Determination and visualisation of LOI to DIN 18128

GGU-LOI

VERSION 6

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Contents:

1 Preface 4

2 Licence protection 4

3 Language selection 4

4 Starting the program 5

5 Description of menu items 6

5.1 File menu 6

5.1.1 "New" menu item 6

5.1.2 "Load" menu item 6

5.1.3 "Save" menu item 6

5.1.4 "Save as" menu item 6

5.1.5 "Output preferences" menu item 6

5.1.6 "Print and export" menu item 7

5.1.7 "Batch print" menu item 9

5.1.8 "Exit" menu item 9

5.1.9 "1, 2, 3, 4" menu items 9

5.2 Edit menu 10

5.2.1 "Preferences" menu item 10

5.2.2 "Tests" menu item 11

5.2.3 "Delete all tests" menu item 12

5.2.4 "General" menu item 13

5.2.5 "Company" menu item 13

5.3 Graphics preferences menu 14

5.3.1 "Refresh and zoom" menu item 14

5.3.2 "Zoom info" menu item 14

5.3.3 "Legend font selection" menu item 14

5.3.4 "Font size selection" menu item 14

5.3.5 "Mini-CAD toolbar" menu item 15

5.3.6 "Toolbar preferences" menu item 15

5.3.7 "Load graphics preferences" menu item 16

5.3.8 "Save graphics preferences" menu item 16

5.4 Output preferences menu 17

5.4.1 "Page size" menu item 17

5.4.2 "Texts" menu item 17

5.4.3 "Table texts + allocations" menu item 18

5.4.4 "Margins" menu item 19

5.4.5 "Position info" menu item 19

5.4.6 "Title (change position)" menu item 20

5.4.7 "Company" menu item 20

5.4.8 "Test no., etc." menu item 20

5.4.9 "Annex and report" menu item 21

5.4.10 "Table" menu item 21

5.4.11 "Reset all" menu item 21

5.4.12 "Move objects" menu item 22

5.5 Info menu 23
5.5.1 "Copyright" menu item 23
5.5.2 "Maxima" menu item 23
5.5.3 "Help" menu item 23
5.5.4 "GGU on the web" menu item 23
5.5.5 "GGU support" menu item 23
5.5.6 "What's new?" menu item 23
5.5.7 "Language preferences" menu item 23
6 Tips and tricks 24
6.1 Keyboard and mouse 24
6.2 Function keys 24
6.3 "Copy/print area" icon 25
7 Index 26

1 Preface

The **GGU-LOI** program allows evaluation and visualisation of loss on ignition to German Standard DIN 18128.

The program is designed to allow simple data input. The system is permanently displayed on the screen. Every alteration to the data is shown on the screen, so that optimum control of input data is guaranteed. Graphic output supports the true-type fonts supplied with WINDOWS, so that excellent layout is guaranteed. Colour output and any graphics (e.g. files in formats BMP, JPG, PSP, TIF, etc.) are supported. PDF and DXF files can also be imported by means of the integrated **Mini-CAD** module (see the "**Mini-CAD**" manual).

The program has been thoroughly tested on numerous examples from the literature and in engineering practice. No faults 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 Licence protection

GGU software is provided with the WIBU-Systems CodeMeter software protection system. For this purpose the GGU-Software licences are linked to a USB dongle, the WIBU-Systems CmStick, or as CmActLicense to the respective PC hardware.

It is required for licence access that the CodeMeter runtime kit (CodeMeter software protection driver) is installed. Upon start-up and during running, the **GGU-LOI** program checks that a licence on a CmStick or as CmActLicense is available.

3 Language selection

GGU-LOI is a bilingual program. The program always starts with the language setting applicable when it was last ended.

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 Starting the program

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

- File
- Info

By going to the "**File**" menu, a previously saved file can be loaded by means of the "**Load**" menu item, or a new one created using "**New**". After clicking on "**File/New**" an empty form in accordance with German Standard DIN 18128 is shown on the screen. Five menus now appear at the top of the window:

- File
- Edit
- Graphics preferences
- Output 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 **GGU-LOI** screen is not refreshed after every alteration.

If you would like to refresh the screen contents, press either [**F2**] or [**Esc**]. The [**Esc**] key additionally sets the screen presentation back to your current zoom, which has the default value 1.0, corresponding to an A4 format sheet.

5 Description of menu items

5.1 File menu

5.1.1 "New" menu item

All data entered will be deleted after a confirmation prompt. You can then define new tests.

5.1.2 "Load" menu item

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

5.1.3 "Save" menu item

You can save data entered or edited during program use to a file, in order to have them available at a later date, or to archive them. The data is saved without prompting with the name of the current file.

5.1.4 "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 "**.glv** 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, "**.glv**" will be used automatically.

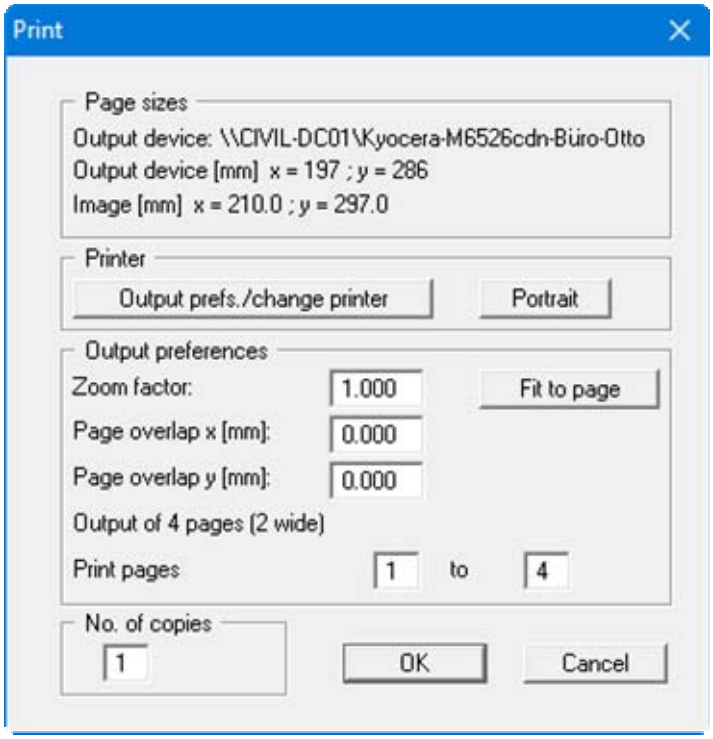
5.1.5 "Output preferences" menu item

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

5.1.6 "Print and export" menu item

You can select your output format in a dialog box. You have the following possibilities:

- "**Printer**"
  allows graphic output of the current screen to the WINDOWS default printer or to any other printer selected using the menu item "**File/Output preferences**". But you may also select a different printer in the following dialog box by pressing the "**Output prefs./change printer**" button.



  In the upper group box, the maximum dimensions which the printer can accept are given. Below this, the dimensions of the image to be printed are given. If the image is larger than the output format of the printer, the image will be printed to several pages (in the above example, 4). In order to facilitate better re-connection of the images, the possibility of entering an overlap for each page, in x and y direction, is given. Alternatively, you also have the possibility of selecting a smaller zoom factor, ensuring output to one page ("**Fit to page**" button). Following this, you can enlarge to the original format on a copying machine, to ensure true scaling. Furthermore, you may enter the number of copies to be printed..

- "**DXF file**"
  allows output of the graphics to a DXF file. DXF is a common file format for transferring graphics between a variety of applications.
- "**GGU-CAD file**"
  allows output of the graphics to a file, in order to enable further processing with the **GGU-CAD** program. Compared to output as a DXF file this has the advantage that no loss of colour quality occurs during export.

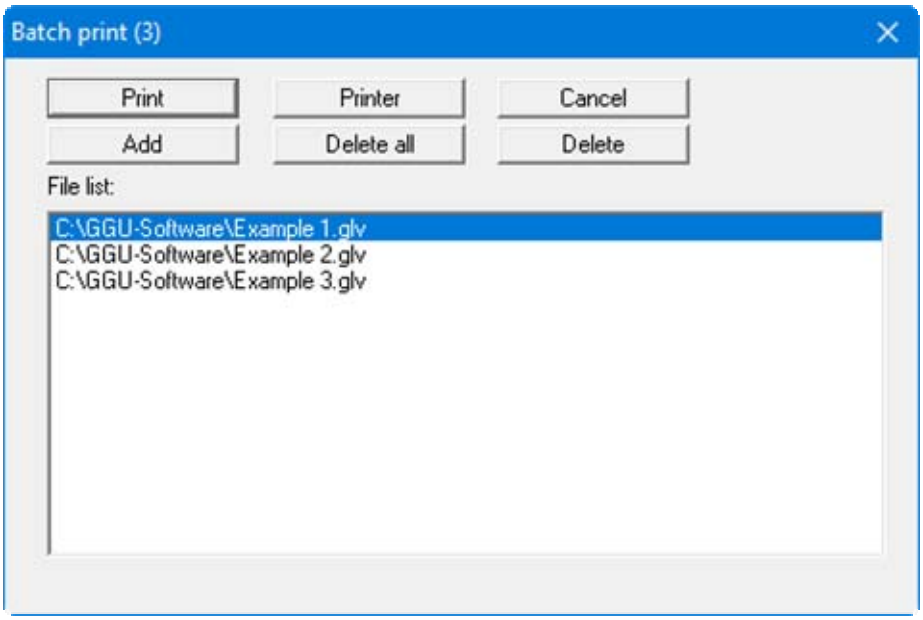
- "**Clipboard**"
  The graphics are copied to the WINDOWS clipboard. From there, they can be imported into other WINDOWS programs for further processing, e.g. into a word processor. In order to import into any other WINDOWS program you must generally use the "*Edit/Paste*" function of the respective application.
- "**Metafile**"
  allows output of the graphics to a file in order to be further processed with third party software. Output is in the standardised EMF format (Enhanced Metafile format). Use of the Metafile format guarantees the best possible quality when transferring graphics.

> If you select the "**Copy/print area**" tool from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see "**Tips and tricks**", Section 6.3).
>
> Using the "**Mini-CAD**" program module you can also import EMF files generated using other GGU applications into your graphics (see Section 5.3.5).

- "**Mini-CAD**"
  allows export of the graphics to a file in order to enable importing to different GGU applications with the **Mini-CAD** module.
- "**GGUMiniCAD**"
  allows export of the graphics to a file in order to enable processing in the **GGUMiniCAD** program.
- "**Cancel**"
  Printing is cancelled.

5.1.7 "Batch print" menu item

If you would like to print several appendices at once, select this menu item. You will see the following dialog box:



Create a list of files for printing using "**Add**" and selecting the desired files. The number of files is displayed in the dialog box header. Using "**Delete**" you can mark and delete selected individual files from the list. After selecting the "**Delete all**" button, you can compile a new list. Selection of the desired printer and output preferences is achieved by pressing the "**Printer**" button.

You then start printing by using the "**Print**" button. In the dialog box which then appears you can select further preferences for printer output such as, e.g., the number of copies. These preferences will be applied to all files in the list.

5.1.8 "Exit" menu item

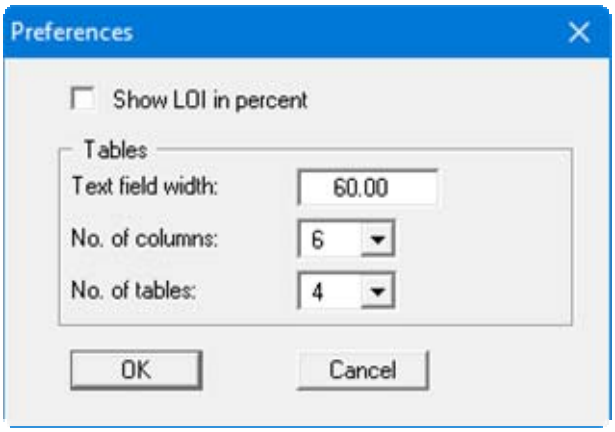
After a confirmation prompt, you can quit the program.

5.1.9 "1, 2, 3, 4" menu items

The "**1, 2, 3, 4**" menu items show the last four files worked on. By selecting one of these menu items the listed file will be loaded. If you have saved files in any other folder than the program folder, you can save yourself the occasionally onerous ***rummaging*** through various sub-folders.

5.2.1 "Preferences" menu item

It is possible to specify settings for the results table to suit user requirements.

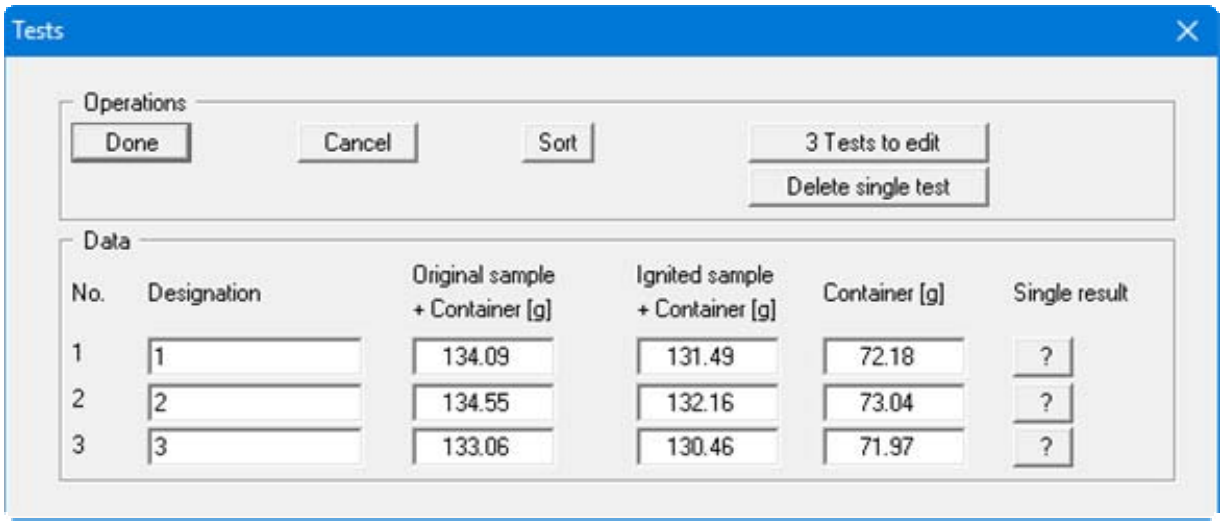


Specify whether the computed LOI should be given in per cent (e.g. 10.5%) or as an absolute value (e.g. 0.105) by activating the check box. Please note that if the settings are changed the texts in the results table must also be adapted accordingly (see Section 0).

The number of columns (maximum 6) and the number of tables (maximum 4) can be specified using the two drop-down list boxes in the dialog box. Further changes to the table visualisation are possible using the menu item "**Output preferences/Table**" (see Section 5.4.10).

5.2.2 "Tests" menu item

This represents the program's central menu item. All the basic data involved in the determination of the loss on ignition is entered here. After clicking this menu item or double-clicking in the result table the following dialog box opens (example):



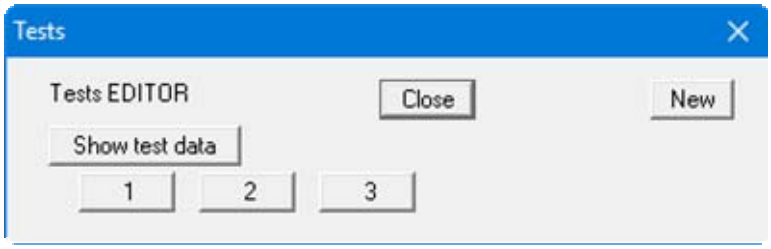
This example contains three single tests, each represented by an input row. Enter the obligatory data in the input boxes shown in the dialog box to determine the LOI. The automatic numbering of the tests defines the sequence in the table. You define the number of input rows needed using the "**x Tests to edit**" button.

Using the "**?**" button behind every input row the input data and test results corresponding to the single test are displayed in a message box. The data are subsequently displayed in the results table on the output sheet.

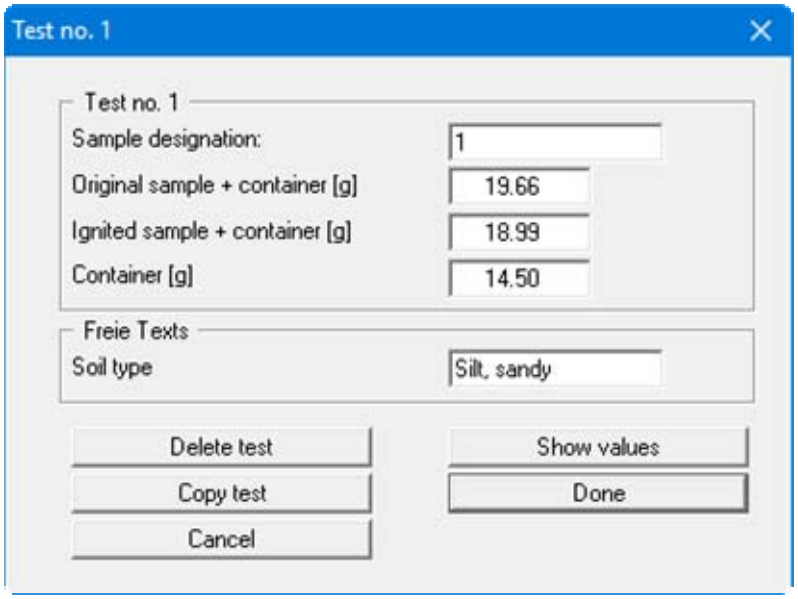
After clicking the "**Delete single test**" button, you can select one of the current single tests to be deleted in an option box.

Using "**Done**" or "**Cancel**" you return to the menu list, having accepted the changes or not, respectively.

Further input boxes for entering additional information (e.g. soil type) can be defined using the menu item "**Output preferences/Table texts + allocations**" (see Section 0). If you have used this option you will no longer see the test input dialog box shown above. Each individual test is opened separately via a button with the automatically allocated test number:



For example, you will see the following dialog box for the first test:



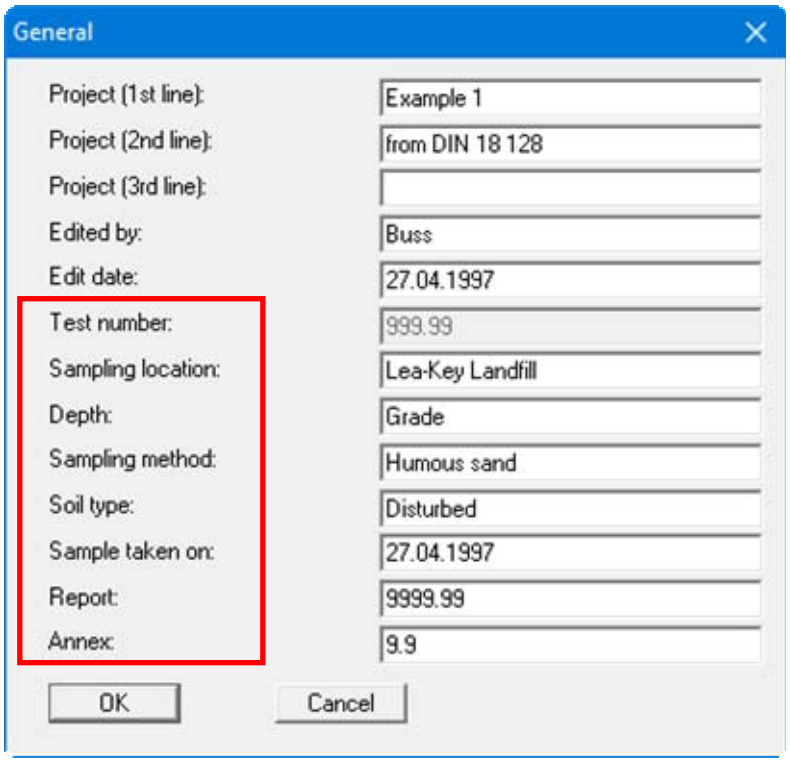
The additional input boxes are shown at the bottom of the dialog box; for soil type input in this example.

5.2.3 "Delete all tests" menu item

After a security request, all tests will be deleted. After this, you can enter a new test using the "**Edit/Tests**" menu item (see Section 5.2.2).

5.2.4 "General" menu item

Go to this menu item to enter general data such as the project identification, report number, annex number, etc. This data is displayed in the correct elements of the output sheet.



The marked texts in the dialog box also appear in the output sheet. Input boxes can be altered or switched off such as "**Test number:**" as shown in the above dialog box by going to the menu item "**Output preferences/Texts**" (see Section 5.4.2).

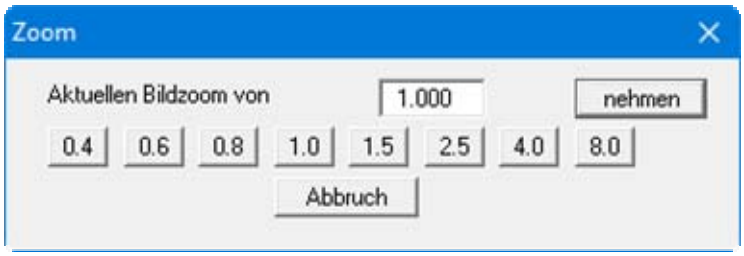
5.2.5 "Company" menu item

You can enter your company address in four lines. These lines will be entered at the top left of the form.

5.3.1 "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.

5.3.2 "Zoom info" menu item

By clicking two diametrically opposed points you can enlarge a section of the screen in order to view details better. An information box provides information on activating the zoom function and on available options.

5.3.3 "Legend 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.

5.3.4 "Font size selection" menu item

You can edit font sizes of texts [in mm] within the various input areas.

5.3.5 "Mini-CAD toolbar" menu item

Using this menu item you can add free text to the graphics 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. 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.

5.3.6 "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-LOI.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 can be activated from the normal menu items.

"**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.

"**Undo move object**"
If you have previously edited the position or size of an element on the output sheet ([**F11**] or used "**Output preferences/Move objects**"), you can undo the last changement with this tool.

"**Restore move object**"
If you have previously undone a changement, you can restore with this tool.

"**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**", Section 6.3).

5.3.7 "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.

5.3.8 "Save graphics preferences" menu item

Some of the preferences you made with the menu items of the "**Graphics preferences**" menu as well as the inputs using the "**Edit/Company**" menu item can be saved to a file. If you select "**GGU-LOI.alg**" as file name, and save the file on the same level as the program, the data will be automatically loaded the next time the program is started and need not be entered again.

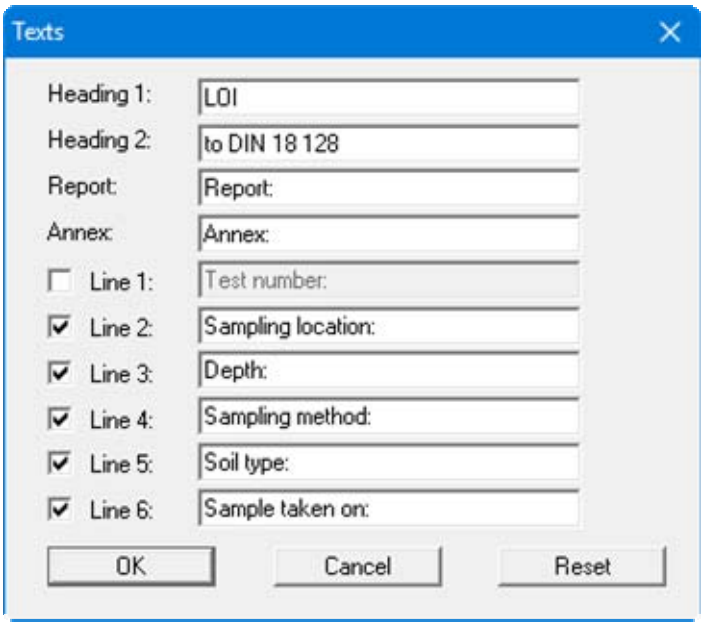
> If you do not go to "**File/New**" upon starting the program, but open a previously saved file instead, the preferences used at the time of saving are shown. If subsequent changes in the general preferences are to be used for existing files, these preferences must be imported using the menu item "**Graphics preferences/Load graphics preferences**" (see Section above).

5.4.1 "Page size" menu item

The default page set-up is A4 (portrait) when the program is started. You can edit the page size in the dialog box.

5.4.2 "Texts" menu item

The default labelling of some output sheet elements can be edited in this menu item's dialog box. Among other things, the name of the output sheet can be specified here.

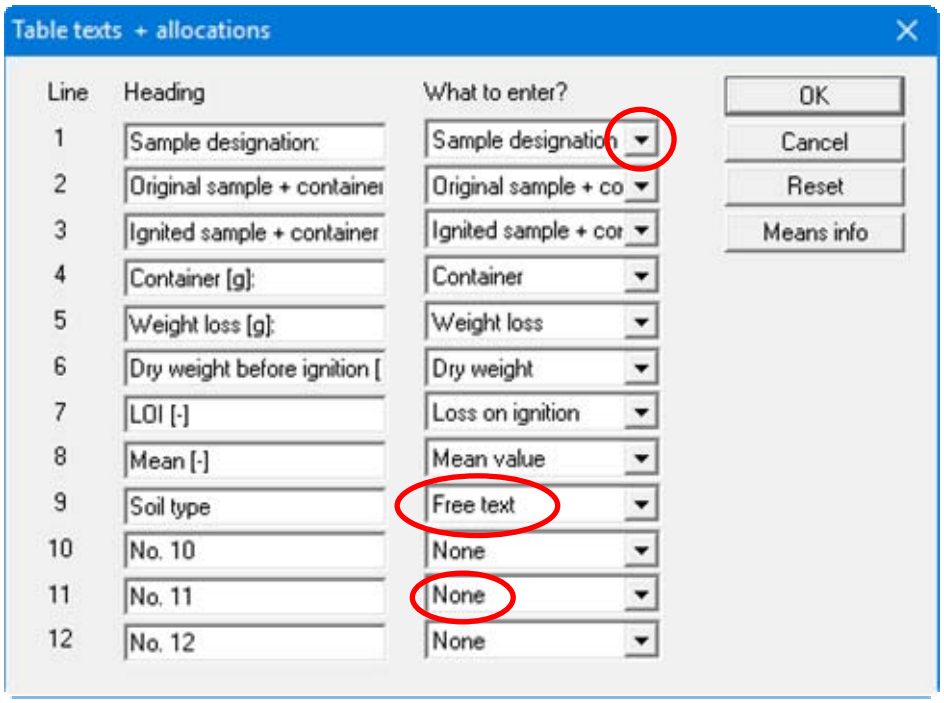


Your input in lines 1 to 6 of the above dialog box, as well as the input for "**Report:**" and "**Annex:**" also represent the designations for the input boxes in the "**Edit/General**" menu item dialog box. If rows are deactivated in the above dialog box, the corresponding input boxes in the "**Edit/General**" menu item dialog box are also deactivated (see Section 5.2.4).

Use "**Reset**" to restore the default labelling settings. If you have retroactively changed the language you will see the internal program translations in the input boxes.

5.4.3 "Table texts + allocations" menu item

A dialog box opens for specifying the parameters and properties to be displayed in the result table. It is possible to display up to a maximum of 12 lines. The sequence corresponds to the numbering in the following dialog box:



Enter texts by hand in the "**Heading**" boxes, which are later used as a label. After clicking the arrows in the "**Enter what?**" column the data or text in the drop-down list entered by hand or determined by the program can be allocated to the rows of the results table. Rows with a "**None**" allocation are not displayed.

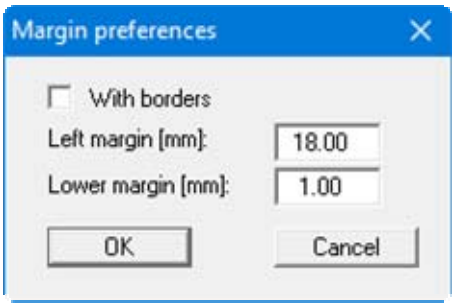
If information, which is not found in the table default texts, needs to be added to the results table a "**Free text**" can be used. This row then appears in the test data input box with the user-defined labelling.

The "**Reset**" button resets the labelling and allocations of the results table to the defaults. If you have retroactively changed the language to English you will see the internal program translations.

Depending on whether LOI visualisation is selected in per cent or not in the "**Edit/Preferences**" menu item (see Section 5.2.1), rows 7 and 8 are labelled in [%] or dimensionless. **Attention**: You must adapt the dimension information in the labelling (left column) by hand! The "**Means info**" button opens a message box with a description of the "**Mean value**" row.

5.4.4 "Margins" menu item

In the default program preferences the form is shown with cutting borders. For output to an A4 printer, a reduction of the printer output is generally necessary, as proprietary printers cannot fully cover an A4 page. The margin preferences can be defined in the following dialog box.



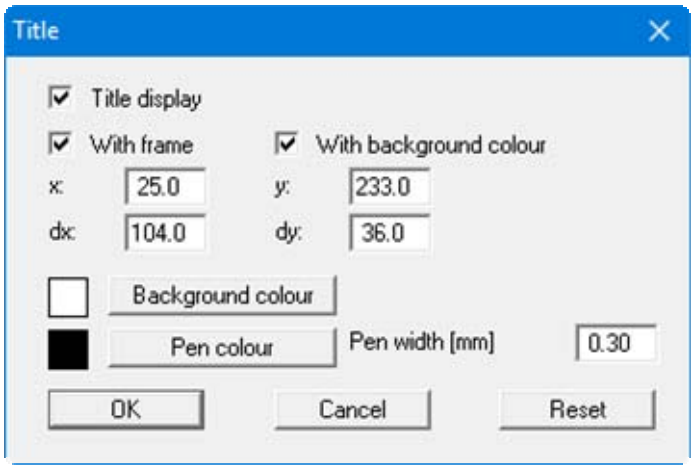
By deactivating the "**With borders**" check box and with an appropriate choice of left and lower margins, it is generally possible to create a non-reduced printer output. It is necessary to also adapt the page height and width (see Section 5.4.1).

5.4.5 "Position info" menu item

The positions and layout of the individual elements on the output sheet can be altered using the following menu items. This menu item provides information on the options for altering the position and layout more quickly using the mouse.

5.4.6 "Title (change position)" menu item

The position and layout of the title element can be altered via the dialog box for this menu item, if the "**Title display**" check box is activated.



The position of the element on the output sheet and its size can be defined or edited by means of the variables "**x**" and "**y**", "**dx**" and "**dy**". The element can be provided with a frame and a background colour to suit your personal requirements. If the element needs to be returned to its original condition, this can be done using the "**Reset**" button. Alternatively, you can alter the size and shape of the element using the mouse (see menu item "**Output preferences/Move objects**", Section 5.4.11).

The heading "**LOI to DIN 18128**" shown in the title element can be edited in the menu item "**Output preferences/Texts**" (see Section 5.4.2). The texts "**Project (1st line)**" to "**Project (3rd line)**" are entered immediately after double-clicking the element or using the menu item "**Edit/General**" (see Section 5.2.4).

5.4.7 "Company" menu item

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). Simply proceed as described there to edit the "**Company**" element.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/Company**" (see Section 5.2.5).

5.4.8 "Test no., etc." menu item

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Test no., etc.**" element, simply proceed as described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/General**" (see Section 5.2.4). For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item "**Output preferences/Texts**" (see Section 5.4.2).

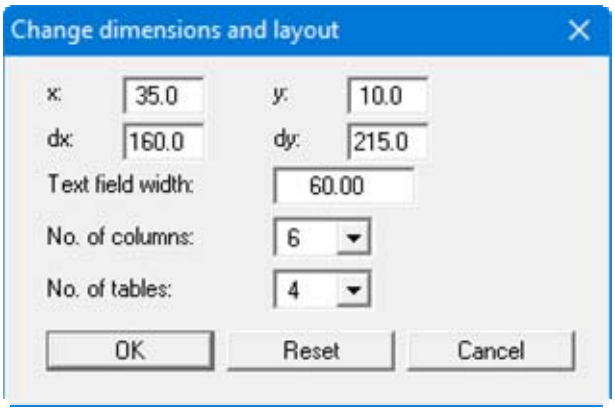
5.4.9 "Annex and report" menu item

Almost exactly the same dialog box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Annex and report**" element, simply proceed as described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/General**" (see Section 5.2.4). For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item "**Output preferences/Texts**" (see Section 5.4.2).

5.4.10 "Table" menu item

Using this menu item, not only the size and position of the table elements can be varied, but also the structure of the results table: The number of columns to be included in the table can be specified in the dialog box, together with the number of any tables to be created. The overall size of the table is given by "**dx**" and "**dy**".



The width of the left table column with the labelling is specified in the "**Text field width**" input box. The width is given in [mm], the labelling font size is automatically adjusted to the available space. The number of tests (= columns) to be visualised in a results table can be specified using the "**No. of columns**" drop-down list box. The columns are divided equally across the remaining table width, the font size of the column headings is also adapted to the available space. The font size of the test data entered can be edited using the "**Graphics preferences/Font size selection**" menu item (see Section 5.3.4).

The number of rows in a results table and the labelling of the first row can be adapted to suit user-requirements using the menu item "**Output preferences/Table texts + allocations**" (see Section 0).

5.4.11 "Reset all" menu item

With this button, all preferences for the aforementioned elements, which may have been edited with the previous menu item, will be reset to the program defaults.

5.4.12 "Move objects" menu item

When you go to this item you can move the various objects with the aid of the mouse. Move the mouse over the object to be moved. When you are located above a moveable object the mouse pointer appears in the shape of a cross. You can now press and hold the left mouse button and drag the object to the required position.

> After going to this menu item only one object at a time can be moved using the mouse or its size be altered.
>
> In order to move or edit several objects, this function can be more quickly activated by pressing [**F11**] or the icon.

The size of an object can also be altered using this menu item or the [**F11**] key. If you move over the frame of a changeable object after activating this function the mouse assumed the shape of a double-headed arrow. Hold the left mouse button and move the frame until the object has reached the required size. To retain the ratio of the sides, pull at one corner only. If on one side only is pulled the object will become higher or wider.

The last change made in the position or size of an object can be undone using [**Back**] or by clicking the icon.

5.5.1 "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 **GGU-LOI**.

5.5.2 "Maxima" menu item

Information on the maximum number of tests allowed by the program is displayed.

5.5.3 "Help" menu item

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

5.5.4 "GGU on the web" menu item

Using this menu item you can access the GGU Software website: www.ggu-software.com.

Get information on updates and modifications on a regular basis from your program module page. You can also subscribe to email notifications, which provide information on all modifications on a monthly basis.

5.5.5 "GGU support" menu item

This menu item takes to the GGU-Software Contact area at www.ggu-software.com.

5.5.6 "What's new?" menu item

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

5.5.7 "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 boxees "**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.

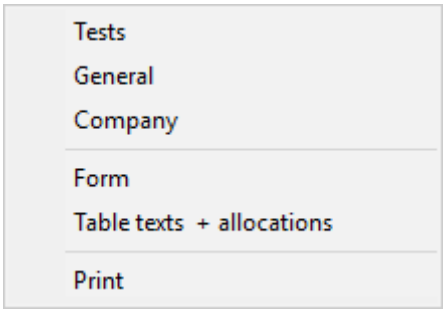
6 Tips and tricks

6.1 Keyboard and mouse

You can scroll the screen with the keyboard using the cursor keys and the [**Page up**] and [**Page down**] keys. By clicking and pulling with the mouse, with [**Ctrl**] pressed, you activate the zoom function, i.e. the selected section will fill the screen. Furthermore you can use the mouse wheel to zoom in/out or scrolling the screen presentation. The following mouse wheel functions are available:

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

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 elements or **Mini-CAD** objects, the editor for the selected object immediately opens, allowing it to be edited. By double-clicking output sheet elements while holding the [**Shift**] key, the preferences for the position, size and appearance of the element open for editing in the editor.

6.2 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 contents and sets the screen back to the given format (A4). This is useful if, for example, you have used the zoom function to display parts of the screen and would like to quickly return to a complete overview.
- [**F1**] opens the manual file.
- [**F2**] refreshes the screen without altering the current magnification.
- [**F11**] activates the menu item "**Output preferences/Move objects**".

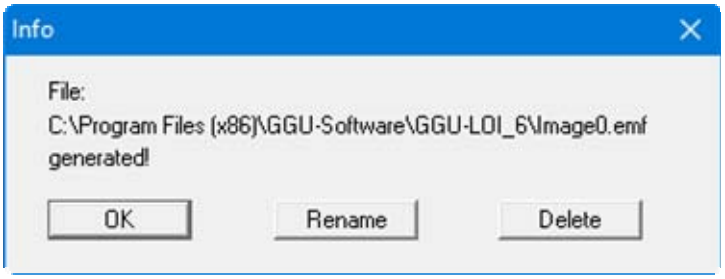
6.3 "Copy/print area" icon

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 opens once the area has been defined:



The default location of the file is the folder from which the program is started 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.

7 Index

A

Annex number,
edit element ... 21
enter ... 13

C

Clipboard ... 8
Company,
edit element ... 20
enter address ... 13
Context menu, open ... 24
Copy/print area ... 8, 15, 25
Cutting borders, turn on/off ... 19

D

Delete,
all tests ... 12
single test ... 11
DXF file,
export ... 7
import ... 4

E

EMF format ... 8

F

File, load/save ... 6
Font size, define ... 14
Free text,
enter ... 12
Free text, define input box in results table ... 18
Function keys ... 24

G

German Standard DIN 18128 ... 5
GGU-CAD file, export ... 7
GGUMiniCAD file, export ... 8
Graphics, add via Mini-CAD ... 15

L

Labelling in results table, enter/edit ... 18
Language preferences ... 4, 23
Layout, output sheet ... 17
Licence protection ... 4
LOI, activate per cent presentation ... 10

M

Manual, open as PDF file ... 23, 24
Metafile, export ... 8
Mini-CAD,
application explanations ... 15
export file ... 8
Mouse,
click functions ... 24
wheel functions ... 24

O

Output preferences ... 6, 7
Output sheet,
alter position/size of individual elements using mouse ... 19, 22, 24
change name ... 17
edit title element ... 20
reset all elements to defaults ... 21
reset individual elements to defaults ... 20

P

Page,
copy/print area ... 15, 25
define margins ... 19
define size ... 17
PDF file, import via Mini-CAD ... 4, 15
Print,
graphics ... 7
section ... 8, 15, 25
several files ... 9
Program,
load/save preferences ... 16
show improvements ... 23
show information ... 23
Project data,
edit element ... 20
enter ... 13

R

Report number,
edit element ... 21
enter ... 13
Results table,
edit element ... 21
edit labelling/allocations ... 18
specify no. of columns ... 10, 21
specify no. of rows ... 18

S

Sample data,
edit element ... 20
edit input box texts ... 17
enter ... 13
Scroll the screen ... 24
Smart icons, for menu items ... 15
Status bar main program, activate ... 15
System, show information ... 23

T

Test data,
display in message box ... 11
enter/edit ... 11
Test numbers,
for sequence of display ... 11
Tests,
delete all ... 12
delete single test ... 11
display maximum number ... 23
Toolbar, for menu items ... 15
Translation,
activate ... 23
display retroactively for output sheet texts ... 17
display retroactively in result table ... 18
True-type font ... 14

V

Version number, display ... 23

W

What you see is what you get ... 14

Z

Zoom factor, define for full-screen display ... 14
Zoom function, activate ... 14, 15, 24