Rittal – The System.

Faster – better – everywhere.

Operating instructions

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Foreword

Dear Customer,

We thank you for choosing the "Workshop programming" PC software from Rittal!

We wish you every success.

Yours
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We are always happy to answer any technical questions regarding our entire range of products.

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1 Notes on the documentation

1.1 Storing the documents

These operating instructions, together with all applicable documents, are integral components of the product. They must be handed to those persons who are engaged with the creation of machining programs and must always be available and on hand for operating personnel.

1.2 Symbols in these Operating Instructions

The following symbols are used in this documentation:

Danger!
Hazardous situation which will result in death or serious injury if the instructions are not followed.

Warning!
Hazardous situation which may lead to death or serious injury if the instructions are not followed.

Caution!
Hazardous situation which may lead to (minor) injuries if the instructions are not followed.

Note:
Indicates situations that can lead to material damage or provide useful tips for working with the workshop programming.

- This symbol indicates an "action point" and shows that you should perform an operation or procedure.

1.3 Associated documents

In addition to the provided operating instructions, the operating instructions of the associated machine tools belong to the complete documentation.

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2 Program structure, program start and program end

2.1 Program structure

The "Workshop programming" program provides a user interface with which the orders, including all required components, can be created. These orders are then processed on a machine tool, such as the Perforex or the Secarex.

To manage all required data, a database server is typically installed in the network so that a single database can be accessed from multiple installations of the workshop programming and also from the machine tools themselves.

In general, main programs are provided for the creation and administration of the various component parts. Orders, etc. have two different base types of screen pages:

– Selection pages, e.g. "Select order", "Select main program", etc.
– Input pages, e.g. "Order input", "Main program input", etc.

The basic layout of each of these screen pages is largely identical.

2.2 Starting the program

The "Perforex.exe" file must be called to start the "Workshop programming" program. If a link is created to this file, the call can pass the program basic settings and the user for the subsequent processing.

- Switch to the "exe" subdirectory in the installation directory of the "Workshop programming" program.
  This directory contains the above-mentioned "Perforex.exe" file.
- Right-click the "Perforex.exe" file and select the "Create link" entry in the context menu of the Windows Explorer to create a link for this file.
- Right-click this link and select the "Properties" entry in the context menu.

You can append the following additional parameters to the "Target" line of the "Properties of..." dialogue:

– **"-av":** The program is started in "Production planning" mode. This does not cause any search for a connected machine tool so that no fault messages appear at the start.
– **"-u":** The user name with which the user is logged in automatically at the start.
– **"-p":** The password of the above-mentioned user.

For example, the complete line for user "Rittal" with password "Rittal" looks as follows:

– C:\Machine\exe\Perforex.exe -av -uRittal -pRittal

Note:
The user name and the password must be appended directly to the associated parameter without any spaces.

- Start the program with a double-click on the created link.
  A separate login for the workshop programming is then no longer necessary (see section 9.1.2 "User login").

2.3 Layout of the selection pages

2.3.1 General

After calling a menu item in the "Enter" menu, a so-called selection page opens initially. All previously created orders, main programs, etc. are available for processing or selection on these selection pages. These pages appear even when, for example, component parts are added to main programs or main programs to orders.

The "Select main program" screen page below illustrates the layout of the selection pages.

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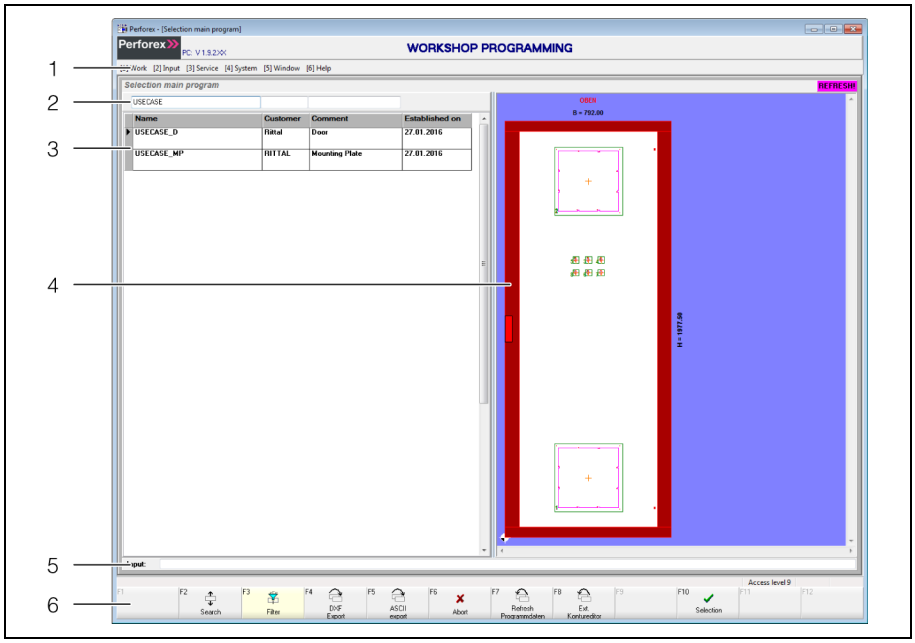

Fig. 1: "Select main program" screen page

Legend

1 Menu bar
2 "Filter" input field
3 Main programs with data block marker selection list
4 Graphical representation of the selected main program
5 "Input" input field
6 Function key bar

2.3.2 Menu bar

The menu bar is identical on all screen pages. The individual menu items can also be selected by pressing the [Alt] key and the associated specified number.

Note:
If the numbers are **not** displayed in front of the entries, they can be activated in the basic settings of the program (see section 9.2.3 "General settings").

Example: Call the "Select main program" screen page.

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu expands and the lower-level menu items displayed.
- Press the [2] key again.
  The "Select main program" screen page opens.

2.3.3 "Filter" input field

This input field is provided on all selection pages to restrict the data blocks displayed in the selection list.

- Press the "[F3] Filter" function key if the "Filter" input field is not displayed above the selection list.
  The "[F3]" function key has a yellow background and the cursor is placed in the "Filter" input field.
- Enter the first character, e.g. "S".
  Only those data blocks that begin with "S" are displayed in the selection list.

Note:
The selection list filter differentiates between uppercase and lowercase. For example, this means that the "SECAREX" project is not found when you enter "Se" in the associated filter field.

- Enter the "_" placeholder for an arbitrary, single character.
  Example: The "SECAREX" and "Seminar" entries are found when "S_" is entered.
- Enter the "%" placeholder for any number of arbitrary characters.
  Example: The "SECAREX 1" and "Seminar 1" entries are found when "S%1" is entered.

2.3.4 Main programs selection list

All main programs that exist in the database are initially displayed in the list. The displayed data blocks can be restricted with the "Filter" input field. Alternatively, the search function can be activated to jump to a specific data block in the selection list (see section 2.3.6 ""Input" input field").

Context menu in the selection list

The display of the selection list can be adapted from the context menu.

- Right-click in the selection list.
  The context menu opens in which the following displays can be activated or deactivated:
  – Name
  – Customer
  – Comment
  – Comment 2
  – Prepared by
  – Prepared on
  – Height
  – Width
  – Thickness

2.3.5 Graphical representation of the selected main program

The content of the main program marked with the data block marker is displayed graphically on the right side of the screen page. The data block marker is a small triangle in the first column that indicates the currently selected data block.

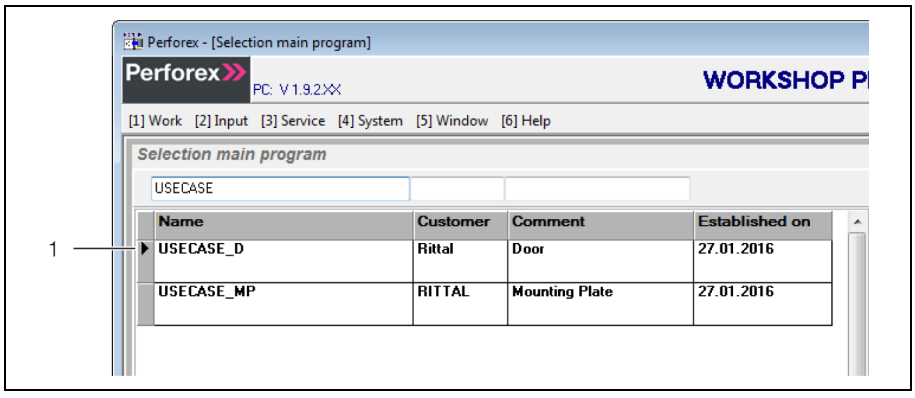

Fig. 2: Data block marker in a selection page

Legend

1 Data block marker

2.3.6 "Input" input field

This input field is provided on all selection pages to allow fast navigation to the desired data block in the selection list.

- Press the "[F2] Search" function key if the "Search" function key does **not** have a yellow background.
  The cursor is positioned in the "Input" input field.
- Enter the first character, e.g. "S".
  All data blocks are still displayed; the data block marker is placed in front of the first data block that begins with "S".

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Note:
The search function differentiates between uppercase and lowercase. For example, this means that the data block marker is not placed in front of the "SECAREX" entry when you enter "Se" in the input field.

Note:
The "_" and "%" placeholders **cannot** be used in the "Input" input field. These characters are used as "normal" characters here.

- Enter further characters until the data block marker is placed in front of the required main program.
- Press the "[F10] Select" function key.
  The "Main program input" screen page is displayed with the data of the selected main program (see section 5 "Main programs").

Note:
If the name in the "Input" input field does not **exactly** match the entry in the selection list, a new main program is created with this name when the "[F10] Select" function key is pressed.

2.3.7 Function key bar

The assignment of the individual buttons or function keys depends on the selected screen page and whether the [Shift], [Ctrl] or [Alt] key is pressed.
This assignment is largely identical for the various screen pages. A separate description is provided on the associated screen page for those selection pages that have a different assignment.

Standard

The function keys are assigned as follows without any additional pressed key:

Key	Function
[F2]	"Search" Activate or deactivate the search function for the "Input" field. – Activated (the button has a yellow background): The search for a data block is made in parallel with the input, i.e. the data block pointer always indicates the first match. – Deactivated (the button has a grey background): No search is made in the existing data blocks.
[F3]	"Filter" Activate or deactivate the filter. – Activated (the button has a yellow background): An input field is displayed above the selection list of the data blocks. Only those data blocks that match the entered search pattern are displayed in the selection list. – Deactivated (the button has a grey background): The input field above the selection list of the data blocks is hidden. The following characters can be used as placeholder in the filter: – _: single character – **%**: any number of characters
[F5]	"ASCII export" Export the selected orders, main programs, etc. as ASCII files. Whereby, it can be selected whether or not an interconnected project should be exported. If yes, for example, the main programs and the component parts, variable component parts, etc. used in these programs for an order are also exported. Such exported data can, for example, be imported to another installation of the workshop programming.

Tab. 1: Function key assignment without additional pressed key

Key	Function
[F6]	"Cancel" Exit the currently selected screen page.
[F7]	"Refresh program data" Refresh the display when changes have been made in nested programs or generally for refreshing the actual content of the database.
[F8]	"Ext. contour editor" Create a contour using the external contour editor, possibly including the creation of an associated component part and a combined component part (see section 4.3 "Combined component parts").
[F10]	"Selection" Open the associated input page to enter or change the data stored for the selected data block.

Tab. 1: Function key assignment without additional pressed key

[Shift] key

When the [Shift] key is pressed, the function key assignment changes as follows:

Key	Function
[F9]	"Print list" Print a bill of materials with all components deployed for the selected data block (see section 2.5.5 "Printing the bill of materials").

Tab. 2: Function key assignment without additional pressed key

[Ctrl] key

When the [Ctrl] key is pressed, the function key assignment changes as follows:

Key	Function
[F2]	"SVG import" Import an SVG file that was previously created externally.
[F3]	"Elpro import" Import an Elpro file that was previously created externally.
[F4]	"DXF import" Import a DXF file that was previously created externally.
[F5]	"ASCII import" Import an order, main program, etc. as ASCII files that were exported previously, for example, to another installation of the workshop programming.
[F6]	"Rename" Rename the currently selected data block. Whereby, not only the name of the order, main program, etc., but also the name of the associated customer/manufacturer can be adapted.
[F7]	"Copy" Copy the currently selected data block. The name of the new order, main program, etc., as well as the name of the customer/manufacturer, can be specified prior to the copy action.
[F8]	"Delete" Delete the currently selected data block.

Tab. 3: Function key assignment for pressed [Ctrl] key

Key	Function
[F10]	"Resolve formula" Resolve all references to the dimensions (such as W and H) and replace them with the calculated result (see section 3.2.4 "Line data"). This operation **cannot** be undone, i.e. a reference cannot be re-established from the numeric value.

Tab. 3: Function key assignment for pressed [Ctrl] key

[Alt] key

When the [Alt] key is pressed, the function key assignment changes as follows:

Key	Function
[F2]	"Snapshot" Create a snapshot for which the current states of the machine are stored in a file. The file has the name "Snapshot", augmented with the date and time, and is stored in the "Snapshot" subdirectory of the installation directory of the workshop programming. This file is used for troubleshooting by the controller manufacturer and is required for fault rectification. A snapshot should always be created when a fault occurs. If the fault should be skipped and processing continued, a snapshot can still be created subsequently, but it then no longer contains the states that were relevant for the occurrence of the fault.
[F4]	"Exit" Exit the "Workshop programming" program. This button corresponds to the [F10] function key, provided no subordinate screen page is active.
[F6]	"Remove hardware" Safe removal of connected hardware components, such as USB sticks.
[F9]	"Logout" Log out the user currently logged in. After the logout, access is possible only with access level 1 to the program (see section 9.1.3 "User logout").
[F10]	"Login" Log in a new user with user name and associated password (see section 9.1.2 "User login").

Tab. 4: Function key assignment for pressed [Alt] key

2.3.8 Copy and paste a new data block

On the selection pages, you can copy and paste a complete data block so it can then be modified appropriately. This reduces the creation effort accordingly for similar component parts or main programs.

- Select with the filter or search function the data block to be used as template.
  The data block marker is placed in front of the associated line.
- Press the [Ctrl]+[F7] key combination to mark the data block.
  The "Copy block" dialogue opens in which you can specify the program number (ultimately, the name of the program) and the name of the customer for the new data block.

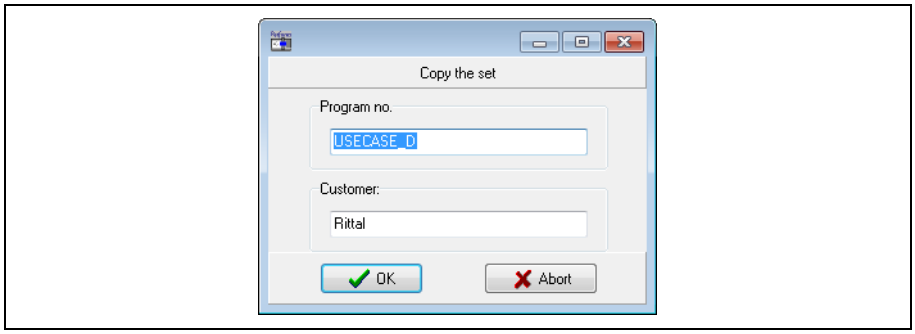

Fig. 3: "Copy block" dialogue

The new data block is created and can now be modified appropriately.

2.4 Layout of the input pages

2.4.1 General

Pressing the "[F10] Select" function key on the selection page displays the so-called input page. On this input page, you can process the values stored for the previously selected data block or create new values.

The "Main program input" screen page below illustrates the layout of the input pages.

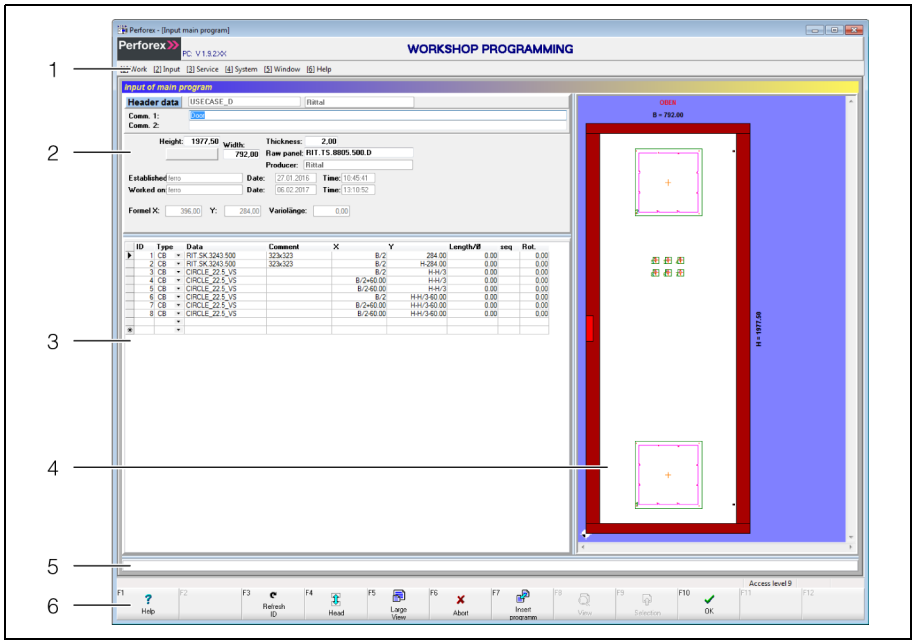

Fig. 4: "Main program input" screen page

Legend

1 Menu bar
2 Header data (alternative to details data)
3 Line data
4 Graphical representation of the selected main program
5 Message bar
6 Function key bar

2.4.2 Menu bar

The menu bar is identical on all screen pages and so corresponds to the menu bar on the selection pages (see section 2.3.2 "Menu bar").

2.4.3 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected main program is displayed as standard.

Parameter	Function
Name	The name of the main program as specified when it was created or renamed. It cannot be changed directly here.
Customer	The name of the customer as specified when it was created or renamed. It cannot be changed directly here.
Comm. 1 and Comm. 2	Comment fields for any background information concerning the main program. As standard, the entry in the first comment field is also displayed on the "Select main program" screen page in the selection list (see section 2.3.4 "Main programs selection list").

Tab. 5: Header data of a main program

If the details data is displayed in the upper area (see section 2.4.4 "Details data"):

- Press the "[F4] Details" function key.
  The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

A separation line separates all information concerning the deployed raw panel in the lower part of the header data.

2.4.4 Details data

As alternative to the header data (see section 2.4.3 "Header data"), the details data can be displayed in the upper area of the screen page. The details data corresponds to the data of the component part marked with the data block marker in the line data.

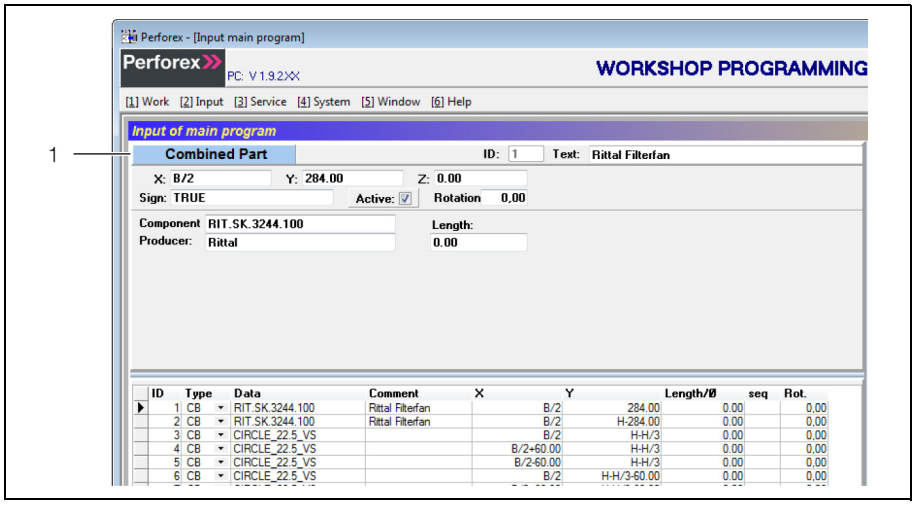

Fig. 5: Details data in the upper area

Legend

1 Details data

- Move the data block marker in the line data to any component part, e.g. with the arrow keys.
  The component part data is also displayed accordingly in the details view.
- Make the changes to the component part data either in the details view or in the line data.
  The changes are transferred automatically to the other view in each case.

Note:
New component parts can be added only to the line data, not to the details data.

If the header data is displayed in the upper area:

- Press the "[F4] Header" function key.
  The background of the "[F4]" function key is marked yellow, the caption changes to "[F4] Details" and the details data is displayed.

2.4.5 Line data

All component parts that were placed on the raw panel in the currently selected main program are displayed in the lower left part of the screen page. New component parts are added by entering values in a previously empty line.

Marking lines

In the line data, one or more lines can be marked so they can then be copied or moved.

- Set the focus in the line data.
- Switch with the arrow keys to the line to be marked.
  The currently selected line is marked with the data block marker in the first column.
- Press the [Alt]+[Ins] key combination.
  If the line is not yet marked, it is now marked red. If the line is already marked, the marking is removed. In both cases, the cursor moves down one line. The selected component part is also highlighted in the graphical representation (see section 9.2.3 "General settings").

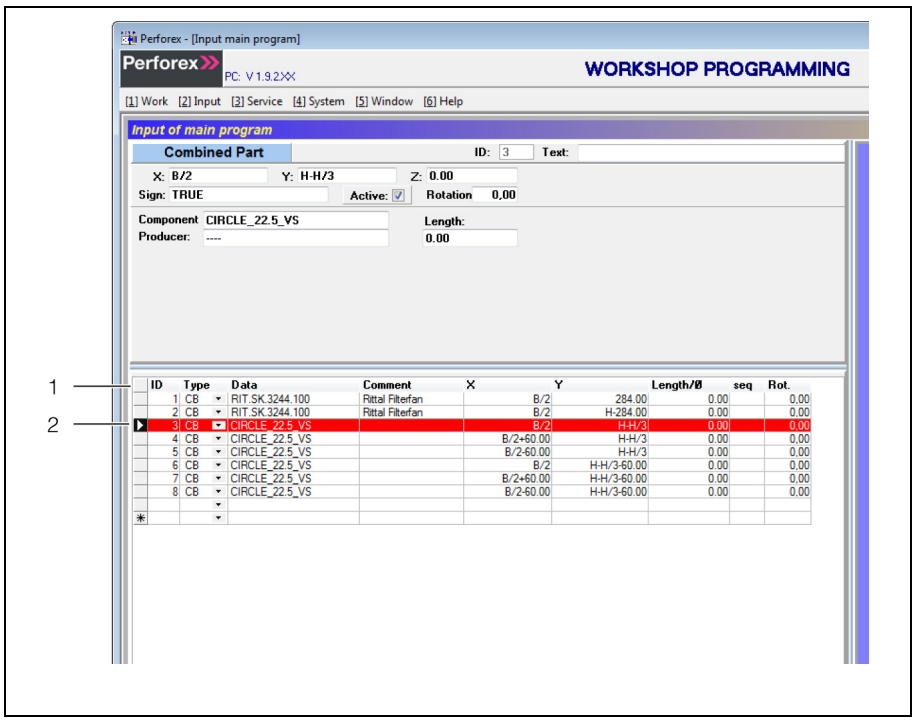

Fig. 6: Line data with marked line

Legend

1 Line data
2 Marked line

- If necessary, switch with the arrow keys to another line to be marked and then press the [Alt]+[Ins] key combination again.
  This line is now **also** marked red.

Alternatively, lines can also be marked with the mouse.

- Press in the first column (the column in which the data block marker is displayed).
  The associated line is marked red.
- Press the [Shift] key and also press in the first column in another line.

All lines to the previously marked line are marked red.

- Press the [Ctrl] key and also press in the first column in another line.
  The last selected line is also marked red in addition to the lines already marked.

You can then copy (or move) and paste such marked component parts together (see section 2.4.8 "Function key bar").

Context menu in the line data

Various work steps can be performed in the line data from the context menu.

- Right-click in the line data.
  The context menu with the following selection options appears:
  - **Copy:** Copies the current line or the previously marked lines (corresponds to the [Ctrl]+[F2] key combination (see section 2.4.8 "Function key bar")).
  - **Paste:** Pastes the previously copied line(s) below the currently selected line (corresponds to the [Ctrl]+[F3] key combination (see section 2.4.8 "Function key bar")). The pasted lines remain marked red.
  - **Delete:** Deletes the marked lines from the line data (corresponds to the [Ctrl]+[F4] key combination (see section 2.4.8 "Function key bar")).
  - **Move:** Moves the marked lines together by a specific amount in the X and/or Y direction.
  - **Augment predrilled component parts:** Creates automatically the required predrilled component parts based on a contour provided no component part or combined component part was created for the contour (see section 4.5 "Contours").

Moving entries to the line data

Component parts and blocked surfaces can be moved individually or together in the X or Y direction.

- Set the focus in the line data.
- Select the lines with the entries that you wish to move.
- Press the [Alt] + arrow key combination to move the component parts or blocked surfaces in 1 mm steps in the associated direction.
  Alternatively, in addition to the [Alt] key, you can also turn the mouse wheel up or down. Whereby, the move is made left or right (X direction) or up or down (Y direction) depending on which column of the line data has the focus.
- Keep the [Alt] + arrow key combination pressed to move the component parts or blocked surfaces by a larger distance.
- Alternatively, press the [Ctrl] key while turning the mouse wheel up or down to move the component part or blocked surface in 10 mm steps.
  The current position of the component parts or blocked surfaces is displayed in the associated line.

Alternatively, previously marked component parts and blocked surfaces can also be moved via the context menu. Whereby, the offset in the X and/or Y direction can be specified directly as numeric value.

- Set the focus in the line data.
- Select the lines with the entries that you wish to move.
- Right-click in the line data.
- Select the "Move" entry in the context menu. Alternatively, press the [Alt]+[V] key combination.
  The following dialogue opens:

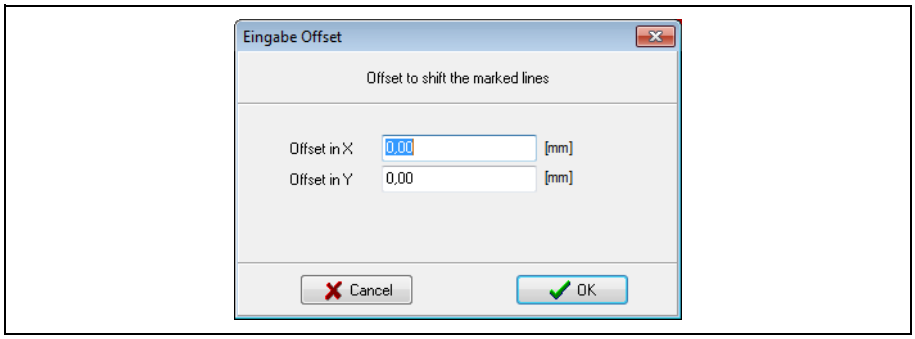

Fig. 7: "Offset input" dialogue

Legend
1 "Offset in X" field
2 "Offset in Y" field

- Enter the desired offset values in the fields.
- Press the OK button to confirm your input.
  All previously marked component parts and blocked surfaces are moved accordingly.

You can also move component parts and blocked surfaces directly in the graphical representation.

- Select the desired component part or blocked surface in the graphical representation.
- Move the mouse over the component part or blocked surface.
  The mouse cursor cross-hair changes to a hand.

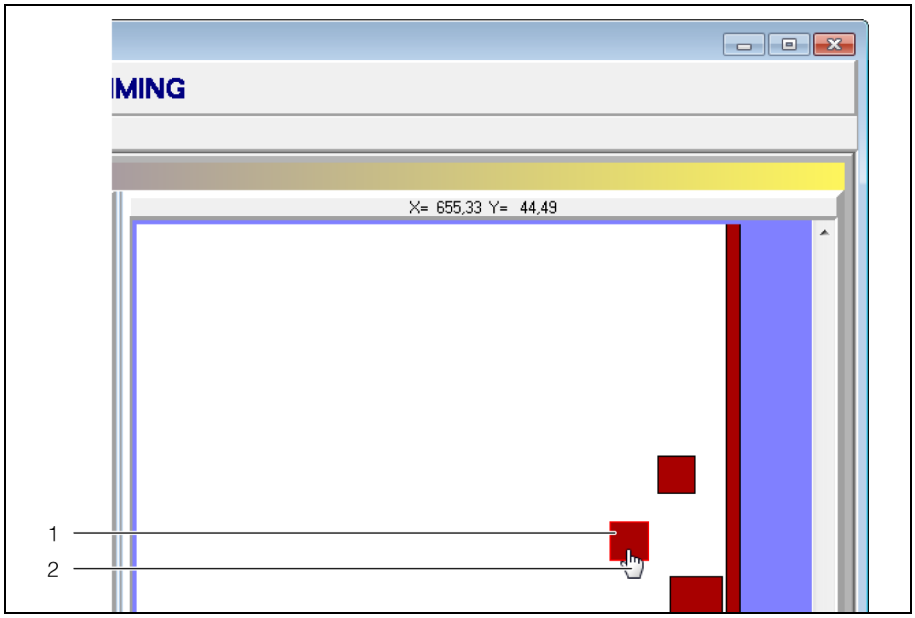

Fig. 8: Moving a blocked surface with the mouse

Legend
1 Selected blocked surface (colour-highlighted edge)
2 Mouse cursor as a hand

- Move the component part or blocked surface to the desired location.

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Note:
The manual moving of component parts or blocked surfaces is obviously very inaccurate. Consequently, manually correct the position in the line data subsequently to ensure that the exact position of the component part or blocked surface is stored.

2.4.6 Graphical representation of the selected main program

The content of the main program is displayed on the right side of the screen page similarly to the selection pages. In addition, the contour of the component part marked with the data block marker is colour-highlighted in the graphical representation on the input pages. This makes it easy to identify the current component part in the graphical representation. Working with the graphical representation is described in detail in section 2.5 "Working with the graphical representation".

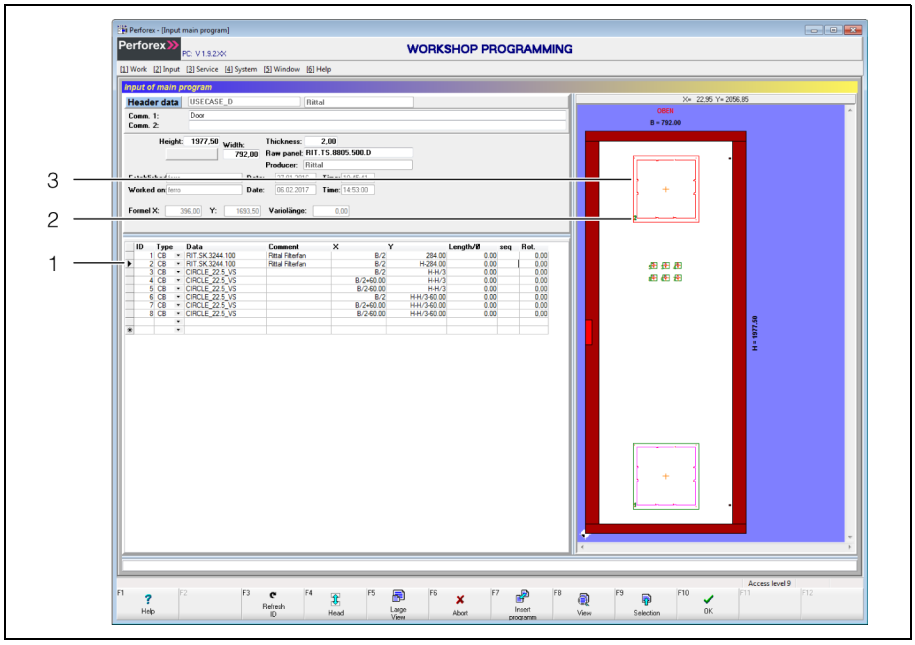

Fig. 9: Selected component part in the line data and the graphical representation

Legend

1 Data block marker
2 ID of the component part in accordance with the line data
3 Coloured highlighting in the graphical representation

2.4.7 Message bar

Any drilling pattern faults are output in a message bar below the line data. Consequently, this message bar is present only on the "Main program input" screen page.

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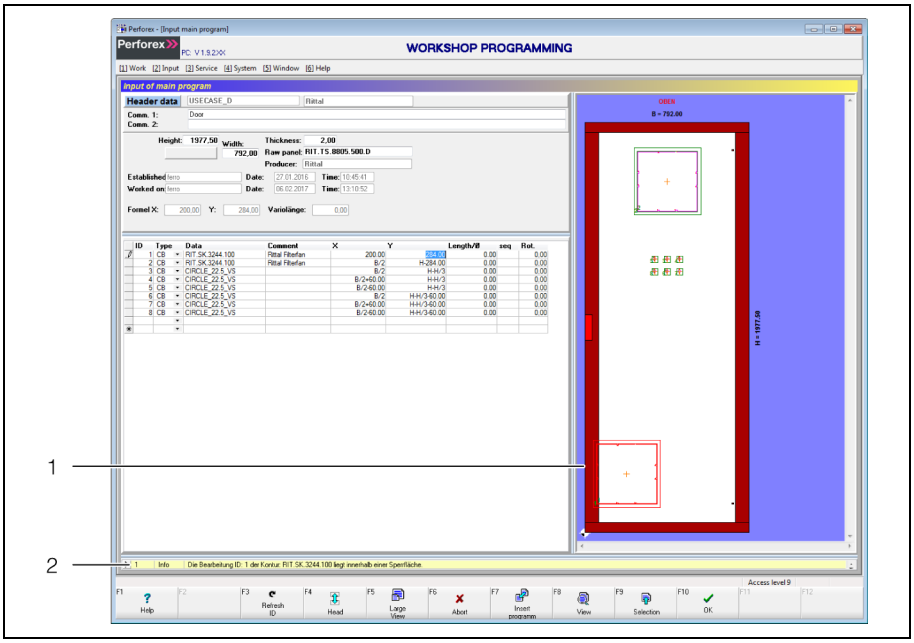


Fig. 10: Message bar

Legend

1 Graphical representation
2 Message bar with information message

Only the first component part with a drilling pattern fault is displayed in the message bar. The message bar has the following structure.

Parameter	Function
ID	ID of the component part with the drilling pattern fault.
Status	Fault message type, e.g. "Info". If the fault is displayed only as information, machining can still be performed.
Fault description	Detailed description of the drilling pattern fault, e.g. "The machining lies outside the workpiece".

Tab. 6: Message bar structure

- Double-click the message bar to display all pending drilling pattern faults for the current main program.
  The message bar is expanded upwards so that multiple entries can be displayed.
- Double-click the message bar again to reduce it to a single line.

2.4.8 Function key bar

Like the selection pages, the assignment of the individual buttons or function keys also depends on the selected screen page and whether the [Shift], [Ctrl] or [Alt] key is pressed (see section 2.3.7 "Function key bar").
The assignment of the function keys or buttons at the lower screen edge is described below. This assignment is largely identical for the various screen pages. A separate description is provided on the associated screen page for those screen pages that have a different assignment.

Standard

The function keys are assigned as follows without any additional pressed key:

Key	Function
[F1]	"Help" Supporting help text for operating the program.
[F3]	"Refresh ID" Refresh or reassign the IDs in increasing sequence. For example, this can be useful when lines are deleted in the line data or pasted by being copied.
[F4]	"Header" or "Detail" Switch manually between the header data and the details data (see section 2.4.3 "Header data" or section 2.4.4 "Details data").
[F5]	"Large graphic" or "Small graphic" Maximise the graphical representation to the complete desktop or minimise. Alternatively, the representation can also be switched with a double-click on the graphic.
[F6]	"Cancel" Exit the input page without transferring the current data to the main program, the order, etc. An appropriate prompt appears before the actual exit.
[F7]	"Add program" Add the machining operations of a previously created program to the current program (or a previously created component part to the current component part).
[F8]	"View" Open the input page for the component part or tool currently selected in the line data. The selected data block can be edited directly there.
[F9]	"Selection" Open the selection page for the associated component part type in the currently selected line.
[F10]	"OK" Transfer the current data to the main program, the order, etc. (= Save).

Tab. 7: Function key assignment without additional pressed key

[Shift] key

The function keys are assigned as follows for pressed [Shift] key:

Key	Function
[F9]	"Print list" Print the current main program, order, etc. with all information displayed on the input page (corresponds to the same function key on the selection pages).

Tab. 8: Function key assignment for pressed [Shift] key

[Ctrl] key

When the [Ctrl] key is pressed, the function key assignment changes as follows:

Key	Function
[F2]	"Copy" Copy the currently selected data blocks to then paste them at another location. This function is also provided in the context menu (see section 2.4.5 "Line data").

Tab. 9: Function key assignment for pressed [Ctrl] key

Key	Function
[F3]	"Paste" Paste the previously copied data blocks. The data blocks are always pasted below the current cursor position. This function is also provided in the context menu (see section 2.4.5 "Line data").
[F4]	"Delete" Delete the currently selected data blocks.
[F5]	"Mirror graphic" The complete graphic is mirrored horizontally, i.e. the view on the raw panel is displayed from the opposite side (rear). The coordinate origin is then at the bottom right.
[F6]	"Resolve formula" If the cursor is located in a cell that references the dimensions of the raw panel or other component parts, the reference is resolved and replaced with the calculated result. This operation **cannot** be undone, i.e. a reference cannot be re-established from the numeric value.
[F7]	"Layer" Show or hide individual elements in the graphical representation (see section 2.5.2 "Displaying and hiding layers").
[F8]	"Representation" Adapt the representation of the raw panel editor. The "details display" and the "graphical representation" can be shown or hidden here. A switch can also be made between the list representation (standard) and the tree representation.
[F9]	"Print" Print the graphical representation. The print-out is made directly on the standard printer stored in the system. It may be desirable to display the print preview before actually printing ([Ctrl]+[F10] key combination; see section 2.5.4 "Printing the graphical representation").
[F10]	"Print preview" Display the print preview for the graphical representation. The scale of the graphic is adapted so that it is printed format-filling with the additional drawing information (see section 2.5.4 "Printing the graphical representation").

Tab. 9: Function key assignment for pressed [Ctrl] key

[Alt] key

When the [Alt] key is pressed, the function key assignment corresponds to the assignment on the selection page (see section 2.3.7 "Function key bar").

2.5 Working with the graphical representation

2.5.1 General

On the input pages, the graphical representation can be adapted to a large extent and then printed. Individual subprograms (component parts, variable component parts, etc.) can also be selected directly with the mouse in the graphical representation. The data block marker in the line view then switches to the appropriate line of the component part.

2.5.2 Displaying and hiding layers

In addition to mirroring the graphic ([Ctrl]+[F5] key combination), individual layers can also be shown or hidden.

- Press the [Ctrl]+[F7] key combination.
  The following dialogue opens:

EN

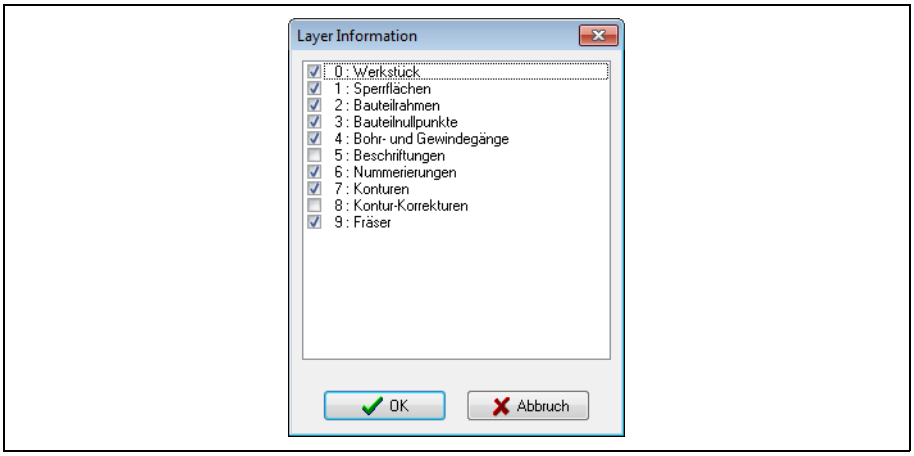


Fig. 11: "Layer Information" dialogue

- Select or deselect the individual layers depending on whether the associated information should be displayed (activated) or not (deactivated).

2.5.3 Increasing or decreasing the size of the graphical representation

- First press in the graphic window so it has the focus.
- Increase the representation size by pressing the [Screen up] key or decrease the representation size by pressing the [Screen down] key.
- If the size increase is set so that only part of the graphic is displayed: Move the displayed section with the arrow keys in the appropriate direction.
- Alternatively, while holding the right mouse key pressed, move an area in the graphical representation.
  The representation is increased in size to this area.

2.5.4 Printing the graphical representation

The graphical representation can be printed directly on the standard printer stored in the system ([Ctrl]+[F9] key combination). Alternatively, a print preview can first be opened and the print-out adapted.

- Press the [Ctrl]+[F10] key combination.
  The following dialogue opens.

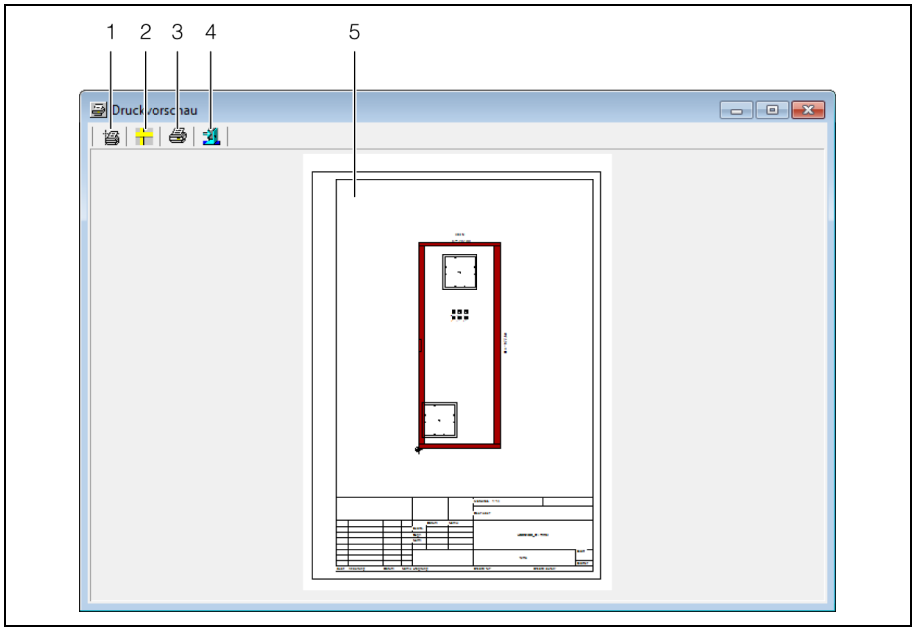


Fig. 12: "Print Preview" dialogue

Legend

1 "Page setup" button
2 "Ruler On/Off" button
3 "Print drawing" button
4 "Exit print preview" button
5 Print preview

The form of the print-out can be customised with the two left buttons at the upper edge.

■ Press the "Page setup" button.
The following dialogue opens.

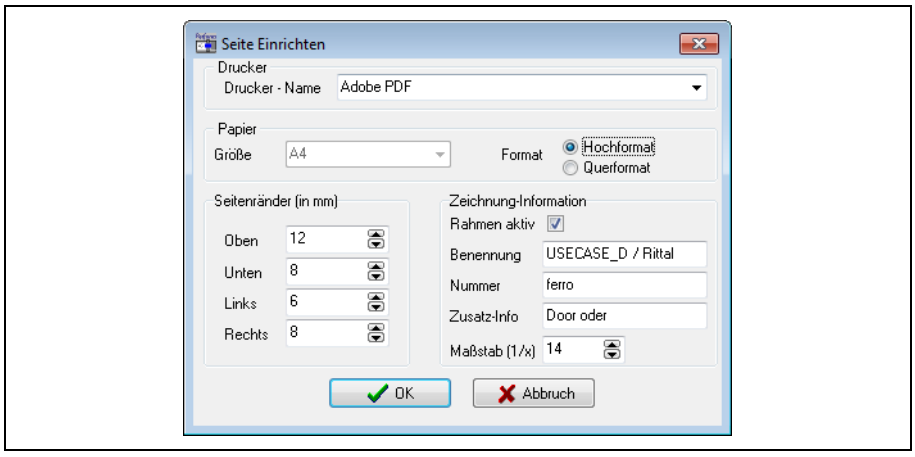


Fig. 13: "Page Setup" dialogue

■ Layout the page and the form of the print-out with the following parameters.

Parameter	Function
Printer name	Select the printer on which the output should be made.
Size	This function is not currently supported. The print-out is always made on A4 paper.
Portrait/landscape format	Select the orientation of the paper and so the print-out.

Tab. 10: Page setup

Parameter	Function
Page margins	Specification of the page margins at the top, bottom, left and right.

Tab. 10: Page setup

- Specify with the parameters in the "Drawing information" area which supplementary information should be printed on the drawing.

Parameter	Function
Margin active	Show or hide the complete supplementary information.
Designation	The name of the graphic or raw panel. As standard, the values are taken from the "Program no." and "Manufacturer" fields as specified when the raw panel was created.
Number	Drawing number. As standard, the "Account name" of the raw panel creator is taken.
Supplementary information	Further information about the drawing. As standard, the content of the first comment field "Comm. 1" is taken.
Scale	As standard, the scale of the drawing is adapted so that the complete raw panel, including the supplementary drawing information, is represented completely on the page. Increasing the scale, causes only part of the raw panel to be printed; decreasing the scale makes the drawing correspondingly smaller.

Tab. 11: Drawing information

- If necessary, press the appropriate button to show a ruler in the drawing.
- Finally, print the drawing or close the print preview.

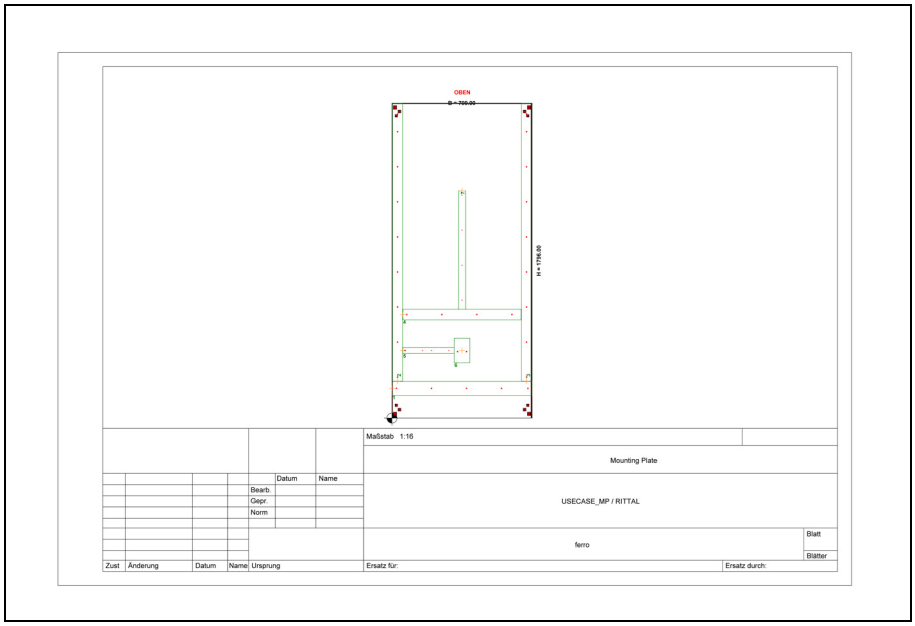


Fig. 14: Example drawing print-out

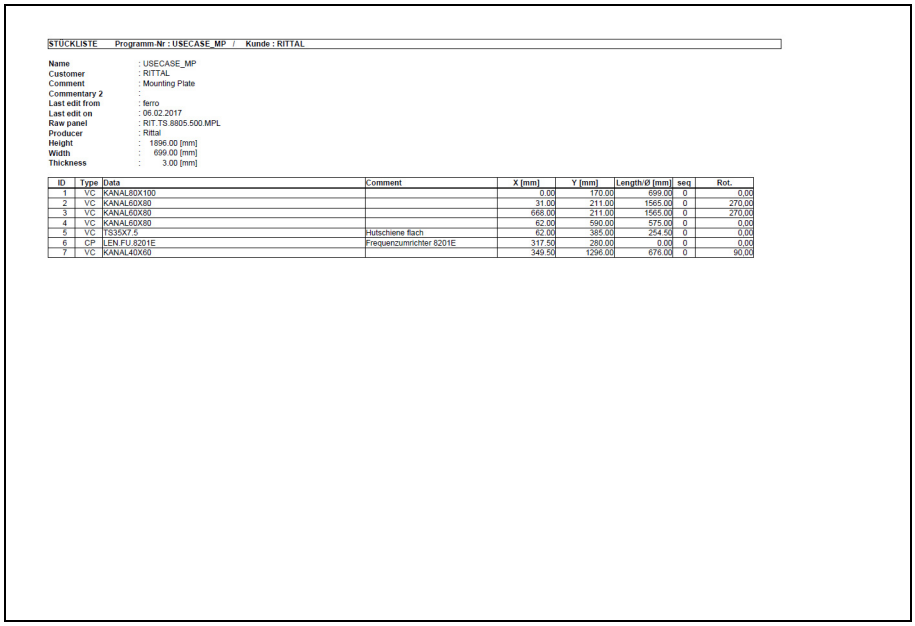
The IDs of the individual component parts can also be output in the drawing. This allows a simple assignment of the individual component parts to the bill of materials.

2.5.5 Printing the bill of materials

The bill of materials of the selected main program can be printed in addition to the graphical representation or even separately. In the bill of materials, all previously calculated values, possibly using references, can be converted into actual

numeric values, for example, to make it easy to cut the cable ducts to the actual required length.

- Press the [Shift]+[F9] key combination.
  Two prompts are displayed whether the bill of materials should be printed or a detailed print-out generated. The print-out is then made on the standard printer stored in the system.



STUCKLISTE Programm-Nr : USECASE_MP / Kunde : RITTAL

Name	: USECASE_MP
Customer	: RITTAL
Comment	: Mounting Plate
Commentary 2	:
Last edit from	: ferro
Last edit on	: 06.02.2017
Raw panel	: RIT.TS.8805.500.MPL
Producer	: Rittal
Height	: 1896.00 [mm]
Width	: 699.00 [mm]
Thickness	: 3.00 [mm]

ID	Type	Data	Comment	X [mm]	Y [mm]	Length/Ø [mm]	seq	Rot.
1	VC	KANAL80X100		0.00	170.00	699.00	0	0,00
2	VC	KANAL60X80		31.00	211.00	1565.00	0	270,00
3	VC	KANAL60X80		668.00	211.00	1565.00	0	270,00
4	VC	KANAL60X80		62.00	590.00	575.00	0	0,00
5	VC	TS35X7.5	Hutschiene flach	62.00	385.00	254.50	0	0,00
6	CP	LEN.FU.8201E	Frequenzumrichter 8201E	317.50	280.00	0.00	0	0,00
7	VC	KANAL40X60		349.50	1296.00	676.00	0	90,00

Fig. 15: Example bill of materials print-out

Because the IDs of the individual component parts are also output in the bill of materials, the mounting position of the component parts is easily visible by comparing with the print-out of the graphical representation.

2.6 Exiting the program

- Ensure that all selection and input pages in the program are closed.
- Press the "[F10] Exit" function key on the main page of the program.
  You are prompted whether the program should be exited.
- Confirm the prompt by pressing the "Exit" button to exit the program or press the "Cancel" button to continue working with the program.

Alternative:

- While holding the [Alt] key pressed, press the [1] key.
  The "Work" menu expands and the lower-level menu items displayed.
- Press the [2] key.
  You are prompted again whether the program should be exited.

EN

3 Raw panels

3.1 General

Like component parts, contours, etc., the data for raw panels is normally created just once when it is needed for the first time for a main program or order. The raw panels are then directly available for subsequent orders, possibly by copying and adapting the stored data.

Not only mounting plates, but also doors and side panels for racks, for example, are designated as raw panels. Raw panels are often supplied with prepunched holes. If machining operations are performed on the edge of a perforation, the machining can cause tool breakage or damage to the machine tool. Because many drilling patterns are performed in the same raw panels, the "Workshop programming" program contains a raw panel editor that permits the dimensioning of raw panels and the assignment of blocked surfaces in which no machining is permitted.

3.2 Entering raw panels

3.2.1 General

In addition to the specification of the dimensions of a raw panel with details of the height, width and thickness, the raw panel editor also allows the assignment of blocked surfaces in which no machining is permitted. This allows, for example, prepunched holes within the raw panel or also reserve areas to be covered with a blocked surface. The blocked surfaces are specified as a list.

3.2.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [3] key.
  The "Select raw panel" screen page opens.
- Select with the filter or search function a previously created raw panel.
- Alternatively, enter in the "Input" field the name of the raw panel that you want to create.
- Finally, press the "[F10] Select" function key.
  The "raw panel input" screen page opens.

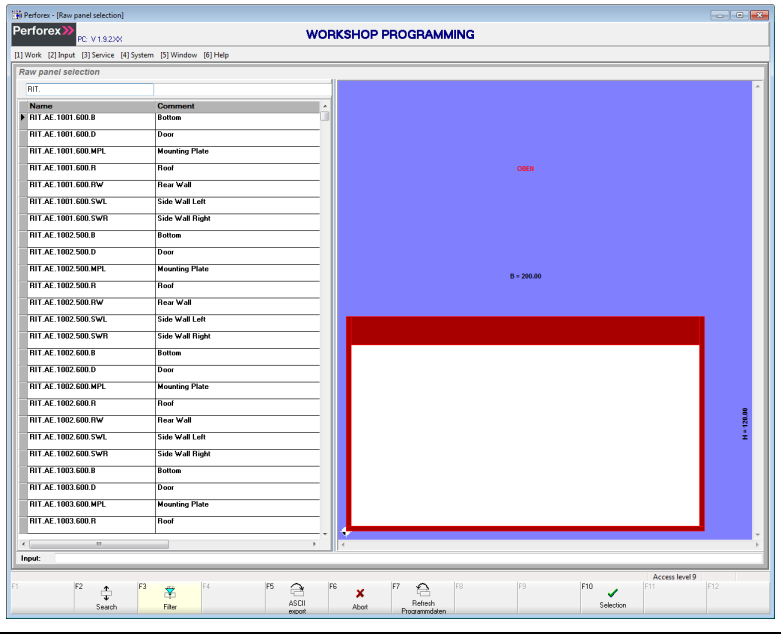


Fig. 16: "Raw panel input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a raw panel are discussed below.

3.2.3 Header data

In the upper area of the screen page, the so-called header data with basic information for the selected raw panel is displayed as standard.

If the details data is displayed in the upper area:

- Press the "[F4] Details" function key.
  The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

The following data can be entered in the header data for a raw panel.

Parameter	Function
Comm. 1 and Comm. 2	Comment fields for any background information concerning the raw panel.
Height	The height of the raw panel in millimetres.
Width	The width of the raw panel in millimetres.
Thickness	The thickness of the raw panel in millimetres.

Tab. 12: Header data that can be edited for a raw panel

Although additional data concerning the raw panel is displayed, it cannot be edited (directly).

Parameter	Function
Created/date/time	Account of the user who created the raw panel at the specified date and time.
Edited/date/time	Account of the user who last edited the raw panel at the specified date and time.

Tab. 13: Additional header data for a raw panel (cannot be edited)

The currently calculated numeric values are displayed in the following fields, that also cannot be edited. If no references are used in the line data, the same values as in the line data are displayed here.

Parameter	Function
X1	X coordinate of the first limitation of the blocked surface.
X2	X coordinate of the second limitation of the blocked surface.
Y1	Y coordinate of the first limitation of the blocked surface.
Y2	Y coordinate of the second limitation of the blocked surface.

Tab. 14: Calculated numeric values

Whereby, the X and Y coordinates define the limitations of the blocked surface as follows. All coordinates are measured from the origin of the raw panel; the origin is represented as a cross in a black-and-white circle.

Note:
When creating blocked surfaces, ensure that the X2 value is larger than the X1 value and the Y2 value is larger than the Y1 value.

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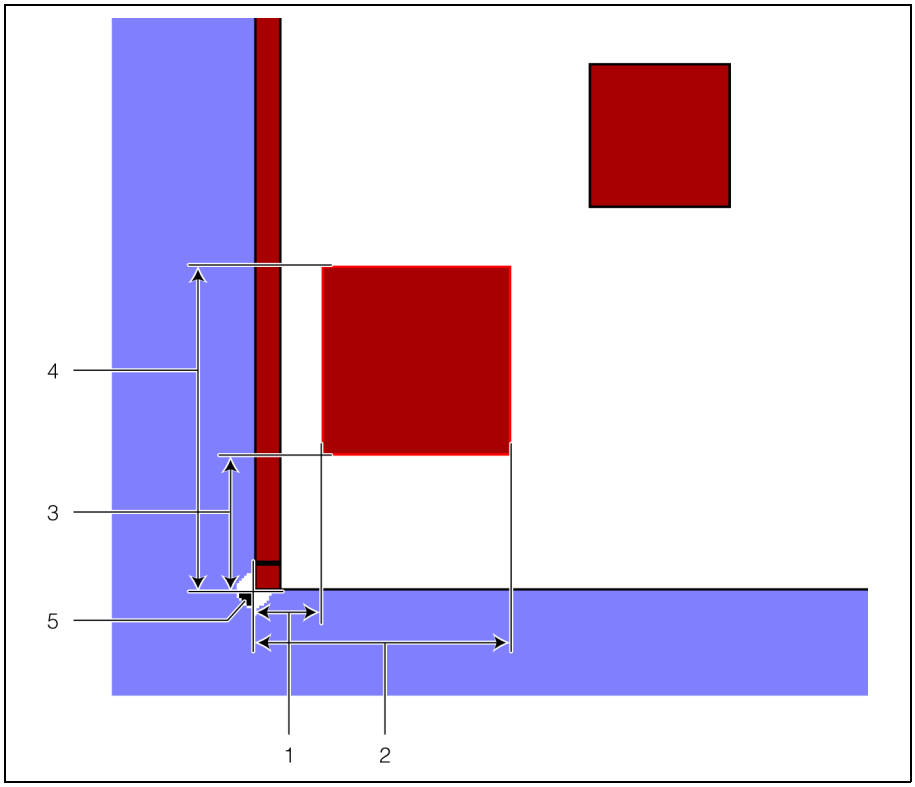

Fig. 17: Limitations of a blocked surface

Legend

1 X1 coordinate
2 X2 coordinate
3 Y1 coordinate
4 Y2 coordinate
5 Origin of the raw panel

3.2.4 Line data

The individual blocked surfaces are entered in the line data. If the cursor is positioned in a line already filled with values, the details data of the associated blocked surface is displayed automatically in the upper area of the screen page. The position and the dimension of a blocked surface are specified with the following data.

Parameter	Function
ID	The data block number of the associated blocked surface (assigned automatically, because this data block number must be unique within a component part).
Type	Blocked surface type. Only the "EA" Exclusion Area entry (for blocked surface) can be selected here.
Comment	The comment field for any background information concerning the blocked surface.
X1, X2, Y1 and Y2	The coordinates of the limitation point of the blocked surface.
Raise pressure plate	Activate ("Yes" entry) or deactivate ("No" entry) whether or not the pressure plate on the machine tool is raised in the area of this blocked surface.

Tab. 15: Line data that can be edited for a raw panel

The following additional parameters can also be specified in the details data.

Parameter	Function
Cond.	This parameter exists for compatibility reasons and is not used actively.
Active	This checkbox specifies whether the blocked surface is "active" and so excluded from the machining. This allows blocked surfaces to be released for machining without the blocked surface needing to be removed from the raw panel.

Tab. 16: Additional parameters in the details data

Using references for the input of blocked surfaces

References to the dimensions of the raw panel can be used when creating blocked surfaces. These references are retained, i.e. when the dimensions of the raw panel are changed, the positions and dimensions of the blocked surface are recalculated accordingly.

The following references can be used for blocked surfaces:

– **W:** Width of the raw panel
– **H:** Height of the raw panel

Example:

A 3 mm wide blocked surface that extends over the complete height at the right-hand edge of the mounting plate should be defined on a mounting plate with the dimensions 1896 mm (height) x 699 mm (width).

- Enter value "B-3" in field "X1".
  The first limitation in the X direction so lies 3 mm from the right-hand edge of the mounting plate.
- Enter value "B" in field "X2".
  The second limitation in the X direction so lies directly at the right-hand edge of the mounting plate.
- Enter value "0" in field "Y1".
  The first limitation in the Y direction so lies at the lower edge of the mounting plate.
- Enter value "H" in field "Y2".
  The second limitation in the Y direction so lies at the upper edge of the mounting plate.

The calculated values based on the actual height and width of the raw panel are displayed in the corresponding fields X1, X2, Y1 and Y2 in the header data:

– **X1:** 696.00
– **X2:** 699.00
– **Y1:** 0.00
– **Y2:** 1896.00

Based on this raw panel, you can now create a new raw panel with different dimensions, e.g. the same blocked surface on the right-hand edge.

- Copy the previously created raw panel (see section 2.3.8 "Copy and paste a new data block").
  The data block marker is then placed in front of the new data block.
- Press the "[F10] Select" function key to edit the data block.
- Adapt the dimensions of the raw panel, e.g. to a width of 499 mm and height of 1997 mm.
  Further adaptation of the blocked surface position is **not** necessary.

The calculated values based on the actual height and width of the raw panel are also displayed in the corresponding fields X1, X2, Y1 and Y2 in the header data:

– **X1:** 496.00
– **X2:** 499.00
– **Y1:** 0.00

– **Y2:** 1997.00

Adding blocked surfaces of previously created raw panels

Blocked surfaces of previously created raw panels can also be transferred. Whereby, when using references to the dimensions, the actual position and the dimensions of the blocked surfaces are adapted to the current raw panel.

- Press the "[F7] Add prog." function key.
  The "Select raw panel" screen page opens.
- Select with the filter or search function the data block from which the blocked surfaces should be added.
  The data block marker is placed in front of the associated line.
- Press the "[F10] Select" function key.
  All blocked surfaces from the selected raw panel are added and marked red.

3.3 Function key bar

On the selection page as well as the input page for raw panels, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

EN

4 Subprograms

4.1 General

Drilling patterns for component parts, combined component parts, variable component parts and contours can be created in the "Subprograms" area.

Like raw panels, the data for subprograms is normally created just once when it is needed for a main program or order. Subprograms serve to reduce the programming effort for main programs (see section 5 "Main programs") by reusing previously created subprograms. The effort for creating subprograms themselves also reduces with a growing "library", because a previously created subprogram of a similar component part can be copied and then easily and quickly adapted.

4.2 Component parts

4.2.1 General

Component parts are subprograms with fixed dimensions and so exactly defined drilling patterns. Component parts are normally of interest for the drilling pattern only when they are attached directly on the mounting plate (e.g. frequency converters, transformers, etc.). Component parts mounted on a variable component part, such as a mounting rail, have no effect on the drilling pattern in the main program.

4.2.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [4] key.
  The "Subprograms" submenu expands and the lower-level menu items displayed.
- Press the [1] key.
  The "Component part selection" screen page opens.
- Select with the filter or search function a previously created component part.
- Alternatively, enter in the "Input" field the name of the component part to be created.
- Finally, press the "[F10] Select" function key.
  The "Component part input" screen page opens.

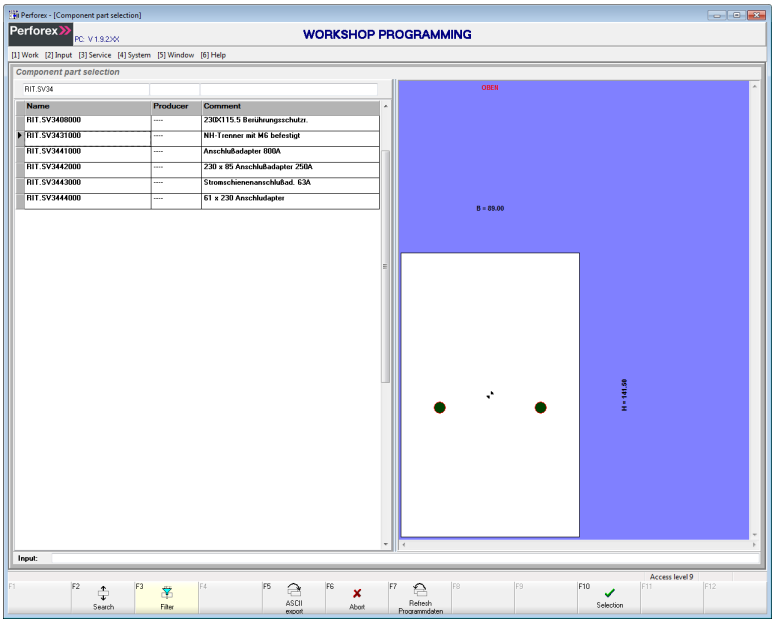

Fig. 18: "Component part input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a component part are discussed below.

4.2.3 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected component part is displayed as standard.

If the details data is displayed in the upper area:

- Press the "[F4] Details" function key.
  The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

The following data can be entered in the header data for a component part.

Parameter	Function
Comm. 1 and Comm. 2	Comment fields for any background information concerning the component part.
Height+ and Height–	The height of the component part in millimetres (Y direction). The height is divided into two values that specify the origin of the component part. Rittal recommends that both height values are entered symmetrically, e.g. +100 mm and -100 mm, so that the origin lies at the centre of the component part (see section 4.2.4 "Line data").
Width+ and Width–	The width of the component part in millimetres (X direction). Like the height, the width is divided into two values that also specify the origin of the component part. Rittal also recommends that both width values are entered symmetrically, e.g. +40 mm and 40 mm, so that the origin lies at the centre of the component part (see section 4.2.4 "Line data").

Tab. 17: Header data that can be edited for a component part

Although additional data concerning the component part is displayed, it cannot be edited (directly).

Parameter	Function
Created/date/time	The account of the user who created the component part at the specified date and time.
Edited/date/time	The account of the user who last edited the component part at the specified date and time.

Tab. 18: Additional header data for a component part (cannot be edited)

The currently calculated numeric values are displayed in the following fields that also cannot be edited. If no references are used in the line data, the same values as in the line data are displayed here.

Parameter	Function
X	The X coordinate of the mounting point.
Y	The Y coordinate of the mounting point.

Tab. 19: Calculated numeric values

4.2.4 Line data

The positions of the individual mounting points as well as the tool used for attaching the mounting points are entered in the line data.

Parameter	Function
ID	The data block number of the associated mounting point (assigned automatically, because this data block number must be unique within a component part).
Type	Entry type. Only the "SP" Single Processing entry (for individual machining) can be selected here.
Data	The number of the tool deployed for creating the mounting point.
Comment	The comment field from the description of the selected tool. The comment can be changed manually, but will be overwritten with the associated text from the description when a tool is selected.
X, Y	The coordinates of the mounting point.
Ø	The diameter of the tool selected for individual machining. This value is taken from the tool management.

Tab. 20: Line data that can be edited for a component part

Using references for the input of mounting points

For the creation of mounting points, in general, the same references to the dimensions of the component parts can be used as for blocked surfaces for raw panels (see section 3.2.4 "Line data").

Note:
Rittal recommends that the dimensions of the component part are entered symmetrically so that the origin lies at the centre of the component part. This simplifies the subsequent positioning of the component part in a main program. This impairs, however, the use of the previously-mentioned references, because the X and Y positions are entered signed in the range ±B/2 and ±H/2.

Example:

A component part for an LV HRC switch connector with the dimensions 141.50 mm (height) and 89 mm (width) should be defined. The component part is secured with two M6 screws. The mounting points in the X direction and in the Y direction are each 25 mm and 6.25 mm from the origin, respectively.

- Enter the value "70.75" in the "Height+" field (half the total height of 141.50 mm).
- Enter the value "-70.75" in the "Height-" field.
  The origin in the Y direction so lies centred in the LV HRC switch connector.
- Enter the value "-44.50" in the "Width-" field (half the total width of 89 mm).
- Enter the value "44.50" in the "Width+" field.
  The origin in the X direction also lies centred in the LV HRC switch connector.
- Set the focus in the line data.
- Press the "[F9] Select" function key.
  The "Select tool" screen page opens.
- Set the data block marker in the line with tool no. 12 "M6 Tap".
- Press the "[F10] Select" function key to confirm the selection.
  The tool is transferred to the line data.
- Enter for the X and Y values the desired position of the first mounting point, i.e. "-25" (X) and "-6.25" (Y).
- Copy this entry and paste it again (see section 2.4.5 "Line data").
  The newly pasted line is marked red.
- Move the entry by 50 mm in the X direction using the "Move" entry in the context menu of the line data (see section 2.4.5 "Line data").

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Adding mounting points of previously created component parts

Like blocked surfaces for raw panels, the mounting points of previously created component parts can be used for component parts (see section 3.2.4 "Line data").

4.2.5 Function key bar

On the selection page as well as the input page for component parts, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

4.3 Combined component parts

4.3.1 General

Combined component parts unite component parts (see section 4.2 "Component parts"), contours (see section 4.5 "Contours") and individual machining operations. This further simplifies the creation of main programs, because this data is grouped in a **single** combined component part.

4.3.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [4] key.
  The "Subprograms" submenu expands and the lower-level menu items displayed.
- Press the [2] key.
  The "Select combined component part" screen page opens.
- Select with the filter or search function a previously created combined component part.
- Alternatively, enter in the "Input" field the name of the combined component part to be created.
- Finally, press the "[F10] Select" function key.
  The "Combined component part input" screen page opens.

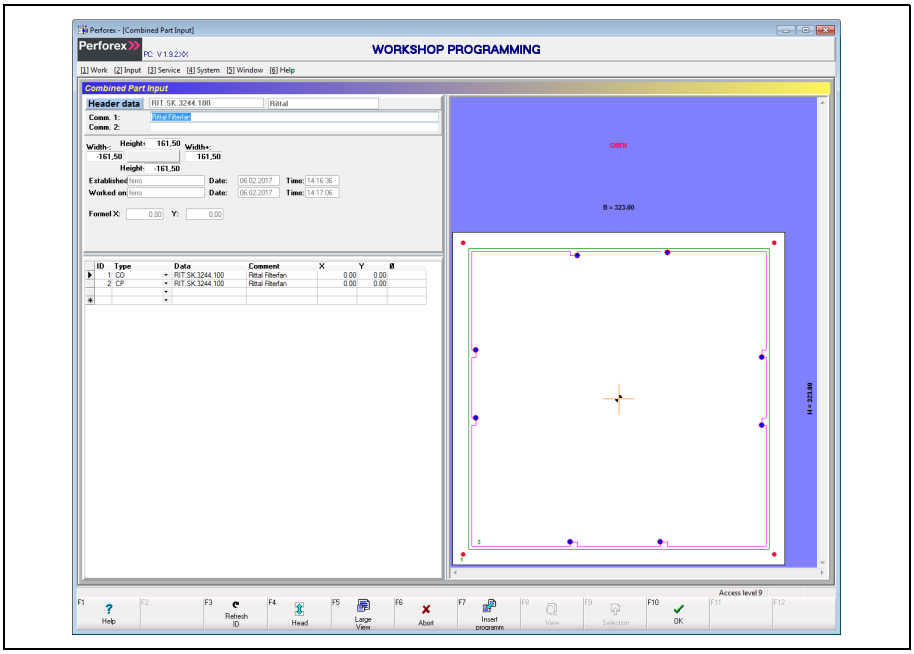

Fig. 19: "Combined component part input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a combined component part are discussed below.

4.3.3 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected combined component part is displayed as standard.

If the details data is displayed in the upper area:

- Press the "[F4] Details" function key.
  The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

The following data can be entered in the header data for a combined component part.

Parameter	Function
Comm. 1 and Comm. 2	Comment fields for any background information concerning the combined component part.
Height+ and Height–	The height of the combined component part in millimetres. The height is divided into two values that specify the origin of the component part. If both height values are entered symmetrically, e.g. +100 mm and -100 mm, the origin lies at the centre of the combined component part.
Width+ and Width–	The width of the combined component part in millimetres. Like the height, the width is divided into two values that also specify the origin of the combined component part. If both width values are entered symmetrically, e.g. +40 mm and -40 mm, the origin lies at the centre of the combined component part.

Tab. 21: Header data that can be edited for a combined component part

Although additional data concerning the combined component part is displayed, it cannot be edited (directly).

Parameter	Function
Created/date/time	The account of the user who created the combined component part at the specified date and time.
Edited/date/time	The account of the user who last edited the combined component part at the specified date and time.

Tab. 22: Additional header data for a component part (cannot be edited)

The currently calculated numeric values are displayed in the following fields that also cannot be edited. If no references are used in the line data, the same values as in the line data are displayed here.

Parameter	Function
X	The X coordinate of the contour, component part or the individual machining.
Y	The Y coordinate of the contour, component part or the individual machining.

Tab. 23: Calculated numeric values

4.3.4 Line data

The individual components of the combined component part are specified in the line data, namely, the contour and possibly the component part and/or additional individual machinings for predrilled holes.

Parameter	Function
ID	The data block number of the associated component (assigned automatically, because this data block number must be unique within a component part).
Type	Entry type. The following entries can be selected. – **SP:** Single Processing (individual machining) – **Co:** Contour – **Cp:** Component part – **VC:** Variable Component Part
Data	The name of the selected component, e.g. of the contour or the component part.
Comment	The comment field from the description of the associated component. The comment can be changed manually, but will be overwritten with the associated text from the description when a component is selected.
X, Y	The coordinates of the associated component.
Ø	For an individual machining: The diameter of the selected tool. This value is taken from the tool management.

Tab. 24: Line data that can be edited for a combined component part

Creating mounting points

Like component parts, the mounting points for combined component parts can be entered as individual machinings (see section 4.2.4 "Line data").

Adding contours and component parts of previously created combined component parts

Like blocked surfaces for raw panels, the data of previously created combined component parts can be used for combined component parts (see section 3.2.4 "Line data").

4.3.5 Creating combined component parts

If a combined component part should be created from scratch, this is best done with the external contour editor. Because all components of a combined component part can be created together in a single step in the external contour editor, the complete combined component part is available directly.

Note:
Because working with the external contour editor is described in detail in section 4.5.5 "External contour editor" as part of the description of contours, a new description is not given here.

If the contour (and possibly also an associated component part) is already available, a combined component part can also be created manually based on this data.

Example:

A combined component part for the Rittal TopTherm filter fan (model no. SK 3244.100) should be created. For this purpose, the appropriate contour "RIT.SK.3244.100", but no component part, was created previously. This means the predrilled holes must be defined in the combined component part, as must the position of the mounting points. The exterior dimensions of the filter fan are 323 mm x 323 mm.

- Enter the value "161.50" in the "Height+" field (half the total height of 323 mm).
- Enter the value "-161.50" in the "Height-" field.

  The origin in the Y direction so lies centred in the filter fan.

- Enter the value "-161.50" in the "Width-" field (half the total width of 323 mm).
- Enter the value "161.50" in the "Width+" field.
  The origin in the X direction also lies centred in the filter fan.
- Set the focus in the line data.
- To add the contour to the combined component part, select the "Co" entry in the "Type" column.
- Press the "[F9] Select" function key.
  The "Select contour" screen page opens.
- If necessary, limit the display using the filter function.
  Example: Enter "RIT." in the filter field to display only Rittal components.
- Select the "RIT.SK.3244.100" contour and press the "[F10] Select" key.
  The contour is added to the combined component part.

The predrilled holes can now be added automatically to a new component part.

- Right-click in the line with the contour and select the "Augment predrilled component parts" entry in the context menu. Alternatively, press the [Alt]+[E] key combination.
  If a component part with the name of the contour does **not** yet exist in the database, an appropriate component part will be created in which the predrilled holes are added automatically. This component part is then also added automatically to the combined component part in a new line.

Note:
If a component part with the name of the contour exists, this component part is added without change, e.g. no new predrilled holes are created.

Finally, the mounting points of the component part can be specified. This can be done either directly in the combined component part or as individual machining operations in the previously added component part. In both cases, the procedure is similar to that described in section 4.2 "Component parts".

4.3.6 Function key bar

On the selection page as well as the input page for combined component parts, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

4.4 Variable component parts

4.4.1 General

In particular, string-form products, such as cable ducts or mounting rails, are mounted in different lengths. If the simple component part editor is used, a wide range of appropriate component parts that differ only in the length would need to be specified. This would lead to a very difficult management of the generated component parts.

Consequently, in addition to simple component parts (see section 4.2 "Component parts"), so-called variable component parts are also created. These variable component parts are stored independent of the last length used.

Note:
Variable component parts are displayed in the graphical representation with a length defined in the program settings (see section 10.1.1 "Input"). This length is used only for display and is not stored in the associated data block.

4.4.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.

The "Enter" menu is expanded and the lower-level menu items displayed.

- Press the [4] key.
  The "Subprograms" submenu expands and the lower-level menu items displayed.
- Press the [3] key.
  The "Select variable component part" screen page opens.
- Select with the filter or search function a previously created variable component part.
- Alternatively, enter in the "Input" field the name of the variable component part to be created.
- Finally, press the "[F10] Select" function key.
  The "Variable component part input" screen page opens.

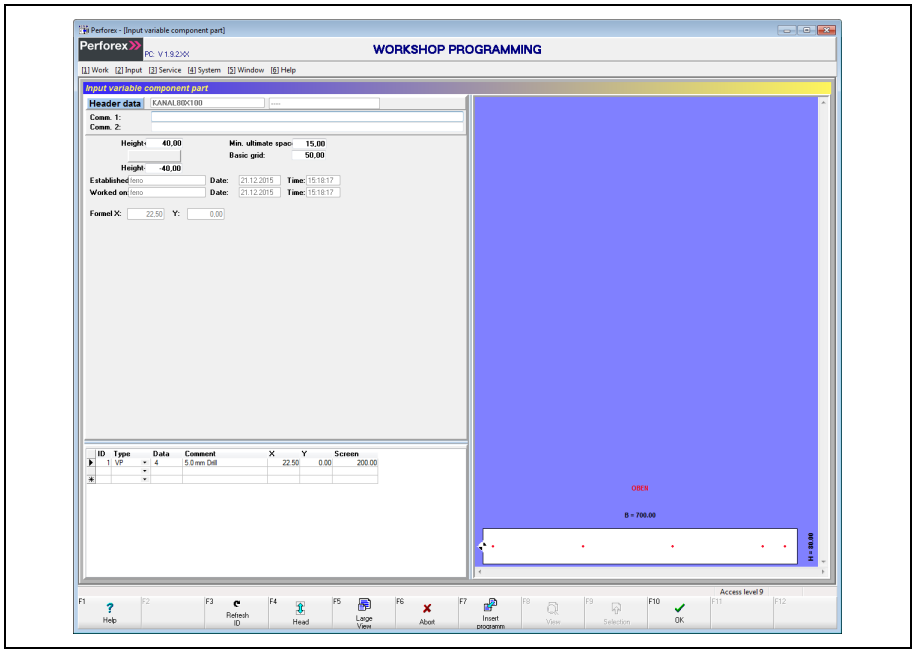

Fig. 20: "Variable component part input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a variable component part are discussed below.

4.4.3 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected component part is displayed as standard.

If the details data is displayed in the upper area:

- Press the "[F4] Details" function key.
  The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

The following data can be entered in the header data for a variable component part.

Parameter	Function
Comm. 1 and Comm. 2	Comment fields for any background information concerning the variable component part.
Height+ and Height–	The height of the variable component part in millimetres. The height is divided into two values that specify the origin of the variable component part. Rittal recommends that both height values are entered symmetrically, e.g. +40 mm and -40 mm, so that the origin lies at the centre of the variable component part.

Tab. 25: Header data that can be edited for a variable component part

Parameter	Function
Min. end separation	The minimum separation of a machining from the component part end.
Base pitch	The actual separation of the mounting points on the variable component part. Entering the pitch in the line data specifies the actual separation of the mounting points.
Model number	The model number of the associated variable component part.
Component part type	The general type of the variable component part. The entries "Duct", "Mounting rails" and "C-section" can be selected.
Raw part length	The length of the uncut variable component part.
Teeth separation	The separation of the teeth for wiring ducts.

Tab. 25: Header data that can be edited for a variable component part

Although additional data concerning the variable component part is displayed, it cannot be edited (directly).

Parameter	Function
Created/date/time	The account of the user who created the component part at the specified date and time.
Edited/date/time	The account of the user who last edited the component part at the specified date and time.

Tab. 26: Additional header data for a variable component part (cannot be edited)

The currently calculated numeric values are displayed in the following fields that also cannot be edited. If no references are used in the line data, the same values as in the line data are displayed here.

Parameter	Function
X	The X coordinate of the mounting point.
Y	The Y coordinate of the mounting point.

Tab. 27: Calculated numeric values

4.4.4 Line data

The individual rows of holes are entered in the line data. If the cursor is positioned in a line already filled with values, the details data of the associated row of holes is displayed automatically in the upper area of the screen page.
The position and the dimension of a row of holes are specified with the following data.

Parameter	Function
ID	The data block number of the associated row of holes (assigned automatically, because this data block number must be unique within a component part).
Type	Entry type. Only the "VP" Variable Punch Row entry (for variable row of holes) can be selected here.
Data	The number of the tool deployed for creating the row of holes.
Comment	The comment field from the description of the selected tool. The comment can be changed manually, but will be overwritten with the associated text from the description when a tool is selected.

Tab. 28: Line data that can be edited for a variable component part

Parameter	Function
X, Y	The coordinates of the first mounting point. For example, the half base pitch (25 mm for base pitch 50 mm) can be used as X value.
Pitch	The separation between the individual mounting points. The pitch must always be an integral multiple of the base pitch. If the value "0" is entered here, an individual machining is performed at the coordinates.

Tab. 28: Line data that can be edited for a variable component part

Using references for the input of rows of holes

For the creation of rows of holes, in general, the same references to the dimensions of the variable component part can be used as for blocked surfaces for raw panels (see section 3.2.4 "Line data").

Note:
Rittal recommends that the height of the variable component part is entered symmetrically so that the origin lies at the centre of the variable component part. This simplifies the subsequent positioning of the variable component part in a main program. This impairs, however, the use of the previously-mentioned references, because the X and Y positions are entered signed in the range ±B/2 and ±H/2.

Example:

A variable component part should be created for a cable duct with the following base data:
– Height: 80 mm
– Depth: 100 mm
– Minimum end separation for a mounting point: 15 mm
– Base pitch: 50 mm
– Model number: 4261267
– Component part type: Duct
– Raw part length: 2000 mm
– Teeth separation: 5 mm

The cable duct should be mounted as follows:
– Mounting type: 5 mm drilled holes
– The position of the first mounting point: 25 mm from the component part start
– Mounting point separation: 200 mm

Note:
The depth of the variable component part is not required for a 2D machining. To provide an unambiguous differentiation between different ducts in the bill of materials, Rittal recommends that the depth of the ducts is included in the name of the data block (e.g. "DUCT 80 x 100").

- Enter the value "40.00" in the "Height+" field (half the total height of 80.00 mm).
- Enter the value "-40.00" in the "Height-" field.
  The origin in the Y direction so lies centred in the cable duct.
- First enter in the header data the base data appropriate for the fields.
- Set the focus in the line data.
- Press the "[F9] Select" function key.
  The "Select tool" screen page opens.
- Set the data block marker in the line with tool no. 4 "5.0 mm drill".
- Press the "[F10] Select" function key to confirm the selection.

The tool is transferred to the line data.

- Enter "25.00" as the X value for the position of the first mounting point.
- Enter "0.00" as the Y value.
  The symmetric definition of the height causes the origin of the variable component part to lie at the centre. Consequently, the input of "0.00" also causes the mounting points to be centred.
- Enter the value "200.00" in the "Pitch" field.
  Consequently, the mounting points are placed with a separation of 200.00 mm. As deviation from this, a smaller separation may result for the last mounting point (also caused by the specification of the minimum end separation).
  The position of the mounting points is displayed directly in the graphical representation for the length (by default 700 mm) of the variable component part stored in the settings.

Adding mounting points of previously created variable component parts

Like blocked surfaces for raw panels, the mounting points of previously created variable component parts can be used for variable component parts (see section 3.2.4 "Line data").

4.4.5 Function key assignment

On the selection page as well as the input page for variable component parts, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

4.5 Contours

4.5.1 General

Contours are subprograms for cutouts milled in the raw panels. The contours normally consist of simple geometric shapes, such as rectangles, possibly with rounded "corners", and circles.

4.5.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [4] key.
  The "Subprograms" submenu expands and the lower-level menu items displayed.
- Press the [4] key.
  The "Select contour" screen page opens.
- Select with the filter or search function a previously created contour.
- Alternatively, enter in the "Input" field the name of the contour you want to create.
- Finally, press the "[F10] Select" function key.
  The "Contour input" screen page opens.

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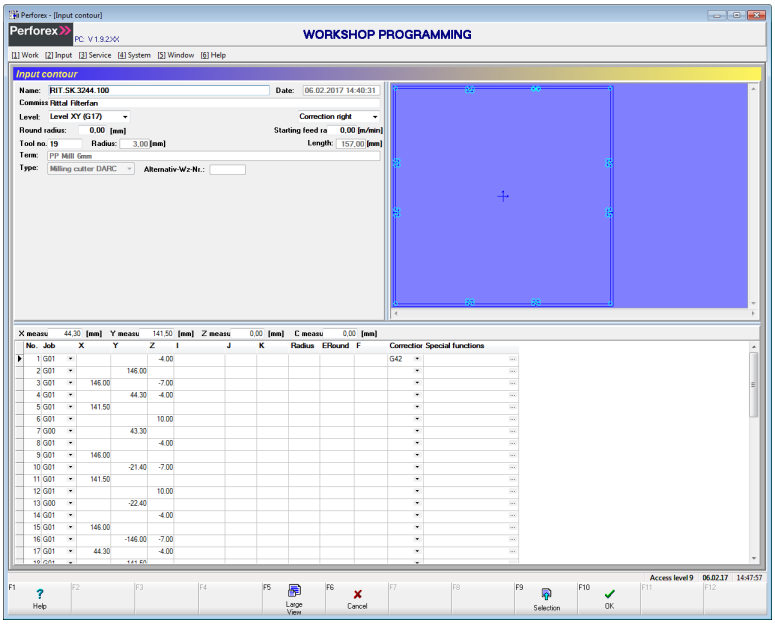

Fig. 21: "Contour input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a component part are discussed below.

4.5.3 Header data

In the upper area of the screen page, the so-called header data with basic information for the selected contour is displayed as standard.

If the details data is displayed in the upper area:

■ Press the "[F4] Details" function key.

The background of the "[F4]" function key is marked grey, the caption changes to "[F4] Header" and the header data is displayed.

The following data can be entered in the header data for a contour.

Parameter	Function
Comm.	The comment field for any background information concerning the contour.
Plane	Global contour plane. The XY plane (G17) must always be selected here for the Perforex machine tool.
Correction	The tool radius correction. The contour lies either on the centre (without correction), on the left or on the right of the programmed path.
Rounding radius	The default value for the rounding radius. All path transitions are rounded tangentially with this value. This default value can be overwritten in the associated line for each machining.
Start feed	Feed speed for the complete contour. This default value can be overwritten in the associated line for each machining.
Tool no.	The number of the tool for which the tool and associated machining data is stored.

Tab. 29: Header data that can be edited for a contour

Note:
An XY feed is specified in the material-dependent tool data for each milling cutter. If the value "0" is entered in the "Start feed" field, the feed value stored in the tool data is also used for the start feed (for the associated material).

Although additional data concerning the contour and the tool is displayed, it cannot be edited (directly).

Parameter	Function
Date	Date and time when the contour was created.
Radius, length, designation, type	The tool data as stored in the tool management for the selected tool.

Tab. 30: Additional header data for a contour (cannot be edited)

4.5.4 Line data

The individual machining steps for generating the contour are entered in the line data.

Note:
The machining steps required for the above-mentioned standard contours are created preferably with the external contour editor (see section 4.5.5 "External contour editor"). For special contours, the input is made directly in the line data.

Parameter	Function
No.	The data block number of the associated mounting point (assigned automatically, because this data block number must be unique within a component part).
Job	The NC code (G command) for the associated path section.
X, Y, Z	The coordinates of the end point for the movement in X, Y and Z.
I, J, K	The circle centre point coordinates in X, Y and Z. For input in absolute coordinates (reference dimension), these inputs are also absolute; for input in relative coordinates (incremental dimension), these dimensions apply to the start point of the circle, i.e. the last programmed end point. Only the centre point coordinates of the associated selected interpolation plane are evaluated.
Radius	Circular interpolation of the radius values. If a radius is entered, it takes priority over any entered centre point coordinates. The radius can be specified signed. If the value is negative, a circle ≥180° results; if the value is positive, a circle ≤180° results.
ERound	The rounding radius for this machining step. The value overwrites the specification in the "Rounding radius" field in the header data.
F	The feed value for this machining step. The value overwrites the specification in the "Start feed" field in the header data.
Correction	The tool radius correction for this machining step. The value overwrites the specification in the "Correction" field in the header data.

Tab. 31: Line data that can be edited for a contour

Parameter	Function
Special functions	Specify the movement behaviour of the axes at the block transition limits.

Tab. 31: Line data that can be edited for a contour

Direct input of the contour via G commands

For the direct programming of a contour, the individual path sections are programmed with NC code (G commands). The following commands are available in the "Jobs" column for this purpose:

- **G00:** Rapid traverse
- **G01:** Linear interpolation
- **G02:** Circular-path programming clockwise
- **G03:** Circular-path programming counter-clockwise
- **G04:** Dwell time
- **G14:** Small circle (not relevant for the Perforex machine tool)
- **G15:** Large circle (not relevant for the Perforex machine tool)
- **G23:** Circular-path programming by specifying an additional interpolation point on the circular path. For this additional function, a circle is determined with three points on the circular path. First point: The end point from the last line; second point: specified in the I (X0) and J (Y0) columns; third point: end point of the current X and Y lines
- **G90:** Absolute programming (DEFAULT)
- **G91:** Relative programming / incremental dimension

Special functions

The movement behaviour of the axes at block transition limits can be specified in the last "Special functions" column. The following functions can be selected:

- **G60:** Accuracy
- **G61:** With stop (direct continuation)
- **G62:** Reduced speed at block transitions. The reduced speed must be specified in [m/min].
- **G63:** Adapted speed
- **G64:** Without stop

4.5.5 External contour editor

Contours, such as a rectangle or circle, can be created quickly and easily with the external contour editor.

Starting the external contour editor

■ Press the "[F8] Ext. contour editor" function key on the "Contour input" screen page.
The external contour editor starts.

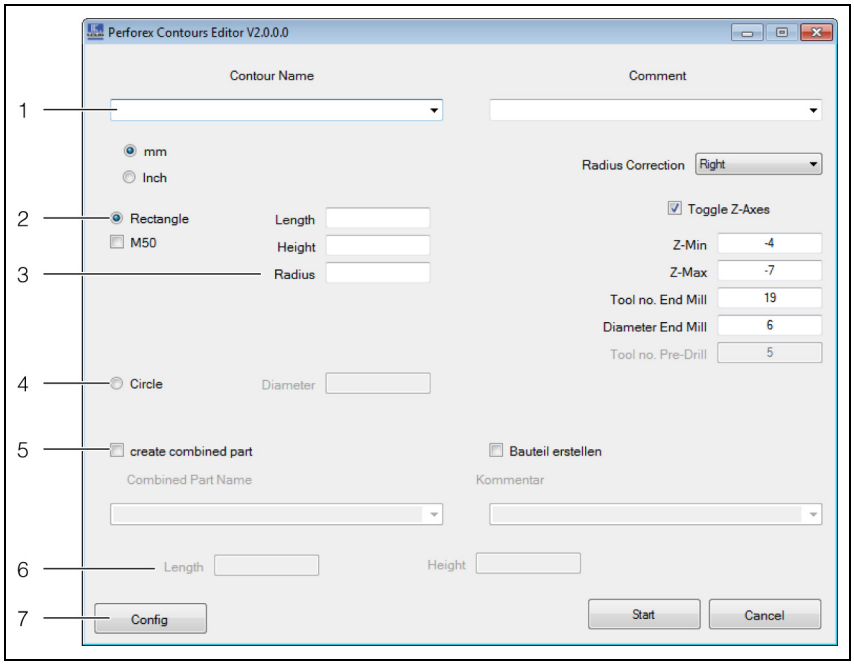

Fig. 22: External contour editor

Legend

1 The contour name and comment
2 "Rectangle" base form
3 The dimensions of the contour for the "Rectangle" base form
4 "Circle" base form and diameter
5 Create a combined component part and a component part
6 Combined component part dimensions
7 "Config" button

Input fields in the external contour editor

The contour is created in the contour editor by filling the following fields with the desired input values. The default values for the individual input values can be entered on the "ConfigWindow" screen page after pressing the "Config" button. The following data is entered for the base form of the contour:

Parameter	Function
Contour name	The name of the contour as displayed later on the "Select contour" screen page.
Comment	The comment field for any background information concerning the contour.
mm/inch	Preselect the unit system for numeric values.
Rectangle/circle	Preselect the base form. Depending on the form, further different fields must be filled.
Length/height/radius	For preselection of the "Rectangle" base form: Dimensions of the contour and radius with which the sides of the rectangle are connected.
Diameter	For preselection of the "Circle" base form: Contour diameter.

Tab. 32: Input fields in the external contour editor (contour)

The following data is entered for the actual machining of the contour:

Parameter	Function
Radius correction	The tool radius correction. The contour lies either on the centre (without correction), on the left or on the right of the programmed path.
Toggling the Z axis	The "Z-Min" and "Z-Max" values specify the limits in which the Z axis traverse in and out during contour traversal. This function serves to extend the tool service life.
Milling cutter tool number	The number of the tool for which the tool and associated machining data is stored.
Milling cutter diameter	The diameter of the tool.
Predrill tool number	The number of the predrill with which the required predrilled holes are produced.

Tab. 33: Input fields in the external contour editor (machining)

The external contour editor allows not only the creation of the contour, but also the creation of a component part in which the required predrilled holes and the external dimensions of the component part are stored. A combined component part can also be created in which the contour and the component part are combined. If **no** component part is created, the predrilled holes and the dimensions are stored directly in the combined component part. The following associated inputs are required:

Parameter	Function
Create component part	Create an associated component part. If this checkbox is activated, the "Length" and "Height" fields are also enabled.
Comment	Comment field for any background information concerning the component part.
Length/height	Dimensions of the component part, provided it is also created.
Create combined component part	Create a combined component part. If this checkbox is activated, the contour and the component part are combined as a combined component part.
Combined component part name	The name of the combined component part, provided it is also created. If a component part is also created, it will be created with the same name as the combined component part.

Tab. 34: Input fields in the external contour editor (component part / combined component part)

Note:
A detailed example for working with the external contour editor is provided in section 7.1 "Creating a combined component part".

4.5.6 Function key bar

On the selection page as well as the input page for contours, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

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5 Main programs

5.1 General

A fully equipped raw panel is created in every main program. To do this, a raw panel stored previously in the program is added and the various types of component parts, also stored previously, are placed on this raw panel.
The effort for creating a new main program reduces with the number of previously created main programs, because it suffices to copy similar main programs and revise them at the appropriate locations.

5.2 Entering main programs

5.2.1 General

When creating a main program, a plausibility check is performed that during the placement of component parts detects, for example, a collision with the blocked surfaces of the raw panel. Appropriate messages are output immediately after the placement of each individual component. The associated description in the message line allows the incorrect input to be corrected quickly.
In general, component parts and individual machining operations can also be placed outside the raw panel. In this case, although an error message is displayed, the raw panel can still be machined. Like the machining performed within a blocked surface, this machining is not performed for the subsequent machining on the machine. Exceptions are contours whose origin lies within a raw panel, although the contour extends outside the raw panel. This possibility allows notches to be created in the raw panel, e.g. for cable entries.

Note:
Risk of damage to the machine!
Take particular care for machining operations that (also) lie outside the raw panel. Check the main program very carefully before you add it to an order.

5.2.2 Layout of the selection and input pages

The layout of the selection and input pages for main programs has already been described (see sections 2.3 "Layout of the selection pages" and 2.4 "Layout of the input pages").

5.2.3 Header data

The individual fields in the header data have already been described generally (see section 2.4.3 "Header data"). The dimensions of the raw panel can also be adapted in the main program.

Parameter	Function
Height	The height of the raw panel in millimetres.
Width	The width of the raw panel in millimetres.
Thickness	The thickness of the raw panel in millimetres.

Tab. 35: Header data that can be edited for a raw panel in the main program

Note:
Changes made to the dimensions of the raw panel are **not** accepted as raw panel data used for creating the main program.

5.2.4 Line data

For the placement of component parts, the same references "W" (width) and "H" (height) to the dimensions of the raw panel are available in the line data as for the creation of blocked surfaces (see section 3.2.4 "Line data"). Furthermore, the fol-

lowing additional references can also be used here:
- **MID:** Position in the middle between two objects. The IDs of the two objects are passed as parameters, e.g. "MID(2,3)".
- **DIST:** Position at a specific separation from an object. The object from which this separation is measured and the desired separation are passed as parameters, e.g. DIST(2,1). If the value "0" is entered as ID, the desired separation value from the outer edge of the raw panel is maintained. If a separation value is entered with positive sign, the separation is measured in the positive X or Y direction; for negative sign, in the negative X or Y direction.
- **MAX:** The length of a variable component part is extended to the maximum possible length. If further component parts are added subsequently to the raw panel, the length may be adapted accordingly.

The origin of the individual component parts has no significance when these references are used; the dimensions and the separations are calculated automatically by the program.

In addition, all references can also be linked with each other and the results reused. Whereby, the program observes the usual arithmetic rules when calculating the end result.

The individual component parts and contours are entered in the line data. Individual machining operations can also be added to a main program.

The position and the dimension of the individual component parts and individual machining operations are specified with the following data.

Parameter	Function
ID	The data block number of the associated component part (assigned automatically, because this data block number must be unique within a main program).
Type	Entry type. The following entries can be selected. – **SP:** Single Processing (individual machining) – **Cp:** Component part – **CB:** ComBined Component Part – **VC:** Variable Component Part – **Co:** Contour
Data	The name of the selected component, e.g. of the contour or the component part, as stored there.
Comment	The comment field from the description of the associated component. The comment can be changed manually, but will be overwritten with the associated text from the description when a new entry is selected.
X, Y	The coordinates of the associated component.
Length/Ø	The length of the associated component part or diameter for the individual machining with a thread-milling cutter.
Sq	The sequence of the milling operations. Initially, all machining operations of layer "0" are performed, then all machining operations of layer "1", etc.
Rotation	The clockwise rotation of the associated component part.

Tab. 36: Line data that can be edited for a main program

Note:
Two detailed examples for creating main programs are provided in section 7.2 "Creating a main program".

Browsing subprograms

After adding component parts, combined component parts, etc. in a main program, the associated subprogram can be browsed. Whereby, the input page of the subprogram is opened, as for creating and changing a subprogram.

- Set the data block marker in the line of the subprogram whose input page should be called.
- Press the "[F8] Browse" function key.
  The input page associated with this subprogram type is displayed and changes can be made to the subprogram.

Note:
Changes made to a subprogram affect all main programs and orders that use this subprogram. Consequently, to avoid unwanted "side effects", changes valid for only a specific main program must be made in a previously created copy of the subprogram.

5.3 Function key bar

The assignment of the function key bar on the selection and input pages has already been described (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar").

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6 Order

6.1 General

The actual machining by the machine tool from previously created main programs is specified in an order. Orders can also be copied based on similar orders and revised at the appropriate locations. Furthermore, the material of the raw panel to be machined is specified only when the order is created. This allows the same main program to be reused without change in various orders for machining raw panels made of different materials. The required machining data is stored in the tool data and is transferred to the machine in accordance with the selected material.

6.2 Entering orders

6.2.1 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [1] key.
  The "Select order" screen page opens.
- Select with the filter or search function a previously created order.
- Alternatively, enter in the "Input" field the name of the order to be created.
- Finally, press the "[F10] Select" function key.
  The "Order input" screen page opens.

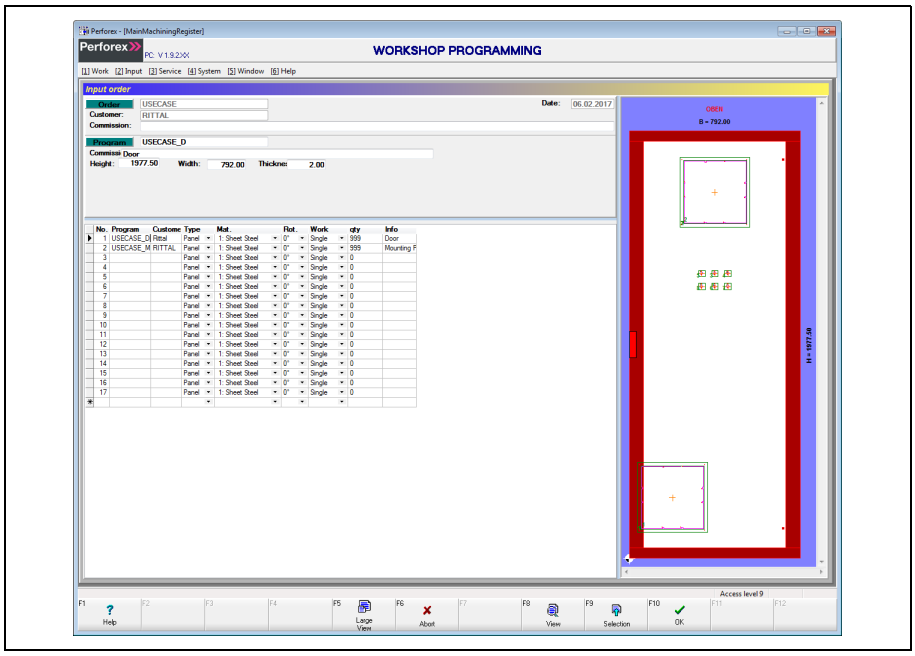

Fig. 23: "Order input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating an order are discussed below.

6.2.2 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected order or the main program selected in the line data is displayed as standard. Switching to the details data is not possible here. The following data can be entered in the header data for an order.

Parameter	Function
Comm.	A comment field for any background information concerning the order.

Tab. 37: Header data that can be edited for an order

Although additional data concerning the order is displayed, it cannot be edited (directly).

Parameter	Function
Order	The name of the order as specified when it was created.
Customer	The name of the customer for which the order is edited.
Date	The date when the order data was last edited.

Tab. 38: Additional header data for an order (cannot be edited)

The header data of the main program selected in the line data is displayed in the following fields (that also cannot be edited).

Parameter	Function
Program	The name of the main program.
Comm.	A comment for the main program.
Height	The height of the raw panel in millimetres.
Width	The width of the raw panel in millimetres.
Thickness	The thickness of the raw panel in millimetres.

Tab. 39: Additional header data of the selected main program (cannot be edited)

6.2.3 Line data

The individual main programs to be processed in the currently selected order are entered in the line data. The details data of the associated main program is displayed in the upper area of the screen page.
Detailed information concerning the associated main program is specified with the following data.

Parameter	Function
Type	The type, and possibly the position, of the workpiece. In addition to the general type of the workpiece ("Plate" for 2D machining or "Enclosure" for 3D machining with a laser processing machine), plates with various mounting positions to be machined successively as "Sequence" or "Block" can also be selected here.
Mat.	The workpiece material. The selection of the material also specifies the technology parameters (such as feeds) based on the associated tool data.
Rotation angle	The rotation of the raw panel as actually fastened to the machine.
Line type	The processing of the individual main programs. The following settings can be selected here: – Individual – Block – Sequence

Tab. 40: Line data that can be edited for an order

EN

Parameter	Function
Unit count	The specified number of workpieces to be machined with the associated main program.
Info	A comment from the main program.

Tab. 40: Line data that can be edited for an order

Line type selection

The individual processing of the main programs stored in the order is specified in the "Line type" column. The following options can be selected:

- **Individual:** The associated main program is processed individually, namely, independent of all other main programs in the order.
- **Block:** All such marked main programs are processed on several plates clamped together in the machine tool. Whereby, each machining type (e.g. all holes with a 3 mm drill) is processed cross-program on all plates with consequent savings in the tool change time. The positions of the individual plates are specified by various "identifications" that must have been stored previously in the "Type" column.
- **Sequence:** All such marked main programs are also processed on several plates clamped together in the machine tool. Whereby, each main program for each individual plate is first processed completely before the next main program is started. This type of processing is used mainly for orders with a laser processing machine for which the individual sides of an enclosure are machined successively in an order. Processing as "sequence" can also be appropriate for machining performed at night (without supervisory personnel). If, for example, a tool breakage occurs during machining, some of the raw panels have been machined completely, some of the raw panels have not been machined at all, and only one raw panel is machined partially.

Note:
A detailed example for creating an order is provided in section 7.3 "Creating an order".

6.3 Function key bar

On the selection page as well as the input page for orders, the assignment of the function key bar corresponds largely to the associated page for main programs (see sections 2.3.7 "Function key bar" and 2.4.8 "Function key bar"). Only a few assignments are missing.

EN

7 Use Case

The chapter uses comprehensive examples to explain working with the "Workshop programming" program.

7.1 Creating a combined component part

7.1.1 General

The Rittal TopTherm filter fan (model no. SK 3244.100) is used as example for explaining the creation of a combined component part.
The following information must be available to create a combined component part:

1. The external dimensions of the filter fan: 323 mm x 323 mm
2. The dimensions and the position of the mounting cutout: 292 mm x 292 mm, centred within the external dimensions
3. The diameter and the position of the mounting points: 4.5 mm, each 10.5 mm in the X and Y directions inwards from the outer edges of the filter fan (consequently, 302 mm separation between the holes)

7.1.2 Working with the contour editor

- Select the "[2] Enter" > "[5] Subprograms" > "[2] Combined component parts" menu item in the workshop programming.
- Press the "[F8] Ext. contour editor" button.
  The external contour editor starts.

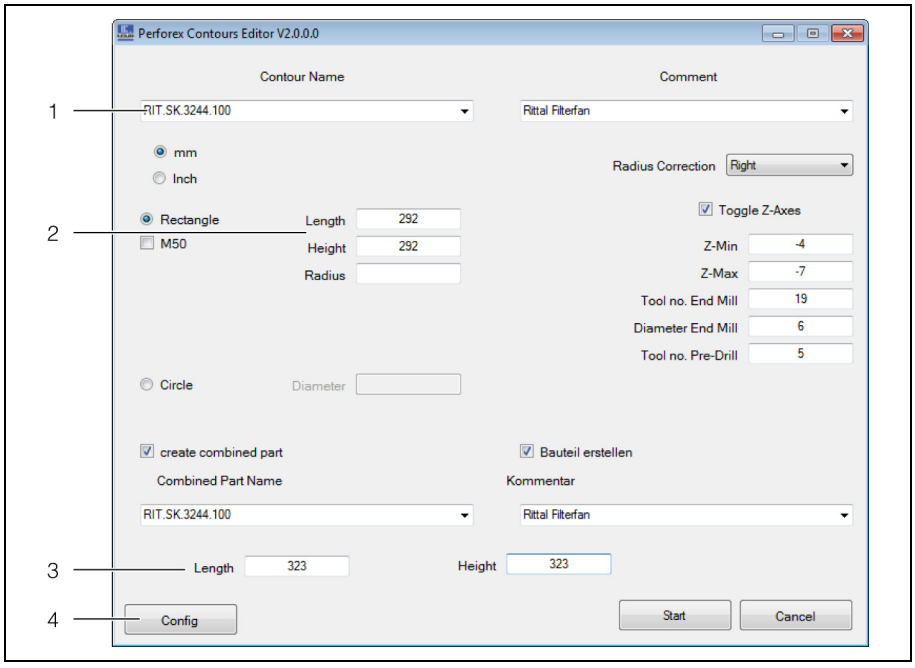

Fig. 24: External contour editor

Legend

1 Contour name
2 Contour dimensions
3 Combined component part dimensions
4 "Config" button

- Enter the required name in the "Contour name" field, e.g. "RIT.SK.3244.100".
- Enter the previously determined dimensions of the mounting cutout in the "Length" and "Height" fields.
  Example: "Length" and "Height", both 292 mm.
- Activate the "Create combined component part" checkbox.
  The name of the contour is taken automatically for the name of the combined component part.

EN

- Enter the exterior dimensions of the combined component part in the lower "Length" and "Height" fields.
  Example: "Length" and "Height", both 323 mm.

Note:
If an appropriate combined component part in which the created contour can be included exists already, no new combined component part needs to be created.

- Activate the "Create component part" checkbox.
  The same name as for the contour is entered automatically for the component part.
- Press the "Start" button to create the appropriate contour.
  A dialogue opens in which the contour, the combined component part and the component part are displayed in the left, the middle and the right, respectively.

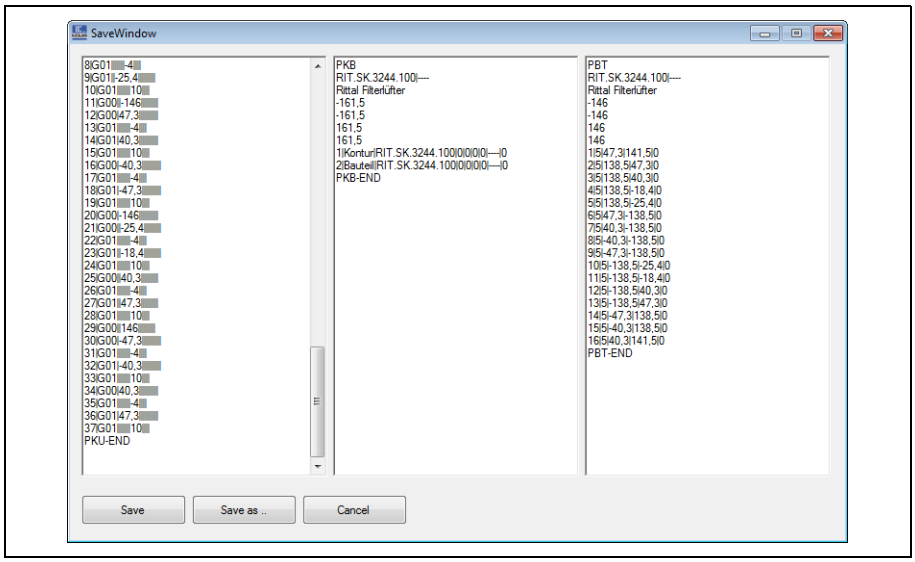

Fig. 25: External contour editor output

- Press the "Save" button to save this information.
  All information is now available directly in the workshop programming.

In the second step, the positions of the mounting point must be stored in the component part that was just created. The values for the height and width of the filter fan are created so the origin lies in the centre of the housing. The positions for the height and width of the filter fan can be specified easily with the "H" and "W" Formula fields, respectively.

- Select the "[2] Enter" > "[5] Subprograms" > "[1] Component parts" menu item in the workshop programming.
- Select the combined component part created previously in the contour editor.
  Example: "RIT.SK.3244.100".
- Press the "[F10] Select" button to edit the component part.

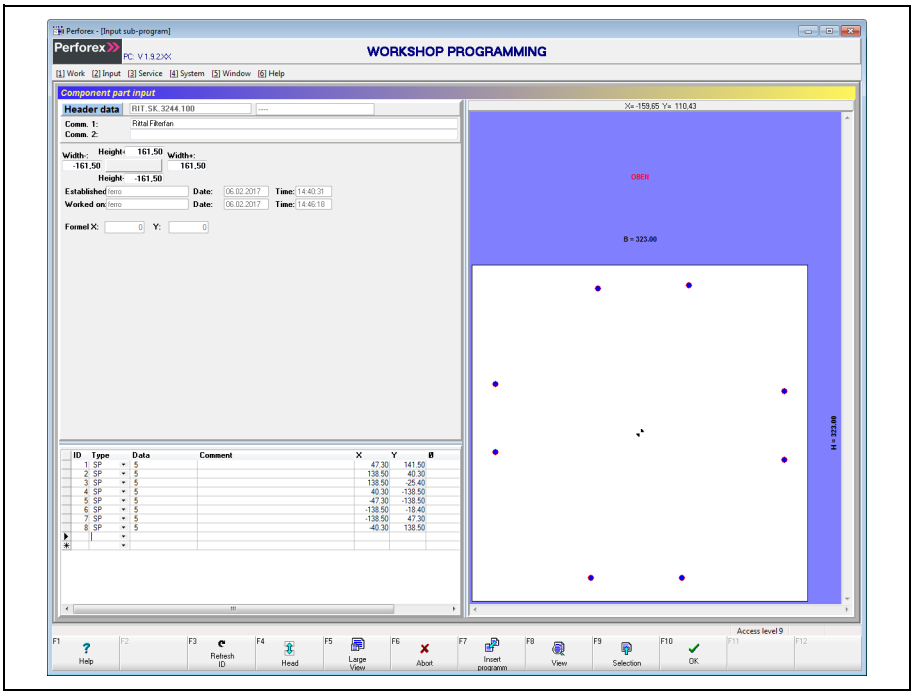

Fig. 26: Component part with predrilled holes

Add successively the position of the four mounting points.

- Select the "SP" Single Processing entry for individual machining in the first free line in the "Type" column.
  The "Select tool" screen page opens.
- Set the data block marker in the line with tool no. 4 "5.0 mm drill".
- Press the "[F10] Select" function key to confirm the selection.
  The tool is transferred to the line data.
- Specify the X position of the lower left mounting point displaced 10.5 mm inwards from the left outer edge (-B/2).
  Example: "-B/2+10.5"
- Specify similarly the Y position of the lower left mounting point displaced 10.5 mm upwards from the lower outer edge (-H/2).
  Example: "-H/2+10.5"
- Check, possibly using the display in the "Formula X" and "Formula Y" fields in the header data, that the absolute positions are calculated correctly.

It is best to copy the first mounting point and then paste it several times so only the position of the hole needs to be adapted appropriately.

- Set the cursor in the line of the first mounting point and press the [Ctrl] and "[F2] Copy" keys concurrently.
- Press the [Ctrl] and "[F3] Paste" keys concurrently three times to prepare the lines for the additional three holes.
- Now adapt the positions of the holes in these three lines:
  - **Hole 2:** X position "+B/2-10.5"; Y position "-H/2+10.5" (identical with hole 1)
  - **Hole 3:** X position "+B/2-10.5" (identical with hole 2); Y position "-H/2-10.5" (identical with hole 1)
  - **Hole 4:** X position "+B/2+10.5" (identical with hole 1); Y position "-H/2-10.5" (identical with hole 3)

Note:
Alternatively, the mounting points can also be added directly in the combined component part as individual machining operations. In this case, they are, however, not stored in the component part and so must be re-entered when this component part is reused.

EN

- Return to the combined component parts by calling the "[2] Enter" > "[5] Subprograms" > "[2] Combined component parts" menu item.
- Return to the input for the "RIT.SK.3244.100" combined component part.
  Not only the predrilled holes, but also the four mounting points are now displayed in the graphical representation.

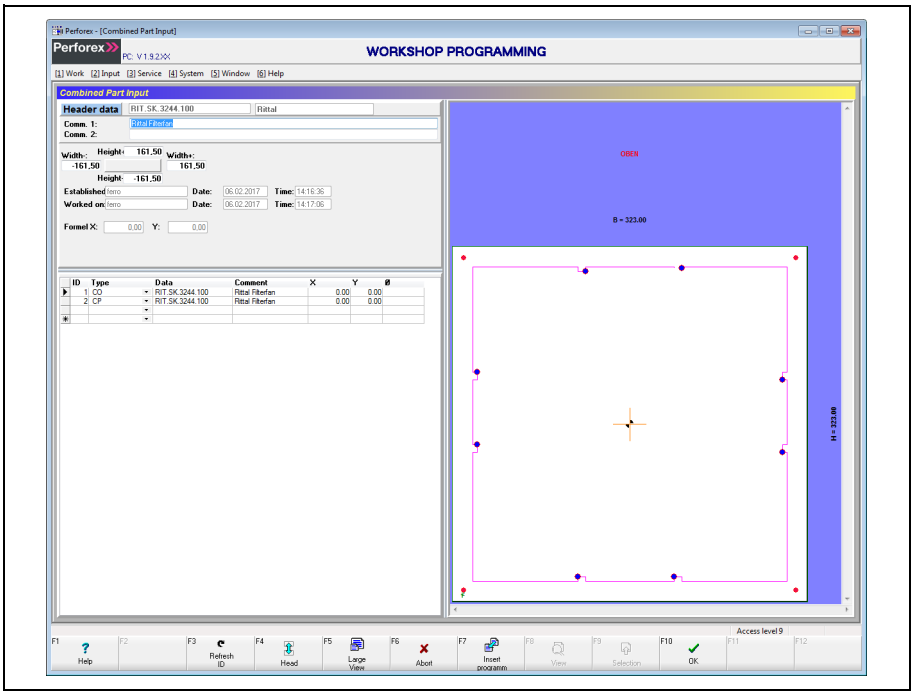

Fig. 27: Combined component part after the conversion

7.2 Creating a main program

7.2.1 Main program for a mounting plate

An appropriate main program must be created for every raw panel to be machined. As example, a main program for a rear mounting plate on which some cable ducts and component parts are mounted is created below.

- Select the "[2] Enter" > "[2] Main programs" menu item in the workshop programming.
  The "Select main program" screen page opens.

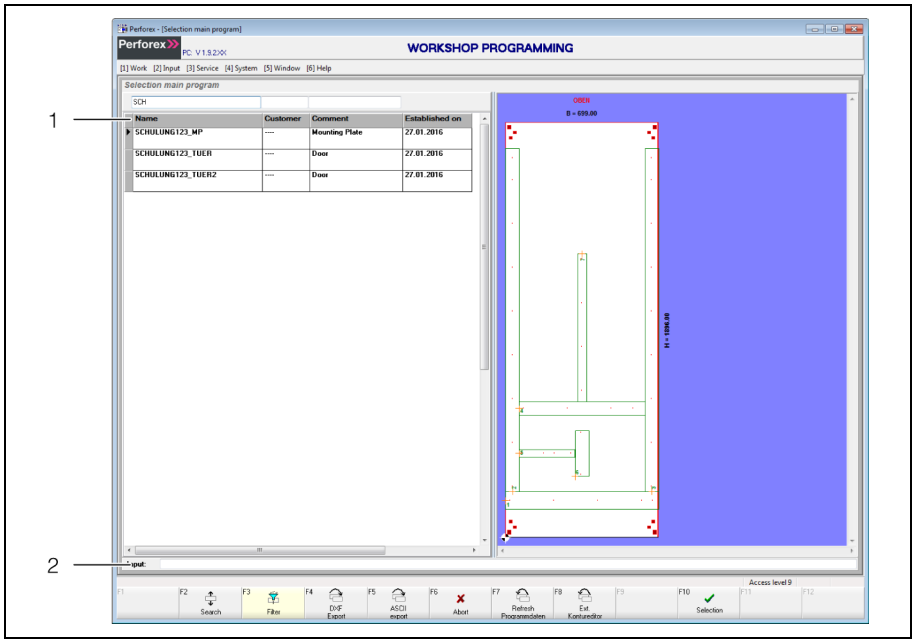

Fig. 28: "Select main program" screen page

Legend

1 Previously created main programs
2 "Input" field

- Enter in the "Input" field the name of the main program that you want to create.
  Example: USECASE_MP
- Press the "[F10] Select" key to confirm your input.
  The "Main program input" screen page opens.

In the first step, add the header data and assign the main program the raw panel on which the component parts are fastened later.

- Enter any required additional comments for the main program in the two "Comm. 1" and "Comm. 2" comment fields.
  Example: "Rear mounting plate with cable ducts"
- Select the "Raw panel" field and press the "[F9] Select" key.
  The "Select raw panel" screen page opens. **All** raw panels stored in the workshop programming are initially displayed.
- If necessary, limit the display using the filter function.
  Example: Enter "RIT.TS.8805" in the filter field to display only the raw panels for the Rittal TS 8 baying system (enclosure size 800 mm x 2000 mm x 500 mm).
- Select the raw panel and press the "[F10] Select" key.
  Example: For the mounting plate, select the "RIT.TS.8805.500.MPL" entry. The values in the "Height", "Width" and "Thickness" fields are taken from the raw panel data.

In the next step, place successively all desired component parts, variable component parts, combined component parts, contours and individual machining operations. In the first step, the required cable ducts are placed on the mounting plate.

- Select the component part type in the "Type" column or the "SP" entry for individual machining.
  Example: Select the "VC" entry for a cable duct for a variable component part. The "Select variable component part" screen page opens.
- If necessary, limit the display using the filter function.
  Example: Enter "DUCT" in the filter field to display only cable ducts.

EN

- Select the desired cable duct and press the "[F10] Select" key.
  Example: Select the "DUCT80X100" entry for a cable duct with height 80 mm and depth 100 mm.

The cable duct is now added with a standard length (here 700 mm) at the origin of the mounting plate.

- Place the cable duct at the desired location.
  Example: With pressed [Ctrl] or [Alt] key, you can move the cable duct to the approximate desired location by turning the mouse wheel or pressing the arrow keys.
- Then adapt the length of the duct.
  To do this, you can either enter a fixed numeric value or work with references.
  Example: Enter the "MAX" placeholder in the "Length/Ø" field to fully exploit the complete available length for the mounting position of the duct.

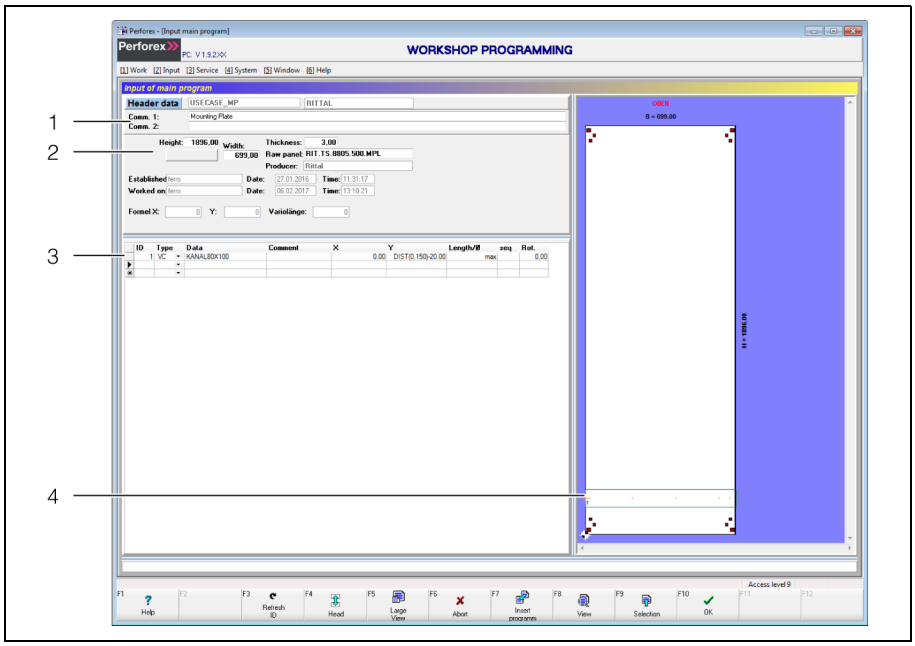

Fig. 29: "Main program input" screen page

Legend

1 Name and comment fields
2 Raw panel dimensions
3 Machining steps
4 Graphical representation

A second cable duct to be mounted vertical and extend from the upper edge of the first duct to the upper edge of the mounting plate is added in the second step.

- Select the desired cable duct and press the "[F10] Select" key.
  Example: Select the "DUCT60X80" entry for a cable duct with height 60 mm and depth 80 mm.

The cable duct is now added with a standard length (here 700 mm) at the origin of the mounting plate. Because the duct should extend vertically, it is turned through 270° (clockwise) so that the origin lies at the bottom and the duct can "grow" upwards. The cable duct should also be mounted on the right at a separation of 1 mm from the outer edge of the mounting plate. To avoid the need to calculate these values for ducts with different width and different reference points, we recommend using the "DIST" function.

- First, enter the value "270.0" in the "Rot." field to allow the duct to extend upwards as desired.
- Then enter the value "DIST(0,1)" for the X position.

The first parameter "0" corresponds to the outer edge of the mounting plate. The second parameter specifies the separation of the duct from the outer edge (here 1 mm).

In the Y direction, the duct should begin above the first horizontal duct and extend to 1 mm separation from the upper edge of the mounting plate. The "DIST" function can also be used for the Y position.

- Enter the value "DIST(1,1)" for the Y position.
  The first parameter "1" corresponds to the ID of the reference object from which the separation should be measured, i.e. the horizontal duct in this case. The second parameter also specifies the separation of the duct from the outer edge of the reference object (also 1 mm).
- Enter the placeholder "MAX-1" in the "Length/Ø" field to fully exploit the complete available length for the mounting position of the duct, reduced by 1 mm separation from the mounting plate upper edge.
  If this causes the duct to overlap a blocked surface of the mounting plate, the duct length can be shortened appropriately (e.g. by specifying "MAX-5" as length).

Another cable duct is now added that is also mounted vertically and extends from the upper edge of the first duct to the upper edge of the mounting plate, but placed on the left side of the mounting plate.

- Copy and paste the previously created vertical cable duct.
- Then change the value for the X position to "DIST(0,-1)".
  This sets the separation to the **right** outer edge of the mounting plate to 1 mm.

A third cable duct is added that extends between the two vertical cable ducts 350 mm above the first horizontal cable duct.

- Select the desired cable duct and press the "[F10] Select" key.
- Place the cable duct at the desired location.
  Example: Enter the placeholder "DIST(2,1)" in field "X". The cable duct so begins 1 mm to the right of the cable duct with ID "2". Enter the placeholder "DIST(1,350)" in field "Y". The cable duct so begins 350 mm above the cable duct with ID "1".
- Then adapt the length of the duct.
  Example: Enter the placeholder "MAX-1" in the "Length/Ø" field to fully exploit the complete available length for the mounting position of the duct, reduced by 1 mm. The new cable duct is limited on the right by the vertical cable duct with ID "3".

In the next work step, a mounting rail is mounted that should also begin at the left with a separation of 1 mm from the vertical cable duct. In the Y direction, the mounting rail should be positioned centred between the two horizontal cable ducts with IDs "1" and "4".

- Select the desired mounting rails and press the "[F10] Select" key.
  Example: Select a mounting rail of type "TS35X7.5".
- Place the mounting rail at the desired location.
  Example: Enter the placeholder "DIST(2,1)" in field "X". Like the cable duct, the mounting rail begins 1 mm to the right of the cable duct with ID "2". Enter the placeholder "MID(1,4)" in field "Y". The mounting rail so sits centred exactly between the two cable ducts with IDs "1" and "4".
- Then adapt the length of the mounting rail.
  Example: Enter the placeholder "MAX-1" in the "Length/Ø" field to fully exploit the complete available length for the mounting position of the mounting rail, reduced by 1 mm. The mounting rail so runs (initially) over the complete space between the vertical cable ducts with IDs "1" and "4".

Finally, a component part mounted directly on the mounting plate is added to the main program. The component is an NH fuse-switch disconnector that should be placed horizontally centred between the two vertical cable ducts with IDs "2" and "3" and also centred vertically between the horizontal cable ducts with IDs "1" and "4".

- Select the component part type in the "Type" column or the "SP" entry for individual machining.
  Example: Select the "Cp" entry for a component part, such as an NH fuse-switch disconnector.
- If necessary, limit the display using the filter function.
- Select the desired component part and press the "[F10] Select" key.
  Example: For an NH fuse-switch disconnector, select the "RIT.SV3431000" entry.
- Place the NH fuse-switch disconnector at the desired location.
  Example: Enter the placeholder "MID(2,3)" in field "X". The NH fuse-switch disconnector so sits centred between the two cable ducts with IDs "2" and "3". Enter the placeholder "MID(1,4)" in field "Y". The component part so also sits centred exactly between the two cable ducts with IDs "1" and "4".

Note:
By adding the NH fuse-switch disconnector centred between the vertical cable ducts at the same height as the mounting rail, the mounting rail is shortened automatically. It so runs only to a separation of 1 mm from the NH fuse-switch disconnector caused by the deployment of the "MAX" reference.

7.2.2 Main program for an enclosure door

Similarly, as example below, a main program is created for an enclosure door on which two filter fans and some push-buttons are mounted.

- Select the "[2] Enter" > "[2] Main programs" menu item in the workshop programming.
  The "Select main program" screen page opens.
- Enter in the "Input" field the name of the main program that you want to create.
  Example: USECASE_D
- Press the "[F10] Select" key to confirm your input.
  The "Main program input" screen page opens.

In the first step, add the header data and assign the main program the raw panel on which the component parts are fastened later.

- Enter any required additional comments for the main program in the two "Comm. 1" and "Comm. 2" comment fields.
  Example: "Enclosure door with fans and push-buttons"
- Select the "Raw panel" field and press the "[F9] Select" key.
  The "Select raw panel" screen page opens. **All** raw panels stored in the workshop programming are initially displayed.
- If necessary, limit the display using the filter function.
  Example: Enter "RIT.TS.8805" in the filter field to display only the raw panels for the Rittal TS 8 baying system (enclosure size 800 mm x 2000 mm x 500 mm).
- Select the raw panel and press the "[F10] Select" key.
  Example: For the door, select the "RIT.TS.8805.500.D" entry.
  The values in the "Height", "Width" and "Thickness" fields are taken from the raw panel data.

In the next step, place successively all desired component parts, variable component parts, combined component parts, contours and individual machining operations. In the first step, the two fans are placed on the door.

- Select the component part type in the "Type" column or the "SP" entry for individual machining.
  Example: Select the "CB" entry for a combined component part, such as a filter fan.
  The "Select combined component part" screen page opens.
- If necessary, limit the display using the filter function.
  Example: Enter "RIT.SK.3244" in the filter field to display only the appropriate filter fans.
- Select the desired filter fan and press the "[F10] Select" key.
  Example: Select the "RIT.SK.3244.100" entry for the filter fan created previously as combined component part.
- Enter the X and Y coordinates for where the filter fan should be placed.
  Example: The filter fan should be placed centred in the width (B/2) and at the height of 284 mm.

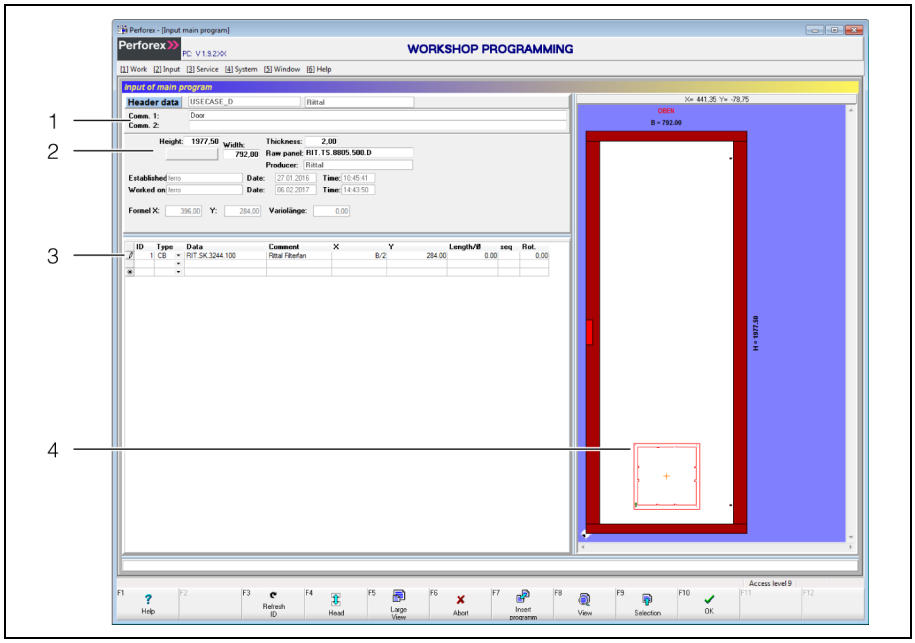

Fig. 30: "Main program input" screen page

Legend

1 Name and comment fields
2 Dimensions
3 Machining steps
4 Graphical representation

- Similarly, add a second filter fan of the same type.
  Either add the filter fan completely new (similar to the first filter fan) or mark the first filter fan, copy it ([Ctrl]+[F2] key combination) and paste it ([Ctrl]+[F3] key combination).
- Also for this filter fan, enter the X and Y coordinates for where the filter fan should be placed.
  Example: The filter fan should also be placed centred in the width (B/2) and at a distance of 284 mm from the upper edge of the door (H-284). The two fans sit symmetrically on the door.

The push-buttons (with anti-rotation lock) are now placed in the second step. A total of six push-buttons are installed, three each in a row. The upper row sits horizontally centred on the door at a height of 2/3 of the total door height. The centres of the push-buttons are displaced 60 mm from each other. The lower row sits exactly below the upper row, displaced 60 mm down.

- Select the component part type in the "Type" column or the "SP" entry for individual machining.
  Example: Because the push-buttons also exist as combined component part, select the "CB" entry accordingly.
  The "Select combined component part" screen page opens.
- If necessary, limit the display using the filter function.
  Example: Enter "CIRCLE" in the filter field to display only the associated circular sections.
- Select the desired section and press the "[F10] Select" key.
  Example: For a push-button with anti-rotation lock, select the "CIRCLE_22.5_VS" entry.
- Enter the X and Y coordinates for where the push-button should be placed.
  Example: The centre push-button in the upper row should be placed centred in the width (B/2) and at the height of 2/3 of the total height (H-H/3 or 2*H/3).

Because five further identical push-buttons should also be added, it is best to copy the first push-button and then paste it several times so only the positions need to be adapted appropriately.

- Set the cursor in the line of the first push-button and press the [Ctrl] and "[F2] Copy" keys concurrently.
- Press the [Ctrl] and "[F3] Paste" keys concurrently twice to prepare the lines for the additional two push-buttons.

The position of each push-button is displaced with an offset of ±60 mm. This value can be entered with the "Offset" function in the context menu without needing to change the associated "X" and "Y" fields directly.

- Switch to the line of the second push-button.
  This push-button is displaced 60 mm left in the upper row; the Y coordinate remains unchanged.
- Right-click in the line of the second push-button and select the "Offset" entry in the context menu.
  The following dialogue opens.

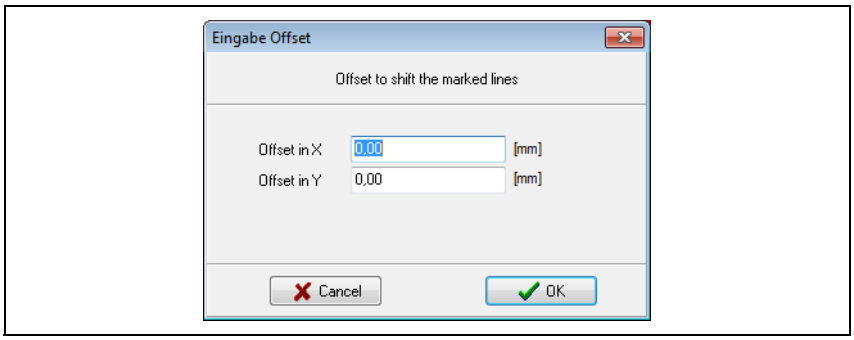

Fig. 31: "Offset input" screen page

- Enter the value "-60" in the "Offset in X" field and leave the value "0" in the "Offset in Y" field.
- Press the "OK" button to confirm your input.
  The value in field "X" changes to "+B/2-60"; the value in field "Y" remains unchanged.
- Similarly, set the offset for the third push-button that is displaced 60 mm to the right.

You can now completely mark this first row with push-buttons, copy and so paste three further push-buttons.

- Place the cursor in the row with the first push-button, and mark the three push-button rows by pressing the [Alt] and arrow keys concurrently.
- Press the [Ctrl] and "[F2] Copy" keys concurrently to copy the three push-buttons.
- Press the [Ctrl] and "[F3] Paste" keys concurrently to prepare the rows for the additional three push-buttons.

The newly pasted rows are marked and can be moved together.

- Right-click in the marking and select the "Offset" entry in the context menu.
- Leave the value "0" in the "Offset in X" field on the "Input offset" screen page and enter the value "-60" in the "Offset in Y" field.
- Press the "OK" button to confirm your input.
  The value in field "Y" changes in all three rows to "+2*H/3-60"; the value in field "X" remains unchanged.

7.3 Creating an order

Finally, the order is created by grouping the two previously created main programs.

- Select the "[2] Enter" > "[1] Order" menu item in the workshop programming.
  The "Select order" screen page opens.
- Enter in the "Input" field the name of the order that you want to create.
  Example: USECASE

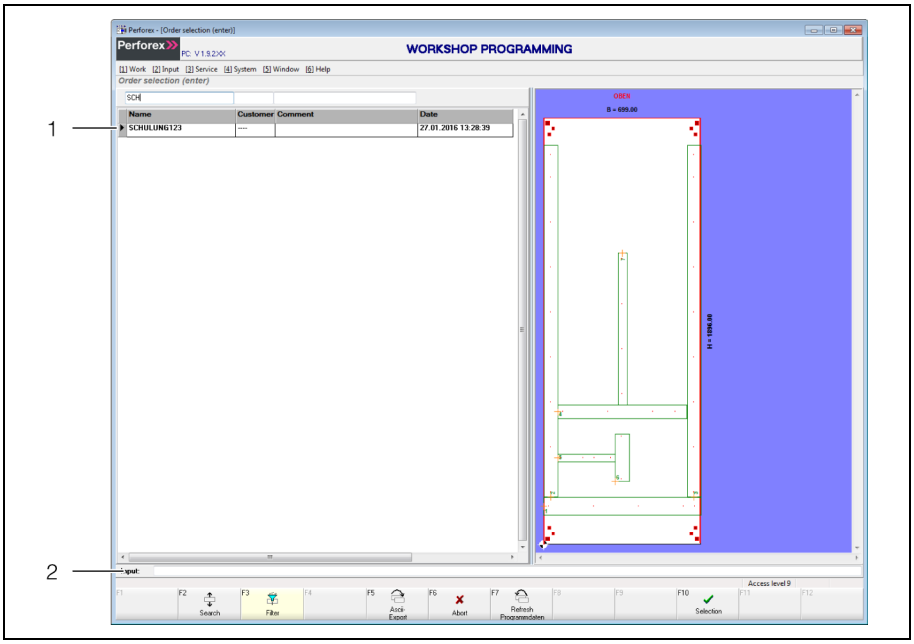

Fig. 32: "Select order" screen page

Legend

1 Previously created orders
2 "Input" field

- Press the "[F10] Select" key to confirm your input.
  The "Order input" screen page opens.

EN

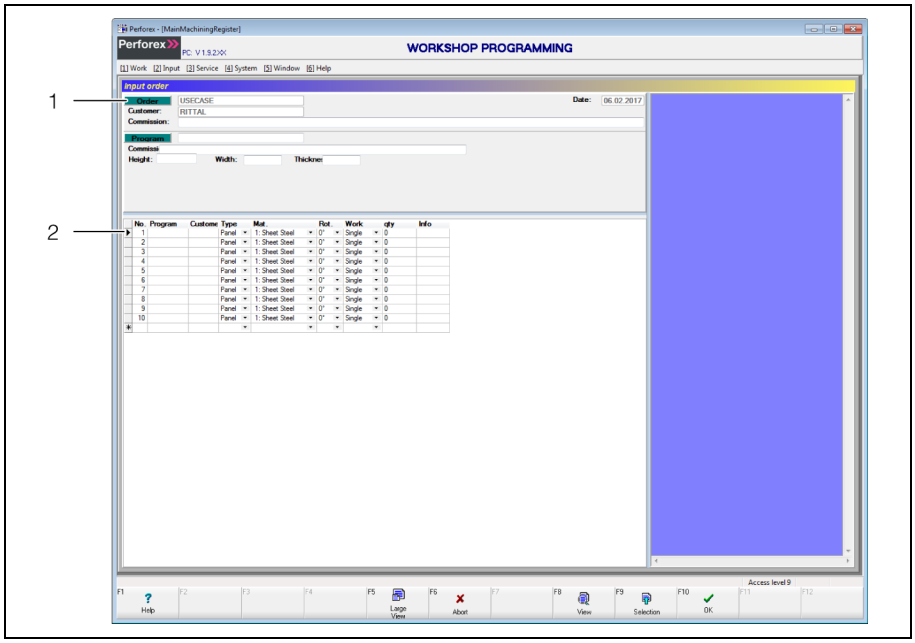

Fig. 33: "Order input" screen page

Legend

1 Fields for the customer name and the commission number
2 Fields for main programs

- If required, first enter the customer name and commission number of the order.
- Select the first main program to be edited during the course of the order. To do this, select the data block marker in the first row and press the "[F9] Select" function key.
  The "Select main program" screen page opens. **All** main programs stored in the workshop programming are initially displayed.
- Press the "[F3] Filter" function key and enter a filter to display only the desired main programs.
  Example: "USECASE".
  The number of displayed main programs reduces accordingly.

EN

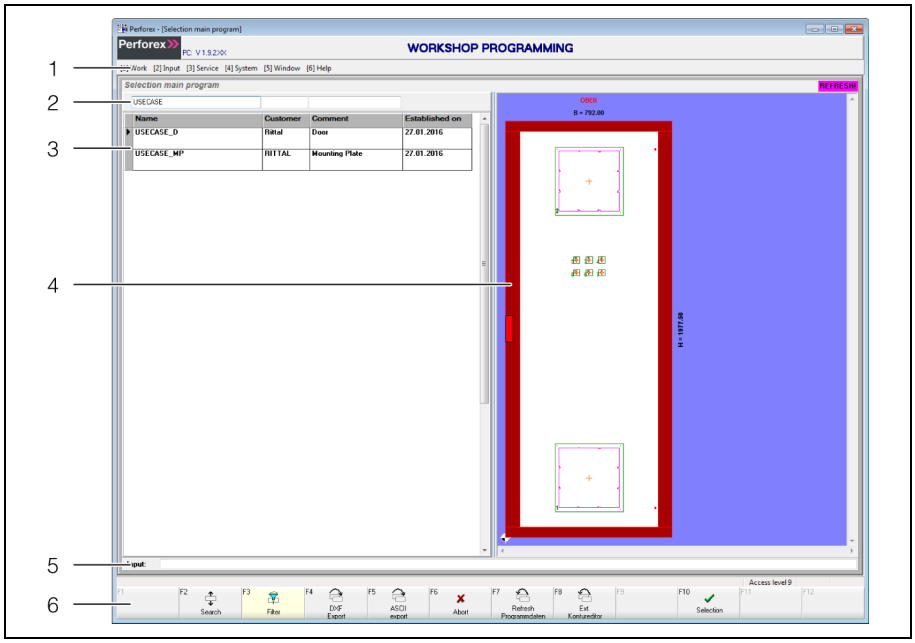

Fig. 34: "Select enclosure" with filter screen page

Legend

1 Menu bar
2 "Filter" field
3 Accordingly reduced list of enclosures
4 Graphical representation of the main program

- Select the desired main program.
  Example: USECASE_D
- Press the "[F10] Select" function key.
  The "Order input" screen page opens.
- Similarly, select the second desired main program to be assigned to the order.
  Example: USECASE_MP
- Press the "[F10] Select" function key.
  The "Order input" screen page opens.

EN

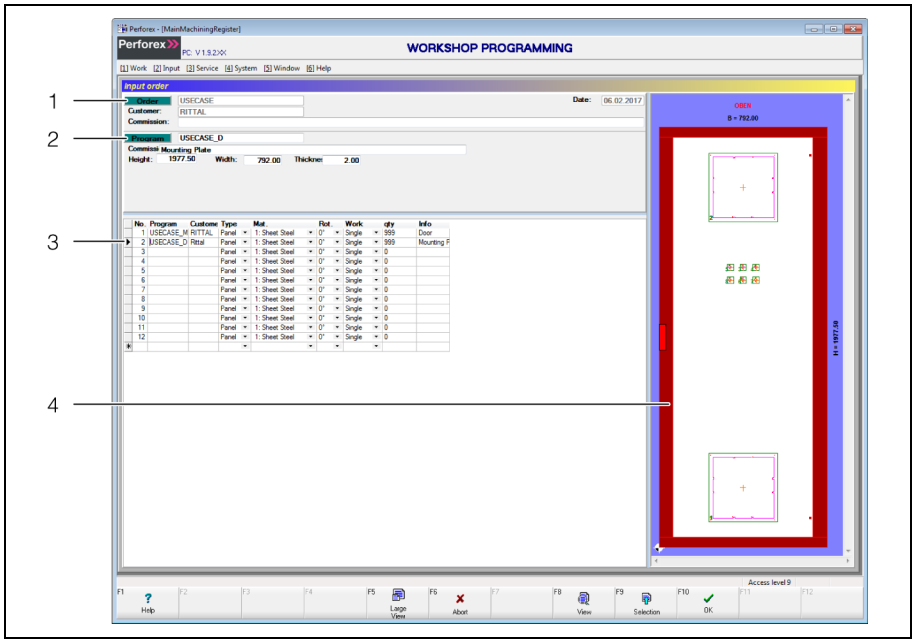

Fig. 35: "Order input" screen page with inserted raw panels

Legend

1 Header data of the current order
2 Header data of the selected raw panel
3 Selected raw panel
4 Graphical representation of the selected raw panel

Enter the required data in the associated line for each main program.

- Select the "Panel" entry in the "Type" column.
  Because the selected raw panels can be very large, only a single panel can be clamped on the machine tool. For smaller panels, another selection would also be generally possible.
- Select the material from which the associated raw panel is made.
  This selection transfers the associated technology parameters from the tool data.
- Specify the angular rotation of the raw panel as actually fastened to the machine.
  For larger panels that cannot be machined standing (=0°) on the machine, the angular rotation is specified in the clockwise direction.
- Also select the "Single" entry in the "Line type" column for **all** raw panels.
  Because of its size, only one raw panel can be clamped on the machine tool and only individual machining is possible. If several smaller panels were clamped together on the machine tool, "Block" or "Sequence" could be selected here.
- Finally, press the "[F10] OK" key to save the inputs for the order.

This completes the order creation.

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8 Other inputs

8.1 Tools

8.1.1 General

The tool editor is used for managing and specifying tool-specific data, such as tool type, dimension, feed and cutting speed, of the deployed tools.

The number of possible work cycles for a tool is also specified in the tool management. The number of work cycles is counted during the machining, and at the end of the raw panel machining subtracted from the remaining work cycles of the associated tool.

This "Service life limitation" type allows the tool wear to be checked and worn tools replaced timely to prevent a threatening tool breakage.

The specification of a representation colour for a tool increases the clarity in the graphical representation and simplifies finding machining operations within a drilling pattern.

8.1.2 Calling the input page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [5] key.
  The "Select tool" screen page opens.
- Select a previously created tool, possibly with the search function.
- Alternatively, enter in the "Input" field the name of the tool to be created.
- Finally, press the "[F10] Select" function key.
  The "Tool input" screen page opens.

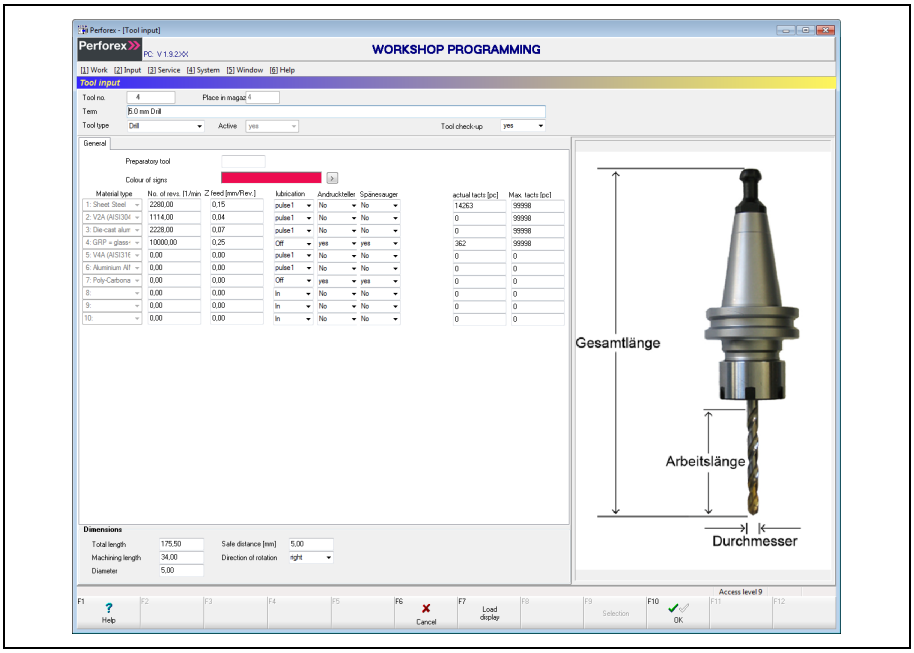

Fig. 36: "Tool input" screen page

Because the general layout of the input pages has already been explained in section 2.4 "Layout of the input pages", only special considerations when creating a tool are discussed below.

8.1.3 Header data

In the upper area of the screen page, the so-called header data with basic information concerning the selected tool is displayed as standard.

The following data can be entered in the header data for a tool.

Parameter	Function
Designation	The designation of the tool as displayed in the description.
Tool type	The base type of the tool. A general differentiation can be made between drills, thread tappers and milling cutters in several variants.
Tool check	Activate or deactivate the automatic determination of the tool length after each machining.

Tab. 41: Header data that can be edited for a tool

Although additional data concerning the tool is displayed, it cannot be edited (directly).

Parameter	Function
Tool number	The number of the tool as stored. When a new tool is created, this number must be specified in the "Input" field.
Magazine slot	The tool slot in the magazine. This number is specified in the magazine management (see section 8.2 "Magazine").
Active	Indicator whether or not the tool is active, "Yes" or "No", respectively. A tool is active when it is assigned to a magazine slot in the magazine management.

Tab. 42: Additional header data for a tool (cannot be edited)

8.1.4 Line data

Detailed information concerning the tool is entered in the line data. The basic properties for the tool are specified with the following data on the "General" tab.

Parameter	Function
Preparatory tool	The number of the tool that should prepare the selected tool.
Character colour	The colour with which the operations of this tool are represented in the graphic.

Tab. 43: Basic properties of a tool

The geometric dimensions of the tool are specified below the "General" tab. The values to be entered here are displayed in the graphic.

Parameter	Function
Total length	The total length of the tool from the tip to the shaft end of the tool holder.
Machining length	The maximum usable length of the tool. For the "drill" tool type, it is the spiral cutter length; for the "milling cutter" tool type, it is the length of the cutting surface.
Diameter	Associated tool diameter
Safe separation	The separation of the tool from the workpiece surface before beginning a work step.
Direction of rotation	The direction of rotation with which the tool operates (selection "left" or "right"). This must be observed, in particular, for thread cutting.
Pitch	The pitch of the thread cutter. This value is specified only for thread tappers.

Tab. 44: Geometric dimensions of a tool

For the actual machining with a tool, the following material-dependent machining parameters are entered.

Parameter	Function
Speed	The tool speed during machining. A speed is specified for the "drill", "thread tapper" and "DARC/FU milling cutter"; a speed step is specified for the "FU milling cutter".
Z or XY feed	The work feed of the tool during the machining. The feed in the Z direction is specified for the "drill" tool type; the feed in the XY plane is specified for the "milling cutter" tool type; no specification is made for the "thread tapper" tool type.
Lubrication	Specification whether or not an automatic lubricating pulse should be performed; if yes, of which type (selection list "Pulse1" to "Pulse9").
Pressure plate	Activate ("Yes") or deactivate ("No") the pressure plate for machining with this tool.
Swarf extractor	Activate ("Yes") or deactivate ("No") the swarf extractor for machining with this tool.
Actual cycles	For activated tool testing, the work cycles already performed with this tool are displayed. If this number exceeds the value in the "Max. cycle count" field, the machining is stopped automatically. If an operation is restarted, the exceeding of the value is notified and no new machining can be performed.
Max. cycles	The maximum possible number of work cycles with this tool. The maximum value is 999999 work cycles. The actual number of work cycles that can be performed is an empirical value that depends on the selected cutting speed, the material thickness and the lubrication. Whereby, different service lives apply to different tool materials. If the tool test fails, the "Actual cycles" field is filled with 999999 that initially prevents any further machining.

Tab. 45: Material-dependent machining parameters

For combi-tools, i.e. drill with thread cutter, the additional "Thread cutter" tab is displayed on which the additional parameters are entered.

Parameter	Function
Speed	The thread cutter speed during machining.
Separation	The separation from the tool tip to the first thread.
Machining length	The maximum usable length of the tool. For thread cutters, this is the length of the thread cutter surface.

Tab. 46: Additional machining parameters for the thread cutter of a combi-tool

8.1.5 Function key bar

There are a few additional assignments of the function key bar on the selection and input pages for tools.

Standard selection page

The following function keys without any additionally pressed key are also assigned on the selection page:

Key	Function
[F4]	"Tool magazine comparison" Comparison of the tool selection with the magazine. Whereby, the individual tools are assigned automatically to the magazine slot stored in the magazine management (see section 8.2.3 "Assigning tools to magazine slots").
[F8]	"Required" Check a main program on the required tools. The list of the required tools helps with the orientation when completing the magazine. For this purpose, after the drill pattern test, the list is filled when working with the deployed tools of the checked main program. The name of the main program is shown above the list.

Tab. 47: Function key assignment without additionally pressed key on the selection page

Standard input page

The following function keys without any additionally pressed key are also assigned on the input page:

Key	Function
[F7]	"Load graphic" Select an arbitrary bitmap file (file format "bmp"). This graphic is then displayed instead of the standard graphic for the associated tool.

Tab. 48: Function key assignment without any additionally pressed key on the input page

8.2 Magazine

8.2.1 General

The reference between the tools stored and used in the "Workshop programming" program and the tools actually inserted in the magazine on the machine tool is established in the magazine management. Not only the created tools, but also the tools loaded in the magazine, serve as machine parameters.

Note:
The operator should take increased care when loading the tool magazine on the machine tool. In particular, ensure that the loading in the tool and magazine management matches the actual loading on the machine. Otherwise, the machine tool can be damaged.

8.2.2 Calling the screen page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [6] key.
  The "Machine parameters" screen page opens.

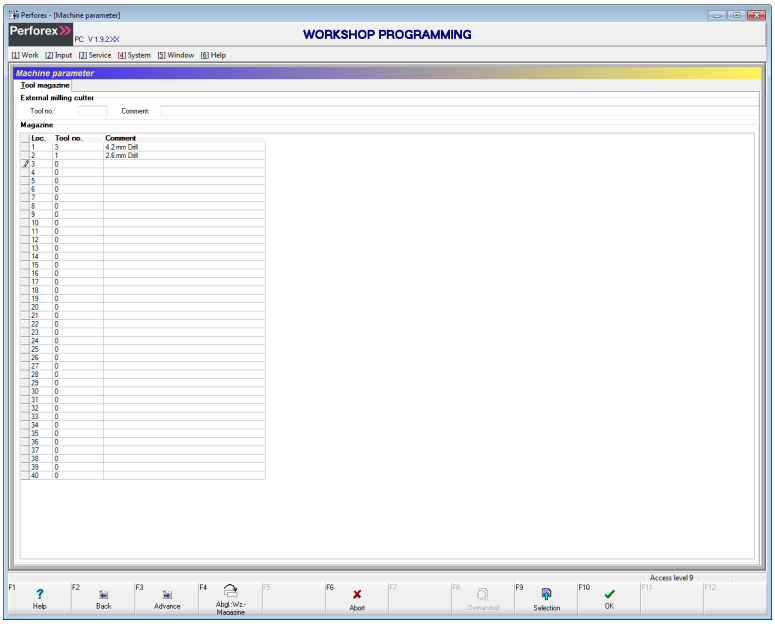

Fig. 37: "Machine parameters" screen page

Because the general layout of the screen page has already been explained in section 2.4 "Layout of the input pages", only special considerations when loading the magazine are discussed below.

8.2.3 Assigning tools to magazine slots

- Move the data block marker in the line data to any magazine slot, e.g. with the arrow keys.
- Set the focus to the "Tool no." column, e.g. with the arrow keys.
- Press the "[F9] Select" function key.
  The "Select tool" screen page opens.
- For example, use the arrow keys to select the tool loaded at the currently selected magazine slot.
- Press the "[F10] Select" function key to confirm your selection.
  The number and description of the tool appear in the "Tool no." and "Comment" columns, respectively.
- Alternatively, you can also enter the number of the tool directly in the "Tool no." column.

8.3 PDA data

8.3.1 General

The "Workshop programming" program includes a production data acquisition "PDA"). This allows access to various production data for a specific day and over the complete run time of the machine.

8.3.2 Calling the selection page

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [7] key.
  The "Select production data" screen page opens.

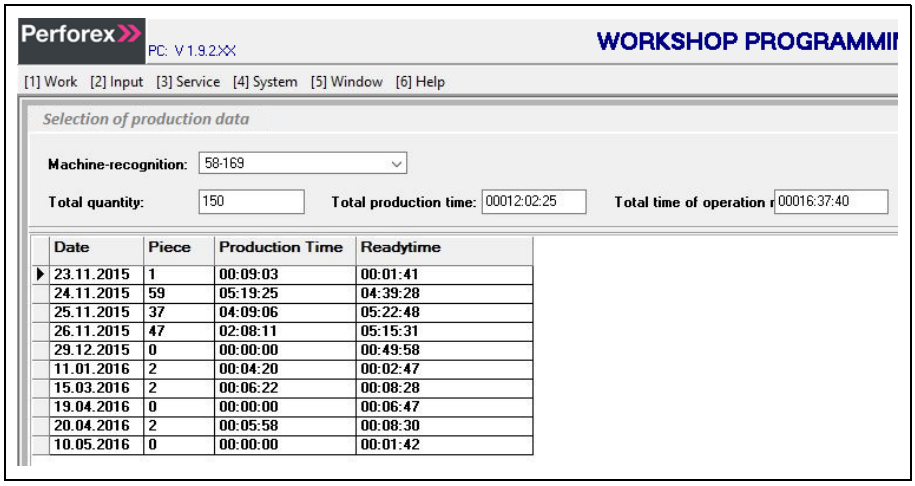

Fig. 38: "Select production data" screen page

8.3.3 "Select production data" screen page

The production data for a specific day and over the complete run time of the machine for each selected machine is displayed on this screen page.

Header data

The production data over the complete run time of the machine is displayed in the header data.

Parameter	Function
Machine identification	Selection list for all available machines. The following fields and the line data always apply to the currently selected machine.
Total quantity	Total number of machined raw panels.
Total production time	The total time in which the machine was producing.
Total operational time	The total time in which the machine was operational.

Tab. 49: The production data over the complete run time of the machine

Line data

The production data for each day is displayed in the line data.

Parameter	Function
Date	Date of the blocked production data.
Count	The number of raw panels machined on this day.
Production time	The duration in which the machine produced on this day.
Operational time	The duration in which the machine was operational on this day.

Tab. 50: Production data for a single day

Selecting a day for the details view

Further information concerning every individual machining can be displayed for a single day.

- Move the data block marker in the line data to any date, e.g. with the arrow keys.
- Press the "[F10] Select" function key.
  The "PDA block" screen page is displayed with detailed information concerning the machining on this day (see section 8.3.4 ""PDA block" screen page").

8.3.4 "PDA block" screen page

Detailed information concerning all machining for a previously selected date is displayed on this screen page.

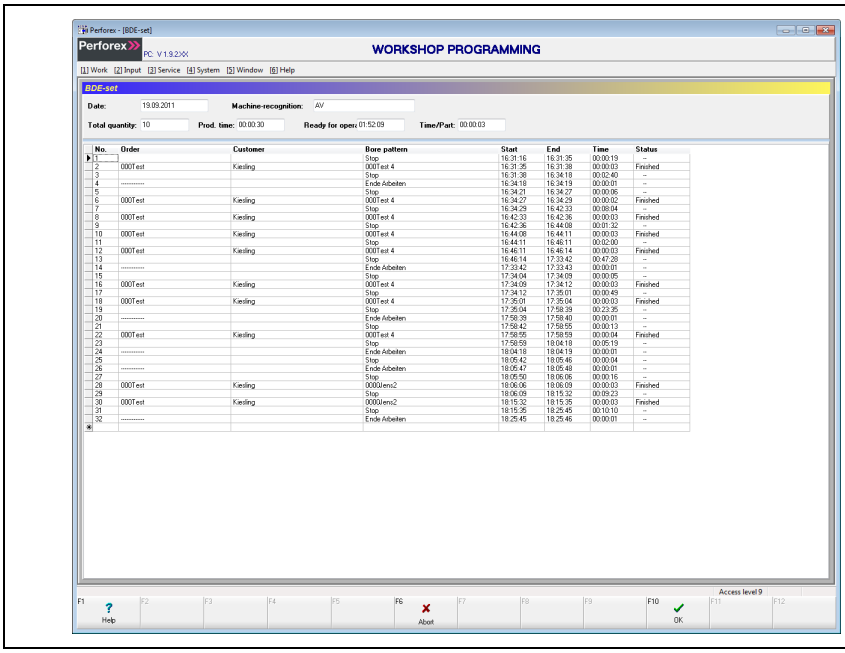

Fig. 39: "PDA block" screen page

Header data

The header data largely corresponds to that on the "Select production data" screen page, however the values for the selected day are displayed. The following parameters are also displayed.

Parameter	Function
Part/time	The average machining time per part on this day (machining duration / number of parts).

Tab. 51: Production data for a single day

Line data

The production data for each individual order is displayed in the line data.

Parameter	Function
No.	The consecutive number of the machining.
Order	The name of the order.
Customer	The name of the customer provided it was specified in the order.
Drilling pattern	The drilling pattern number of the machined raw panel or indicator of the "Operational", "Work end" or "Malfunction" machine state.
Start, end, time	The start, end and duration of the associated machining.
Status	The machining status of the associated workpiece. The entries "--" for a machining state, "Complete" (machining was performed completely) and "Abort" (machining was aborted) are possible.

Tab. 52: The production data for all orders of a day

8.3.5 Function key bar

There are several additional assignments of the function key bar on the selection page and the "PDA block" page for production data.

Standard selection page

The following function keys without any additionally pressed key are also assigned on the selection page:

Key	Function
[F5]	"CSV export" Export the day data in CSV format for further processing. The folder in which the CSV file is stored can be selected prior to the export. The CSV file can be processed by a spreadsheet program (e.g. Excel). The file name is formed from the selected day date, the suffix "_PDA_" and the name of the machine.

Tab. 53: Function key assignment without additionally pressed key on the selection page

"PDA block" screen page [Shift] key

With additionally pressed [Shift] key, the following function keys are also assigned on the "PDA block" screen page:

Key	Function
[F12]	"Copy to clipboard" Copy the PDA data to the clipboard in order to process it with a spreadsheet program (e.g. Excel).

Tab. 54: Function key assignment on the "PDA block" screen page with additionally pressed [Shift] key

8.4 ASCII import

8.4.1 General

External data can be imported into the "Workshop programming" program with the "ASCII import" function. This provides a universal interface to various planning systems in order to transfer data for raw panels constructed in these systems to the workshop programming.

Whereby, it is possible to import a complete project consisting of

– Main program
– Raw panels
– Component parts
– Variable component parts
– Combined component parts
– Contours

Alternatively, it is also possible to import a single combined component part or individual files.

The also possible ASCII export allows data blocks to be exported from the workshop programming and then reimported.

8.4.2 Calling the ASCII import

- While holding the [Alt] key pressed, press the [2] key.
  The "Enter" menu is expanded and the lower-level menu items displayed.
- Press the [8] key.
  The "Parameters for ASCII conversion" screen page appears with the "ASCII import" tab in the foreground.

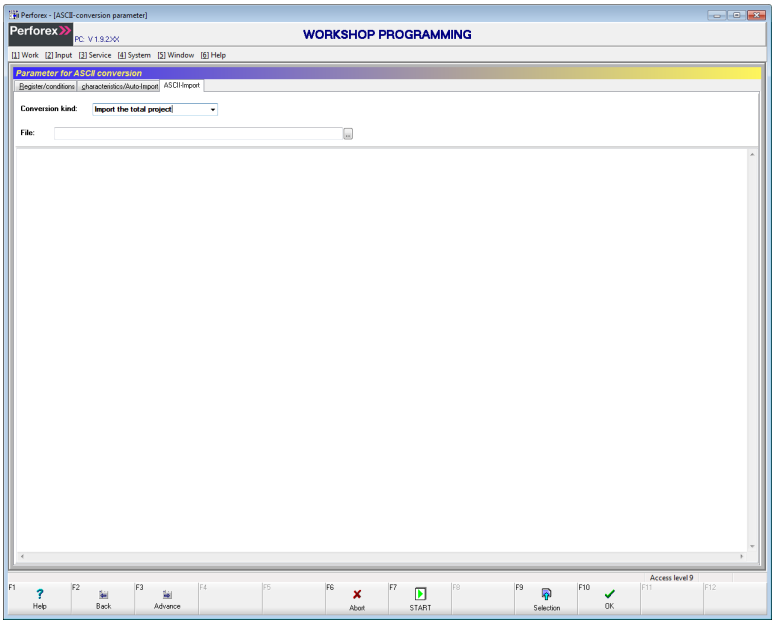

Fig. 40: "Parameters for ASCII conversion" screen page, "ASCII import" tab

8.4.3 Importing ASCII data

- Select in the "Conversion type" selection list which information is stored in the external ASCII file.
  Depending on the selected conversion type, the file filter is adapted accordingly in the following selection step:
  – **Import complete project:** Files with the file name extension "*.PPR" are displayed.
  – Import complete combined component Files with the file name extension "*.PKB" are displayed.
  – **Import single files:** Files with the file name extension "*.PAU" are displayed.

Note:
The file name extensions can be customised in the system settings (see section 10.2.1 ""Directories/conditions" tab").

- Press the button behind the "File" field to select the file in which the imported ASCII data is stored.
  The file name is displayed in the "File" field.
- Start the data import by pressing the "[F7] Start" function key.
  Messages concerning the file import are displayed in the message window. Depending on the settings on the "Directories/conditions" tab (see section 10.2.1 ""Directories/conditions" tab"), prompts can appear when, for example, component parts exist already in the workshop programming.

The messages in the message window are divided into two categories:
– **Info:** Information about the section in which the conversion is currently being performed.
– **Err:** Error, when, for example, the content or structure of the ASCII file is incorrect or the ASCII files are inconsistent. This can occur, for example, when a component part that does not exist in the database or in the associated ASCII file is entered in a raw panel.

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9 System settings

9.1 User administration

9.1.1 Rights levels

To use the workshop programming, users with different rights can be created. The following rights levels are available for this purpose.

Level 1:

Users of level 1 may perform the following actions with jobs:

– Create
– Change
– Delete
– Process

Users of this level may also perform the following actions:

– Traverse the machine axes in manual operation
– Browse the F-Test functions
– Browse the machine parameters
– Change the user interface language
– Browse the log files
– Create further users with the user's own or a lower rights level.

Level 2:

In addition to the level 1 functions, users of level 2 may perform the following actions:

– Manage tools
– Manage the magazine
– Define variables
– Browse the advanced machine parameters
– Browse the PLC parameters
– Export and import PLC data

Note:
Changes may be made to the PLC parameters only when instructed by the machine manufacturer.

Level 3:

In addition to the level 2 functions, users of level 3 may perform the following actions for the PDA data:

– Browse
– Delete
– Export

Level 4:

In addition to the level 3 functions, users of level 4 may perform the following actions for main programs, raw panels, component parts, variable component parts, combined component parts and contours:

– Create
– Edit
– Delete

Users of this level may also import data from the formats DXF, ASCII, SVG, etc.

Level 5:

In addition to the level 4 functions, users of level 5 may perform the following actions:

– Parameterise import routines

– Change machine parameters
– Change outputs and static values in the F-Test module
– Change logging

Level 6:
Because this level is not assigned, users have the same functions as for level 5.

Level 7:
In addition to the level 5 functions, users of level 7 may directly browse the drive parameterisation of the machine via a link to the external program "Darc Service".

Level 8:
Because this level is not assigned, users have the same functions as for level 7.

Level 9:
As administrator, users of this level may change all the workshop programming settings.

9.1.2 User login

The user login can be made automatically by calling the workshop programming with the appropriate command line parameter (see section 2.2 "Starting the program"). Alternatively, the user can also login after starting the workshop programming.

■ While holding the [Alt] key pressed, press the [4] key.
The "System" menu expands and the lower-level menu items displayed.
■ Press the [1] key.
The "User" submenu expands and the lower-level menu items displayed.
■ Press the [1] key.
The "User login" dialogue appears.

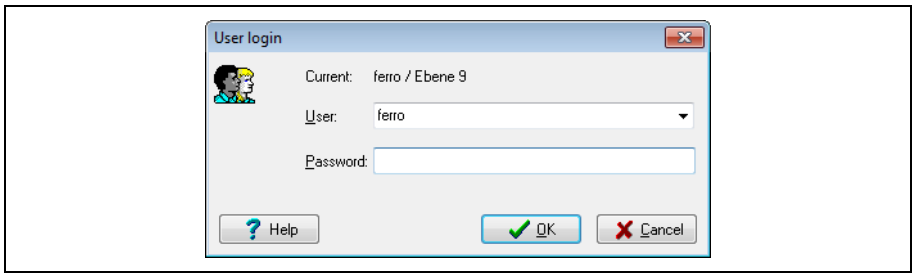

Fig. 41: "User login" dialogue

■ Select the desired user name in the "User" field.
■ Enter the associated password.
■ Press the "OK" button to confirm your selection.
The user is logged in and the access level of the logged in user appears in the lower right area of the screen page.

9.1.3 User logout

To prevent unwanted changes to the workshop programming, the user can be logged out.

■ While holding the [Alt] key pressed, press the [4] key.
The "System" menu expands and the lower-level menu items displayed.
■ Press the [1] key.
The "User" submenu expands and the lower-level menu items displayed.
■ Press the [2] key.
The user is logged out immediately without any further prompt.

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9.1.4 User administration

In the user administration
– new users with a specific access level can be created
– existing users can be deleted
– existing users can be assigned different access levels, and
– passwords can be changed.

Whereby, a user of a specific access level can perform these functions only for other users of the same or lower access level.

■ While holding the [Alt] key pressed, press the [4] key.
The "System" menu expands and the lower-level menu items displayed.
■ Press the [1] key.
The "User" submenu expands and the lower-level menu items displayed.
■ Press the [3] key.
The "User administration" dialogue appears.

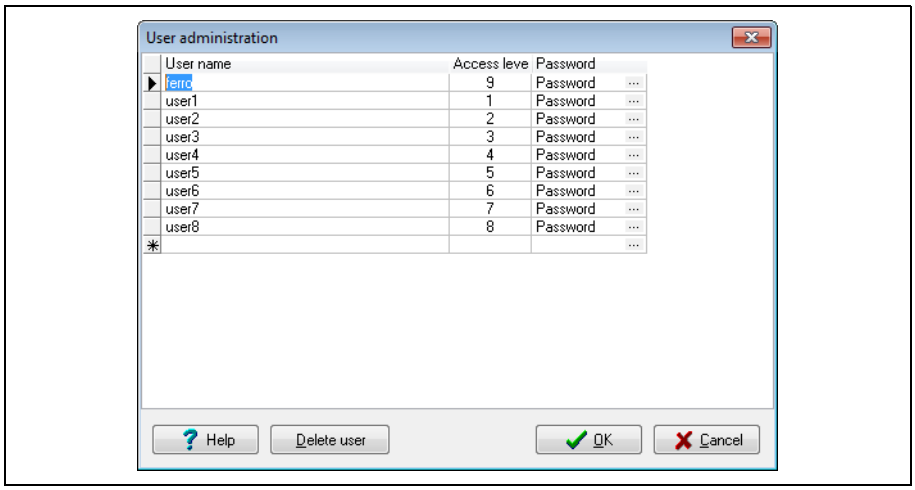

Fig. 42: "User administration" dialogue

Creating a new user

■ Set the data block marker in the last (free) line.
■ Enter the user name and assign the desired access level to the user.
■ Press the button in the "Password" field.
The "Change password for XXX" dialogue appears.

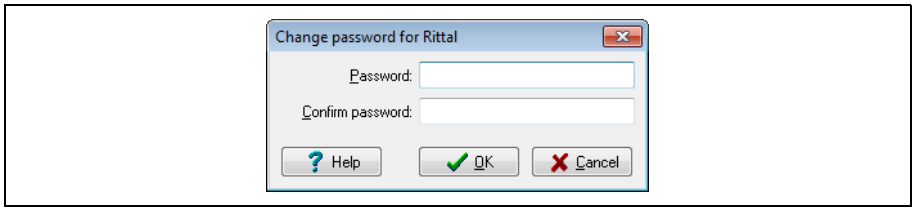

Fig. 43: "Change password for XXX" dialogue

■ Enter the password in the "Password" field and repeat it in the "Confirm password" field.

Deleting a user

■ Set the data block marker in the line that displays the user to be deleted.
■ Press the "[F2] Delete user" function key or press the appropriate button in the "User administration" dialogue.
The user is deleted immediately without any further prompt.

Assigning a different access level

■ Set the data block marker in the line that displays the user to which a different access level should be assigned.
■ Switch to the "Access level" column and enter the desired access level.

- Press the "OK" button in the "User administration" dialogue to accept the changes.

Changing the password

- While holding the [Alt] key pressed, press the [4] key.
  The "System" menu expands and the lower-level menu items displayed.
- Press the [1] key.
  The "User" submenu expands and the lower-level menu items displayed.
- Press the [4] key.
  The "Change password for XXX" dialogue appears (Fig. 43).
- Enter the password in the "Password" field and repeat it in the "Confirm password" field.

9.2 Basic settings

9.2.1 Opening the language selection

The user interface of the "Workshop programming" program can be displayed in various languages.

- While holding the [Alt] key pressed, press the [4] key.
  The "System" menu expands and the lower-level menu items displayed.
- Press the [2] key.
  The "Basic settings" submenu expands and the lower-level menu items displayed.
- Press the [1] key.
  The "Language selection" submenu expands and the lower-level menu items displayed.
- Press the [1] key again.
  The "User administration" dialogue appears.

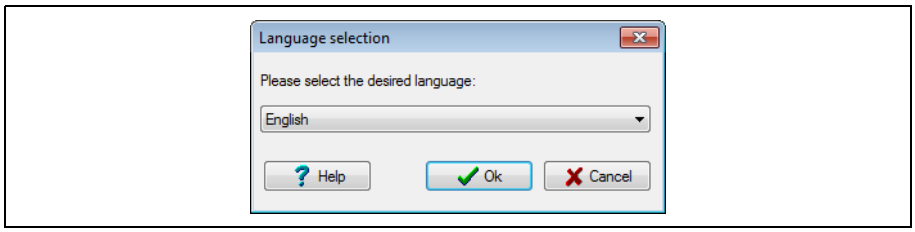

Fig. 44: "Language selection" dialogue

- Select the desired language for the user interface.
- Press the "OK" button to confirm your selection.
  The language is switched immediately without the program needing to be restarted.

9.2.2 Language selection parameters

The path to the individual language files can be adapted. This is required only in special cases and may be done only after consultation with Rittal. Otherwise, program malfunctions may occur.

9.2.3 General settings

The basic settings for the "Workshop programming" program are specified on the “General settings” screen page. The screen page provides two tabs for this purpose.

"Representation" tab

The general representation of the workshop programming can be customised with the following parameters.

Parameter	Function
Dialogue style	The dialogue style in the form of "Ferrocontrol" or "Windows". Rittal recommends the "Ferrocontrol" setting here to prevent unwanted changes being made to the entered programs.
Function key bar	Representation of the function key bar with 10 or 12 keys. This can be customised depending on the screen width.
Window with its own title bar	If this entry is activated, each screen page is represented in its own window. The buttons for minimising, maximising and closing are displayed in the upper area.
Window with key bar	Without function
Window by dragging the …	If this entry is activated and also the "Window with its own title bar" entry, each window (each screen page) can be moved individually with the mouse.
Inactive windows are …	If this entry is activated and also the "Window with its own title bar" entry, it is possible to switch between the windows (screen pages) with the mouse.

Tab. 55: "Representation" tab, "General" group box

The representation of the menu and status bars can be customised with the following parameters.

Parameter	Function
Menu position	Select whether the menu bar is displayed above or below the header line.
Numeric menu	If this entry is activated, the menus can be activated with the prefixed number (e.g. "[2]" for the "Enter" menu).
Status bar position	Select whether the status bar is displayed above or below the function key bar, or hidden.

Tab. 56: "Representation" tab, "Menu and status bar" group box

"Miscellaneous" tab

The advanced settings of the workshop programming for creating snapshots in a fault situation can be customised with the following parameters.

Parameter	Function
Max. number of snapshot files	The number of retained snapshot files. If this number of files exists and another snapshot is created, the oldest snapshot file will be deleted.
Timeout monitoring	If the creation of the snapshot file takes longer than the time entered here (default value: 60 seconds), the creation is cancelled.

Tab. 57: "Miscellaneous" tab, "Snapshot" group box

The advanced settings for operating the workshop programming with a touch panel can be customised with the following parameters.

Parameter	Function
Operating support …	Activation of the operating support for touch panels. If this setting is activated, the following two input fields are enabled. This allows the operability on a touch panel to be improved by customising the representation size.
Font size main menu	The associated font size in "pt" for the main menu.
List element height	The height of the list element in "px".

Tab. 58: "Miscellaneous" tab, "Operating support for touch panels" group box

9.2.4 Start options

The settings for starting and closing the "Workshop programming" program are specified on the “Start options” screen page.

Parameter	Function
Activate the Windows user interface	If this entry is activated, the program is displayed in its own Windows window with the appropriate buttons for minimise, maximise and close.
Start automatically after the Windows login	If the "Program" entry is activated, the program is started automatically after the login to the operating system (Auto-Start). Alternatively, a batch file can be started in which, for example, before starting the program, a check is also made whether the database server is started and can be accessed.
Start parameters	Additional parameters used when the workshop programming is started.

Tab. 59: "Miscellaneous" tab, "Windows start" group box

A server for synchronising the system time can be specified in the "Program start" group box.

Parameter	Function
Synchronise the system time with the server	If this entry is activated, the system time is synchronised with a time server.
Time server	The Internet address of the time server deployed for the synchronisation.

Tab. 60: "Miscellaneous" tab, "Program start" group box

The settings for closing the workshop programming are made in the "Close" group box.

Parameter	Function
Shutdown Windows after program end	If this entry is activated, after closing the workshop programming, Windows is also closed and the computer switched off. This entry enables the following entries.
Force programs to close	If this entry is activated, when Windows is shutdown, the closing of any other open programs is forced so that Windows can finally be closed.
Wait time … seconds	Before the forced closing of programs, a delay whether the program can be closed is made for the wait time set here.

Tab. 61: "Miscellaneous" tab, "Close" group box

9.2.5 Task system

The "Task system" function is deployed by Rittal for logging and analysis purposes.

9.2.6 Communications channels

The "Communications channels" function is deployed by Rittal for logging and analysis purposes.

9.2.7 Units systems

The associated units for various values are preset on the "Units systems" screen page.

– Length
– Angle
– Pressure
– Temperature
– Speed

■ Select the appropriate unit in the list for the associated values used most often (e.g. "mm" for length units).

If the units system is changed, e.g. from "mm" to "cm", all stored data is converted accordingly.

9.2.8 Interbase

The connection of the workshop programming to the database server is configured on the "Interbase" screen page. The following settings can be made for this purpose.

Parameter	Function
Server name	The IP address or computer name of the PC on which the database file is stored or the database server runs. If the database is located on the local computer, specify the IP address "127.0.0.1" or "localhost" here.
Path and name of the database file	Select the database file, including the path. This selection can either be entered directly or the file is selected by pressing the button behind the field. Whereby, the drive letter on which the database server runs from the viewpoint of the computer, not a network drive, must be entered.
User name	"SYSDBA" standard user for access to the database.
Password	The password of the above-mentioned user, default "masterkey".
Group	No entry is required in this field.

Tab. 62: "Interbase" screen page

Example input for the server name and the database file

The following example assumes that the database server in the network runs on the "SBS" computer with IP address 192.168.62.5. The database file is located in the "D:\Database\PERFOREX.FDB" directory on this server.

■ Enter IP address "192.168.62.5" or alternatively the name "SBS" in the "Server name" field.
■ Enter the above-mentioned path "D:\Database\PERFOREX.FDB" in the "Path and name of the database file" field.
  This is the path where the database file is stored on the server.
■ After making changes on the screen page, test the access by pressing the "Test" button.

The "Connection is OK" message appears if connection to the database can be established. An appropriate error message appears if no connection can be established.

EN

10 Service

10.1 Machine > Machine parameters

Further basic settings for the workshop programming can be performed on various tabs on the "Machine parameters" screen page.

10.1.1 Input

The default values stored on the "Input" tab are used when no other inputs are made by the operator.

Parameter	Function
Length	The length with which the "Height" field is filled when creating a main program or raw panel.
Width	The width with which the "Length" field is filled when creating a main program or raw panel.
Thickness	The thickness with which the "Thickness" field is filled when creating a main program or raw panel.
Variable component part length	The length with which the part is displayed in the graphic when creating a variable component part.

Tab. 63: "Input" tab, "Default prg. data" group box

The following setting specifies the tool to be used when no tool is specified explicitly.

Parameter	Function
Tool	The number of the standard tool.
Type	The type of the tool used by default. No input is possible here; the value is taken automatically from the tool management.

Tab. 64: "Input" tab, "Default tool" group box

The following settings specify the limit values for the tool lengths. These values ensure the process reliability and depend on the deployed machine tool (axis traversing path).

Parameter	Function
Magazine tools	The minimum and maximum lengths for tools deployed in the magazine. An error message is issued if values are entered in the tool management that lie outside these limits.
External milling tools	The minimum and maximum lengths for tools deployed on an external milling unit. An error message is issued if values are entered in the tool management that lie outside these limits.

Tab. 65: "Input" tab, "Limitation of the tool lengths" group box

The following settings define the various materials for the machining parameters entered in the tool management.

10.1.2 Representation

The colour of the graphical representation of the individual workshop programming elements can be customised on the "Representation" tab.

- Press on the currently stored colour behind the desired graphic element. The Windows colour palette opens.
- Select a standard colour or specify a user-defined colour by pressing the "Define colours" button.

Because the settings are stored locally on the associated computer, the representation can be customised individually.

10.1.3 Program settings

Further settings for the workshop programming are performed on the "Program settings" tab.

Parameter	Function
PDA export	The default directory used for exporting the process data in CSV format.

Tab. 66: "Program settings" tab, "Directories" group box

Parameter	Function
PLC messages in every editor …	This parameter has only direct effects on the machine. If the entry is activated, the PLC line remains, even during programming.

Tab. 67: "Input" tab, "Messages" group box

The default representation of the input pages is set in the "Browser" group box.

Parameter	Function
Representation	"Tabular" (standard) or "Tree structure" selection. This selection can be switched on every screen page by pressing the "[F8] Representation" function key.

Tab. 68: "Input" tab, "Browser" group box

10.1.4 Software configuration

The connection of the workshop programming to "eplan" is set and the type of the connected machines is defined on the "Software configuration" tab.

- Activate or deactivate the settings depending on whether the workshop programming is connected to "eplan" and which machine tools are deployed alongside a Perforex machine ("Secarex" and/or the "Perforex LC" laser processing machine).

10.2 ASCII conversion parameters

The presettings for importing and exporting ASCII files are performed on various tabs on the "Parameters for ASCII conversion" screen page.

10.2.1 "Directories/conditions" tab

The specifications for the directories and the default file name extensions used for importing and exporting ASCII files are made on this tab.

Parameter	Function
Path for ASCII import	The default directory for importing ASCII files.
Path for ASCII export	The default directory for exporting ASCII files.
ASCII file extensions	The file name extensions for the various types of ASCII files. They are used automatically for the export; for the import, the file filter is set accordingly so that only those files "appropriate" for the import are displayed.

Tab. 69: "Directories/conditions" tab, "Paths/extensions" group box

The action to be performed when it is determined during the import of ASCII files that data blocks exist already is specified in the "Overwrite" group box.

Parameter	Function
Action for identical data blocks	Select the desired action from the following options: – **Overwrite without prompt:** Any data blocks that exist already in the database will be overwritten with the data of the ASCII file without a prompt being issued. – **Overwrite with prompt:** A prompt is issued in which the decision can be made whether the data blocks should be taken from the ASCII file or the existing data should continue to be used. – **Do not overwrite:** No existing data blocks will be overwritten during the import.

Tab. 70: "Directories/conditions" tab, "Overwrite" group box

It is specified in the "Logging" group box whether an ASCII import is written to the log file and whether further information is displayed for the import.

Parameter	Function
Entry in the log file	If this entry is activated, all import actions are logged in a log file. The log file is stored as the "ASCII_EXP_IMP.Prot" file in the "Logs" subdirectory for the workshop programming.
Information display	If this entry is activated, the associated information is displayed for each import.

Tab. 71: "Directories/conditions" tab, "Logging" group box

10.2.2 "Identifications/Auto-import" tab

The specifications for the identifications within the ASCII files as well as details for the automatic import are made on this tab.

Note:
Changes may be made to the settings in the "Identifications" group box only after consultation with Rittal. Otherwise, compatibility to external CAD planning systems may be lost.

The settings for the automatic import of ASCII files are made in the "Automatic ASCII import" group box. The automatic import makes it possible to transfer data from an external system stored in a specified directory automatically to the workshop programming (possibly after refreshing the display).

Parameter	Function
Activated	If this setting is activated, ASCII files are always imported automatically.
Wait time between ...	If the workshop programming detects a new file in the directory used for the auto-import, the import is made only after the wait time set here.
Path for auto-import	The directory for auto-import. If a new ASCII file is stored in this directory, it will be imported automatically in the workshop programming after the above-mentioned wait time.

Tab. 72: "Identifications/Auto-import" tab, "Automatic ASCII import" group box

10.3 DXF conversion parameters

The basic settings for converting DXF files are specified on the "Parameters for DXF conversion" screen page. These parameters are normally customised once according to the deployed CAD system and the output of the associated DXF drawings.

10.4 Elpro conversion parameters

The basic settings for converting Elpro files are specified on the "Parameters for Elpro conversion" screen page. The specifications for the associated default directories used for the import are made here.

Parameter	Function
Local path of the Elpro files	The default local directory from which Elpro files are imported.
Network path of the Elpro files	The default network directory from which Elpro files are imported.

Tab. 73: "Directories/conditions" tab, "Paths" group box

It is specified in the "Overwrite" group box which action should be performed when it is determined during the import of Elpro files that data blocks exist already.

Parameter	Function
Action for identical data blocks	Select the desired action from the following options: – **Overwrite without prompt:** Any data blocks that exist already in the database will be overwritten with the data of the Elpro file without a prompt being issued. – **Overwrite with prompt:** A prompt is issued in which the decision can be made whether the data blocks should be taken from the Elpro file or the existing data should continue to be used. – **Do not overwrite:** No existing data blocks will be overwritten during the import.
Action for existing predrilled component parts	Select the desired action from the following options: – **Overwrite:** Any predrilled component parts that exist already in the database will be overwritten with the data of the Elpro file without a prompt being issued. – **Do not overwrite:** No existing data blocks will be overwritten during the import.

Tab. 74: "Directories/conditions" tab, "Overwrite" group box

10.5 SVG conversion parameters

The basic settings for converting SVG files are specified on the "Parameters for SVG conversion" screen page.

10.5.1 "Directories/conditions" tab

The settings to be made on this tab correspond to those for the import of Elpro files (see section 10.4 "Elpro conversion parameters").

10.5.2 "Identifications" tab

Similar to the import of DXF files, a specific colour is also assigned to the various tool numbers to identify the machining for the SVG import.

10.6 Variables definition

The default variables "W" (width) and "H" (height) can be used to define positions within a component part or the positioning of a component part on a raw panel. Further auxiliary variables used for positioning can be created on the "Available variables" screen page.

- Enter the designation of the user-defined variable, e.g. "Q".
- Enter the value for the variable after the equal sign "=".
  This can be a fixed numeric value (e.g. "1234"), a calculation with the default variables "W" and "H" or other user-defined variables.

Example: MX=W/2

This defines the variable "MX" to which half the width of the component part is assigned. This variable can then be used for positioning component parts.
The variables can be used for calculations in the "Formula input" field.

- Enter the desired formula in the "Formula input" field.
- Press the "[F5] Evaluate" function key.
  The associated numeric value is output in the "Result" field.

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