
Installation- and operating manual

GDUSB 1000



Universal interface adapter for GMSD/GMxD-sensors

1 General

The GDUSB1000-adaptor makes it possible to connect a standard pressure sensor of the type GMSD/GMXD directly to the USB-port of a personal computer. Two operation modes are available:

Standard-mode: (Master-Slave)

In this mode the GDUSB1000 acts like a portable measuring instrument of the GMH3xxx-series and gives back the wanted measurement on request (measurand, maximum or minimum data).

The communication can occur with the standard GMH/EASYBUS-software (e.g. EBS9M) and offers the possibility to monitor long-run measurements of pressure for example.

Fast-mode: (autom. sending)

In this operating mode after a fulfilled trigger condition the GDUSB1000 sends the measuring data automatically in the adjusted cycle time.

This mode is especially adapted for the analysis of pressure curves and the survey of pressure peaks (with pre-trigger)



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2 Safety regulations

This device was designed and tested considering the safety regulations for electronic measuring devices. Faultless operation and reliability in operation of the measuring device can only be assured if the General Safety Measures and the devices specific safety regulation mentioned in this users manual are considered.

1. Faultless operation and reliability in operation of the measuring device can only be assured if the device is used within the climatic conditions specified in the chapter "Specification".
2. By faulty handling of the interface adapter a damage of the device can not be excluded. Likewise a damage of your attached device is possible. **In such case we cannot assume any warranty.**
The manufacturer will not assume any warranty for damages to other devices resulting by use of the interface adapter.
3. Standard regulations for operation and safety for electrical, light and heavy current equipment have to be observed, with particular attention paid to the national safety regulations (e.g. VDE 0100).
4. When connecting the device to other devices (e.g. the PC) the interconnection has to be designed most thoroughly, as internal connections in third-party devices (e.g. connection of ground with protective earth) may lead to undesired voltage potentials.

5. The device must be switched off and must be marked against using again, in case of obvious malfunctions of the device which are e.g.:
- visible damage
 - no prescribed working of the device
 - storing the device under inappropriate conditions for longer time

When not sure, the device should be sent to the manufacturer for repairing or servicing.

6. **Attention:** Do NOT use this product as safety or emergency stopping device, or in any other application where failure of the product could result in personal injury or material damage. Failure to comply with these instructions could result in serious injury and material damage.

3 Specification

Measuring range:	corresponding to used pressure sensor
Max. range:	-19999 ... 19999 digit
Resolution:	corresponding to used sensor
Pressure units:	mbar, bar, kPa, MPa, mmHg, PSI, mHzO can be selected corresponding the used sensor
Accuracy: (typ.)	±0,2 % FS (at nominal temperature)
Measuring cycle:	1 ms
Connection:	
PC:	standard USB-plug connector (type A)
GMSD, GMxD:	6-pin screened lockable Mini-DIN-socket. <i>Automatic sensor detection and setting of measuring range upon plugging in of the sensor.</i>
Power supply:	via USB-interface
Operating conditions:	-25 ... 50 °C, 0 ... 95 %RH (non condensing)
Nominal temperature:	25 °C
Storage temperature:	-25 ... 70 °C
Housing:	
Dimensions:	approx. 56 x 31 x 24 mm
Cable length:	approx. 30 cm
Weight:	approx. 40 g
EMC:	The device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (2004/108/EG). In accordance with EN 61326:1997 + A1 :1998 + A2 :2001 (app. B, class B)

4 Disposal instructions

The device must not be disposed in the regular domestic waste.

Send the device directly to us (sufficiently stamped), if it should be disposed. We will dispose the device appropriate and environmentally sound.

5 Operating modes

After restart the adapter is in the standard-mode.

5.1 Standard - Mode

In this mode the GDUSB1000 acts like a portable measuring instrument of the GMH3xxx-series. It gives back the wanted measurement on request.

For this purpose 4 measuring channels are allocated at the addresses 1 – 4:

- | | | |
|---|---------------|--|
| 1 | Measurand: | with adjustable low-pass filter (0.00 ... 10.00) |
| 2 | Average: | the average between two measuring-points |
| 3 | Minimal peak: | lowest measurand for the last request; unfiltered, with highest sample rate |
| 4 | Maximal peak: | highest measurand for the last request; unfiltered, with highest sample rate |

The communication can occur with every standard software for the GMH3xxx or **EASYbus** (e.g. EBS9M) and offers the possibility to monitor long-run measurements of pressure for example.

For the integration in your own programs, we offer you the function-library EASYBUS.DLL. This operating mode is especially adapted for the measuring of 1 measurand per second.

For example: long-run measurements of pressure, leakage test,...

Note: for use the GDUSB1000 you must select in the software the interface USB3100.

5.2 Fast - Mode

The device can be set to the mode “fast measurand display” via command. In this mode the measurement is started by a trigger condition. Then the device automatically gives back the measurands in the adjusted cycle time without any request, until the stop condition is fulfilled.

Adjustable parameters are among other ones:

- | | |
|---------------------|---|
| Cycle time: | 1ms ... 10sec.; programmable in steps of ms |
| Measuring channel: | cycle < 5 ms it is possible to choose the recording channel (measurand, min. peak, max. peak) |
| | cycle ≥ 5 ms all four measuring channels are recorded automatically |
| Trigger conditions: | 5 for the measuring start |
| | 6 for the measuring stop |
| Pre-trigger: | 50 data sets (at a cycle time of ≥ 5ms) respectively 200 measurands (cycle time < 5 ms) |

For the communication and configuration of the device in this mode the software GSOFTE-USB is necessary.

This mode is especially adapted for measuring very fast pressure changes (1000 per second)

For example: detecting pressure peaks at switching operations,

6 General handling instructions

6.1 To connect/change sensors

Only sensors of the GMSD or GMXD-serial are allowed to be used! If other sensors are used the adapter and the sensor may be destroyed.

To change the sensor you have to disconnect the adapter. Sensors have to be connected before activating the adapter. Otherwise they are not found by the adapter correctly.

During the connecting it is possible that the connector does not snap in the jack correctly. In this case you have to hold the connector at the anti-kink device not at the casing. Don't plug the connector wedged. An accurate attached jack can be easily plugged in without great effort. To disconnect the sensors it is not allowed to pull at the cable. In this case you have to hold the connector at its casing.

6.2 Altitude correction of the absolute pressure sensor

The device measures the absolute pressure of the ambient air. But this pressure is not to be confused with the "pressure at sea level", which is quoted by meteorological stations!

At this indication the decrease of the air pressure which is dependent on the level will be calculated. The device has the ability to do this air pressure height adjustment.

Activate for this the "sea level function" via the configuration software (GSOFT_USB) and specify the height beyond the sea level of your habitation.

6.3 Zero correction of the pressure sensor ('OFFS')

For the measurement a zero offset can be conducted:

$$\text{shown value} = \text{measured value} - \text{offset}$$

The zero correction in combination with the slope correction (see below) are mainly used to adjust the deviation of sensors. The entry has to be made in the configuration software. The offset information will be stored in the sensor. So you can set it individually for each sensor.

6.4 Slope correction of the pressure sensor ('SCAL')

The measurement's slope can be affected by this factor (factor in %):

$$\text{shown value} = \text{measured value} * (1 + \text{scale} / 100)$$

The slope correction in combination with the zero correction (see above) are mainly used to adjust the deviation of sensors. The entry has to be made in the configuration software. The scale information will be stored in the sensor. So you can set it individually for each sensor.

6.5 Pressure connection to the pressure sensor

The measuring adapter is conceived that way that all sensors of the GMSD/GMXD...-series can be connected without new calibration. Therefore a multiplicity of fully exchangeable sensors for metering ranges of 1.999...2.500mbar relative to 0...400.0 bar absolute for example are available.

Relative pressure sensors (type: GMSD/GMXD...MR, GMSD/GMXD...BR)

- For overpressure and respectively low-pressure measurements: fix the flexible hose with 4mm inner diameter at the fitting "B".
- For pressure difference measurements: fix both flexible hoses with 4mm inner diameter at the fittings "A" and "B", whereas the higher pressure has to be connected to the attachment "B".

Absolute pressure sensors (type: GMSD/GMXD...BA)

Fix the flexible hose with 4mm inner diameter to the fitting "A" ("B" is without any function).

Stainless steel sensors (type: GMSD/GMXD...MRE, GMSD/GMXD...BRE, GMSD/GMXD...BAE)

For overpressure, low-pressure or absolute pressure measurements: screw the sensor in the winding (G1/4") or connect a flexible hose with an appropriate adapter to the pressure sensor.

6.6 Advice for calibration service

Factory calibration certificate – DKD-certificate – ministerial certifications:

If the measuring device shall have a calibration certificate you have to send it inclusive the sensor to the manufacturer. Just the manufacturer can check the factory settings and correct them if necessary

7 Driver Installation

7.1 Windows Vista™, Windows XP and Windows 2000

For installation of the device drivers a user account with an administrator-authorisation is required. If you haven't an appropriate authorisation please consult your system administrator.

- Insert driver disk into the drive of your PC.
- Start the installation of the driver.
Path-example: E:\Treiber V5.3\Windows_2K_XP_S2K3_Vista\CP210XVCPInstaller.exe
E: means the letter of your drive.
- Follow the instructions of installation.
- Plug in the Device into the USB-connection.
- Now the installation will be finished.

Now the Device is installed on your system and available for all users.
For application with our software a new additional COM-Port is available.

7.2 Windows 98SE (Version V4.28a)

Insert driver disk into the drive of your PC.

- Plug in the USB-plug connector of the Device into the USB-connection of your PC.
- The “**Add New Hardware Wizard**” for installation of “**CP2102 USB to UART Bridge Controller**” appears. Click button “**Next**”.
- Confirm the selection window for an appropriate driver with button “**Next**”.
- In the following selection window choose “**Specify a location**”. In window “**Browse directory**” select the path of your driver and push button “**OK**”.
Path-example: E:\Treiber V4.28a (Windows 98)\WIN
E: means the letter of your drive
- Accept the suggested driver “**CP210x USB Composite Device**” by pushing button “**Next**”.
- Now the installation will be partly finished. You must acknowledge with button “**Finish**”.
- Now then the first part of the installation is completed, the hardware-assistant for installation of “**CP2102 USB to UART Bridge Controller**” appears again.
- Click on button “**Next**” and confirm the selection window for an appropriate driver with button “**Next**”.
- Choose the directory for your disk driver again, then click button “**Next**”.
- Accept the suggested driver “**CP210x USB to UART Bridge Controller**” by pushing button “**Next**”.
- Now the installation will be finished. You must acknowledge with button “**Finish**” again.

Now the Device is installed on your system and available for all users.
For application with our software a new additional COM-Port is available.

8 Frequently asked questions (FAQ)

8.1 How to check whether the adaptor has been installed correctly and via which COM-port can I approach the installed adaptor?

Start the Device-Manager: start \ settings \ control panel \ performance and maintenance \ system \ hardware and open the submenu **“Ports (COM & LPT)”**

If the installation was successful, there will be the entry **“CP210X USB to UART Bridge Controller (COM x)”**, in which the x after the Com indicates the available COM-port (i.e. COM 4).

Note: The adaptor will not be shown in the device manager, if it is not connected to the PC.

If the entry is occupied by an exclamation mark or the entry is not there, then the driver has not been installed correctly.

8.2 How to change the COM-port of the adaptor?

Make sure that the adaptor is connected, start the Device-Manager start \ settings \ control panel \ performance and maintenance \ system \ hardware) and open the submenu **“Ports (COM & LPT)”**

If the installation was successful, there will be the entry **“CP210X USB to UART Bridge Controller (COM x)”**, in which the x after the Com indicates the available COM-port (i.e. COM 4).

Open the features of this connection by a double-click, go to **“Port Settings”** and then click there the button **“Advanced...”**.

There you can choose the preferred COM-Port at the point **“COM Port Number”**. If this port is already reserved for another (even not connected) device, a error message will appear:

“In principle it is possible that 2 devices are set on the same COM-port, but then you have to take care, that not both devices are connected at the same time, because this would lead to a conflict!”

8.3 Is there an automatic update function that updates the installed driver to the latest version?

The driver is not updated automatically.

If there is already a suitable (for the operating system) driver during the installation, this driver will be used automatically.

If the usages of the adaptor cause problems please make sure that the latest version of the driver for the adapter is used and installs the latest version manually if necessary.

8.4 How to find out the used version of the driver?

Make sure that the adaptor is connected and start the Device-Manager start \ settings \ control panel \ performance and maintenance \ system \ hardware).

For the COM-driver open the submenu **“Ports (COM & LPT)”**, open the features for this connection **“CP210X USB to UART Bridge Controller (COM x)”** by double-click and change then to **“Driver”**.

There you can see the currently used driver version.



Operating Manual

Windows™ - Operating Software **GSOFT_USB** for USB measuring adapter GDUSB1000 as of version 1.3

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This manual is subject to being changed

1 General Information

1.1 Software Operation

This operating manual postulates basic knowledge of how to handle a personal computer with the operating system Windows™. If this is not existent it is recommended to make oneself familiar with the main features of Windows™ before installing this software (operating manuals, specialised literature, introductory courses etc.).

1.2 Software License Agreement

We kindly ask you to read the software license agreements on the disk package carefully. By opening the package you agree to the stipulations mentioned.

1.3 Software Registration

Get your software registration now! It is profitable!

As a registered customer you will have the following advantages:

- **Technical support:** Only our registered clients will receive support as far as technical questions on the programs which are concerned.
- **Low-priced update offers:** It is only our registered customers who may use our low-priced update offers.
- **Latest Information:** We are enlarging our product range constantly. As a registered customer we will keep you informed about our new and improved products. We want you to be up to date!

Your opinion counts: Let us know your wishes and recommendations.

Your opinion counts and may be used when we modify existing, or develop new products.

A blank registration form is included. Simply fax us the completed form.

1.4 System Requirements

- IBM compatible PC (Pentium™ with 1GHz)
- At least 20 MB hard disk capacity available
- CD-ROM drive
- At least 256 MB main memory
- Windows™ 98SE, 2000, XP or Vista
- mouse
- One unassigned USB-port

1.5 Software Installation

- Start Windows™
- Insert CD-ROM in CD-ROM drive
- Select "Execute" in Menu "Start"
- Enter "d:\setup" - d stands for the letter of your CD-ROM drive – and acknowledge. In case your CD-ROM drive is not 'd', please use the corresponding letter.
- Follow now the instructions given by the installation program.
- A new program group with the following program icon will be created:
The software will be started by double clicking on this symbol. 
- Start program, choose the language you desire and the interface to which you have connected your interface adapter.

2 Operating Software GSOFT_USB

GSOFT_USB permits the handling of an USB measuring adapter of the GDUSB1000 series. This adapter enables a direct connection of a standard pressure sensor of the type GMSD/GMXD to the USB-interface of a personal computer. With this dedicated software it is possible to start, stop, read in and display recordings. For visualisation and for a better overview the recorded data can be shown in diagrams.

2.1 Screen Elements

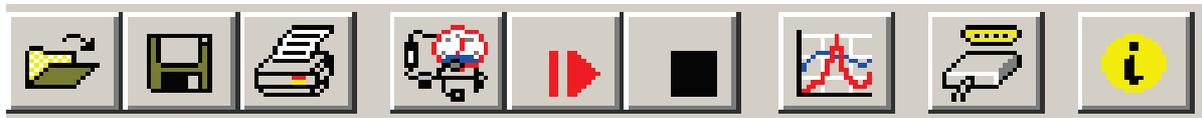
2.1.1 Menu bar

You can easily have access to all software functions by using the menu bar. The content of the menu bar depends on the program status:

File USB measuring adapter Diagram Configuration Window About

2.1.2 Toolbar

To ensure comfortable software operation the most important software functions have been put together at the Toolbar. The content of the toolbar depends on the program status:



1.1

1.2

1.3

2.1

2.2

2.3

3.1

4.1

4.2

File functions:

- 1.1 open file
- 1.2 save file
- 1.3 print file

Sensor functions:

- 2.1 connect USB-measuring adapter
- 2.2 start new recording
- 2.3 stop recording

Data representation:

- 3.1 create new diagram

Further functions:

- 4.1 interface configuration
- 4.2 program information

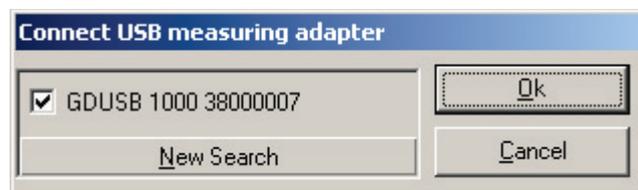
When moving the mouse pointer over a symbol a short description of the function is shown after a short time.

2.2 Data Recording

2.2.1 Connecting the USB-Adapter



- connect the USB measuring adapter to the USB-Port
- click in the menu item „USB measuring adapter“ on „Connect“ or on the associated icon in the toolbar.
- GSOFT_USB is now searching after connected measuring devices.
- The located measuring adapter will be shown like this:



If there was no device found you have to click on „New Search“. The USB-port will be initialised and attached devices will be located. Should still no measuring adapter be found please check the following points again:

- Is the USB measuring adapter connected to the USB-port?
- Was the correct interface chosen? („Configuration / Interface“)

The marked measuring adapter will be opened by „OK“.

2.2.2 Sensor Data Window

register "instrument"

register "data"

register "comment"

register "extras"

measurements table

Measurements		
1	Relative Pressure	1233 mbar
2	Average relative pressure	1233 mbar
3	Relative Pressure Min.	1233 mbar
4	Relative Pressure Max.	1233 mbar

current status of the recording;
start-/stop-condition

number of data sets and
period of recording

Data Sets: 81

first: 27.03.2007 14:28:58

last: 27.03.2007 14:29:06

2.2.3 Start Recording



When recordings are restarted, all data which have been recorded until that moment will be deleted!! If necessary read in and save important information or save the data on demand before a measurement-restart!

To start a new recording please select "start new recording" or click at the corresponding toolbar symbol. Now you can choose from an assortment of start and stop conditions and define the output data.

Start New Recording

GDUUSB 1000 38000007

Output

cycle time: 5 ms

measured value
 min peak
 max peak

Start

Start Signal:
 measured value
 average
 min/max peak

Start Condition:
 immediately
 start if measured value >= limit 1
 start if measured value <= limit 2
 start if measured value >= limit 1 or measured value <= limit 2
 start if measured value <= limit 1 and measured value >= limit 2

preTrigger
limit 1: 950

Stop

Stop Signal:
 measured value
 average
 min/max peak

Stop Condition:
 manually
 stop after 0 seconds
 stop if measured value >= limit 3
 stop if measured value <= limit 4
 stop if measured value >= limit 3 or measured value <= limit 4
 stop if measured value <= limit 3 and measured value >= limit 4

limit 3: 1050

Stop Delay: 0 seconds

Start
Cancel

Choice of the recording mode:

Output:

Cycle time: here you can decide in which intervals measuring points should be recorded. At the same time you can select which value will be displayed (measured value, min/max peak).

Keep this in mind: at a cycle time of more or equal than 5ms all measured values will be selected automatically. A direct selection is no longer possible.

Start:

You have to select the desired condition under the different possibilities. If „immediately“ is selected the measuring will start directly after starting it. At the other conditions you have to define one or more thresholds (if these are under- or overrun the condition depending on the selected case is fulfilled or not). The thresholds` entry is carried out in the mask on the right side. You even can select which signal shall cause the measuring start. But this is only available when the cycle time is higher or equal than 5ms. You can make this entry on the left side under „Start Signal“.

The preTrigger makes it possible for you to detect values before the normal values measured (after the start condition).

After the completion measurement the additional measured values will be shown in the register „Data“, too.

At a cycle time of less than 5ms 200 measured values are possible.

At a cycle time more or equal than 5ms 50 data sets are possible, which are made up of four different series of measurements (50 data sets x 4 series of measurements = 200 measuring values).

Example: a cycle time of 10ms is selected. There will be 10ms long 50 data sets (=500ms) recorded before the normal measuring will be started.

Stop: here it is possible for you, in analogy to the start conditions, to set the stop conditions. Besides the manual stop and the measuring stop after a certain time, the stop by specified thresholds is available, too (if these are under- or overrun the condition depending on the selected case is fulfilled or not). The thresholds` entry is carried out in the mask on the right side. You even can select which signal shall cause the measuring stop. But this is only available when the cycle time is higher or equal than 5ms. You can make this entry on the left side under „Stop Signal“.

The Stop Delay effects a continuous measurement until the defined time is up. After this the measuring will be stopped automatically.

2.2.4 Reading in of Measurements

To read the measuring values the cyclic recording has to be stopped first.

After loading the data the values will be shown in the register „Data“ automatically.

The white fields for the table heading can be edited.

In the register „Comment“ you can write arbitrary texts.

Do you want to view the data later again, you have to save them now by choosing „Save“ or „Save as“ in the menu „File“.

2.2.5 Stop Recording

If a recording is stopped, data are preserved which have been saved until that moment.

2.2.6 Comment

As soon as the data have been read you may enter your comments here.

The comment can be printed together.

If data are saved as a file, the comment will also be saved in the same file automatically.

This is an important function to help you describe data so that you will be able to identify and assign them even after a longer period of time.

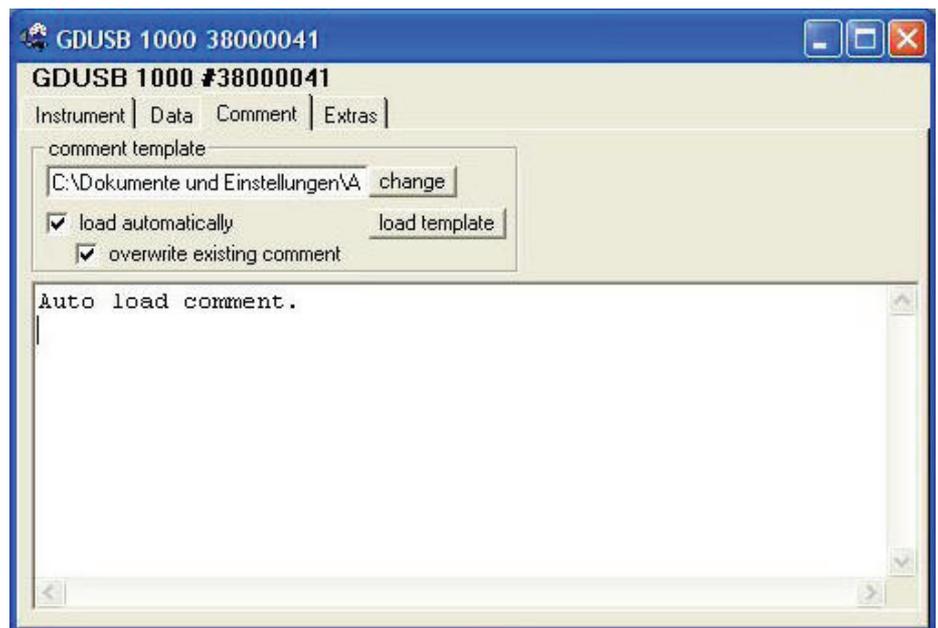
Furthermore there is the possibility to load recurrent comments in form of a template.

To do so, enter a suitable text-file (only .txt-format!) via button “change”.

Via button “load template” the text will be loaded manually to the window. If “load automatically” is activated, the previously selected text file is loaded automatically, whenever data is read out.

The comment can be edited afterwards as usual.

When “load automatically” activated, then “overwrite existing comment” is selectable. This function overwrites the existing comment, when a new record activate.



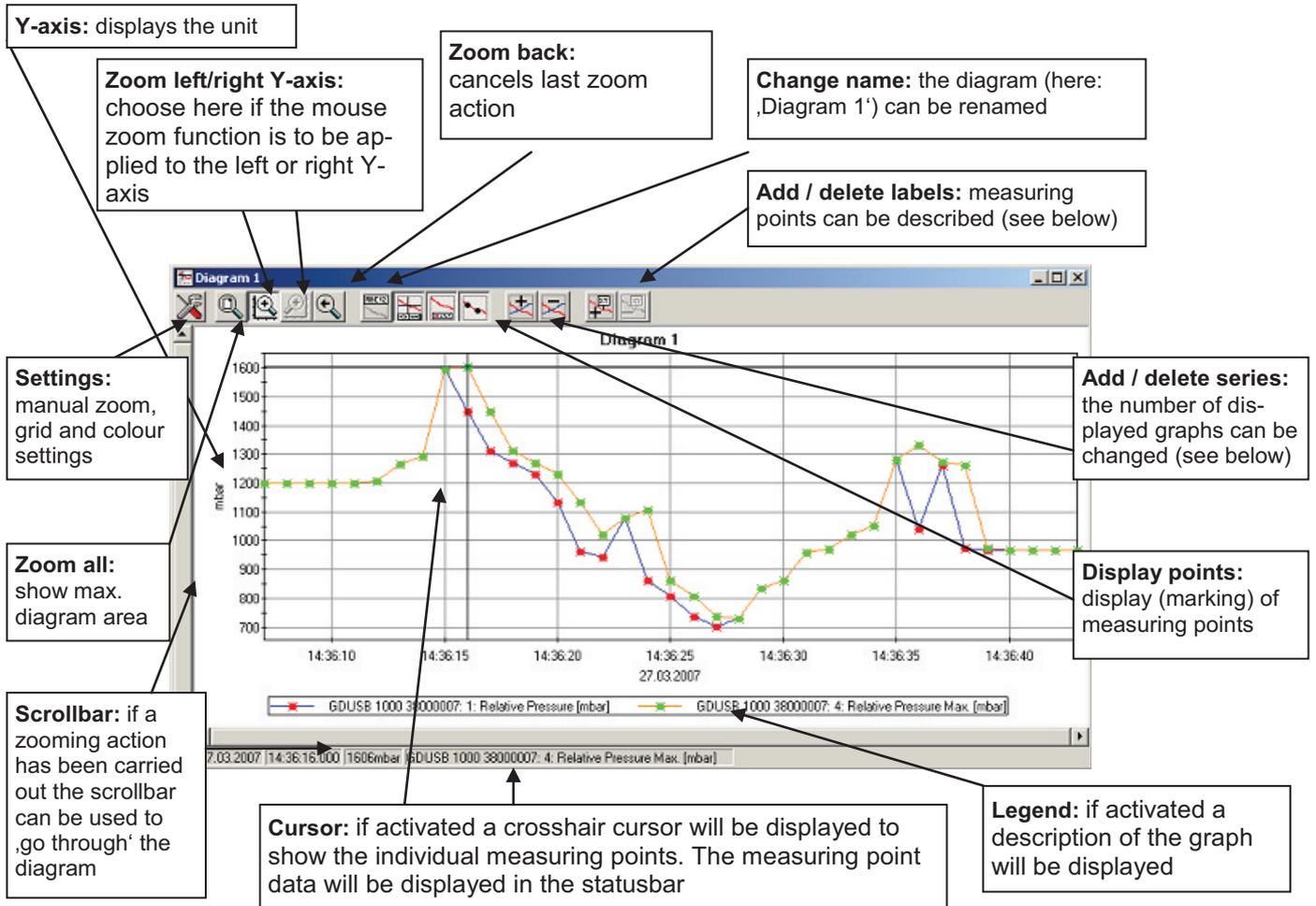
2.3 Measurement Diagrams

The loaded data of the measuring windows can also be displayed in diagrams.

Select for this „Create new diagram“ in the menu point „Diagram“.

Then a selection of all possible graphs will be displayed. Select the desired graphs and acknowledge your selection by pressing 'Ok'. The diagram will be opened.

System limitations: - maximum 2 different units (mbar, bar, etc.) per diagram
- maximum 15 graphs per unit



2.3.1 Adding Data Labels

To add a comment to a specific measuring point select menu item "Diagram/Add Data Label" or click on the corresponding symbol. By moving the mouse over the diagram the  symbol will appear as mousepointer. A text line which can be filled in freely will be placed at the position desired by a mouseclick.

2.3.2 Adding Series

To be able to display additional measuring series in a diagram, select the menu item "Diagram / Add Series" or click on the corresponding symbol of the diagram window. The data source selection will appear again and you can select additional measuring series.

2.3.3 'Zoom': Enlarge a Area of the Display

If 2 units are displayed : use the  and  symbols to select the Y-axis desired.

Place the mouse at the beginning of the desired area, hold the left mouse key, move the mouse to the end of the desired area and release the mouse key: the selected part will be enlarged (zoomed).

With „diagram – zoom back“ the actual area will be set back to the view before.

With „diagram – zoom all“ the whole diagram will be set back to the original view.

The enlarged view can be moved left, right, up and down with the scrollbar. To show accurate display details we recommend the function „diagram – settings“. With it a desired section can be defined by number and time declaration.

2.3.4 Copying Data To Clipboard

Diagrams can be copied to the clipboard, to insert them in other applications again:

Click on the required diagram and press the key combination **Strg + C** -> the diagram will be copied to the clipboard as a bitmap.

2.4 File Operation

If you have saved data by selecting menu „file“ function “save“ or “save as“ you can re-load them at any time into the program to see the data or to analyse them.

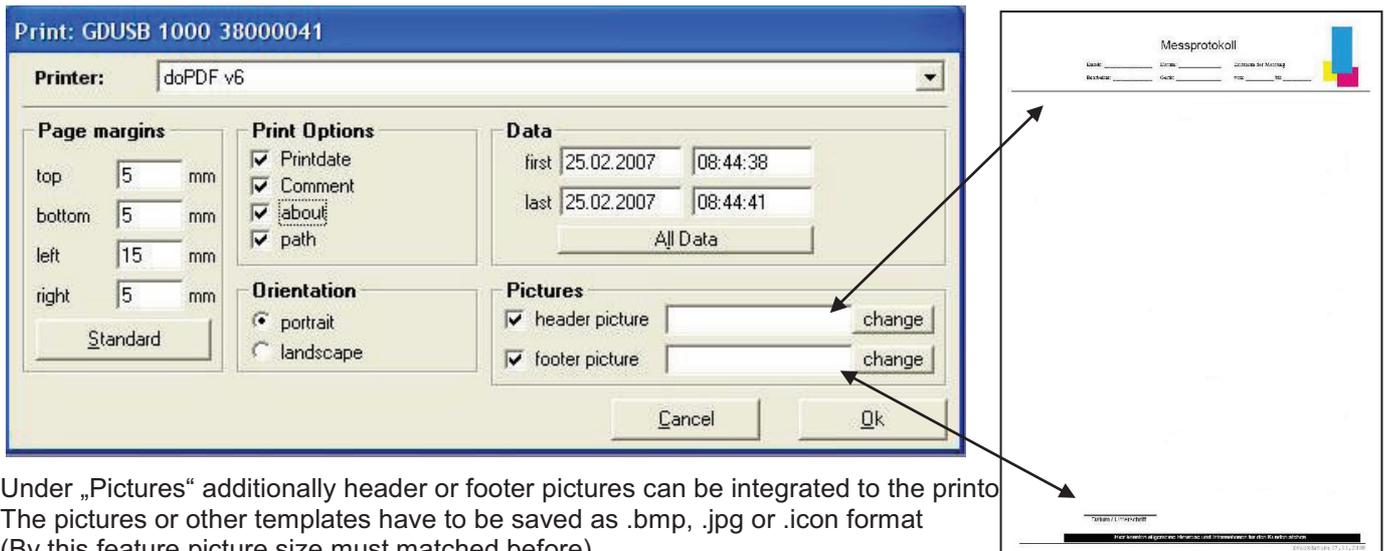
In that case please select “File / open...” and open the corresponding file.

2.4.1 Export Files

The data files can be saved as ASCII (=text) – file to view them for example in word processing or in a spreadsheet programs. Select the required data window and choose „file / export ...“ at the menu. Pay attention particularly at spreadsheets to make right settings in the following pop-up window „export files“.

2.5 How to Print Data

The selected window (data or diagram) can be printed via ‘File – Print’ provided a printer has been installed to the computer. Use ‘File – Printer Setup’ to change printer parameters or to chose another printer.



Under „Pictures“ additionally header or footer pictures can be integrated to the printout. The pictures or other templates have to be saved as .bmp, .jpg or .icon format (By this feature picture size must be matched before).

The printout can be extended to a individual form by simple means.