIONAL   FULL

A compact table is used to give a quick summary of the tabular data of a measurement file. Insert a normal table into a layout section and then do a right-click into the table. Select the command "Compact table" in the context menu:

Training6.MWF

	t Time Second	P1	P2	P3	P4	N1
148	4,41	37,38	4,92	3,31	3,88	0,00
296	8,85	49,89	13,65	25,80	20,11	278,40
444	13,29	71,79	17,74	44,23	33,76	902,20
592	17,73	105,00	35,45	62,11	36,90	3.177,00
740	22,17	69,95	22,03	14,55	44,46	2.757,00
888	26,61	64,80	18,81	34,28	25,27	1.398,00
1036	31,05	36,46	0,15	3,31	3,88	0,00
1184	35,49	52,84	14,39	30,04	21,58	341,40
1332	39,93	79,15	21,02	48,28	33,76	1.498,00
1480	44,37	101,20	35,56	58,61	34,13	3.142,00

Records : 10   Filter : Compact table

Configure a compact table

The compact table is created with a configuration file that can be modified. Do a right-click into the compact table and select the command „Format – Edit":
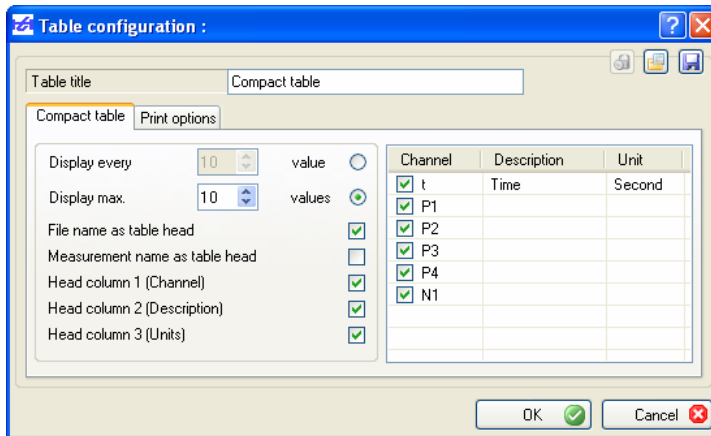
Display every ... value	enable this option and set a value; then the compact table will contain each x. value of the original table (with '10' and 2000 original values, the compact table will contain 200 values)
Display max ... values	enable this option and set a value; then the compact table will contain exactly this number of values
File name as table head	if enabled, the name of the measurement file will be used as head of the compact table
Measurement name as table head	if enabled, the name of the measurement series will be used as head of the compact table
Head column	
1 (Channel)	if enabled, the channel (measurand) will be displayed in the column head
2 (Description)	if enabled, the name of the measurand will be displayed in the column head
3 (Units)	if enabled, the units of the measurand will be displayed in the column head
Channel	enable all channels (Measurands) that shall be contained in the compact table

Click on [OK] to save the modifications and close the dialog.

7.4 Edit histograms

PROFESSIONAL   FULL

You may edit an histogram in four ways.

- Change format – double-click on the histogramm and continue below
- Format bars – double-click on a bar and continue here
- Apply automatic scaling
- Add elements

Format a histogram – Register 'General'
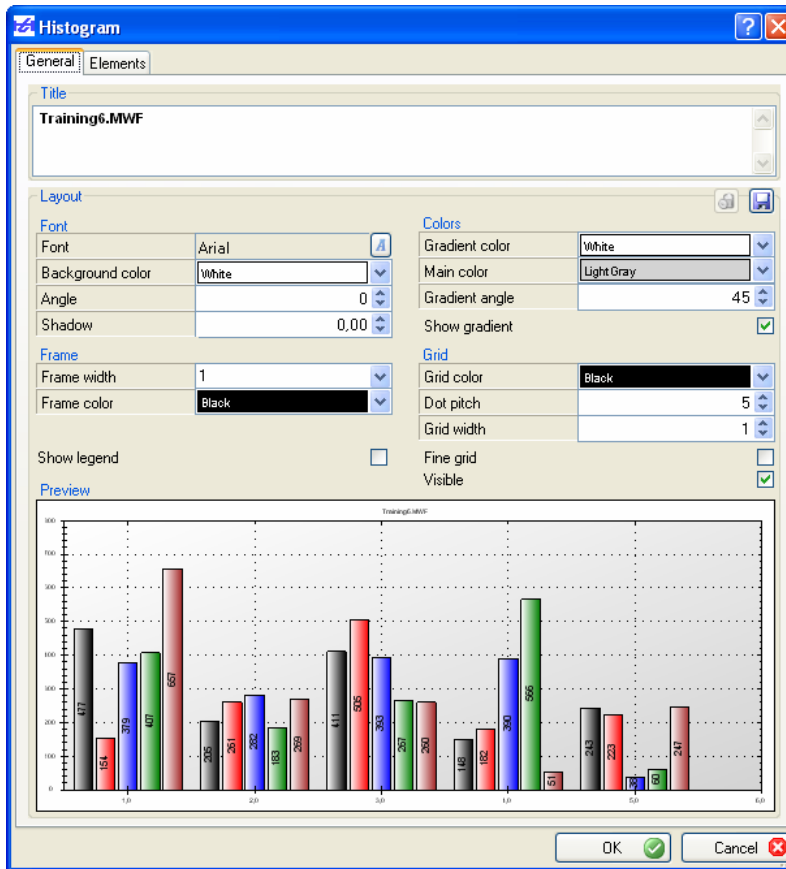
Here you can set the look of the histogram. The upper part of the dialog contains the formatting options, beneath you can see a preview where the effect of each modification is displayed instantly:

Title	the name of the measured data file is used as a standard, but you may append or overwrite it
Font	shows the used font; click on [A] to select a different font and size
Background color	select the background color for the title
Angle	you may rotate the title by entering an angle
Shadow	enter a value here to display a shadow beneath the title in the entered distance
Frame width	set the width of the frame around the histogram; width 0 means no frame
Frame color	select the frame color
Show legend	if enabled, a legend will be displayed for each bar of the histogram
Gradient color	select a color for the gradient in the data area of the histogram
Main color	select a color for the background of the data area
Gradient angle	set the desired angle for the color gradient

Show gradient	the color gradient will only be displayed if this option is enabled; otherwise the main color will be displayed, only
Grid color	select a color for the lines of the grid
Dot pitch	the grid consists of dotted lines; here you set the distance between two dots; the entry 0 results in solid lines
Grid width	set the thickness of the grid lines here
Fine grid	enable this option to use a close meshed grid
Visible	this option switches the grid on and off
	saves the current settings as standard
	deletes the standard settings and resets them to factory settings

Click on [OK] to save the modifications and close the dialog.

Format a histogram – Register 'Elements'
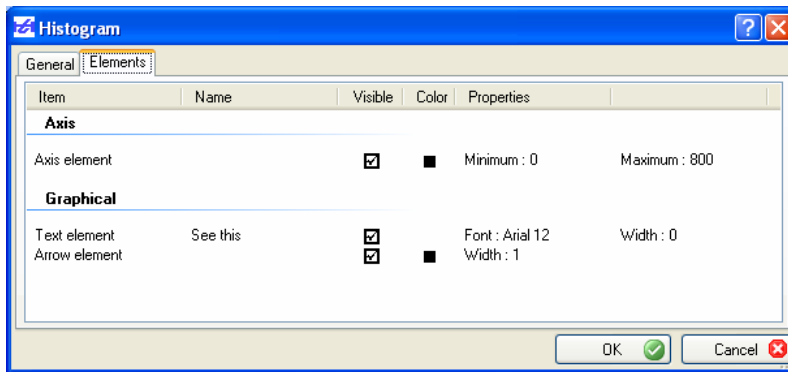
Here you may format the axes of the histogram and all placed elements (text, picture, arrow). Do a right-click on an element to display the context menu. There you will find four commands:

Edit	opens the dialog with all formatting options of the element
Visible	select whether the element shall be displayed, or not
Delete	deletes the element
Show groups	switches the grouped arrangement of the elements on or off

7.5   Edit pictures

PROFESSIONAL   FULL

Pictures placed in layout sections can be edited with one function, only. Do a right-click in the picture and select the command "Stretch". The picture will be scaled until it fills the complete layout section, what may cause distortions.

7.6   Edit texts

PROFESSIONAL   FULL

Only the look of text placed into text layout sections can only be edited. Do a right click into the layout section and select the command "Font" from the context menu:

Select the desired font and set the format options. Then click on "OK" to apply the modifications to the text in the layout section.

---

8   Configuration files

8.1   Benefits of configuration files

`PROFESSIONAL`   `FULL`

The use of configuration files can ease your work with HYDROcom enormously. You can define many properties of several presentation elements in these files. This achieves a high consistency in the look of your presentations, and a dramatical reduction of the formatting efforts.

Configuration files can be saved for four presentation elements:

- Line diagrams
- Histograms
- Classifications
- Tables

For all presentation elements there are some general commands when working with configuration files.

8.2   General commands for configuration files

`PROFESSIONAL`   `FULL`

Four commands relate to the configuration files in the context menus of the presentation elements:
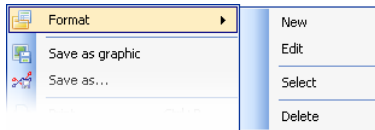
New	opens the dialog to create a new configuration file
Edit	opens a dialog where you can open the configuration file that you want to modify; if a configuration file has already been loaded, this will be opened for modification
Select	opens a dialog where you can select a configuration file to be assigned to the layout section
Delete	undoes the assignation of the configuration file to the layout section; the file will not be deleted, the standard configuration file will be assigned

There are three icons displayed in the configuration file definition dialogs that have always the same meanings:

saves the configuration file
loads a saved configuration file
deletes the opened configuration file (only active if a configuration file has been loaded before)

8.3   Line diagram configuration files

`PROFESSIONAL`   `FULL`

Line diagram configuration files can be

- defined
- assigned
- removed
- edited
- deleted

8.3.1 Define line diagram configuration file

Two cases must be distinguished when defining a new line diagram configuration file:

- Configuration file in an empty line diagram layout section
- Configuration file in a line diagram layout section with a placed measurement series

### *8.3.1.1 ... in an empty layout section*

Do a right mouse click in a line diagram layout section. Select the command "Format – New" from the context menu:
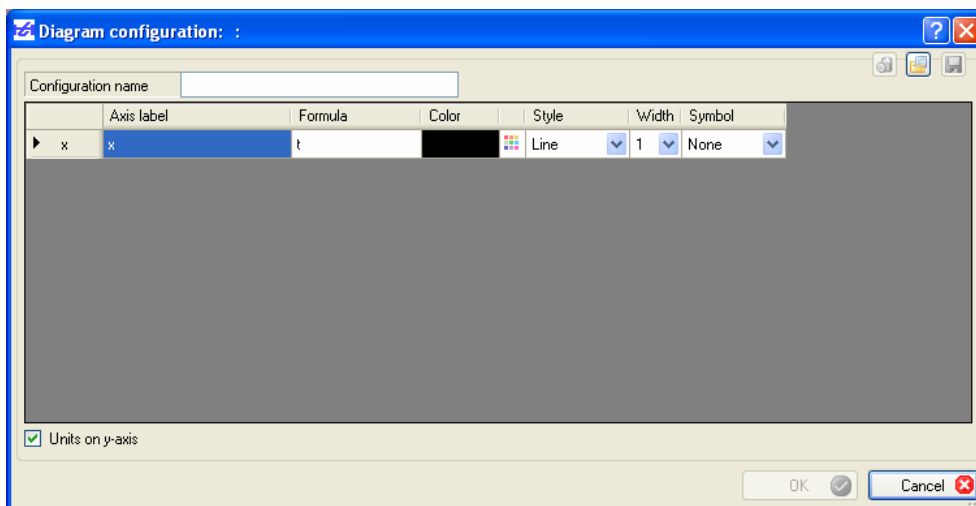
During the definition of the configuration file, you enter a name for the diagram and define its elements. The x-axis is pre-defined and the time is assigned to it, what can be changed, if desired.

1. Enter the name of the diagram into the box „Configuration name".
2. If desired, change the x-axis element:

- click into the box "Axis label" and enter the desired label
- click into the box „Formula" and enter the measurand or calculation formula for the x-axis
- click on ⠿ and select the desired line color
- select line style, width and symbol

3. Do a right mouse click into the dark grey area and select "Add" from the context menu:
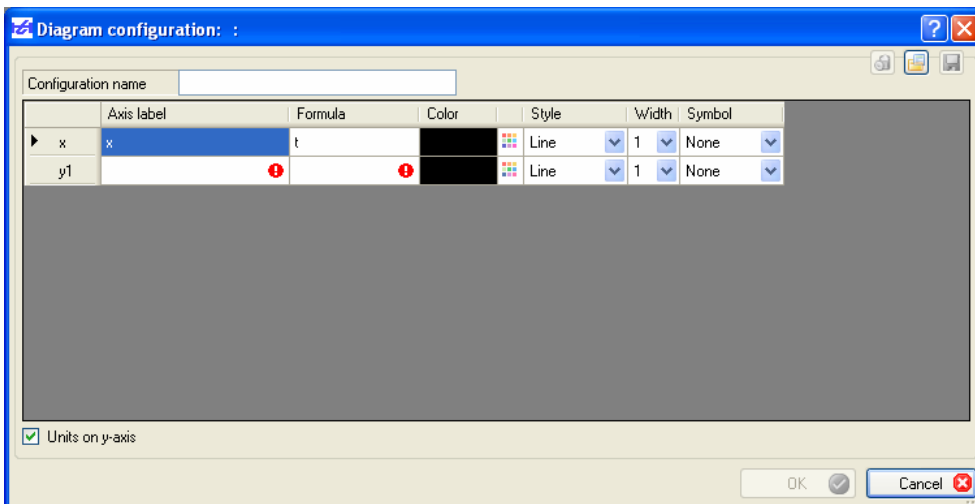
4. Enter the text for the axis label.
5. Press the [Tab] key, the cursor jumps into the next cell.
6. Enter the formula for the diagram element. This can be a channel of the series of measurements that shall be displayed as line diagram, or a calculation with channels, mathematical operators and constants.
7. Do the required line layout settings by clicking 🏭, and setting the options "Style", "Width" and "Symbol".
8. Repeat steps 3. to 7. and define all elements of the line diagram:
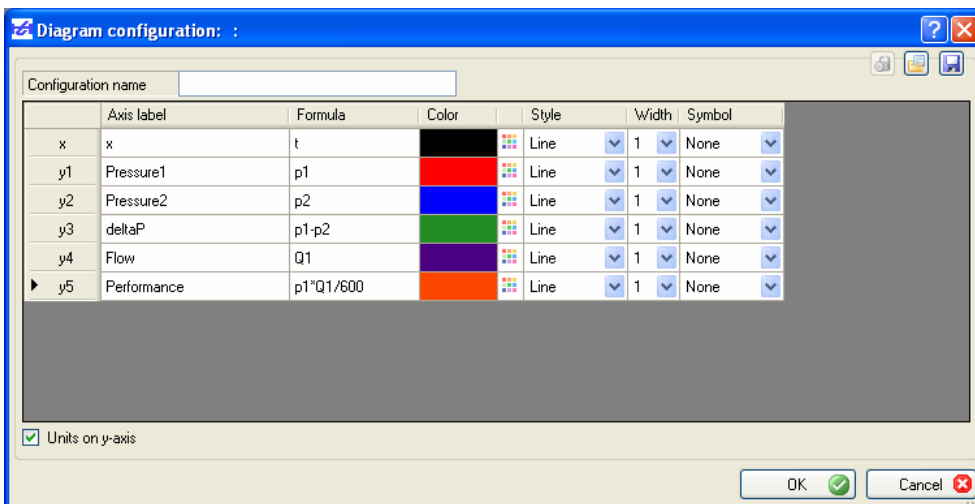
In the example shown, the line diagram takes the measurands p1, p2 and Q1 from the measured value file and draws their curves in different colors. Two calculated elements are added, the pressure difference as y3-axis and the pump performance as y5-axis.

9. Enable the option „Units on y-axis" if the units shall be displayed at the axes.
10. Click on 💾 to save the line diagram configuration file:

---
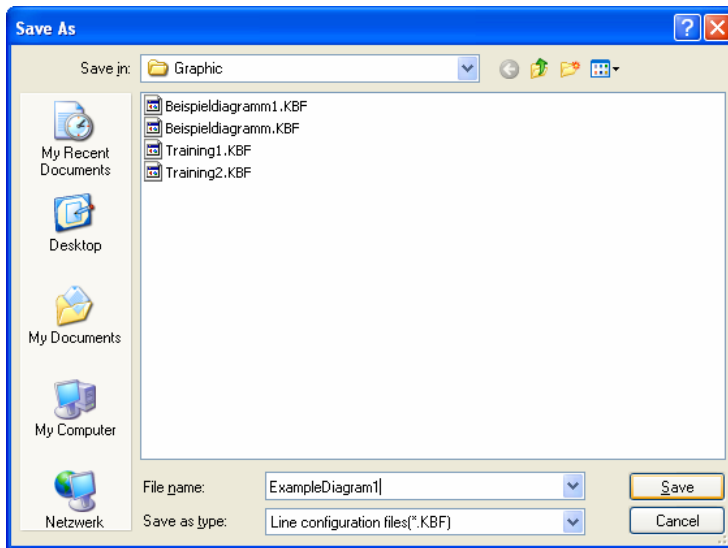
11. Enter the file name and click on "Save".
12. Click on [OK] to apply the configuration file to the layout section. The button is only active, if at least one y-channel has been defined and all information in the list is fault-free. Incorrect entries are marked with warning labels.

8.3.1.2 ... at an existing line diagram

PROFESSIONAL | **FULL**

Do a right-click into the diagram layout section. Select the command "Format – New" from the contect menu:
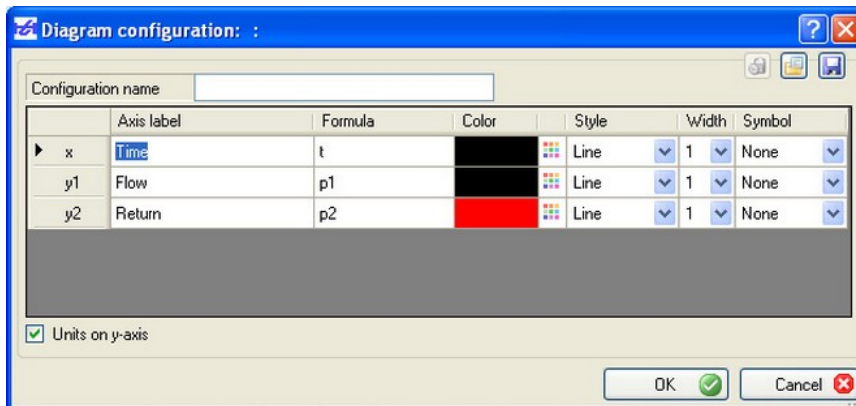
The channels of the placed series of measurements are shown as elements of the new diagram. You may freely delete elements or add new. First enter the title of the diagram and then define the elements.

1. Enter the new diagram name into the box "Configuration name".
2. First you want to delete the element p1. Do a left-click on the box "p1" to highlight it.
3. Do a right-click on the highlighted cell and choose the command "Delete" from the context menu (the x-axis cannot be deleted):

---
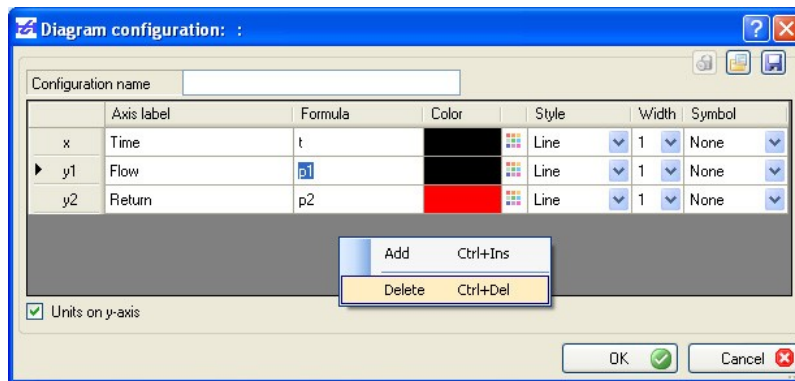
4.   Do a right-click onto the dark grey area and select the command " "Add" from the context menu:
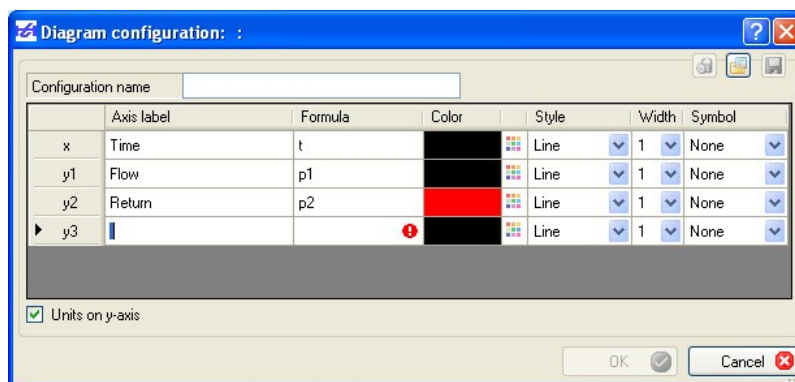
From here the procedure is identic to that for the definition of a configuration file in an empty layout section. Please continue in step 3 there.

8.3.2   Assign a configuration file tp a line diagram

PROFESSIONAL   **FULL**

You may assign a configuration file to an empty line diagram layout section, or to a section, where a measurement series has been placed, already.

1.   Do a right-click into the layout section.
2.   Select the command "Format – Select" from the context menu:
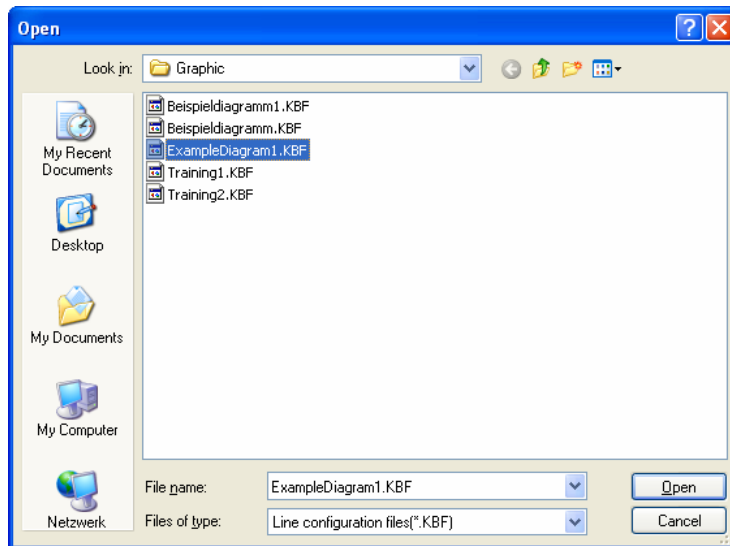
3.   Highlight the desired configuration file.
4.   Click on "Open" to assign the configuration file.
5.   If not done before, drag a measurement file into the layout section. The diagram will be calculated and displayed:
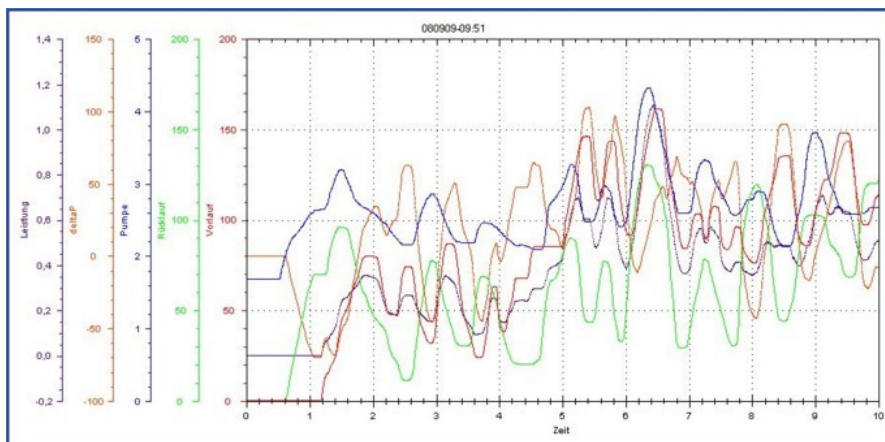
8.3.3   Remove configuration file from a line diagram

PROFESSIONAL   FULL

You can only remove a configuration file, if one had been assigned before. Do a right-click into the layout section and select the command "Format – Delete" from the context menu. The configuration file will be removed and the standard configuration will be assigned. The configuration file will not be deleted.

8.3.4   Edit configuration file of a line diagram

PROFESSIONAL   FULL

Do a right-click into a line diagram layout section. Select the command "Format – Edit" from the context menu. The assigned configuration file will be opened and displayed. If no configuration file is assigned, you will first have to select the desired configuration file.

Do the desired modifications as described in section 8.3.1 on page 90. If you want to keep the original configuration file, you should save the modified with a different file name. Otherwise the old file will be overwritten.

8.3.5   Delete a configuration file

PROFESSIONAL   FULL

Do a right-click into a diagram layout section and select the command "Format – Select" from the context menu. Do a right-click on the file that you want to delete and select the respective command from the context menu:
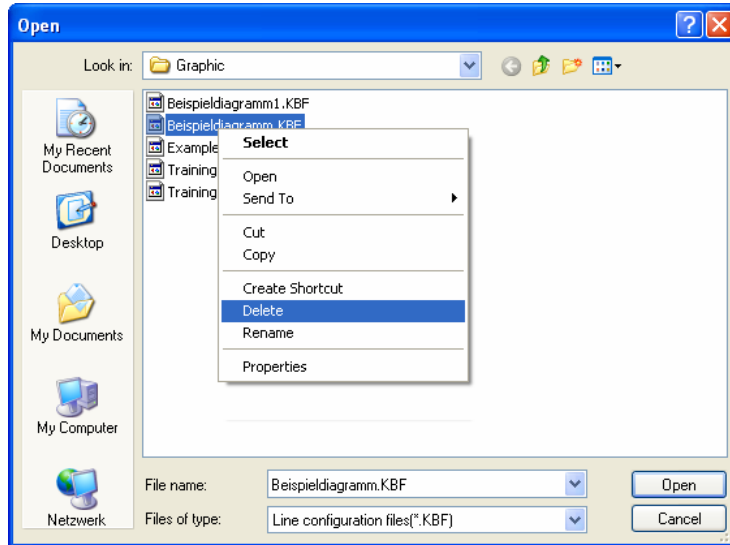
You may also click on the button [icon] in the dialog for the definition of a configuration file to delete a loaded configuration file.

8.4   Histogram configuration files

PROFESSIONAL   FULL

Histogram configuration files can be

- defined
- edited

8.4.1   Define a histogram configuration file

PROFESSIONAL   FULL

You define a new histogram configuration file when placing a series of measurements in a histogram layout section. Please see the section 6.2.3 on page 54 for more information. Click on [icon] after defining all options to save the configuration file:
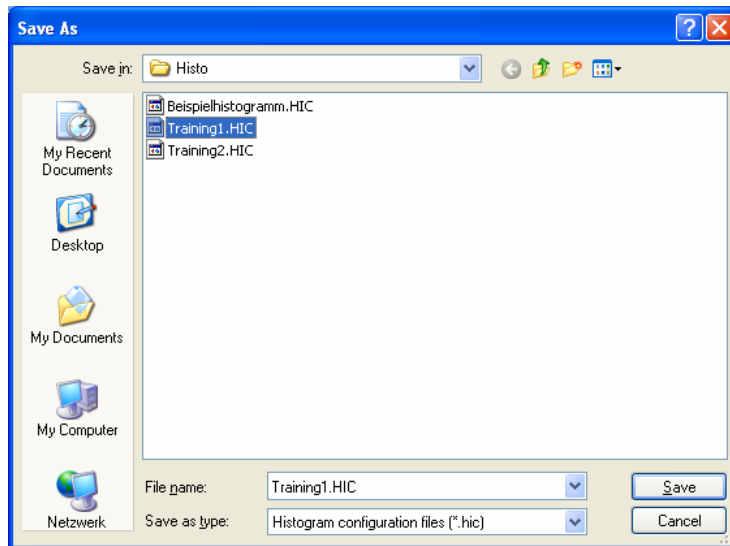
Enter the desired file name and then click on „Save".

8.4.2   Edit a histogram configuration file

`PROFESSIONAL`   `FULL`

Do a right-click on the histogram and select the command "Format – Edit" from the context menu. The configuration file will be opened and displayed. Alternatively you may also double-click on a bar of the histogram to open the configuration file.

Do all modifications as desired and described in the section 6.2.3 on page 54. If you want to keep the original configuration file, you should save the modified file with a different file name. Otherwise the old file will be overwritten.

8.5   Classification configuration files

`PROFESSIONAL`

Classification configuration files can be

- defined
- edited

8.5.1   Define a classification configuration file

`PROFESSIONAL`

You define a new histogram configuration file when placing a measurement file in a classification layout section. Please see the section 6.2.4 on page 55. Click on 🖫 after setting all options to save the configuration file:
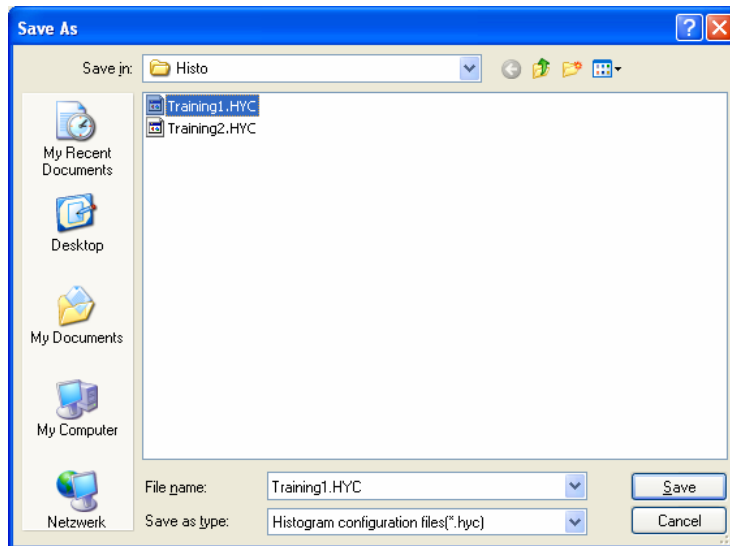
Enter the desired file name and then click on "Save".

8.5.2   Edit a classification configuration file

PROFESSIONAL

Do a right-click into a classification and select the command "Format – Edit" in the context menu. The configuration file will be opened and displayed. As an alternative you may also double-click on a classification to open the assigned configuration file.

Do all modifications as desired, like described in the section 6.2.4 on page 55. If you want to keep the original configuration file, you should save the modified with a different file name. Otherwise the original file will be overwritten.

8.6   Table configuration files

PROFESSIONAL   FULL   BASE

Table configuration files may be

- defined
- assigned
- removed
- edited
- deleted

8.6.1   Define a table configuration file

PROFESSIONAL   FULL

You have to distinguish two cases when defining a new table configuration file:

- Configuration file in an empty table layout section
- Configuration file in a table layout section with placed measurement series

8.6.1.1 ... in an empty layout section

PROFESSIONAL   FULL

Do a right mouse click into the table layout section. Select the command "Format – New" from the context menu:
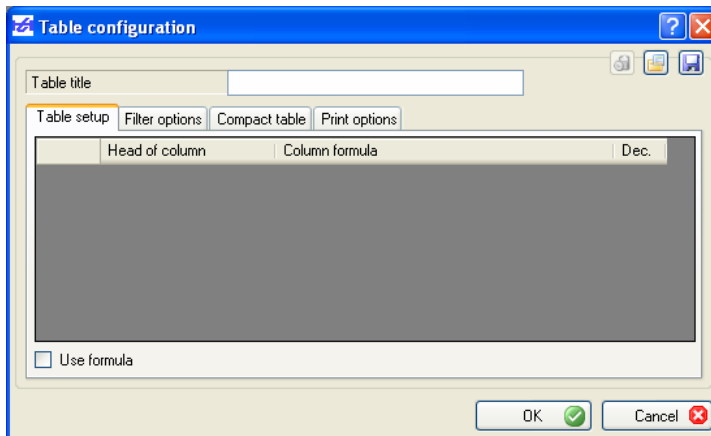
1. Enter a name into the box "Table title".
2. Do a right mouse click into the dark grey table section and select "Add" from the context menu:
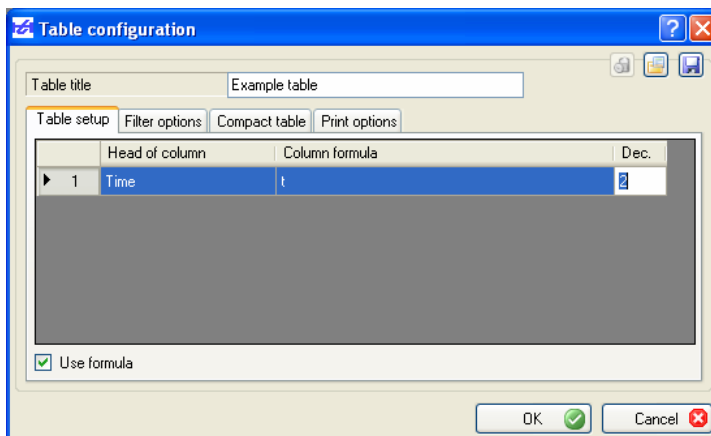
3. Enter the text that shall be used as column header.
4. Press the [Tab] key, the cursor jumps into the next cell.
5. Enter the formula for the column. This can be a channel of the series of measurements that you want to insert into the table, or a calculation with channels, mathematical operators and constants.
6. Press the [Tab] key, the cursor jumps into the next cell.
7. Enter the desired number of decimal places for the values in this table column.
8. Repeat steps 2. to 7. and define all columns of the desired table:
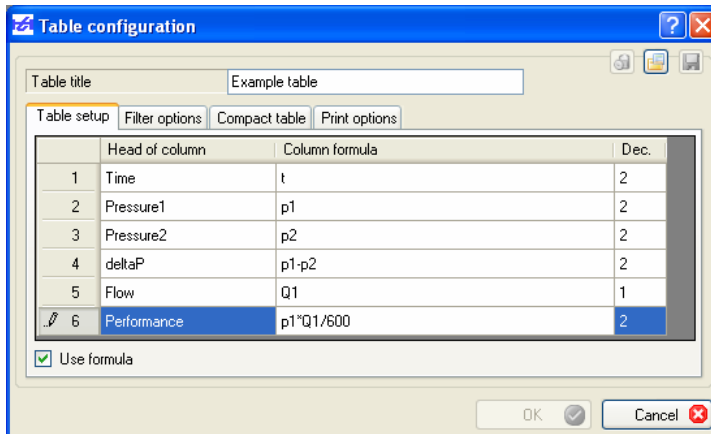
In the example shown here, the table gets the measurands p1, p2 and Q1 from the measurement file. Two other columns are filled with calculations: column 4 shows a simple pressure difference between p1 and p2, column 6 contains the calculation of the pump performance.

> 9.   Enable the option "Use formula" to have the entered columns calculated.

Note

You can also use a table configuration file to define a compact table or the filtering of data. In this case you should disable this option to avoid calculations in the columns.

> 10.   Click on the register „Filter options".
> 11.   Define the Filter settings for the desired table.
> 12.   Click on the register „Compact table".
> 13.   Define the settings for the desired Compact table.
> 14.   Click on the register „Print options".
> 15.   Define the print options as desired.
> 16.   Click on 🖫 to save the table configuration file:
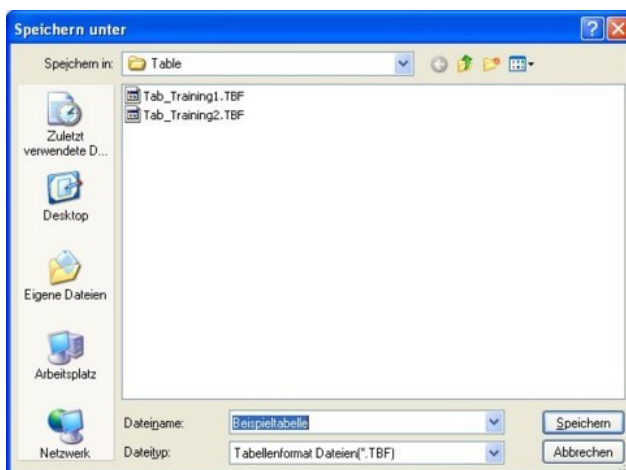
17. Enter the file name and click on "Save".
18. Click on [OK] to use the settings. The button is only active, if at least one column has been defined and all entries in the list are correct. Incorrect entries will be marked with a warning plate.

8.6.1.2   ... at an existing table

PROFESSIONAL   FULL

Do a right-click into the table layout section. Select the command "Format – New" from the context menu:
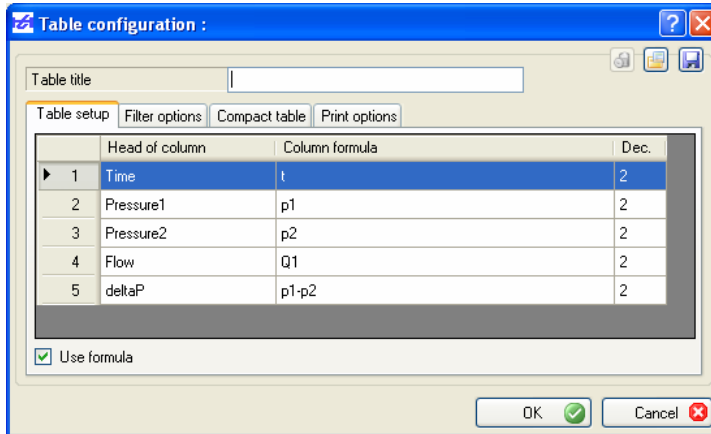
The channels of the series of measurements are displayed as columns of the new table. You are free to delete or add columns. First enter the table title and then define the table columns:

1. Enter the name of the table into the box "Table title".
2. At first you want to delete column 5. Do a left mouse click on the cell "5" to mark the line.
3. Do a right mouse click on the marked cell and select the command "Delete" from the context menu:
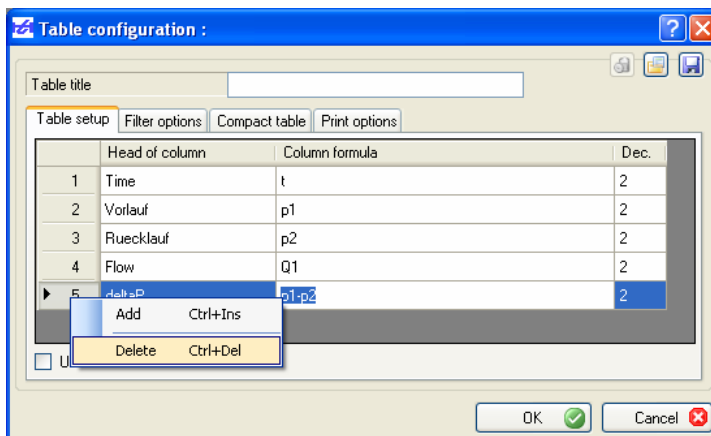
4. Do a right mouse click in the dark grey section of the table and select the command "Add" from the context menu:
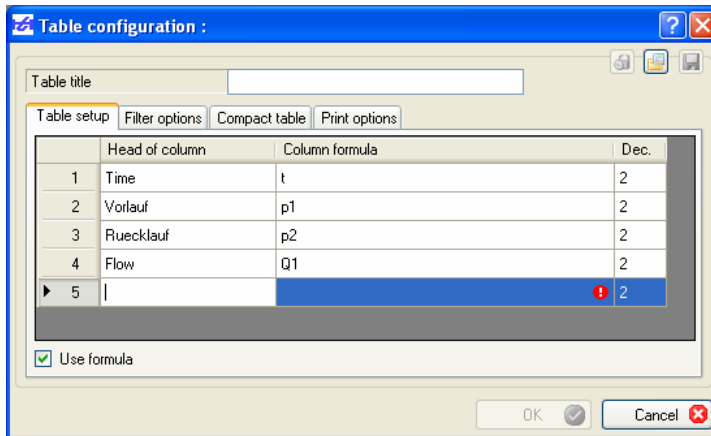
From here, the procedure is identic to that described in section 8.6.1.1 on page 98. Please continue with step 3. there.

8.6.2 Assign a table configuration file

`PROFESSIONAL` `FULL`

You may assign a configuration file to an empty table layout section, or to a section where a measurement series has been placed, already.

1. Do a right-click into the layout section.
2. Select the command "Format – Select" from the context menu:
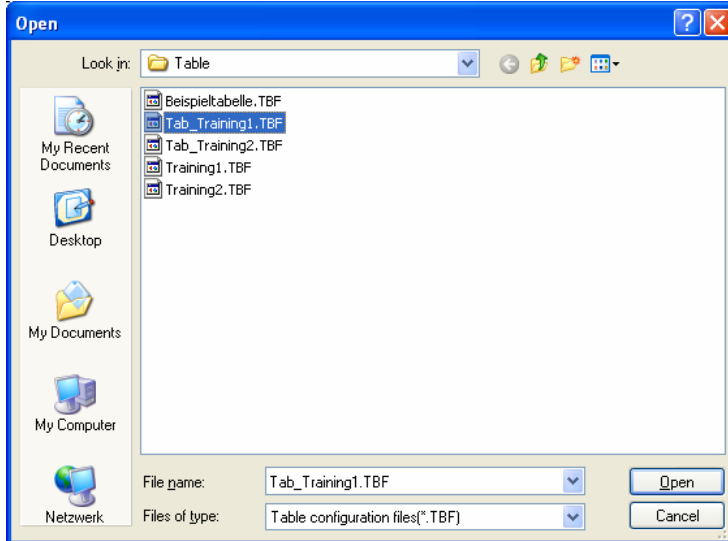
3. Highlight the desired configuration file.
4. Click on "Open", the configuration file will be assigned to the layout section.
5. If not done before, place a measurement series in the layout section. The table will be calculated and displayed:

Tab_Training1						
	Vorlauf p1	Rücklauf p2	Pumpe Q1	deltaP p1-p2	Leistung p1*Q1/600	
▶ 1	36,09	0,17	---	35,92	---	
2	35,73	0,15	---	35,58	---	
3	36,83	0,17	---	36,66	---	
4	37,01	0,17	---	36,84	---	
5	37,20	0,17	---	37,03	---	
6	37,38	0,17	---	37,21	---	
7	37,20	0,15	---	37,05	---	
8	36,65	0,15	---	36,50	---	
9	36,65	0,15	---	36,50	---	
10	36,65	0,17	---	36,48	---	
Records : 1484			Filter : Tab_Training1			

The name of the assigned configuration file is displayed beneath the table (Filter: Tab_Training1). The columns are created, calculated and labelled as defined in the configuration file.

8.6.3 Remove a table configuration file

PROFESSIONAL   FULL

Do a right-click in a table layout section and select the command "Format – Delete". The configuration file will be removed and the standard configuration will be assigned. The configuration file will not be deleted.

8.6.4 Edit a table configuration file

PROFESSIONAL   FULL

Do a right-click in a table layout section. Select the command "Format – Edit". The assigned configuration file will be opened and displayed. If no configuration file is assigned to the layout section, you will first see a dialog to open a configuration file.

Do all modifications as desired like described in section 8.6.1 on page 97. If you want to keep the original configuration file, you should save the modified with a new file name. Otherwise the original file will be overwritten.

8.6.5 Delete a table configuration file

PROFESSIONAL   FULL

Do a right-click into a table layout section and select the command "Format – Select" from the context menu. Do a right-click on the file to be deleted and select the command "Delete" from the context menu:
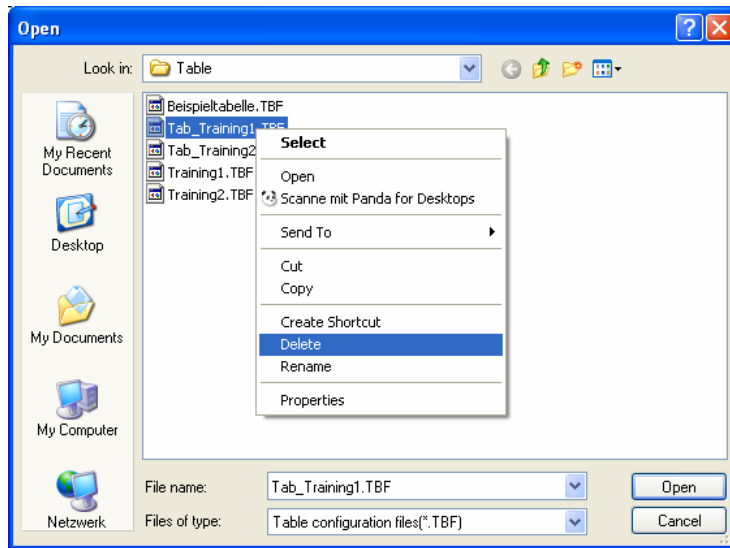
You may also click on in the dialog for the creation of configuration files to delete the loaded configuration file.

HYDROTECHNIK

---

9 Use a presentation

9.1 Save a presentation

PROFESSIONAL   FULL   BASE

Choose one of three possibilities:

- save complete presentation
- save a single layout section
- save a measurement file

9.1.1 Save complete presentation

PROFESSIONAL   FULL

A complete presentation is saved in the Hydrotechnik presentation format (*.hyw). It can be opened for further use or modifications.

    1.   Create the presentation.
    2.   Select the command "File – Save as – Presentation":
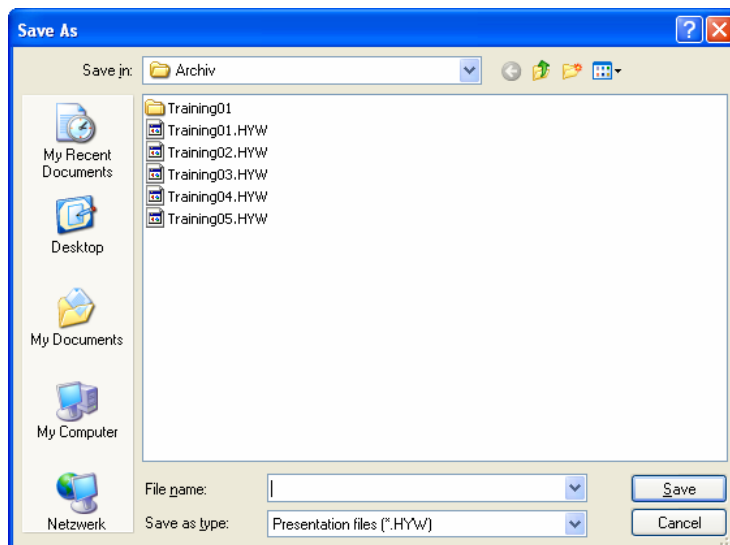
    3.   Select the folder where you want to save the presentation.
    4.   Enter a file name.
    5.   Click on [Save].

9.1.2 Save a layout section

PROFESSIONAL   FULL   BASE

You may save layout sections of the types 'Line diagram', 'Classification' and 'Histogram' as image files. You may choose from several picture formats allowing the later use in other applications (e.g. word processor, calculation software, a.s.o.). Layout sections saved as graphics cannot be modified with HYDROcom anymore.

HYDROTECHNIK

1. Highlight the layout section that you want to save as graphic.
2. Select the command "Processing – Save as graphic":
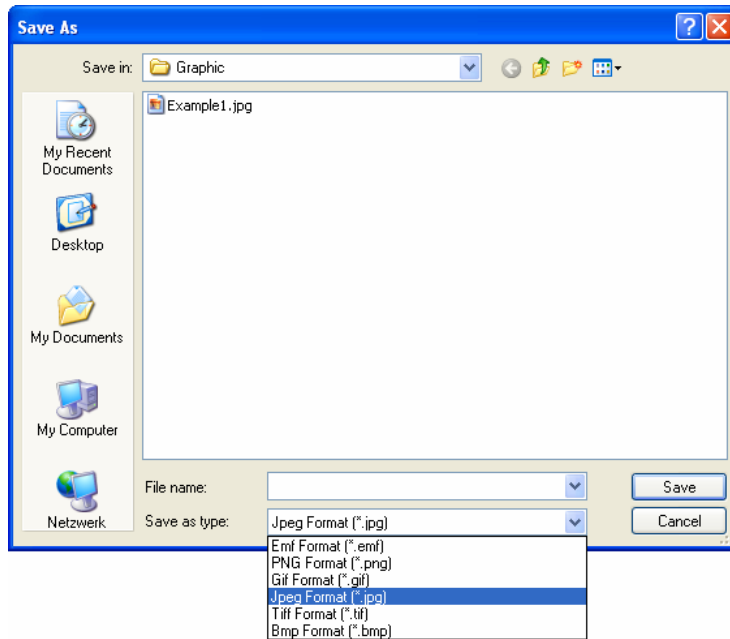
3. Select the folder where you want to save the graphic.
4. Enter a file name.
5. Select the desired file format.
6. Click on [Save].

9.1.3 Save a measurement series

PROFESSIONAL   FULL

After working with a measurement series (e.g. adding a calculated channel) or combining several channels, you may save a new measurement file (*.mwf):

1. Create a line diagram, or a table with the desired modifications.
2. Select the command "File – Save – Measurement":
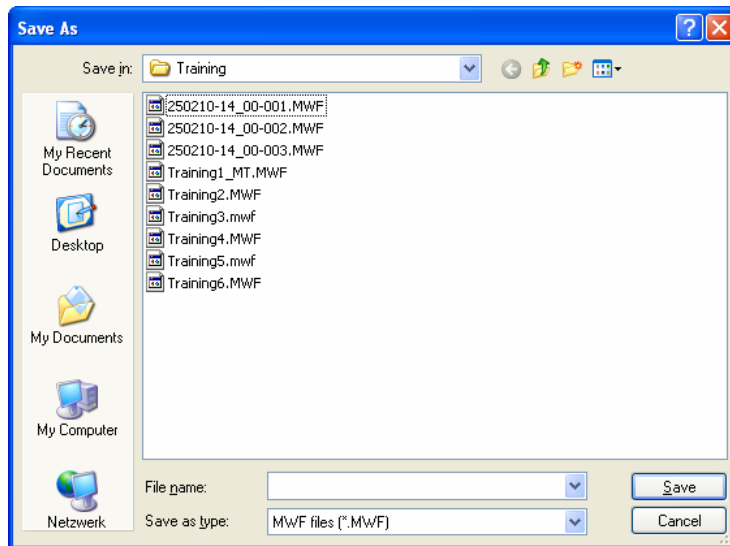
3.   Select the folder where you want to save the file.
4.   Enter a file name.
5.   Click on [Save].

The new mwf file may be used for presentations and calculations like a 'normal' measurement file.

9.2   Print a presentation

PROFESSIONAL   FULL   BASE

You may print a presentation on any printer connected to your computer. Select the command "File – Print":
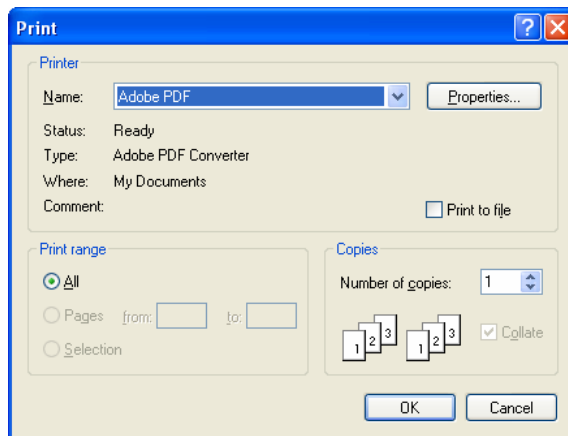
Select the desired printer, set all options and click on [OK]:
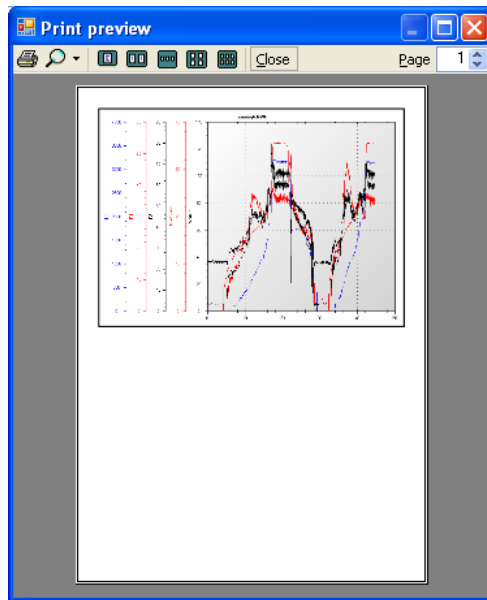
A print preview of the presentation will be displayed, if the option "Print preview" in the Dialog "Options – printing and tables" is enabled. If the presentation does not fit on one page, it will be printed on the required number of pages. Use the buttons to display the other pages or zoom into the preview.

Click on 🖨 if you are satisfied with the printing result. The presentation will be printed. Click on [Close] to close the preview.

9.3 Copy & paste a presentation

PROFESSIONAL   FULL   BASE

You may copy layout sections into the clipboard to paste them into other applications (e.g. word processors). Highlight the desired layout section and select the command "Processing – Copy". If you want to copy all layout sections, you may use the command "Viewer – Copy all elements". Open the target application and paste the content there. Line diagrams, classifications, histograms and picture are transferred as pixel images, texts and tables as editable texts.

9.4 Transfer a presentation

PROFESSIONAL   FULL

If you want to transfer a presentation to a different computer, you should enable the option "Save presentation with a copy of corresponding files" in the dialog "Extras – Options – General".

Then save the presentation and a sub-folder will be created in the standard folder that gets the same name like the presentation file. The presentation and copies of all used files (e.g. measurement series, pictures, a.s.o.) will be saved there. Then transfer the complete folder to the target computer, where you may open the presentation and work with it as usual.

10 Report

10.1 Report function

Using this function you only need a few mouse clicks to create attractive reports from one or several presentations. Reports are created with a separate application that is started out if HYDROcom directly. Click on the menu "Report" or on the button :
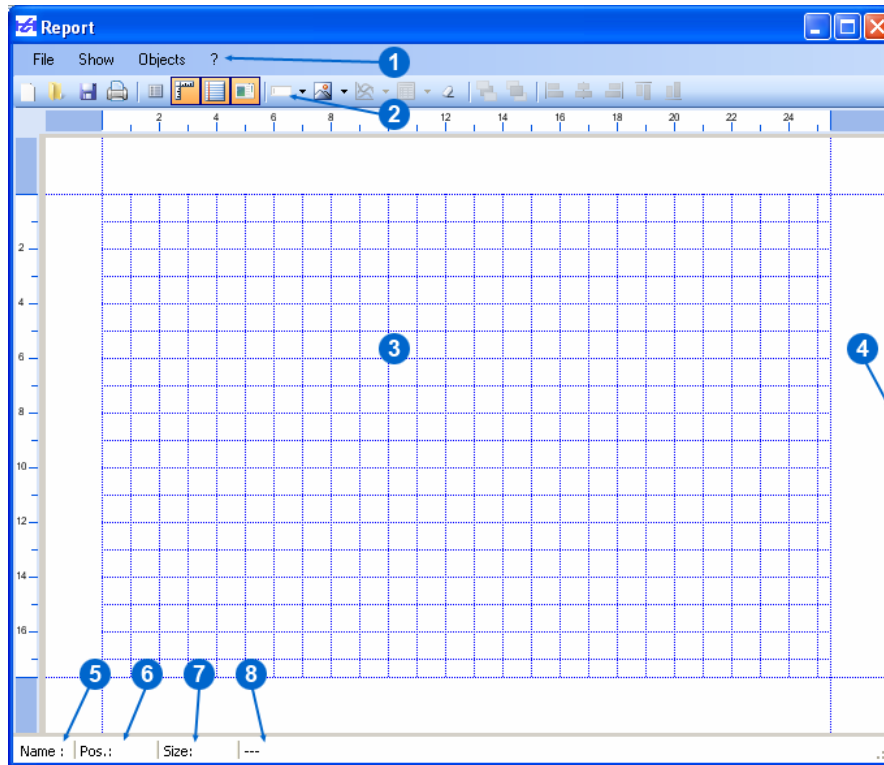
You can distinguish eight sections beneath the title bar with the name of the application and the standard buttons of the operating system:

1. Menu bar with operation menus containing all commands/functions
2. Icon bar with buttons for the most important commands/functions
3. Working area where reports can be composed
4. Margin area: indicates the size of the report sheet
5. Report name; is shown after the first saving
6. Current object/cursor position
7. Dimensions of the object
8. Information box for current commands and functions

10.2 Compose a report

PROFESSIONAL

You have to execute these steps to compose a report:

- Setup working area
- Place report elements

10.2.1 Report working area setup

PROFESSIONAL

You can setup the working area of your report with these functions:

- Select page format
- Set margins
- Show/hide ruler and grid

10.2.1.1 Select page format

PROFESSIONAL

The standard format of a report is DIN A4 (210 x 297 mm) in normal orientation. Select the command "Show – Layout" to change this:
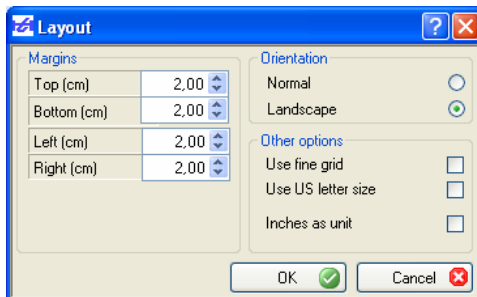
You can now rotate the page to landscape orientation and select the "US letter" format (216 x 279 mm). Additionally you may choose "Inch as units". Confirm your settings with a click on [OK].

10.2.1.2 Set page margins

PROFESSIONAL

In the shown start display the page margins are not shown. Click on 📋 or select the command "Show – Margins":
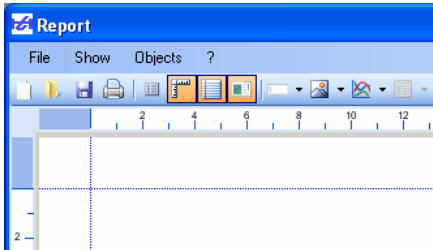
The page margins are displayed as blue lines. Double-click on the report page to modify them:
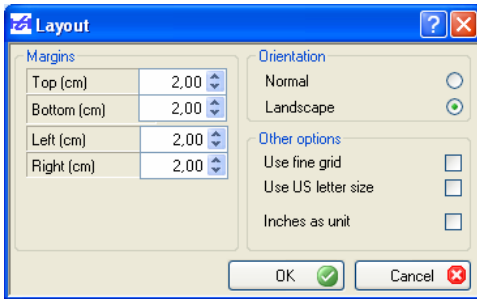
The page margins are measured as a distance in cm from the corresponding edge of the report page. Set the desired values and click on [OK].

10.2.1.3 Show ruler and grid

PROFESSIONAL

You may use ruler and grid to ease the exact positioning of the report elements. Click on 📏 (or choose the command "Show – Ruler") and the command "Show – Grid":
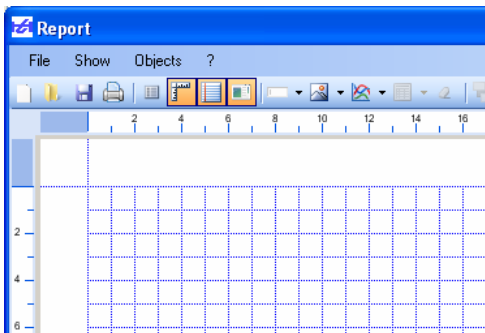
Ruler and grid are displayed here. The grid can be made more precise by enabling the option "Use fine grid" in the dialog "Show – Layout":
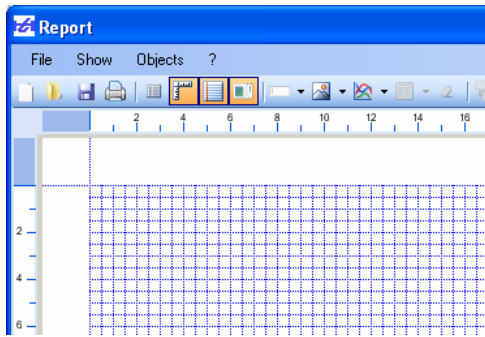
10.2.2   Place report elements

PROFESSIONAL

You can place the same elements in reports like in presentations. But there are some differences:

- line diagrams, histograms, classifications and tables can **only** be placed from a presentation that is opened in HYDROcom at the same time
- texts and pictures can be placed from an opened presentation, **and** can be created as new elements in the report directly

10.2.2.1   Elements from an open presentation

PROFESSIONAL

There are four ways to place elements from an opened presentation:

With drag & drop

1. Arrange presentation and report side-by-side on your screen.
2. Click into the desired layout section to highlight it.
3. Press the <Ctrl>-key and pull the layout section to the desired location in the report.

In case of the function Overwriting is enabled, report elements can be replaced by newer information. This allows to use an existing report as template for a new one.

Menu command

Point on one of the commands in the menu "Objects":
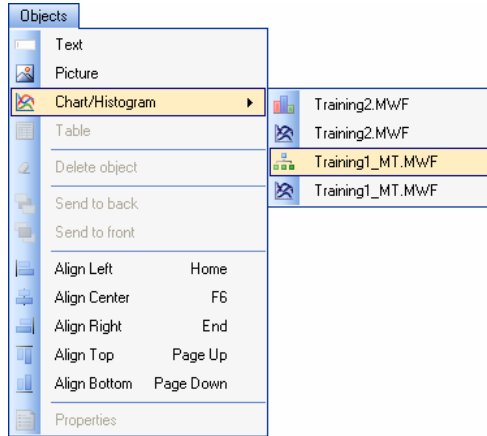
If at least one of the desired elements is contained in the opened presentation, they will be contained in this submenu. Click on the element that you want to place.

Submenu of the button

Click on the small black triangle beside the button of the desired element type:

- places a text element
- places a picture element
- places a line diagram, histogram or a classification
- places a table

If at least one of the desired elements is contained in the opened presentation, they will be contained in this submenu. Click on the element that you want to place.
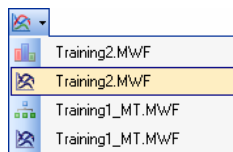
Dialog „Properties" of the element

Click on the corresponding menu command or the symbol in the button. This opens the dialog with the properties of the desired element:
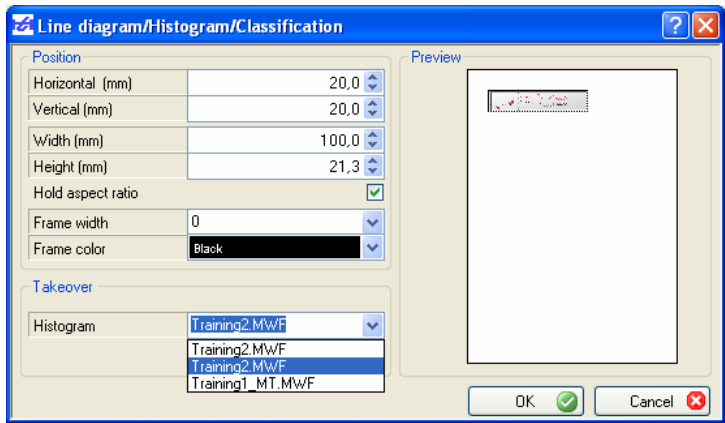
Here you may select the desired element in the area "Takeover". See the element being displayed in the preview and click on [OK] to place it. The options of this dialog are explained in the section "Edit element properties".

10.2.2.2   New elements

PROFESSIONAL

Texts and pictures (images) can not only be placed out of an opened presentation, but can be created in the report directly.

Add text

Click on the symbol in the button [ ] or select the menu command "Objects – Text":
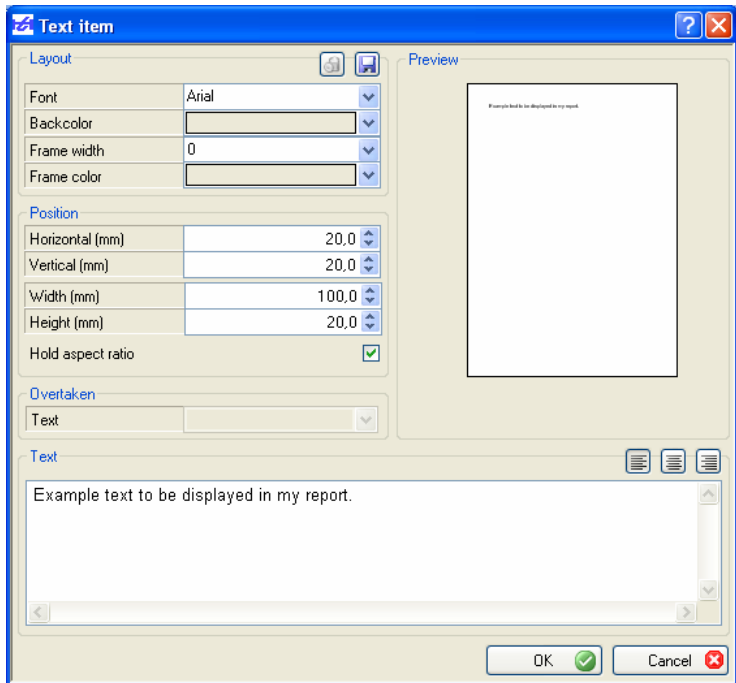
Enter text into the box "Text". See how the text is displayed in the preview area and click on [OK] to place it in the report. The options of this dialog are explained in the chapter "Text properties".

Place picture

Click on the symbol in the button or select the menu command "Objects – Picture":
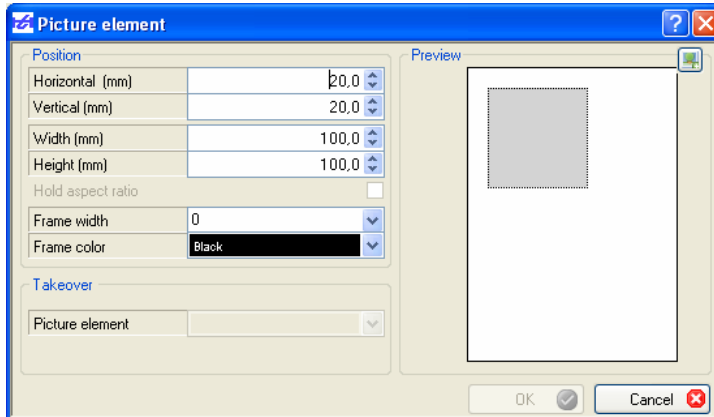
Click on the button to select a picture file:
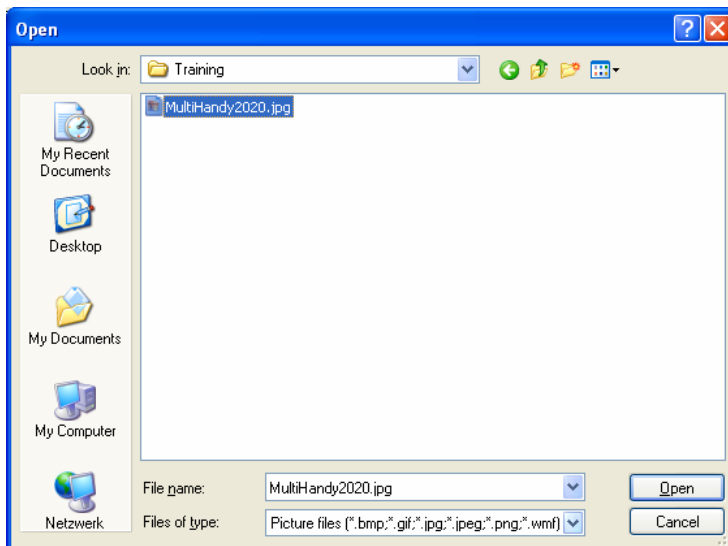
Highlight the desired picture file and click on [Open]:
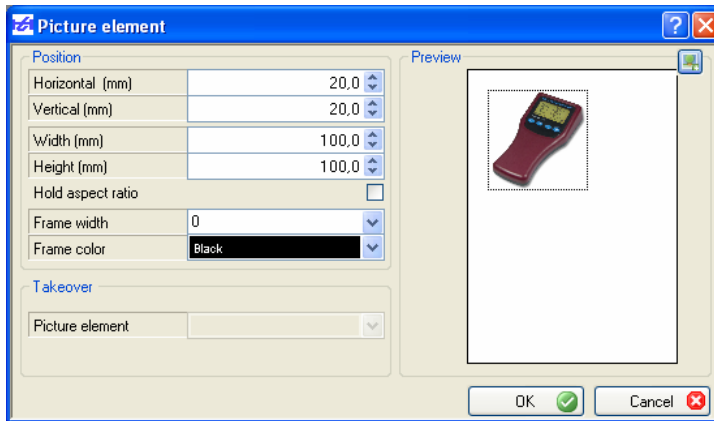
The selected picture will be displayed in the preview area. Click on [OK] to place it. The options of this dialog are explained in the chapter "Picture properties".

10.3 Edit functions

PROFESSIONAL

You can edit reports with these functions:

- Scale and move elements using the mouse
- Position element exactly
- Set qualities of the elements

10.3.1 Scale and move elements

PROFESSIONAL

After placing an element in the report, you may click on it and ears are displayed at the corners of the element:
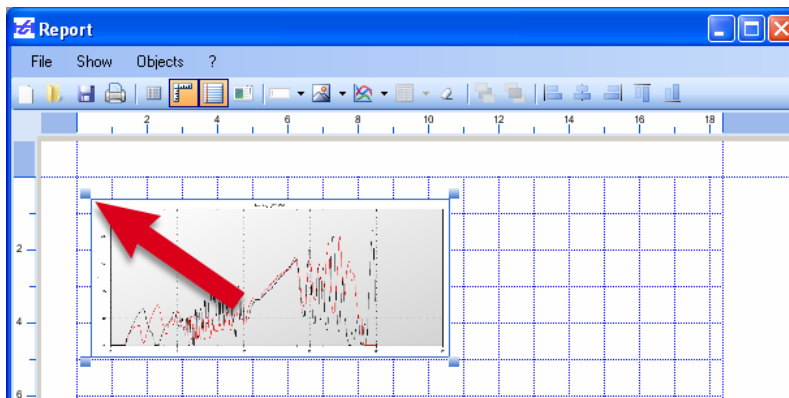
Now you have two possibilities:

- **Scaling**: position the mouse pointer on an ear, press and hold the left mouse button and pull the element larger or smaller
- **Move**: position the mouse pointer within the element, press and hold the left mouse button and move the element to a different position

10.3.2   Position elements exactly

You have two possibilities to place elements exactly:

- align at page margins
- align with cursor keys

10.3.2.1   Align elements at page margins

Use commands from the menu "Objects" to align placed elements at the page margins or page center exactly:

1.   Click on an element to highlight it.
2.   Select the alginment command from the menu „Objects":

Objects	
Text	
Picture	▶
Chart/Histogram	
Table	
Delete object	
Send to back	
Send to front	
Align Left	Home
Align Center	F6
Align Right	End
Align Top	Page Up
Align Bottom	Page Down
Properties	
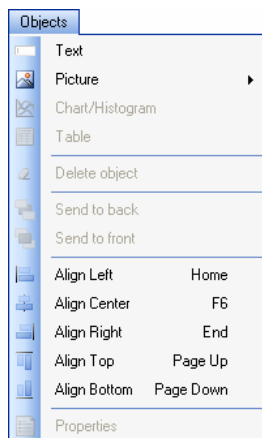
Use the commands "Align left / right " top / bottom" move the element to the corresponding page margin. The command "Align center" moves the element horizontally to the page center.

10.3.2.2   Align elements with cursor keys

If you want to align several elements you should display the grid and position the elements using the cursor keys:

1.   Use the mouse to move the elements to their approximate positions.
2.   Highlight the element that you want to move:
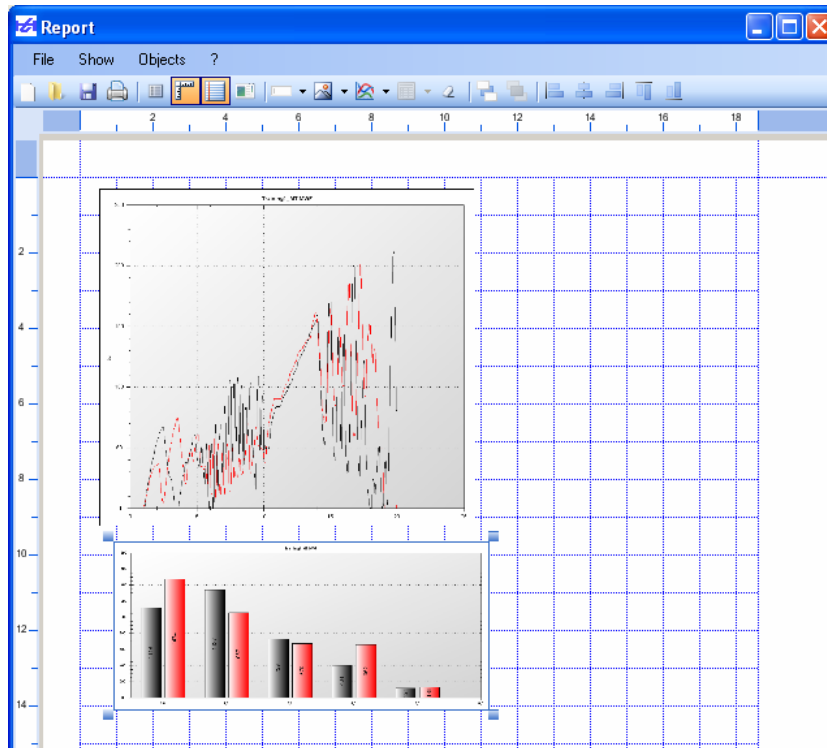
3. Press the cursor keys until the element is positioned correctly.
4. Repeat this for all elements to be positioned.

10.3.3 Report - edit elements

PROFESSIONAL

You can edit the properties of all placed elements:

- Line diagrams
- Histograms
- Classifications
- Tables
- Pictures
- Texts

10.3.3.1 Edit line diagram / histogram / classification

PROFESSIONAL

Click on a line diagram / histogram / classification. Select the command "Objects – Properties":
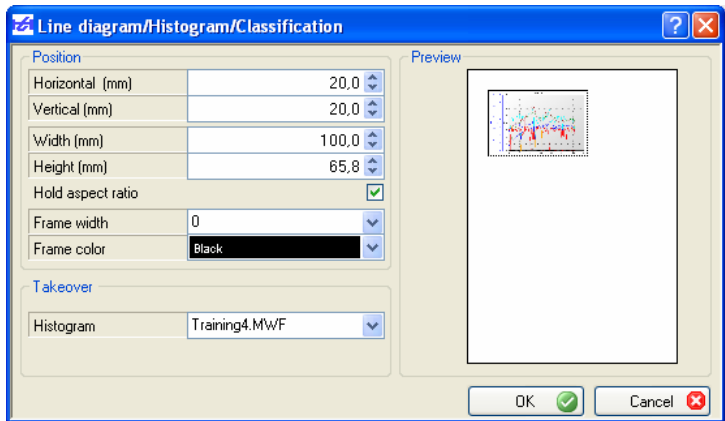
Horizontal / Vertical	indicates the position of the left, upper corner of the element in relation to the left, upper corner of the report sheet; enter different values, or click on the arrow keys to move the element
Width / Height	indicates the size of the element; enter different values, or click on the arrow keys to scale the element
Hold aspect ratio	enable this option to keep the width-height ratio during scaling; otherwise the element can be distorted; this effects numerical entries, only, not scaling with the mouse
Frame width / color	select line width and color if a frame shall be displayed around the element
Line diagram / Histogram / Classification	here you can select an element from the opened presentation that shall be edited and displayed

All modifications will be shown in the preview area. Click on [OK] to save the changes and close the dialog.

10.3.3.2   Edit tables

PROFESSIONAL

Double-click on a table to open the properties dialog:
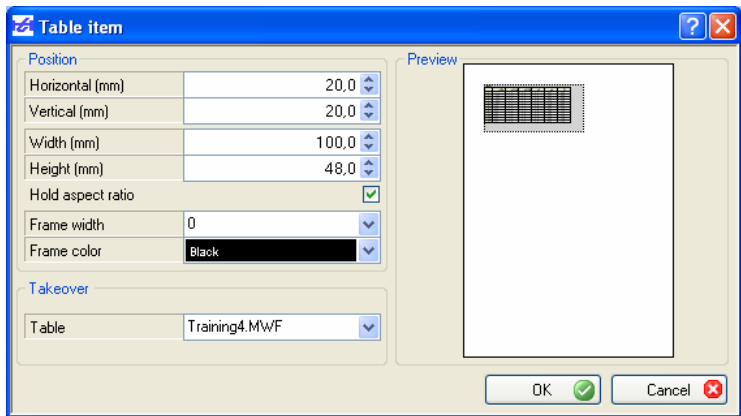
Horizontal / Vertical	indicates the position of the left, upper corner of the table element in relation to the left, upper corner of the report sheet; enter different values, or click on the arrow keys to move the element
Width / Height	indicates the size of the table element; enter different values, or click on the arrow keys to scale the element
Hold aspect ratio	enable this option to keep the width-height ratio during scaling; otherwise the element can be distorted; this effects numerical entries, only, not scaling with the mouse
Frame width / color	select line width and color if a frame shall be displayed around the table
Table	here you can select a table from the opened presentation that shall be edited and displayed

All modifications will be shown in the preview area. Click on [OK] to save the changes and close the dialog.

10.3.3.3   Edit pictures

PROFESSIONAL

Click on an image and select the command "Object – Properties":
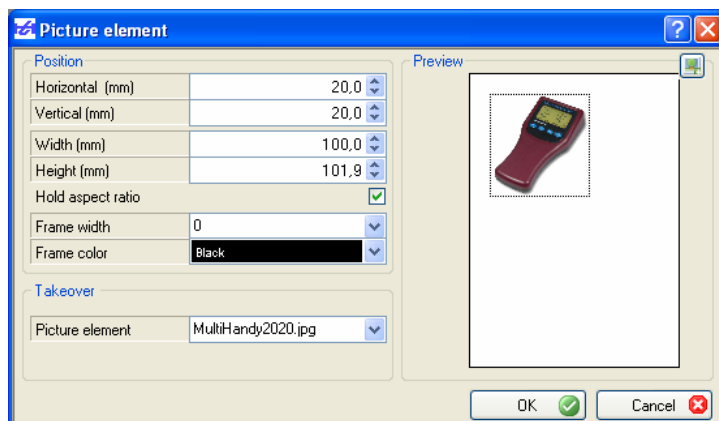
Horizontal / Vertical	indicates the position of the left, upper corner of the picture element in relation to the left, upper corner of the report sheet; enter different values, or click on the arrow keys to move the element
Width / Height	indicates the size of the picture element; enter different values, or click on the arrow keys to scale the element
Hold aspect ratio	enable this option to keep the width-height ratio during scaling; otherwise the element can be distorted; this effects numerical entries, only, not scaling with the mouse
Frame width / color	select line width and color if a frame shall be displayed around the picture
Picture element	here you can select a picture from the opened presentation that shall be edited and displayed

All modifications are displayed in the preview section immediately. Here you can also find the button that can be used to select a picture from your file system. Click on [OK] to save the modifications and close the dialog.

10.3.3.4   Edit texts

PROFESSIONAL

Double-click on a text element to open this dialog:
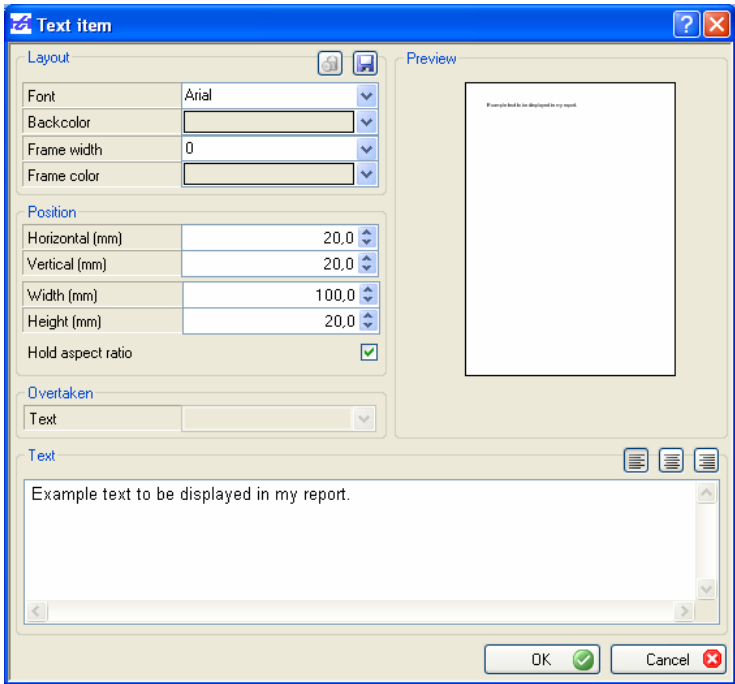
Font	select the font type of the text element
Background color	the rectangle around the text will be filled with this color
Frame width / color	select line width and color if a frame shall be displayed around the text element
Horizontal / Vertical	indicates the position of the left, upper corner of the text element in relation to the left, upper corner of the report sheet; enter different values, or click on the arrow keys to move the element
Width / Height	indicates the size of the text element; enter different values, or click on the arrow keys to scale the element
Hold aspect ratio	enable this option to keep the width-height ratio during scaling; otherwise the element can be distorted; this effects numerical entries, only, not scaling with the mouse
Text	here you can edit the text; click on the buttons to align the text within its frame

All modifications will be shown in the preview area. Click on [OK] to save the changes and close the dialog.

10.4 Print report

Select the command "File – Print". A dialog will be displayed where you can select and configure the desired printer. Click on [Print] there to display the print preview:

Here you can see how the report will be printed. You may use the zoom tool and open the printer settings. Click on [Print] when finished and the report will be printed.

10.5 Save report

Select the command "File – Save":
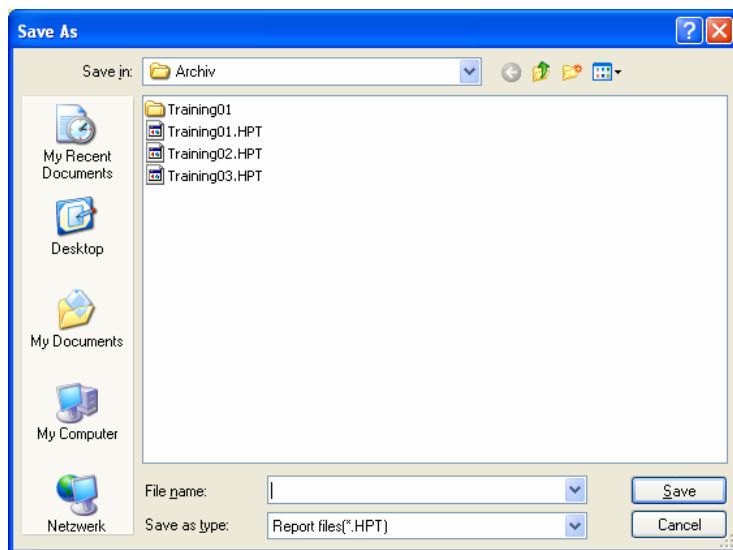
Select the desired folder, enter a file name and then click on [Save].

11 References

11.1 Buttons in HYDROcom

| PROFESSIONAL | FULL | BASE |

Here you find explanations to the buttons of the

- main icon bar
- work icon bar

11.1.1 Main icon bar

| PROFESSIONAL | FULL | BASE |

	New: creates a new presentation
	Open: opens an existing presentation or series of measurements
	Save: saves the active presentation or series of measurements
	Print: prints the presentation
	Recent measurements: displays a list of the recently used series of measurements
	Shutdown: closes HYDROcom
	Connect: connects HYDROcom with a Hydrotechnik measuring instrument
	Disconnect: interrupts the connection with a Hydrotechnik measuring instrument
	Connection options: displays options regarding the connection with measuring instruments
	Read memory: displays a list of all measurements in the connected measuring instrument
	Online mode: starts the configuration of the online mode
	RS485: this function is not implemented, yet
	Linearisation: this function is not implemented, yet
	Parameters: displays important parameters of the connected measuring instrument
	Device list: displays a list of all connected measuring instruments
	Data exchange: displays data exchange settings and starts import or export
	Combine: combines two mwf files and saves them as one file
	Folders: definition of the favored directories for the saving of presentations and format files

	Language: operation language selection
	Licence: display and entry of licence information
	Options: definition of general application settings
	Viewer undo: macht die letzte Aktion im Viewer rückgängig
	Delete element: deletes the highlighted element from the viewer
	Delete layout section: deletes the contents of the highlighted layout section
	Copy all layout sections: copies all sections as an image into the clipboard, from where it can be pasted into other applications
	Expand current layout section: enlarges to window size; click again to reduce size
	Line diagram: switches the highlighted layout section to "Line diagram", or inserts a line diagram at the desired position
	… with configuration file: inserts a line diagram into the highlighted layout section by using a pre-defined configuration file
	Table: switches the highlighted layout section to "Table", or inserts a table at the desired position
	… with configuration file: inserts a table into the highlighted layout section by using a pre-defined configuration file
	Text: switches the highlighted layout section to "Text", or inserts a text at the desired position
	Picture: switches the highlighted layout section to "Picture", or inserts a picture at the desired position
	Histogram: switches the highlighted layout section to "Histogram", or inserts a histogram at the desired position
	Classification: switches the highlighted layout section to "Classification", or inserts a classification at the desired position
	Layout: allows to choose a pre-defined layout for the viewer
	Report: opens the application „Report"
	Options: allows to select the icons that shall be contained in this bar

11.1.2   Secondary icon bar

PROFESSIONAL	FULL	BASE

	All folders: displays the complete folder structure in the explorer
	Current folder: shows only the current folder in the explorer
	Add calculated channel: adds a calculated channel to the series of measurements
	Delete measurement: deletes the highlighted series of measurements

	Group view: merges the information on the registers Details and Statistics into groups
	Print: print the highlighted layout section
	Copy: copies the highlighted layout section into the clipboard
	Configuration: manages the configuration files for the type of the highlighted layout section; you can create, modify, assign and delete format files
	Statistics: adds the statistical information of the selected series of measurements into the highlighted text or table layout section (register Statistics must have been opened once)
	Font: define font and text settings for the highlighted text layout section
	Expand: scales a picture that it fills the complete layout section
	Filter options: displays the filter options for the highlighted table
	Compact table: converts the highlighted table into a compact table
	Save as graphic: saves the highlighted layout section as image file
	Original: shows the original size of the line diagram (zoom out)
	Reset scaling: replaces the manual scaling by the automatic scaling
	Manual scaling: manual entry of scaling limits
	Add element: adds an element (text, image, arrow) to an line diagram, histogram or classification
	Smooth: smoothes a line diagram
	Spot measurement: shows a movable spot line
	Move curve: allows to move the curves of one or several elements along the x-axis
	Difference measurement: shows to movable parallel lines that can be used to measure distances and differences between the curves
	Options: allows to select the buttons that shall be displayed in the icon bar

11.2 Buttons in the application 'Report'

PROFESSIONAL

	New: creates a new report
	Open: opens a saved report file
	Save: saves the current report
	Print: prints the current report
	Layout: opens a dialog to modify the report layout
	Ruler: toggles the visibility of the rulers
	Margins: toggles the visibility of the margins
	Landscape: alters between protrait and landscape paper orientation
	places a **text element** in the report
	places a **picture element** in the report
	places a **line diagram** or a **histogram** in the report
	places a **table** in the report
	Delete: deletes the highlighted element from the report