



GGU-CAD manual

2D CAD program (standalone or for GGU files)

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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-CAD: Preface

The **GGU-CAD** program is a CAD program, which was originally intended merely for post-editing work on graphics produced by the GGU program range. As a result of the encouragement of program users, however, an almost complete CAD program has developed over the years, which leaves almost nothing to be desired in the "foundation engineering" field. Further suggestions and criticism are requested and will be taken into consideration for new program versions, where practical.

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-CAD: 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-CAD: 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 Tips and tricks

4.1 GGU-CAD: Function keys

The most important menu items can be reached using the function keys. The corresponding function keys are given at the respective menu items.

The individual function key allocations are:

- **[Esc]** refreshes the screen contents and resets the screen to your current zoom; this is 1.0 in the default setting. This is useful if you have used the zoom function to display parts of the screen, for example, and would like to quickly return to a complete overview.
- **[F1]** opens the menu item **"Draw/Polygon"**.
- **[F2]** refreshes the screen without altering the current zoom.
- **[F3]** opens the menu item **"Draw/Edit object"**.
- **[F4]** opens the menu item **"Draw/Lines via editor"**.
- **[F5]** opens the menu item **"Draw/Move object"**.
- **[F6]** opens the menu item **"Lines/Edit line"**.
- **[F7]** opens the menu item **"Lines/Extend (line)"**.
- **[F8]** opens the menu item **"Draw/Delete object"**.
- **[F9]** opens the menu item **"Draw/Text"**.
- **[F11]** moves to the next higher layer.
- **[F12]** moves to the next lower layer.

4.2 GGU-CAD: "Copy/print area" icon

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

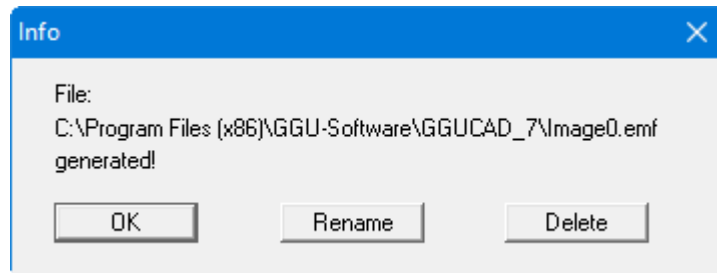


in the menu toolbar is clicked, describing the options available for this function. For example, using this icon it is possible to either copy areas of the screen graphics and paste them into the report, or send them directly to a printer.

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.

5 First steps

5.1 GGU-CAD: Program concept

The **GGU-CAD** program was primarily developed for post-editing work on graphics produced by the GGU program range. It offers numerous functions allowing the program to also be used as a two-dimensional CAD system. The program differentiates between the following four drawing objects:

- lines;
- characters (texts);
- colour-filled areas;
- graphics.

Note on lines

Although numerous drawing objects, such as rectangles, circles, Bezier splines, etc. are available, these objects are treated as individual lines once they are created. A circle, for example, is composed of numerous individual lines. After generating a circle the circle segments are treated as individual lines and can only be edited using the corresponding actions for lines. Beside a number disadvantages this generally provides only advantages (see menu item "**Window/Erase**" for example).

Note on colour fill and graphics

Colour-filled areas and graphics can only be erased, moved, copied, etc. as a whole.

10 different visualisation layers can be used. Almost all actions, such as "**Draw/Polygon**" or "**Window/Move**", for example, refer to the current drawing layer. The active drawing layer is displayed in the status bar. The active drawing layer can be changed using the **[F11]** and **[F12]** keys or via the toolbar.

GGU-CAD files can be generated from within any GGU program using the print function; they can then be loaded and further processed in the **GGU-CAD** program.

If you generate a DXF file or a HPGL file in a different application it is possible to import the data using the "**File/Import**" menu item.

After starting the program you will see an empty start-up screen with cross-hairs. There are nine menus in the menu bar:

- File
- Draw
- Lines
- Preferences
- Special

- Window
- Graphics preferences
- Fonts
- Info

After clicking one of these menus, the so-called menu items roll down, allowing you access to all program functions. The displayed screen area roughly corresponds to an A3 format page. However, a total drawing area of approx. 130 x 130 cm can be used.

The program works on the principle of ***What you see is what you get***. This means that, overall, the display on the screen represents what you will see on your printer. In the last consequence, this would mean that the screen display 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-CAD** screen is not refreshed after every alteration. If you would like to refresh the screen contents, please press either [F2] or [Esc]. The [Esc] key additionally sets the screen display back to your current zoom, which has the default value 1.0.

5.2 GGU-CAD: General

The principal program functions are described briefly below, allowing you to get to know the program without studying the user manual in detail.

Start the **GGU-CAD** program. You will see cross-hairs. A rectangular field is seen at the intersection, the so-called "**snap radius**". The cross-hairs trace the movements of the mouse.

The mouse position coordinates are displayed in the status bar at the bottom of the screen. The coordinate system is initial set so that the origin lies at the bottom left of the screen (0.0). The scale is 1:100 in both directions. The location of the origin and the scale can both be edited in "**Preferences/Scales**".

The default program setting opens a dialog box when any of the most important menu items are used; this provides brief information on the corresponding function, for example as in the following box:



Deactivate the "**Display info**" check box to stop being **nagged** after a familiarisation phase.

Some important menu items can also be accessed using the function keys [F1] to [F12]. These menu items are marked with the corresponding function key numbers in the menus.

5.3 GGU-CAD: Polygon or line

The "**Draw/Polygon**" action ([F1] function key) is automatically activated after starting the program. Click 3 points on the screen consecutively using the left mouse button. A polygon course is drawn. If you click with the right mouse button the connection to the last polygon point is annulled. You can now draw a new polygon course.

5.4 GGU-CAD: Freehand

Go to the menu item "**Draw/Freehand**". You can draw lines by permanently holding the left mouse button. The action is completed by releasing the mouse button.

5.5 GGU-CAD: Rectangle

Go to the menu item "**Draw/Rectangle**". After clicking two points with the left mouse button a rectangle of corresponding size is drawn. Finish the action by clicking the right mouse button, otherwise the next rectangle begins at the last corner point of the previous one.

5.6 GGU-CAD: Circle and ellipse

Go either to the menu item "**Draw/Circle**" or "**Draw/Ellipse**". In terms of their size a circle and an ellipse are defined by two mouse clicks. The centre point of the circle or the ellipse is then positioned using the left mouse button.

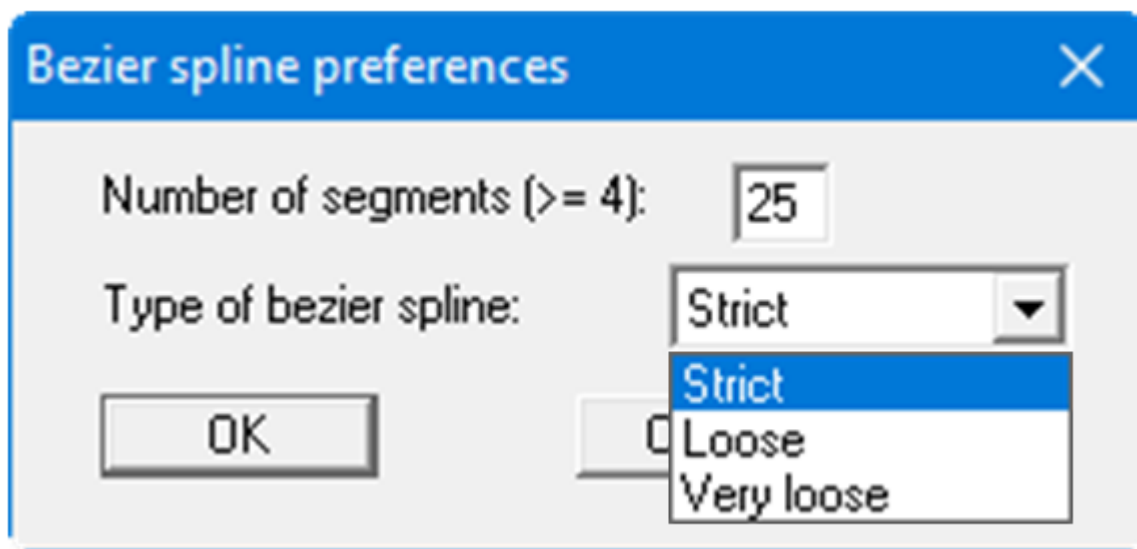
Circles and ellipses are composed of several individual line segments. The number of segments is specified in the menu item "**Preferences/Circle/Ellipse**".



A minimum of 3 segments can be defined. A triangle would be drawn in this case. Defining a start angle is then practical, because this influences the orientation of the triangle.

5.7 GGU-CAD: Bezier spline

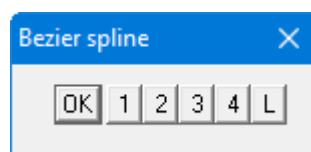
Go to the menu item "**Draw/Bezier spline**". The Bezier spline is compiled from four model points (definition points), which you click consecutively with the left mouse button. The Bezier spline can be regarded as a type of curve template. One of three Bezier spline formats can be selected in the "**Preferences/Bezier**" menu item:



- **Strict**
The four definition points lie on the Bezier spline.
- **Loose**
The first and the last definition point lie on the Bezier spline. Definition points 2 and 3 serve to determine the smoothing.
- **Very loose**
As for "**loose**", only slightly looser in terms of smoothing.

The Bezier spline is composed of several individual line segments. The number of segments can be specified.

After clicking the fourth definition point the following dialog box opens:



The locations of definition points 1, 2, 3 or 4 can be post-edited using the "**1, 2, 3, 4**" buttons. If the "**L**" button is pressed the Bezier spline is rejected and deleted. If "**OK**" is pressed the Bezier spline is used in the drawing. The final point is then the 1st point of the next Bezier spline. If you need a new starting point, first click the right mouse button and you can then define the next Bezier spline using 4 new points.

5.8 GGU-CAD: Text

Go to the menu item "**Draw/Text**" or press the [**F9**] function key. Using the left mouse button click at the position on the screen that the text is required:



Enter the required text, in three lines if necessary; they are arranged below each other depending on the specified line spacing. Font size, orientation and pen number, with which the text shall be drawn, can be specified. The defaults for the above dialog box can be specified in the menu item "**Preferences/Default text/pen**".

In addition, the font can be selected. If you require additional fonts, go to the menu item "**Fonts/Edit**". The default font is also specified here.

The background can be deleted to ensure that the text is easily visible, for example in front of coloured areas. If this check box is activated the text is displayed on a white rectangle.

5.9 GGU-CAD: Active drawing pen

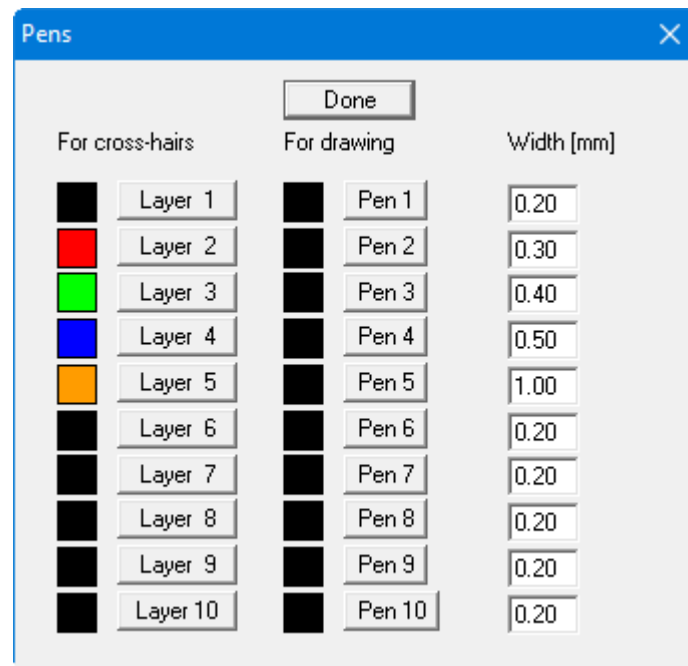
All objects are drawn using the active drawing pen. A total of 10 different pens can be defined in advance. Go to the menu item "**Preferences/Default text/pen**":



The active drawing pen is specified in the "**Pen no.**" group box . You can select from 4 different dash formats for the active drawing pen.

- normal (continuous);
- dashed;
- dash-dotted;
- dotted.

The repeat interval for the dashing is given by the dash length. By pressing the "**Edit pens**" button the same dialog box opens as for the menu item "**Preferences/Pen colour and width**". The pen colours and pen widths can be edited here.



The pen widths are entered in the width column. The pen colours can be defined after clicking the "**Pen 1**", "**Pen 2**", etc. buttons. Any objects already drawn are not affected by subsequent changes.

If you change layer while working, the colour of the cross-hairs also change. The layer colours can be edited using the buttons "**Layer 1**", "**Layer 2**", etc. If you are managing a drawing in several layers, differentiating *which object is in which layer?* can be difficult. In order to display the drawing objects (lines and texts) of a layer in the above-defined layer colours, activate the "**Screen display in cross-hair colours**" check box in the menu item "**Preferences/General**".

5.10 GGU-CAD: Snap radius

For example, if you need to draw a polygon and the start or end point shall be located directly on the start or end point of an existing line, it is difficult to precisely position the mouse. In order to simplify this job, we have the "**snap radius**" (actually a snap rectangle), which is located at the centre of the cross-hairs. Whenever you click with the left mouse button the program searches within the snap radius for existing end points and snaps to them if found. By default, the snap radius is set so that only the active drawing layer is searched. This is recognised by the dashed format of the snap radius. Go to the menu item "**Preferences/General**" to allow the snap radius to operate on all layers (snap radius as continuous line) or to switch it off completely.

The size of the snap radius can also be edited in the menu item "**Preferences/General**" by specifying the number of pixels in x- and y-direction.

5.11 GGU-CAD: Undo

If you have drawn objects these can be individually deleted by pressing the **[Backspace]** key. A mistakenly deleted object can be undone again using the **[Ins]** key or the shortcut **[Alt]** and **[Backspace]** (Undo function).

5.12 GGU-CAD: Window

The program has a "**Window**" menu. The term **Window** here does not refer to a Windows operating system window, but a rectangular area of the screen that certain actions can be limited to. The default size of this window can be edited in the menu item "**Window/Preferences**" or in the menu item "**Preferences/General**".



This is even easier using the menu item "**Window/Window size**", by clicking two corner points with the left mouse button. The defined window area is displayed instead of the cross-hairs if you go to the menu items in the "**Window**" menu. With the exception of the "**Window/Erase**" function, the selected action is only applied to those objects completely within the window. If the window is so small that none of the drawn objects fit entirely within it, enlarge the window area as described above.

5.13 GGU-CAD: Moving objects

If your active drawing does not yet contain any objects draw a number of lines, for example using the "**Draw/Polygon**" menu item and enter some text in your drawing using the "**Draw/Text**" menu item. Now go to the menu item "**Window/Move**". If the defined window is not the correct size adapt it using the "**Window/Window size**" menu item.

Position the window area over the objects to be moved and then click the left mouse button. All objects in the window are displayed in a different colour. An incorrect click that includes the wrong objects can be undone by clicking with the right mouse button. Now move the objects by moving the mouse to their new position and clicking the left mouse button again. The objects appear at their new position.

If you also hold down the shift key in conjunction with the last click, the selected objects are copied. If you change the active drawing layer after copying objects (function key **[F11]** or **[F12]**), the objects are moved or copied to the new drawing layer. If all line objects, for example, are to be excluded when moving objects, deactivate the "**Lines**" check box in the above dialog box of the "**Window/Preferences**" menu item.

If you only need to move a single object, this can be done more simply using the "**Draw/Move object**" menu item (**[F5]** function key).

5.14 GGU-CAD: Post-editing of objects

A different pen or colour can be selected for existing objects. It is also possible to change the display sequence. If you need to edit several objects simultaneously it is best to use the "**Window/Edit**" menu item. Individual elements can be more quickly edited via the menu item "**Draw/Edit object**" or the [F3] function key and then directly clicking the required object. This allows text input to be directly edited, for example.

5.15 GGU-CAD: Changing the sequence of objects

The objects are displayed on the screen in the sequence in which they were drawn. This can lead to certain objects being hidden by colour fills or graphics hatching. To move a colour-fill to the background, for example, so that other objects are not hidden, go to the menu item "**Draw/Edit object**" or press [F3] and click the colour fill.



Then activate the "**To back**" check box in the dialog box and confirm with "**OK**". The colour fill is then drawn first. Alternatively, it is possible to click hidden objects and bring them forwards.

5.16 GGU-CAD: Deleting objects

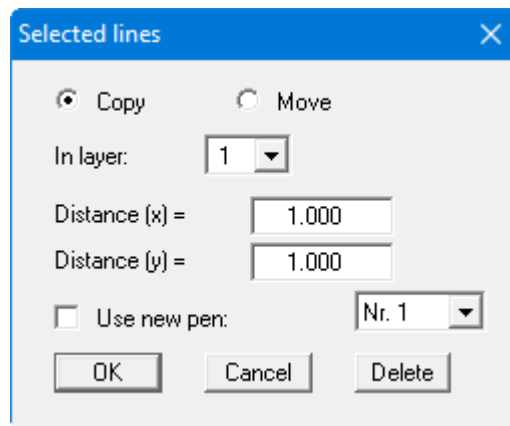
Drawn objects can be deleted. Use the menu item "**Window/Delete**" to delete several objects simultaneously. Activate the menu item "**Draw/Delete object**" or press [F8] to delete individual objects by clicking with the mouse.

5.17 GGU-CAD: Moving lines

Go to the menu item "**Lines/Move lines**" and then click the first line of a polygon course or just a single line. Starting at this first line the program now searches for further lines with a common end or start point with the previous line. A prompt window then opens:



If the program's search meets your requirements, confirm by pressing "**Yes**". To select further lines or to remove selected objects again, click "**Edit**" and mark the required lines by clicking with the mouse. If the [Shift] key is also held down when clicking the first line, only this line is selected and a further search for neighbouring lines is suppressed. Further lines can then be added without using [Shift]. Let the program know you have finished editing work by clicking the right mouse button. The above "**Polygon OK?**" prompt appears again. When you have confirmed this the following dialog box opens:



The selected lines can now be moved or copied within the active layer or in other layers. If you activate the **"Use new pen"** check box, the lines can also be drawn with a different pen. The action is carried out when you have confirmed your preferences. The action must be confirmed by clicking **"Yes"** in the **"Lines OK?"** prompt box. If you click **"No"**, you return to the edit mode and can add or remove lines.

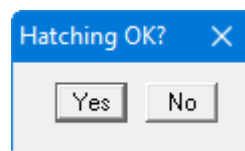
If you click the **"Delete"** button in the dialog box, all previously marked lines are deleted. It is possible to delete several lines at once in this way. In contrast to deleting via a window the lines may be spaced far apart or lie between other lines not to be deleted.

5.18 GGU-CAD: Hatching

To hatch an area, it must be surrounded by a polygon. Using the **"Draw/Polygon"** menu item first draw a closed polygon course, for example with 5 model points. Now go to the menu item **"Special/Hatch"** and then click the first line of the polygon course. Starting at this first line the program now searches for further lines with a common end or start point with the previous line. A prompt window then opens:



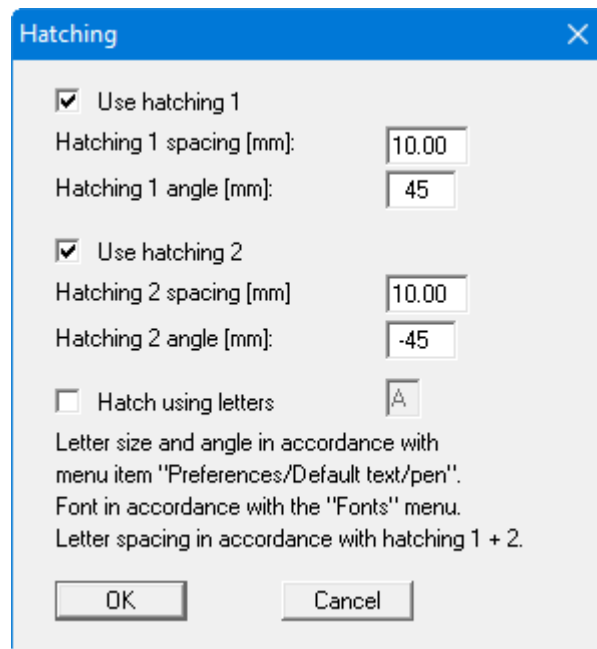
If you select **"Edit"** in this box the selected polygon course can be extended or adopted lines removed from it by clicking further line objects. In addition, changes to the default preferences can still be carried out (menu item **"Preferences/Hatching"** see below). Let the program know you have finished editing work by clicking the right mouse button. The **"Polygon OK?"** prompt then appears again. If you confirm this the hatching is drawn and a further prompt window opens:



If you are happy with the hatching click **"Yes"** and the hatching is used in the drawing. If you click **"No"**, you return to the edit mode and can add or remove polygon course lines or edit the hatching preferences.

If the **[Shift]** key is also held down when clicking the first line, only this line is selected and a further search for neighbouring lines is suppressed. You can then add further lines without using **[Shift]** by clicking them.

The program draws the hatching using the defined preferences. They can be edited in the menu item **"Preferences/Hatching"**:



Hatching uses either hatching 1 or 2 or both. Alternatively to hatching with lines, letters may also be used for hatching. If you activate the **"Hatching with letters"** check box, a repeated letter is drawn on the line position instead of lines. User-defined fonts can be used with the aid of the **CHARKONV.EXE** application (provided). For example, the letter **"U"** can be provided with the dash to designate silt. With the correct settings made this is then used for hatching. The **"BODEN.STZ"** vector font provided with the program, for example, has the silt dash below the letter **"U"**.

5.19 GGU-CAD: Slope lines or terrain hatching

The lines to be provided with a slope or terrain hatching can be selected in complete analogy to the menu item **"Lines/Move lines"**. Once your line selection is completed you will the following dialog box, for example, for the slope lines:



If you are happy with the appearance of the subsequent graphics, complete the action by clicking **"Yes"** in the **"Slope lines?"** prompt box. Follow the same procedure for terrain hatching.

6 File menu

6.1 GGU-CAD: "New" menu item

Select this menu item to delete an existing drawing.

6.2 GGU-CAD: "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-CAD: "Save" menu item

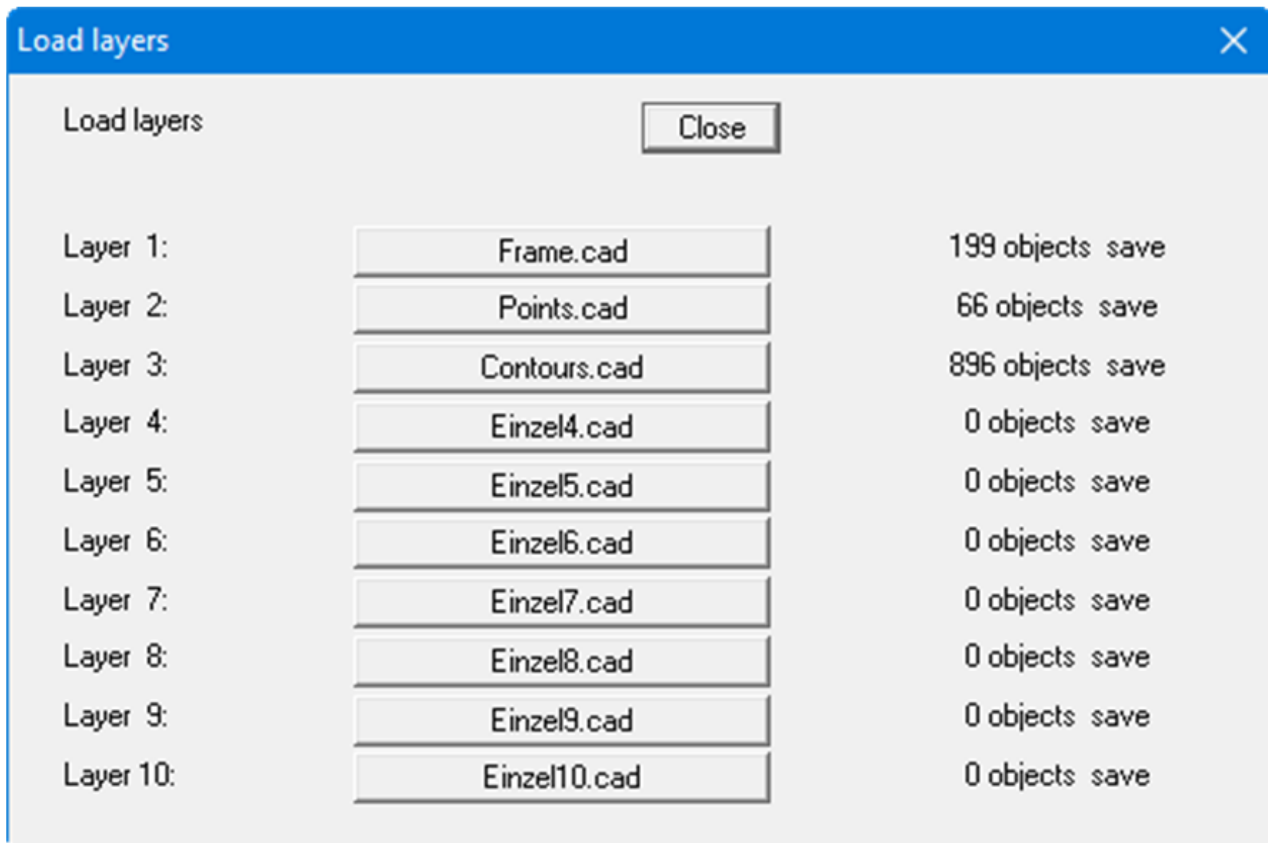
You can save data entered or edited during program use to a file, to have them available later, or to archive them. The data is saved without prompting with the name of the current file. The file contains all system information. Loading again later creates the same visualisation as was present at the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

6.4 GGU-CAD: "Save as" menu item

Drawing elements entered or edited during program use can be saved to a file, in order to have them available at a later date, or to archive them. The data is saved without prompting using the name of the current file. The allocation of drawing elements to the individual layers is retained.

6.5 GGU-CAD: "Load individual layers" menu item

As an alternative to the "File/Load" menu item described above, files can be loaded individually onto one of the ten drawing layers using this menu item.



The above dialog box opens. By clicking the buttons a file selector box is opened allowing you to allocate the required file to the corresponding drawing layer. If you load a file with objects distributed across several layers, the allocations are annulled for **individual loading**. All elements of this file then belong to this layer.

The number of objects in the layer is shown behind the file name. In addition, the word **save** indicates that these layers have not been altered by drawing operations. The word is not shown if drawing operations have been carried out and have not yet been saved to a file.

It makes sense to save a default frame for various page formats, including the company header/stamp as a separate file. This frame can then be loaded to a layer, independent of the other objects, without the need to convert scales, as used for a site map, for example.

6.6 GGU-CAD: "Save individual layers" menu item

As an alternative to the "**File/Save**" menu item described above, the drawing elements of individual layers can be saved to separate files using this menu item in order to make certain layers (e.g. points on a site map) available for other files.

Click one of the buttons to save the elements in this layer to a file. The file extension is **".CAD"**. If no extension is specified, the program uses this extension automatically.

6.7 "Import" menu item

6.7.1 GGU-CAD: DXF import

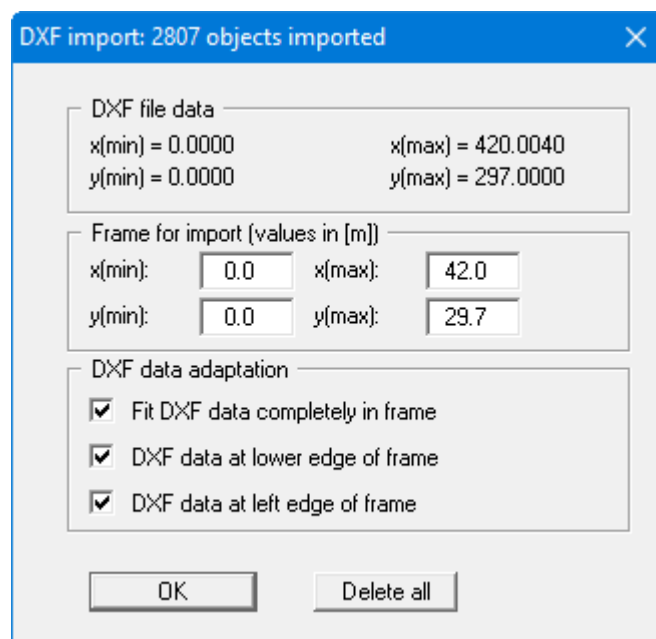
Before you import DXF data, you should move to a new layer to be able to edit the imported objects without having to pay attention to existing objects.

After clicking the **"DXF file"** button the following dialog box opens:



If you encounter problems when importing fonts from the DXF file, e.g. special characters are not correctly represented, you may be able to achieve better results by deactivating the **"Texts in DXF file in OEM format"** check box or by applying a font size factor. If colour fill does not need to be imported, activate the **"Command TRACE"** and **"SOLID without fill"** check boxes. If coloured lines or texts are to be imported from the DXF file, deactivate the **"Use"** check box for the appropriate standards.

Select the required DXF file from the file selector box after clicking **"OK"**. The program interprets the DXF commands and converts them to **GGU-CAD** objects. The following dialog box opens:

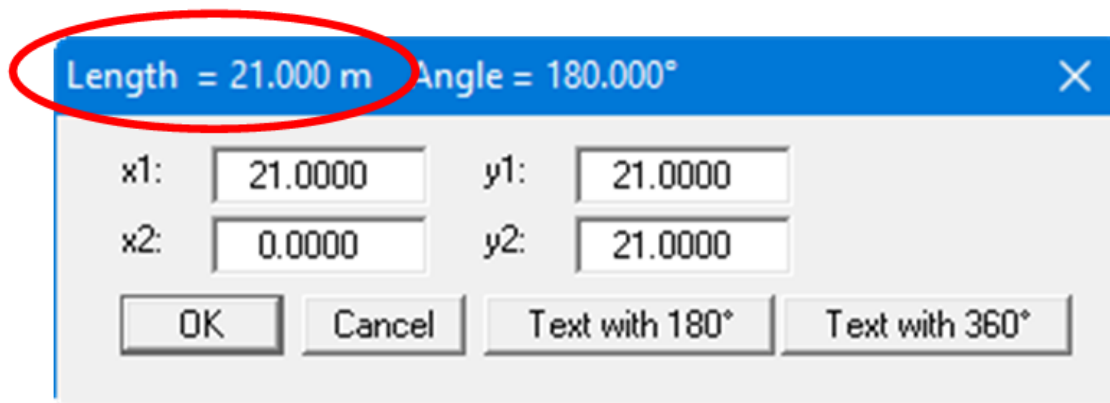


In the upper group box information on the dimensions of the DXF file and the image data for your current project can be seen. The image data are given in the **"Frame for import"** group box. However, you can also enter a region of your drawing where the DXF file shall be displayed. If you click the **"Delete all"** button in the dialog box above, the data in the current DXF file will not be imported.

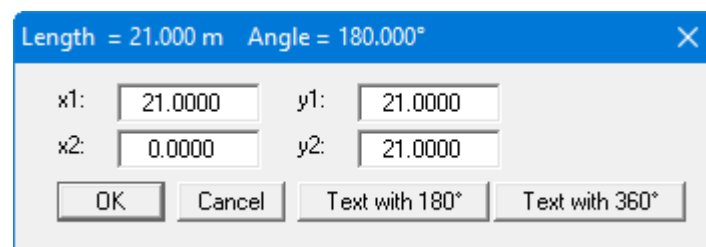
If you have already correctly defined your drawing scale and the DXF data have been transferred with the correct coordinates, you should deactivate all check boxes in the **"DXF data adaption"** group box.

However it is useful in many cases to let the lower three check boxes in the dialog box be activated (default setting). The program then ensures that the DXF file fills the screen. In order to adjust the scale and the coordinates of the DXF data to that of your drawing project proceed as follows:

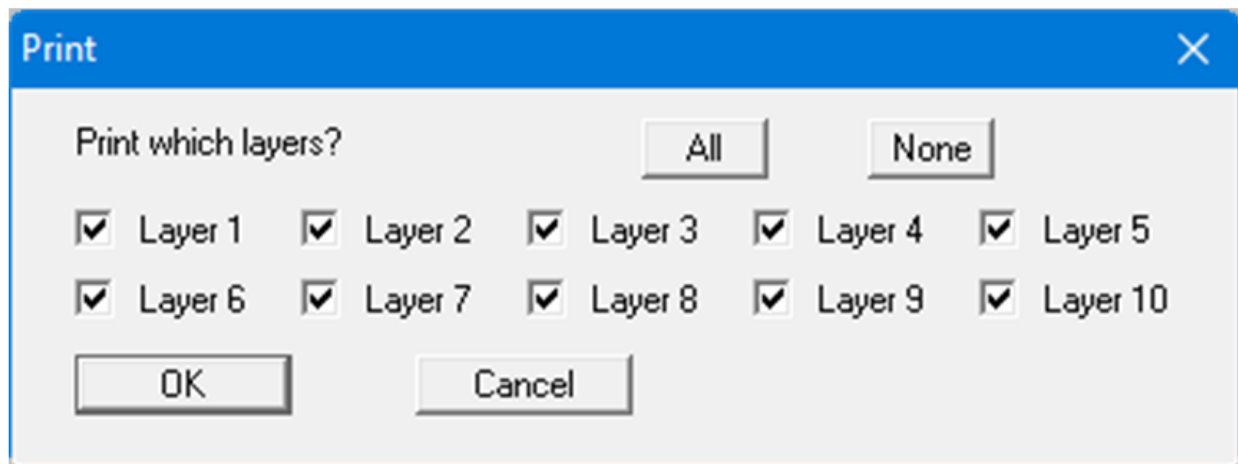
- Find a horizontal and a vertical line in the imported DXF data of known lengths. You can also draw an auxiliary line between two points of known spacing. After going to the menu item "**Draw/Edit object**" or pressing [F3] click the lines and then the "**Coordinates**" button in the dialog box. The actual length of the clicked line is given on the blue bar of the dialog box.



- If the required length is divided by the actual length the result is the zoom factor for the size correction. Because different heights and widths result from zooming to full screen size, you also get differing horizontal and vertical zoom factors.
- In order to adapt the DXF elements to your specified drawing scale enter the computed zoom factor in "**Preferences/Enlarge/Reduce layers**" for the x- and y-direction and select the layer to which the zoom shall be applied. You can also import the DXF data into a window via "**Window/Compress**" and zoom appropriately.
- To adapt the location of the imported elements (e.g. height of an intersecting line) to your drawing coordinates, proceed in analogy to the scale correction. Find a line in the DXF import, the height of which is known, for example (= y-coordinate). After going to the menu item "**Draw/Edit object**" click the line and then "**Coordinates**" in the dialog box. The current y-coordinate of the clicked line is given below.



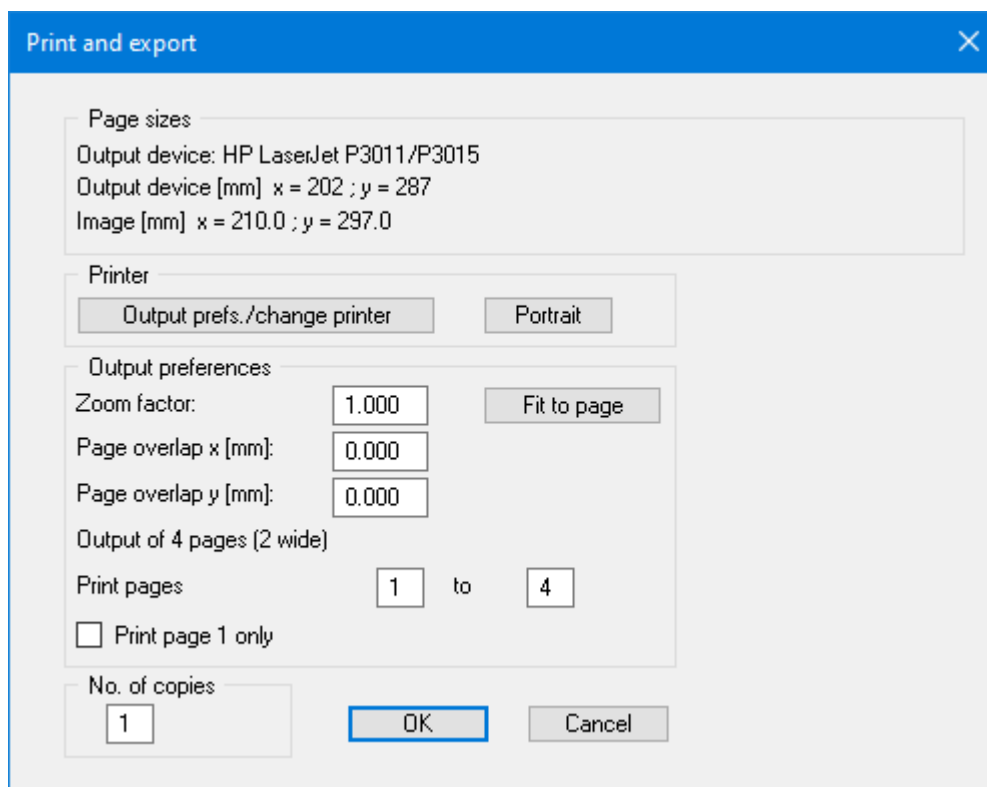
- Compute the difference between the theoretical and the actual height. Enter this in "**Preferences/Move (layers)**" and select the layer to which the movement shall be applied. Additionally, activate the button "**Move in [m] (drawing scale)**".
- If a final coordinate system has not been defined before importing the DXF data the imported drawing elements can be simply aligned using "**Preferences/Define origin**".



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

- **"Printer"**

allows graphic output of the current screen contents (**graphical representation**) to the WINDOWS standard 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). 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. You can also print only the 1st page with zoom factor = 1.0, in which case the bottom left-hand area is printed. 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



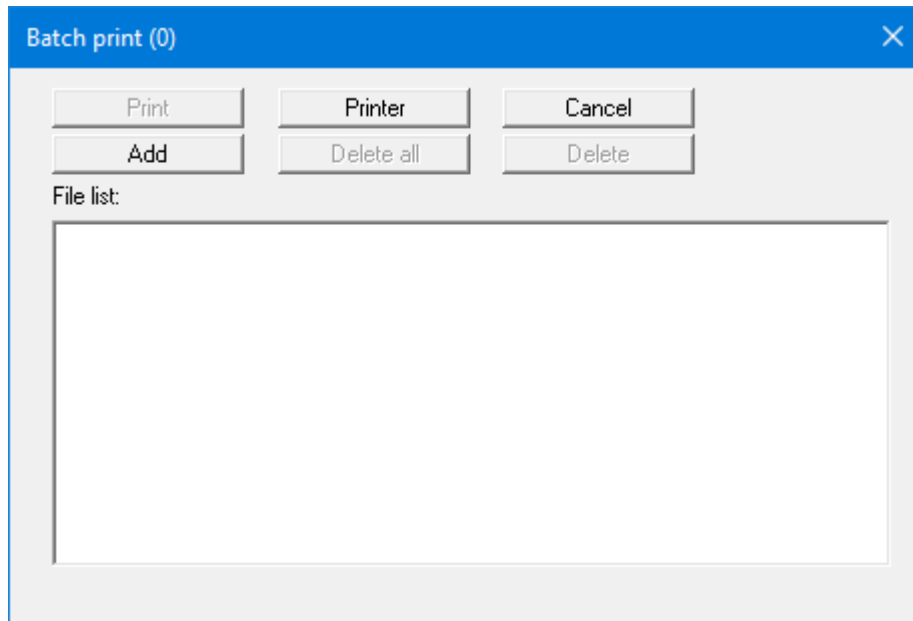
from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see "**Tips and tricks**").

Using the "**Mini-CAD**" program module you can also import EMF files generated using other GGU applications into your graphics (see menu item "**Graphics preferences/Mini-CAD**").

- "**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.

6.12 GGU-CAD: "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 printer 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.

6.13 GGU-CAD: "Exit" menu item

After a confirmation prompt, you can quit the program.

6.14 GGU-CAD: "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 Draw menu

7.1 GGU-CAD: "Freehand" menu item

With the left mouse button pressed the cross-hairs operate like a pencil being drawn in freehand across the drawing. Releasing the mouse interrupts the line.

7.2 GGU-CAD: "Polygon" menu item

After selecting this menu item or pressing [F1] you first mark the start point of a line with the left mouse button and then the end point. A polygon course is then created by clicking the left mouse button again, where the last respective end point defined is the start point of the next line. The polygon course is completed by clicking the right mouse button and a new one can be started.

7.3 GGU-CAD: "Rectangle" menu item

Rectangles can be drawn using this menu item. The first corner point of the rectangle is generated by clicking the left mouse button. Release the left mouse button again and draw a rectangle. A second corner point is defined diagonally to the first one by pressing once again. Clicking the right mouse button releases the pen, otherwise the second corner point is used as the first corner point of the next rectangle.

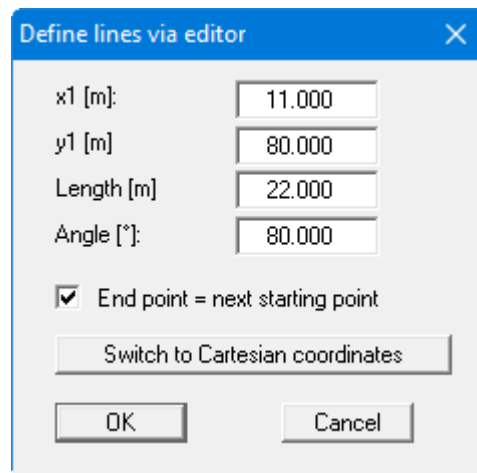
7.4 GGU-CAD: "Lines via editor" menu item

If you need to draw lines with precise start and end coordinates, this is often difficult using the mouse-controlled functions. This can be done using this menu item, which can also be accessed via the [F4] function key. The following dialog box appears:



Enter the respective x- and y-coordinates of the start and end point of the line. Activate the **"End point = next start point"** check box to create a polygon course. After confirming your input the defined line is drawn on the screen. If you go to this menu item a second time the old end coordinates are adopted as start coordinates.

Alternatively, input can be in polar coordinates. Click the button **"Switch to polar coordinates"**. The following adapted dialog box opens:



Instead of the end coordinates, enter the length and angle of the line here.

7.5 GGU-CAD: "Circle" menu item

This menu item can be used to draw circles. The circle is made up of several lines. The number of lines can be edited in the menu item "**Preferences/Circle/Ellipse**" (see Section 6.4.8). To draw a circle, first define the diameter of the circle by clicking two points. The circle is then drawn but is still attached to the cross-hairs. You can now position the centre of the circle by clicking the left mouse button. If the snap radius is activated the centre point can be precisely attached to a line end point. The snap radius settings are made using the menu item "**Preferences/General**".

TIP:

If you make the following settings in the "**Preferences/Coordinates**" menu item, the coordinates are displayed in the status bar in polar coordinates.



In addition, these coordinates are reset to zero at each mouse click. This means that the current diameter of the circle is always displayed.

7.6 GGU-CAD: "Ellipse" menu item

An ellipse is defined in analogy to the "**Draw/Circle**" menu item. The shape of the ellipse is defined by two points.

7.7 GGU-CAD: "Bezier spline" menu item

A description of this menu item can be found in the "**First steps**" in Section "Bezier spline".

7.8 GGU-CAD: "Parallel" menu item

Using this menu item you can create a parallel copy of any line in your drawing. Left-click the required line, a copy of the line is then attached to the cross-hairs. By clicking again this line can be dropped anywhere and is parallel to the original line. If you clicked the wrong line by mistake, abort the copy process by right-clicking. You can now select a different line.

7.9 GGU-CAD: "Normal" menu item

Using this menu item you can create a normal to any line in the drawing. After clicking the original line a line that is normal to the clicked line attaches to the cross-hairs. The normal can be created with the required line length by clicking again at the required position. The start point of the normal always remains on the extension of the selected line. The drawing process can be aborted by right-clicking.

7.10 GGU-CAD: "Text" menu item

A description of this menu item can be found in Section "**Text**" of the "**First steps**" chapter.

7.11 "Edit object" menu item

7.11.1 GGU-CAD: General

Previously drawn objects can be edited after selecting this menu item. Left-click the object to be edited. Various dialog boxes will open depending on the object. The function can also be accessed by pressing [F3].

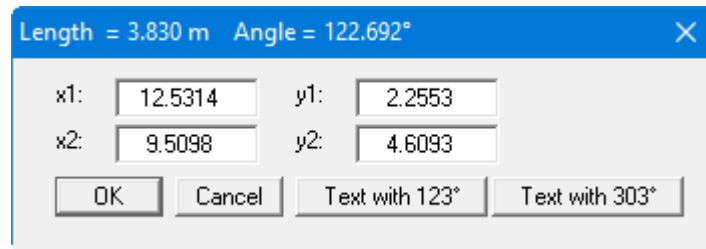
7.11.2 GGU-CAD: Post-editing lines

If you go to this menu item and then click a line, for example, the following dialog box opens:



The pen width and colour can be changed and a dash format be allocated to the line. The line is drawn either last or first using the "**Move to back**" or "**Move to front**" check boxes. This is particularly practical if there are coloured areas in the drawing and you wish to prevent lines being covered by them.

If you click the "**Coordinates**" button the following dialog box opens:



The line coordinates can be edited here. If you click one of the two "**Text with x°**" buttons the dialog box closes and the "**Text**" function is automatically activated. An axis-parallel annotation can now be entered for the line; the program adopts the angle of the line as the default value in the text editor's dialog box.

7.11.3 GGU-CAD: Post-editing text

The following dialog box opens if a text object is clicked:



Beside the change in the drawing sequence described under lines, both the text entered and the font, writing angle, font colour and font size can be altered. In addition, the background can be deleted so that the text is also easily visible, in front of coloured areas, for example. If this check box is activated the text is displayed on a white rectangle.

7.11.4 GGU-CAD: Post-editing colour fill

If you click inside a colour fill the following dialog box opens:



In order to prevent text or lines being hidden, for example, coloured areas can be moved "**Move to back**" or "**Move to front**" in the same way as described for lines. To change the colour press the "**Colour**" button and define the new colour via a Windows palette. A further option is selecting "**Fill colour 1**", which is specified in "**Preferences/Fill colours**".

In order to quickly adopt a previously used fill colour for other colour fills, click the check box "**Active colour as new fill colour 1**". If a new colour fill is performed this colour is used as the fill colour or, when editing existing colour fills, the new colour is adopted by clicking "**Fill colour 1**".

7.12 GGU-CAD: "Delete object" menu item

After going to this menu item or after pressing [**F8**] any object can be deleted by clicking with the mouse. The deleted object is restored by pressing [**Backspace**] or using the shortcut [**Alt**] and [**Backspace**].

7.13 GGU-CAD: "Move object" menu item

After going to this menu item or after pressing [F5] any object can be deleted by clicking with the mouse. The marked object adheres to the cross-hairs and is released at the required location by clicking the mouse button again. The movement is undone by pressing [Backspace].

Using this function the marked objects can also be moved or copied to a different layer. Mark the object and change to the required layer using [F11] or [F12]. Release the object with a mouse click or using the [Home] key.

7.14 GGU-CAD: "Undo" menu item

If any changes have been made to dialog boxes or moved objects to a different position on the screen after selecting the "**Editor 1/Move objects**" menu item or using [F11], this menu item will allow you to undo the last change. This function can also be accessed using [Backspace] or the appropriate tool in the toolbar.

7.15 GGU-CAD: "Restore" menu item

When this menu item is selected the last change made in a dialog box or the last change in the position of objects, which you undid using the menu item "**Editor 2/Undo**" will be restored. This function can also be accessed using [Ins] or the appropriate tool in the toolbar.

7.16 GGU-CAD: "Preferences" menu item

You can activate or deactivate the undo functions.

8 Lines menu

8.1 GGU-CAD: "Edit line" menu item

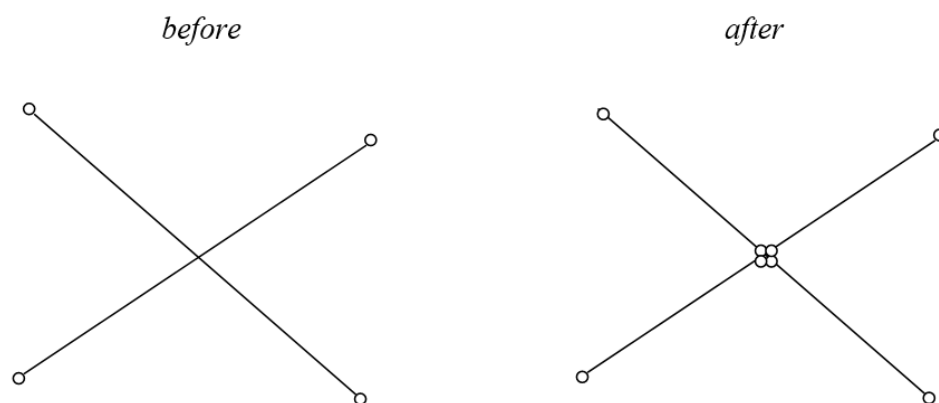
Individual line end points can be clicked and their positions redefined using this menu item. If only minor changes need to be made it may be necessary to change the snap radius in "**Preferences/General**", otherwise it will always snap to the old end point. The function can also be activated by pressing [F6].

8.2 GGU-CAD: "Extend" menu item

After going to this menu item or pressing [F7] the length of a line can be edited. Click the end of the line to be edited. A new length for the line can then be entered, the angle of the line is retained. If only minor changes need to be made it may be necessary to change the snap radius in "**Preferences/General**", otherwise it will always snap to the old end point.

8.3 GGU-CAD: "Break" menu item

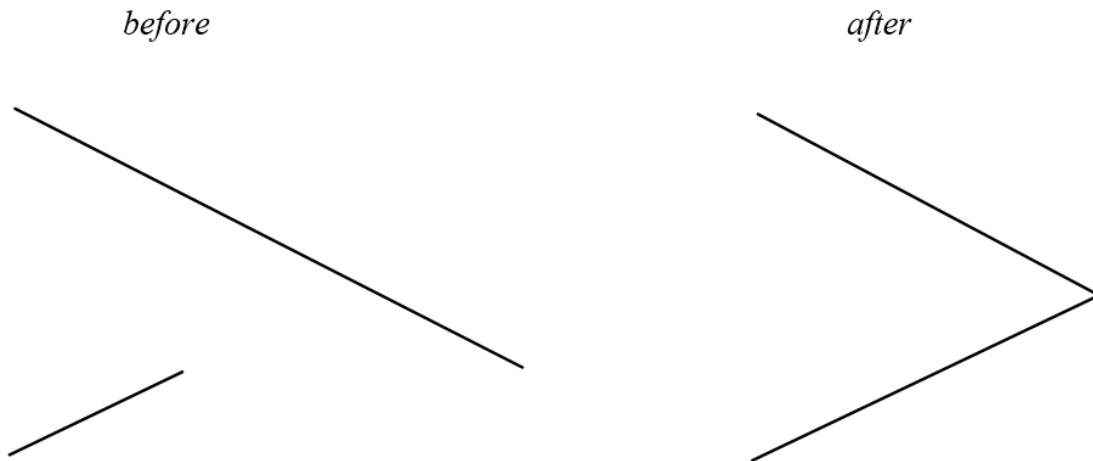
Four lines can be generated by clicking on two intersecting lines; they all then have a new starting point at the previous intersection.



It is then possible to delete one of the four new lines, for example.

8.4 GGU-CAD: "Trim" menu item

This menu item allows two lines to be joined at their intersection by clicking the lines, one after the other.



The shorter of the lines is extended to the intersection. The shorter end of longer lines is deleted as far as the intersection. If, as in the above example, the lower section of the longer line is to be retained, the upper end must first be shortened via [F7] or the lower end extended.

8.5 GGU-CAD: "Move lines" menu item

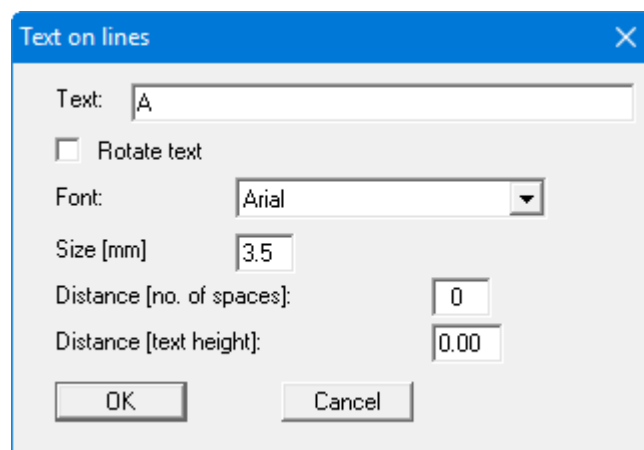
A description of this menu item can be found in Section "**Moving lines**" in "**First steps**".

8.6 GGU-CAD: "Text on lines" menu item

Lines or polygon courses can be annotated with text using this menu item. Click the first line of a polygon course or an individual line. Starting at this first line the program searches for further lines with a common end or start point with the previous line. A prompt window then opens:

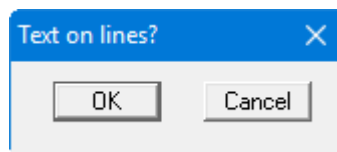


If the program's search meets your requirements, confirm by pressing "**Yes**". The following dialog box then appears:



The text is repeated at regular intervals along the selected lines. The text is rotated by 180° using the "Rotate text" check box. In addition, the font and font size can be adapted. The input following "Spacing [number of spaces]" determines the distance between the repetitions. The input following "Spacing [text height]" defines the distance of the text from the line as a multiple (fraction) of the text height.

If you answer the original "Polygon OK?" prompt with "Edit" the selected polygon course can be extended or adopted lines removed from it by clicking further line objects. Changes to the default preferences can also be made at this stage. Let the program know you have finished editing work by right-clicking with the mouse. The above mentioned "Polygon OK?" prompt appears followed by visualisation on the screen. A further prompt appears:



If this is satisfactory, click "OK" and the text is placed in the drawing. If "Cancel" is clicked, you return to edit mode and can add or remove lines. Complete work by right-clicking.

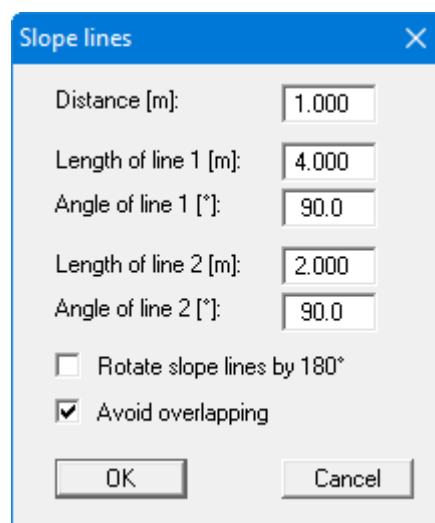
If the [Shift] key is also held down when clicking the first line, only this line is selected and a further search for neighbouring lines is suppressed. Further lines can then be added without using [Shift].

8.7 GGU-CAD: "Slope lines" menu item

Slope lines can be drawn normal to existing lines.



Selection of the lines to be allocated slope lines is analogous to the previous menu item "Lines/Text on lines". The following dialog box opens by right-clicking after completing line selection:



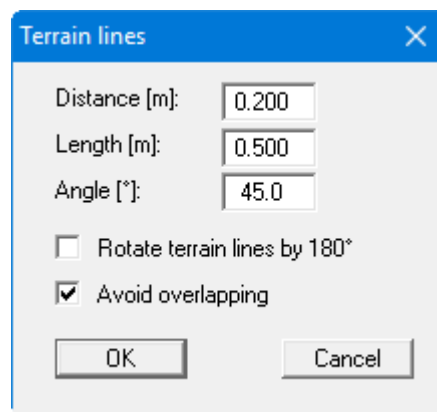
The spacing of the slope lines can be defined as well as the length and angle of slope lines 1 and 2. Always activate the "**Avoid overlapping**" check box to prevent lines being drawn across each other in corners and on curves. The slope lines are drawn once the preferences are confirmed. If the slope lines are drawn on the wrong side of the line, click "**Cancel**" at the "**Slope lines?**" prompt. If you subsequently complete line selection by right-clicking, activate the check box "**Rotate slope lines by 180°**". Further alterations, e.g. the length of the slope lines, can also be made and adopted by confirming the prompt.

8.8 GGU-CAD: "Terrain hatching" menu item

Existing lines can be allocated terrain hatching.



The lines to be allocated terrain hatching are selected analogous to the previous menu item "**Lines/Text on lines**". The following dialog box opens by right-clicking after completing line selection:



Define the required spacing, lengths and angle of the terrain hatching. The "**Avoid overlapping**" check box should be activated, exactly as when defining slope lines, to prevent the lines being drawn across each other in corners and on curves. The terrain lines can also be rotated by 180° if they are drawn on the wrong side.

9 Preferences menu

9.1 GGU-CAD: "General" menu item

Global default program settings can be made in this menu item. The following dialog box opens:



"Show info before calling certain menu items"

Information on the functioning of the corresponding menu item is displayed by default for a number of important menu items. This is particularly useful during the familiarisation phase. The information can be deactivated or reactivated using this check box.

"Window size in pixels"

The size of the window can be defined for window operations (see Section "**First steps/Windows**" and the "**Window**" menu). This can also be more simply done by opening the popup dialog (right mouse click), clicking the "**Define window size**" button and then defining the size of the window by clicking the two corner points.

"Window acts on"

The window action for window operations can be specified. For example, if only the "**Text**" box is activated, all window operations (such as "**Delete window**", for example) act on texts only. Lines are not deleted in this case. This setting is also accessible via the popup dialog (right-click).

"Cross-hair length [pixels]"

The size of the screen cross-hairs can be altered. The default setting uses cross-hairs that extend to the screen boundaries.

"Snap radius [pixels]"

Here, the size of the so-called snap radius can be defined (dotted box around cross-hairs). A further description can be found in Section "**First steps/Snap radius**".

"Snap radius acts on"

The action of the snap radius can be defined. It is possible to restrict the action to the active layer (box has a dashed outline) or to extend it to all layers (box has a continuous line) or to turn it off completely. Activate the corresponding box. It is simpler to perform these settings in the popup dialog, which opens by right-clicking on the screen. In addition, the three different options are available by pressing "**F**" without opening this dialog box.

"Use array"

The cross-hairs will snap to the nearest array point when the mouse is clicked if an array in x- and y-direction is defined and the appropriate check box is activated. In addition, the two different options are available by pressing "**R**" without opening this dialog box.

"Always refresh"

If this check box is activated the drawing is always redrawn after changes are made. This may take some time for many types of objects. Deactivate this check box to increase processing speed. The disadvantage of this is that the screen contents do not always reflect the actual conditions. If necessary, go to the menu item **"Graphics preferences/Refresh"** or press [F2].

"Screen visualisation in cross-hair colours"

The option of screen visualisation in cross-hair colours simplifies visualisation when working in several layers, because then all objects are shown in the colour of the cross-hairs for the respective layer. The colours of the cross-hairs in the various layers are specified in the menu item **"Preferences/Pen colour and width"**.

"Autosave after [minutes]"

The program saves the file at the specified intervals. The name and path of the recovery file can be read in **"Info"**.

"Create BAK files"

If the generation of BAK files is also required, activate this check box.

9.2 GGU-CAD: "Default text/pen" menu item

This dialog box allows the default values for font size and orientation to be specified for writing text. In addition, the active pen can be defined and settings made.

9.3 GGU-CAD: "Pen colour and width" menu item

A description of this menu item can be found in the **"First steps"** in Section **"Active drawing pen"**.

9.4 GGU-CAD: "Fill colours" menu item

A total of 10 default colours can be defined and selected as active fill colour. This colour is used as the default colour for filling objects (see menu item **"Special/Colour hatching"**). A change in the colour settings does not affect existing **colour hatching**.

9.5 GGU-CAD: "Hatching" menu item

Areas can be allocated hatching. The dialog box for this menu item allows the type of hatching to be defined.



Two different types of hatching are available, for which the line spacing and the angle can be defined. It is also possible to use both simultaneously, if both check boxes are activated.

One special feature compared to other CAD applications is the use of a **line hatching** using letters. Activate the check boxes **"Hatch using letters"** and **"Use hatching no. 1"**. The letter defined in the corresponding box is drawn on imaginary hatching line 1 at the distance entered in Hatching 2. The line spacing is therefore defined by **"Hatching 1 spacing"** and the distance between the letters by **"Hatching 2 spacing"**. In order to define a different letter spacing the dialog box must be closed with the check box for hatching no. 2 activated and then opened again and check box 2 deactivated.

The currently active font is always used for the letter (see **"Fonts"** menu). For example, if the current font is BODEN.STZ (tick in front of the font name in the **"Fonts"** menu) and the letter **"U"** (capital U) is specified, the selected screen area (see menu item **"Hatch"** in the **"Special"** menu) is filled by the DIN symbol for silt, because the capital **"U"** is allocated the silt symbol in the BODEN.STZ font. User-defined fonts can also be created using the **CHARKONV.EXE** font editor provided with the program, using any kind of letter shape, and thus create customised **letter hatching**.

9.6 GGU-CAD: "Random hatching" menu item

In analogy to hatching using lines, areas of the drawing can be filled by text (also see menu item **"Special/Random hatching"**). The text is distributed randomly in the defined area (polygon course). The default settings for random hatching are made in the dialog box for this menu item:



Enter the text and the number of recurrences (hits). Also specify the text font size. The currently active font is used, as shown by the tick in front of the font name in the **"Fonts"** menu.

9.7 GGU-CAD: "Coordinates" menu item

The coordinate display in the status bar can be changed using this menu item.



If the check box **"Coordinate display automatically to zero"** is activated, the coordinate system origin is set to this point after every mouse click (also see the tip in the menu item **"Draw/Circle"**). This allows the length of a line to be read directly from the status bar when drawing, for example.

9.8 GGU-CAD: "Circle/Ellipse" menu item

Every circle and every ellipse is constructed from a certain number of polygon lines. The number of segments can be defined in the dialog box for this menu item.



A minimum of 3 segments can be defined. A triangle would be drawn in this case. Defining a start angle is then practical, because this influences the orientation of the triangle.

In addition, the centre of the circle or ellipse can be provided with a cross, the size of which can be specified here.

9.9 GGU-CAD: "Bezier" menu item

A description of this menu item can be found in the "**First steps**" in Section "**Bezier spline**".

9.10 GGU-CAD: "Dimensioning" menu item

The program also allows drawings to be dimensioned. A number of default settings for the wall can be specified using this menu item. The following dialog box opens:



The number of decimal places can be specified in the top line; they are shown on the screen for subsequent dimensioning. If "**Extension lines**" are used as the type of line boundary, the extension lines are drawn normal to the dimension lines; their length can be defined.

Dimension arrows are also drawn if the corresponding function is selected. The length and width must then be entered.

9.11 GGU-CAD: "Scales" menu item

The scale of the drawing in both x- and y-directions can be specified using this menu item. In addition, the position of the left edge of the screen (x-value of origin) and the bottom edge of the screen (y-value of origin) can be specified.



If the scale is altered after an object has been drawn and dimensioned, the dimensioning must be renewed because the dimension text is not adapted automatically.

9.12 GGU-CAD: "Define origin" menu item

After clicking this menu item a point on the screen can be clicked and a certain coordinate pair allocated. The coordinate system is displaced according to the (x/y) data pair entered for the clicked point. The scale can also be edited in the dialog box for this menu item.

9.13 GGU-CAD: "Define scale" menu item

After clicking this menu item a point on the screen must be clicked and the required (x/y) data pair then entered for that point. The program then automatically computes the x- and y-direction scales from the location of this point and that of the origin (see menu item "**Preferences/Define origin**").

This menu item can be used if a site map has been imported as a graphics file, for example, without precisely defining the scale beforehand. First redefine the origin at the end of a dimensioned line using the previous menu item. The current scale can then be defined by going to this menu item and clicking the end of the dimensioned line. Accept the computed scale. If the site map is subsequently printed with a user-defined scale, first define the required scale using "**Preferences/Scales**" and then bring the drawing objects to the new scale using "**Preferences/Enlarge/Reduce (layers)**".

9.14 GGU-CAD: "Select layer" menu item

This menu item allows the active drawing layer (= active layer) and the required visualisation layers to be selected. Alternatively, the visualisation layers can also be selected in the popup dialog by right-clicking. If the drawing objects are distributed across a number of layers, things may be clearer if only the active layer is visible and the other visualisation layers are hidden.

The next drawing layer can also be reached using [**F11**] or one layer higher or lower using [**F12**], or use the icons in the toolbar. Hidden visualisation layers are automatically revealed again if the layer is selected and it then becomes the active drawing layer.

9.15 GGU-CAD: "Delete layer" menu item

Following a confirmation prompt the objects in individual layers can be deleted completely. Once completely deleted the contents of the layer(s) cannot be restored.

9.16 GGU-CAD: "Enlarge/Reduce layer" menu item

The objects on individual layers can be enlarged or reduced. Different zoom factors can be used for the x- and y-directions. The action is applied to the selected layers and can be restricted to certain object types (lines, text, etc.).

9.17 GGU-CAD: "Move layer" menu item

The objects on selected layers can be moved by a given amount in x- and/or in y-direction. Specify whether the objects shall be moved in millimetres, such as a sheet frame, for example, or in metres of the specified scale., for example an object on a site map.

9.18 GGU-CAD: "Transfer layer" menu item

All objects on selected layers can be transferred to a different layer. Specify the target layer and select one or more source layers in the dialog box. If the "**Copy layers**" check box is activated, all objects are retained in the source layer.

10 Special menu

10.1 GGU-CAD: "X-line" menu item

Horizontal lines can be drawn by going to this menu item. After specifying the starting point by left-clicking at the required position the line remains attached to the cross hairs as a horizontal line and is released again by a further click to define the end point and length. The mouse does not need to be clicked in the horizontal extension of the starting point.

The point at which the end point is defined is automatically adopted as the starting point of the next x-line; the next horizontal line can thus be directly started with a given y-displacement.

A new start can be achieved by right-clicking if the next horizontal is not to be connected to the same x-value.

10.2 GGU-CAD: "Y-line" menu item

Vertical lines can be drawn by going to this menu item. After specifying the starting point by left-clicking at the required position the line remains attached to the cross hairs as a vertical line and is released again by a further click to define the end point and length. The mouse does not need to be clicked in the vertical extension of the starting point.

The point at which the end point is defined is automatically adopted as the starting point of the next y-line; the next vertical line can thus be directly started with a given x-displacement.

A new start can be achieved by right-clicking if the next vertical is not to be connected to the same y-value.

10.3 GGU-CAD: "Rays" menu item

After the first click on a point all following clicks generate lines radiating from the first point. A new start can be achieved by right-clicking.

10.4 GGU-CAD: "Hatch" menu item

A description of this menu item can be found in the "**First steps**" in Section "**Hatching**".

10.5 GGU-CAD: "Colour hatching" menu item

A marked polygon course can be colour-filled in analogy to the "**Special/Hatch**" menu item. An explanation of specifying and editing polygon courses can be found in Section "**First steps/Hatching**". The colour settings are edited using the menu item "**Preferences/Fill colours**".

10.6 GGU-CAD: "Graphic hatching" menu item

In analogy to the "**Special/Hatch**" menu item, a marked polygon course can be filled with graphics from a stored file.

First define the area to be filled as described in Section "**First steps/Hatching**". Then select the required graphics file and specify the visualisation options in the following dialog box.



Enter the width and the height to width ratio. The graphics are then drawn over the specified area. If the "**Show as transparent**" check box is activated the graphics are *translucent*, i.e. underlying lines or colour fills remain visible.

10.7 GGU-CAD: "Random hatching" menu item

A marked polygon course can be text-filled in analogy to the "**Special/Hatch**" menu item. An explanation of specifying and editing polygon courses can be found in Section "**First steps/Hatching**". Before defining the polygon course a dialog box opens allowing settings to be made for the random hatching texts; the text, size, number of hits and the font can be defined.

The currently active font is always used for the letter (see "**Fonts**" menu). For example, if the current font is **BODEN.STZ** (tick in front of the font name in the "**Fonts**" menu) and the letter "**U**" (capital U) is specified, the selected screen area is filled by the DIN symbol for silt, because the capital "**U**" is allocated the silt symbol in the **BODEN.STZ** font.

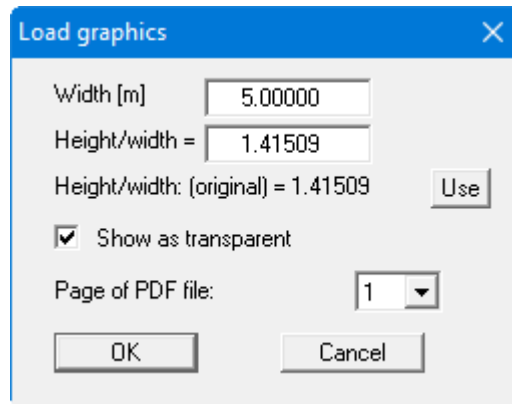
10.8 GGU-CAD: "Graphics" menu item

If the file contains integrated graphics only the file name with complete path will be saved. If you are working with a file with integrated graphics the graphics file must thus always be saved with it.

This menu item allows a graphics file to be imported and pasted into the current drawing. Following a prompt, you define the position of the top left corner by pressing the left mouse button. A window opens from which you can load an image from any folder. The following are possible graphics formats:



The following dialog box opens, allowing the size and appearance of the graphics to be defined.



The size of the image can be altered using "**Width**" and the ratio "**Height/Width**". The height/width ratio of the original can be read off below the height/width input box. In order to import an undistorted image click on the "**Use**" button to the right. If the "**Show as transparent**" check box is activated the graphics are translucent, i.e. underlying lines or colour fills remain visible. If you import a **PDF** file as a graphic, you can define which page of the PDF document is shown.

Once the size settings are satisfactory click in the graphics and the above dialog box appears once again. If the height to width ratio has been altered the original ratio can be restored by pressing the "**Use**" button.

10.9 GGU-CAD: "Dimensioning" menu item

After going to this menu item a dimension line can be created by clicking two points. The two points are then connected and the length of the line computed and added to the drawing. The settings made in the "**Preferences/Dimensioning**" menu item are adopted. Extension lines and dimension arrows are added, if this is activated. The font size corresponds to the settings made in the menu item "**Preferences/Default text/pen**".

The sequence of the two points of the dimension line are crucial. Annotation is normal for a horizontal dimension line if the left point is clicked first. Annotation is rotated by 180° if the right point is clicked first.

By pressing **x** or **y** annotation can be restricted to horizontal or vertical dimensioning only. Pressing **w** releases this and allows **free** dimensioning again.

10.10 GGU-CAD: "Parallel dimensioning" menu item

This menu item can be used to dimension existing lines. Click a line and define the appearance in the following dialog box:



The dimension line is drawn above the clicked line if a positive value is entered for the spacing; the program automatically recognises the starting and end points and thus the original direction of drawing of the selected line. If the dimensioning annotation direction is to be rotated by 180°, also activate the **"Rotate"** box. If a negative spacing is given the dimension line is drawn below the selected line. The dimensioning is only adopted if the prompt is affirmed after leaving the above dialog box, otherwise the dimensioning is deleted again.

10.11 GGU-CAD: "Refresh dimensioning" menu item

This menu item allows existing dimensioning to be altered. For example, if the dimensioning font sizes in any layer are not satisfactory, a new font size can be specified in the menu item **"Preferences/Default text/pen"**. By then going to the menu item **"Special/Refresh dimensioning"** all the dimensions in one or more layers are adjusted. In the same way it is possible to alter the settings in the menu item **"Preferences/Dimensioning"**, such as number of decimal places, dimension arrows, etc., for all existing dimension lines in one or more layers.

This menu item should also be used if the scale of the drawing has been changed. If **"Special/Refresh dimensioning"** is then clicked, the annotation of the dimension lines is converted to fit the new scale.

10.12 GGU-CAD: "Measure + dimension angle" menu item

If two lines in the drawing are clicked the angle between the lines is displayed. The sequence in which the lines are clicked is important. The angle is always determined anti-clockwise. The angle annotation can be activated directly from the message box containing the angle data; the settings of the menu item **"Preferences/Dimensioning"** apply.

10.13 GGU-CAD: "Arc" menu item

A line can be drawn as an arc. The centre point and the radius of the arc are defined by clicking two points. The end of the arc can then be specified by clicking a third point.

10.14 GGU-CAD: "Grid" menu item

The following dialog box appears, in which the dimensions and the spacing in x- and y-direction of the grid can be defined:



After confirming with "**OK**" the grid is displayed on the screen and a prompt box opens. The grid can be changed once more if the "**Again**" button is clicked. The proposed grid is deleted using the "**Cancel**" button and the menu item aborted. The menu item must be selected again to define another grid.

10.15 GGU-CAD: "Compute area" menu item

A polygon course can be defined in analogy to the menu item "**Special/Hatch**" and the area enclosed by the lines be computed according to the drawing scale. The area and the scale used are shown in a message box.

A description of defining and editing the polygon course can be found in the "**First steps**" in Section "Hatching".

11 Window menu

11.1 GGU-CAD: General

If menu items in this menu are selected (window operations), a window, which is move parallel to the mouse, is displayed on the screen in place of the cross-hairs. The term **Window** here does not refer to a Windows operating system window, but a rectangular area of the screen that certain actions can be limited to. The size of the window can be defined in the menu item "**Window/Preferences**" using numerical input or in the menu item "**Window/Window size**" using the mouse by clicking two points on the screen.

Window operations allow editing of sections of the drawing, e.g. deleting, moving, copying, distorting, zooming, etc.

The window action specified in either the menu item "**Preferences/General**" or "**Window/Preferences**", or in the popup dialog after right-clicking is of crucial importance here.

The window action can be applied to lines, text, coloured areas and graphics. For example, if the window action is specified for lines only, all window operations are restricted to lines. Moreover, only those lines with their starting and end points completely within the window are included (with the exception of "**Window/Erase**").

These general comments apply to all window operations described below.

11.2 GGU-CAD: "Preferences" menu item

The window size and window action can be specified.



Alternatively, the window preferences can be defined using the popup dialog by right-clicking with the mouse on the screen.

11.3 GGU-CAD: "Window size" menu item

After going to this menu item the window size (for window operations) can be specified graphically using the mouse by clicking two points. Alternatively, this operation can also be selected from the popup dialog by right-clicking with the mouse on the screen.

11.4 GGU-CAD: "Save" menu item

Selected drawing objects can be saved to a file using this menu item. Position the window above the objects to be selected and press the left mouse button. The selected objects are displayed in negative and a file selector box opens. If the required objects are not completely contained within the window they are not selected for the action. In this case, click "**Cancel**" in the file selector box and change the window area if necessary. The selected objects are then saved in a file using the extension "***.sym**" (for symbol). Once saved, the objects on the screen are refreshed.

11.5 GGU-CAD: "Load" menu item

Files with the "***.sym**" extension previously saved using the "**Window/Save**" menu item can be opened. After going to this menu item the required file is opened via a file selector box. A window is then moved parallel to the cross-hairs, showing the outlines of the loaded objects. After pressing the left mouse button and confirming, the loaded objects are adopted in the drawing.

11.6 GGU-CAD: "Delete" menu item

After left-clicking, all objects within the window are deleted (window action is retained). Deletions can be undone in stages using the [**Backspace**] key.

11.7 GGU-CAD: "Move" menu item

After left-clicking, all objects within the window are first displayed in negative on the screen to indicate the objects to which the action applies. The contents of the window can then be repositioned. The window contents are finally repositioned by pressing the left mouse button. Pressing [**Backspace**] resets all objects to their original positions.

Pressing [**Shift**] and the left mouse buttons copies the content, so that the window contents are reproduced at the new position in parallel to the old one.

Using this function the window contents can also be moved or copied to a different layer. After including the required objects in the window move to the required layer using the [**F11**] or [**F12**] function keys. The objects are released from the window by mouse-click or by pressing [**Home**].

11.8 GGU-CAD: "Erase" menu item

The window acts as an eraser. In contrast to the other window functions, lines only partially within the window are also deleted by the eraser. The line is separated at the edge of the window and that part inside the window is removed. All erased objects are restored by pressing [**Backspace**].

11.9 GGU-CAD: "Edit" menu item

After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. The governing properties of all objects within the window can then be edited. Pressing [**Backspace**] resets the properties.

11.10 GGU-CAD: "Zoom" menu item

After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. A box then opens allowing the zoom factor to be specified; the objects within the window can then be enlarged or reduced. The zoom centre is the centre of the window. Pressing [**Backspace**] resets the sizes of the changed objects.

11.11 GGU-CAD: "Rotate" menu item

After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. A box then opens allowing the angle of rotation for the objects within the window to be specified. The centre of the window is always the centre of rotation. [**Backspace**] restores the original condition.

11.12 GGU-CAD: "Mirror" menu item

After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. The mirroring axis for the selected objects is then selected in a dialog box. The x and y mirror axes run through the respective centres. The action can be undone using [**Backspace**].

11.13 GGU-CAD: "Compress" menu item

In contrast to the menu item "**Window/Zoom**" objects can be enlarged or reduced using different zoom factors for the x- and y-directions. After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. The "**Compression factors**" for the x- and y-directions are selected in the following dialog box. The compression axes run through the respective centres. The action can be undone using [**Backspace**].

11.14 GGU-CAD: "Distort" menu item

In contrast to the menu item "**Window/Rotate**" objects can be rotated using different angles for the x- and y-directions. After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. The "**Distortion angles**" for the x- and y-directions are selected in the following dialog box. The rotation axes run through the respective centres. The action can be undone using [**Backspace**].

11.15 GGU-CAD: "Transfer" menu item

After selecting a window area and left-clicking, the objects within the window are first displayed in negative to indicate the objects to which the action applies. In the following dialog box the objects can be moved by a given amount in metres of the drawing scale in x- und y-direction. At the same time it is possible to move the marked objects to a different layer. [**Backspace**] restores everything to its original condition.

12 Graphics preferences menu

12.1 GGU-CAD: "Refresh" menu item

After going to this menu item the screen is refreshed without altering the coordinates and zoom factor.

12.2 GGU-CAD: "A3 format" menu item

If close-ups of the drawing have been generated by zooming or by creating a different default zoom factor in the menu item "**Graphics preferences/Zoom factor**", the screen can be reset to an approximately A3 format image. The appearance of the drawing on an output device (plotter, printer, etc.) is not affected.

12.3 GGU-CAD: "Zoom factor" menu item

After going to this menu item a new default zoom factor for the screen presentation can be selected. The location of the origin is not influenced. The appearance of the drawing on an output device (plotter, printer, etc.) is not affected. A zoom factor of 1.0 corresponds approximately to A3 format. Pressing [**Esc**] always facilitates a complete screen presentation using the zoom factor specified in this menu item.

12.4 GGU-CAD: "Show all" menu item

The zoom factor is automatically selected by the program so that all objects are completely visible on the screen.

12.5 GGU-CAD: "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.

12.6 GGU-CAD: "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.

12.7 GGU-CAD: "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.

12.8 GGU-CAD: "Save graphics preferences" menu item

Almost all preferences can be saved in a file. If **"GGU-CAD.alg"** is used as the file name and the file is saved in the program folder, the data will be automatically loaded the next time the program is started.

13 Fonts menu

13.1 GGU-CAD: "Edit" menu item

This menu item facilitates font management. The following dialog box appears:



A new font can be loaded by selecting one of the 26 radio or an old font be deleted. For example, if the button in front of "**Standard.stz**" is marked, a new font can then be loaded via the file selector box by clicking the "**Load**" button. WINDOWS fonts and vector fonts (**GGU-CAD**-specific) are differentiated.

Accordingly, after activating the "**Standard.stz**" button and then clicking the "**Delete**" button, this font can be deleted. Before deleting the program checks whether text using this font is present in the drawing, merely for your own security. If this is the case the font cannot be deleted.

In principle, existing fonts can be reallocated different fonts. However, because all of the fonts provided with the program are proportional fonts (e.g. the "i" of the default font requires less space than the "w"), optically unacceptable spacing may result in existing texts.

If a drawing has been created and then saved using several fonts, the names of the fonts used are also stored in the file. If the program is started again later and this file opened, the necessary fonts are automatically loaded. If a font is not available in the program folder, the selected **GGU-CAD** file cannot be loaded. Two options are then available:

- The necessary font can be loaded from a different location using this menu item and then the required **GGU-CAD** file opened once again. If the **GGU-CAD** program is terminated and the same file opened again after restarting, the same problem will continue to exist.
- Exit the program, copy the required font to the program folder, start the program again and finally load the required **GGU-CAD** file.

After closing the box shown above the font marked by one of the 26 radio buttons is the active font.

13.2 GGU-CAD: "Arial, Standard.stz, etc." menu items

The fonts loaded using "**Fonts/Edit**" are listed here. A (W) following the name of the font designates a WINDOWS font. A (V) designates a vector font. The active font is marked with a tick. This font is used as the default if new text is added to the drawing using the menu item "**Draw/Text**". The default font can be changed simply by clicking on the required new font. As of this point the new font is used. Texts previously written in a different font are not affected by the change.

14 Info menu

14.1 GGU-CAD: "Help" menu item

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

14.2 GGU-CAD: "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.

14.3 GGU-CAD: "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.

14.4 GGU-CAD: "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.

14.5 GGU-CAD: "What's new?" menu item

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

14.6 GGU-CAD: "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.