



GGU-BORELOG manual

Borehole logs (DIN 4022 / ISO 14688-1, 14689-1)

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Theorie. Und Praxis.

Geotechnische Softwarelösungen können so einfach sein. Denn Theorie und Praxis lassen sich mit **GGU-Software** und den neuen Angeboten der **civilserve Academy** prima kombinieren: Knackige theoretische Aufgaben lösen und als Sahnehäubchen Ihr

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1 GGU-BORELOG: Preface

The **GGU-BORELOG** program allows simple input and high-quality graphical output of bore logs to either DIN 4022 or ISO 14688-1 and ISO 14689-1.

In addition, data sets can be read and generated which were created or are to be read by the **GGU-STRATIG** program (soil profile visualisation). Furthermore, it is possible to import files into **GGU-BORELOG** that were created during on-site ground investigation using the smartwork Geo software solution.

The program includes convenient data input. The system is permanently displayed on the screen. Every change to the data is displayed on the screen, so that optimum control of the input data is guaranteed.

There are "?" and "Info" buttons in the dialog boxes for many technical and program-specific questions. Click on the "?" buttons or "Info" buttons to obtain the necessary information.

The graphic output supports the true type fonts provided by WINDOWS, so that an excellent layout is guaranteed. Colour output and numerous graphic formats (BMP, TIF, JPG etc.) are supported. PDF and DXF files can also be imported via the integrated **Mini-CAD** system (see "**Mini-CAD**" manual).

The program has been extensively tested. No errors have been found. Nevertheless, liability for completeness and correctness of the program and the manual, and for any damage resulting from incompleteness or incorrectness, cannot be accepted.

2 GGU-BORELOG: Licence protection

To protect the GGU software from unauthorised access, each GGU program is equipped with the **CodeMeter software protection system** from WIBU-Systems. Each GGU program is bound to a so-called **CmContainer** via a licence with the corresponding product code.

To be able to use the GGU licences in a CmContainer, a runtime environment, the **CodeMeter Runtime Kit**, must be installed on your computer via driver software. You can obtain the current version from [Software for Users - Wibu-Systems](#) (CodeMeter User Runtime for Windows).

You can work with the following CmContainer types on your PC with the CodeMeter Runtime Kit installed (= **CodeMeter licence server**):

- **CmStick**
The licence for your GGU program is stored in a USB dongle.
- **CmActLicense** (soft licence, not for virtual PC/servers)
The licence for your GGU program is stored in a licence file that is linked to the hardware of a computer.
- **CmCloudContainer**
The licence is located on a CmCloud server of WIBU-Systems and is mirrored to your CodeMeter licence server. The advantages of this type of licence binding are described on the following website: [Licence binding | GGU Software](#).

The GGU programs check at start-up and during runtime whether a corresponding license is available in a CmContainer.

3 GGU-BORELOG: Language selection

The GGU programs can be used in German and English. The program always starts with the language in which it was terminated.

The language preferences can be changed at any time in the "**Info**" menu, using the menu item "**Spracheinstellung**" (for German) or "**Language preferences**" (for English).

4 GGU-BORELOG: Starting the program

After starting the program, you will see two menus at the top of the window:

- File
- Info

After clicking the "**File**" menu an existing file can be opened using the "**Load**" menu item. A new file can be created using the "**New**" menu item. First, decide whether the bore log will be visualised to ISO 14688-1 in a dialog box. A standard page (empty) of the selected bore log is then displayed on the screen. Four menus appear at the top of the window:

- File
- Edit
- Graphics preferences
- Info

After clicking one of these menus, the so-called menu items roll down, allowing you access to all program functions.

The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the screen is not refreshed after every alteration.

If you would like to refresh the screen contents, press either **[F2]** or **[Esc]**. The **[Esc]** key also resets the screen display to your current image zoom, which is usually preset to 1.0, which corresponds to an A3 or A4 sheet in most GGU programs (see menu item "**Graphics preferences/Refresh and zoom**").

5 Tips and tricks

5.1 GGU-BORELOG: Keyboard and mouse

By double-clicking the left mouse button on legends or **Mini-CAD** objects, the editor for the selected element immediately opens, allowing it to be edited.

If you double-click in the system graphics with the left mouse button you will see a message box with the results at the selected depth. This gives you a quick overview of the results for any desired depth.

In most dialog boxes, the buttons for leaving the box or buttons for decisive functions are marked thickly and can be reached by clicking the **[Enter]/[Return]** key.

In dialog boxes in which you have to make entries, e.g. change soil properties, the quickest way to jump to the next input box is to use the **[Tab]** key. The previous value is marked and can be overwritten directly with the new entry. You do not have to move to the box with the mouse and delete the old entry in advance.

In input boxes with numerical values, you can use the calculation operations listed in “**Tips and tricks: Mathematical functions in input boxes with numbers**” to change them.

You can scroll the screen with the keyboard using the cursor keys and the **[Page up]** and **[Page down]** keys. After activating the zoom functions, click on an area of the screen to enlarge or reduce the display by a factor of 2. Alternatively, by clicking and dragging the mouse while holding down the **[Ctrl]** key, you define a window section which is then displayed in full screen. By clicking and dragging the mouse while holding down the **[Shift]** and **[Ctrl]** keys, you zoom into your system graphic, i.e. you change the scale of your system representation.

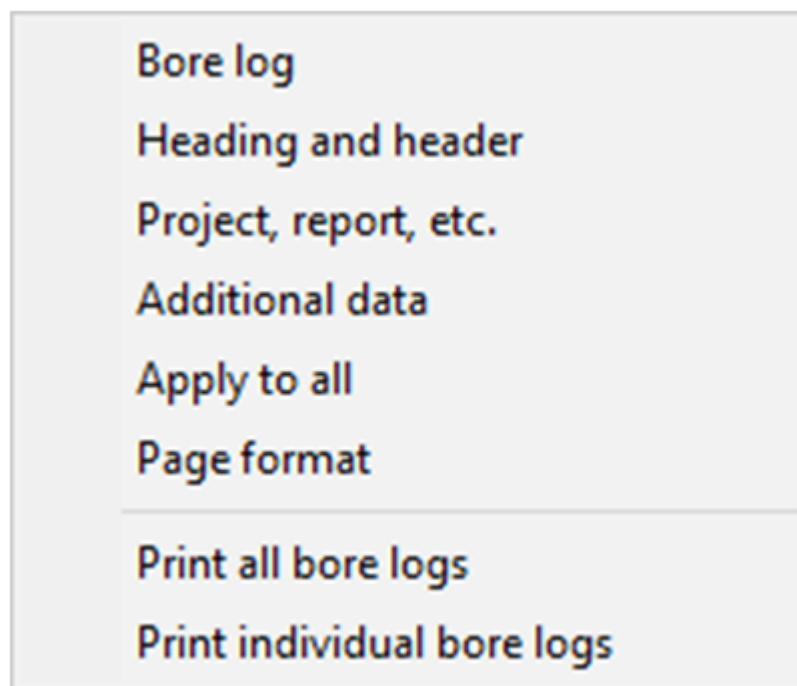
You can also use the mouse wheel to zoom in or out or to move the screen display. When the program is started for the first time, the default setting for mouse wheel operation is activated according to Windows conventions:

- Mouse wheel up = move screen image up
- Mouse wheel down = move screen image down
- **[Shift]** + mouse wheel up = move screen image right
- **[Shift]** + mouse wheel down = move screen image left
- **[Strg]** + mouse wheel up = enlarge screen image (zoom in)

[Strg] + mouse wheel down = reduce screen image (zoom out)

From a zoomed representation you return to the full screen with **[Esc]**.

If you click the right mouse button anywhere on the screen a context menu containing the principal menu items opens.



By double-clicking the left mouse button on output sheet or **Mini-CAD** objects, the editor for the selected object immediately opens, allowing it to be edited.

5.2 GGU-BORELOG: Function keys

Some of the function keys are assigned program functions. The allocations are noted after the corresponding menu items. The individual function key allocations are:

- **[Esc]** refreshes the screen content and resets the screen section to your current image zoom, which is preset to 1.0. This is useful, for example, if you have used the magnifying glass function to display sections of the drawing on the screen and want to quickly return to the overall view.
- **[F1]** opens the manual file.
- **[F2]** refreshes the screen without altering the current magnification.
- **[F11]** activates the menu item "**Move objects**", which appears in the GGU programs under various menu titles, e.g. "**Page size + margins**", "**Graphics preferences**" or "**Output preferences**".

In this GGU program, the following function keys are also assigned to program functions:

- **[F12]** navigates backwards through the bore logs. The current page is displayed in the status bar.

5.3 GGU-BORELOG: "Copy/print area" icon

A dialog box opens when the **"Copy/print area"** icon

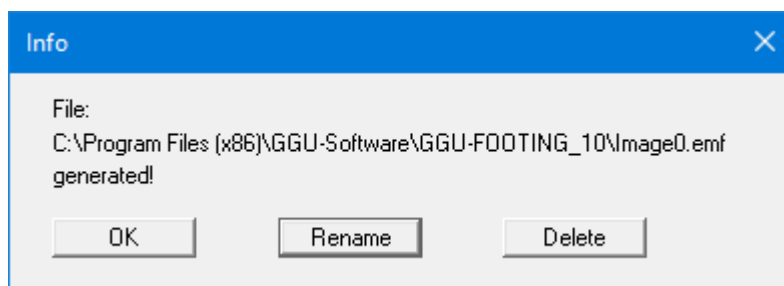


in the menu toolbar is clicked, describing the options available for this function. For example, using this icon it is possible to either copy areas of the screen graphics and paste them into the report, or send them directly to a printer.

In the dialog box, first select where the copied area should be transferred to: **"Clipboard"**, **"File"** or **"Printer"**. The cursor is displayed as a cross after leaving the dialog box and, keeping the left mouse button pressed, the required area may be enclosed. If the marked area does not suit your requirements, abort the subsequent boxes and restart the function by clicking the icon again.

If **"Clipboard"** was selected, move to the MS Word document (for example) after marking the area and paste the copied graphics using **"Edit/Paste"**.

If **"File"** was selected, the following dialog box appears after defining the area, shown here as an example for the **GGU-FOOTING** program:



The default location of the file is the folder from which the program is started (here: GGU-FOOTING_10) and, if several files are created, the file is given the file name **"Image0.emf"** with sequential numbering. If the

"Rename" button in the dialog box is clicked, a file selector box opens, and the copied area can be saved under a different name in a user-defined folder. Saving can be aborted by pressing the **"Delete"** button.

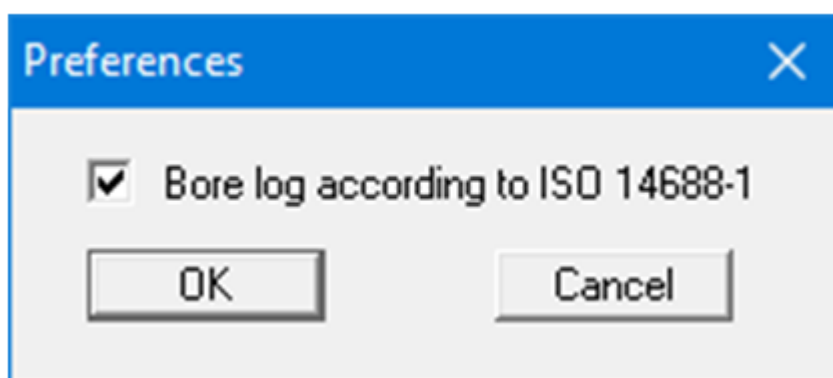
If the **"Printer"** button was pressed in the first dialog box, a dialog box for defining the printer settings opens after marking the area. Following this, a dialog box for defining the image output settings opens. After confirming the settings, the defined area is output to the selected printer.

6 File menu

6.1 GGU-BORELOG: "New" menu item

Select this menu item to create a new bore log. You will thus delete all existing entries for bore logs. You should therefore ensure that you have properly saved any previous logs.

The following dialog box opens for selecting the required standard. If the check box is deactivated bore log visualisation is based on DIN 4022.



An empty standard page corresponding to the chosen standard will appear on the screen. You can now enter a new bore log.

6.2 GGU-BORELOG: "Load" menu item

You can load a file with system data, which was created and saved at a previous sitting, and then edit the system.

6.3 GGU-BORELOG: "Save" menu item

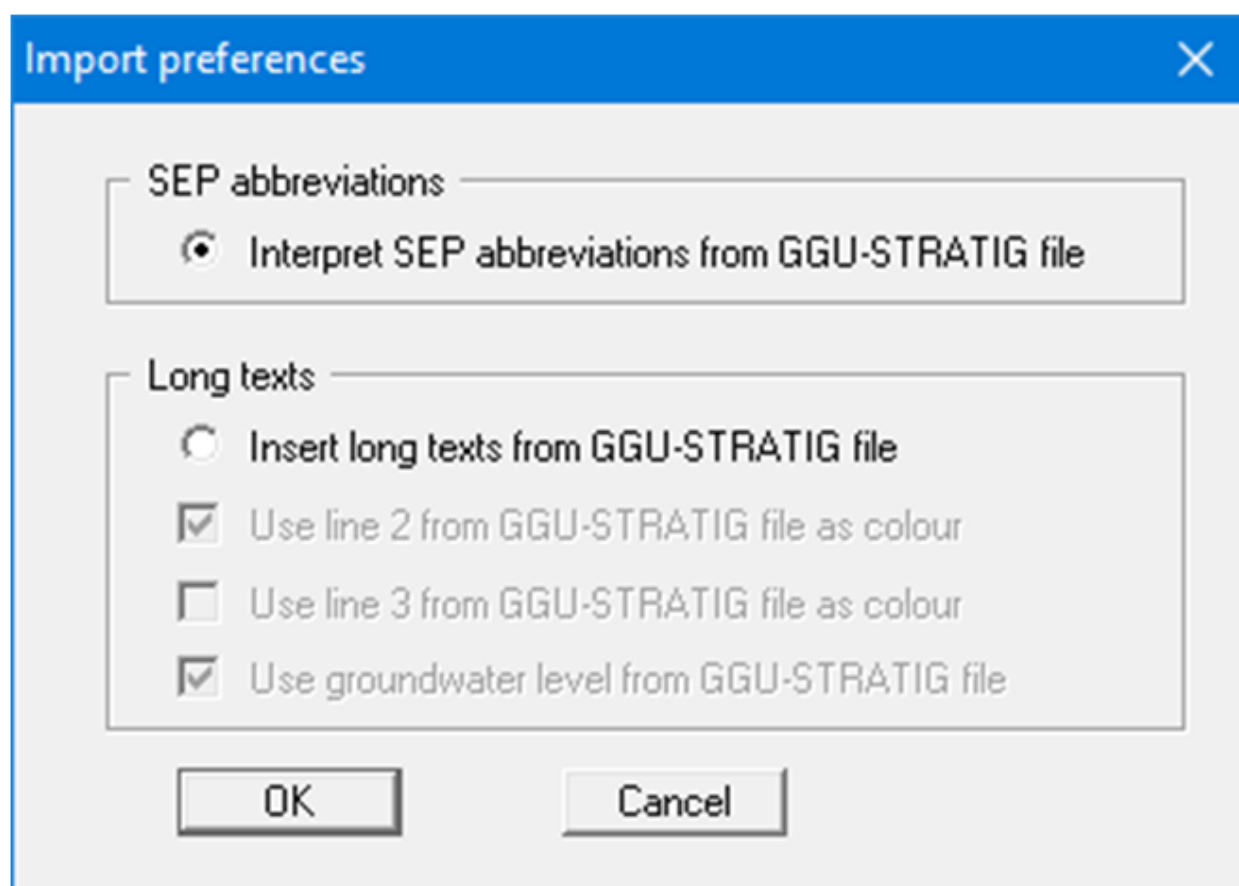
You can save data entered or edited during program use to a file, to have them available later, or to archive them. The data is saved without prompting with the name of the current file. The file contains all system information. Loading again later creates the same visualisation as was present at the time of saving.

6.4 GGU-BORELOG: "Save as" menu item

You can save data entered during program use to an existing file or to a new file, i.e., using a new file name. For reasons of clarity, it makes sense to use ".sch" as file suffix, as this is the suffix used in the file requester box for the menu item **"File/Load"**. If you choose not to enter an extension when saving, ".sch" will be used automatically.

6.5 GGU-BORELOG: "Import GGU-STRATIG file" menu item

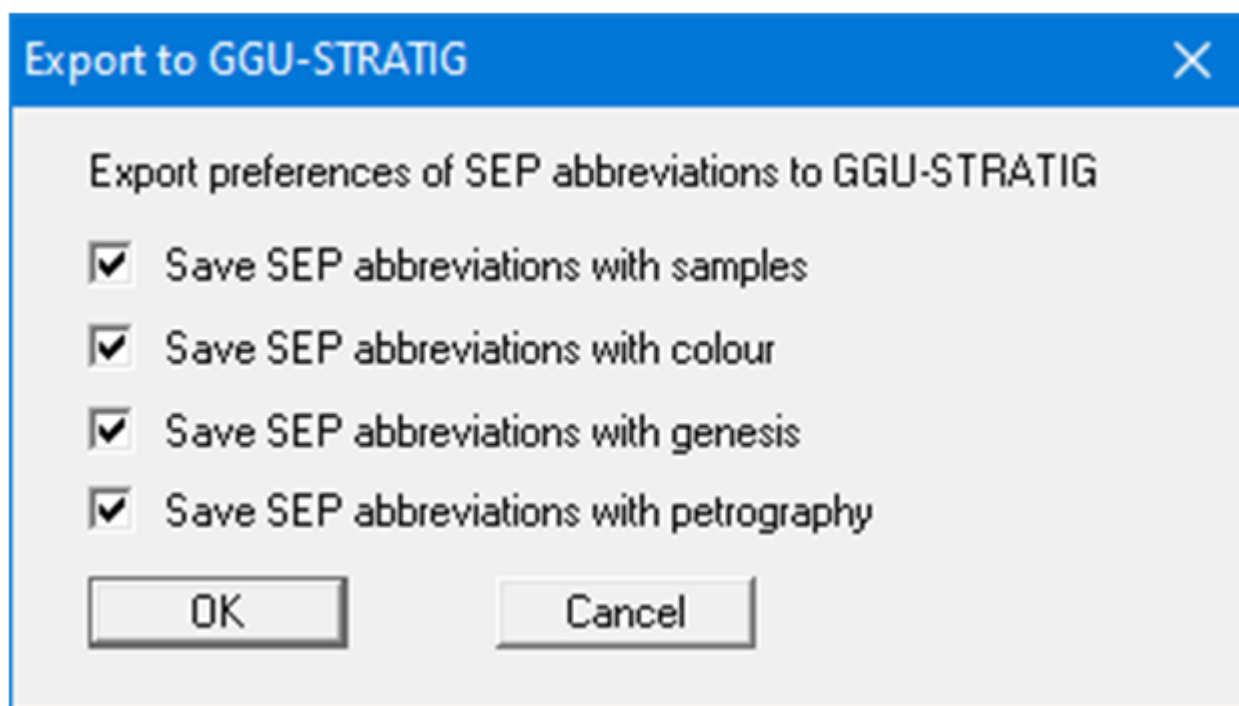
This menu item allows loading or adding of files created with the **GGU-STRATIG** (graphical presentation of bore profiles). These data can then be equipped with additional information typical for bore logs. The default suffix for the **GGU-STRATIG** program is ".bop". Before the **GGU-STRATIG** file can be imported into **GGU-BORELOG**, you must define the import format.



To achieve maximum *import security*, the **GGU-STRATIG** files should be generated with SEP 2 abbreviations. Then, select the upper **"Interpret SEP abbreviations from GGU-STRATIG file"** check box for the imports.

6.6 GGU-BORELOG: "Save GGU-STRATIG file" menu item

Once you have created a bore log, you can create a further file from this, which can then be read and edited by **GGU-STRATIG**. As the bore log generally contains much more information (e.g. information on the drilling process, geological information, etc.) than the graphical output of **GGU-STRATIG**, it usually makes more sense to first create the log and then the **GGU-STRATIG** file, using this menu item. Output to **GGU-STRATIG** is:

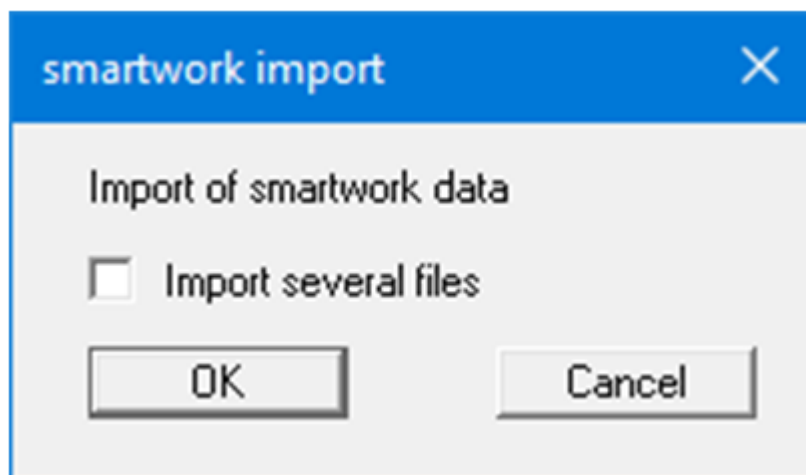


6.7 GGU-BORELOG: "smartwork import" menu item

You can import data that you have saved as a ".txt" file via smartwork GEO during your on-site ground investigation. smartwork GEO is a software solution from affinis for digitalised data acquisition, e.g. via a tablet. Find out more about the possibilities of this software solution at:

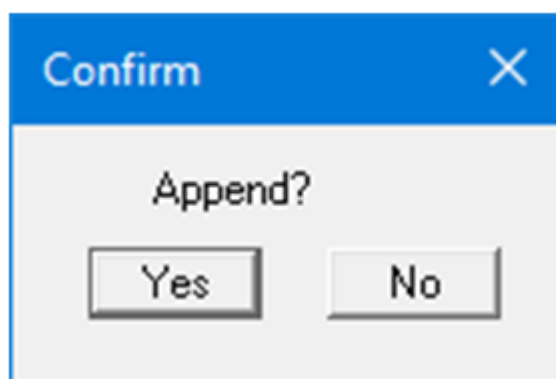
<https://www.affinis.de/services/smartworkgeo/>

If you select this menu item, you will first see the following dialog box:



If you have saved several files in smartwork Geo which you would like to display together in one **GGU-BORELOG** file, activate the "**Import several files**" check box. This enables multiple marking of the desired files in the Windows selection box that opens.

If you have only imported one file at first, you can add further data later by starting the menu item again. If boreholes have already been imported, the following request box appears after exiting the above dialog box:



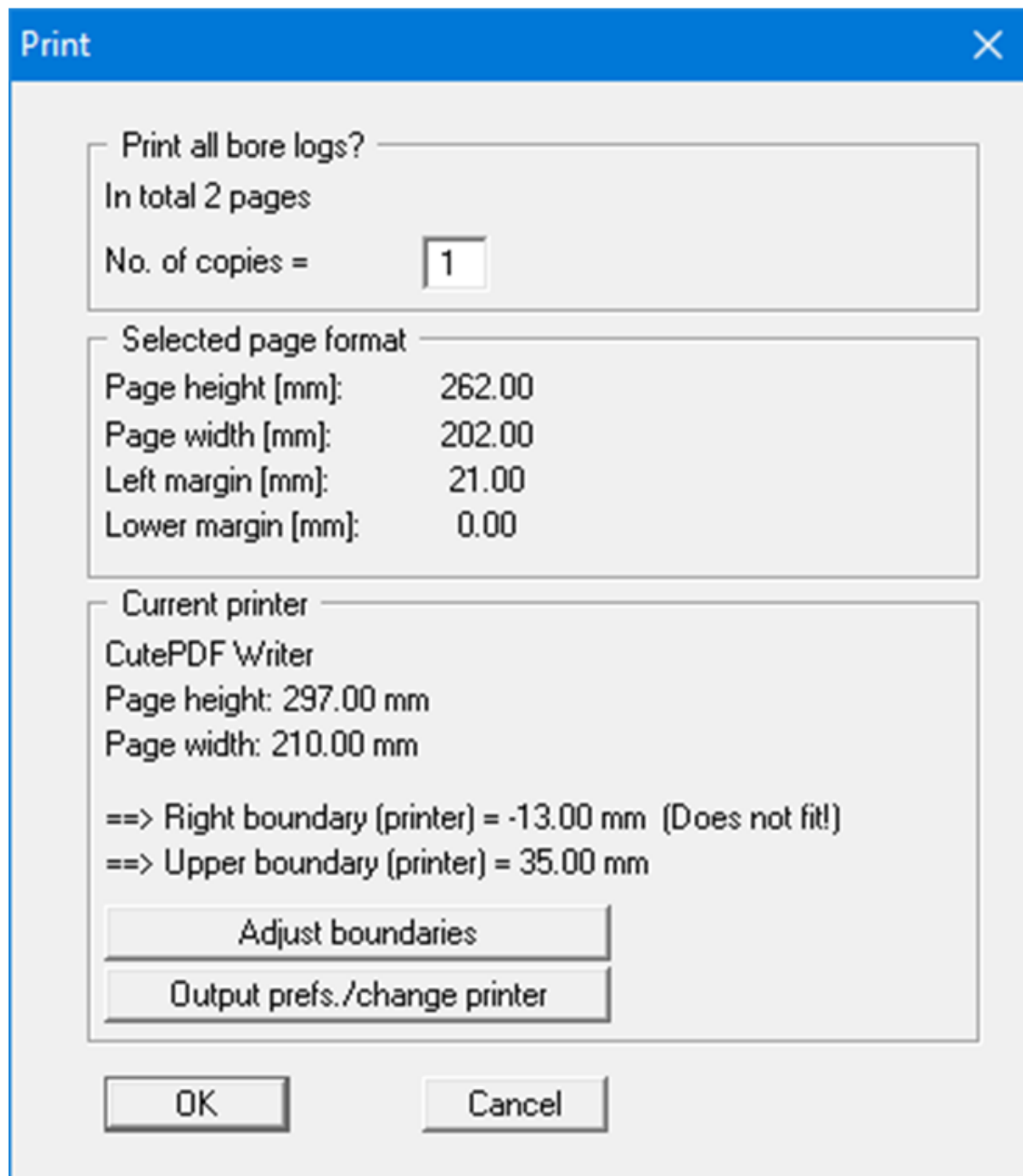
If you select "**Yes**", the new boreholes are appended to the end of the bore log. If you select "**No**", a new file with bore logs will be created.

6.8 GGU-BORELOG: "Output preferences" menu item

You can edit output preferences (e.g. swap between portrait and landscape) or change the printer in accordance with WINDOWS conventions.

6.9 GGU-BORELOG: "Print all bore logs" menu item

All bore logs entered can be sent to the local printer using this menu item. A different printer may also be selected by pressing "**Printer prefs./change printer**"



The image shows a 'Print' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog is divided into three main sections by horizontal lines. The first section, titled 'Print all bore logs?', contains the text 'In total 2 pages' and 'No. of copies =' followed by a text input field containing the number '1'. The second section, titled 'Selected page format', displays four values: 'Page height [mm]: 262.00', 'Page width [mm]: 202.00', 'Left margin [mm]: 21.00', and 'Lower margin [mm]: 0.00'. The third section, titled 'Current printer', shows 'CutePDF Writer' as the selected printer, with 'Page height: 297.00 mm' and 'Page width: 210.00 mm'. Below this, it indicates a fit issue: '==> Right boundary (printer) = -13.00 mm (Does not fit!)' and '==> Upper boundary (printer) = 35.00 mm'. At the bottom of this section are two buttons: 'Adjust boundaries' and 'Output prefs./change printer'. At the very bottom of the dialog are 'OK' and 'Cancel' buttons.

Print all bore logs?	
In total 2 pages	
No. of copies =	1

Selected page format	
Page height [mm]:	262.00
Page width [mm]:	202.00
Left margin [mm]:	21.00
Lower margin [mm]:	0.00

Current printer	
CutePDF Writer	
Page height:	297.00 mm
Page width:	210.00 mm
==> Right boundary (printer) = -13.00 mm (Does not fit!)	
==> Upper boundary (printer) = 35.00 mm	
Adjust boundaries	
Output prefs./change printer	

OK Cancel

Specify the required number of copies in the dialog box. The other group boxes show the currently used page format and information on the printable area for the selected printer. If the page settings do not allow the page to be output completely on one sheet, the necessary adjustments can be made by pressing "**Adjust boundaries**". The following dialog box opens:

Page size

Selected page format

Page height [mm]: 262.00

Page width [mm]: 202.00

Left margin [mm]: 21.00

Lower margin [mm]: 0.00

Current printer

CutePDF Writer

Page height: 297.00 mm

Page width: 210.00 mm

==> Right boundary (printer) = -13.00 mm (Does not fit!)

==> Upper boundary (printer) = 35.00 mm

Output prefs./change printer

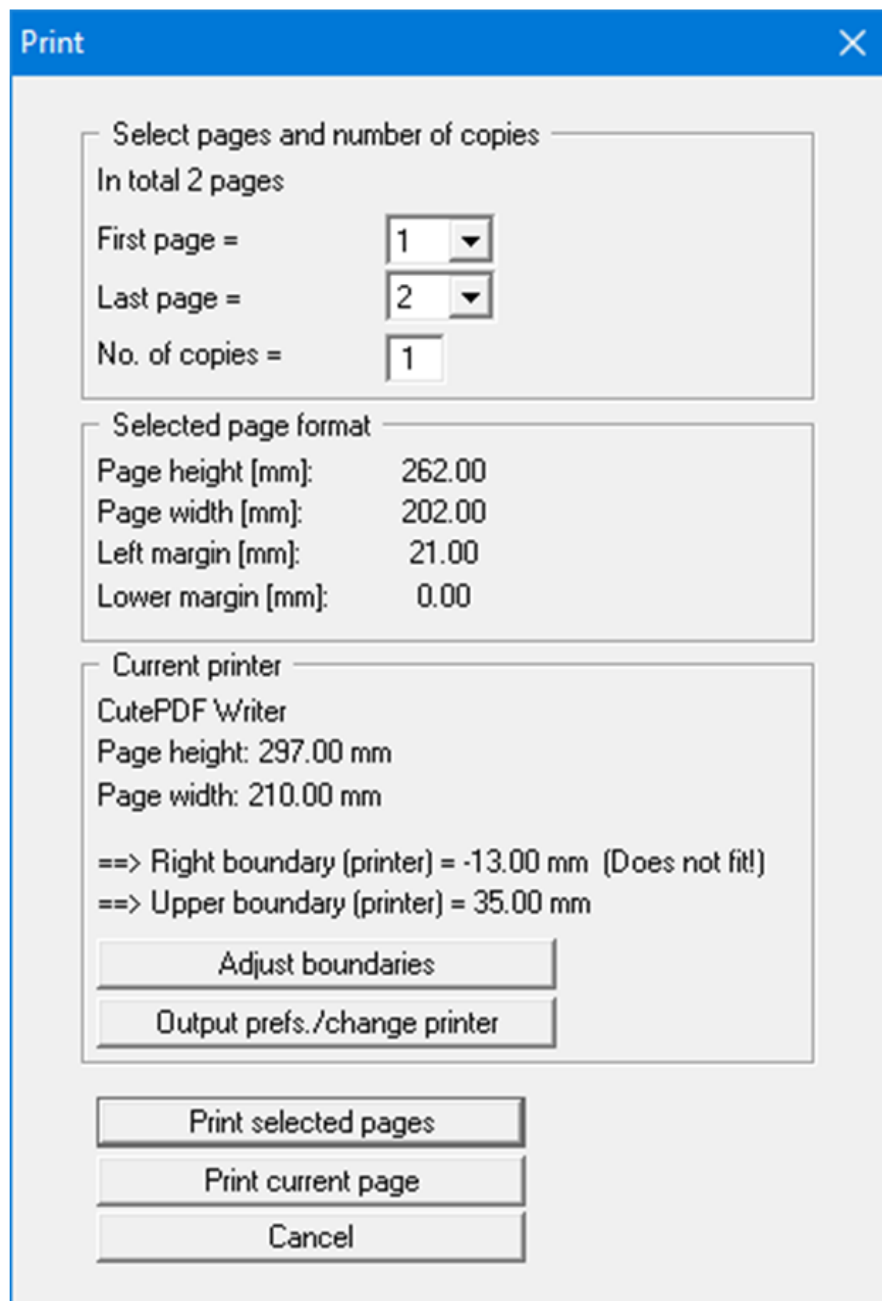
Adapt page height/page width to printer

OK Cancel Refresh

Click the **"Refresh"** button afterwards if these settings are manually adjusted. The new data is then compared to the printer data and the result displayed. It is also possible to specify the left and lower boundaries only and have the program determine the required sizes by pressing **"Adapt page height/page width to printer"**.

6.10 GGU-BORELOG: "Print individual bore logs" menu item

The individual pages of the bore log can be printed using this menu item.



Select the required pages and the number of copies in the upper group box. Below this the same settings are available for page optimisation as where previously described for the menu item "**File/Print all bore logs**".

Start the printing process by pressing "**Print selected pages**". It is possible to quickly print the bore log page currently displayed on the screen without making any selections beforehand by pressing "**Print current page**".

6.11 GGU-BORELOG: "Exit" menu item

After a confirmation prompt, you can quit the program.

6.12 GGU-BORELOG: "1, 2, 3, ..." menu items

If you have not stored a working directory for the program icon, the program jumps to the program directory after starting to load or save a file.

Under the menu items of the File menu, the most recently edited files are listed with the respective storage path ("**1**, **2**, **3**, ..."). Selecting one of these files loads the selected file. The next time the "**File/Load**" or "**File/Save**" menu items are called up in the same program session, the program automatically jumps to the directory of the last file loaded.

7 Edit menu

7.1 GGU-BORELOG: "Preferences" menu item

The following dialog box opens for selecting the required standard. In an existing bore log this allows easy movement between the various visualisations of the different standards.



If the check box is deactivated bore log visualisation is based on DIN 4022.

7.2 "Bore log" menu item

7.2.1 GGU-BORELOG: General processing options

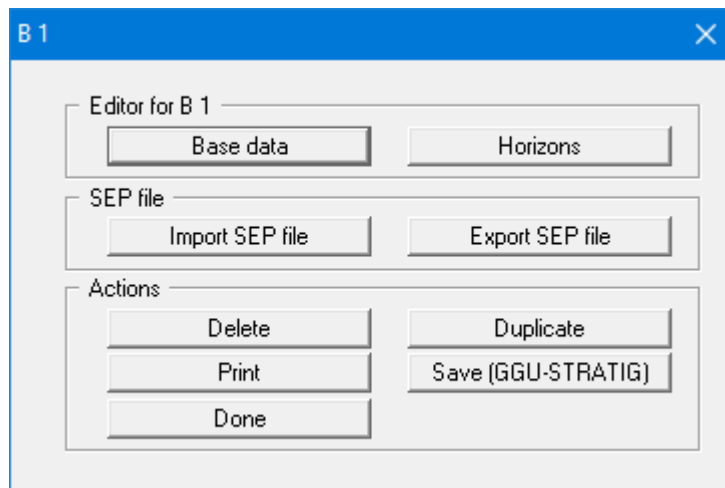
This menu item allows new bore log input or existing bore logs to be edited. The following dialog box will open, for example:



One bore log B1 is already present in this example. The following actions are now possible:

- **"To menu bar"**
You return to the original menu bar.
- **"New"**
You will create a new bore log.
- **"B 1"**
By clicking a box containing a borehole name (here: B 1 and B 2) the corresponding bore logs opens and can be edited.

After clicking on **"New"** or on the button of an existing bore log the following dialog box opens:



The descriptions of the two upper buttons "**Base data**" and "**Horizons**" can be found in Sections "Base data" button - "Horizons" button: Input using SEP abbreviations. The following additional actions can be started in the subsequent dialog boxes for the B1 bore log selected here:

- "**Import SEP file**"

Clicking the button allows a file created using the *SchichtenErfassungsProgramm* (Strata Recording Program) SEP (Version 2) developed by LBEG (formerly NLfB) in Hannover, Germany to be imported. The abbreviations used in the SEP 2 program were developed for recording data from field investigations. The SEP 2 abbreviations are automatically interpreted and converted to the corresponding long text. The highest possible degree of compatibility between the **GGU-STRATIG** and **GGU-BORELOG** programs can be achieved by using the SEP 2 set of abbreviations. The SEP 2 abbreviations are described in more detail in Section "Horizons" button: Input using SEP abbreviations.

- "**Export SEP file**"

The abbreviation record can be exported in the LBEG Hannover SEP 2 program format. The only requirement is that stratigraphic data was entered using the SEP 2 abbreviations. The **GGU-BORELOG** program includes the SEP 2 abbreviations defined for the engineering geology field. Therefore, when exporting your bore log to a SEP 2 file, select the type "**Engineering geology (IG)**". An input box opens for the header data required by the LBEG SEP 2 program for every bore log.

- "**Delete**"

The currently displayed bore log will be deleted.

- "**Duplicate**"

The currently displayed bore log will be duplicated. You will automatically find yourself in the "**Base data**" dialog box of the duplicated bore log.

- "**Print**"

Only the current bore log (B 1 in the example) is printed. It is possible to print only a single sheet if the bore log consists of several sheets. If further adjustments of sheet size etc. are required, it is better to select the menu items for printing under the menu title "**File**".

- "**Save (GGU-STRATIG)**"

The current bore log (B 1 in the example) can be saved as a single borehole as a ".bop" file for import into the GGU-STRATIG program.

- "Done"

You will arrive back at the previous dialog box.

7.2.2 GGU-BORELOG: "Base data" button

Using the "Base data" button in the editor box belonging to the "**Edit/Bore log**" menu item, the specific base data for a new bore log can be entered or the data of an existing bore log be edited. For y new bore log you will see the following dialog box, for example:



The borehole data entered here are in turn entered into the form corresponding to the selected standard. Activating the "**Borehole**" and "**Trench**" radio buttons and the "**+ absolute height**" check box facilitates the corresponding input on the form. The distinction between borehole and trench is only active with DIN 4022.

Some of the input boxes in the above dialog box are hidden by default, because they are normally specified once for all bore logs or annexes. If the input rows are activated in the menu item "**Edit/Project, report, etc.**", input can be made individually for each bore log, as shown in the example dialog box below.

Base data

Edit base data ☒ Borehole
☐ Trench

Designation

Project

Height ☐ + absolute height

Date

Report ← Project no.:

Report no.

Annex ← Annex no.: 3.#

Annex no. ← Page: #

Geographic position

Coordinate system: ?

Easting [m]: ?

Northing [m]: ?

The default entries for "Report:" and "Annex:" can be edited as required (e.g. to "Project no.:" and "Page no."). In addition, it is possible to generate automatic numbering within the bore log by entering "#" in the input rows after "Annex:" and "Annex no.". In the example above the annexes are sequentially numbered in the format 3.1, 3.2, 3.3 etc., by entering "3.#" (also see Section menu item 'Edit/Project, report, etc.').

7.2.3 GGU-BORELOG: "Horizons" button: General data input information

After selecting a bore log in the "Edit/Bore log" menu item's dialog box, the ground structure of the corresponding bore log can be entered or edited using the "Horizons" button. The following dialog box shows an example:

A stratum input is always possible via manual input of the description in the corresponding input boxes. It is much quicker to use the abbreviations in the uppermost line, the **abbreviation line**. By clicking the "Interpret" button after entering the abbreviations, the program automatically enters the long texts associated with the abbreviations in the corresponding lines.

The SEP 2 abbreviations according to the 'Schichten-Erfassungs-Programm SEP' (Version 2) published by the LBEG Landesamt für Bergbau, Energie und Geologie (formerly: Geological Survey of Lower Saxony NLfB) are used. If you have switched to GGU abbreviations, please switch back to the SEP abbreviations.

Due to the greater flexibility, the SEP abbreviations are recommended.

At the bottom right you will see four boxes with code numbers. The code numbers control the fill of the horizon presentation with soil type symbols according to German Standard DIN 4023. The code numbers are only relevant if the bore logs entered in **GGU-BORELOG** are required for subsequent graphical visualisation as soil columns in the **GGU-STRATIG** program.

There are a further nine buttons in the lower area of the "Horizons" dialog box, used for the following actions:

- **"Previous"**
You will return to the previous horizon. Alterations to the current horizon will be saved.
- **"Next"**
You will advance to the next horizon. Alterations to the current horizon will be saved.
- **"Delete"**
The horizon displayed in the dialog window will be deleted.

- **"Paste"**

An additional horizon can be pasted prior to the displayed horizon.

- **"Remarks"**

Clicking this box generates a dialog box for entering remarks or similar on the borehole. They appear on the DIN 4022 form in column 3 or in column 7 of the ISO 14688-1 form. Some long texts interpreted from abbreviations, e.g. groundwater level information, are automatically entered in the corresponding columns for the selected standard during interpretation.

- **"Sh. text"**

The short text relevant for using the record for graphical visualisation in **GGU-STRATIG** can be entered in this dialog box.

- **"Samples"**

Enter the type, number and depth of samples in this dialog box. These data can be found in the DIN 4022 form in columns 4, 5 and 6 or on the ISO 14688-1 form in column 6. The samples can also be entered and interpreted using the SEP 2 abbreviations (see explanation in Section **"SEP abbreviations"**).

- **"Cancel"**

Horizon input will be stopped. Alterations to the displayed horizon will be rejected.

- **"Done"**

Horizon input is complete. Alterations to the displayed horizon will be accepted.

7.2.4 GGU-BORELOG: "Horizons" button: Input using SEP abbreviations

SEP stands for SchichtenErfassungsProgramm.

The SEP program, Version 2 of which is implemented in **GGU-BORELOG**, was developed by LBEG (*Landesamt für Bergbau, Energie und Geologie*, formerly: *Niedersächsisches Landesamt für Bodenforschung, NLFb*) in Hannover and allows the acquisition of data collected in field investigations. The SEP 2 program includes a set of abbreviations that can also be selected for use in the **GGU-BORELOG** program for entering strata using abbreviations. If you have the **GGU-STRATIG** program (graphical presentation of stratigraphic logs), as well as **GGU-BORELOG**, you can achieve the highest possible compatibility between the data sets of both programs by exclusively using the SEP 2 abbreviations.

For a detailed study of the SEP 2 abbreviations please see the SEP 2 manual, available from the LBEG. After bore or sounding input, **GGU-BORELOG** allows saving in a SEP 2 compatible format, if you have used the SEP 2 abbreviations. You can thus achieve a high degree of compatibility to other applications. Loading of files created with the SEP 2 program is also supported.

The abbreviations defined by LBEG for the **"Engineering geology"** subset are included in the **"SEPKURZ-e.TXT"** file, which is included with the program. The existing SEP 2 abbreviations can be viewed, printed and, if necessary, modified in the menu item **"Edit/SEP abbreviations"** together with the long texts and short texts, and the code numbers for controlling soil column hatching.

If files created using modified SEP 2 abbreviations are forwarded to third parties, compatibility with the **receiver's** programs cannot be guaranteed, because the modified abbreviations are not available and cannot therefore be interpreted.

If data forwarding is required, e.g. at the client's request, it is better to work with the original SEP 2 file (for transfer to the SEP 2 program) or to send the modified "**SEPKURZ-e.txt**" file with the data (for transfer to **GGU-BORELOG** and **GGU-STRATIG**).

A SEP 2 abbreviation line consists of seven input areas :

- Depth
- Stratigraphy (age)
- Petrography (main soil types + accessory soil types + characteristics if necessary)
- Genesis (origin)
- Colours
- Supplements
- Samples

These input areas are each separated by a " / ".

In the petrography field, the main and accessory soil types are separated by a " ; ".

Several abbreviations within a field are separated by commas " , ".

Depth / Stratigraphy / Petrography (main) ; Petrography (accessory) / Genesis / Colours / Supplements / Samples

The SEP 2 program allows an abbreviation line length of 256 characters. **GGU-BORELOG** also allows this line length. If the number of abbreviation characters goes above a value of 60, the input window will scroll horizontally to the left. With the [Pos1] key you can return to the beginning of the line. With the [End] key you can move to the end of the abbreviation line.

The abbreviation area Petrography includes the SEP 2 abbreviations for main soil types and accessory soil types. in addition, abbreviations for **properties** can be entered in any position in the petrography field, e.g. information on grain roundness for a fine gravel fraction or on lime content. The abbreviations and corresponding long texts can be found under "**Edit/SEP abbreviations**" by pressing the dialog box button "**Petrographic properties**".

In the abbreviation line, the main soil type and accessory soil types are separated by a semicolon. This separation is important if the data entered in **GGU-BORELOG** are to be graphically displayed in **GGU-STRATIG**. In **GGU-STRATIG**, everything before the semicolon is treated as the main soil type during long text allocation. Everything after the semicolon is treated as accessory soil types. The assignment of the long texts to the 3 long text lines A1, A2 and B in **GGU-STRATIG** is done accordingly. If only 1 main soil type and 1 accessory soil type with a small batch are present, enter the "#" character as a placeholder for the non-existent 2nd main soil type, so that the graphical representation of the soil signatures and colours of the soil types is interpreted correctly when your file is transferred to **GGU-STRATIG** (see Section Data exchange with **GGU-STRATIG**). The placeholders can also be used if, for example, you wish to describe a fill, but the explanatory soil types are not to be displayed (e.g.: 2,35// A,#,#,#; mS, fs2, u4// bn).

Quality information is noted by a number associated with the corresponding abbreviation. They are allocated as follows: "1" = "very slight", "2" = "slight", "4" = "strong", "5" = "very strong". It is not necessary to enter the "3" = "middle".

- Example:

The following horizon is to be entered:

Horizon base = 2.35 m

Medium sand, slightly fine-sandy, very silty, brown, soil group SU,
stratigraphy, genesis and samples not present*

The abbreviation line is:

2.35// mS, #; fs2, u4// bn/ SaU2

After pressing the "**Interpret**" button all input will be converted to long texts.

If an input is not required in an area, simply leave the area empty - in the above example: stratigraphy and genesis. The slash to the next area follows directly.

Unnecessary fields at the end of the abbreviation line are simply left blank - in the above example: no samples. The line ends after the soil group abbreviation.

For **colour** input, two colours can also be combined. For example:

- gero ==> yellowred (ge = yellow; ro = red)
- dbn ==> dark brown (d = dark; bn = brown)

If an "=" is entered after the colour abbreviation, the long text will be supplemented with "ish". For example:

- ge= ==> yellowish
- ro= ==> reddish

If an abbreviation from a different input area is to be used in any of the areas, the **area designation**

- S: for Stratigraphy
- P: for Petrography
- G: for Genesis
- F: for Colours

- Z: for Supplements

must be entered. For example:

- 2.35// mS, #; fs2, u4, F:bn/// SaU2

The colour **brown** (bn) will thus be interpreted into the "**Petrography**" area.

Free text can be entered into any area. The free text must be entered in apostrophe's. For example:

- 2.35// 'Construction rubble', mS, #; fs2, u4// bn/SaU2

The free text **Construction rubble** will thus be interpreted into the "**Petrography**" area.

If you would like to have the long text in **brackets**, simply enter these at the desired position in the abbreviation line. For example:

- 2.35// 'Construction rubble', (mS, #); fs2, u4// bn/SaU2

Medium sand, in long text, will then be placed in brackets.

Using the **Supplements** field in the SEP 2 abbreviation line it is possible to record the **soil group**, the **consistencies** or the **drilling progress** in the corresponding fields of the bore log form. The allocations are defined by the column names in the "**SEPKURZ.txt**" file (also see menu item "**Edit/SEP abbreviations**", dialog box button "**Supplements**"). It is also possible to combine a number of abbreviations, e.g. "**kos2-kos3**" for consistencies "**soft to firm**".

In the supplements field abbreviations are also provided for describing **groundwater** conditions. The depth information is entered in brackets following the abbreviation. Additional descriptions, e.g. the date, are entered in single quotation marks and follow after the depth data and a space or comma.

The brackets containing the depth data must immediately follow the groundwater abbreviation, without a space.

The decimal separator for depth input must be a point, not a comma.

Example:

- 2.35// 'Building waste', mS, #; fs2, u4// bn/ SaU2, bv3-bv4, gws(2.66,'30.07.22')

This means that in the DIN 4022 form, for example, the soil group in column "2h" is entered as "SU*", "medium - difficult to drill" is entered in column "2d" and "GW risen to (2.66, 30.07.22)" in column "3".

Input of **samples** and their designations follows at the end of the abbreviation line. After the final supplement input enter a " / " and begin with the depth from which the sample was taken.

It is important that the sample depth information is entered using a decimal point, not a comma.

You can then enter the field designation in brackets. For the type of sample, the SEP abbreviations are available once again, which you can view or supplement in "**Edit / SEP abbreviations**", button "**Samples**". The sample type (e.g. special sample) must also be placed in brackets and be separated from the sample designation by a comma. If a further sample has been taken from the same horizon, separate the entries with a " ; " and enter the depth, number and type in the same sequence.

- For example the entry
..... / 1.2 (Gl 1) , (bp1) ; 1.4 (Gl 2) , (so)
means very poor quality bore sample (= bp1) at a depth of 1.2 m in glass 1 and a special sample (= so) at a depth of 1.4 m in glass 2

The sample base level is entered in the format shown above. If the top and bottom of the sample need to be displayed, the appropriate check box must first be activated under "**Edit/SEP abbreviations**", dialog box button "**Preferences**". Depth input then follows the example below:

-/ 1.0-1.2 (Gl 1), (kp)
This allows both depths to be used in the form.

The SEP 2 program is much more consequential than the DIN 4022. The genetic expressions **topsoil**, **boulder clay**, **fill**, etc., e.g., are thrown into one pot with purely petrographic expressions (e.g. sand, gravel, etc.) in DIN 4022. If you would like to enter these genetic expressions in the first position in the long text line, using **GGU-BORELOG** (e.g. to 1.2 m fill, sand, silty), you must enter the following abbreviation line:

- 1,2// G:y, S, u

Where "G:" stands for the genetic abbreviation subset and the "y" is the SEP 2 abbreviation for fill from this subset. In principle, it is also imaginable to enter the "y" abbreviation, together with the long text "**fill**" into the petrography subset. This procedure may be pragmatic, as you can do without input of the "G:", you will, however, lose compatibility to the SEP 2 program. The functionality of the **GGU-BORELOG** program will not be restricted in any way. You can also create a completely different set of abbreviations with completely different long texts.

7.2.5 GGU-BORELOG: Data exchange with GGU

If you not only work with the **GGU-BORELOG** program, but also need to use the data entered in the **GGU-STRATIG** program for graphical visualisation of the stratigraphic logs, please note the following points:

- Always use the SEP 2 abbreviations, because they allow you to transfer considerably more information in an abbreviated format.
- In the supplements field, always enter the soil group, consistency and groundwater as abbreviations.
- Always enter the samples using the abbreviation line. Use the description of the sample type, e.g. so = special sample. The symbol for special sample (filled box) is then automatically displayed in **GGU-STRATIG**.
- When interpreting the abbreviations, a short text is created automatically and can be used to achieve a **narrow** stratigraphic log when the data are transferred to **GGU-STRATIG**.

- Each abbreviation in the petrography field is allocated a code number. These code numbers control the soil type fill symbols used in the stratigraphic log visualisation to DIN 4023. A maximum of four code numbers can be allocated for horizon input. The four data boxes (code boxes) are filled in from left to right when interpreting a SEP 2 abbreviation line. The first two code boxes facilitate a complete fill of the allocated soil signatures for visualisation in **GGU-STRATIG**; they are therefore reserved for main soil types and soil types with large proportions of other constituents. The last two code boxes only fill half of the log with the allocated soil signatures; they should be reserved for medium to small proportions of soil types.

To prevent the code number for the following accessory soil type being written in the second code box when there is only one main soil type, a place holder (#) is entered in the abbreviation line, e.g.:

2.35// mS; #, fs2, u4// bn/ SaU2.

The place holder '#' does not influence visualisation of the bore log **GGU-BORELOG**.

Data transfer to **GGU-STRATIG** can also be carried out if abbreviations are not used, i.e. the horizons are entered by hand in the text rows. A correct file is also created in this case, but it then requires post-processing in **GGU-STRATIG**.

The individual bore log can be saved as a **GGU-STRATIG** file using the button "**Save (GGU-STRATIG)**" in the general dialog box of the "**Edit/Bore log**" menu item. If all bore logs need to be transferred to **GGU-STRATIG** use the menu item "**File/Save GGU-STRATIG file**".

7.3 GGU-BORELOG: "Heading and header" menu item

The default format for the DIN 4022 form includes a two-line header. The two form title lines can be modified, depending on whether a bore log is to be created to DIN 4022-1, DIN 4022-2 or DIN 4022-3. The height of the form header can be increased by a maximum of 5 mm in the dialog box's lower group box.



For a bore log to ISO 14688-1 the information on the borehole and the project given in the dialog box are displayed on the form. This menu item also allows modification to the input box designations. Data input is made in the menu item "**Edit/Additional data**".

If the various bore logs are regularly used, a number of different templates can be created using the appropriate titles and designations and saved to different ".alg" files in "Edit/Save graphics preferences".

7.4 GGU-BORELOG: " Project, report, etc " menu item

If several bore logs are loaded and you would like to edit the project name, the date, the report and/or annex number, then you would normally need to open the "Base data" dialog box for all logs and edit them individually. Using this menu item you can have the same data entered in all logs.



The data are used in all bore logs if the respective "Apply to all" check box is activated. The lines of input ticked here are no longer displayed in the 'Base data' dialog box for the individual bore logs.

In the "Annex" and "Annex no." group boxes automatic numbering can be achieved by using the place holders "#" and "%". See the corresponding "Info" boxes for more information.

Some examples will clarify the available options:

The example file contains two bore logs, B 1 und B 2. Each bore log consists of three pages, meaning the file has a total of six pages.

1. The Annex box contains text only: "Annex no.:", which is the same for all annexes. The input for Annex no. is "3.#", continuous page numbering is activated.

The screenshot shows two configuration windows. The top window, titled 'Annex', has fields for 'Page:', 'Annex no.:', 'Offset for annex:', and 'No. of header pages'. It includes checkboxes for 'Increase only with each borehole (#)' and 'Apply to all', and an 'Info' button. The bottom window, titled 'Annex no.', has fields for 'Annex no.', 'Offset for annex no.', and 'No. of header pages'. It includes checkboxes for 'Number all pages continuously (#)' and 'Apply to all', and an 'Info' button. Red arrows indicate the flow from the 'Annex no.' window to the resulting report annex numbers.

Report no.:	Annex no.:
10 / 2001	3.1
10 / 2001	3.6

Annex numbering begins at 3.1 and continues in sequence to 3.6.

1. The Annex box contains text only: "**Annex no.:**", which is the same for all annexes. The input for Annex no. is "**3.#**", continuous page numbering is activated.

A header page will be added in front of bore logs B 1 and B 2; a "1" is therefore entered for the number of header pages.

The screenshot shows two configuration windows. The top window, titled 'Annex', has fields for 'Page:', 'Annex no.:', 'Offset for annex:', and 'No. of header pages'. It includes checkboxes for 'Increase only with each borehole (#)' and 'Apply to all', and an 'Info' button. The bottom window, titled 'Annex no.', has fields for 'Annex no.', 'Offset for annex no.', and 'No. of header pages'. It includes checkboxes for 'Number all pages continuously (#)' and 'Apply to all', and an 'Info' button. Red arrows indicate the flow from the 'Annex no.' window to the resulting report annex numbers.

Report no.:	Annex no.:
10 / 2001	3.2
10 / 2001	3.8

Annex numbering begins at 3.2 for bore log B 1, the B 1 header page is Annex 3.1. Numbering for bore log B 2 begins at 3.6 and continues to 3.8, the B 2 header page is Annex 3.5.

1. Numbering has been entered in Annex, to be increased with each borehole only. The current page number and the total number of pages in Annex 3 are entered in Annex no. Remember that a header page is added in front of each borehole.

The B 1 bore log is annex number 3.1, that of B 2 is 3.2. With a header page per borehole page numbering for borehole B 1 starts on page 2 and on page 6 for borehole B 2. A total page number of 8 then results for Annex 3, including the header pages.

7.5 GGU-BORELOG: "Company" menu item

This menu item is active for visualisation to DIN 4022. A dialog box with five text lines opens. The lines are for entering your company address data. The texts are displayed at the top left of the DIN 4022 form. Once entered, the company data can be saved in the "GGU-BORELOG.alg" file in the program folder. The company data are then automatically available for new bore logs whenever the program is started.

7.6 GGU-BORELOG: "Additional data" menu item

This menu item is active for visualisation to ISO 14688-1. A dialog box opens for entering the data required by the ISO standard. The input box designations can be adapted to your personal needs in the menu item "Edit/Heading and header". The data entered here can be saved in the "GGU-BORELOG.alg" file in the program folder. The data are then automatically available for new bore logs whenever the program is started.

7.7 GGU-BORELOG: "Apply to all" menu item

Using this menu item, it is possible to make certain entries for all existing bore logs at once. These include information on the project and report, normally entered for all bore logs via the menu item "Edit/Project, report, etc.". The input boxes are only available in the "Apply to all" menu item's dialog box if the "Apply to all" check boxes have been deactivated. The dialog box then looks like this:

For the texts to be used in all existing bore logs the respective "**Apply to all**" check box must be pressed for the appropriate line of text.

The texts entered in "**Apply to all**" are then not used automatically in subsequently created or appended bore logs. If these entries need to be used for new bore logs the respective "**Apply to all**" buttons must be clicked again.

7.8 GGU-BORELOG: "Swap bore logs" menu item

The sequence of the bore logs can be swapped using this menu item. This can be useful if log collections have been imported from **GGU-STRATIG**, but the borehole series was entered corresponding to the required profile and not to the borehole names.



7.9 GGU-BORELOG: "Page format" menu item

This menu item allows the dimensions of the bore log form to be adapted to suit your requirements and/or the maximum dimensions accepted by the printer. A different printer may also be selected by pressing "**Output prefs./change printer**".



In the dialog box, "**Does not fit!**" can be seen following the value for the printer's right boundary. Click the "**Refresh**" button afterwards if these settings are manually adjusted. The new data is then compared to the printer data and the result displayed. It is also possible to specify the left and lower boundaries only and have the program determine the required sizes by pressing "**Adapt page height/page width to printer**".

7.10 GGU-BORELOG: "Load graphics preferences" menu item

You can reload a graphics preferences file into the program, which was saved using the "**Graphics preferences/Save graphics preferences**" menu item. Only the corresponding data will be refreshed.

The image shows two overlapping windows from the GGU-BORELOG software. The background window is titled 'Petrographic major constituent' and the foreground window is titled 'Supplements'.

Petrographic major constituent window:

- Buttons: Forw., Back, Cancel, Done, Print
- Go to no.: 12
- Edit no. of abbrevs.
- Sort
- Table with columns: No., Abbrev., Code, Long text, Short text

No.	Abbrev.	Code	Long text	Short text
12	G	40	Gravel	G
13	fG	41	Fine Gravel	fG
14	mG	42	Medium Gravel	mG
15	gG			
16	Fig			
17	M			
18	Tr			
19	F			
20	S			
21	fS			
22	mS			
23	gS			
24	Kl			
25	Kls			
26	U			

Supplements window:

- Buttons: Forw., Back, Cancel, Done, Print
- Go to no.: 146
- Edit no. of abbrevs.
- Sort
- Table with columns: No., Abbrev., Column, Long text, Short text

No.	Abbrev.	Column	Long text	Short text
146	mzs	d	difficult bit work	
147	ld1	c	very loose	
148	ld2	c	loose	
149	ld3	c	medium	
150	ld4	c	compact	
151	ld5	c	very compact	
152	spvl	3	circulation loss	
153	spvl1	3	very low circulation loss	
154	spvl2	3	low circulation loss	

If the SEP 2 file has been modified, it can be saved under a different name by pressing "**Save SEP abbreviations**". This file is then available for subsequent sessions under the "**Load SEP abbreviations**" entry. If "**SEPKURZ.TXT**" is used as the file name and the file is saved in the program folder, the file be automatically loaded the next time the program is started.

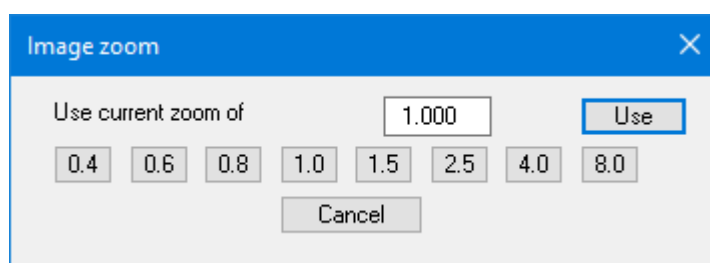
When making modifications please note that the same abbreviations file must be used in both programs if the data are transferred to **GGU-STRATIG**.

8 Graphics preferences menu

8.1 GGU-BORELOG: "Refresh and zoom" menu item

The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the screen is not refreshed after every alteration.

If, e.g., after using the zoom function (see below), only part of the image is visible, you can achieve a complete view using this menu item.



A zoom factor between 0.4 and 8.0 can be entered in the input box. By then clicking on "Use" to exit the box the current factor is accepted. By clicking on the "0.4", "0.6", etc. buttons, the selected factor is used directly, and the dialog box closed.

It is much simpler, however, to get a complete overview using [Esc]. Pressing [Esc] allows a complete screen presentation using the zoom factor specified in this menu item. The [F2] key allows screen refreshing without altering the coordinates and zoom factor.

8.2 GGU-BORELOG: "Zoom info" menu item

An info box informs you about the activation and options of the zoom function.

The quickest way to enlarge a specific section of the screen is to open a zoom window by holding down the [Ctrl] key and the mouse button.

8.3 GGU-BORELOG: "Font selection" menu item

With this menu item you can switch to a different true-type font. All available true-type fonts are displayed in the dialog box.

8.4 GGU-BORELOG: "Header toolbar" menu item

Using this menu item, you can add free text to the bore logs and add lines, circles, polygons and images (e.g. files in formats BMP, JPG, PSP, TIF, etc.). PDF files can also be imported as images.

All drawing objects created using Mini-CAD are used on every page of the bore log.

This menu item is therefore only of use for special labelling, e.g. for use in the company logo.

A pop-up menu opens, the icons and functions used are described in more detail in the **Mini-CAD** manual saved in the 'C:\Program Files (x86)\GGU-Software\ Manuals' folder during installation.

8.5 GGU-BORELOG: "Toolbar preferences" menu item

After starting the program, a horizontal toolbar for menu items appears below the program menu bar. If you would rather work with a popup window with several columns, you can specify your preferences using this menu item. The smart icons can also be switched off.

At the bottom of the program window, you find a status bar with further information. You can also activate or switch off the status bar here. The preferences will be saved in the "GGU-BORELOG.alg" file (see menu item "Graphics preferences/Save graphics preferences") and will be active at the next time the program is started.

By clicking on the tools (smart icons) for the menu items you can directly reach most of the program functions. The meaning of the smart icons appears as a text box if you hover with the mouse pointer over the tools. Some of the tool functions cannot be called up via normal menu titles and menu entries.

Not all of the icons described below are available in all GGU programs.



"Next page"/"Previous page"

You can use these icons to scroll forwards and backwards between individual pages. In many GGU programs, you can use this in the **output table representation**.



"Select page" or "Diagram/Output table"

If you are in the **output table representation**, you can use this symbol to jump to a specific page or switch back to the normal display, i.e. your graphic display.



"Zoom out"

If you have previously zoomed in, this tool returns to a full screen display.

**"Zoom (-)"/"Zoom (+)"**

With the zoom functions you can zoom in or out of parts of the image, by clicking the left mouse button.

**"Copy/print area"**

Use this tool to copy only parts of the graphics in order to paste them, e.g. to a report. You will see information on this function and can then mark an area, which is copied to the clipboard or can be saved in a file. Alternatively, you can send the marked area directly to your printer (see **"Tips and tricks"**).

**"Colour on/off" or "Colour/hatching"**

If you want to remove the colour from the system display, e.g. to create a black and white printout, you can do this using this on/off switch.

In several GGU programs, 4 colour and hatching settings are possible via this icon, which you can click through in sequence. A colour filled representation is the default setting, the next click shows the hatching, then coloured and hatched. The fourth click shows a representation with neither colour nor hatching. The next click starts again.

**"Move object"**

Use this icon to position legends and diagrams at the desired position on the output sheet.

**"Undo move object"**

By clicking this icon the last performed movement of graphical elements made using the [F11] function key or the menu item **"Output preferences/Move objects"** can be undone.

**"Restore move object"**

By clicking this symbol, the last object movement undo carried out using "Undo move object" can be restored.

**"Construction phase back"/"Construction phase forward"**

If you are in the display of construction phases, you can use these icons to scroll back and forth between the individual construction phases.

9 Info menu

9.1 GGU-BORELOG: "Copyright" menu item

You will see a copyright message and information on the program version number.

The "**System**" button shows information on your computer configuration and the folders used by the GGU program.

9.2 GGU-BORELOG: "Maxima" menu item

You will see information on the default program maxima.

9.3 GGU-BORELOG: "Help" menu item

The manual is opened as a PDF document. The help function can also be accessed using the **[F1]** function key.

9.4 GGU-BORELOG: "Mini-Help" menu item

Descriptions of the use of the function keys and accessing dialog boxes are displayed in an info box.

9.5 GGU-BORELOG: "GGU on the web" menu item

Using this menu item, you can access the [GGU Software website](#).

Check the page of your program module at regular intervals for information about updates and changes. On the "**Changelogs**" subpage, you can also subscribe to an e-mail notification that informs you of all changes on a monthly basis.

9.6 GGU-BORELOG: "GGU support" menu item

This menu takes you directly to the [GGU Software Support Portal](#).

Here you can enter your support request directly and upload your edited GGU program file.

9.7 GGU-BORELOG: "What's new?" menu item

You will see information on program improvements in comparison to older versions.

9.8 GGU-BORELOG: "Language preferences" menu item

This menu item allows you to switch the menus and the graphics from German to English and vice versa. To work in German, deactivate the two check boxes "**Dialoge + Menüs übersetzen (translate dialogues, menus)**" und "**Graphiktexte übersetzen (translate graphics)**".

Alternatively, you can work bilingually, e.g. with German dialog boxes but with graphic output in English. The program always starts with the language setting applicable when it was last ended.