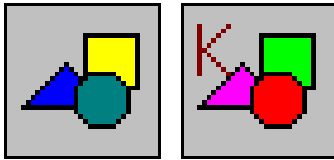


Integrated 2D CAD system for additional annotation
of GGU application graphics

MINI-CAD HEADER CAD

VERSION 7



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Copyright: Prof. Dr. Johann Buß
Technical implementation and sales: Civilserve GmbH, Steinfeld

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1 About the Mini-CAD system

1.1 *Mini-CAD and Header CAD*

An integrated CAD system is included in all GGU programs, allowing your GGU program graphics to be supplemented with texts, characters or graphics objects.

In some GGU applications you can choose between "**Mini-CAD**" and "**Header CAD**" functions. These two CAD systems can be thus differentiated:

- Drawing objects created with "**Mini-CAD**" are with reference to the drawing coordinate system (generally in [m]) and are displayed accordingly. You should therefore only select this menu item if you need to add additional information to the system.
- Drawing objects created with "**Header CAD**" are with reference to the page format (in [mm]). They therefore always remain at the same position on the page, regardless of the coordinates of the system. You should always use this menu item when entering general information (e.g. company logo, report number, appendix number, stamp). When you save these so-called header data, they can be reloaded into a completely different system (with different system coordinates). This header data will therefore always appear at the same position. This greatly simplifies the generation of general page information.

1.2 *Activating the Mini-CAD system*

After selecting the "**Mini-CAD**" or "**Header CAD**" menu item in your GGU application a so-called pop-up window with icons appears in the lower right program window; the CAD functions can be activated from here.

The same dialogue box opens for both menu items; all subsequent descriptions apply to both CAD systems. You can see which CAD system is currently activated by referring to the blue title bar in the pop-up window. You can supplement the current drawing with freely positionable

- lines;
- rectangles;
- circles;
- texts;
- tables;
- diagrams;
- graphics (file formats e.g. JPG, BMP, PSP, TIF);
- DXF files.

The pop-up window is moveable, just as any other window. By selecting the "**Mini-CAD**" or "**Header CAD**" menu item a second time, the pop-up window is removed from the screen and the **Mini-CAD** system deactivated.

All preferences and operations described below are only active within the current CAD system. Settings required for both CAD systems must therefore be specified and saved in both CAD systems.

1.3 Activating the Mini-CAD functions

























Information on each function can be seen if the mouse pointer is placed over a **Mini-CAD** toolbar icon without pressing the mouse button.

In order to activate the respective function you must first select the object to be drawn (line, circle, rectangle, text, graphics, etc.) with a mouse click on the corresponding icon. Activated icons are displayed inverted.

The actual drawing process is initiated by concurrently pressing the [**Shift**] key and the left mouse button. The [**Shift**] key can then be released. Alternatively, the "**CAD without shift key**" can also be activated. You can then add **Mini-CAD** objects without simultaneously pressing the [**Shift**] key.

The "**CAD without Shift**" icon is activated by default when the program starts, recognisable by its inverted appearance .

2 Short description of individual icons

		Deactivate Mini-CAD system
Mark objects		Move node/Create normal
Delete		Cut
Copy		Paste
Mark all		Undo
Restore		Single line
Horizontal line		Vertical line
Polygon lines		Polygon
Break lines		Trim lines
Rectangle		Circle
Polygon (filled, ...)		Bezier spline
Text		Fonts
Graphics		Table
Diagrams		Capture line ends
Array preferences		Modify objects
Rotate selected objects		Multiply
DXF import		Load (Mini-CAD file)
Save (Mini-CAD file)		Pen 1 (as current pen)
Pen 2 (as current pen)		Pen 3 (as current pen)
Pen preferences		Edit styles
(Mini-CAD tools) Preferences		CAD without shift key
General information		Special functions
Layers		Up a layer
Down a layer		

3 Mini-CAD system preferences

3.1 General notes on preferences

You can apply preferences to a variety of tools in advance of working with the **Mini-CAD** system. These preferences remain active throughout the complete session, even if you deactivate the **Mini-CAD** system in the meantime. After leaving the program and restarting, the **Mini-CAD** system default preferences are activated once again.



"Preferences"

You can alter the column number of the **Mini-CAD** window or deactivate the **Mini-CAD** system using the "Off" button.



"CAD without shift key"

If you need to draw a number of **Mini-CAD** objects you can simplify the task by activating this tool. You can then add new objects without simultaneously pressing the [Shift] key.



"Info"

You will see some general information. Furthermore, you can select preferences for status bar display and some general display options (see Section 3.2).



"Layers"

You can work on 20 layers in the **Mini-CAD** systems. Using this icon you may select between drawing and selection layer and perform various operations on the objects in selected layers (see Section 3.3).

3.2 General "Info" preferences

A dialogue box opens allowing you to define the information to be displayed in the **Mini-CAD** module status bar.

If you have copied objects the new objects are pasted at the same location by default. If the "**Move objects slightly after paste**" check box is activated the copied objects can be more easily recognised by slightly offsetting them and thus be marked for moving, for example.

The remaining objects are partially *smeared* when the moved objects are pulled across them. In order to see all objects correctly again after moving, activate the check box "**Refresh screen after moving**".

Symbols, which can be imported from a file with the ".syb" extension, can be used to fill polygons. If the symbol file is saved using the default name "**MiniCadSymbols.syb**" it is automatically loaded when the program starts. The file is first searched for in the program folder, then at the working level and finally in the Windows folder. If the symbols are also to be used in other GGU programs it makes sense to save the symbol file in the Windows folder. To open a new symbol file click the corresponding button and select the file from the file selector box. Symbols can be created using the GGU mbH freeware program **SymbolDef** and saved in a symbol file. More complex symbols can be created using the GGU mbH freeware program **GGUMiniCAD** and then integrated into your symbol file.

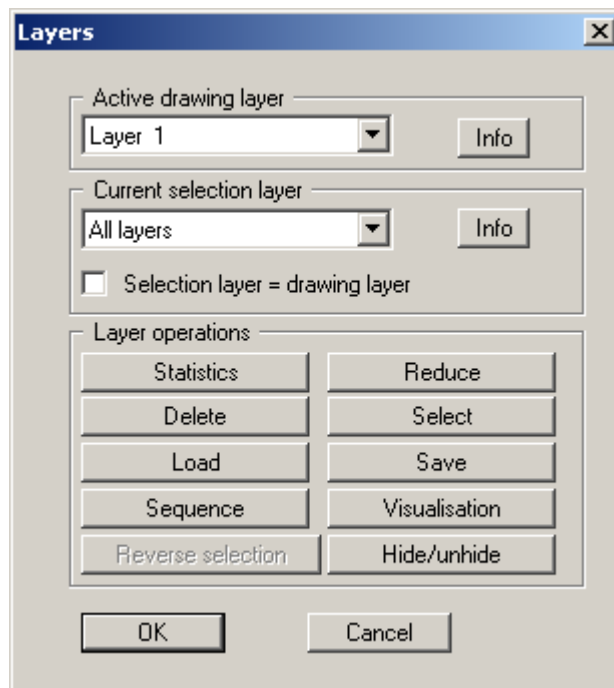
The preferences specified in the "Info" dialogue box can be saved in either the ".ggu_mcd_ini" file or the ".ggu_kpf_ini" file. If these files are saved in the program folder (default) the preferences will be automatically loaded the next time the program is started.

In addition, you can view the total number of **Mini-CAD** objects present in this icon's dialogue box by pressing the "Statistics" button. Detailed statistics including the number of objects on the individual layers are shown in the "Layers" icon dialogue box (see Section 3.3).

3.3 Layer preferences

3.3.1 Drawing and selection layers

Define preferences according to your requirements for working on the various layers. After clicking the "Layers" icon the following dialogue box opens:





All subsequent objects are drawn on the layer selected as "**Current drawing layer**". Objects pasted from the clipboard are also inserted in the selected drawing layer.

Objects on the layer defined as the "**Current selection layer**" can be selected and moved using the left mouse button or by opening the object editor using the right mouse button. It may make sense to define a certain selection layer, if a number of objects are closely spaced or overlap and are therefore difficult to mark using the mouse.

The current drawing and selection layers are displayed in the program's status bar:

CAD layers: 2 / 1 = drawing layer 2/selection layer 1.


By activating the "**Selection layer = drawing layer**" check box, the selection layer is automatically adjusted when changing to the next higher or lower drawing layer. This can be done very quickly using the "**Up one layer**"  and "**Down one layer**"  icons.

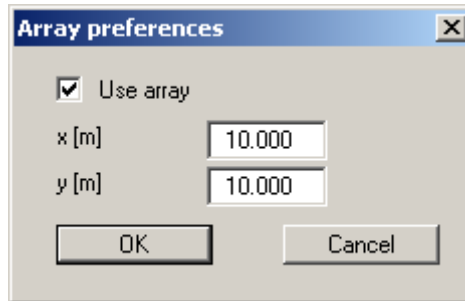
3.3.2 Layer operations

The following options are available in the "**Layer operations**" group box:

- "**Statistics**"
A dialogue box opens displaying the total number of objects in the individual layers. The buttons of layers containing objects are active and can be clicked. A message box opens listing the objects by object type and the respective number of each type.
- "**Reduce**"
The objects on all layers can be moved to a layer selected in a dialogue box. This operation cannot be undone. You should therefore save your **Mini-CAD** data to a file before commencing (see also Section 7.2).
- "**Delete**"
All objects on one or more selected layers can be deleted.
- "**Select**"
Selected object types on a selected layer or on all layers can be marked for certain operations.
- "**Load**"
Objects from a **Mini-CAD** file of the same CAD type can be loaded into a selected layer in addition to the existing objects. If you click the "**New**" button, the existing objects are deleted from this layer; they are supplemented using the "**Append**" button. Any distribution among the layers in the appended **Mini-CAD** file is not taken into consideration; all objects are loaded into the selected layer.
- "**Save**"
All objects of a selected layer can be saved to a **Mini-CAD** file using the ".mcd" or ".kpf" file extension, depending on the selected CAD type.
- "**Sequence**"
Mini-CAD objects are displayed in the sequence they were created in. Using this button all objects in a selected layer can be moved either in front of ("**To front**" button) or behind all other objects ("**To back**" button). All objects in a selected layer can also be moved to a different layer (also see Sections 6.3.2 and 6.4).
- "**Visualisation**"
By default, the **Mini-CAD** objects used in GGU programs are drawn over the graphics of the respective GGU program. This means that some regions of the result graphics or legends may be covered by the **Mini-CAD** objects. In this button's dialogue box you can choose to display objects behind the graphics of the respective GGU program. Simply deactivate the check box for required layer (see also Section 6.3.3).
- "**Reverse selection**"
If certain object types have been marked using the "**Select**" button, the selection can be quickly reversed using this button and the previously unmarked objects be selected.
- "**Hide/unhide**"
To improve clarity when using a large number of **Mini-CAD** objects it is possible to hide selected drawing layers. To do this, remove the ticks in the boxes for the respective layer. Using the buttons in the dialogue box's lower group box all layers can be hidden or unhidden simultaneously, or a selection reversed.


3.4 Array preferences

You can insert or draw your objects on a defined x and y array. Click the  icon and activate the array spacing input boxes in the dialogue box using the "Use array" check box.



You do not define the origin of the array with the first mouse click. The array spacing is always relative to the system origin $x/y = 0/0$. That is, the drawing object is always positioned at a point corresponding to a multiple of the x/y value given in the dialogue box. For the example above that is $x = 10, 20, 30$, etc.


3.5 Capturing line ends

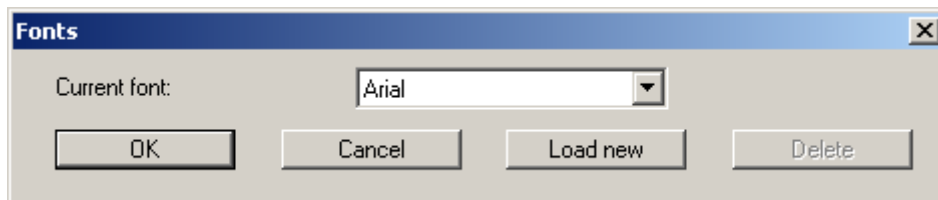
If several lines need to be connected to a polygon, the precise positioning of the mouse at the end of the previous line can be difficult. This can be greatly simplified by activating the "Capture line ends"  tool in the pop-up window.

After pressing this too, the mouse pointer changes to a square with cross-hairs. If, when pressing or releasing the left mouse button, an existing line end is within the square, the new line end will automatically capture the existing line end.

Depending on the layer selected as the selection layer using the "Layers" icon preferences, the end points of lines on different layers can also be snapped to: Drawing is always carried out on the currently active drawing layer (also see Section 3.3.1, "Layer preferences").


3.6 Defining fonts

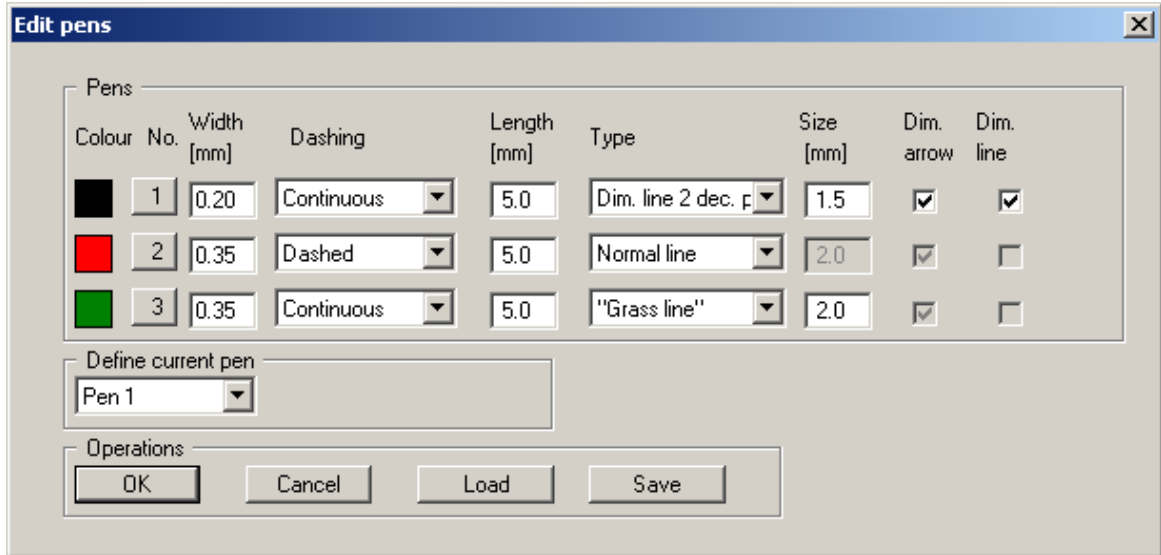
The "Fonts"  function allows to use any font desired for text. By clicking on this tool you will see the following dialogue box; you can now select the desired font from the drop-down list.




If you would like to use a font not listed here, press the "Load new" button to supplement the list with the required font. The defined preference applies to all newly defined texts from the time of altering the preference. It does not apply to existing texts; they must be changed in the editor box (see Section 5.1.4).

3.7 Pen preferences and pen selection

Using "Edit pens 1,2,3"  the width, colour and type of line representation can be predefined. You can choose between a variety of line types including dimension lines, ground lines, slope lines, hatch lines, grass lines, arrowed lines, or height or groundwater symbols.



The pen colour can be altered by clicking the corresponding button with the pen designation. The current pen colour is used as the text colour when adding text to the drawing.

At the bottom of the dialogue box it is possible to define the current pen in a drop-down list box. Selection of a default pen for use with the subsequent drawing functions is achieved by clicking the corresponding icon "Pen 1", "Pen 2" or "Pen 3"  in the **Mini-CAD** pop-up menu.

The pen preferences can be saved to a file with the extension ".**ggu_mcd_std**" or ".**ggu_kpf_std**". If these files are saved in the program folder (default) the preferences will be automatically loaded the next time the program is started.

4 Creating/inserting Mini-CAD objects

4.1 Line objects (lines, polygons, rectangles, circles, Bezier splines)

For "**Single line**", "**Horizontal line**", "**Vertical line**", "**Rectangle**" and "**Circle**" click the start point with the left mouse button and move to the end point holding the mouse button down. The line is then drawn after releasing the left mouse button.

When creating "**Polygon lines**", "**Polygon**" or "**Polygon (filled, ...)**", the start point is defined by pressing the left mouse button. By pressing the left mouse button once again you define the end point of the line, which is then also the start point of the next line. The function is completed by pressing the right mouse button.

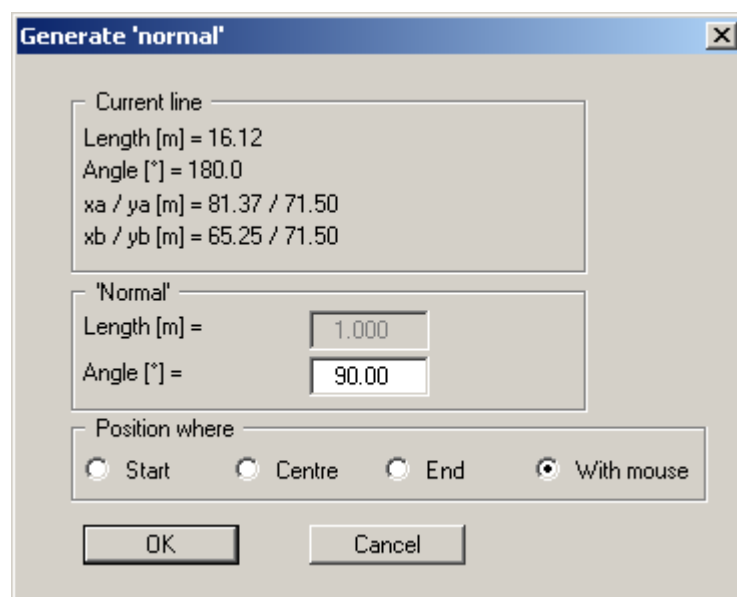
The "**Bezier spline**" function allows you to draw any kind of curve. Four points are required for this, which are defined by mouse click using the left mouse button. In order to attach a Bezier spline to an existing one, activate the "**Capture line ends**" function before starting to draw. Each individual spline is treated as a "**Polygon (filled, ...)**" and can be correspondingly edited, e.g. provided with a colour fill.

Colour, pen width, dashing or selecting a certain line type (e.g. dimension line) can be selected in advance by activating a predefined pen (see Section 3.7). When editing an existing line object open the corresponding editor box by double-clicking the corresponding object (see Section 5.1).

4.2 Generating a normal

Lines can be generated at a user-defined angle (called the *normal* here for simplicity) to existing lines or edges of existing **Mini-CAD** system objects. Activate the "**Move nodes/generate normal**" icon and click the object to be edited. The nodes of the selected object are displayed. These are the two end points of a line or the defined points of a polygon.


If the line is clicked with the right mouse button between two polygon points, a dialogue box opens allowing a *normal* to the clicked line to be generated:

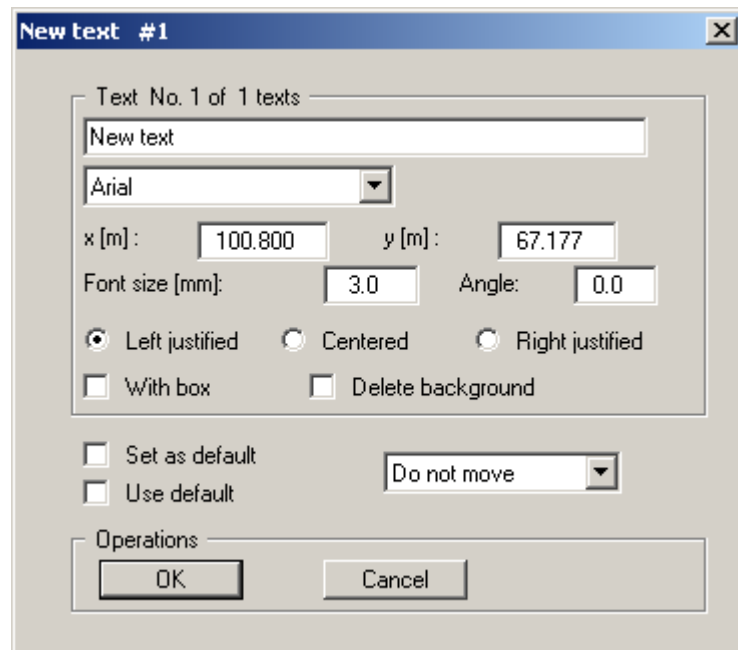


If the "Start", "Centre" or "End" are activated as the position in the lower group box, the length of the *normal* to be drawn must be given in the group box above this. Using the "Angle" input box lines can also be generated that are not classical *normals* at 90° to the selected line. If a negative angle value is given the line is drawn on the opposite side of the selected line.

To generate a *normal* of any length, activate the "With mouse" option button. A line can be generated using the mouse and can be positioned anywhere, even far away from the originally clicked line. The new line always remains in the extension of the originally clicked line. The length of the *normal* can also be defined individually by moving the mouse.

4.3 Texts

Activate the "Text" icon  and define the position of new text by pressing the left mouse button. A dialogue box then opens, in which you can enter the text, together with further preferences (left justified, centred, right justified, font size and direction). In order to make the text more visible you can generate a frame by activating the "With box" check box. If you activate the "Delete background" check box, objects situated behind the text are covered by a white-filled polygon.




To use these preferences for further text, activate the "Set as default" check box. When you then enter the next text these preferences will already be activated as default. Subsequent adjustment of existing texts can be carried out by means of the "Use default" check box.

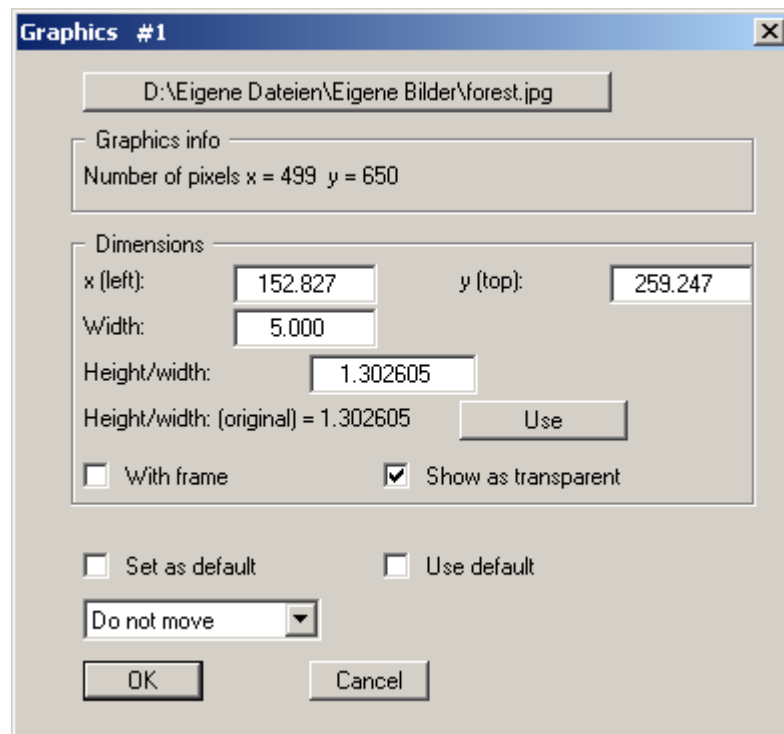
The colour used for a new text is defined by your choice of pen (see Section 3.7). Depending on the preferences for the selected pen it is thus possible to display text in a given colour directly at input. If an existing text is subsequently edited the dialogue box shown above is extended by a "Colour" button, allowing the colour of the selected text to be edited (see Section 5.1.4).

The current drawing layer is shown in the blue dialogue box title bar by #1'. That is, you are now in layer 1. New text can also be directly inserted in other layers by selecting a different layer in the "Do not move" drop-down list box. The new text is then placed in the selected layer but you remain in the current drawing layer.

4.4 Graphics

If the file contains integrated graphics only the filename 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.

Activate the "Graphics" icon  and 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. Once you have selected the desired image an editor window opens; this window can also be opened by double-click on an existing image.



Further images can be loaded at any time by clicking on the uppermost button. "Graphics info" gives the number of pixels in the loaded image.

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. The default width is always 5.0, which often represents a very small value in Mini-CAD (in metres in your system). It is probably better to set the width to a higher value, otherwise the graphics may be so small that they are difficult to click for further editing.

The image can be rotated by 180° by entering the width as a negative value. If you enter negative values for height/width the image will be mirrored around the x axis. You can mirror the image around the y axis by entering both of these inputs as negative values. Please note, however, that any text in the image will also be mirrored. These image must either be previously processed in a graphics application or the text hidden by a new text box after mirroring (activate the "Delete background" function) or by a "Polygon (filled, ...)".

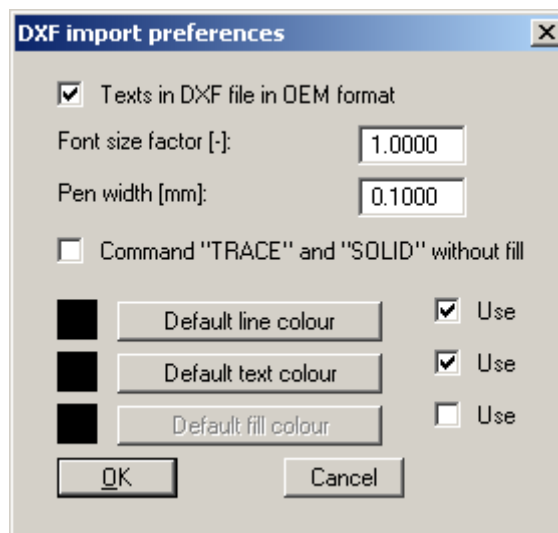
If the image contains a large amount of white, it may be useful to frame the image. Activate the "**With frame**" check box to draw a frame around the image. Moreover, the image can also be represented transparently or opaque.

If you need to insert a number of images, the width setting and the settings for the frame and transparency can be used for the following images by clicking "**Set as default**". In contrast to new text input, graphics are always inserted in the current drawing layer, which is displayed in the blue title bar of the editor box by '#1'.

4.5 DXF import

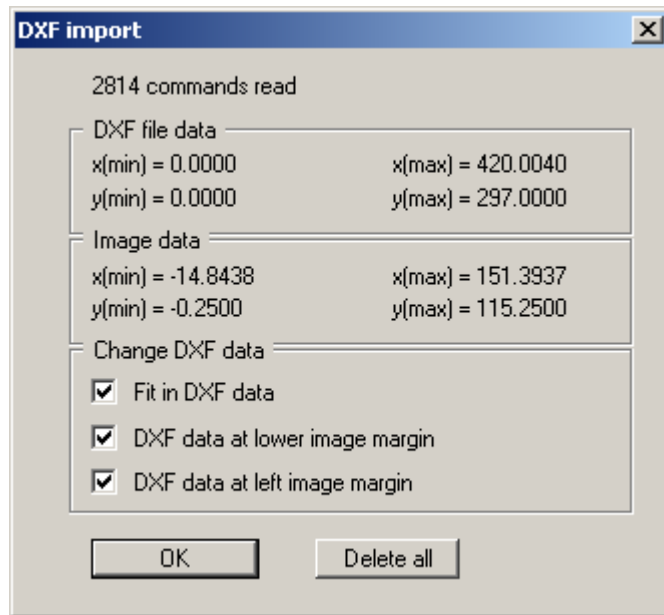
4.5.1 Importing DXF data

If you have already drawn some **Mini-CAD** objects, you must now decide, after selecting the "**DXF import**" icon, whether the DXF data are to be added ("**Additional**" button) or first the existing objects be deleted ("**New**" button). You will then see a dialogue box in which you can define import preferences.



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 box.

When you now click on "**OK**" you can select the DXF file to be imported. The program interprets the DXF commands and converts them to **Mini-CAD** objects. You will then see a dialogue box similar to this one:



At the top of this box you can see information on the dimensions of the DXF file and the image data for your current project. It is generally useful to activate the lower three check boxes in the dialogue box (default setting). The program then ensures a screen-filling representation of the DXF data and you see a summary of the imported DXF objects.

4.5.2 Scaling DXF data

In order to adjust the scale and the coordinates of the DXF data to that of your 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. Click the line icon and then double-click the auxiliary line with the left mouse button. The actual length of the clicked line is given on the title bar of the opened editor box.

If the required length is divided by the actual length the result is the zoom factor for the size correction. Because differing heights and widths result from zooming to full screen size, you also get differing horizontal and vertical zoom factors.

To adapt the DXF objects to the defined project scale select the "**Modify objects**" icon




and enter the calculated zoom factors for the x and y directions (also see Section 5.5).

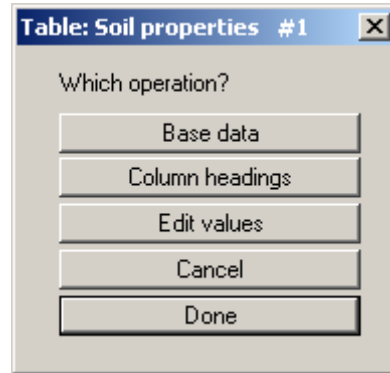
- Displacements can also be generated in analogy to this to position the DXF import at the correct x and y coordinates. For example, in the first step find a line of known height (= y coordinate). Open the editor box by double-clicking the line to get the y coordinate.

Calculate the difference between the theoretical and the actual height, which is required as displacement. Ensure that the zoom factor in the "**Modify objects**" icon dialogue box is 1.0.

4.6 Tables

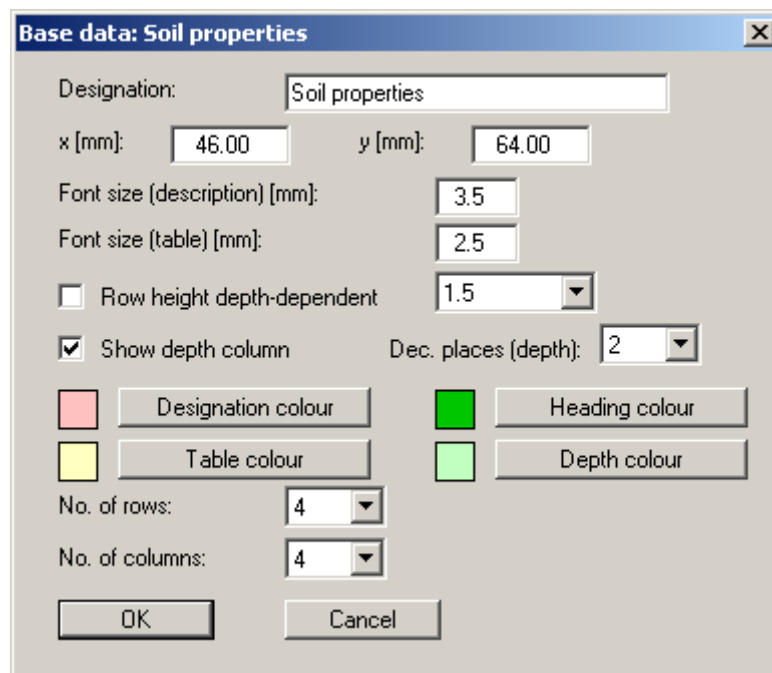
4.6.1 Start tables function

Activate the "**Table**" icon  and define the position of the table by pressing the left mouse button. A selection window opens in which you can define the table appearance and enter the desired values in a series of dialogue boxes.



4.6.2 Enter base data

Use the "**Base data**" button to enter the designation, position, font sizes, row heights, colours and number of rows and columns. The following dialogue box appears, for example:



Any designation entered is displayed in a header line in the table. If no designation is entered this row is absent from the table. A different font size to the remainder of the table can be used for the designation. The position of the table can be precisely defined using "**x**" and "**y**" coordinates.

By activating the "**Row height depth-dependent**" check box the visualisation can be adapted to the depth scale. This allows the parameters of individual strata to be visualised in sections, for example. In addition, the depth can be given in a depth column by activating the corresponding check box.

The background can be coloured in the various columns and header rows. The number of rows and columns can be varied. In a strata-oriented visualisation the number of rows must correspond to the number of strata in the corresponding section. The number of columns corresponds to the parameters to be visualised, except the depth column.

After confirming with "**OK**" further inputs can be done using the buttons "**Column headings**" and the "**Edit values**".

4.6.3 Enter column headings

After clicking the "**Column headings**" button you will see the following dialogue box, for example, depending on the number of columns defined in the base data:

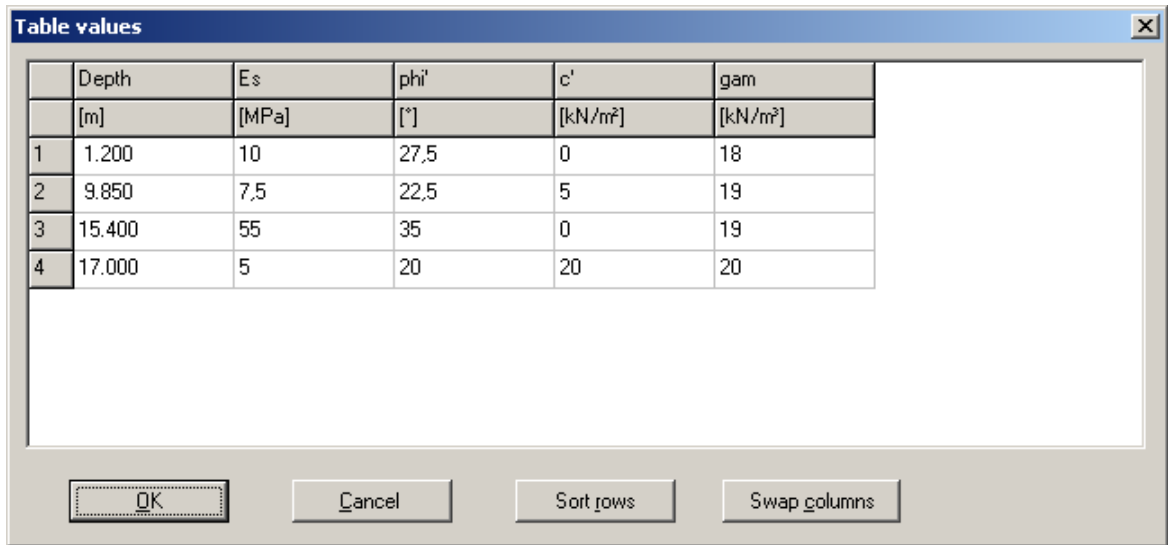
Column	Heading 1	Heading 2
Depth	Depth	[m]
1	Es	[MPa]
2	phi'	[°]
3	c'	[kN/m ²]
4	gam	[kN/m ²]

OK Cancel

The "**Depth**" column is always present whether it is subsequently displayed or not. The input under "**Heading 2**" is displayed in a second row within the heading row in the table. Use the input by pressing "**OK**".

4.6.4 Enter table values

After clicking the "**Edit values**" button the follow dialogue box opens for entering or editing the data to be displayed in the table.




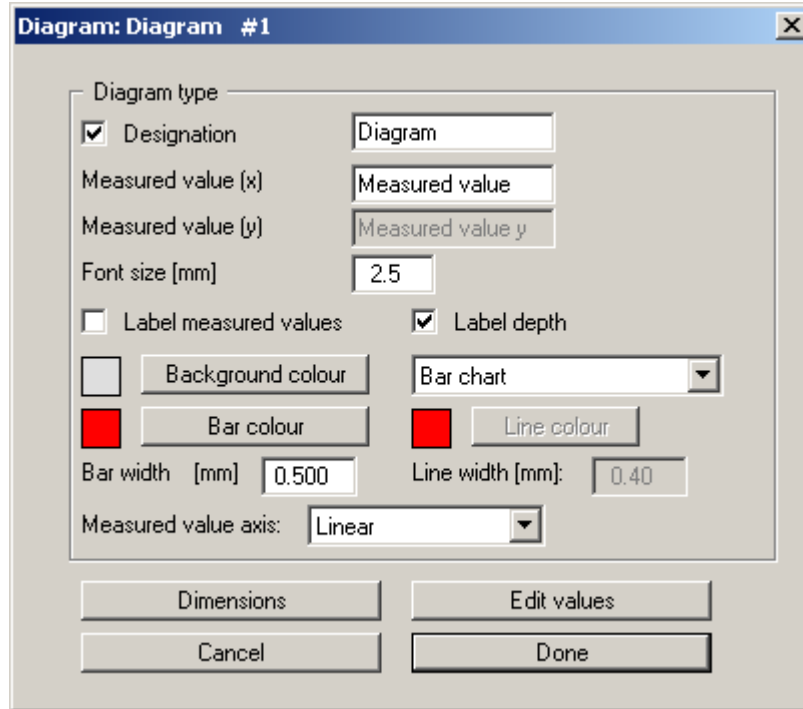
	Depth	Es	phi'	c'	gam
	[m]	[MPa]	[°]	[kN/m²]	[kN/m²]
1	1.200	10	27,5	0	18
2	9.850	7,5	22,5	5	19
3	15.400	55	35	0	19
4	17.000	5	20	20	20

The strata depths of the corresponding section must be entered in the "Depth" column for a strata-oriented table display. If the number of rows is subsequently increased a new row is inserted here. The program assigns the new row number as the depth and the new row is inserted into the corresponding depth section. In the example above a new 5th row would be inserted between rows 1 and 2. Once the data has been edited the rows can be put in the correct sequence using the "**Sort**" button, although this is also done automatic when the box is closed using "**OK**".

If the sequence of columns needs to be altered, click the "**Swap columns**" button and enter the required columns in the opened dialogue box. The headings can be left as they are and thus any input made in the incorrect column be corrected.

4.7 Diagrams

Activate the "Diagram" icon  and define the position of the diagram by pressing the left mouse button. The following window opens to enable input of the diagram name, value designations, font sizes, annotation, etc.



The image shows a dialog box titled "Diagram: Diagram #1". It contains the following fields and controls:


- Diagram type:** A section containing:
 - Designation: Diagram
 - Measured value (x): Measured value
 - Measured value (y): Measured value y
 - Font size [mm]: 2.5
 - Label measured values
 - Label depth
 - Background colour: (empty)
 - Bar chart: (dropdown menu)
 - Bar colour: (red)
 - Line colour: (red)
 - Bar width [mm]: 0.500
 - Line width [mm]: 0.40
 - Measured value axis: Linear (dropdown menu)
- Buttons:** Dimensions, Edit values, Cancel, Done.

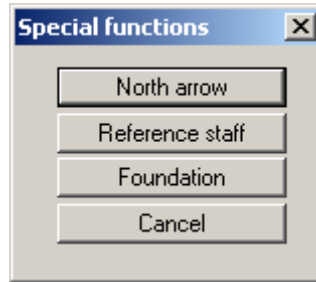
Depending on the visualisation selected in the menu (bar, line, x/y graph), the corresponding input boxes and buttons required are current. When the lower buttons are clicked further dialogue boxes open to allow input of graph colours, dimensions and measured data.

Tip: To delete a value once it has been entered allocate it a fictitious depth larger than that of any other value (or the highest y value for x-y diagrams). Then sort the values by depth (or by the y values for an x-y diagram) and reduce the number of values by one. The value with the maximum depth (or the maximum y value) has now been deleted.

4.8 Special functions

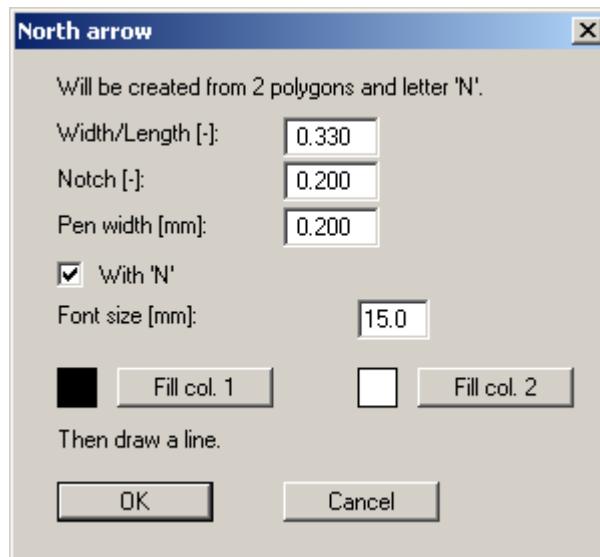
4.8.1 Selection

Using the "**Special functions**" icon  you can have a selection of objects represented without having to draw them yourself. The following dialogue box opens allowing selection of the required object:



4.8.2 North arrow

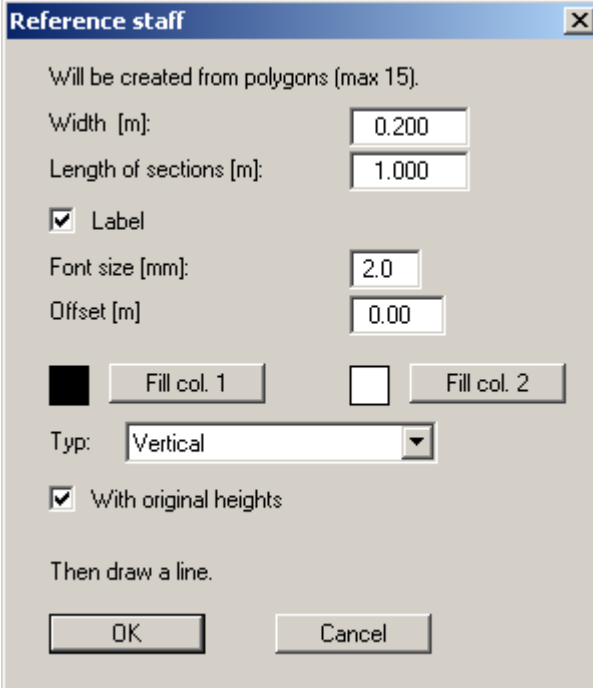
To draw a North arrow, select the "**North arrow**" button; you will see the following dialogue box:



After entering the required data and confirming with "**OK**", draw a line along the North-South line and you will automatically get a North arrow.

4.8.3 Reference staff

In addition to the reference staffs used by some of the GGU programs you can also have further vertical reference lines represented, e.g. if you have a number of sections at differing heights or you need to use this function to generate horizontal or otherwise oriented scale bars. Click on the "**Reference staff**" button and enter the required values into the subsequent dialogue box.



The image shows a dialog box titled "Reference staff" with a close button (X) in the top right corner. The dialog box contains the following settings:

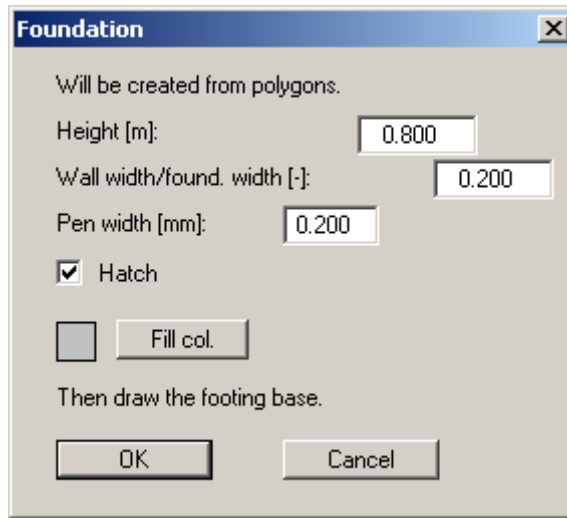
- Text: "Will be created from polygons (max 15)."
- Width [m]: 0.200
- Length of sections [m]: 1.000
- Label:
- Font size [mm]: 2.0
- Offset [m]: 0.00
- Fill col. 1: (black swatch)
- Fill col. 2: (white swatch)
- Typ: Vertical (dropdown menu)
- With original heights:
- Text: "Then draw a line."
- Buttons: OK, Cancel

If you then draw a line, the program creates a reference staff from this, which always begins and ends with a complete length unit. The "**With original heights**" check box is always activated by default for vertical reference staffs. The actual section heights of the started GGU program (e.g. **GGU-STRATIG**) are then used for the reference staff.

If you need a section-independent, vertical reference staff, you can deactivate this check box and define a start point for the staff by using the "**Offset [m]**" function. If "**User-defined**" or "**Horizontal**" are selected from the staff type list, the check box is automatically inactive and you can work with the offset.

4.8.4 Foundation

To represent a standard foundation click on "**Foundation**", enter the foundation dimensions into the dialogue box and draw the footing base.






The "**Foundation**" function remains active, allowing you to draw a number of foundations in succession.

5 Editing Mini-CAD objects

5.1 Editing with the editor box

5.1.1 General editing notes

By double-clicking on objects with the left mouse button a dialogue box opens, allowing the object to be individually edited. If the "**Mark objects**"  function is activated, the editor box opens when you press the right mouse button above the corresponding object.

Only objects on the current selection layer can be selected. If you have specified a special selection layer using the "**Layers**" icon and not all layers, you must first change to the drawing layer which is also defined as selection layer. This can be done very quickly using the "**Up one layer**"  and "**Down one layer**"  icons (also see Section 3.3.2 "**Layer preferences**").

Objects that directly open an editor box for new input (e.g. texts, tables, etc.) also open the editor box again if the object is double-clicked. However, the box is now supplemented by a "**Delete**" button and a number of other functions (e.g. "**Set as default**", "**Use default**", "**Do not move**" drop-down combo box). These functions are described in more detail in separate sections (see Sections 5.2 and 6.3.1).

5.1.2 Editor box for a line

The example below shows the editor box for a line, in which you can edit the coordinates, colour, line strength, dashing and line type (e.g. dimension line, ground line, slope line, etc.). For lines, the length is shown in the blue title bar at the top of the dialogue box, together with the angle of inclination. In addition, the current drawing layer is shown in the title bar by the '#1'. Using the "In polar coordinates" and "In delta coordinates" buttons you can define the coordinates of the line from a given origin.

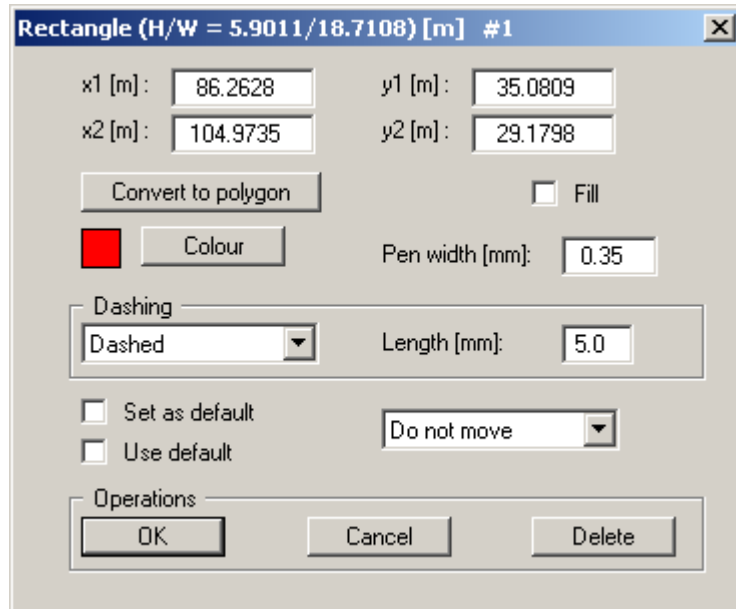
The screenshot shows a dialog box titled "Line (L = 42.0312/W = 179.22 °)[m] #1". It contains the following fields and controls:

- Coordinates: x1 [m]: 134.4790, y1 [m]: 90.2057, x2 [m]: 92.4517, y2 [m]: 90.7815
- Modification: "In polar coordinates" and "In delta coordinates" buttons
- Colour: A red square and a "Colour" button
- Pen width [mm]: 0.20
- Dashing: "Continuous" dropdown and "Length [mm]: 5.0" field
- Line type: "Slope line" dropdown and "Size [mm] 1.5" field
- Checkboxes: "With dimension arrows" and "With dimension lines"
- Buttons: "Rotate"
- Checkboxes: "Set as default" and "Use default"
- Dropdown: "Do not move"
- Operations: "OK", "Cancel", and "Delete" buttons

TIP: If you want to measure a certain length in the drawing, first draw a corresponding line using **Mini-CAD**. Then double-click on this line and read the values from the dialogue box. You can then delete the line (e.g. by using the [**Back**] key).

5.1.3 Editor box for a rectangle or a circle

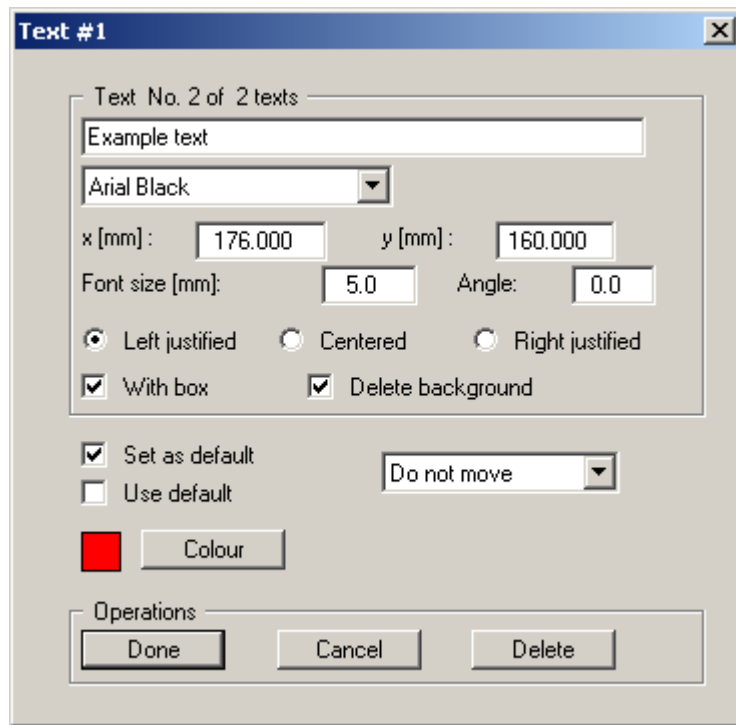
The editor box for a rectangle is shown below. The circle editor box is identical, the only difference being that instead of the x/y coordinates of the opposing corners of the rectangle you will see the x/y coordinates of the circle centre and the radius.



The pen colour, width and dashing correspond to the preferences for the pen selected to draw the rectangle or circle. If the "Fill" check box is activated, the rectangle or the circle is drawn with a colour fill, which can be defined via the "Colour" button. The outline of the rectangle or circle is always drawn in black if the colour fill is activated. Only the pen width and the dashing can then be altered.

5.1.4 Editor box for a text

If an existing text is double-clicked the following editor box opens:

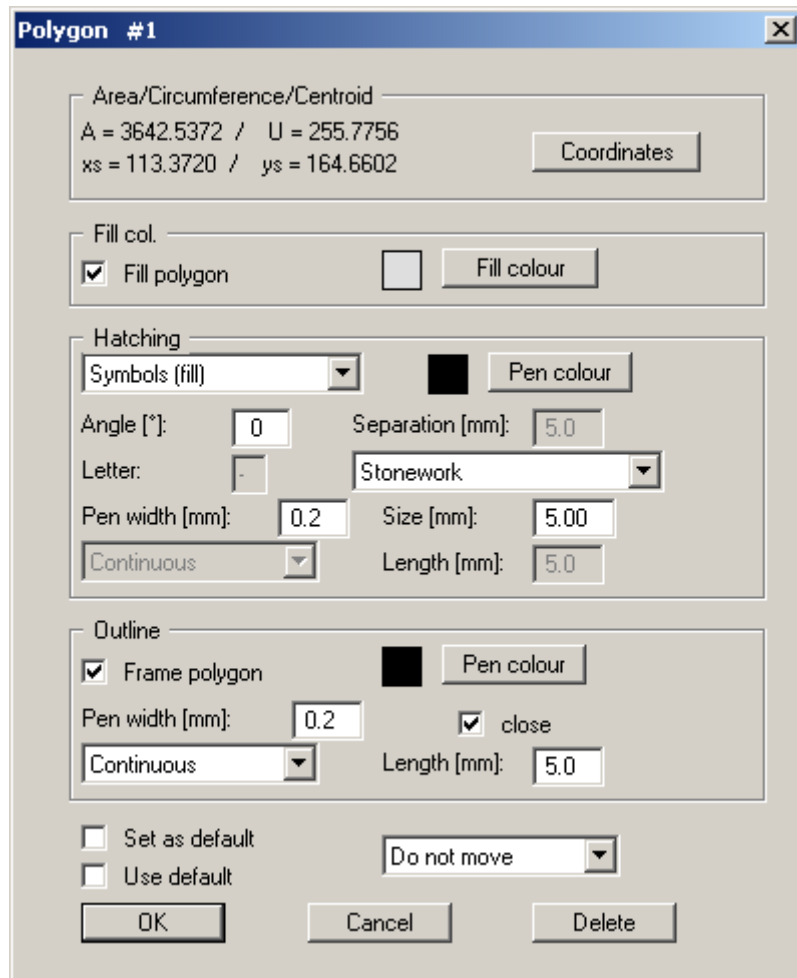


If you need to change the font of an existing text the new font can be selected from the upper drop-down combo box. If the required font is not listed, it must first be opened in the **Mini-CAD** system via the "**Font**" icon (see Section 3.6).

The colour displayed corresponds to the preferences for the selected pen used to create the text. The colour preferences can be edited via the "**Colour**" button.

5.1.5 Editor box for a polygon

The following dialogue box opens for editing a polygon. The box is the same for an unfilled or a filled polygon. It is thus possible to provide an unfilled polygon with a colour or hatch fill.

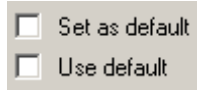


If a ".syb" symbol file was opened at program start-up or later via "Info" (see Section 3.2), symbols from this file can be used to fill the selected polygon in the "Hatching" group box. For example, if "Symbols (fill)" is selected from the upper drop-down combo box, the subsequent fill covers the entire area. In the second drop-down combo box the symbol can be selected from the list of symbols available in the ".syb" file ("Stonework" in the above box). The symbol fill can be adapted to your requirements via the pen width and size. Symbol fill can be aborted before complete by pressing the right mouse button. If no ".syb" file is available the "Symbols" choice is not displayed for hatching.

TIP: If you want to hide parts of the drawing, cover the corresponding region with a "Polygon (filled, ...)". After a double-click on the polygon, assign the fill colour "white", "without hatch" and deactivate the "Frame polygon" check box. The polygon then acts as an 'eraser'.

5.2 Set as default/Use default

If you have already drawn an object you can use the preferences for this object as the default values for subsequent, similar objects. To do this, open the editor dialogue box for this object by double-clicking the object. Then activate the "**Set as default**" check box and leave the dialogue box using "**OK**". When using the "**Text**" and "**Graphics**" functions the preferences can be saved as the default for further objects of this type immediately upon the first input or first insertion.



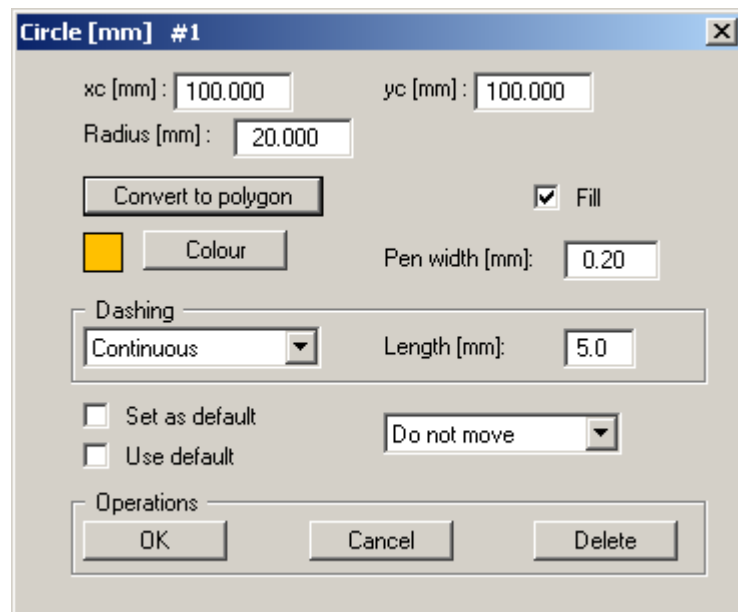
If a number of previously drawn objects need to be adapted to a default setting, the preferences are first applied to one object and then set as default (see above). The editor dialogue boxes of the other objects can then be opened and the "**Use default**" check boxes activated.

Subsequent adaptations of several objects of differing types can also be carried out using the "**Edit styles**" function (see Section 5.6). However, colour or hatch fill for "**Polygon (filled,...)**" objects can only be edited directly in the object editor or via "**Set as default**"/"**Use default**".

5.3 Convert to polygon

The line objects "**Rectangle**" and "**Circle**" can be subsequently converted to polygons, in order to adapt the figures using the "**Move nodes**" icon, for example (see Section 5.9).


First, draw the desired object and then open the editor dialogue box with a double-click over the object; here, as an example, is the box for a circle:




If you click on the "**Convert to polygon**" button, the circle is automatically converted to a polygon. To further edit the object open the editor with a double-click over the circle once again to get the dialogue box for a polygon.

If the polygon is to be filled with the current pen colour (shown in the little coloured box next to the "**Colour**" button), activate the "**Fill**" check box first and then click the "**Convert to polygon**" button. Upon conversion, the new polygon will be given the selected colour fill and the object edging automatically set to black.

5.4 **Mark objects**

You can select individual objects for editing by selecting the "**Mark objects**"  tool and then clicking on the object in question. By pressing the [Shift] key and simultaneously clicking on individual objects, several objects can be selected for editing at once. You can also select several objects simultaneously by pressing the left mouse button and drawing a rectangle around the objects in question. All objects within this rectangle are thus selected.

It is possible to select object types on certain layers or on all layers using the "**Layers**" icon. Simply click the "**Select**" button in the "**Layers**" icon dialogue box and select the object type and layer (or all layers) on which the objects are to be selected. Circles and rectangles belong to the object type *line objects*.

By clicking the "**Mark all**" icon  all drawn objects are selected regardless of type and can then be edited.

The marked objects can also be edited with the normal functions. The preferences and operations are then only applied to the selected objects. The following additional functions are available *only for marked objects*:



"Cut"

You can cut out the marked objects, open a new file and paste the objects via **Mini-CAD**.



"Copy"

You can copy the marked objects and then paste them to the same file, or a new file. When pasting to the same file it can be useful to activate the "**Move objects slightly after paste**" check box in the "**Info**" dialogue box, otherwise the copied objects are pasted exactly on top of the original.



"Paste"

Cutted or copied objects can be pasted.



"Rotate"

Marked objects (with the exception of graphics, tables and diagrams) can be rotated by a user-defined angle.



"Multiply"

The marked objects can be duplicated in the specified number. You can define a spacing in x and y direction for the new objects.



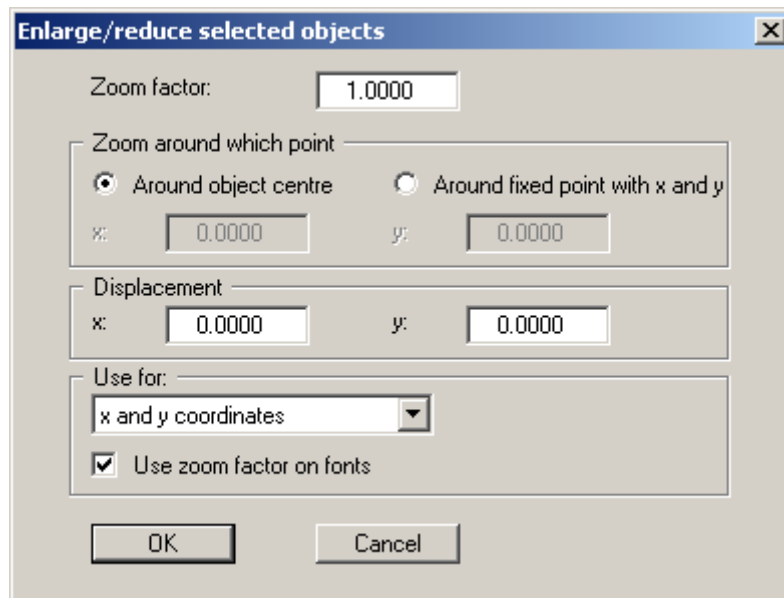
"Edit styles"

You can modify the line colours, for example, in one step for several marked objects (see Section 5.6 for details).

5.5 Modify objects



The "**Modify objects**" tool allows object sizes to be modified or objects to be displaced by defined distances. If objects have been previously marked the command applies to the selected objects only, otherwise all objects on all layers are modified. After clicking the icon the following dialogue box opens. The blue title bar indicates that the operation only applies to the selected objects.

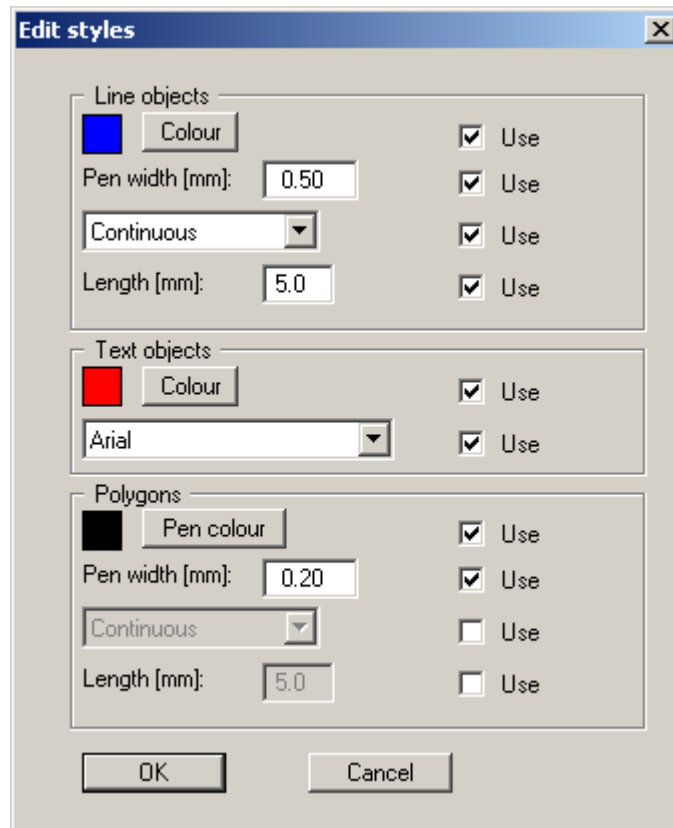


You can use the zoom factor to enlarge or reduce objects. The zoom centre can be in the centre of the selected objects or at a point specified by the user (activate "**Around fixed point with x and y**"). Zooming can even be limited to a given direction (x or y coordinates), selected in "**Apply to:**". If you only need to modify font sizes, select "**None**" here. If you need to retain the font size when zooming, deactivate the "**Use zoom factor on fonts**" check box.

By entering values in "**Displacement**", you can move objects in metres of the current scale in x and/or y direction. Ensure that any previously adopted zoom factor is set back to 1.0 for the displacement.

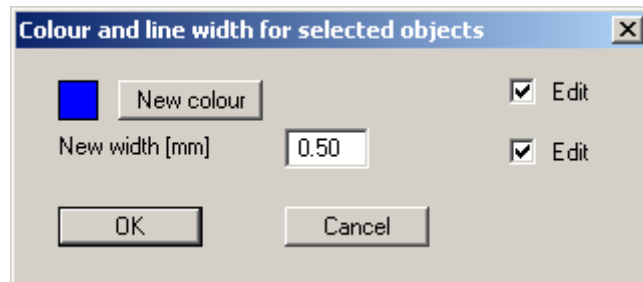
5.6 Edit styles

The "**Edit styles**" function is only available if you have marked one or more objects. The marked objects can all be modified together, e.g. all line objects and all text objects can be represented in a given colour. The group boxes for line objects, text objects and polygons displayed in the dialogue box only appear if the corresponding object types are marked, otherwise those areas of the box are hidden.



After activating the respective "**Use**" check boxes the desired modifications can be entered or selected. In the "**Line objects**" group box the colour fill of colour-filled rectangles and circles can be edited using the "**Colour**" button. The pen colour for colour-filled rectangles and circles is black and cannot be altered. The line pen colour for normal lines and unfilled objects can be changed using the "**Colour**" button. The colour fill of polygons cannot be altered using "**Edit styles**" (see also Section 5.2).

Colour and pen width can also be edited by selecting the objects to be modified and then clicking on the icon of a different pen to the one currently in use. You will then see the following dialogue box:

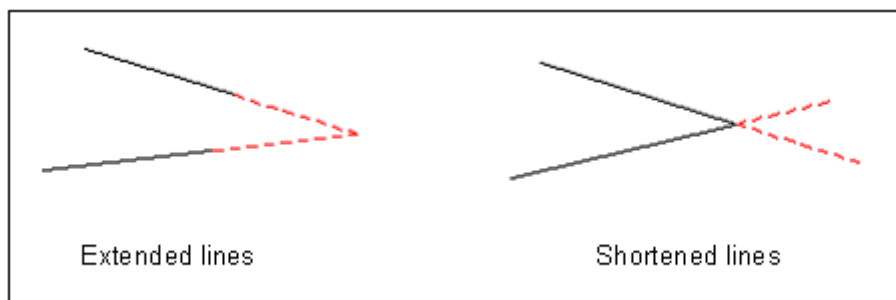



However, lines, texts or polygons are not differentiated; the changes apply to all marked objects. The new colour of colour-filled rectangles and circles is adopted for the colour fill and the new width for the outlines.

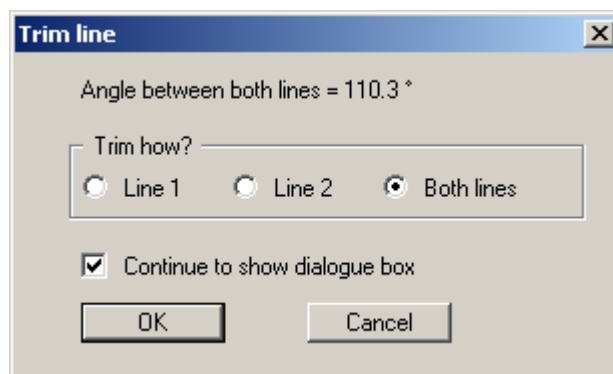
5.7 Trim lines

5.7.1 Trim two lines

Two lines can be automatically extended or shortened to their intersection. The lines need not be located on the same drawing layer, you need only to have activated all layers as the selection layer (see Section 3.3.1, "**Layer preferences**").



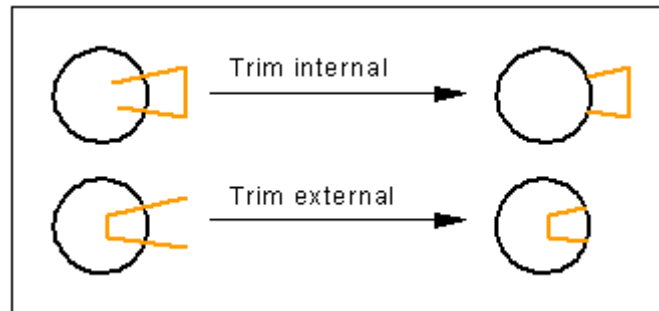
Activate the "**Trim lines**" tool  and then click on the lines to be trimmed. The first is marked by little black squares at the line ends. When you click the second line you will see the following dialogue box:



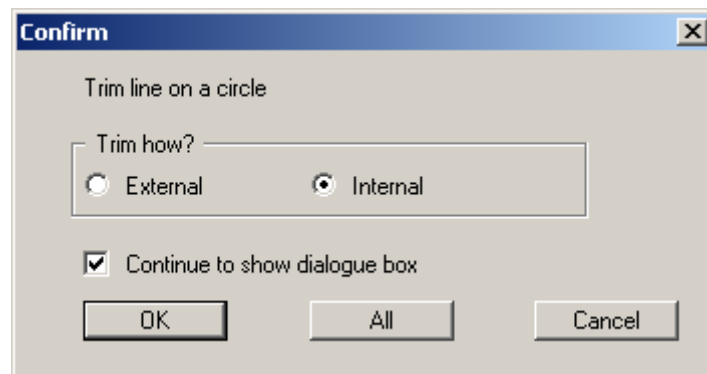
If "**Both lines**" are clicked, the lines are united, i.e. extended or shortened as shown in the sketch above. If "**Line 1**" or "**Line 2**" are selected, only the respective line is extended or shorted to the imaginary intersection. Where crossing lines need to be shortened, the shortest individual line ends will always be trimmed. The line numbers refer to the sequence when clicking the lines.

5.7.2 Trim lines on an object

Beside trimming two lines, it is also possible to trim lines on a circle, a rectangle or a polygon. This provides exact line attachments to the respective object. It is possible for this type of trimming to trim the lines inside or outside of your object, as demonstrated in the following sketch.

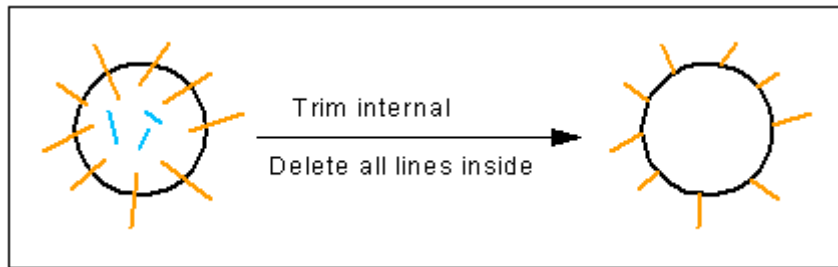


Activate the "**Trim lines**" icon and click the object first, i.e. circle, rectangle or polygon. Second, click the line to be trimmed. For a circle, for example, the following dialogue box opens:



Select external or internal trim and click "**OK**". If the "**Continue to show dialogue box**" check box is left activated a further line can be clicked immediately after trimming the first one; the marked object then remains selected.


The "**All**" button in the dialogue box may also be used. All lines that intersect the marked object (here a circle) are trimmed internally or externally depending on the selection made above, without the need to click every line. Before carrying out this operation a further dialogue box opens allowing the "**Also delete ALL lines within Circle**" check box to be activated. If the check box is activated lines inside the object are deleted even if they do not intersect its outline. This is demonstrated in the following sketch.

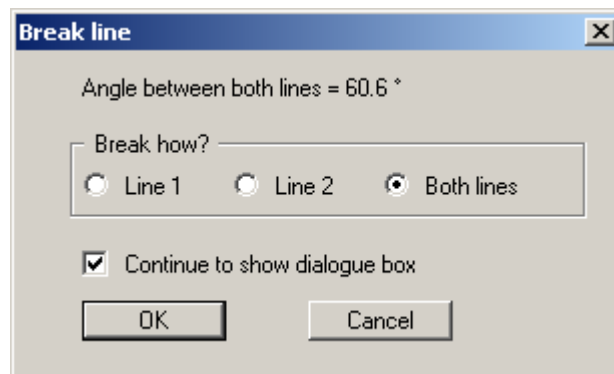


For the situation demonstrated in the sketch and the selected trimming procedure, you are informed upon completion that 3 lines were deleted and 9 lines trimmed.

5.8 Break lines


If two lines cross each other, they can be broken at the intersection, i.e. the lines are divided at the intersection. The lines need not be located on the same drawing layer, you need only to have activated all layers as the selection layer (see Section 3.3.1, "**Layer preferences**"). After breaking a line a piece of the broken line remains on the selection layer, the other part is pasted to the current drawing layer.

Activate the "**Break lines**" tool  and then click on the lines to be broken. The first is marked by little black squares at the line ends. When you click the second line you will see the following dialogue box:



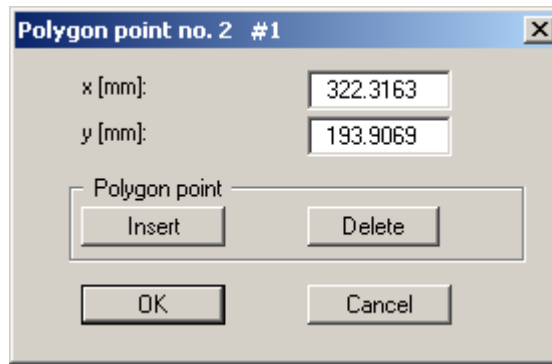
If "**Both lines**" is clicked the lines are broken at the intersection, i.e. instead of the original 2 lines there are now 4 lines. They can now be displayed with different properties, e.g. different colours or pen widths. If "**Line 1**" or "**Line 2**" is selected, only the respective line is broken into 2 lines at the intersection. The line numbers refer to the sequence when clicking the lines.

5.9 Move nodes

The "Move nodes"  function allows the shape of an existing object (line, rectangle, circle, polygon, Bezier spline) to be altered. Activate the icon and click the object to be edited. The movable nodes on the selected object are displayed as small, black, square points. On a line, for example, these are the two end points and the defined polygon points in a polygon. If the mouse pointer is located above a node its pointer forms a cross and the point can be moved by holding the left mouse button.

If an existing node is right-clicked a dialogue box displaying the coordinates of the clicked point opens. The object type is displayed in the blue dialogue box title bar, together with the object's layer. The node coordinates can be edited in the dialogue box by direct numerical input.

The number of the clicked polygon point is displayed in the title bar, as shown in the following dialogue box:



A further option available for polygons is changing the polygon course using the "Insert" and "Delete" buttons. A polygon point is always inserted centrally between 2 existing polygon points.



6 Displacing/moving Mini-CAD objects

6.1 Displacing with the mouse

You can displace a single object by means of the *right mouse button*. A prerequisite for this is that the icon for the appropriate object type is clicked and the object is located on the selection layer. Position the mouse over the object and move it to the desired position with the right mouse button pressed. This action can be undone by pressing the [Back] key or by clicking the "Undo"

icon .

Direct displacement with the *right mouse button* is not possible for polygons, Bezier splines, tables and diagrams.

Alternatively, objects can also be moved by marking ("Mark objects"  icon is activated) and subsequently moving them using the *left mouse button*. Several objects can be marked using the [Shift] key and the left mouse button or open a window on the required objects by holding the left mouse button. All drawn objects are selected regardless of type by clicking the "Mark all" icon . If objects of a certain type need to be marked, press the "Select" button in the "Layers" icon dialogue box (also see Section 5.4).

After marking your objects (regardless of how) move them to their new positions by holding the left mouse button. To move a marked object only *horizontally*, hold the X key and move the marked objects using the left mouse button. The mouse pointer turns into a left-right pointer. If objects only need to be moved *vertically*, hold the Y key and move using the left mouse button. The mouse pointer turns into an up-down pointer.

6.2 Displacing via editor

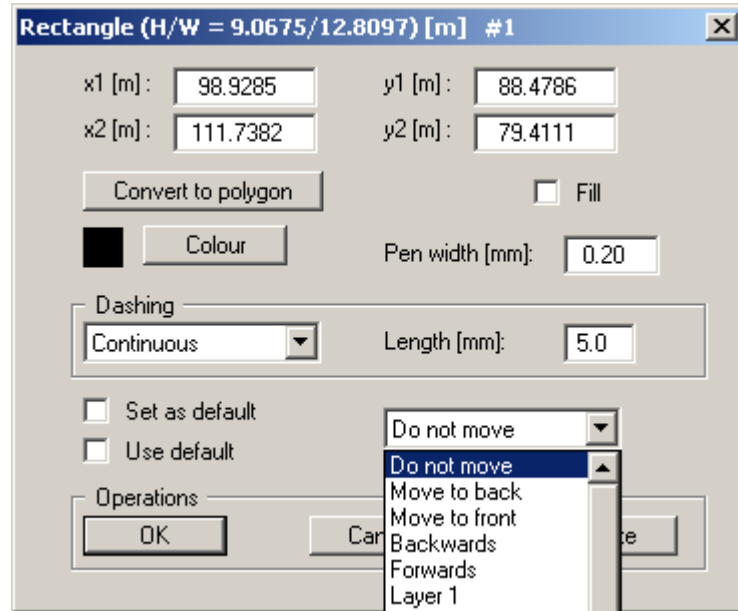
In general, displacement of objects by direct modification of the object coordinates is possible. For example, double-click over the object to be moved to open the corresponding editor dialogue box (see Sections 4.1 pp. and Section 5.1).

If you need to move several objects at once by a fixed amount, select the objects to be moved and then click on the "Modify objects" icon. In the dialogue box you can then specify the displacement in metres in the current scale for the x and/or y direction (see Section 5.5).

6.3 Changing sequence of visualisation

6.3.1 Move individual objects

The **Mini-CAD** objects are drawn in the sequence in which they were created. If objects are (partially) covered by objects drawn later, you can alter the sequence of object representation. This is achieved via a list in the lower region of the editor dialogue boxes, shown here for an example rectangle.

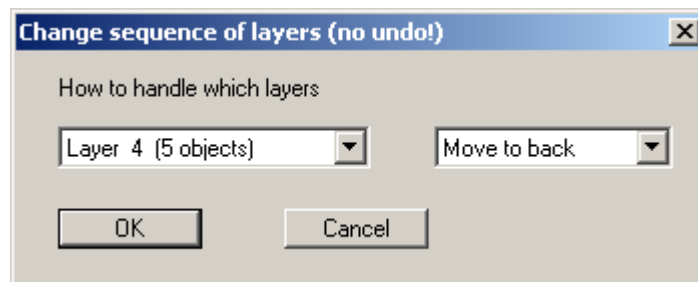


The **"Do not move"** preference is the default setting and does not influence the sequence of representation. With **"Move to back"** and **"Move to front"** the object is moved to the foremost or rearmost position. Using **"Backwards"** and **"Forwards"** the object is moved back or forwards by one position.

The sequence always refers to the objects on one layer only. If individual objects on one layer need to be drawn in front of objects on a different layer, these objects must be placed on empty layers (see Section 6.4) and these layers then moved to the foreground (see Section 6.3.2).

6.3.2 Move all objects on a layer

Using the **"Layers"** it is possible to move all objects in a layer simultaneously to the back or to the front in the visualisation sequence. Click the **"Sequence"** button in the dialogue box that opens after clicking the **"Layers"** icon. The following dialogue box opens, for example:



The number of objects in the selected layer is shown in brackets. If all the objects on a layer are selected it is only possible to move them "**Move to back**" (all objects are moved to the back) and "**Move to front**" (all objects are moved to the front). The visualisation sequence of the individual objects on the selected layer is not altered by this operation.

6.3.3 Changing the sequence of Mini-CAD objects/program graphics

Objects inserted using **Mini-CAD** are drawn in front of the program graphics in the default setting. It is therefore possible that the **Mini-CAD** objects cover parts of the main graphics. Problems may occur when graphics are integrated via **Mini-CAD** in particular.

If the graphics are imported, e.g. a site map bitmap, click "**Show as transparent**" in the **Mini-CAD** graphics editor. The image will then be displayed transparently so that the graphics generated using the main program remain visible. There are some printer drivers that do not correctly reproduce the *transparent* function. The **Mini-CAD** graphics then cover the main graphics after output.

Activate the "**Layers**" icon and click the "**Display**" button in the dialogue box to position **Mini-CAD** objects behind the program graphics. Deactivate the check boxes for the layers whose objects are to be displayed behind the program graphics. All layers can also be simultaneously activated or deactivated via the corresponding buttons.

6.4 Changing layer allocations

Mini-CAD objects are always drawn on the current drawing layer. Individual objects can be moved to a different layer by double-clicking the object's editor box to open it and selecting the required layer from the "**Do not move**" drop-down combo box.



If several objects are marked (even on different layers) they can be moved to a different layer using the "**Cut**" and "**Paste**" functions. Cut the objects, move to the required drawing layer via the "**Up one layer**" or "**Down one layer**" icons and paste the object again.

If all the objects on a layer are to be transferred to a different layer, activate the "**Layers**" icon. In the corresponding dialogue box, click the "**Sequence**" button. Select the layer to move the objects to and start the operation by pressing "**OK**". The movement between layers cannot be undone, unless the target layer is void of other objects. Then, of course, this step can be performed in the reverse direction.


If all objects on all layers need to be amalgamated on a single layer, click the "**Reduce**" button in the "**Layers**" icon dialogue box. Select the required target layer and confirm by pressing "**OK**". This operation is also irreversible, so save the **Mini-CAD** data to a file before proceeding.

7 Deleting/saving/loading Mini-CAD objects

7.1 Deleting Mini-CAD objects


The last-drawn object can be deleted by means of the "Undo"  icon or by pressing the [Back] key. Deleted objects can be recovered using the "Restore"  icon.

Individual objects are deleted by selecting them with the mouse and then pressing the [Del] key. A prerequisite for this is that the icon for the appropriate object type is clicked. You can also open the editor boxes of individual objects and click the respective "Delete" button.

You can delete one or more objects simultaneously with the [Del] key, after previously selecting them with the "Mark objects" function. Also available is the "Delete"  icon. Using this option you can delete all **Mini-CAD** objects concurrently (after a confirmation prompt). If you have previously marked objects, only those marked objects will be deleted with the "Delete" icon, but without prompting.

If all objects on a selected layer are to be deleted, activate the "Layers" icon. Click the "Delete" button in the corresponding dialogue box and select the layer to be deleted. Only those layers containing **Mini-CAD** objects are actively displayed. If objects on a layer are accidentally deleted the operation can be restored using the "Undo" icon.

7.2 Saving Mini-CAD objects


In all GGU software applications the **Mini-CAD** objects are saved with the current record. If you want to save objects separately in order to load them into different GGU programs or into a different record of the same program, you can do this after selecting the "Save" icon .

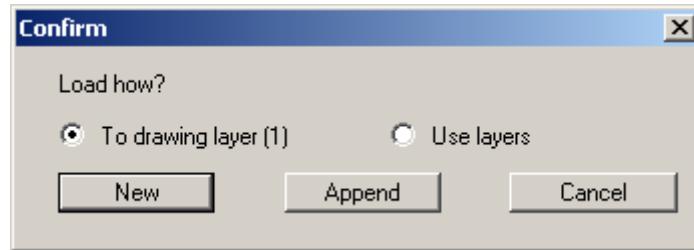
The files generated using "Mini-CAD" are automatically awarded the ".mcd" file extension. **Mini-CAD** files generated using "Header CAD" are automatically awarded the ".kpf" file extension.

If you have selected objects before with "Mark objects", only these marked objects will be saved. All objects on individual layers can also be saved separately. Activate the "Layers" icon. Click the "Save" button in the corresponding dialogue box and select the required layer.

If you have integrated a "Graphics" into the record, only the filename with complete path will be saved. During a "DXF import" the DXF data are converted to **Mini-CAD** objects; the original DXF file is then no longer required.

7.3 Loading Mini-CAD objects

You can open an existing **Mini-CAD** file at any time during your project session by using the "Load"  icon. A dialogue box opens allowing preferences for the type of data transfer to be defined.



All objects contained within the new file can be imported to the current drawing layer, which is shown in brackets. If the objects are distributed among different layers in the new file, they layer allocations can be accepted by activating the option box. If objects are already present in your program, you may decide whether the existing objects should be deleted ("**New**" button) or retained ("**Append**" button).

A **Mini-CAD** file can also be imported directly to a selected layer. Activate the "**Layers**" icon and click the "**Load**" button in the corresponding dialogue box. The required layer can be selected from the drop-down combo box; any existing objects are given in brackets following the corresponding layer. In this way a previously unoccupied layer can be selected without effort. If a layer is selected that already contains objects, the subsequent choice of button, "**New**" or "**Append**", is important, because the existing objects on the selected layer are deleted if "**New**" is chosen. Any distribution among the layers in the appended **Mini-CAD** file is not taken into consideration when importing to a layer; all objects are imported to the selected layer.

If you have integrated a "**Graphics**" into the record, only the filename with complete path will be saved. Therefore, if you use such a record on a different computer, the same graphics file must be saved on that computer using the same path. If this is not the case, the user is requested to enter the new path when loading the record.

8 Keyboard commands

[Back]
undoes the last action.

[Del]
deletes the objects at the mouse pointer or the selected objects with the drawing function activated.

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