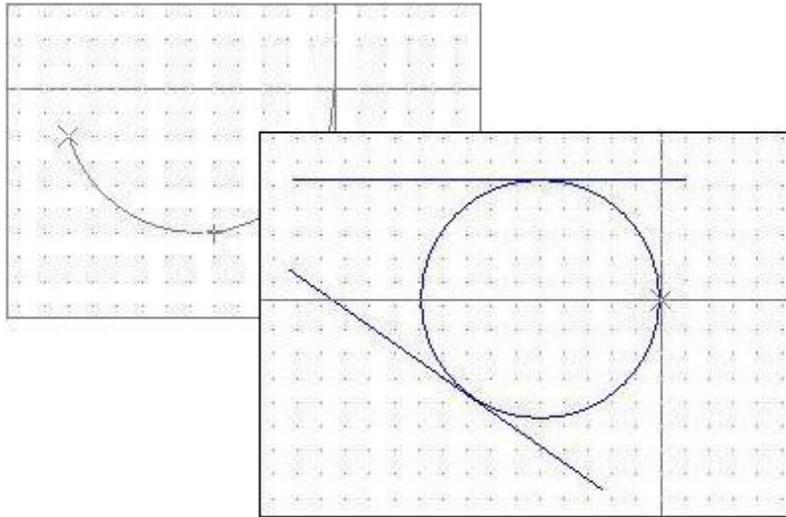




Sketcher



Online help

Sketch-module for cncCUT





Welcome to the help files for Sketcher

General Tips for Navigation of the Program



Choosing the Control Method:

There are two ways to navigate the help pages for *Sketcher*.

1. Interactive Navigation

This allows you to decide for yourself which texts you need to read. Place the mouse cursor over the rectangles drawn onto the screenshots to get a more detailed description.

interactive

or

2. Continuous Navigation

This mode leads through the document sequentially. All details will be shown one after the other, simply press the 'Next' button (right arrow in the Navigation Panel [1]) to move through the document one step at a time.

continuous

Important Note

The continuous development of *Sketcher* can lead to differences between the program's actual GUI and the GUI shown in the online help documents. If this occurs, please check the version and date of the help file against that of the program. If necessary, check our [homepage](#) for a newer version, or contact us.

The screen is split into four frames: The Menu to the left [1] with the navigation arrows for navigating the whole help document, and a box for entering a page number.

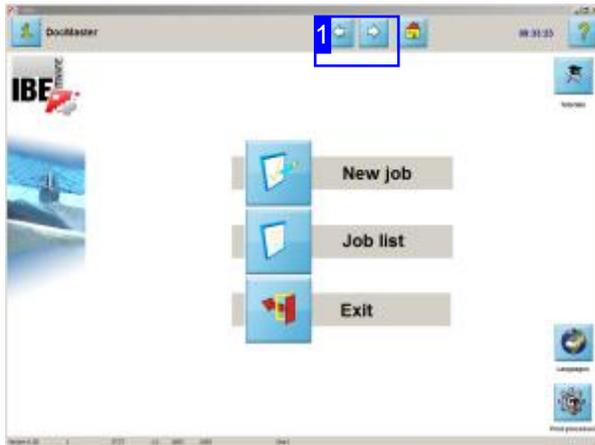
The top shows the Contents List [2] divided into chapters. The Glossary [4] of the most important technical terms is shown at the bottom. You can switch between the Glossary and an Index in this frame. Whichever you choose, clicking the keywords will link you directly to the most relevant part of the corresponding help page.

The middle frame shows you the current help page [3].

Choose your favorite method controlling the document:

The Start Screen

Start and exit the program, program navigation.

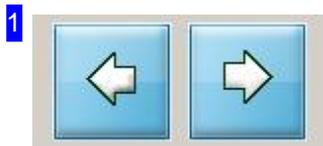


The start screen is your gateway to *cncCUT*. The call of the *Sketchers* occurs at the locations of the program, at which parts are produced for processing. This can happen when you select a drawing or when a drawing is created by a macro.

- o To create a drawing, you start by clicking 'New Job' or just click 'next' [1].
- o In a second step, specify a sheet as a basis for *cncCUT*.
- o Close the program by clicking 'Exit'.

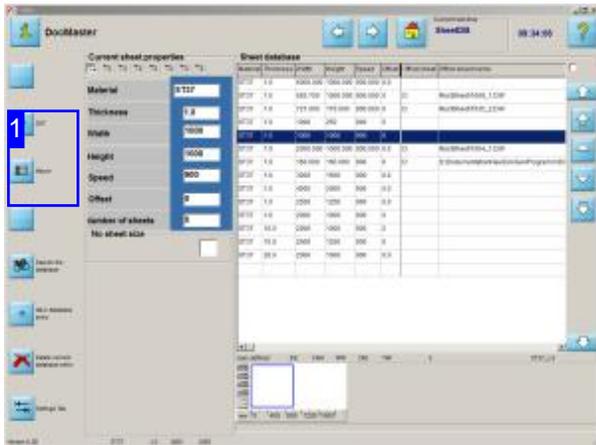
The *Sketcher* is an optional, integral part of *cncCUT*. You will find a detailed description of the program and its wide-ranging sheet-metal forming functions in the online help files accompanying *cncCUT*. You can easily create drawings or manipulate existing drawings with the *Sketcher*. The program is protected by a dongle and must be unlocked in this.

For contact, give us a call, or send an email and we'll always call you back. We also happy to receive visitors through our homepage.



These buttons are for navigating the program. 'Back' and 'Forwards' always takes you to the next step in the work process, Click on 'Forwards' to enter sheet selection screen.

Choose a sheet as a working basis.



You always need a sheet to work with *cncCUT*.
Choose a sheet from the sheet database, or simply click here on 'Forward' [1].

- o Choose a sheet from the database:
Use the buttons to the right of the list, or select directly one entry from the list.

You will find detailed information to this page in the Online help for *cncCUT*.

- o Once you have selected a sheet for your work, you determine the source of your data. The button in the navigation bar [1] takes you to the macro selection screen to create a drawing.

A sheet always serves as a working basis for *cncCUT*. Select a sheet from the sheet database in this screen.

Take the next step to create a drawing, from here.

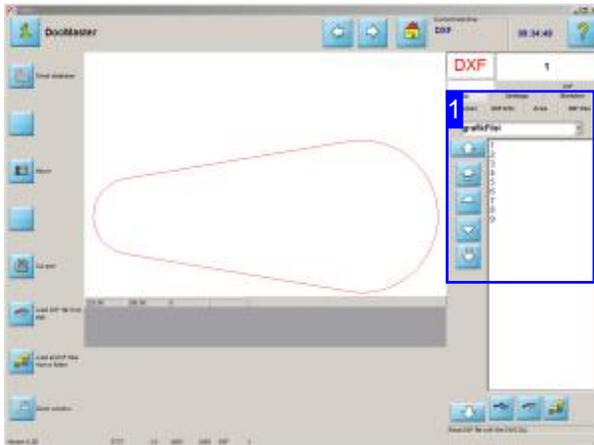


Choose 'DXF' to import a DXF file.

Click the button 'Macro' to proceed using a macro.

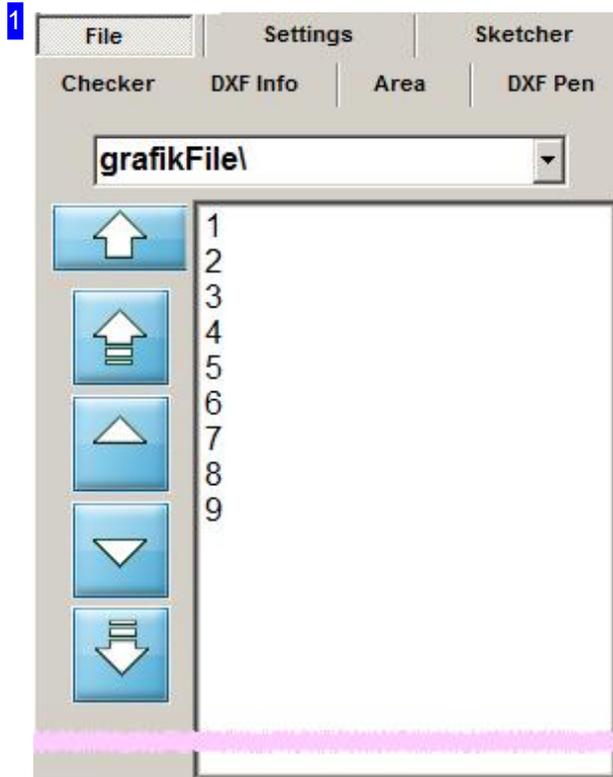


Select a drawing or create a new one.



You can select a drawing from your stock or invoke the Sketcher directly to create a new drawing. Select the tab 'Sketcher', to determine the further step.

This screen shows you all DXF and DIN files available from your stock. You can select a finished drawing and possibly manipulate with *Sketcher*, or create a new one.



All DXF files in your stock will be shown in this list. Click on your selected component to view a preview of it. The name will be displayed in the field above.

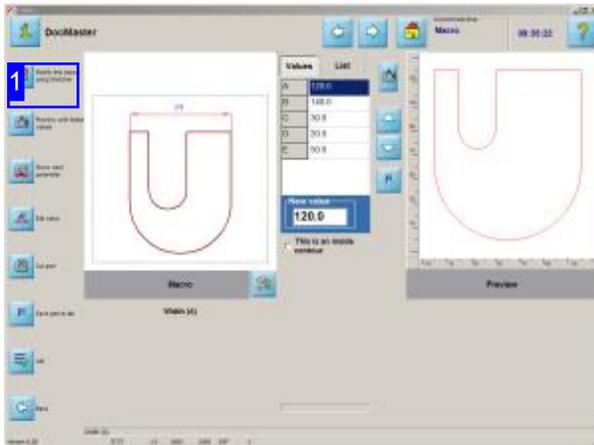
If you wish to make modifications to the part shown, or create a new part, the *Sketcher* module offers the functionality you require. To select it, open the 'Sketcher' tab.



This frame allows you to open the *Sketcher* module. Click the top button to create a new part, or click the bottom button to transfer the previewed part to the *Sketcher* for editing.



Generate a drawing with a macro.



First, select the desired macro and run this. You can see a preview of the part in the right frame. Then, transfer the drawing to the *Sketcher*.

In the macro editing, you can manipulate a drawing, generated with a macro, subsequently with the *Sketcher*.

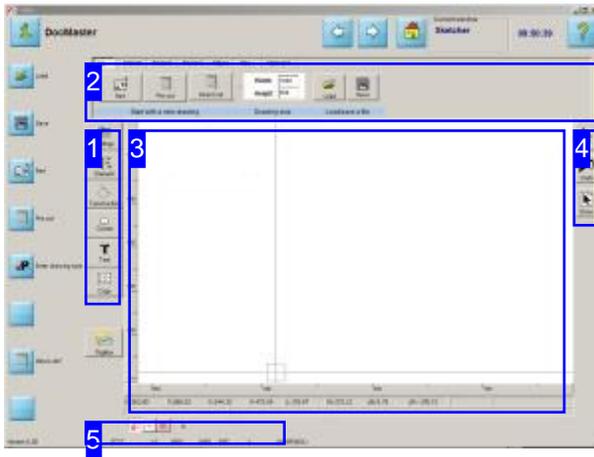


Click this button to switch to the *Sketcher* module and edit your drawing.



Introduction

The Sketcher's GUI.



This is the *Sketcher* screen. The centre area [3] is an open drawing space with a workspace and status bar. The workspace can be a given area (pre-cut), an external contour or a restricted area in the classical sense.

To the left of the workspace are six buttons [1] for selecting tool types. Available tools of the chosen type are shown in the header panel [2]. The individual tools shown in the header panel can be selected via a tab bar.

The footer [5] contains special quick-keys for displaying cursor values and the grid.

To the right [4] there are 3 general buttons for all functions.

The *Sketcher* is a tool for quickly and easily constructing cutting parts and modifying existing drawings. You can create geometric figures, and all artistic options for creating a drawing are available to you.

The program is constructed such that all functions can be controlled using the keyboard alone - a mouse is not obligatory. This allows you to use the program on a machine's control panel.

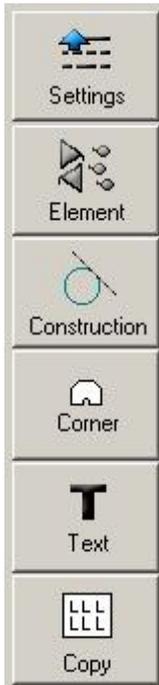
You do of course have the option to use a mouse in the usual fashion.

Notes:

- o The abbreviation 'LC' is used to denote a left-click.
- o The cursor can be moved using the mouse, cursor panel or arrow keys. If the cursor is in the snap-zone of a given point the point's type will be shown with a corresponding cursor symbol and it will be described in the status bar [3] at the bottom left of your screen.
- o Designations in triangular brackets (<Esc> <CR> <A>) identify simple key-presses.
- o The tabs in the header panel [2] can be selected with the <left> and <right> control keys. Access the tabs by pressing <TAB>.
- o Decimal figures in the input fields are always to be entered in English notation (always with dot as a decimal point, e.g., 4.78).



1



These buttons allow you to switch quickly between function-grouped sets of tools:

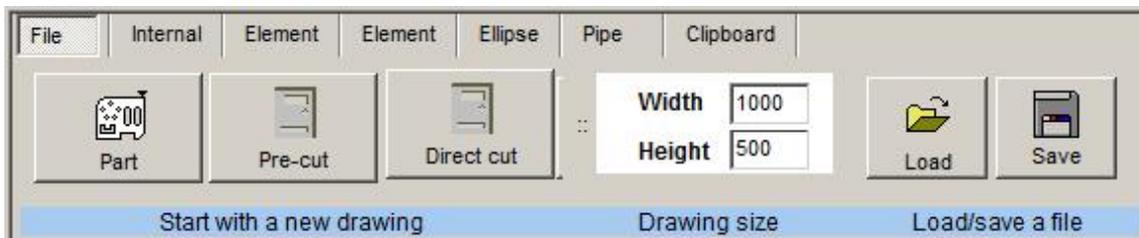
- o Settings: For information about line types and presets.
- o Element: For adding new drawing elements.
- o Construction: Draw construction lines and elements.
- o Contour: Offers a multitude of prefabricated contour elements.
- o Text: Allows you to write using fonts installed on your computer.
- o Copy: For creating matrices and polar arrangements of contour elements.

All function groups offer tabs for direct control of functions in other groups for fast access.

Use <Pg up> and <Pg down> to select these buttons.

A button for digitalizing will be present if this option was purchased.

2



The function groups can be selected using the tabs in the header panel.

The navigation panel (far left) always reflects the content of the function group selected in the header panel [2]. Selecting a new function group changes the content of this panel. This allows you to control the functions using this navigation panel. The control panel version allows you to use the function keys on your panel to control these functions, select them from top to bottom using <Shift><F1> to <Shift><F8>. You can also use the mouse if one is connected.

The function groups can also be called using a pull-down menu. Right-click in the header panel to activate the pull-down. The individual function groups are described in the coming chapters.



Use the pull-down menu to directly select the functions in menu panel. Right-click in the function field [2] to access the pull-down menu.



This area is the 'drawing board', where your cursor will appear as a cross-hair. Click to fix a start-point, which will be displayed in the status bar below the drawing board. The current mouse position and the distance to the start-point are also shown in the status bar.

When moving the cursor over a drawing's elements, it will turn into a symbol representing the point's type. The point's meaning is shown in the second status panel at the bottom left of your screen.

Use your mouse's scroll wheel to zoom in and out on a drawing.



4



Click the top button to switch to the selection screen.

The middle button allows you to undo your last action. Control key for this is <Pg down>.

Click the bottom button to call the whole drawing back into sight on your drawing board [3].

5



The buttons to the left allow you to de/ activate cursor, cut point and grid functions. If you are using the cursor function the quick-keys for setting step-width will be shown on the right.

The number to the right shows the next free element number.

Control keys are <up> and <down>.



Starting a drawing.



The functions in the header panel allow you to start a new drawing.

Choose between 'Part' or 'Pre-cut'.

Your choice determines the workspace. Selecting 'Pre-cut' means the part will be treated as a complete external contour, but not cut.

Selecting 'Part' opens a drawing board which you can provide directly with an external contour from the selection of premade contours. This allows you to create and cut simple parts with minimal effort.

If you wish to make a new drawing in the 'classical' sense, start with construction lines and adapt your drawing to the constructed external contour later on.

Various methods are offered for drawing a new component. To help you get started quickly, the program offers a choice between a premade external contour based on a complete element (Part) that just needs defining to match your requirements, or a pre-cut part.

You can also jump straight into the editor and use construction lines to form your drawing. You can adapt the external contour to the drawing later on.



Enter the part's dimensions in the cells to the right.

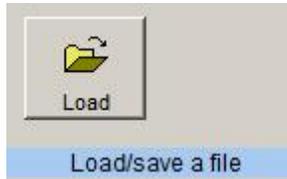
Press 'Part' to create a new drawing without pre-cut. Next, select a predefined element or begin drawing using construction lines. You can fit your drawing to the external contour later.

If you have a pre-cut part enter its dimensions in the cells and select 'Pre-cut'.



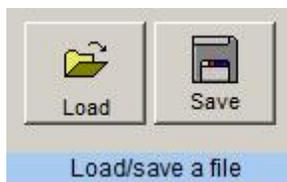
The same applies for 'direct cutting', although in this case the contours are not sorted, but cut as they are drawn.

2



Load a drawing here. If you have created a drawing then a button for Saving will appear.

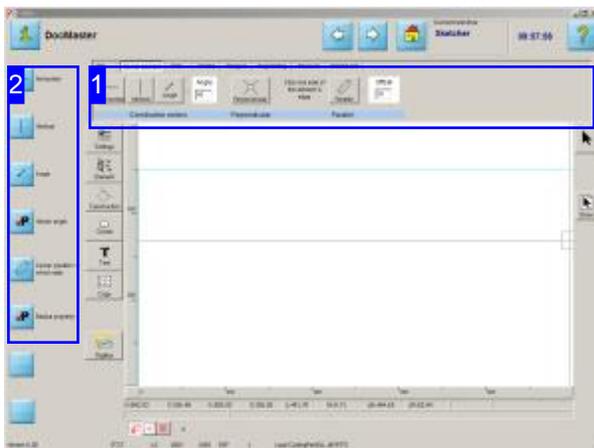
3



Click 'Save' to save your drawing. A dialog box appears for you to name your file.

The drawing functions.

The Various Methods of Drawing Elements.



Draw your elements using the tools grouped into function groups [1]. The functions can be accessed using their tabs or the left navigation panel [2].

In the control panel version, the buttons in the left navigation panel can be activated using the function keys <Shift><F1> to <Shift><F8>. The buttons' functions will change to match the current context so that the relevant functions can always be accessed using these keys on a control panel.

A drawing consist of various collected elements which come together to make a component. When drawing, all elements are oriented against the zero-point.

You can use construction lines to help construct a component. These are treated as 'open' lines, drawn across the entire board. Fundamentally these construction lines are normal elements, but distinguish themselves by the simplicity of their creation. If construction lines are drawn in a different color they can be easily and quickly removed. Construction lines can be edited with all functions available for a normal element, and as such can be integrated into your drawing.

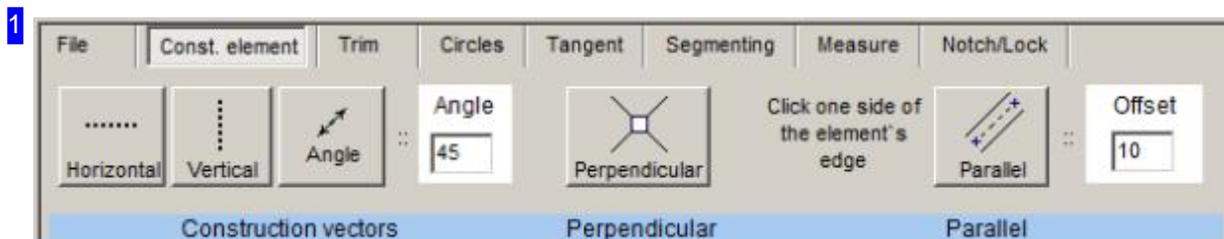
There are three different ways to draw contour elements.

1. Elements drawn starting from the current cursor position.
2. Elements drawn from a start position to the current cursor position.
3. Draw functions that require multiple steps.

Note:

If in the next pages you see 'LC' this means Left Click, unless specifically noted otherwise.

The cursor can be moved with the mouse or the arrow keys on your keyboard.





Select the function groups via the tab panel. The drawing tools are activated from the function frame.

1. Elements drawn from the cursor position:

- o Construction lines
- o Perpendiculars
- o Parallels
- o Straight lines (Vectors)
- o Arcs
- o Circles
- o Ellipses
- o Roundings (Fillet)
- o Cut-outs
- o Text
- o Matrices

2. Elements drawn with a start and end position:

- o Straight lines (Vectors)
- o Arcs
- o Arcs through 3 points

3. Sequences:

- o Circles on 2 elements
- o Tangents



2



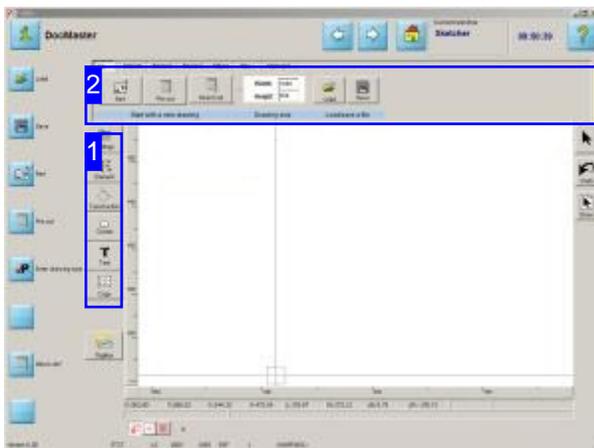
The navigation panel reflects the content of the function frame and its content will change when you select a new function group in the header panel [1].

The input cells in the function field can be activated and scrolled through using the relevant parameter buttons (P).

The control panel version allows you to use the function keys on your panel to control these functions, select them from top to bottom using <Shift><F1> to <Shift><F8>.

Work Areas

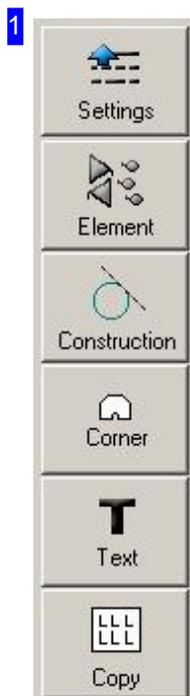
Function groups grouped into work areas.



Select the required work area [1] and then the relevant function group from the tabs in the header panel [2]. The functions will then be displayed under the tab panel.

Using the functions can lead to the function frame changing if the function demands that, eg when positioning the cursor. Once the function has been executed the function frame will return to its previous state. You can also choose to remain in such a function. To do this, <Ctrl>-click the function to select it, enabling you to use it repeatedly. Exit the function with a key-press when you are done.

The *Sketcher*'s tools are grouped by function, and these function groups are then grouped into work areas. The work areas can be selected directly [1] and the function sub-groups can then be selected from the header panel [2].



These buttons are for selecting a work area. When you select a work area the relevant function groups will be displayed in the header panel [2].

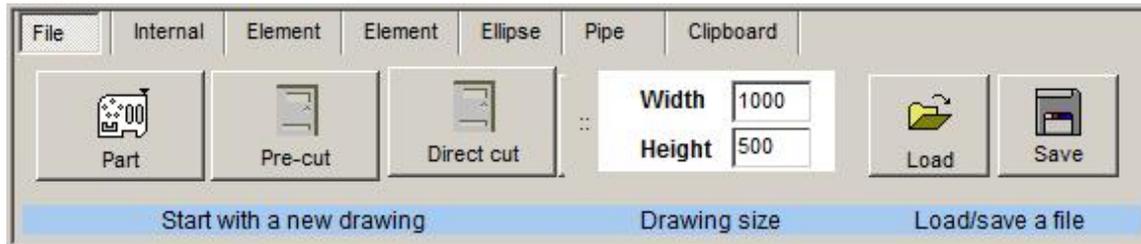
These buttons allow you to switch quickly between function-grouped sets of tools:

- o Settings: For information about line types and presets.
- o Element: For adding new drawing elements.
- o Construction: Draw construction lines and elements.
- o Contour: Offers a multitude of prefabricated contour elements.
- o Text: Allows you to write using fonts installed on your computer.
- o Copy: For creating matrices and polar arrangements of contour elements.

All function groups offer tabs for direct control of functions in other groups for fast access.



2



Use the tabs in the header panel to select the function groups.

Selecting a function group displays the corresponding functions under the tab panel.

The function groups can also be called using a pull-down menu. Right-click in the header panel to activate the pull-down. The individual function groups are described in the coming chapters.

Settings - Setting line types and defaults.



This screen allows you to make settings about the line type, cursor display and grid size.

You can select the following function groups from the tab panel:

- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Cut/lines - Define your lines and their meanings with relation to processing here.
- o Cursor - Functions relating to cursor control, including selecting specific points and adjusting the drawing's size.
- o Grid - Set the grid from here.
- o Settings - Set various defaults and the background color for your drawing board.
- o Measure - Measure between given points.
- o Drawing - Set the zero-point and drawing size.



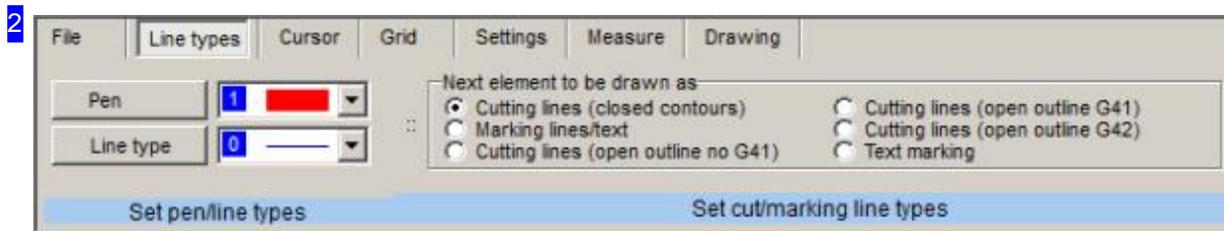
The 'File' menu allows you to start a new drawing or load an existing one from your stock.



If you wish to make a new drawing for a pre-cut part, enter the drawing's size in the middle frame and click the 'Pre-cut' button. The external border of your drawing will be treated as the external contour and elements within your drawing will be considered internal contours (holes). The contours will be sorted correspondingly ready for processing, although the virtual external contour will not be cut.

When creating a new drawing for direct cut, the program will not sort for you. The parts will be cut directly, usually in the order they were drawn. The drawing sequence is very important in this case.

Press 'Part' to start a new drawing. Select a preset element as a starting point, or begin drawing using construction lines. You can adjust the drawing's size onto an external contour later on using the 'Drawing' tab.

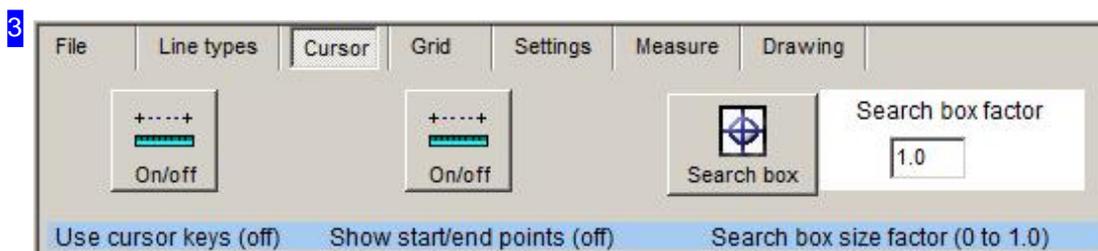


The left frame in the 'Cut/lines' tab allows you to set the line type and color for drawing. Selecting a different color for construction lines and elements to cut makes it much easier to work on them separately. You should also note that the line type selected is of specific meaning to your machine.

A further Frame allows you to set the line type.



The right frame has a selection box which allows you to set the line type for the next drawing operation, and so for processing.

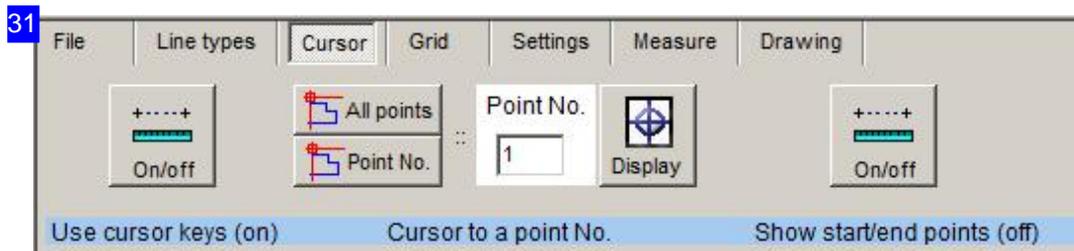




'Cursor' allows you to control your cursor.

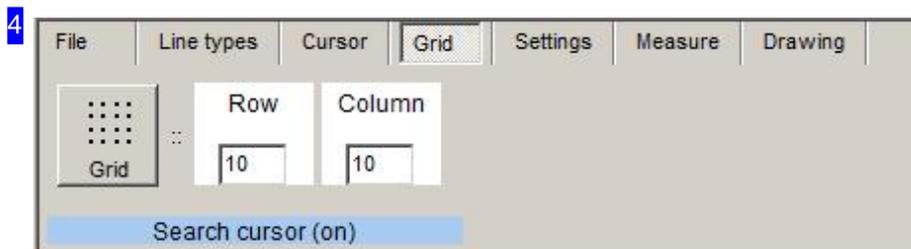
The 'Cursor Keys (on/off)' frame opens a frame which allows you to select specific points on your drawing.

Use the 'On/off' button in the 'Show start/ end points' frame to show the start and end points of each element.

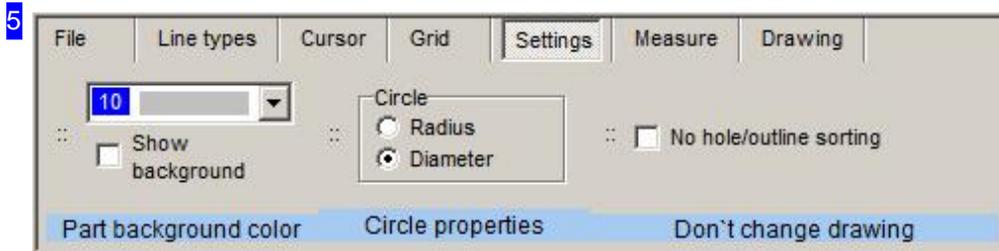


Here you have the option to target a specific point with the cursor.

The top left button in the 'Cursor to point' frame allows you to cycle through each point in your drawing. The bottom button allows you to move the cursor to a given point number. To see your drawing's point numbers superimposed on the drawing board, just click 'Show'.



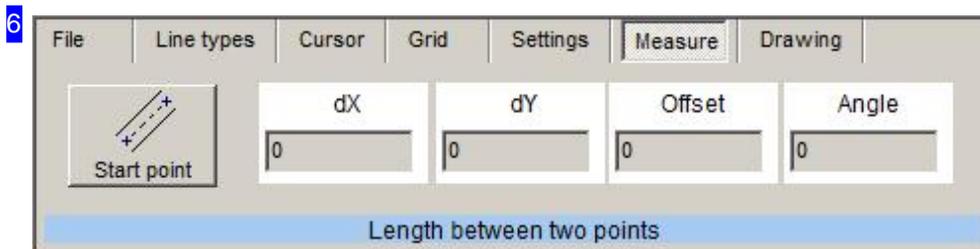
The 'Grid' tab switches *Sketcher*'s snap-to-grid mode. Enter the grid size and click 'Grid'. The snap-to-grid mode's status (On/off) is shown in the footer panel. If the grid mode is on, the drawing cross-hair will move only from grid-point to grid-point as you move the mouse cursor, and you will only be able to click on grid points.



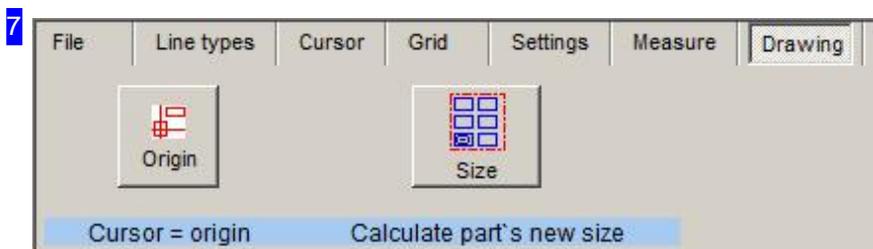
The 'Settings' for *Sketcher*'s defaults and display settings are available here.

The left frame allows you to change the background color. The 'Circle Settings' frame allows you to set how circles are defined. Choose either 'Radius' or 'Diameter'. This entry will be considered when entering circle elements.

To ensure the cutting procedure runs smoothly, the contours will be sorted in the coming Technology screens. The frame to the right allows you to stop this sorting. If you mark the checkbox then the part will be cut just as it is drawn.

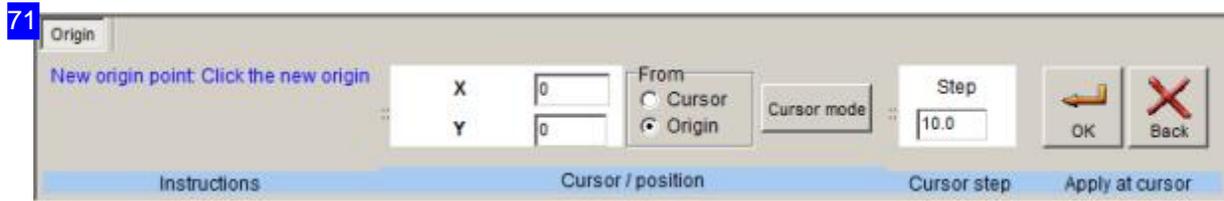


The 'Measure' tab allows you to measure the distances and angles between any given points. Click 'Start-point' and select a start-point anyway on your drawing board. Next click your end-point, and the measurements will be shown in the appropriate cells.



To reset the drawing's zero-point, click 'Zero-point' in the 'Cursor=Zero-point' frame. A new frame will open for redefinition of the origin.

Click the button in the right frame to set your drawing board's size by the drawing's size.



Setting a new zero-point has the same conditions as setting the cursor type.



Element - Drawing contour elements, with provision for selecting premade elements.



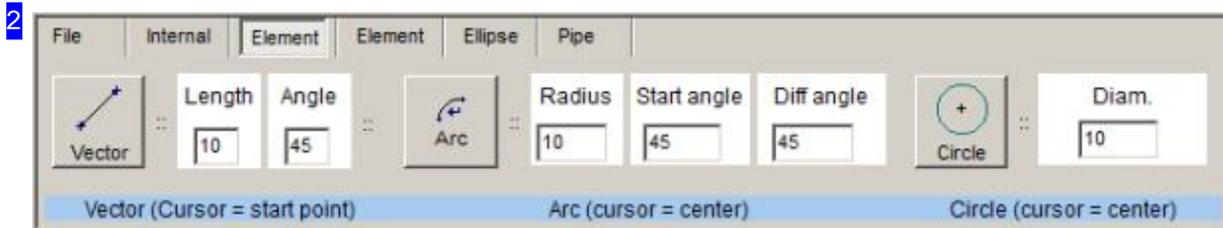
This screen allows you to draw new contour elements, or add predefined ones to your drawing.

You can select the following function groups from the tab panel:

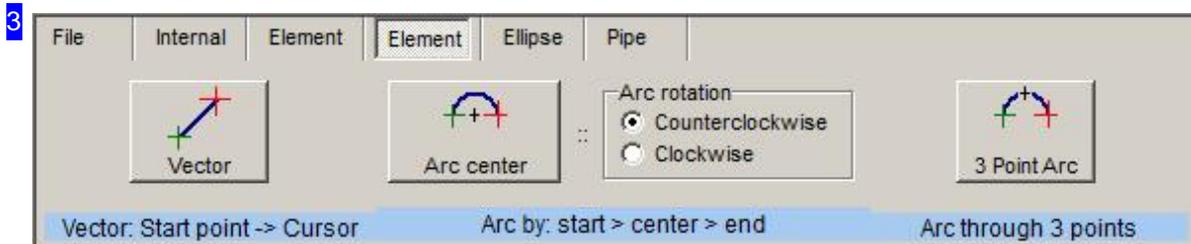
- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Contour - Draw predefined contours at the cursor position.
- o Element - Draw predefined elements at the cursor position.
- o Element - Draw elements at a start position.
- o Ellipse - Draw an ellipse at the cursor position.



The functions offered under 'File' are described in the 'Settings' page.

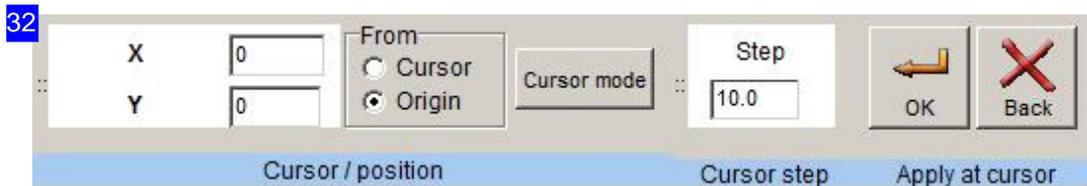


Define premade elements here, and click the Element button to draw these at the cursor position. A new frame for positioning the cursor will open to allow precision when placing your new element.



These functions allow you to draw an element at a start position.

Select the element to draw and a new frame for positioning the cursor will open to allow precision when placing your new element. The 'Start pointer' will be shown at your chosen point. You will need to define a second point when drawing an arc (Arc point or Center). The 'Arc pointer' or 'Center pointer' will be shown at the chosen point. Move the cursor to the end position and click 'OK', or click the end position in the drawing.



The cursor settings have the same meaning in nearly all functions.

The 'Cursor position' frame allows you to make inputs in terms of X and Y or direction and distance/offset. The cursor is placed on the reference point given in the 'From' frame.

The mode of value input can be toggled in the 'Cursor Position' frame tab using the 'Cursor Mode' button.

There are three modes available:

- o X-/Y position absolute
- o X-/Y position relative
- o Direction / Distance

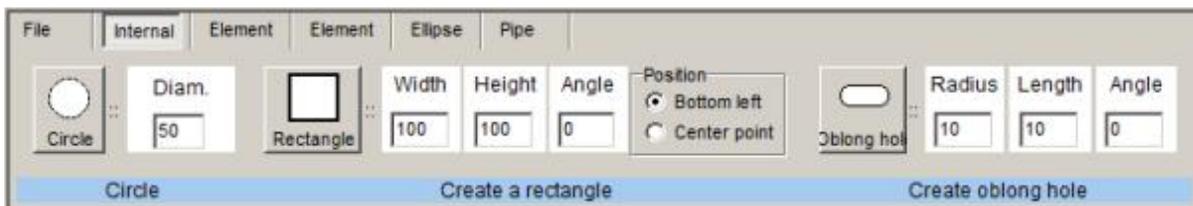


The step width sets the grid size for moving the cursor. You can also make this setting using the Quick keys in the footer.

Click 'OK' to move the cursor to the new position. 'Back' aborts this process. If you have selected a function by <Ctrl>-clicking it, 'Back' takes you back to that function.

You can also set the cursor position by clicking on your drawing board.

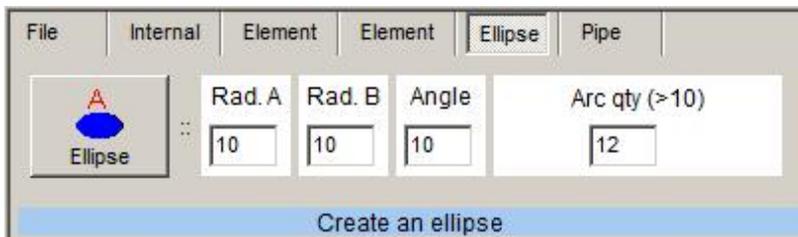
4



'Contour' allows you to insert premade geometric forms quickly and easily. Enter the required dimensions in the appropriate cells then choose between 'Circle', 'Rectangle' and 'Slotted hole'. A new frame for positioning the cursor will open to allow precision when placing your new element.

The 'Position' frame allows you to set the location of the entered position relative to the rectangle.

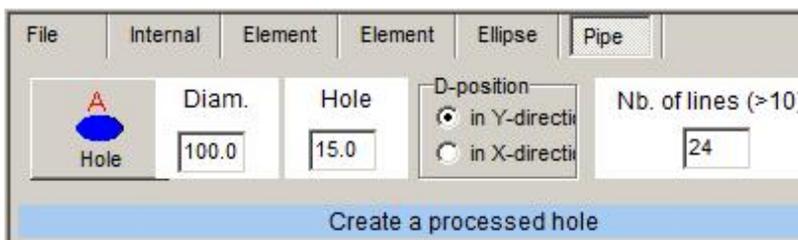
5



Draw ellipses in exactly the same way as other 'Contour's. Enter the required dimensions in the appropriate cells then choose 'Ellipse'.

A new frame for positioning the cursor will open to allow precision when placing your new element.

6



Nets of holes in pipes are special types of ellipse forms. This function is important for drawings that are generated from the net macros. Virtual axis points are entered in the drawing for the relevant macros in



order to mark the positions of hand- or manholes.

You can set holes at these locations easily on the tab 'pipes'. Enter the required diameters for hole and pipe and the orientation of the net and chose 'Hole'.

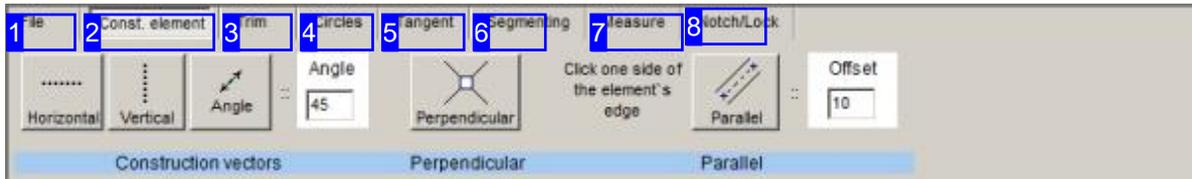
A new frame for positioning the cursor will open to allow precision when placing your new element.

Select the appropriate axis point.

The function must be released in the post-prozessor.



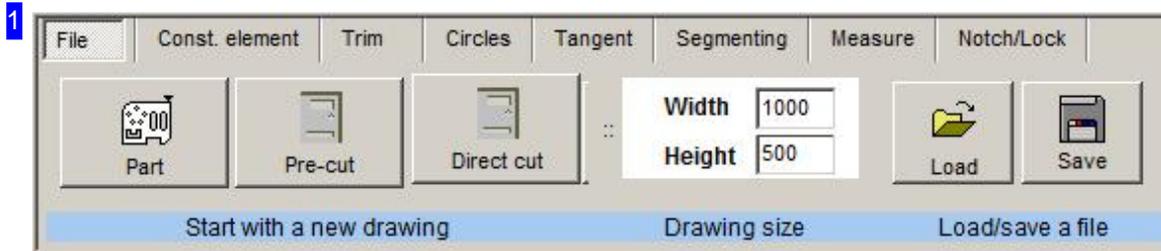
Construction - Draw construction lines and elements.



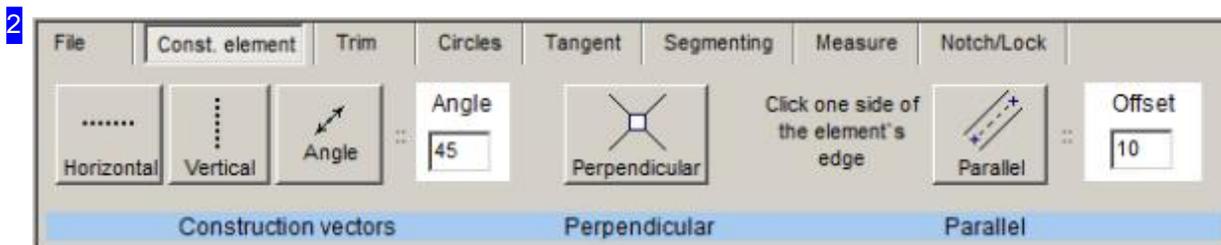
This screen allows you to add lines and elements to your drawing board to help you construct your part.

You can select the following function groups from the tab panel:

- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Constr. Elem. - Draw straight, perpendicular and parallel construction lines.
- o Trim - Trim lines and close gaps.
- o Constr. Circle - Allows construction of circles on lines.
- o Tangents - Allows construction of tangents on and between circles.
- o Segmenting - Separate an element into multiple parts.
- o Measure - Determine measurements between any two points.
- o Locking joint - Separating large parts using automated settings for locking joints.



The functions offered under 'File' are described in the 'Settings' page.



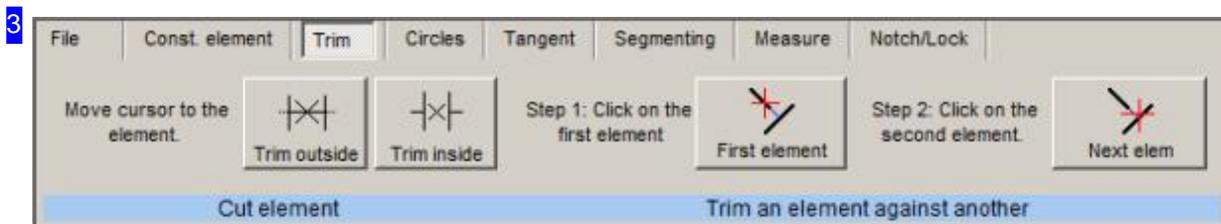
The 'Const. Elem' tab offers options for creating construction lines. If you set a separate line color for construction lines you will be able to work on (check, edit, delete) them more quickly and accurately.

When creating a diagonal construction line, you will need to give the angle. This can be positive or negative to set the direction.

The 'Perpendicular' button draws a construction line perpendicular to the drawing-point clicked.

The 'Parallel' button draws a construction line parallel to the drawing-point clicked. Identify the element by clicking it on the side you want the line drawn at.

A new frame for positioning the cursor will open to allow precision when placing your new element.

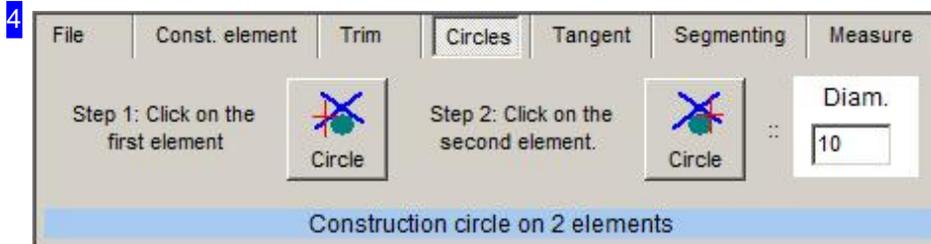


The 'Trim' tab allows you to remove pieces of, or shorten, an element.

The 'Cut element' frame allows you to remove parts of an element between two other elements using the 'Internal contour' button, or use the 'External contour' button to remove parts outside other elements, thus fitting a part between two elements. Press the relevant button and click to identify the element to trim.



The 'Adapt element' frame allows you to close a gap between two contour elements. Click 'First element' to identify the element to be adapted, then 'Next element' to select the 'target' element to adapt to, and the gap will be closed for you.



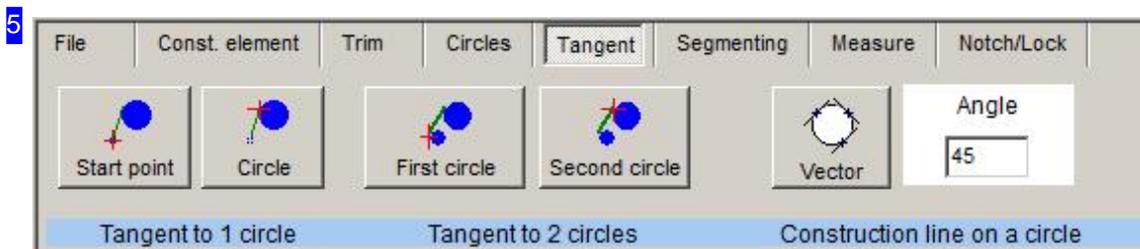
The 'Const. circle' tab offers a special method of creating a circle.

To draw a circle against two existing elements, first set its radius or diameter, then click the left button in the 'Circle on 2 elements' tab and click the first element.

Click the right button to determine the second element; the circle will then be drawn.

Please ensure the radius/ diameter is valid and the circle can be drawn.

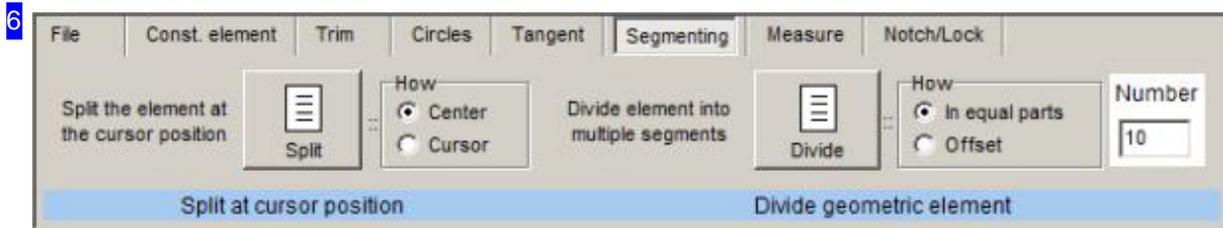
The choice between drawing circle by radius or diameter is made in the Settings window for circles.



The 'Tangents on a circle' frame in the 'Tangents' tab allows you to draw a tangent to a given point on a circle. Click 'Start point' and identify the point. Click 'Circle' and identify the side of the circle to draw a tangent against.

To place a tangent between two circles simply click 'First circle' in the 'Tangents on two circles' frame and click the side of the first circle to draw against, then 'Second circle' and identify the side of the second circle to draw against. This method allows you to draw tangents both inside and outside your circles.

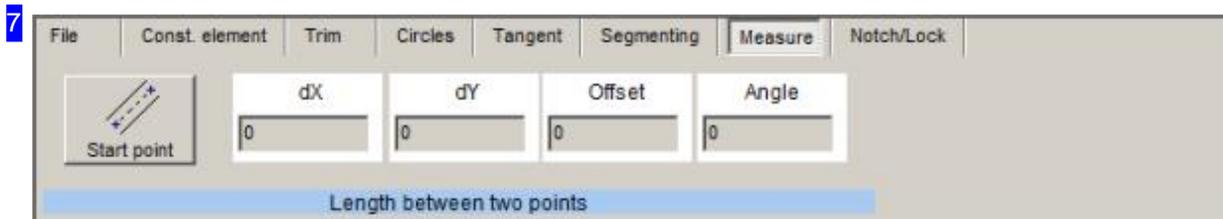
To draw a tangential construction line against a circle at a given angle, enter the angle in the cell in the right frame, click 'Vector' and select the circle the tangent should lie on.



The 'Segmenting' function allows you to dismantle an element into multiple parts.

To split an element, mark the option in the left frame that describes how you wish to split the element, then click 'Split'. A new frame for positioning the cursor will open to allow precision when splitting your element.

To dismantle an element into multiple parts, set the number of parts to be created or the length of each part in the 'Quantity/Offset' cell. Check the relevant option in the right frame and click 'Separate'. A new frame for positioning the cursor will open to allow precision when separating your element.



The functions offered under 'Measure' are described in the 'Settings' page.



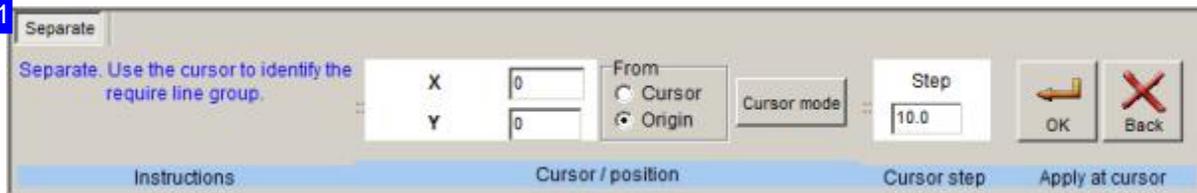
Large parts can be separated into smaller parts for a more elegant workflow. You can allocate separating cuts in the 'notch/locking joint' tab; these will have material added such that you can later rejoin the parts with a locking joint. Click 'Separating vector' to introduce a separation cut. This switches to the 'Separating vector' field.

You can add folds or tabs to existing contour elements here; click the relevant button and mark the element the additional material should be placed on.

You can also separate an existing line e.g. an open contour directly. Click the 'Separate' button to activate this function.



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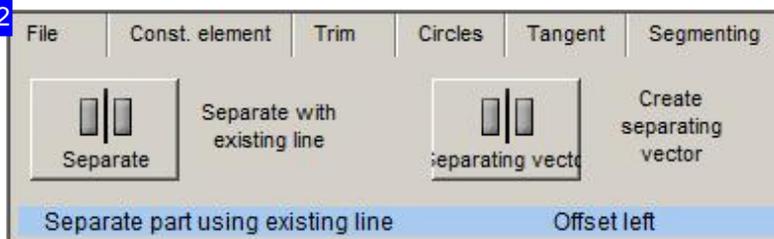
You can set your separating vector here. Define a start position on an existing contour, and set the end point as a position on another contour, or a position on the opposite side of the same one.

The part will be split, the right half moved over and extra material with the specified length added to both parts. The left part will get a fold, the right part a tab, so the positioning of the separating cut does have some importance.

Since only one part is ever moved, you should pay attention to the order in which you make any multiple separating cuts you require.

The Functions for cursor settings are described in the previous help file.

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A separating vector can also be placed directly onto an existing line, e.g. an open contour. This separates the part, and moves the separated part left. You should always use this function moving through parts from left to right. Insure that the separating line ends at a contour so that the contour can be closed at the line afterwards.

Since only one section of a part is moved, you must pay attention to the operating sequence if multiple separations are to be made.

The Functions for cursor settings are described in the previous chapter.



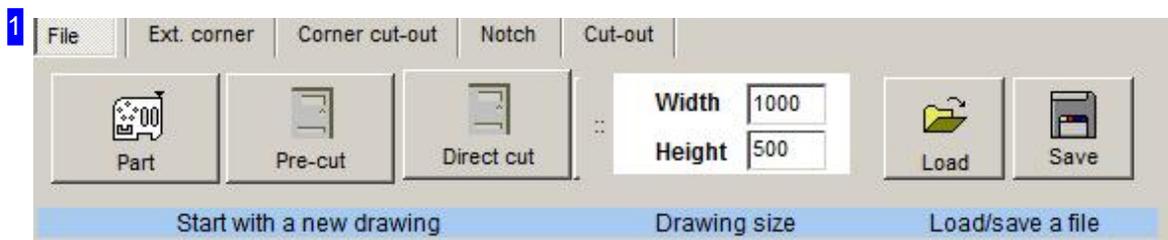
Contour - Insert premade contour elements.



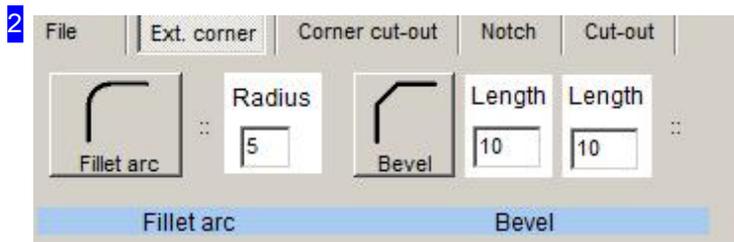
This window allows you to polish your drawing off using predefined elements.

You can select the following function groups from the tab panel:

- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Corner - Give your elements' corners a predefined rounding.
- o Cut-out - Give your elements' internal corners a predefined cut-out.
- o Notch - Give your elements' external corners a predefined notch.
- o Slot - Give your elements' edges a predefined slot.

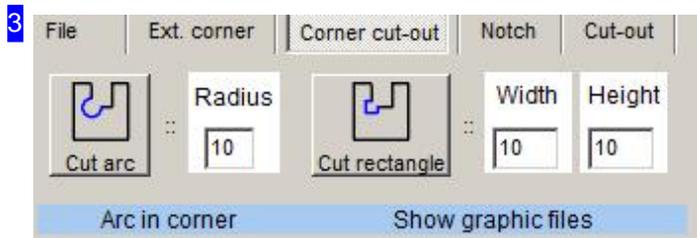


The functions offered under 'File' are described in the 'Settings' page.

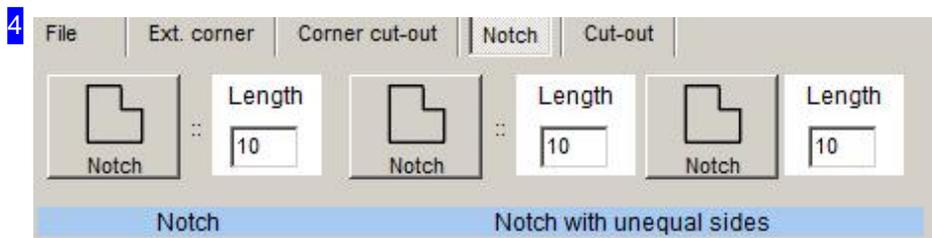


'Corner' allows you to round your elements' corners. Enter the relevant values in their cells and click the corresponding button. The 'Chamfer' option allows you to set a chamfer by 'length/length' or by 'length/angle'.

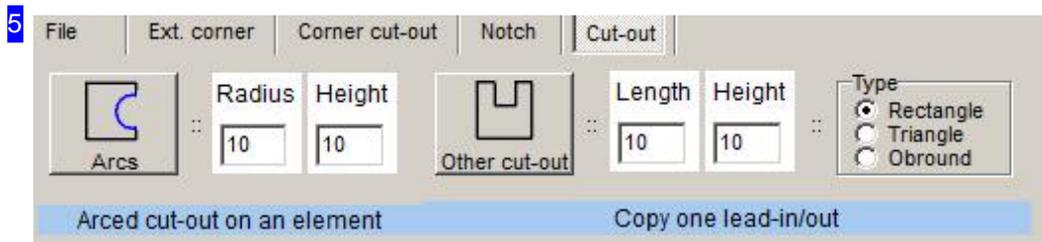
Select the corner you wish to round off. A new frame for positioning the cursor will open to allow precision when placing your new corner.



'Cut-out' allows you to make cut-outs on the internal corners of your part. Enter the required dimensions in the input cells and click the button corresponding to the cut-out you want. Use the cursor to identify the corner you want to make the cut-out at. A new frame for positioning the cursor will open to allow precision when placing your new corner.



'Notch' allows you to make predefined cut-outs on your part's external corners quickly and easily. Enter the required dimensions in the input cells and choose between 'Notch' and 'Notch with 2 different sides'. A new frame for positioning the cursor will open to allow precision when placing your new corner.



'Slot' allows you to make a notch on a contour's edge as opposed to at a corner. Enter the required dimensions in the input cells and click the button corresponding to the slot type you want. Available slot types are:

- o Arc
- o Rectangule
- o Triangle
- o Slotted hole

A new frame for positioning the cursor will open to allow precision when placing your slot.



Text - Text strings using fonts from your system.

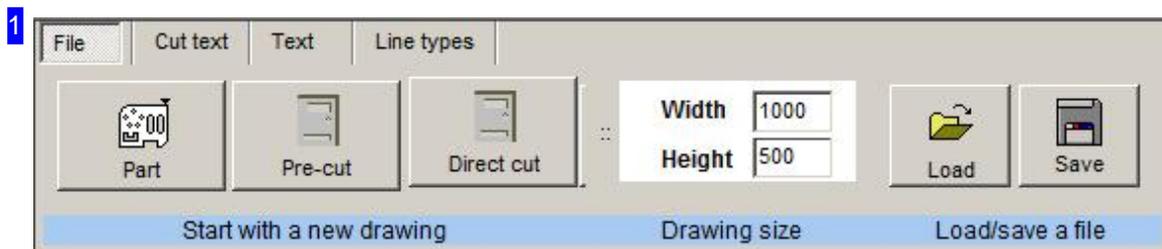


This screen allows you to generate text strings from your own true-type fonts or the system's standard font, and treat them as contours. Text strings where the letters are closed contours can be treated as outlines, where the letters can be nested individually as parts.

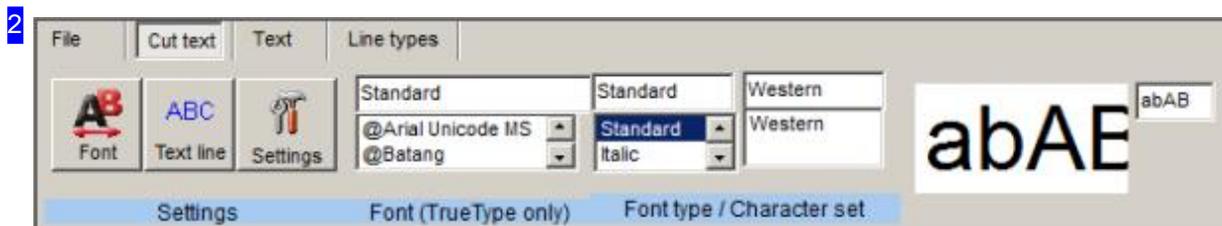
Noter: Texts should always be written as an outline. Where disconnected elements should remain together, set a cutting bridge manually.

You can select the following function groups from the tab panel:

- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Cut text - 'Draw' text using your own fonts.
- o Text - 'Draw' text using the standard font.
- o Cut/lines - Define line types' meanings for your cutting tool.



The functions offered under 'File' are described in the 'Settings' page.





The 'Cut text' tab contains *Sketcher*'s layout text functions for true-type fonts. The 'Settings' tab allows you to make various settings:

- o Char - Choose from your 'True Type' fonts.
- o Text - Enter the text size and string.
- o Settings - Vector / Arc settings.

The right frame allows you to select a font and font style, and create a test string. Enter a string in the textbox at the top-right of the screen, select your font and see if it doesn't look just right.

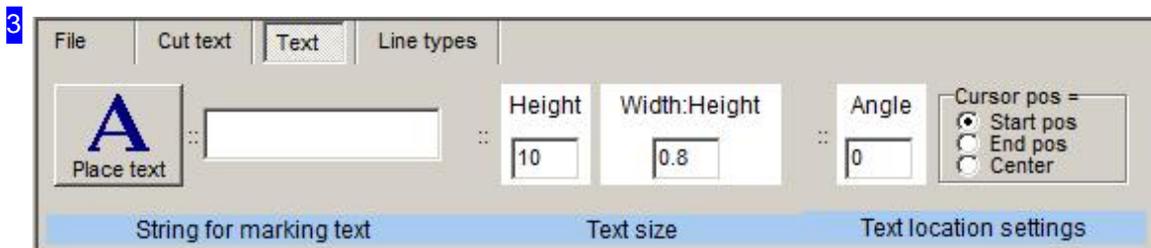


Select 'Text' to make inputs regarding the text's size, angle, aspect ratio [3] and where to place text relative to the cursor.

Enter the required string in the 'Cut text line' box and click 'A' to place your string in the drawing.

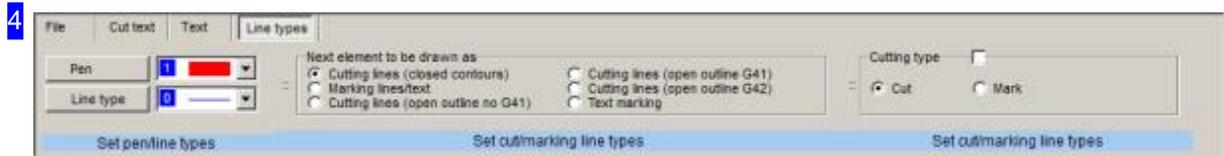


The 'Settings' tab allows you to set whether to 'draw' text using vectors only, or whether to smooth it using arced curves.



The 'Text' tab contains *Sketcher*'s offering allowing you to add simple text into a drawing.

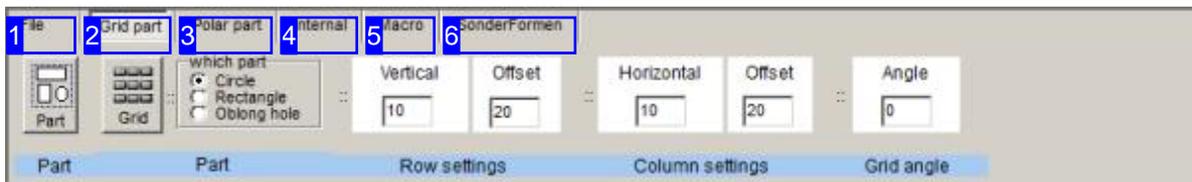
Make the relevant settings, set the text's position relative to the cursor, enter the string in the 'Marking text' box and click 'Create text'.



The functions offered under 'Settings' are described in the 'Line type' page.



Copy - Create Matrices and Polar Arrangements of contour elements.



This screen allows you to create a grid or radial arrangement of a part to place on your sheet.

You can select the following function groups from the tab panel:

- o File - Allows the creation of a new drawing / external contour. You can save your part here, too.
- o Grid Part - Arrange parts in a grid formation. Selected part will be put in a matrix.
- o Polar Part - Radial arrangement of parts. The selected part will be copied around a center.
- o Contour - Insert pre-defined contour at the cursor position.
- o Macro - Insert parts from a macro at the cursor position.

If there is a part in the clipboard then this function group will be supplemented with this option:

- o Clipboard - Allows copying the part from your clipboard.



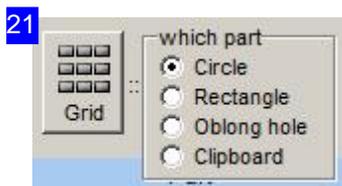
The functions offered under 'File' are described in the 'Settings' page.



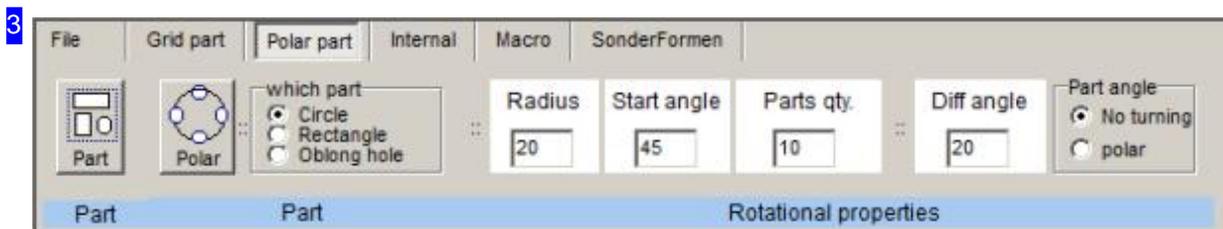
The 'Grid Part' tab allows you to arrange a pre-defined part, or a part from your clipboard, in a grid and place that on your sheet. If you have a part in the clipboard there will be an extra Option - 'Clipboard' in the 'Which Part' frame.

Set the settings for rows and columns and set the angle for your grid. Click 'Grid' in the 'Parts' frame and the parts will be filled into a grid according to your settings.

Click 'Part' in the left frame to switch directly to the 'Contour' function frame, from which you can use the 'Back' button to return to the 'grid part' or 'polar part' functions.



If there is a part in your clipboard the option list for selecting the part to be matrixed will be extended with the 'Clipboard' option.



The 'Polar Part' tab allows you to arrange a pre-defined part, or a part from your clipboard, in a radial arrangement and place that on your sheet. If you have a part in the clipboard there will be an extra



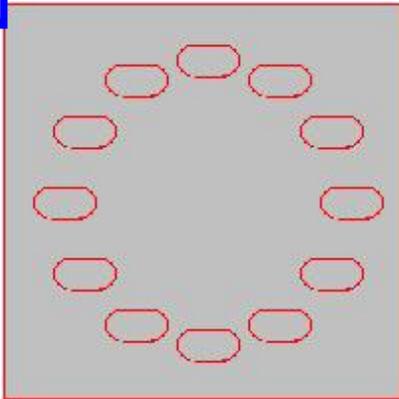
Option - 'Clipboard' in the 'Which Part' frame.

Set the settings for your parts and set the angle for your arrangement. 'No turn' means the parts will be placed as drawn, all in the same alignment, and not rotated. 'Polar' means the parts will be laid out radially from the center.

Click 'Polar' in the 'Parts' frame and the parts will be filled into a radial grid according to your settings.

Click 'Part' in the left frame to switch directly to the 'Contour' function frame, from which you can use the 'Back' button to return to the 'grid part' or 'polar part' functions.

31

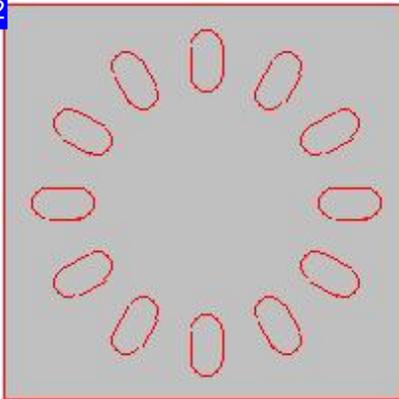


When arranging parts radially you can choose either 'No turn' or 'Polar' formations.

'No turn' means the parts will all be arranged as drawn, such that they all face the same way, as shown here.

'Polar' arranges each of the parts radially from the center.

32

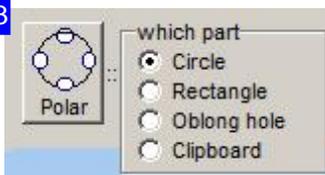


When arranging parts radially you can choose either 'No turn' or 'Polar' formations.

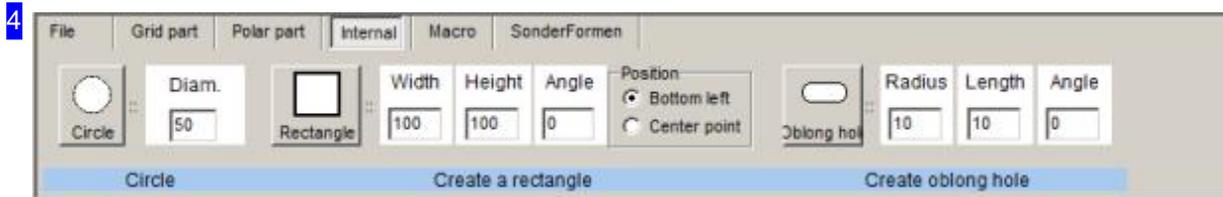
'Polar' means the parts will all be arranged as drawn, such that they all face radially from the center, as shown here.

'no turn' draws each part with the same alignment.

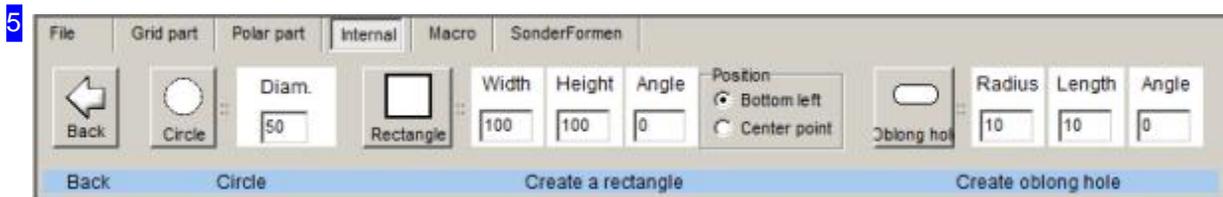
33



If there is a part in your clipboard the option list for selecting the part to be radially arranged will be extended with the 'Clipboard' option.

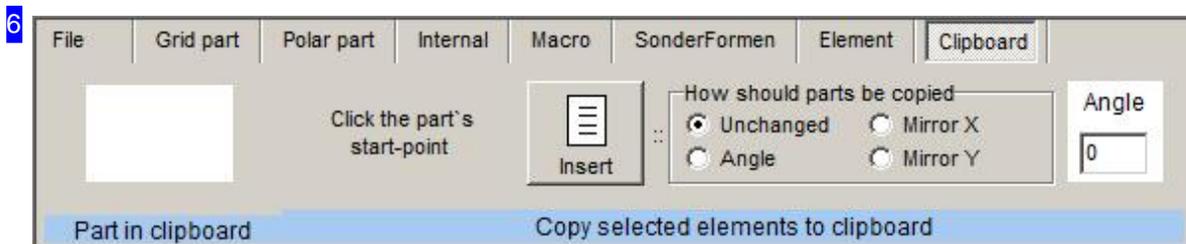


The Functions under 'Contour' are described in the 'Element' work area's help.



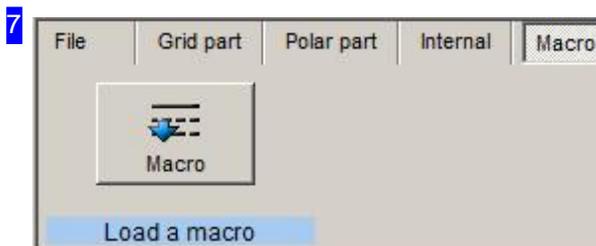
You can use the 'Part' function from the Grid/Polar copy functions to switch to this offering for part selection. Click 'Back' in the left frame to return to the previous function.

The functions in the remaining frames are also accessible from the 'Contour' tab and are described in more detail in the 'Element' help file.



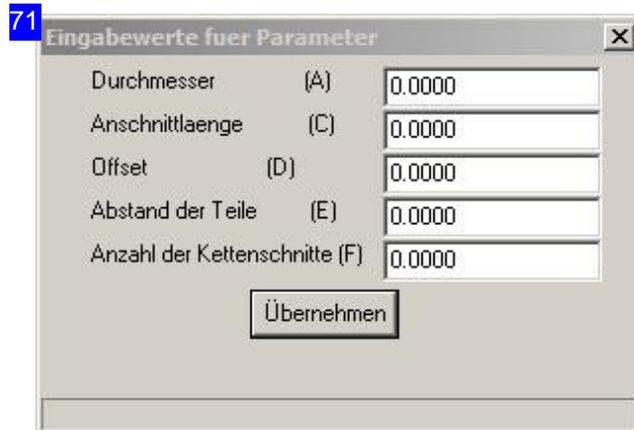
If there is a part in your clipboard the function group will be extended with a 'Clipboard' option.

The left frame shows a preview of the part in the clipboard. To copy the part, select an option in the middle frame and click 'Insert'. You will be presented the offering for positioning the cursor for accuracy.





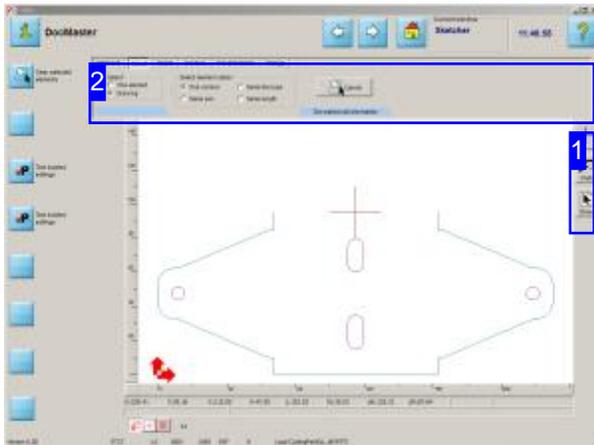
The 'Macro' tab allows you to make grid and radial arrangements using parts created from a macro. Click 'Macro', set the position and then a file manager will open for you to select the macro part. According to your selection a Dialog will be shown for setting the macro's variable parameters. You should first view the macro in *cncCUT* to understand how the variables affect the part's final form. The part will be drawn in once you save its variables.



This dialog's content is decided by the macro you select. You should first view the macro in *cncCUT* to understand how the variables affect the part's final form. The part will be drawn in once you save its variables..



Identify and delete contour elements.



Sketcher's select screen can be accessed directly from all work areas. Return to your previous screen using the same button [1].

You can identify a whole area by dragging the mouse cursor over it - click at one corner and drag a box out.

This is *Sketcher*'s selection screen. Select, copy, move, flip, or delete your contour elements from this screen.

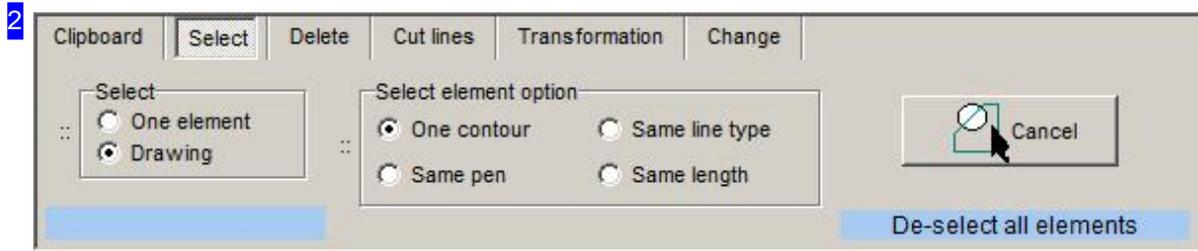
You can also copy to the clipboard from this screen.



Click the top button to return to your previous work screen.

The middle button undoes your last action.

Click the bottom button to call the whole drawing back onto your drawing-board [3].

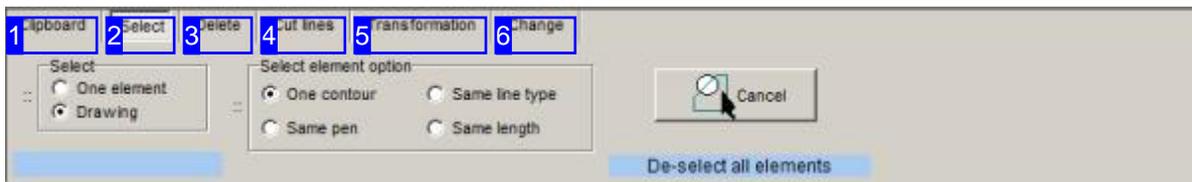


The tabs in the header panel allow you access to the select screen's function groups.

Select a function group to show its options in the tab panel

The function groups can also be accessed via a Pull-down menu. Right-click in the header panel to open that menu.

Select and modify your contour elements..

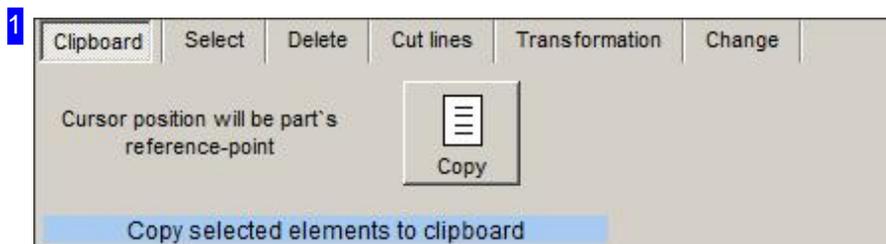


This screen allows you to identify, copy, move or delete contours and contour elements.

Individual elements, groups or areas can be selected. Simply stretch a box over an area to select all elements contained within it.

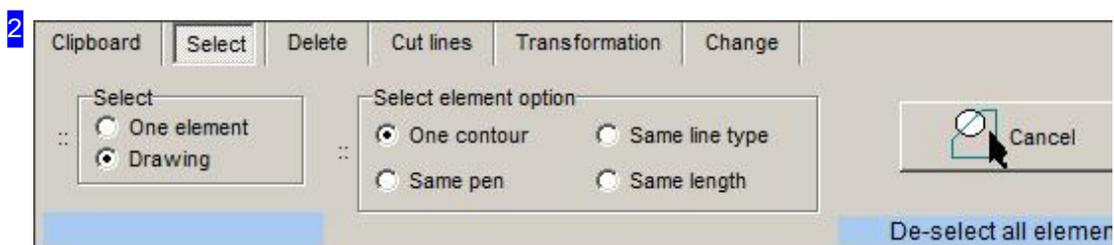
You can select the following function groups from the tab panel:

- o Clipboard - Copy parts to the clipboard.
- o Select - Identify contours and contour elements.
- o Delete - Remove contours and contour elements.
- o Cut element - Allocate line types a meaning.
- o Transformation - Shuffle elements' positions and locations.
- o Modify - Change elements' sizes.



The 'Clipboard' tab allows you to copy selected elements or parts to the clipboard.

The clipboard's contents can be further worked in the copy-screen. The grip and polar functions will now have an added Option 'Clipboard' and the drawing screen will have an extra function group 'Clipboard'.



The 'Select' tab allows you to mark contours or contour elements - mark the relevant checkbox in the left frame.

The middle frame allows you to select which type of element should be selected.

Click 'Abort' to clear your selection.



The 'Delete' tab allows you to delete specific elements. Simply click 'Delete' in the left frame to delete all marked elements.

Click 'Delete element' in the right frame to delete a single element. Click the button to delete the last element each time.

You can also delete specific elements one at a time. Enter an element's number and click 'show number' to see it, then 'Delete element' to remove it.



The 'Cut element' tab allows you to change contours' line types.

Identify the contour to modify, select the new line type and style and click 'Modify'.

Further Information for this option is available in the settings screen's help.



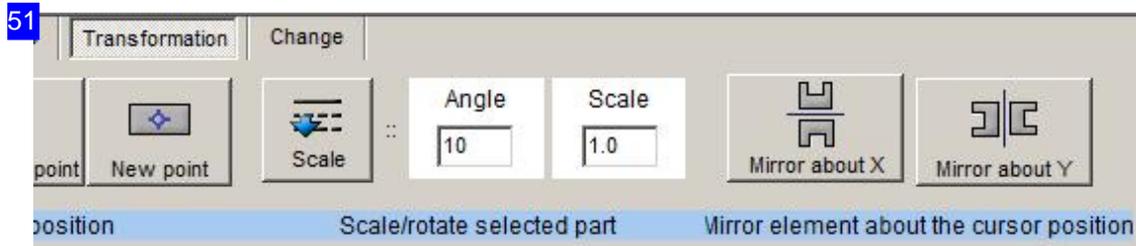
The 'Transform' tab allows you to position, turn or scale your parts and elements.

To move parts, first select a part then identify the reference point and where it should be relocated to.



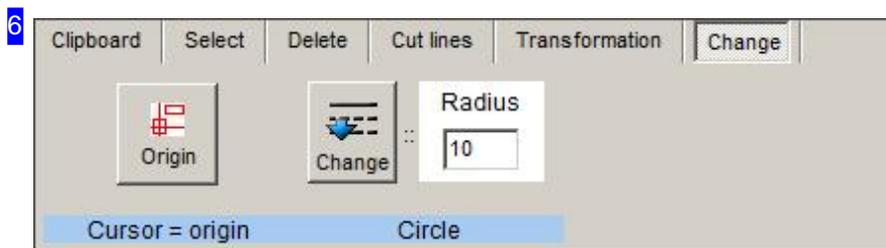
To turn or scale parts, enter the angle and scale factor in the cells in the middle frame. The angle can be positive (counter-clockwise) or negative (clockwise) - use a minus sign to determine the rotation direction. A turning point must be set when you click 'Scale', so you will be presented with a window for positioning the cursor .

You can mirror parts in another frame.



You can mirror parts about the X or Y axes under the right-hand tab 'Transformation'.

First identify the parts to mirror, then click the button indicating which direction to reflect through. You must then use the cursor to identify the reference point for the mirror axis.

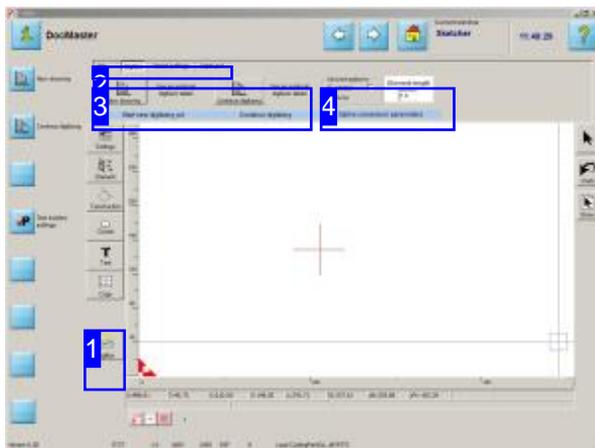


The 'Modify' tab allows you to change circles' radii. Identify the circle to modify and enter the its new radius in the input cell. Click 'Modify' to apply your transformation.

If you wish to modify the drawing's origin point, click 'Null point' in the right frame. A new Frame will open to set this.

Digitizing

Vectorizing an image using a digital tablet.



Digitizer functions are started and ended using numerical codes.

- o Line groups from vectors (2), arcs (3), stretched lines (5) and tangents (6)
- o Circles through 3 points (4)
- o Spline curves (7)

A function remains active until the cursor is repositioned using the 'Place Cursor' function (1). You can close and calculate the spline curve function by clicking 'Exit' (8).

The digitizing function is an optional feature for the Sketcher module which must be authorized through your dongle. You can digitize images up to whatever size your tablet can handle.

The functions are based on the digitizer's process and aim to create unbroken flowing line groups. There are three separate functions (line group, circle, spline) each demarkated by a start and an end.

You can create nicely smoothed curves by making line groups from splines. The interpolation points are joined as a polygon with differentiated transitions to create a naturally flowing curve.

Important Note

The digitizing tablet represents the entire display area of the screen. If you have two monitors connected this will halve the working area as the conversion of coordinates is based on the mouse's working area, which in this case will be twice as large. To avoid this you should only use the digitizer on a computer using one monitor.



1



If the option is enabled then an extra button will be present in the navigation panel. Click it to access the corresponding functions.

2



You can select functions in the tab panel to setup the digitizer tablet. Take care when making these settings as insufficient or incorrect entries will result in incorrect calculations, usually resulting in a stretched or squashed drawing.

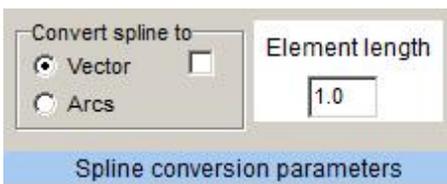
3



Click the left button to create a new drawing. A new window will open where you can begin digitizing.

Click the right button to continue with a digitization you have already begun.

4



Digitized points can be converted into varying geometric elements. This frame allows you to control these settings:

- o Vector - Chops the geometric drawing into straight-line vectors.
- o Arcs - Creates fine-resolution arcs between points.
- o Coarse Arcs - Uses a simplified calculation to create a drawing based on coarser arcs.

Mark the relevant checkbox. The element length sets the resolution for converting spline curves. A smaller value refines the resolution, but leads to longer calculation times and larger drawing files.

Mark the checkbox if you wish to see the original spline curve when selecting arc or vector conversion. This allows you to analyse the curve and recognise the result. If this checkbox is marked another button will appear which allows you to delete the original spline curve.

Tablet Settings



This screen allows you to make settings for your digitizing tablet.

The tab panel allows you to select the following functions:

- o Digitize - Digitize a new drawing or continue an existing process.
- o Tablet Settings - Scaling the tablet for vectorizing.
- o File - Save your part here.



You must scale the tablet here so that the drawing's points are converted with the correct X/Y ratio. These settings must be made carefully if your vectors are to be created correctly. Take care when making these settings as insufficient or incorrect entries will result in incorrect calculations, usually resulting in a stretched or squashed drawing.

- o Place a box around the drawing and measure its size precisely..
- o Enter the values under width/height.
- o Click 'Digi Size' and define the working area on the right right.



Define the working area on tablet by entering the corner-points bottom-left and top-right.

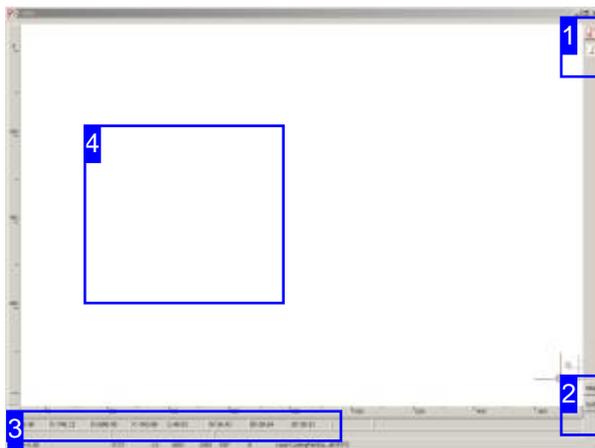
- o Use the mouse to mark the box's bottom-left corner on the tablet.
- o Use the mouse to mark the box's top-right corner on the tablet.



General file management functions - more information can be found under Settings .



Vectorizing



This window is the work-screen for using your digitizing tablet. The goal is to capture line groups using the tablet's mouse, and convert them to geometric drawing elements. The line groups can consist of vectors and arcs which can be added to each other continuously until the shape is formed. Circles represent one exception, as they are defined by selecting three points on their circumference, and spline curves, which are begun and ended as separate functions, represent another.

These functions are called and exited using the tablet's function codes in order to allow position notices from the tablet to be incorporated,

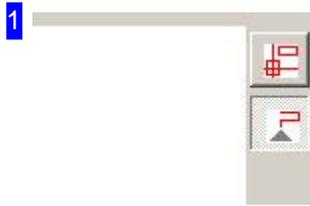
To start the digitizer functions, press the relevant button on the keypad:

- o Place cursor (1).
- o Line group from vectors (2).
- o Line group from arcs (3).
- o Circle through 3 points (4).
- o Continuation with stretched lines (5).
- o Continuation with tangents (6).
- o Start spline curve (7).
- o End and calculate spline curve (8).

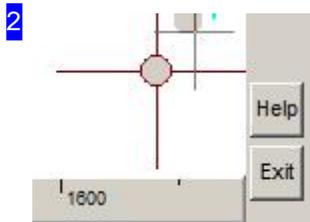
A function remains active until the cursor is repositioned using the 'Place Cursor' function (1). You can see examples of Line groups under [4].

You can use the tablet's function keys to search for geometry points to continue line groups using the required function.

- o F2 - Find all geometry points. Hovering above the contours shows all points by changing the cursor symbol (on/off).
- o F3 - Snap mode for an nd point (on/off).
- o F4 - Find nearest point.
- o F5 - Find nearest element.
- o F8 - Undo.
- o F11 - Save results to a temporary file (Quick-save). This file is held until the final drawing is saved.
- o F12 - Import temporary file. This function can still be 'Undone' (F8).



These two functions show functions (2) and (3)'s status (on/off). Click them to switch the status.



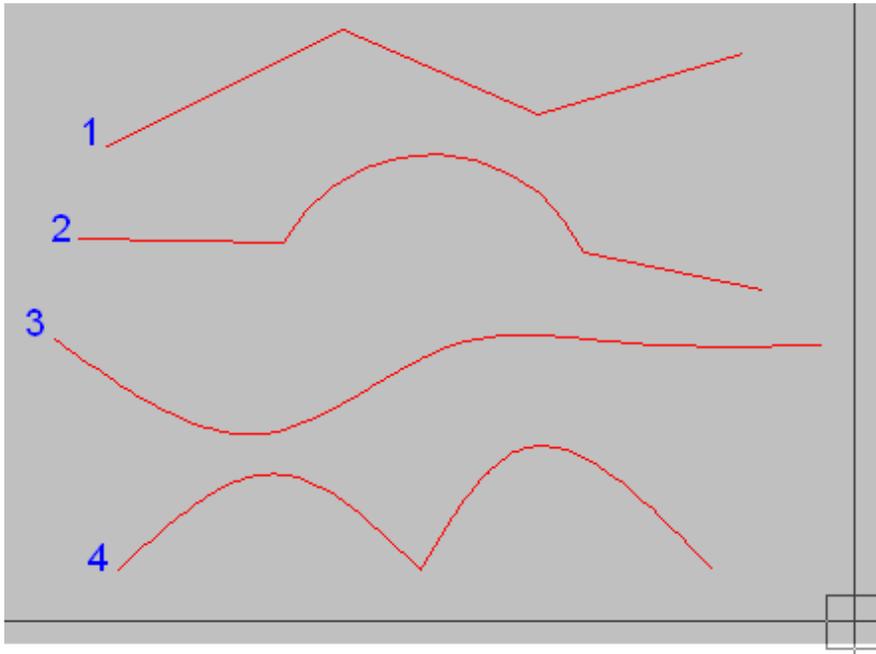
The help button opens a tool tip with explanations for the function keys.
Click the 'Exit' button or press <ESC> to leave and exit to the Sketcher.



This display shows the cursor position as you work. The output is expressed as 4 pairs. The first pair gives the current position of the mouse, the second pair gives the cursor position. The third pair gives the offset and angle between the cursor and mouse. The last pair gives the differential values in X and Y.



4



These line groups captured with the following key sequences (click=mouse the left button):

1. 1, click, 2, click, click, click, 1
2. 1, click, 2, click, 3, click, click, 2, click, 1
3. 7, click, click, click, click, 8
4. 7, click, click, 2*click, click, click, 8

You can finalize and calculate a spline curve by selecting function (8).

If you click twice at the same position when marking a spline curve, the point will not be differentiated, but taken as a line group's start/end point with a sharp corner (see line 4).

When marking a circle at 3 points, double-clicking the second point places the circle's center at the center between points 1 and 2.



Glossary

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Arcs as part of a circle (Segment).

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Circles as closed elements.

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