

## PC-Software HMGWIN 3000

### User manual

English (Translation of original instructions)



## Table of Contents

<b>1</b>	<b>General Information</b>	<b>4</b>
<b>2</b>	<b>Installation</b>	<b>5</b>
2.1	Hardware and Software Requirements	5
2.2	Installing the Drivers for HMGWIN 3000 under Windows 2000 and XP	5
2.3	Installing HMGWIN 3000	5
2.4	Starting HMGWIN 3000	5
2.5	Connection errors	6
<b>3</b>	<b>Using HMGWIN</b>	<b>7</b>
3.1	Viewing actual measured values of the HMG 3000 in HMGWIN 3000	7
3.2	Retrieving a Measurement Curve	7
3.2.1	Retrieving (and Deleting) a File from the HMG 3000 in HMGWIN 3000	7
3.2.2	Opening a measurement curve already saved on the PC	8
3.2.3	Retrieving an open file	8
3.3	Views of a measurement curve	9
3.4	Working on a measurement curve	9
3.4.1	Measure	9
3.4.2	Measuring difference	10
3.4.3	Tracker	10
3.4.4	Zoom In	11
3.4.5	Zoom Out	11
3.4.6	Panning	11
3.4.7	Full view	11
3.4.8	Automatic scale	11
3.4.9	Scale Settings	12
3.4.10	Keyboard Navigation	12
3.4.11	Remark	13
3.4.12	Remarks List	14
3.4.13	Settings	15
3.4.14	Back	15
3.4.15	Forwards	15
3.4.16	Save View	16
3.4.17	List Views	16
3.4.18	Create Picture	16
3.5	Editing a Measurement Curve	17
3.5.1	Extract Recording	17
3.5.2	Curve Overlay	17
3.5.3	Time-Shift Channels	18
3.5.4	Add Calculated Channel	18
3.5.5	Add a Filtered Channel	19
3.5.6	Remove Channels	19
3.6	File Dialogue	19
3.6.1	Open	19
3.6.2	Save	19
3.6.3	Save As	20
3.6.4	Save All	20

3.6.5	Export .....	21
3.6.6	Create PDF Document .....	22
3.6.7	Print .....	22
3.6.8	Close.....	22
3.6.9	Close All.....	22
<b>3.7</b>	<b>Editing the Settings of the HMG 3000 in HMGWIN 3000.....</b>	<b>23</b>
3.7.1	Changing, Saving and Retrieving the Settings of the HMG .....	23
3.7.2	Start Recording.....	25
3.7.3	Communications Settings.....	26
<b>3.8</b>	<b>Extras .....</b>	<b>27</b>
3.8.1	Update für HMG 3000 .....	27
3.8.2	Options .....	27
<b>3.9</b>	<b>Help .....</b>	<b>27</b>
3.9.1	About HMGWIN 3000.....	27

## 1 General Information

The PC software HMGWIN 3000 can only be used in conjunction with the HYDAC Portable Data Recorder HMG 3000 or to process/evaluate measurements recorded using the HYDAC portable data recorders. We cannot accept any liability or provide warranty outside this field of application.

Our “**General Conditions of Sale and Delivery**” and the “**Special Conditions of Sale and Delivery for Software Products / Freeware**” apply to the use of the HMGWIN 3000. These Terms and Conditions can be viewed on our website <http://www.hydac.com> (click Company/Legal information) or are available on request as a PDF file.

## 2 Installation

### 2.1 Hardware and Software Requirements

#### Minimum requirements:

- PC, Pentium 400 MHz
- 256 MB RAM
- Windows XP / 2000
- CD-ROM drive
- 3 MB free hard disk space
- RS 232 port
- RS 232 connector cable
- Graphics resolution: 640x480, 256 colors

#### Recommended:

- PC, Pentium 1.8 GHz
- 256 MB RAM
- Windows XP / 2000
- CD-ROM drive
- 3 MB free hard disk space
- USB 1.1
- Graphics resolution: 1024x768, 65536 colors

### 2.2 Installing the USB-Driver

If the HMG 3000 is being connected for the first time with the PC via USB, then you must first install the HYDAC USB driver „HE-Virtual-Comport-Driver“.

The driver are included on the CD-ROM contained in the scope of delivery.

- Call up the file “**HE-VIRTUAL-COMPORT-INSTALLER.EXE**” in the “**HE-VIRTUAL-COMPORT-DRIVER**” folder and follow the instructions of the “**Setup Wizard**”.

### 2.3 Installing HMGWIN 3000

- Call up the file “**HMGWIN3000\_Vxx\_Rxx-SETUP.EXE**” in the “**Installation**” folder and follow the instructions of the “**Setup Wizard**”.

### 2.4 Starting HMGWIN 3000

- If you have installed the program in the default path suggested by the Setup Wizard it is located in the Start Menu under “**Programs**” → “**HYDAC-ELECTRONIC - HMGWIN 3000**”. To launch the program, click on “**HMGWIN 3000**”.
- When launching the program for the first time a window appears enabling you to select the user interface language: German, English or French. Simply click on the language of your choice with your mouse. Confirm by clicking on “**OK**”.
- Establishing a link with the HMG 3000:
  - Click on the dialogue box “**HMG 3000**”
  - A window opens “**HMG 3000**”.
  - In this window click on “**Link settings**”.
  - A new window opens “**HMG 3000**” to define or search for the “**interface**” to which the HMG is connected.
  - **Note:** When first using the program both windows open at the same time after clicking on the dialogue box “**HMG 3000**”. It is not necessary to select “**Link settings**”.
  - Click on “**Search HMG 3000**”.
  - HMGWIN 3000 shows you on which port it has detected the HMG 3000. Click on “**OK**” to confirm the link.

- If an HMG is found, click on **“Apply”** to maintain the interface, or on **“Cancel”** to reject the interface.
- Click on **“Link”** to make the link to the HMG.
- Now you can communicate directly with the HMG 3000 from your PC by selecting **“Measured values”**, **“Recordings”**, **“Settings”**, **“Start recording”** and **“Disconnect”**. You also have the option of conveniently processing, rendering, and evaluating the measurements you have conducted.

## 2.5 Connection errors

If no link is possible, this could be for the following reasons:

- Cause of error on HMG 3000
  - Check if the HMG 3000 is switched on and if the **“USB”** is set under **“Settings”**, **“Change Initial Setup”**, **“PC link”**.
- Cause of error on PC
  - Check in the unit manager if all drivers are correctly installed. (If no drivers or only one is installed, **“HE USB Comport Bridge”** is marked with a question mark.)
  - In this case install the drivers again.

## 3 Using HMGWIN

### Note:

All options can only be selected using the mouse.

### 3.1 Viewing actual measured values of the HMG 3000 in HMGWIN 3000

- To view actual measured values of the HMG
  - Click on the **“HMG 3000”** dialogue box.
  - **“HMG 3000”** opens in a new window.
  - Click on **“Current measured values”** on the left hand side of the window.
  - The measured values of all active channels of the HMG 3000 appear on the right.
  - Click on **“Smaller”** to display the measured values in a smaller size.
  - Click on **“Larger”** to display the measured values in a larger size.
  - Click on **“Colour”** to display the measured values in a different colour.
  - Click on **“3D effect”** to display the measured values in a 3D effect; click again to turn the 3D effect off.
  - Click on **“Min/Max”** to show the minimum and maximum values of the individual sensors shown; click again to hide these again.
  - Close the **“HMG 3000”** window to continue working with “HMGWIN 3000”.

### 3.2 Retrieving a Measurement Curve

There are three ways of doing this:

You can import a measurement curve from your HMG 3000 into HMGWIN 3000, open a saved file, or retrieve a file that is already open.

#### 3.2.1 Retrieving (and Deleting) a File from the HMG 3000 in HMGWIN 3000

- Opening a file from the HMG 3000:
  - Click on the **“HMG 3000”** dialogue box.
  - **“HMG 3000”** opens in a new window.
  - Click on **“Recordings”** on the left hand side of the window.
  - All of the recordings stored in the HMG 3000 are shown on the right.
  - Select one or more recordings in the list
  - Click on **“Open”** in the line under the recordings.
  - All of the recordings selected are opened in HMGWIN 3000, the file opened last is shown in the display window and the others in the left hand column as **“Recording x”** ( $x = \text{sequential number}$ ).
  - Close the **“HMG 3000”** window.
  - Now you can work with the recording (see **“3.3”** ff)
  - The recording can be saved afterwards (see **“3.6.2 Save”** and **“3.6.3 “**).
- Saving an HMG 3000 file directly in HMGWIN 3000
  - Click on the **“HMG 3000”** dialogue box.
  - **“HMG 3000”** opens in a new window.
  - Click on **“Recordings”** on the left hand side of the window.
  - All of the recordings stored in the HMG 3000 are shown on the right.

- Select one or more recordings in the list.
- Click on **“Save”** in the line under the recordings.
- **“Select folder”** opens in a new window.
- Select **“Keep name of recording”** or **“Ask for new file name”** in the drop-down menu.
- Select the folder in which the recording is to be saved.
- If you selected **“Keep name of recording”** the recordings will be saved immediately with the same name as in the HMG.
- If you selected **“Ask for new file name”** the **“Save recording as”** window opens.
- The recordings are merely saved, not opened.
- Close the **“HMG 3000”** window to continue working with HMGWIN 3000.
- Deleting an HMG recording
  - Click on the **“HMG 3000”** dialogue box.
  - **“HMG 3000”** opens in a new window.
  - Click on **“Recordings”** on the left hand side of the window.
  - All of the recordings stored in the HMG 3000 are shown on the right.
  - Select one or more recordings in the list.
  - Click on **“Delete”** in the line under the recordings.
  - **WARNING:** You are not asked again whether you want to really delete the file. It is immediately deleted **in the HMG**.
  - Close the **“HMG 3000”** window to continue working with HMGWIN 3000.

### 3.2.2 Opening a measurement curve already saved on the PC

- Click on the **“File”** dialogue box and select **“Open”** in the dropdown menu. You also have the option of clicking directly on **“Open”** on the bottom left of the screen.
- Select the required recording in the relevant folder (file extension: **\*.herf**).
- To open recordings made with a previous version of the HMG (e.g. HMG 2020), select **“Legacy formats”** as the file type in the dropdown menu (file extension: **\*.hmg, \*.cur, \*.pro**).
- To open a recording made using a HSI sensor (e.g. HYDACLab®), click on file type **“HSI log”** in the dropdown menu.
- Click on the **“File”** dialogue box. In the dropdown menu above the **“Quit”** menu item you will find a list of the most recently opened recordings (max. 8).

### 3.2.3 Retrieving an open file

- All open files are listed on the left hand side of the window and can be retrieved for further work using the program by clicking on the file name.

### 3.3 Views of a measurement curve

There are four views of a measurement curve: **Graph**, **Table**, **Recorded data**, **Description**. All four views can be selected either in the dropdown menu of the “**View**” dialogue box or at the top of the screen, directly underneath the “**Tool bar**”.

- **Graph:** displays the measurement curve as a function (for edit options, see “**Working on a Measurement Curve**” and “**Editing a Measurement Curve**”). The time is shown in the X axis, the measured values of the curves are shown in the Y axis, the curves being shown in the relevant color (for hiding or showing, see “**Settings**”).
- **Table:** table showing the measured values of the individual sensors recorded at a particular point in time.
- **Recorded data:**
  - General: type of measurement curve, number of sensors, number of data records, starting and end date of the measurement, etc.
  - Channels with their measurement ranges
- **Description:** Designation and comments entered for the curve. The designation and comment can be changed or added here.

### 3.4 Working on a measurement curve

There are various options for working on and editing a curve. All editing functions can be found in the dropdown menu of the “**Graph**” dialogue box as well as at the bottom of the screen.

#### 3.4.1 Measure

- Click on the “**Graph**” dialogue box and select “**Tools**” in the dropdown menu and “**Measure**” in the submenu, or select “**Measure**” at the bottom of the screen.
- “**Measure**” is now highlighted at the bottom of the screen.
- When you move the mouse over the graph, the mouse pointer turns into a ruler.
- Move the ruler to a point in the graph and press the left mouse button.
- Crosshairs and the corresponding values of the intersection of these crosshairs are shown on the X and Y axis. If you hold down the left mouse button you can move the crosshairs in the graph.
- The intersection can be shifted as follows:
  - By moving the mouse over the crosshair you want to change (parallel to the time axis or value axis of the sensors). When the mouse pointer changes to a double arrow (↕), click the left mouse button and shift the relevant axis to the point from which you need the measured value.
  - By clicking on another point in the graph with the ruler.

### 3.4.2 Measuring difference

- Click on the **“Graph”** dialogue box and select **“Tools”** in the dropdown menu and **“Measure difference”** in the submenu, or select **“Measure diff. ”** at the bottom of the screen.
- **“Measure diff. ”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph, the mouse pointer turns into a vernier caliper.
- Using the caliper gauge, select one of the two points between which you would like to measure the distance and press the left mouse button.
- Es erscheint wiederum ein Kreuz aus zwei „fetten“ Anzeigelinien (bestehend aus A crosshair in bold (each of the hairs consisting of two thin parallel lines) appears along with a color-highlighted numerical value on each of the axes showing the distance.
- If you move the mouse over one of the axes a double arrow (↕) appears. If you hold the left mouse button down you can pull the thick line "apart" and drag one of the lines to the level of the second point. The color-highlighted numerical value changes, indicating the distance. You can repeat this with all four lines as often as you like.
- After selecting the first point you can also hold down the left mouse button and immediately select the second point.
- Here, too, a new starting point can be repeatedly selected by clicking on another point in the graph.

### 3.4.3 Tracker

- Click on the **“Graph”** dialogue box and select **“Tools”** in the dropdown menu and **“Tracker”** in the submenu, or select **“Tracker”** at the bottom of the screen.
- **“Tracker”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph the mouse pointer turns into a vertical broken line.
- Click (left mouse button) on the approximate point in time for which you would like to know the measured values.
- An indicating line appears vertically on the time axis on which the values of the individual curves are marked by squares. The time and the individual measured values are color-highlighted on the axes.
- If you hold the left mouse button down you can drag the line along the time axis where by the values are displayed. During tracking, you jump from one measured value to another.
- The indicating line can also be moved along the time axis by clicking on the Arrow Up/Down buttons (lower right of screen underneath **“Measured Value No.”**) or by actuating the Arrow Up or Arrow Down keys on the keyboard. By doing this, you track each measured value.
- Clicking on another position in the graph will move the indicating line to that point.

### 3.4.4 Zoom In

- Click on the **“Graph”** dialogue box and select **“Tools”** in the dropdown menu and **“Zoom in”** in the submenu, or select **“Zoom in”** at the bottom of the screen.
- **“Zoom in”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph the mouse pointer turns into a magnifying glass with a plus sign.
- Only whole grid squares can be magnified.
- To zoom in on one of the grid squares, click on it and hold the left mouse button down. You can select one or more grid squares by dragging the mouse and drawing a rectangle around them. The selected portion is indicated by a thicker broken line.
- Release the left mouse button to zoom in on the selected portion, i.e. the selected portion is displayed larger within the overall graph.

### 3.4.5 Zoom Out

- Click on the **“Graph”** dialogue box and select **“Tools”** in the dropdown menu and **“Zoom out”** in the submenu, or select **“Zoom out”** at the bottom of the screen.
- **“Zoom out”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph the mouse pointer turns into a magnifying glass with a minus sign.
- Zooming out functions in a similar manner to zooming in. Select one or more grid squares by dragging the mouse and drawing a rectangle around them.
- Releasing the left mouse button causes the view last shown in the overall graph to be displayed in the framed area.

### 3.4.6 Panning

- Click on the **“Graph”** dialogue and select **“Tools”** in the dropdown menu and **“Pan”** in the submenu, or select **“Pan”** at the bottom of the screen.
- **“Pan”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph the mouse pointer turns into a hand.
- Click on the graph and keep the left mouse button depressed.
- Using the mouse now shift the image in the required direction.
- Release the mouse button.
- Panning is only done in whole grid units.

### 3.4.7 Full view

- Click on the **“Graph”** dialog and select **“Full view”** in the dropdown menu, or select **“Full view”** at the bottom of the screen.
- The graph now shows the entire time and amplitude range of the measurement.

### 3.4.8 Automatic scale

- Click on the **“Graph”** dialogue box and select **“Automatic scale”** in the dropdown menu, or select **“Automatic”** at the bottom of the screen.
- The scale settings selected (see section 3.4.9) are applied to the current recording.

### 3.4.9 Scale Settings

- Click on the **“Graph”** dialogue box and select **“Scale settings”** in the dropdown menu, or select **“Scale settings”** at the bottom of the screen.
- Selecting the resolution type and scaling type (refers to the default scale settings):
  - Resolution settings: Click on the upper arrow button. A dropdown menu opens in which you can choose among the various resolution settings.
    - **best fit resolution**
    - **fine resolution**
    - **medium resolution**
    - **coarse resolution**
    - **1-2-5 resolution**: This resolution is in reference to the difference between the largest and smallest value of the current display range. Scaling is in increments of 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, etc. If a value is exceeded, the next larger value is used as the scaled range. Example: if the difference between the smallest and largest value is 49 bar, scaling is from the *smallest value* to the *largest value + 50*, if the difference were 51 bar, scaling would be from the *smallest value* to the *largest value +100*)
  - Scaling type of channels:
    - Scale all channels separately: when default scaling is applied, each channel is rendered optimally in a separate window with its maximum and minimum value.
    - Scale channels with the same unit jointly: when default scaling is applied the smallest and largest measured value overall is used for scaling between these two values. The same scaling is applied to all channels with the same unit.
- Click on **“OK”** to apply the modified scale settings or **“Cancel”** to discard your changes.

### 3.4.10 Keyboard Navigation

- Click on the **“Graph”** dialogue box and select **“Tools”** in the dropdown menu and **“Keyboard navigation”** in the submenu, or select **“Keyboard navig.”** at the bottom of the screen.
- **“Keyboard navig.”** is now highlighted at the bottom of the screen.
- Using the keyboard arrow keys you can shift the viewing area to the right, left, up and down. Every time you press an arrow key the viewing area is shifted by one grid unit in the relevant direction.
- If you press the Shift key at the same time, every time you hit the → or ← key the time axis of the graph is enlarged or reduced respectively. This corresponds to a zoom function, but for the time axis only.
- If you press the Shift key while hitting the ↑ or ↓ key, you can change the scaling of the Y axis. This corresponds to a zoom function, but for the Y axis only.

### 3.4.11 Remark

- Click on the **“Graph”** dialogue box and select **“Remark”** in the dropdown menu, or select **“Remark”** at the bottom of the screen.
- **“Remark”** is now highlighted at the bottom of the screen.
- When you move the mouse over the graph the mouse pointer turns into a square connected with the "handle" (cf. dot) by a line.
- Using the "handle", click on the approximate position you would like to insert a remark.
- A Remark window opens. It is subdivided into three parts: text, style and anchor.
  - Remark text
    - The remark text %T: %V automatically appears, which serves as a placeholder, **“Anchor to measured value”** being activated by a checkmark in the white checkbox.
    - Entering placeholders using %T for the actual time and %V for the actual measured value is not possible unless **“Anchor to measured value”** is activated.
    - If you leave the placeholders %T, %V and click on **“OK”**, you automatically get a measured value for a specific time (= quick and easy method for entering measured values in the graph).
    - Additional text can be entered, or the placeholders can be deleted.
  - Font
    - Here you can change the font size and color and put the text in **“Bold”**, **“Italic”** or **“Underline”** by clicking the respective checkbox.
    - A blue-highlighted box with **“Set style as default”** appears. To use these settings as the default font settings, left-click on this box. A window pops up containing the message **“The current style has been set as default”**. Confirm with **“OK”**. The message window closes.
  - Anchor
    - The checkbox in front of **“Anchor to measured value”** is initially activated (i.e. checked). To enter text without anchoring it to a measured value, deactivate this function by clicking on the checkbox.
    - If the checkbox is activated you can select the sensor (measurement channel) to which the remark is to be anchored (checkmark in the checkbox of the respective sensor).
    - You can also indicate the time at which the remark is to be anchored to the measurement curve. You can either enter the time in ms or change it by clicking the arrow keys next to the time box with your mouse. One click on one of the arrows ▲▼ corresponds to a change by the preset measurement rate.
- When you are finished entering your settings, confirm by clicking on **“OK”**.
- If you click on **“Cancel”** your entries will be discarded.
- After clicking on **“OK”** the Remark window closes and the remark box can now be seen.
  - If anchoring has been activated, the remark box is linked to the selected curve by a line. The circle at the end of the line shows which measured value the remark refers to.
  - If anchoring has been deactivated, only the remark is visible.
- The remark can be edited and shifted later providing the remark function has been enabled.

- The position at which the remark is anchored to the measurement curve can be shifted by moving the mouse pointer over the anchor position. If you hold the left mouse button down you can drag the anchor to the position desired. If you have entered the placeholder it is adjusted accordingly when you release the mouse button. The anchor point is always a measured value as the remark is anchored to the measurement curve.
- The remark box itself can be shifted by moving the mouse pointer over the remark box (it is now blue-highlighted; the square turns into a hand pointer, 3 handles appear in the lower right corner). Click and hold down the left mouse button and move the remark box to the required position.
- To edit the text or manually enter another "anchor time", click on the 3 handles in the lower right corner.
- The remark box opens again.
- **"OK"**, **"Cancel"** and **"Delete"** appear in the bar at the bottom of this window.
  - **"OK"** = apply changes
  - **"Cancel"** = close window and discard changes
  - **"Delete"** = delete the entire remark

### 3.4.12 Remarks List

- Click on the **"Graph"** dialog and select **"Remarks list"** in the dropdown menu, or select **"Remarks list"** at the bottom of the screen.
- A window opens with the remark list.
- All remarks are listed along with the particular X axis allocated, their anchor, their position on the X axis (time), and the relevant remark text.
- The entire text of the blue-highlighted remark appears in the lower box.
- Click on **"Delete"** in the bar beneath this window to delete the blue-highlighted remark.
- Click on **"OK"** to close the window with the remark list.

### 3.4.13 Settings

- Click on the **“Graph”** dialogue box and select **“Settings”** in the dropdown menu, or select **“Settings”** at the bottom of the screen, or click on one of the scales of the Y axis.
- A window with the settings is opened containing a number of tabs (each tab can be selected by clicking on the tab name):
  - **“General”** tab (appears first when opening the window):
    - The recording time and the actual output range are indicated. The actual output range can be changed manually by entering other time values.
    - You can also choose whether the time or the measurement range of a sensor is to be scaled along the X axis (e.g. for a P/Q diagram).
    - By clicking the checkbox for **“Left Y axis”** and **“Right Y axis”** you can determine which channels are to be displayed on the Y axis (right- or left-hand side of the graph).
  - Individual measurement channel tabs:
    - Under Designation you can give the measurement channel a name, e.g. "system pressure" if the system pressure of an equipment item was measured in this measurement channel using a pressure transducer.
    - The following can be entered by hand in the second section: the full indication range (the range shown when selecting **“Full indication range”**) and the actual indication range (range currently shown).
    - Third section: the type of display can be set and whether or not the associated measurement series is to be displayed. The measurement series is hidden when you deactivate the checkbox after **“Show measurement series”** (i.e. click on the checkbox so that the checkmark disappears). You can also select the color for the measurement series from a list. You can access the list by clicking on the arrow button next to the color. You can select the line type by clicking on the arrow button. Options: **“Solid line”**, **“Dotted line”** and **“Dash dotted line”**.
    - Last section: you can enter a remark for the measurement series.
- Click on **“OK”** to save your changes or **“Cancel”** to discard them.

**Tip:** *If you only want to change the settings of one channel, e.g. hide it, click on this channel in the upper right next to the graph view. The Settings window opens in which the tab of this measurement channel is preselected.*

### 3.4.14 Back

- To undo changes in the view, click on the **“Graph”** dialogue box and select **“Back”** in the dropdown menu, or select **“Back”** at the bottom of the screen. You can do this as many times as there are changes.

### 3.4.15 Forwards

- To redo changes which have been “Undone” in the graph view click on the **“Graph”** dialogue box and select **“Forwards”** in the dropdown menu, or by select **“Forwards”** at the bottom of the screen. You can do this as many times as there are changes to redo.

### 3.4.16 Save View

- To save a zoomed view, for example, click on the **“Graph”** dialogue box and select **“Save view”** in the dropdown menu, or select **“Save view”** at the bottom of the screen.
- A window opens where you can enter a name and a description for the saved view.
- Click on **“OK”** to save the view or **“Cancel”** to discard it and return to the graph.

### 3.4.17 List Views

- The list views is used to jump back and forth between various saved views.
- To view a saved view or select or rename it, click on the “Graph” dialogue box and select “List views” in the dropdown menu, or select “List views” at the bottom of the screen.
- A window with the saved views opens.
- This window is divided in two: the upper part contains a listing of all views with their names, the bottom part a description of the view currently selected.
- You can select any view by clicking on it with your mouse. When selecting a view, the view is shown in the background and your description appears in the lower section.
- **“OK”**, **“Delete”** and **“Rename”** appear in the bar at the bottom of this window.
  - **OK** = closes the window
  - **Delete** = deletes the selected view
  - **Rename** = to rename the selected view. When this option is selected, a window for renaming the view is opened. Enter a new name and confirm with “OK” to save it, or click on “Cancel” to retain the old name.

### 3.4.18 Create Picture

- Click on the **“Graph”** dialogue box and select **“Create picture”** in the dropdown menu, or select **“Create picture”** at the bottom of the screen.
- A new window opens in which the actual graph view is shown as a picture so to speak.
- In the left part of the window you have the following options.
  - **Transparent** = the created picture is transparent so that the underlying picture is visible, thus enabling two curves to be compared visually.
  - **Copy** = the picture is copied to the Windows Clipboard for use in other documents.
  - **Save** = opens a window for saving the picture in JPG format. (Saving is done in the same manner as in any Windows application.)

## 3.5 Editing a Measurement Curve

You have various options for editing and processing a curve. All of the functions for this are located in the dropdown menu of the **“Edit”** dialogue box. **“Extract Recording...”** and **“Curve Overlay...”** create a measurement which is filed in the left box when files are open, the files being named **“Recording X”** ( $x = \text{sequential number}$ ). They are not stored automatically however.

### 3.5.1 Extract Recording

- To create a copy of the measurement currently open or extract a zoomed portion of the measurement, click on the **“Edit”** dialogue box and select **“Extract Recording”** in the dropdown menu.
- The measurement is filed in the left box of the open files and can now be edited without any changes being made to the original file.
- You can save this file under a name of your own choosing (see **“3.6.2”** or **“3.6.3”**).

### 3.5.2 Curve Overlay

- Overlaying two measurement curves is useful for comparing measurements, e.g. the measurement of a machine cycle taken three months ago vs. its current condition.
- To superimpose two measurement curves, click on the **“Edit”** dialogue box and select **“Curve Overlay”** in the dropdown menu (Note: possible only for curves with the same sampling interval).
- The **“Wizard for Overlay”** opens in a new window.
- You are now asked to select a 2<sup>nd</sup> recording, i.e. the recording to be used for overlaying the curve currently open.
- Click on the arrow button to get a list of all open curves recorded using the same sampling rate.
- To see all the curves possible, click on the arrow button next to the name. (The list is empty if no curves with the same sampling rate are open.)
- Click on the curve you would like to superimpose, followed by clicking on **“Next”** in the bar at the bottom of the window.
- The second recording is opened in the same window as the original recording and a prompt for coordinating the time of the second recording appears in the wizard. (Shifting can only be done along the time axis.)
- The recording can be adjusted roughly using the mouse and clicking on the scrollbar, keeping the left mouse button pressed, and shifting the recording to the approximate position desired.
- To position the recording precisely, click on the arrow buttons to the right (▶) and left (◀) of the scrollbar until the second recording is positioned as desired.
- To overlay the curves click on **“Complete”** in the bar at the bottom of the window.
- Click on **“Cancel”** to abort the overlay.

### 3.5.3 Time-Shift Channels

- To time-shift one or more channels in a measurement, click on the **“Edit”** dialogue box and select **“Time-shift channels”** in the dropdown menu.
- The **“Wizard for Time-shifting of channels”** opens in a new window.
- Select the channel you wish to time-shift in the dropdown menu.
- The measurement channel can be adjusted roughly by clicking on the scrollbar, keeping the left mouse button pressed and dragging to the right or the left.
- To position the recording precisely, click on the arrow buttons to the right (▶) and left (◀) of the scrollbar or press the right (→) and left (←) arrow keys on the keyboard until the measurement channel is positioned as desired.
- Click on **“Close”** to return to the main window.
- The time axis is now marked with an asterisk (\*time [ms]). This means that at least one of the curves has been time-shifted.
- To undo the shifts, return to the **“Wizard for Time-shifting of channels”** (see above).
- Click on **“Delete”** to undo the shift of the active channel (see name in upper box). Click on **“Delete All”** to remove the time shift on all channels.
- Once you have undone all time shifts the time axis no longer features an asterisk.
- Click on **“Close”** to return to the main window.

### 3.5.4 Add Calculated Channel

- To calculate a channel from one or more measurement channels, click on the **“Edit”** dialogue box and select **“Add calculated channel”** in the dropdown menu.
- A new window opens for calculating the channel.
- Enter the mathematical formula for the virtual channel in the formula input box at the top. The formula can be comprised of numbers, measured values, arithmetical operators and functions. For measured values, use "S1...Sn" in the formula.  
Example:  $5 * ((S1 + S2) / 2)$
- For detailed information on the formula contents and symbols, click on **“Help”** located in the line below on the right. Click on **“Help”** again to close the window.
- The unit of the channel being calculated can be entered in the **“unit”** input box.
- Select the number of decimal places for the measured values displayed (0 .. 8 decimal places) from the **“Decimal places”** box.
- After entering a formula to be calculated, click on **“Calculating”** in the line at the bottom of the window. The computed curve is now inserted.
- This process can be repeated as often as desired.
- After entering all the channels to be calculated and computing them, click on **“OK”** to close the window.
- Clicking on **“Cancel”** also closes the window but the calculated channels are removed again.
- On the right of the screen you will now find the calculated channels. The settings can be changed here as for any other channel. Calculated channels are always marked with an **asterisk (\*)**.

### 3.5.5 Add a Filtered Channel

- To remove noise from a measurement, for example, click on the **“Edit”** dialogue box and select **“Add a Filtered Channel”** in the dropdown menu.
- A window for filtering the channel opens.
- Clicking on the button next to the channel input box causes a dropdown menu to appear in which all channels are listed. Select the channel to be filtered.
- Clicking on **“Settings”** to open the channel settings window. Click on **“OK”** to save any changes you might have made, or **“Cancel”** to discard them.
- By moving the arrow on the bar **“Filter strength”** with your mouse the degree of filtering is changed. Changes can be monitored in the display pane of the graph.
- When the filter setting desired is located, click on **“OK”** and the channel is inserted permanently and can be edited like any other channel. Filtered channels are also always marked with an **asterisk (\*)**.
- Click on **“Cancel”** cancel the action.

### 3.5.6 Remove Channels

**CAUTION:** This action cannot be undone!

- To remove, i.e. not just hide, individual measurement channels, click on the **“Edit”** dialogue box and select **“Remove channels”** in the dropdown menu.
- A new window opens in which all the channels of the recording are listed.
- Select the channels to be removed.
- When you have selected all of the channels to be removed, click on **“OK”**.
- Click on **“Cancel”** to cancel the action.

## 3.6 File Dialogue

The dropdown menu of the **“File”** dialogue box contains various possibilities for retrieving, saving, etc. recordings.

### 3.6.1 Open

- See **“3.2 Retrieving a Measurement Curve”**

### 3.6.2 Save

- To save a recording, click on the **“File”** dialogue box and select **“Save”** in the dropdown menu, or click on **“Save”** at the bottom left of the window.
- If the file has already saved no window opens; only the changes are saved.
- If the recording has not yet been saved, the **“Save recording as...”** window opens.

### 3.6.3 Save As

- To save a file which hasn't been saved or to save a file under another name, click on the **"File"** dialogue box and select **"Save as..."** in the dropdown menu, or click on **"Save as..."** at the bottom left of the window.
- The **"Save as..."** window opens.

### 3.6.4 Save All

- To all changes in all files, click on the **"File"** dialogue box and select **"Save all"** in the dropdown menu, or click on **"Save all"** at the bottom left of the window.
- If all recordings have been previously saved, saving occurs without any new window opening.
- If one or more of the recordings have not yet been saved, the **"Save recording as..."** window opens.

### 3.6.5 Export

The export function enables you to save measured data in a format that can be exported to a spreadsheet program (e.g. Excel), for example.

- To export a file, click on the **“File”** dialogue box and select **“Export...”** in the drop-down menu, or click on **“Export...”** at the bottom left of the window.
- Now the **“Export data”** window opens.
- Select the time range to be exported:
  - **“Whole time range”**
  - **“Displayed time range”**
- Select the channels to be exported:
  - **“All channels”**
  - **“Displayed channels”**
- Decide how unit of measurement should be displayed:
  - **“Without unit”** *or*
  - **“Separate row”**
- Select the data format in which the recording is to be saved:
  - **“Text (separated by tabs)”**
  - **“CSV (separated by commas)”**
  - **“Formatted text (separated by spaces)”**
  - **“User-defined ASCII/ANSI Format”**
- Select the delimiter characters (for **“User-defined ASCII/ANSI Format”** only):
  - **“No quotation marks”**
  - **“Single quotation marks (‘)’**
  - **“Double quotation marks (”)”**
- Select the separators (for **“User-defined ASCII/ANSI Format”** only):
  - **“Space”**
  - **“Tab”**
  - **“List separator”**
  - **“Other”**
- Select the column width (for **“User-defined ASCII/ANSI format”** only):
  - **“Without fixed width”**
  - **“Automatic optimum width”**
  - **“Fixed column width”**
- Export folder:
  - Click on button next to the input box.
  - A window opens enabling you to browse for the folder.
- File name:
  - **“Keep name of recording”**
  - **“Ask for new name”**
- File extension (for *User-defined ASCII/ANSI format* only):
  - Click in the box.
  - You can manually enter the file extension here.

### 3.6.6 Create PDF Document

- To save a recording as a PDF file, click on the **“File“** dialogue box and select **“Create PDF Document...“** in the dropdown menu, or click on **“Create PDF Document“** at the bottom left of the window.
- The **“Create PDF“** window opens.
- Select the path in which you want the recording to be saved as a PDF.
- You can **“Keep the name of the recording“** as the file name or click on the arrow button and select **“Ask for new file name“** from the dropdown menu.
- In the upper section you can select whether the recording is to be stored in black & white (**“Monochrome“**) and whether the PDF file is to be opened directly after being created (**“Show PDF document“**).
- In the lower section you can decide which portions of the recording are to be contained in the PDF document by clicking on the checkbox before the particular portion.
- Click on **“Create PDF“** to create the pdf document.
- Click on **“Cancel“** to cancel the action.

### 3.6.7 Print

- To print a recording, click on the **“File“** dialogue box and select **“Print“** in the dropdown menu, or click on **“Print“** at the bottom left of the window.
- The **“Print“** window opens.
- In the upper part you can choose whether you want to print the recording in black & white only (**“Monochrome“**).
- In the lower section you can decide which portions of the recording are to be contained in the printout by clicking on the checkbox before the particular portion.
- Click on **“Print“** at the bottom of the window.
- Click on **“Cancel“** to cancel the action.

### 3.6.8 Close

- To close the measurement curve you are currently editing, click on the **“File“** dialogue box and select **“Close“** in the dropdown menu, or click on **“Close“** at the bottom left of the window.

### 3.6.9 Close All

- To close all open measurement curves, click on the **“File“** dialogue box and select **“Close all“** in the dropdown menu, or click on **“Close all“** at the bottom left of the window.
- If you have not saved your recordings, you are prompted to do so.

## 3.7 Editing the Settings of the HMG 3000 in HMGWIN 3000

### 3.7.1 Changing, Saving and Retrieving the Settings of the HMG

You can modify the sensor, trigger, recording and display settings and automatic units of measurement in the HMG 3000 from your PC. Here you have a number of options for saving the settings or for retrieving saved settings.

- To change, save or retrieve the settings in the HMG, click on the **“HMG 3000”** dialogue box.
- **“HMG 3000”** opens in a new window.

If a link has been established to the HMG, the following items appear on the left: **“Measured values”**, **“Recordings”**, **“Settings”**, **“Start recording”**, **“Disconnect”** and **“Communications settings”**. If this is not the case, establish a link to the HMG 3000 first (see section 2.4

- Starting HMGWIN 3000).
- Click on **“Settings”**.
  - Changing the settings:
    - **“Settings”** appears in the box on the right along with the various settings that can be modified. The same setting parameters are available to you as in the HMG 3000 itself (cf. HMG 3000 user's guide).
    - To change the sensor settings, click on **“Settings of measurement channels”**.
      - All the channels with their settings appear in the box on the right.
      - You can activate the channels and deactivate them.
      - To make changes, click on the blue measurement range settings on the right.
      - When you have finished making your changes, click on **“OK”** to save them or **“Cancel”** to return to the previous menu without saving.
    - To change the trigger settings, click on **“Trigger settings”**.
      - The various events with their settings appear in the box on the right.
      - You can activate the events and deactivate.
      - To set the events, click on the respective blue-highlighted event with its settings.
      - The actual settings of the particular trigger appear on the right. Make your changes as needed.
      - When you have finished making all the trigger settings, click on **“OK”** to save them or **“Cancel”** to return to the Settings menu without saving them.
    - To change the recording settings, click on **“Recording settings”**.
      - The recording settings now appear in the box on the right.
      - **“Name”** refers to the name under which the next measurement will be saved in the HMG 3000.
      - Click on **“OK”** when you have finished entering your settings and want to apply them. Click on **“Discard”** if you want to return to the Settings menu without applying your changes.
    - To change the automatic units of measurement for pressure, temperature and flow rate, click on **“Automatic units of measurement”**.
      - The automatic units of measurement now appear in the box on the right.
      - Select the required unit of measurement for pressure, temperature and flow rate from the relevant dropdown menu.
      - When you have finished making all of your settings for the units of measurement, click on **“OK”** to save them. Click on **“Cancel”** if you want to return to the Settings menu without applying your changes.
    - To change the display settings, click on **“Display settings”**.
      - Select the required display settings in the same manner as you would on the HMG 3000 and whether the min/max values are to be displayed.

- When you have finished making all the display settings, click on **“OK”** to save them or **“Cancel”** to return to the Settings menu without saving them.
- Saving your settings:
  - There are two possibilities for saving the settings made by you: in the HMG 3000 or on your PC.
  - To save your settings in a file stored in the HMG 3000, select **“Save to HMG”**. You are now prompted to enter a name. In the HMG 3000 you will now find it in the **“Settings manager”** menu.
  - To save the settings on your PC, click on **“Save to file”**.
  - You also have the option of making a backup of the settings saved in the HMG.
    - Click on **“Back up”**.
    - All of the settings saved in the HMG 3000 appear in the box on the right.
    - Select one or more settings you wish to back up (they are blue-highlighted when selected).
    - Click on **“Back up”**. A window opens to browse the folder for saving your backup.
    - Click on **“OK”** when you have found the folder or **“Cancel”** to cancel the backup procedure.
    - After you have made your backup you automatically jump from the right box back to the Settings menu.
- Retrieving settings:
  - Loading settings from the HMG 3000:
    - Click on **“Load from HMG”**.
    - All of the settings saved in the HMG 3000 appear in the box on the right.
    - Now click on the required setting (it is now blue-highlighted).
    - To load the settings, click on **“Open”**, to cancel this, click on **“Back”**.
    - You automatically return to the Settings menu.
  - Loading settings from your PC:
    - Click on **“Load from File”**.
    - A window opens for opening a file.
    - The setting is opened, however it is **not** saved in the HMG 3000.
  - Restoring one or more settings:
    - Click on **“Restore”**.
    - A window opens for opening a file.
    - The selected setting(s) is(are) opened and **saved in the HMG 3000 at the same time**.
- Deleting settings:
  - Click on **“Delete”**.
  - All of the settings saved in the HMG 3000 appear in the box on the right.
  - Click on setting(s) you wish to delete.
  - When you click on **“Delete”** all the blue-highlighted files are deleted. **Caution:** *You are not asked again whether you really want to delete the file(s).*
  - Click on **“Back”** to return to the Settings menu.
- Refreshing the settings of the HMG 3000:
  - Click on **“Refresh”** to display the changes which were made to the settings on the HMG 3000 also on your PC.

### 3.7.2 Start Recording

Measurements can also be made from your PC.

- To start recording from your PC, click on the **"HMG 3000"** dialogue box.
- "HMG 3000" opens in a new window.

If a link has been established to the HMG, the following items appear on the left: **"Measured values"**, **"Recordings"**, **"Settings"**, **"Start recording"**, **"Disconnect"** and **"Communications settings"**. If this is not the case, establish a link to the HMG 3000 first (see section Fehler! Verweisquelle konnte nicht gefunden werden.

- Starting HMGWIN 3000).
- Click on **"Start recording"**.

Apart from the **"Recording data"** menu item, you will find the following same settings options as on the HMG 3000 itself. For more details, refer to the **"Start recording"** section in the HMG 3000 user's guide.

Under **"Recording Data"** you find the following items in the dropdown menu: **"Save to HMG"** and **"Save to PC"**.

- **"Save to HMG"** means the measurement will be recorded in the HMG, saved there and immediately transferred to the PC, where it is saved under the file name entered by you.
- **"Save to PC"** means the measured values of the sensors will be transferred directly from the HMG to the PC and saved there under the file name entered by you. You can also watch the live measurement as an "online" graph on your PC screen. The smallest sampling rate in this recording option is 1 ms.
- Beispiel für eine Aufnahme mit **„Aufnahmedaten – im PC speichern“** anhand einer **„Messkurve mit Trigger“** .:
- Example of a recording made using **"Recording settings – Save to PC"** employing the **"Use trigger"** option:
  - In the **"Start recording"** menu, select the following settings in the dropdown menus:

<b>Recording data</b>	<b>: Save to PC</b>
<b>Recording</b>	<b>: Measurement with trigger</b>
<b>Sensors</b>	<b>: e.g. A,B</b>
<b>Sampling rate</b>	<b>: 1 ms</b>
<b>Recording time</b>	<b>: 10 sec.</b>
<b>Trigger settings</b>	<b>: e.g. T1 with the following settings: Specific value, Sensor A, Measured value rises, value: 50 bar</b>
<b>Pre-/post-trigger</b>	<b>: 50% / 50%</b>
<b>Automatic measurement</b>	<b>: Activated</b>
<b>Comment</b>	<b>: Practice example</b>

- When you are finished making your settings, click on **"Start"**.
- The **"Save recording as..."** window opens. Select the folder in which the recording is to be saved, enter a file name and click on **"Save"**.
- On your PC screen you see the actual measurement being plotted "online". Since the pre-/post-trigger has been set to 50% / 50%, 50% past is now shown in the graph. When the trigger event occurs the measurement is recorded, saved under the file name entered by you and restarted.
- To enlarge a portion of the recording, click on **"Zoom in"** at the bottom of the screen.
- **"Zoom in"** is now in bold type.
- When you move the mouse over the graph the mouse pointer turns into a magnifying glass with a plus sign.
- To enlarge click in one of the grid squares and hold the left mouse button down and highlight the grid squares you want to enlarge.

- Release the left mouse button to enlarge the selected portion.
- Click on **“Full size”** to see the whole range again.
- By clicking on **“Display settings”** a window will pop up.
  - You can choose whether the time or one of the sensors is to be scaled along the X axis. This enables a P/Q diagram to be rendered on line, for example.
  - By clicking on the checkbox for left Y axis and right Y axis you can determine which channels are to be displayed on the Y axis (right- or left-hand side of the graph).
  - In the lower section you can hide and show individual channels. By manually entering the **“Current display range”** you can assign a different Y scaling to the individual channels.
  - **“Accept”** means the changes made by you are applied without closing the window.
  - Click **“OK”** to apply the changes made by you and to close the window.
  - Click **“Cancel”** to close the window without the changes being applied.
- If you select **“End recording”** cancels the current measurement and restarts it again.
- To finish recording, click on **“End automatic”** and then **“End recording”**, in case no more trigger events occur.

### 3.7.3 Communications Settings

To change the data link settings, click first on the actual link and then on **“Disconnect”** and then on **“Communications settings”**. Now browse for the HMG again as described in section 2.4 and establish the link.

## 3.8 Extras

### 3.8.1 Update für HMG 3000

- Click on the **“Extras”** dialogue box and select **“Update HMG 3000”** in the dropdown menu.
- The Update Wizard window opens.
- Click on **“Next”**.
- Select the folder in which the new update file is saved. The Firmware version of the HMG 3000 (HMG3000\_Vxx\_Rxx.heupd) current at the time of purchase can be found in the “Installation” directory on the CD.
- An update file always has the following file extension: **\*.heupd**. Select the file and click on **“Open”**.
- Now follow the instructions of the Update Wizard.
- For information on activating the update in the HMG 3000, refer to the HMG 3000 user's guide.

### 3.8.2 Options

- Click on the **“Extras”** dialogue box and select **“Options”** in the dropdown menu.
- The Options window opens, offering you the following settings options:
  - Options folder:  
The configuration file of HMGWIN 3000 is stored in the Options folder. If you don't specify a folder, this file (HMGWINConfig.xml) is stored in the folder in which the application HMGWIN3000.exe is located.  
If more than one user is using HMGWIN, each of them can create an Options folder of their own. When this user selects this folder after launching HMGWIN, HMGWIN uses the configuration customized by the user. This enables different users to each work with their own customized configuration settings.
  - Working folder  
The folder selected here is automatically used when saving or opening recordings or settings.
  - Language
    - Click on the box after the **“Language”** box in which the current language setting is shown.
    - An arrow button appears after it.
    - Click on this button: a dropdown list opens.
    - Click on the required language.
- Click on **“OK”** to apply your changes or **“Cancel”** to retain the old settings.

## 3.9 Help

### 3.9.1 About HMGWIN 3000

- Click on the **“Help”** dialogue box and select **“About HMGWIN 3000”** in the dropdown menu.
- A window opens containing a link to the HYDAC website and information on the version of HMGWIN 3000 you are using.

**HYDAC ELECTRONIC GMBH**

Hauptstr. 27  
D-66128 Saarbrücken  
Germany

Web : [www.hydac.com](http://www.hydac.com)  
E-mail : [electronic@hydac.com](mailto:electronic@hydac.com)  
Tel.: +49-(0)6897-509-01  
Fax: +49-(0)6897-509-1726

**HYDAC Service**

If you have any questions concerning repairwork, please don't hesitate to contact HYDAC Service:

**HYDAC SERVICE GMBH**

Hauptstr. 27  
D-66128 Saarbrücken  
Germany

Tel.: +49-(0)6897-509-1936  
Fax: +49-(0)6897-509-1933

**Notice**

The information and particulars provided in this manual apply to the operating conditions and applications described herein. In the event of deviating applications and/or operating conditions, please contact the respective HYDAC department concerned.

If you have any questions, suggestions, or encounter any problems of a technical nature, please contact your HYDAC representative.

All technical details are subject to change without notice.

Trademarks: Where trademarks of other companies are used, these relate exclusively to the products of those companies.