



USER'S GUIDE

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1. INTRODUCTION

This guide is designed for WRYKRYs program users. It is used to teach how to work with this program and to look up detailed information about particular functions. After reading the guide, the user should be able to ensure technological preparation of cutting machines independently.

1.1. HW and SW Requirements of the Wrykrys Program

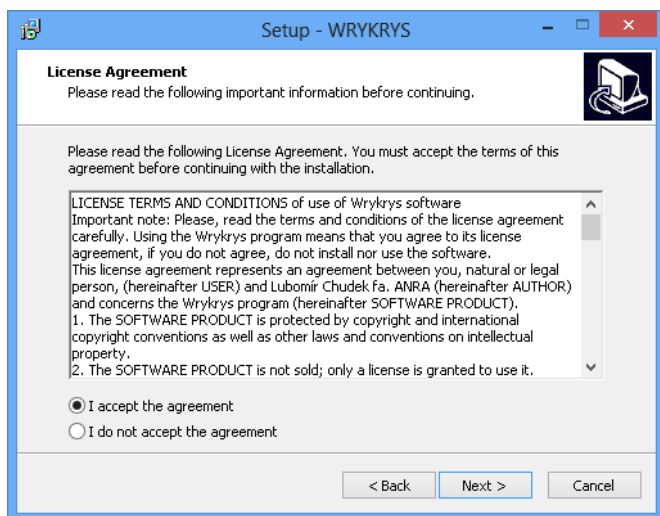
1. 32-bit or 64-bit operating system Windows 7, 8, 10, 11
2. .NET framework
3. Dual-core or multi-core processor
4. Monitor with a minimum resolution of 1920x1080
5. Mouse with a scroll button
6. Any printer

1.2. WRYKRYs Program Installation

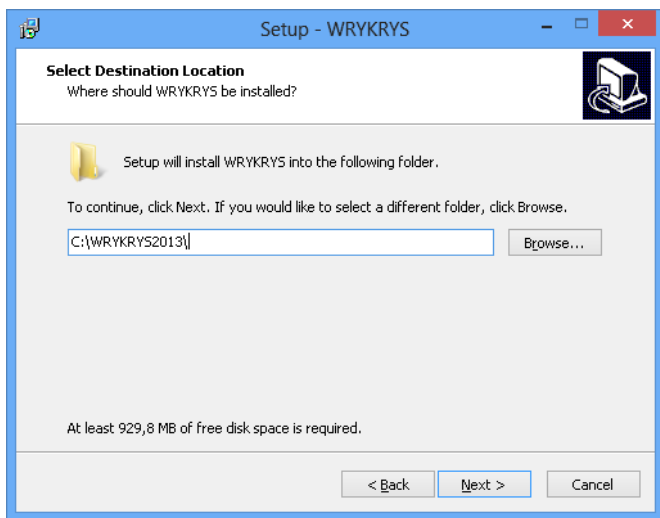
The installation DVD contains a 32- and also 64-bit installer; after the DVD is inserted, the 32-bit installation starts automatically; if you want to install the 64-bit version, you need to start it manually from the DVD.



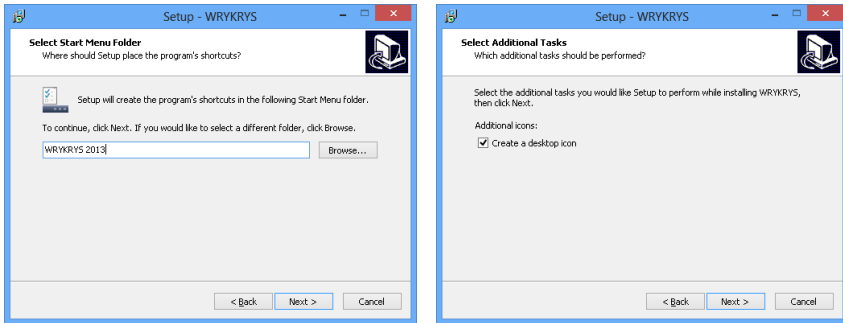
To continue the installation, you need to agree to the license terms and conditions of the Wrykrys program.



Next, choose the target directory. To install the full version including the multimedia help, you need about 1 GB of free disc space.



In the next step, you can create a folder in the Start menu and a desktop icon.



After the WRYKRY5 installation is finished, installation of a hardware key driver and module needed to load DWG files is suggested.



After that, you can start WRYKRY5.

Note: When you install a version downloaded from the Internet, it does not contain the installer of multimedia help, hardware key driver or DWG module. It is necessary to download and install these components separately if needed.

1.3. Content of WRYKRYs Directory Sub-folders

↑ Name	Ext	Size	Date	Attr
[.]		<DIR>	04.02.2014 11:20	----
[AIRMODMAKRA]		<DIR>	04.02.2014 11:17	----
[ARIEL]		<DIR>	04.02.2014 11:17	----
[COLORPLUS]		<DIR>	04.02.2014 11:17	----
[cs-CZ]		<DIR>	04.02.2014 11:17	----
[DATABANK]		<DIR>	04.02.2014 11:18	----
[FAKTURY]		<DIR>	04.02.2014 11:18	----
[FILTRYNEW]		<DIR>	04.02.2014 11:17	----
[GALERIE]		<DIR>	04.02.2014 11:17	----
[HELPS]		<DIR>	04.02.2014 11:17	----
[IMPORT]		<DIR>	04.02.2014 11:17	----
[MULTIHELP]		<DIR>	04.02.2014 11:17	----
[PROPALY]		<DIR>	04.02.2014 11:18	----
[SOURCECAD]		<DIR>	04.02.2014 11:17	----
[TEMP]		<DIR>	04.02.2014 11:20	----
[TESTKEY]		<DIR>	04.02.2014 11:18	----
[WMAKRA]		<DIR>	04.02.2014 11:18	----
_UKLID	BAT	622	30.08.2013 11:33	-a--
Ace0_30	cjp	2 084	28.05.2013 11:39	-a--
Ace40_90	cjp	2 084	28.05.2013 11:33	-a--
Airmod	exe	659 456	30.09.2013 14:50	-a--
BMPDXF	exe	69 632	17.10.2008 15:26	-a--
Genice	nmt	77 21 01	2009 10-01	-a--

From the point of view of the user, the following folders may be essential:

AIRMODMAKRA - contains macros and their previews for air conditioning; if you create a new macro in AirMod, you can add pictures here.

ARIEL - contains the whole Ariel font adapted in the form of individual DXF files.

DATABANK - standard directory for Wrykrys databases

FILTRYNEW - contains all Wrykrys post processors

GALERIE - contains a set of different pictures in the form of DXF files

MULTIHELP - multimedia help videos (included only in the installation from DVD, when installing the Internet version, you need to add them later)

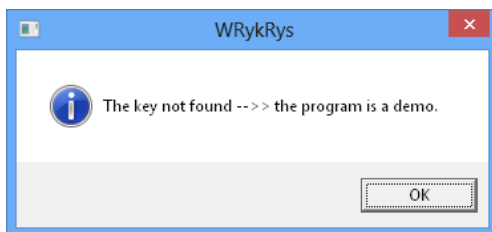
PROPALY - standard directory where strictly defined burns are saved

WMAKRA - includes all macros; in the same way as with AirMod, after you create your own macros, you can add a preview of the same name here (you need to respect the classification of macros = the first letter of the file name)

In the main directory, you start WRYKRYs by using file Wrykrys.exe, or if need be, you can start some individual subprograms for specific purposes (e.g. database catalogue or InterCAD)

1.4. Program Protection against Illegal Copying

The program is protected by a hardware key which is connected into any USB (LPT with older keys) port. You are informed about the lack of the key by a notice appearing when the program is started:



You can also find this information in menu Setting -> Hardware key. This window contains the following report: 'HARDWARE KEY NOT FOUND'. Without a hardware key, the program is a DEMO. In case the hardware key is connected and its driver installed, the table shows information about the key (internal number) and the following report is displayed: 'The key is utilizable up to version XXXX ->> it works with this version' (or does not work, if you have no more the right to this version).

There is no time limit for a demo, but export functions are not accessible in it. It means that you can try how to work with the program, but you cannot use it with a machine if you have no hardware key.

1.5. Program History and Development

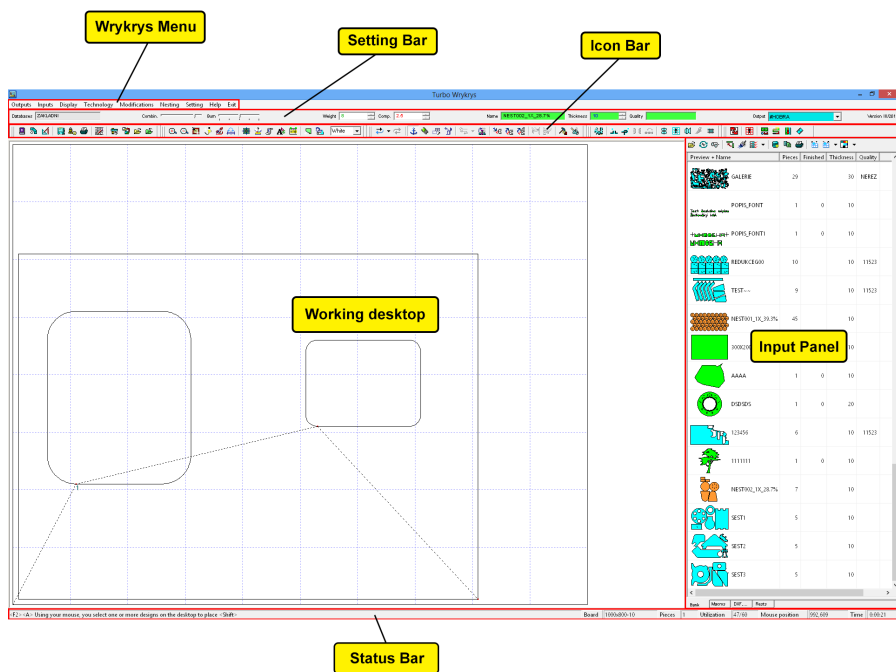
The basic versions of the programs were developed in 1992 in C++ language and were designed for the MS DOS 3.1. operating system. In the course of the development, experience from the previously developed system that worked on computer PDP 11-70 was used. The aim was to create a not so vast, easy-to-learn system that would only concern cutting machine issues. The following development moved on from the MS DOS operating system to the Windows system and still continues on 64-bit operating systems nowadays. These days, Wrykrys is used for a lot of types of CNC machine at more than 2000 workplaces worldwide, mainly in Central and Eastern Europe.

2. WRYKRY'S PROGRAM

The WRYKRY'S technological program is used to prepare production for cutting machines. It is designed to significantly fasten the entire preparation process and make it easier.

In the following chapters, you will learn more about the program structure and you will find a detailed description of its particular functions.

This is the main window that appears after you start the program, and the parts of which we are going to deal with step by step:



2.1. Working desktop

The working desktop is used to create configurations. Here, you can load individual drawings or complete configurations that have been already created and place them on the preset plate format.

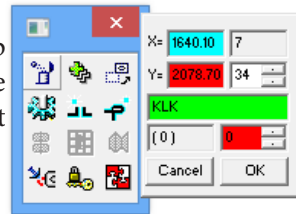
In window ,Basic Generating Parameters‘ (see chapter 2.12.2), you can set not only the board dimensions but also colours and other features connected to the desktop.

You can control the desktop by the scroll button of your mouse: scroll to zoom in/out the cut-out, press the scroll button (or central button) to move the desktop, and double click the middle button to centre the board to the desktop.

To handle particular designs that are loaded ,on your cursor‘ above the main desktop, you can:

- use the space bar to rotate the set value (the default one is 30°) and keys ,+‘ and ,-‘ to rotate by 1°
- use the arrows to move the design slowly
- right click to mirror the design
- left click to position the design and then, choose the direction in which to move it towards the other designs/edge of the board while respecting the set space in between
- use Enter (no left click before) to place the design right into the current position (there is no move or space control afterwards).

Right click on a placed design on the desktop to open a menu that enables you to access some functions quickly, and also, to set the exact position of the component by using coordinates:



2.2. Input Panel

The side panel is used for loading to the desktop. The standard position of this panel is on the right; you can change its position by using button ,move the window to another position‘ or by pressing key F5.

In its lower part, you can switch between four bookmarks (cards) - Bank, Macros, DXF and Rests - depending on what you want to load. The fifth card is used to switch between configurations you are working on.

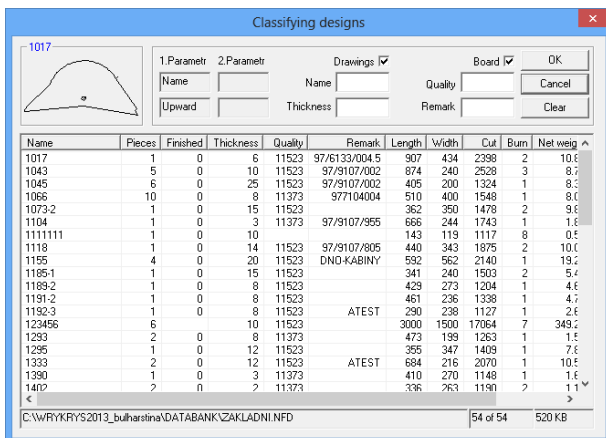
Each card has its own toolbar. We describe the functions and icons of the particular cards below. Some of the icons are common and that is why we only describe them when speaking about card ,Bank‘.

2.2.1. Card Bank

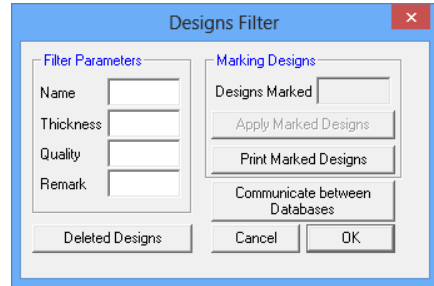
Card Bank serves to load designs and configurations from your database. The toolbar of this card contains the following functions:



- ,Selecting the database of designs‘ - this function serves to choose the database that you want to work with. This is the database where all configurations saved via function ,Saving to database‘, designs from the Internal CAD system or, for example, results of automatic generation are recorded. You can also create a new database there. When opening it, if you tape a name that does not exist in the selected directory, a new empty database is created.
- ,Classifying Designs‘ - In this window, you can classify or filter the content of the database. To start classifying, click on the heading of the selected column; you can filter by using the Name of the item, Thickness of the material, Quality, or Remark. The changes are reflected in the list immediately and after you confirm by the OK button, they also appear in the whole database. You can cancel all filters or classifying of designs by ,Esc‘ at the moment when the side panel is active, i.e. the cursor is placed on it. The default state of the database shows all saved items which are in the order in which they were saved one-by-one.

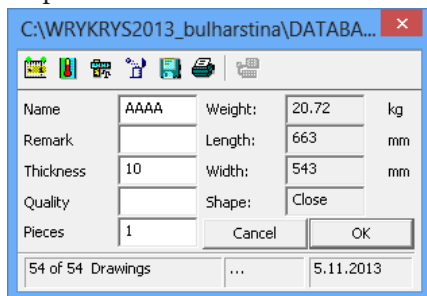



- ‚Searching for designs‘ - in this window, you can also filter items according to parameters of your choice. Besides that, you can view designs deleted by mistake there and restore them. This step is only possible before you execute compression of the database which is made when the program is switched off. You can also filter marked designs if you have selected some of the items beforehand by using function ‚Marking designs‘. The last option is to initiate simple communication between the active database and another one that you have selected. For advanced communication between databases, use ‚Manabank‘ that is mentioned below.
- ‚Move the window to another position‘ - moves the whole side panel to another position (on the right/at the top/on the left/at the bottom). You can also use key ‚F5‘.
- ‚Marking and cancelling designs‘ - is used for subsequent filtering (see above).
- ‚Finished‘ - enables you to mark configurations in the database as finished, the number of particular designs (if these are saved in the database) from selected configurations are subsequently added to the information about the finished pieces; in the drop-down arrow, you can remove configurations from the list by left-click.
- ‚Manabank‘ - see chapter 2.8.12.
- ‚Data of items in the database‘ - see chapter 2.8.10; this window works in the same way as ‚Data of individual designs‘, however, it does not refer to the designs on the desktop but to the whole content of the database.
- ‚Output to the printer‘ - enables you to print the entire content of the database with the selected parameters.
- ‚Increasing/decreasing the number of windows‘ - changes the way the database is displayed; you either select a different size of the previews + selected parameters (settable in the drop-down arrow) or just parameters without any design preview. Then, the database print uses the current display setting.



- ,Setting colours' - enables you to set different colours for all objects that may be displayed in the input panel (designs, configurations, macros, rests, ...).

Besides that, when you are on card Bank (or Rests), you can right-click on any item and adjust its parameters.



Icons in this window allow quick access to some functions (Dimension control, Export, Print,...), that are described in detail in the following parts of this guide. An exception is the icon  that serves to filter configurations where a selected design is placed; the total number of the pieces in these configurations is in the brackets. If it is not in any configuration, the icon cannot be used.

2.2.2. Card Macros

Card Macros allows quick generation of predefined shapes with preset parameters and their loading to the desktop.



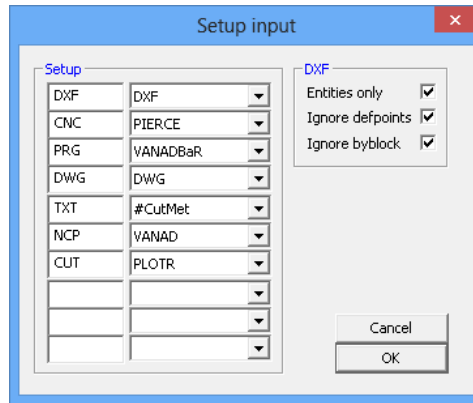
Besides the mentioned icon serving to change the position of the panel and to set the size of the preview, there are four icons enabling you to switch between different types of macro and an icon starting the editor of macros where you can create your own macros for shapes that often repeat. Macro Editor is described in chapter 6.

2.2.3. DXF,... Card

Card DXF is not only used for input of DXF files but also for loading configurations in the format of cutting machines.



- ‚Open directory with input files‘ - use this icon to select a directory from which files with selected extensions will be loaded into the panel.
- ‚Setup‘ - is used to determine file extensions that shall be displayed in the panel and to select filters to be used to load them. If you are not sure which filter to choose, for the first import, you can use function Import CNC, see chapter 2.7.5. Besides that, it is here that you can determine filters of particular objects for loading DXF files.



- ‚ManaDraw‘ - see chapter 2.8.11.
- ‚Design dimensions control‘ - enables you to check dimensions of a selected design or designs in the configuration. We describe this control function in detail in chapter 2.8.6.

2.2.4. Card Rests

Card Rests is used to load rests of plates that were saved beforehand. In fact, it is also a database, the format is identical (file with *.nfd extension) and that is why it is possible to open the same database in card Bank and also in card Rests. However, it is more practical to have rests in a separate database.

The toolbar of card Rests is identical with the toolbar of card Bank.

2.2.5. Card 1-X

The last card that can be on the side input panel is card 1-X. It is only displayed if you have more configurations on the desktop at the same time. Instead of X, the total number of the opened configurations is displayed and you can switch between them on the panel.

2.3. Presetting Bar

The screenshot shows a software interface for setting parameters. It is divided into two horizontal sections. The top section contains: 'Databases' with a dropdown menu showing 'ZAKLADNI'; 'Combin.' with a slider bar; 'Burn' with a slider bar; 'Weight' with a numeric input field set to '8'; and 'Comp.' with a numeric input field set to '2.5'. The bottom section contains: 'Name' with a text field 'SEST3'; 'Thickness' with a numeric input field '10'; 'Quality' with a green progress bar; 'Output' with a dropdown menu showing '#HOBRA'; and 'Version III/2013'.

You can use this bar to preset parameters of some functions. One by one, you can find the following options there:

- Database - this is just an informative field; it displays the name of the currently opened database.
- Combi. - this slide bar sets the width of the side input panel.
- Burn - this slide bar sets the display size of the initial points (burns) of designs on the desktop.
- Weight - you complete the weight of 1 dm³ of the material in [kg] here. The default value is 8, which is usually calculated in case of iron. This value is used during some operations where you need to find the weight of parts (e.g. Quick info on the desktop, Normalising designs, etc.); it does not influence the final code for the machine in any way.
- Comp. - you insert the real width of the cutting line (compensation) of the machine. It is only used for technological operations with common cut (e.g. Chessboard, Sticking, etc.) where you need to adjust the dimensions of designs right on the desktop. In the other cases, compensation is usually treated later on the machine, or, exceptionally, in the stage of code exporting.
- Name, Thickness, Quality - these three parameters are connected to the configuration on the desktop (i.e. they change if you switch between configurations you are working on using card 1-X); again, they are used during some operations such as Saving to database, Normalising designs, etc.
- Output - you can choose output format (post processor) to be used for code exporting to the machine.
- Version - information about the version of the currently running WRYKRYs.

2.4. Main Toolbar



This icon bar contains the most used tools of the Wrykrys program. All these functions are also included in the menus and are described systematically in chapters 2.6 - 2.13.

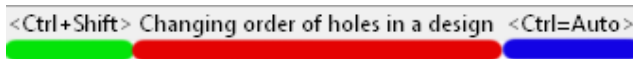
If a particular function has also an icon on the toolbar, it is always mentioned at the beginning of the description of the function and the image of the relevant icon is added.

2.5. Status Bar

The bottom line in which you can usually see additional information about the active function, for example in the course of adding burns, changes of individual components, etc.

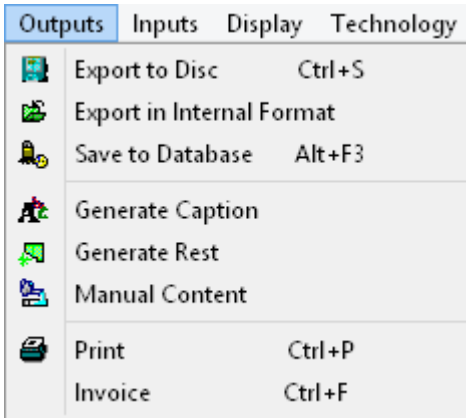
You can also see there the description of the function on which the cursor is placed on the main toolbar. The description has the following system: at the beginning, there are shortcut keys that you can use either to initiate the function (e.g. simulation ,Alt+S', saving to database ,Alt+F3', etc.) or together with its initiation (e.g. ,Ctrl' + using function ,Dividing design into more parts' for automated division of components on the desktop), the description of the function follows and then, all shortcut keys that can be used in the course of the function (e.g. ,Shift' for multiple marking when positioning/copying components, and the like).

For example, for function Changing order of holes in a design, the status bar will show the following:



which means that the initiation of the function together with pressing ,Ctrl + Shift' will automatically change the order of all holes on the desktop, then the description of the function follows and then, ,Ctrl' that, after the function is initiated, enables you to select a design and change the order automatically by individual components.

2.6. Menu OUTPUTS



2.6.1. Export to Disc

This function is also on the main toolbar and has the following icon: 

This is the final function for exporting the code in the format for the machine. It is described in detail in chapter 5 - Integrated Output.

2.6.2. Export in Internal Format

This function is also on the main toolbar and has the following icon: 

Function Export in internal format enables you to save the current content of the desktop in the internal format of the Wrykrys program. The saved file has a *.NEX extension and it is possible to load it again only into the Wrykrys program.

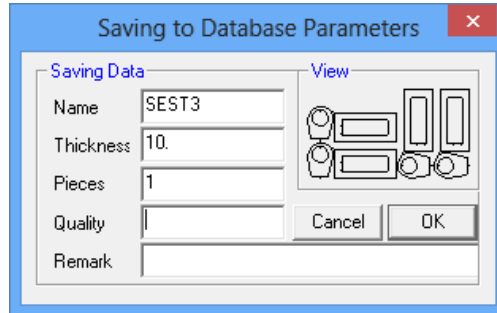
This export does not require any hardware key and that is why you can use it, for example, for transfers from your home workplace or from a different station where there is no hardware key at your disposal at that moment.

Also use this output when you have a problem with the configuration or a question to ask us. The thing is that the file contains the exact copy of your desktop which is the essential material to be used for an appropriate analysis.

2.6.3. Save to Database

This function is also on the main toolbar and has the following icon: 

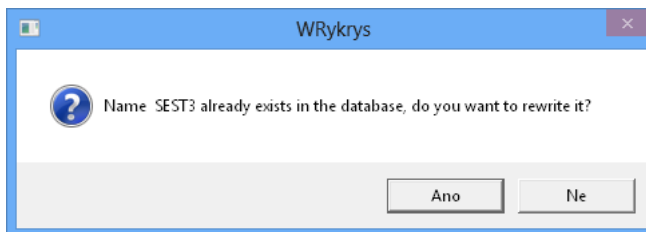
After you initiate this command, the program offers you a table where you can save created configurations into the current database:



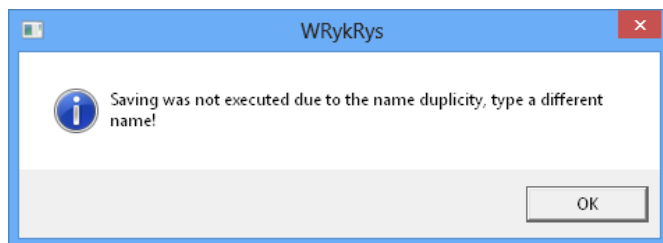
In this table, you complete the marked spaces with the data under which you want to record the item you are saving in the current database. The most important (and the only obligatory) entry is ‚Name‘. It can consist of up to 23 characters. If you do not enter the name, the following warning pops up:



There is also a control of duplicate names; if the entered name already exists in the database, the following notice pops up:



If you select ,No', you need to enter a different name:



Besides the name, you can also complete the following entries:

,Thickness' - thickness of the material from which the configuration will be cut

,Pieces' - this indicates how many times the configuration will be cut

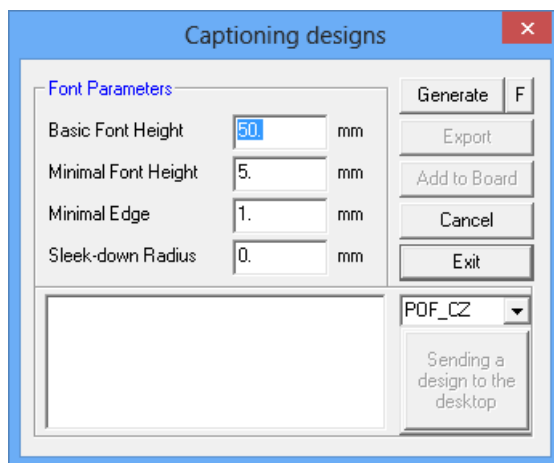
,Quality' - quality of the material from which the configuration will be cut (max. 15 characters)

,Remark' - any informative text (max. 31 characters)

2.6.4. Captioning Designs

This function is also on the main toolbar and has the following icon: 

To label burnt designs, use another command ,Generating Captions'. Every detail has its name under which it is saved. If you need to name a design, you export an independent configuration with these captions or you add them on the desktop and when exporting, you match the appropriate tool with them.



You determine the font format by setting parameters in the table for Generating captions. The basic font height defines the initial font size. The caption adapts to the detail size in order not to be outside of it while respecting the defined minimal font height. It also respects the determined edges. The sleek-down radius enables you to round sharp edges to make it easier for the labelling head to pass.

Use command ‚Export‘ to save the captions as an individual configuration.

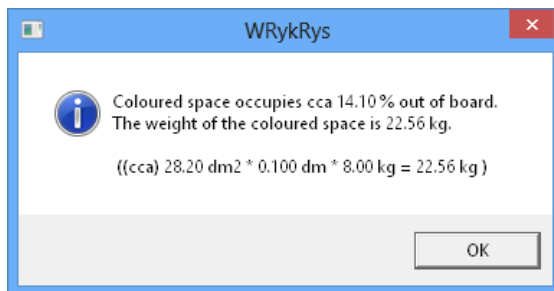
If you use ‚Add to Board‘, the caption becomes a part of the configuration and you can work it in the same way as designs and move it as needed. ‚Cancel‘ deletes the captions on the desktop; ‚Exit‘ only closes the window.

The empty field in the lower part enables you to add on the desktop any caption created with the font suitable for captioning; in the pop-up menu, you can choose the language of this caption if you need to use foreign characters (with a different ASCII table); including even Cyrillic alphabet. You place the generated caption into the configuration by ‚Sending the design to the desktop‘.

2.6.5. Manual Content

This function is also on the main toolbar and has the following icon: 

This function is informative. There are two options: the content control of either already placed parts or the remaining part. After you choose this command, mark (colour) one of these options. Left-click on the inner parts of the particular designs or on the remaining area of the plate surrounding these details. Designs with inner holes influence the calculation of manual content with the option of already placed parts; the point is whether you will calculate them or you will not. The program colours the marked part or parts; your right-click initiates the table with calculations:



The program calculates the percentage utilization point by point of the screen with accuracy depending on the screen resolution.

There is additional information about the weight of the coloured area that stems from the parameters set in the Presetting Bar (chapter 2.3).

This is not the only command of the program that informs about the utilization of the plate. Running information about the utilization is also displayed in the lower Status bar.

Utilization	52/67
-------------	-------

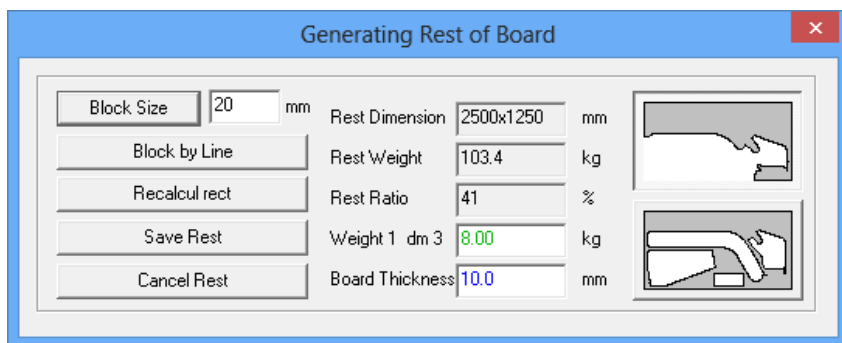
The first figure is calculated as addition of net weight of the saved designs. The second figure refers to the container content; the program calculates the smallest possible circumscribed rectangle of every design. In the case of shaped details, this figure can exceed 100%.

2.6.6. Generating a Board Rest

This function is also on the main toolbar and has the following icon: 

A function that generates rests of the board. You use it when there is a considerable unused part of the board and you want to use it in the future in the course of another generation. Use this command to define and save the generated rest into the catalogue of rests which you can display by switching to card 'Rests' on the Input panel (chapter 2.2).

The particular parameters of the rest are determined by the table that pops up after you select this command and after you left-click on the place where you want to create it. This is the place where the program marks (colours) the rest according to the current values of the displayed table:



Generating Rest of Board			
Block Size	20	mm	
Rest Dimension	2500x1250	mm	
Block by Line	Rest Weight	103.4	kg
Recalcul rect	Rest Ratio	41	%
Save Rest	Weight 1 dm 3	8.00	kg
Cancel Rest	Board Thickness	10.0	mm

‚Block size‘ defines the place where the coloured area shall not continue (if it touches a space smaller then the set block). The modification is implemented after you click on ‚Recalculate rest‘.

Use ‚Block by line‘ to determine manually your own ‚block‘ on the desktop, in the place or places where you need it, left-click to create lines, right-click to end adding lines and return to the window with the parameters of the rest. This window also shows information about the rest that is being created - dimensions, weight and percentage ration of the whole board, and also parameters of the weight of 1 dm³ and of material thickness taken from the Presetting Bar.

On the right, you can switch between two types of rest. The first one (default) reflects all the above mentioned parameters, the second one ignores these parameters and creates a complete reverse shape, i.e. saves the whole structure around individual designs.

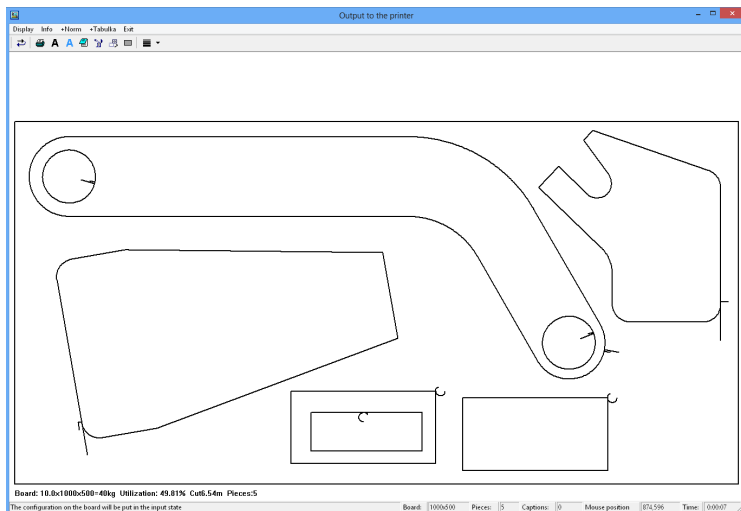
After you determine the rest you need, use button ‚Save rest‘ to save it; a dialogue pops up that is identical with the one that appears when you save configurations (chapter 2.6.3); the only difference is the targeted place of saving which is not the current database of designs and configurations but the database (catalogue) of rests selected on card ‚Rests‘.

The basic step of using a rest again is loading it to the main desktop. The edge of the rest should be parallel to the edge of the board due to its positioning in the machine. Such a rest, anchored in this way, is a new selected shape of a plate for you where you can load and generate a design. Be careful when exporting a configuration created in this manner! The rest represents for the Wrykrys program a design as any other, but it should just be used as a contour of generation, so before exporting, it should be deleted so that its final code for the machine does not also contain its contour. Also, you can put it at the end of the order and place a stop before it if the machine enables you to do so.

2.6.7. Print

This function is also on the main toolbar and has the following icon: 

This command opens an individual window for output to the printer. You can only open it when there is a configuration on the board that has been loaded or just created or a design placed there. Everything that is on the main desktop (board) is placed into this window where, before starting printing, you can complete or modify the configuration to be printed.



2.6.7.1. Menu of the Output to the Printer

- **Display** - here, you can switch on/off displaying order numbers of individual components, switch on/off displaying quick shifts (passages) between components, set maximum heading font used when generating captions of the components and switch between automatic captions, captioning by name or order number (suitable if there are small components and long item captions in your configuration that would fit in the components with difficulties or that would be unreadable).
- **Info** - information about the version of the printing subprogram.
- **+Norm** - enables you to join to the configuration to be printed a table containing the basic information about the configuration (name, dimensions,...) and price and time calculation of the cut per individual items in the configuration. This function (Calculation) is described in detail in chapter 2.8.7.
- **+Table** - enables you to place a simple table containing the order and number of pieces of particular items directly into the configuration. The position where you place the open window corresponds to the subsequent position of the printed table.
- **Exit** - closes window ,Output to the printer‘

2.6.7.2. Toolbar of the Output to the Printer



One step back - puts the configuration back to the initial state in which it was loaded from the WRYKRYs desktop, i.e. cancels created captions, modified board format, etc.



Output to the printer - opens the standard Windows printing menu where you determine and confirm printing. The print proceeds in the way that you have determined beforehand, i.e. with added captions, order numbers, etc. To print a configuration, it is usually suitable to choose landscape printing; if you also attach a Norm (see above option ,+Norm'), the page is set for portrait printing (the table is in the upper part, the picture of the configuration in the lower part).



Generating a new heading - enables you to create manually any text that you place into the area of the configuration to be printed. The process is as follows - left-click on the desktop to display the size of the selected field, then, write the text needed; move your mouse to change the size of the selected area (font size is automatically adapted to the size of the selected field, maximal heading font size is set in ,Display', see above; left-click again to confirm the size and create the heading.



Automatic captions to designs - generates captions of all the components in the configuration to be printed; the captions correspond to the component names (if need be, only their order numbers are generated if this is determined in menu ,Display' - option ,Caption').



Notepad - opens a table in notepad which shows the order and names of particular items in the configuration to be printed. This table is useful if you used only order numbers during ,Automatic captions to designs' and so, the component names are not directly in the configuration.



Delete the heading - enables you to delete a manually created heading in the configuration to be printed by a left-click.



Moves the heading - enables you to move a manually created heading in the configuration to be printed by a left-click.



Determining board dimensions - enables you to change board dimensions (i.e. rectangle that frames the configuration on the desktop). Default dimensions are taken from the WRYKRYs main desktop. This dimension is also used to calculate the board weight and percentage utilization in the lower line below the picture of the configuration:

Board: 10.0×1000×500=40kg Utilization: 49.81% Cut6.54m Pieces:5



It allows you to set the line thickness for printing (with some printers, you need to choose a thicker contour in order to be able to see dashed quick shifts well, for example). The drop-down arrow of this icon offers 4 levels. What you can see on your monitor does not have to correspond strictly to the printed result.

2.6.8. Invoice

This is a function that creates delivery notes and invoices from particular designs or items of your configurations. After you select this, the following window pops-up:

Invoicing

Name	Board	Thickness	Quality	Remark	Databar
777	1	10	11523		Boar

Supplier

Supplier: Save Save as...

Dodavatel: JCO 43357164 DiC CZ5902080415
Lubomir Chudek AMRA
Cernická 20
301 00 Písek

Customer

Customer: Save Save as...

Odbíratel: JCO 111222333 DiC CZ444555666
Josef Novak NOVAKO
u Trahi 30
32333 Novakov

Order

Order Number:

Date:

Name	Thickness	Quality	Pieces	Cut	Burn	Net weight	Gross weight
542	20	11523	1	1.322	1	13.98	17.56
563	20	11523	1	1.035	1	6.37	10.38
710	20	11523	1	2.491	3	13.52	35.52
MAKRO001	20	11523	1	0.627	1	3.12	3.12
MAKRO002	20	11523	1	1.068	2	1.85	3.12

Item details

Name: Thickness:

Note: Quality:

Pcs: Set price: ☐ EUR

Invoice

Invoice No. (Variable symbol):

Tax: 123456789

Tax fulfillment: Due date:

Issue date:

Constant symbol:

Specific symbol:

Terms of payment:

Mode of payment:

Price list

☒ Price/1m cut: EUR

☒ Price/1 burn: EUR

☐ kg (netto): EUR

☐ kg (rect.): EUR

kg/dm3: kg

Invoice

VAT:

Currency:

Format:

Invoice: Save Save as...

Delivery note 1:

Delivery note 2:

Notepad:

Languages:

Archiv:

Cancel OK

kg C:\WRYKRY2013_buharstina\FAKTURY

In the upper left section, the current configuration is loaded; you can add other configurations and designs from the database and use buttons ,+‘ and ,-‘ to modify their number. Right-click to remove a configuration from the list, use button ,Reset‘ to remove all the configurations.

The table below shows all the designs that are in the selected configurations. Double click to add them to the information needed in the invoice / delivery note (and the other way round, double click to remove them from the third table).

In both tables, you can use your mouse to mark any item and see on the right its preview and detailed information where you can overwrite the number of pieces or set a fixed price of the item concerned.

At the moment where they are added, weights and prices of the added items are determined according to the current price list selected in the middle bottom part of the window (section ,Invoice data‘) - you can set the price per cut meter and per burn and choose if you want to calculate the price per kg of net weight or gross weight (of a circumscribed rectangle). You can also set the weight of cubic decimetre here according to the material density. You can switch the price list of a selected item additionally or change its parameters (data are updated immediately). If need be, you can - as mentioned above - set the fixed price for a selected item regardless the price list.

The other sections of the window are used to complete data for the particular document - supplier, customer, purchase order number, purchase order date and payment details (variable, constant and specific symbol, issuing date, due date, and date of taxable event and method of payment and payment terms and conditions).

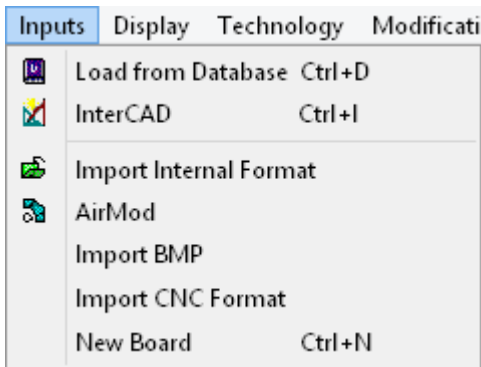
The number of the delivery note/invoice can be given an order number automatically. You just set the number of digits and if it is to be placed at the beginning or at the end of the invoice number; the program will search in the archive of documents and will offer the smallest possible higher number that has not been used. You can go through the archive by using button ,Archive‘ in the lower part of the window. It is here where you can reprint, view or delete documents.

It is natural that you can also set the VAT rate, currency and number format (number of decimal places).


The output is implemented by buttons ,Invoice‘ in order to print the invoice and ,Delivery note 1‘ and ,Delivery note 2‘ in order to print delivery notes. Variant 1 contains the standard table with items while variant 2 comprises views of particular pieces to make it easier to identify them during dispatch. Button ,Delete all‘ resets the entire invoice table and selected configurations as well.

Use button ,Languages‘ to find a table with expressions that are used both in window ,Invoicing‘ and in individual outputs; if you need, you can adjust them here (the place where each expression is used is mentioned in the pictures below buttons ,?‘ of particular outputs).

2.7. Menu Inputs



2.7.1. Load from Database

This function is also on the main toolbar and has the following icon: 

This command opens a separate window with the database catalogue. However, a faster way how to access the items of the database is card Bank in the side input panel (see chapter 2.2.1) which successively adopted all the essential functions of the Database catalogue. This catalogue is usually used only in the course of initiation from the Internal CAD system with the aim to edit the saved items.

2.7.2. InterCAD

This function is also on the main toolbar and has the following icon: 

InterCAD or Internal CAD system is a module used to create or edit particular details. It is a large subprogram and that is why there is a separate chapter 3 - InterCAD dedicated to it.

2.7.3. Import the Internal Format

This function is also on the main toolbar and has the following icon: 

It enables you to reload configurations in the internal format with extension *.NEX that were exported from WRYKRYs by using function 'Export the internal format' (see chapter 2.6.2).

2.7.4. AirMod

This function is also on the main toolbar and has the following icon: 

AirMod is a module used to create deployed shapes of air conditioning duct usually. It is describe separately in chapter 4 - AirMod.

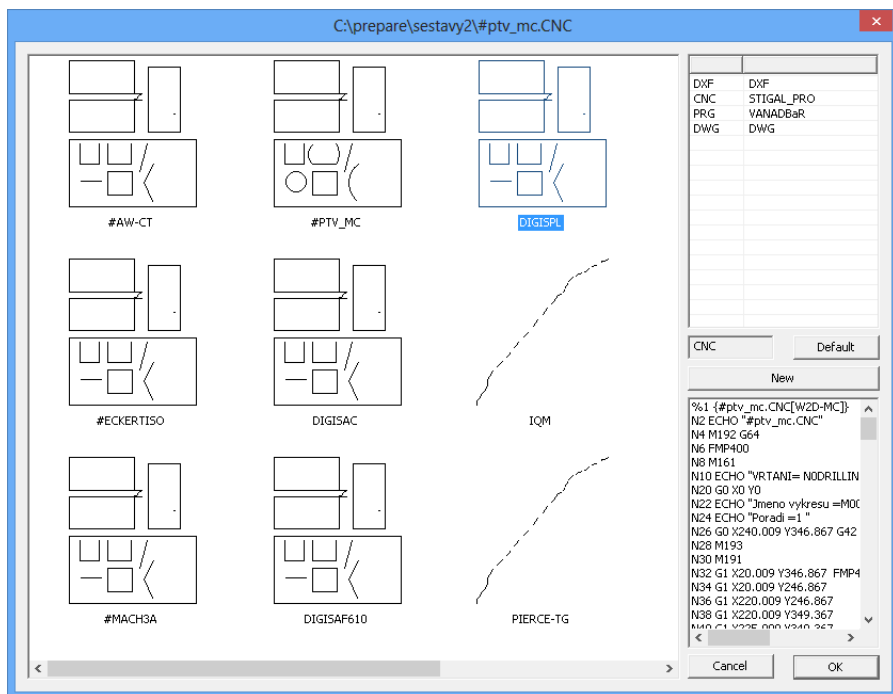
2.7.5. Import CNC

Import CNC is a function that enables you to load a configuration from a format designed for a machine. Loading such configurations is also possible with card 'DXF,...' (see chapter 2.2.3). However, in this case, it is an import guide that will make loading easier for you, for example, if you are not sure for which machine the configuration has been exported and which filter (post processor) to set for its loading.

The first step is to choose the file that you need to load. Then, the program will try to work it using all post processors that are at its disposal, and it will show the below displayed window with individual previews of those that were successfully used to load at least something. You just select the one that you consider as correct (there may even be more of them that are identical).

In the upper right part, there is a list of file extensions with matched filters from your setting (see also chapter 2.2.3); if you select the same extension for a different filter, it is also changed in this tables. If you load a new extension, it is added to the table including the relevant selected filter.

Use button 'Default' for default setting of the program. Use button 'New' to load another file.



2.7.6. Import BMP

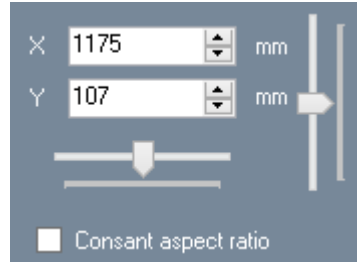
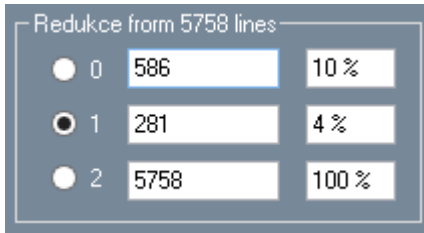
Use this function to transform bitmap graphics to particular line segments. After its start, you need to choose the source picture in format *.bmp. Areas that are supposed to be 'material' should be dark (ideal is black colour), its surroundings, i.e. holes, white. For example, a bitmap WRYKRYs logo for import should look like as follows:




After it is processed, the result is as follows:



In the right part of the window, you can choose ,simple' contour by reducing the number of line segments and also, you can set the final design size in millimetres.



You can see the changes immediately in the preview. After that, to send the design to the WRYKRY5 desktop, use the following icon: .

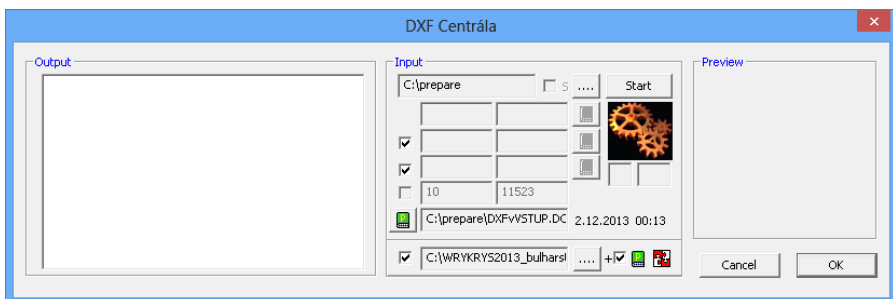
2.7.7. New Board

Use this command, to create a new plate on the desktop. The previous configuration is saved as semi-finished. You can switch between configurations in card 1-X (see chapter 2.2.5) or by using key F4.


2.7.8. Collective Processing of DXF Designs

This function is also on the main toolbar and has the following icon: 

Use this function to load DXF files collectively from a selected directory and to save them to the WRYKRY5 database.




The first step is to select the directory where you have your DXF files. After you tick option ,S', files from all its subdirectories are loaded as well.

Press button ,Start' to view a list of loaded files on the left. The two first fields show the number of loaded files and loading time. Use the button on the right side , to open the created list in notepad.

In the list on the left side, you can left-click to mark a design which will appear afterwards in the preview on the right side of the window. Double-click to send the design to the desktop straight away.

If the field of the next option is switched on, duplicate names are checked during loading. If there are designs with the same name in the subdirectories, the field shows their number and their list appears on the left side. Use the button on the right, to open this list in notepad.

The next option enables you to control open shapes. The principle is the same as with the previous case. After loading is finished, the number of open shapes appears and their list is displayed. Open shapes and duplicate designs are considered as mistakes - their total number is displayed in the field on the right.

The fourth pair of fields enables you to complete information about the quality and thickness for all designs. The entire list is always recorded into the file with extension DCV in the main directory of the Wrykrys program. You can also open this in notepad by using the button below .

The last option is used for final record of all DXF files on the list into a selected database. If it is switched on, after loaded, all designs are saved in the database straight away, and if option ,Nesting' which is placed on the right, is switched on as well, these details are immediately used to create configurations. In case a detail with the same name already exists in the database, it is not overwritten and a notice showing the list of designs appears on the left side.

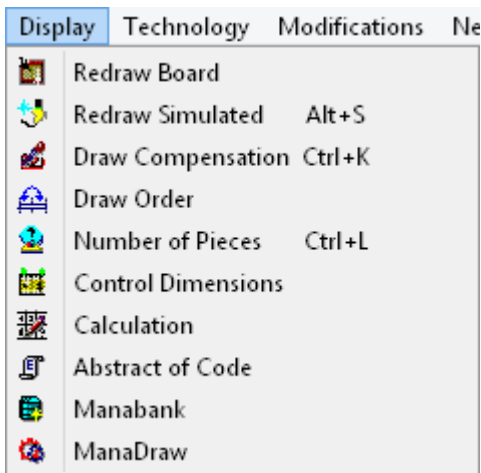
It is natural that you can record only separate details into the database and then, use the standard Nesting of the main program. If you wish to use the option of automatic generation straight away, you will probably need to change the number of pieces in the DCV file.

For example, the model process can be as follows:

1. Choose a directory from which you wish to load files.
2. Complete the required thickness and quality.
3. Check if there are any duplicate designs or open shapes.
4. Open the file with the list of designs and make the changes you need - the two last values of each line refer to the generation priority (the higher the number, the sooner the detail is used) and number of pieces. The default setting for both values is '1'. Save the changes made and close the file.
5. Switch off overwriting parameters, otherwise the default values would apply, choose the target database, switch on recording including automatic generation and restart the loading process - details and even generated configurations will be saved in the database straight away.

To try to work with the DXF switchboard, it is suitable to create a new database. Each time you record designs into the database, first, you should make sure that your list only includes those files that you wish to load to prevent undesirable loading of a large number of details from subdirectories to the database.

2.8. Menu Display



2.8.1. Redraw Board

This function is also on the main toolbar and has the following icon: 

This is a simple command used to restore designs drawn on the main desktop (board). After you use this function for redrawing the board, the designs are shown without quick shift passages, order numbers or compensation (unless these are set as always displayed). So, we can take this function as a reverse function of all mentioned informative commands.

2.8.2. Redraw Simulated

This function is also on the main toolbar and has the following icon: 

This command redraws all designs with passages in so called simulation mode. The configuration of designs is drawn slowly so that you can see the way in which the particular pieces are cut from the material. Besides that, you can also see the order in which the particular pieces will be cut and quick shift passages of the machine. The simulation drawing mode is used to control a generated configuration. You can accelerate the simulation by repeated left-clicking outside the designs on the desktop or by the space bar. To slow it down, right-click (you can set the default speed in window ,Basic Generating Parameters', see chapter 2.12.2).

If you left-click on a specific design on the desktop, the simulation is applied only to this selected design.

Use ,Esc' to exit the simulation.

2.8.3. Draw Compensation

This function is also on the main toolbar and has the following icon: 

This is another control command. If you draw compensation, the added compensation is displayed in colour by all already placed designs on the desktop. The correct compensation (or chink) of the inner holes is inside and in the contours, the compensation is outside. Without this compensation, a square of 100 x 100 mm would have the dimensions of 98 x 98 mm after being cut. The real dimensions of the product depend on the chink size (it differs with different technology, material thickness, etc.).

WRYKRYs adds compensation to the pieces drawn or imported automatically in the way that eliminates this error. It means that the machine jet does not go directly in the contour of the design but to the right or to the left of it.

The chink size is usually only set by the cutting machine operator or it is set during export of the final cutting program in the integrated output (see chapter 5). There are some technological processes that are exceptions to this rule; these processes use common cut and it is necessary to consider compensation during their use already.

The drawn compensation is distinguished by its colour. Red colour refers to the left compensation and blue to the right compensation. The left compensation means the clockwise path in an outer shape, or anti-clockwise in holes, and the right compensation the other way round. Some technologies (for example plasma cutting machines) usually require using only left compensation.

2.8.4. Draw Order

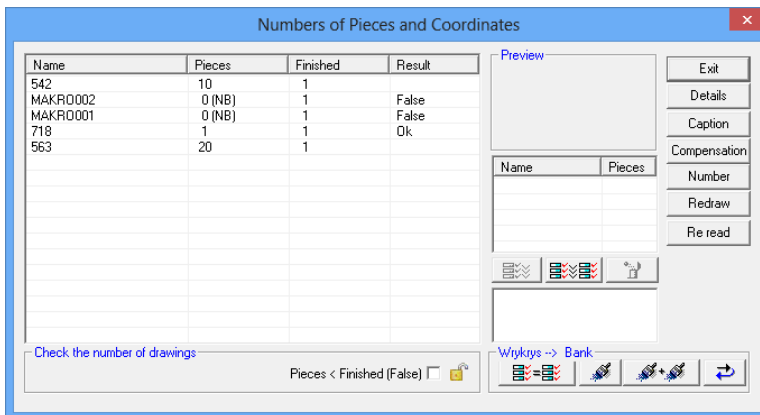
This function is also on the main toolbar and has the following icon: 



This is a control command for drawing order of individual designs in the configuration on the desktop. If you choose this command, an order number is displayed in the place of the initial point of each design. This function is only informative; in case you wish to change this order, use function ‚Change cutting order‘.





2.8.5. Number of Pieces

This function is also on the main toolbar and has the following icon: 

This window is used to control the number of pieces in a configuration and, if need be, also in configurations saved in the database.



Column ‚Pieces‘ shows the number of pieces required for each piece in the database. In case there is no design of this name in the current database (e.g. loaded macro, DXF file, ...), an ‚NB‘ (not in bank) appears. Column ‚Finished‘ shows the number of pieces on the desktop in the initial state, but after you add finished configurations on the right side of the window (either individually by selecting a design, by marking a configuration and transferring it to the list of ‚finished‘ by using the button , or it is possible to use the button to add, at once, all configurations from the database in which one of the current components on the desktop is placed ) the numbers of pieces of these are added as well. Column ‚Result‘ is used to control if the required number of pieces from the database corresponds to the total number of finished pieces. If the required number of pieces has not been reached, the column is empty. If the number of finished pieces is identical with the required one, ‚OK‘ is displayed, and if the required number has been exceeded (or the component is not in the bank, and therefore, 0 is required), ‚False‘ is displayed. If you tick option ‚Pieces < Finished‘ in the lower part in section ‚Check the number of drawings‘, when you exceed the required number, this window opens automatically.

In the lower right part, you can move finished configurations  that you have marked into the database so that the numbers of finished pieces also appear on card Bank in the Input panel. By using buttons  and  also in the side panel, you can filter designs and configurations that are related to the components on the desktop. You can use the button  to cancel these filters afterwards.

2.8.6. Control Dimensions

This function is also on the main toolbar and has the following icon: 

This function is used to control dimensions of particular designs, if need be, even to control distances between components or between a component and the edged of the plate. The same function is used in more parts of the Wrykrys program (e.g. InterCAD, item menu in card Bank, Integrated output, etc.), however, its principle is always the same. You can choose from two measuring modes - control of so called join points or control of all points in the contour.

In some cases, there are separate icons for these modes, you can switch between them here after you initiate the function by using key ,Shift'. The default (and also most often used) mode is controlling join points. These are displayed in green on the designs after you switch on the control. Joint points are places of connection of two elements (lines/circles) or circle centres. Left-click to choose the first measuring point, move your computer mouse to change the second measuring point (automatically, the measuring point that is available and the nearest to the mouse cursor is selected, if you switch to controlling all points, the nearest point wherever in the contour is selected). Between these two points, dimension figures are displayed. There are in total 6 variants of displaying dimension figures at your disposal: distance in axes X and Y, direct distance, one and the other angle, X distance only, and Y distance only. Use the space bar to switch between these variants. To exit the control mode, use ,Esc'.

2.8.7. Calculation

This function is also on the main toolbar and has the following icon: 

Use this function to calculate cutting time and prices and also weight of particular components, or more precisely, the entire configuration on the desktop.

Calculation

Data for Printed Table

Name of Design Config.	777	Board Thick.	10
Programmer		Board Length	1000
Material Quality	11523	Board Width	500
Goes / Burners	1 / 1	No. of Boards	1

Calculation Data

€ per Cut Meter	50.00	Mins per Cut Meter	5.00
€ per Burn	2.00	Mins per 1 Burn	1.00
€ for Handling	50.00	Mins for Handling	20.00
€ per Transfer. Met.	0.50	Mins per Tran. Met.	0.20
View in notep.		Weight 1 dm3 (kg)	8


Colour Print	<input type="checkbox"/> Cut Meters	6.544	No. of Burns	8
Print 2nd Table	<input checked="" type="checkbox"/> Transf. Meters	2.566	Net Utilization	49.81 %

Load Input Data

Save Input Data

Save as...

\nordata.nrd



Exit

Print

Output in €

€ per Cut Meters	327.19
€ for Burns	16.00
€ for Handling	50.00
€ for Transfer	1.28
Total €	394.48

Output in Norm-minutes

NM for Meters Cut	32.72
NM for Burns	8.00
NM for Handling	20.00
NM for Transfer	0.51
NM Total	61.23

In the upper part, in section ‚Data for Printed Table‘, complete the information about the entire configuration - its name, programmer, material quality, number of goes (how many times the configuration will be cut) and number of burners for acetylene machines, for example, which are used to burn simultaneously with more burners. If the number of burners in one configuration changes, you need to mark the particular places by the so called ‚Stop‘ (more about using stop in chapter 2.9.11), and then, you write the numbers of torches in the order in which they are used without any division (e.g. ‚132‘ means that, first, one torch will be used up to the first stop, then, three torches and after the next stop, two burners will be used till the end of the configuration). The right column shows material thickness and length and width of the board taken from the desktop and the number of boards.

In the second section, ‚Calculation Data‘, fill in the information needed for the calculation. This table is completed with the information in accordance with the needs and possibilities of the user depending on the cutting machine and overhead costs of the user's company. Each company has different costs and overheads; the price depends on the source of the cutting machine, material and other aspects. Time values are completed according to the parameters of the machine. Value ‚handling‘ is added once as a lump sum per the entire configuration; for example, it can include time and work needed to insert the board and cleaning the products after they have been cut and the like; value ‚transfer‘ (passages) refers to the so called quick shifts (passages of the machine between particular components). Complete field ‚Weight 1 dm3[kg]‘ with the correct value according to the material density so that the component weight can be calculated (for iron, value 8 is usually calculated). In the lower part, you can determine colour or black and white print and switch on or off printing the second table which contains the overall list of burns, cut, etc. for the entire configuration.

In order not to overwrite section ‚Calculation Data‘ for every configuration (because values will, of course, differ significantly in the case of burning a 5 mm metal plate with a plasma machine compared to e.g. a 50 mm metal plate burnt with acetylene), it is possible to prepare these data in individual files and just load them afterwards. For this purpose, there are the following buttons in the lower part:

A screenshot of three buttons from a software interface. The buttons are rectangular with a light gray background and a thin border. The first button on the left is labeled 'Load Input Data', the middle one 'Save Input Data', and the right one 'Save as...'. They are arranged horizontally.

Use button ,Save Input (calculation) Data‘ to save values and setting of the window (the program will remember them for the next time), use button ,Save as...‘ to save the values from section ,Calculation Data‘ in a separate file (e.g. one for a 10-12 mm metal plate, another for a 12-15 mm one, etc.). Afterwards, you can load these files by using button ,Load Input Data‘. After you complete the values, you can use either output directly to the printer (button ,Print‘, or to the notepad (button ,View in notep.‘).

For example, a printed norm can look like as follows:

Configuration name: TEST		Board thickness: 10.00 mm		Material quality: 11523				
Board dimension: 1000x500 mm		Pieces of board: 1		Board weight: 40.00 kg				
Programmer: MIREK		Goes / burners: 1 / 1		Printing date: 24. 2. 2014				
Total Euro: 394.48		Total NM : 61.23		Utilization Net/Gross 50 % / 89 %				
Order	Name	Pieces	Net weight	Gross weight	Cut	Burn	Minutes	Euros
96/69/142/1	542	1	7.17	9.01	1.322	1	7.61	68.10
96/69/142/1	563	1	3.27	5.32	1.035	1	6.18	53.77
96/99/109/1	718	1	6.94	18.22	2.491	3	15.45	130.53
	MAKRO001	1	1.60	1.60	0.627	1	4.14	33.38
	MAKRO002	1	0.95	1.60	1.068	2	7.34	57.41
Total sums of designs		5	19.92	35.74	6.544	8	40.72	343.19

In the upper part, there is some kind of ,header‘ of the configuration containing the information that you have filled in and total calculations of price, time (,NM‘ are the so called Norm-minutes; item ,NM Total‘ refers to the total time needed for production including times set for passages and for handling) and net and gross percentage utilization (the gross one calculates with the smallest possible circumscribed rectangle of each component and thus, it can exceed 100% theoretically).

In the lower part, there is a table with particular items of the configuration and with their calculation based on information filled in beforehand.

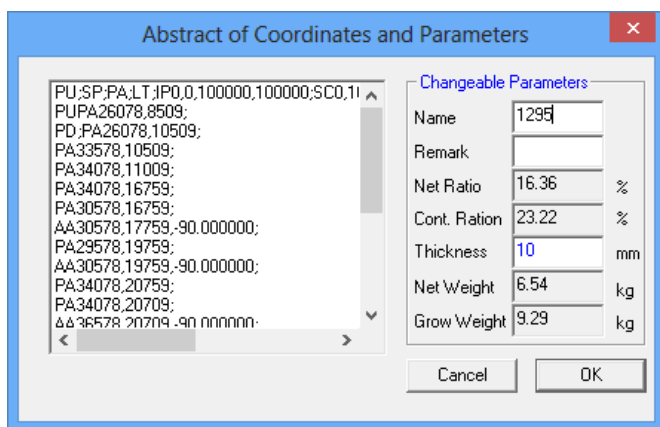
This is how the ,2nd Table‘ look like if print of this 2nd table has been switched on:

Calculation in Euros			
Cut	50.0 x 6.5 =	327.2	82.9 %
Burn	2.0 x 8 =	16.0	4.1 %
Handling	50.0 x 1 =	50.0	12.7 %
Transfer	0.5 x 2.6 =	1.3	0.3 %
Total	394.5	100 %	
Calculation of minutes			
Cut	5.0 x 6.5 =	32.7	53.4 %
Burn	1.0 x 8 =	8.0	13.1 %
Handling	20.0 x 1 =	20.0	32.7 %
Transfer	0.2 x 2.6 =	0.5	0.8 %
Total	61.2	100 %	

2.8.8. Abstract of Code

This function is also on the main toolbar and has the following icon: 

This command belongs to the informative ones. After you initiate it and you mark a design on the desktop, a window opens in which a code is displayed in the form in which it will appear during export to the machine (the code is displayed in the format that corresponds to the selected output in the Presetting Bar - see chapter 2.3).



2.8.9. Thermosim

This function is also on the main toolbar and has the following icon: 

ThermoSim or heat simulation is a tool that helps you to identify problematic places of the configuration where there might be a potential of material overheating and subsequent heat distortion. How to set and use it is described in detail in chapter 7.

2.8.10. Data of Individual Designs

This function is also on the main toolbar and has the following icon: 

This command opens window 'InfoLocal' which is used to display, if need be, to edit and subsequently export data connected to all items in the current configuration. The export is implemented into a file that may be subsequently imported into other programs (e.g. MS Excel) with the aim to process the data.

The screenshot shows the 'InfoLocal' window. It contains a table with columns: Order, Name, Remark, Thickness, Quality, Pieces, Cut, Burn, Net weight, and Gross weight. The table lists 7 items. Below the table is a summary row for item 7. To the right of the table is a 'Preview' section. Below the table are buttons for '+', '-', 'Notepad', 'Export', and 'F'. There are also input fields for 'Weight' and 'Net'. To the right of these are checkboxes for 'Burn', 'Net weight', 'Remark', 'Thickness', 'Quality', 'Pieces', 'Cut', 'Finished', and 'Figure'. At the bottom are 'Clear', 'ALL', 'CANCEL', and 'OK' buttons.

Order	Name	Remark	Thickness	Quality	Pieces	Cut	Burn	Net weight	Gross weight
1.	M013		10		1	1.481	1	11.48	14.40
2.	M013		10		1	1.481	1	11.48	14.40
3.	M021		10		1	2.765	7	7.64	12.80
4.	M007		10		1	1.257	1	10.05	12.80
5.	M001		10		1	0.600	1	1.60	1.60
6.	M001		10		1	0.600	1	1.60	1.60
7.	M001		10		1	0.600	1	1.60	1.60

Order	Name	Remark	Thickness	Quality	Pieces	Cut	Burn	Net weight	Gross weight
7.					7	8.783	13	45.46	59.20

Weight: ☒ * 10 * 8

Net: * 7.92 = Board

Options:

- ☒ Order
- ☒ Name
- ☒ Remark
- ☒ Thickness
- ☒ Quality
- ☒ Pieces
- ☒ Cut
- ☒ Burn
- ☒ Net weight
- ☒ Gross weight
- ☐ Size KB
- ☐ Total
- ☐ Finished
- ☐ Figure

Buttons: +, -, Notepad, Export, F, Weight, Net, P, Clear, ALL, CANCEL, OK

On the right, in section ,Options', you can select which columns are to be displayed, and on the left, use buttons + and - to choose if to display each particular detail separately or if you wish to unify the same names in one line. In section ,Weight', you can switch on calculation of the required weight; if this function is switched off, the columns show the weight and the area in square decimetres; after you switch it on, it is multiplied by the set material thickness and density and the real weight is calculated. More to the right, there is a section that enables you to edit values directly (button ,P'). After you select a column with the parameter that you need to change, you can either change the value for all items directly or select a particular item and make the changes only there. The exception is parameter ,figure' that can only be added to all items. It is used to identify a whole group of details and you can use it for writing the number of the configuration for example or for identifying the programmer.

The last part deals with exporting data. At the bottom, use the standard way to select the saving target, above, you can set export parameters. Option ,F' determines the fixed width of the columns, the next field enables you to set the selected column punctuation (e.g. semicolon or another mark that you do not use in design names nor in their notes); option ,S' adds at the end of the exported file a line with sums and option ,+' is used to write exported data to the end of an already existing file instead of its overwriting or creating a new one. Button ,Notepad' displays a preview of the export while respecting the current setting and button ,Export' implements the record to the file.

2.8.11. ManaDraw

This function is also in the toolbar of card ,DXF,...‘ and has the following icon:



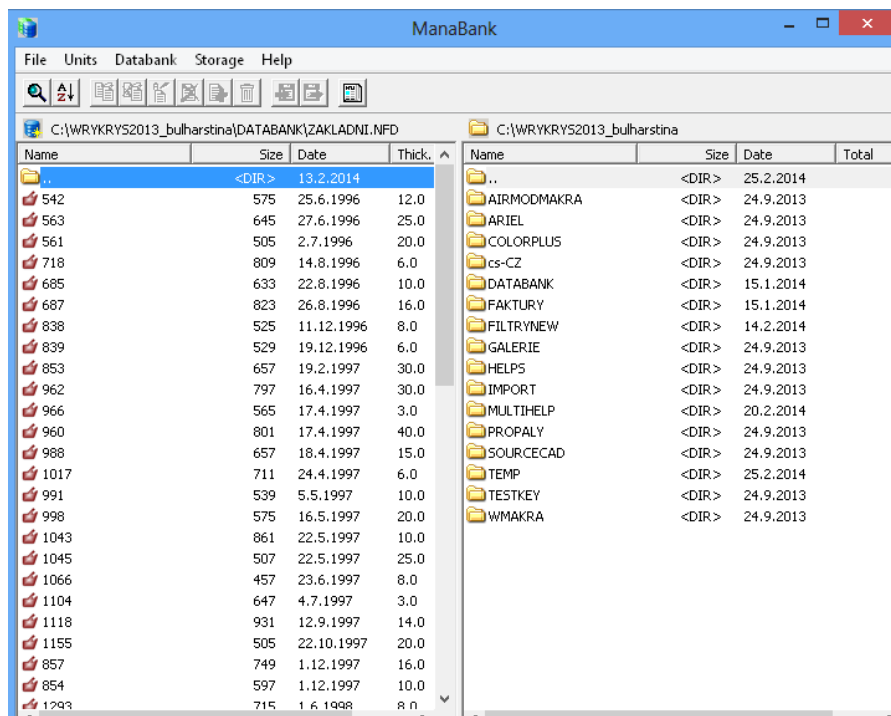
It manages copying/transferring/deleting of designs or configurations. It works on the same principle as ,Manabank‘ which is described in the next chapter, however, it does not work with databases and their content but with DXF files, if need be, with files exported for the machine.


2.8.12. Manabank



This function is also in the toolbar of card ,Bank‘ and has the following icon:



Manabank manages communication among your databases. It works on a similar principle to common known file managers, but it also enables you to work directly with the content of your databases and copy/move items among them.

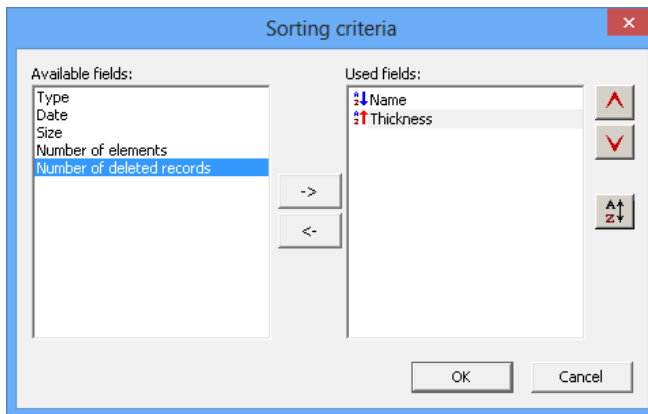


First, you choose a directory that contains your databases and after you double click on a database (databases have an icon  ZAKLADNI.NFD), its content is displayed.

It includes designs ( 1427) and configurations ( TEST).


If you need to communicate between two databases, use the same way to select the database you need also in the second half of the window.

Menu ‚File‘ includes order function where you can sort the parameters required for ordering of either separate databases or of their content. Control the priority of particular parameters and switch between ascending and descending order by using buttons on the right.



For simple sorting, click on the header of the needed column.










The second option of this menu is function ‚Preview‘ which displays a preview of the active item in the lower part.












Option ‚Units‘ contains functions used to work with particular items. Use the standard way to select more items - press key ‚Shift‘ to mark an entire block and press key ‚Ctrl‘ to add particular items to the choice. Afterwards, you can copy or move the active item or items into the second open database or you can rename or delete them. After you delete an item or move it, it is not removed straight away but it is only marked with sign deleted ( 1420). Such an item is not displayed in the database catalogue but you can restore it by using another function.

Definite removal of deleted items is only implemented after you use function ‚Compress‘ in the ‚Databank‘ menu. This function removes permanently all items in the selected database that have the sign deleted, and then, you cannot restore them anymore.


The last option ‚Storage‘ is used to initiate the catalogue of the open database and back up databases in the active directory, or to restore these backups.

2.9. Menu Technology

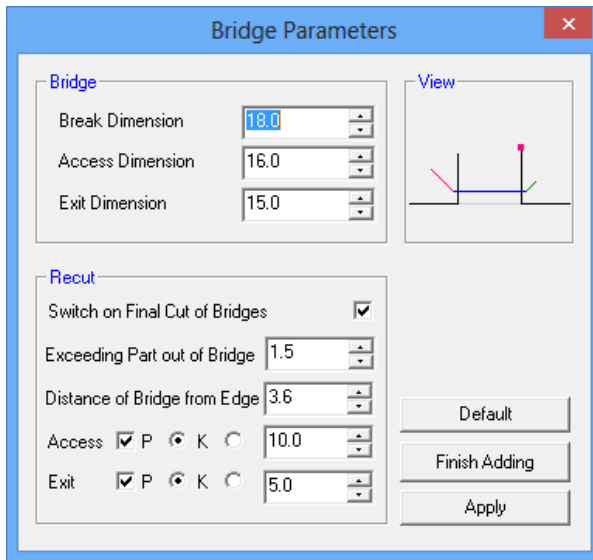
Technology	Modifications	Nesting	Set
	Add Bridge		
	Add Loops		
	Join Designs		
	Burns		▶
	Common Cut		
	Common Cut on Two Sides		
	Generate Chessboard		
	Generate Stripes		
	Stick Pieces		
	Connect Designs		
	Insert Stop		Shift+S
	Blok		

	Burns	▶		Remove Burn Manually	
	Common Cut			Cut All Burns	Alt+F6
	Common Cut on Two Sides			Add Burn Manually	Alt+F5
	Generate Chessboard			Automatic Burn to One Design	
	Generate Stripes			Automatic Burn to All Designs	
	Stick Pieces			Burn Generation and Modification	
	Connect Designs			Modifiable Burn	

2.9.1. Add Bridge

This function is also on the main toolbar and has the following icon: 

This function is used to add bridges (in a different terminology also called locks), which prevents the drawing from heat distortion during its cutting. In fact, a bridge is a cutting break used in order to make the cut piece remain in the material, not to curve or not to fall down in between the grids. In rare cases, you can also use a bridge as ignition. You can bridge both a line and a circle. You can set bridge parameters in the window that appears after you choose this command:



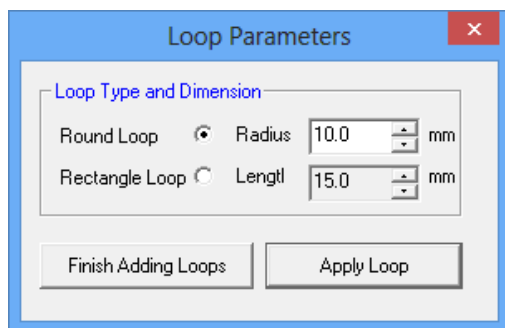
Value 'Break Dimension' determines the width of the bridge and value 'Access' and 'Exit' the height of the bridge. When changing these parameters, you can check in the preview which value is being changed. Use button 'Apply' to get back to the desktop where you left-click on a detail and left-click again to place a bridge or bridges on it where needed. You can right-click to return to the window where bridges are set and change its parameters.

Window ,Bridge Parameters' also allows you to select the option of automatic final cut of added bridges. If you do not select this option, you need to cut the bridges manually after the entire configuration is finished. If you select this function, the detail is cut with added bridges and then, the program returns to the places where there are bridges and the product is finally cut according to the determined values (exceeding part out of the bridge, distance of the bridge from the edge, or individually determined access and exit of this final cut). Changes in these values are again shown in the preview to make clear what the applied bridge will look like.

2.9.2. Add Loops

This function is also on the main toolbar and has the following icon: 

To prevent unwanted ignition of the corners of the designs, you can use the so called loops. They are designed to replace an acute passage in the corners by a continuous passage out off the contour of the design. After you initiate this command, a window appears where you can set the parameters of the added loop:



First, you select if the form of the loop will be round or rectangle. The next information deals with dimensions of the selected shape (radius of inscribed circle if the loop is round or length of the leg of an isosceles triangle which is used with rectangle loops). Confirm your selected loop by button ,Apply Loop' to get back to the desktop where you left-click to select a design where you want to add the loop or loops. The program always suggests the nearest corner to the mouse cursor; left-click again to carry out the addition. To return to the loop parameters setting, right-click.

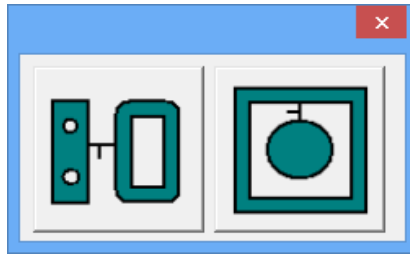
In practice, loops are especially used in the course of cutting with plasma when thicker material usually implies stronger ignition.

2.9.3. Joining Designs

This function is also on the main toolbar and has the following icon: 

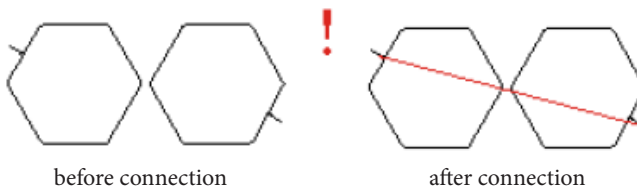
This function is used to save cutting machine by lowering the number of ignitions by joining two or subsequently more designs into one burn. The connection is made between the end of the first design and the beginning of the second design without switching off the burner.

After you initiate this function, you need to select the type of connection - either two adjacent components, or a component inserted into a hole of another design:



Then, you left-click on the desktop to choose the first and the second design to be joined. The compensation of the designs remains the same, but the cutting order changes; the pair or the group of more elements takes the number of the design having higher cutting order.

ATTENTION! If you want to use this command, all designs need to have the burn added in the appropriate place so that it is possible to join these burns. Before you apply this command, you need to check the places where the burns are. In case the burns are added in an inappropriate place, the connection of designs might cause that the designs will be cut across:



The program processes joined designs as one detail no matter how many designs have been connected. As far as inner holes are concerned, these holes are always cut first and each of them have their own burn.

2.9.4. Burns

They represent an important group of commands used to set, add and remove burns (also called ignition, shot, etc.) it means places where the machine starts and stops cutting particular contours. To add burns, you need to have the correct design - it means a closed shape with the correct (inner/outer) compensation so that the program can add the burn. In standard situations, **every design should have a burn added before it is exported to the machine otherwise a defective product might be produced!**

2.9.4.1. Remove Burn Manually

This function is also on the main toolbar and has the following icon: 

This command is used to remove burns from particular designs on the desktop. You can only use it with designs where there are some burns. If you select this function, the designs on the desktop are coloured - the designs without burns remain black while designs with a burn (and so, it is possible to remove it) are highlighted in green. Left-click to remove - all burns in the selected detail are deleted (it means even from all its potential holes); if you wish to remove only one particular burn, use function ,Cut Particular Burns' or directly ,Correct Particular Burns', see chapter 2.10.4 or more precisely 2.10.5.

2.9.4.2. Cut All Burns

This function is also on the main toolbar and has the following icon: 

This command is used to remove burns from all designs that are in the configuration on the desktop and that have a burn. It is natural that it also concerns inner holes.

2.9.4.3. Add Burn Manually

This function is also on the main toolbar and has the following icon: 

This command is used to add burns to particular designs on the desktop. You can only use it in designs where (at least on one of its contours) there is no burn. After you use this function for the first time, window ,Modifiable Burn' opens (described in chapter 2.9.4.7) where you can set parameters of the burn and after you confirm it, the designs on the desktop colour - details where there is already a burn remain black while designs where there is no burn (and so you can add one) are highlighted in green. Then, left-click to select a design where you will add burns to all its contours (if there are any holes).

2.9.4.4. Automatic Burn to One Design

This function is also on the main toolbar and has the following icon: 

This command works in the same way as preceding function ,Add Burn Manually', but the burns are placed automatically on the selected design. This saves your time but the selected position does not always have to be the ideal one as far as the technological point of view is concerned.

2.9.4.5. Automatic Burn to All Designs

This function is also on the main toolbar and has the following icon: 

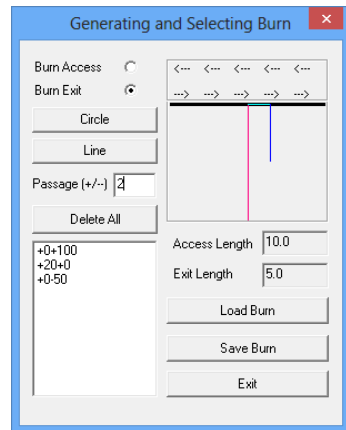
Again, the command works in the same way as preceding function ,Automatic Burn to One Design', but after you set the parameters of the burn, these are placed to all closed contours that are on the desktop and that did not have any burn before. You also need to think about the fact that the burn positions selected by the program do not always have to be fully suitable. Subsequently, you can remove or modify the burns in particular components.

2.9.4.6. Burn Generation and Modification

This window enables you to create a strictly defined burn that you can use in sets of burns afterwards. These burns have almost been completely substituted by application of Modifiable Burn which is described in the following chapter. It only makes sense to use strictly defined burns in the cases where you use a somehow atypical burn (meaning that the access or exit contains more parts) with always constant dimensions repeatedly.

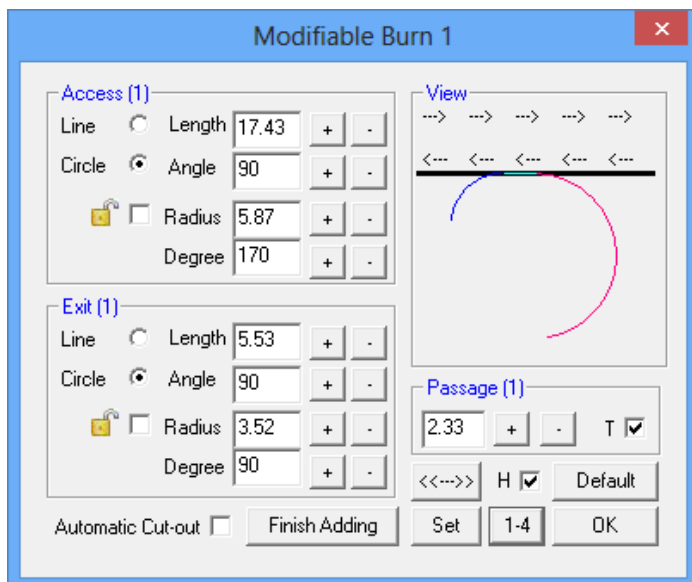
You should set individual parts of the burn one by one; first, the access, then, the passage and finally, the exit. Use your computer mouse to mark the part which you want to create and then, click on button ,Circle' or ,Line' depending on which one you want to add. In the consequently opened windows, you set and confirm the parameters of the line or circle. The added component is shown in the preview straight away; double click on the line with the code to adjust the parameters of the corresponding object.

You can save your finished burn as a file with extension *.PRO by using button ,Save Burn'.



2.9.4.7. Modifiable Burn

This is a window for setting burn parameters. You can open it from this menu or it opens automatically after you initiate the function for adding burns and also, you can return into it by a right-click at any time in the course of adding a burn.



The heading of this window shows the order number of the burn. At the same time, you can prepare up to 4 burns in advance between which you can switch in the course of adding them either on the side panel (if option ,H' is ticked) or by using the space bar. You change the number of the burn that you are adjusting by button ,1-4'. For the above described functions for adding burns automatically (chapter 2.9.4.4 and 2.9.4.5), Modifiable Burn 1 is used for holes and burn 2 for outer shapes.

In general, a burn consists of three parts - the first one that serves to ,cut through' the material is ,Access' (the red part in the preview) - this one can be fully defined in the table; you can choose between a line and a circle, set its length and angle at which the burn will be directed to the component; in the case of a circle, you can set and fix its radius and determine the length of the curve in degrees.

After that, the component is cut. Use button ,<-->>' to change the orientation of the burn, it means the direction in which the machine will go and also, even the fact if there will be the left or right compensation (some machines might require using the left compensation only, for example). This modification (as well as the other ones) is reflected in the preview straight away including the cutting direction which is indicated by arrows. This cutting direction is shown for outer shapes; during adding, the direction turns automatically in holes in order to keep the same compensation.

At the end of the component, the second part of the burn starts; it is the 'Passage' (the light blue part in the preview); you set only its length and it should be used to ensure that the component cutting is finished in the correct way. Use option ,T' only when adding a burn to inner circle holes - if it is ticked, the passage is added in the form of a short line segment - chord of the given circle. If it is not ticked, the passage is placed right in the contour of the given circle. In theory, this leads to better results and minimizes ignition traces, but if you add an extremely small passage, a circle of a very short length is created, which might cause various errors with some machines. So, straight passage with ticked ,T' is the ,safe' option.

The third and last part of the burn is ,Exit' (the dark blue part in the preview); it should be used to prevent machines from switching off in the contour of the detail and thus, from leaving undesirable traces. You can define the exit fully in the same way as you define Access.

It is not always necessary to use all the parts of the burn (for examples, some machines might not require any passage). **Needed parameters of added burns differ significantly according to the technology used, material thickness, etc.** You should be informed about the appropriate type of burn for your machine by its producer, or you will learn it by practice.

There is also button ,Default' which resets the parameters of the burn to reach the default setting (this is not a ,universally usable' burn, just default values in case you preset your burn in the wrong way by mistake).

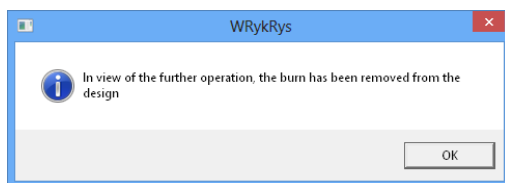
There is also option ,Automatic Cut-out' at your disposal. If it is ticked, the relevant contour is zoomed in automatically in the course of adding burns manually.

The last button is ,Set'. You can use it to open sets of strictly defined burns that are saved in the program installation or that you have created using function ,Burn Generation and Modification' (chapter 2.9.4.6).

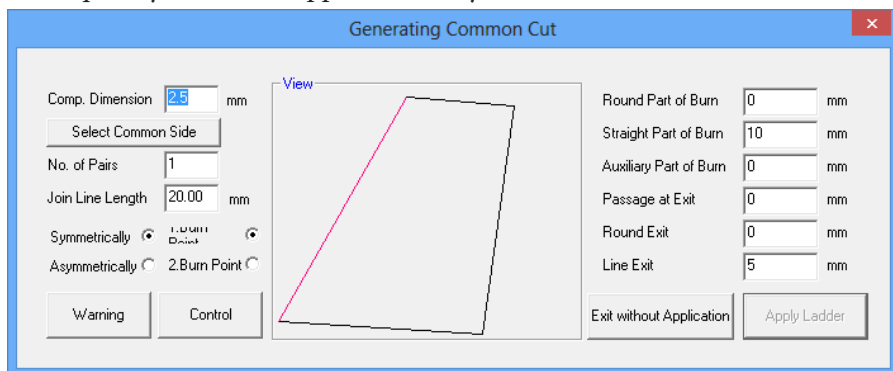
2.9.5. Common Cut

This function is also on the main toolbar and has the following icon: 

The common cut is another technological function. After you choose it, on the desktop, mark the design that you want to use for the common cut. This design has to have at least one outer edge straight so that the common cut could be created and it should not have any added burn. If there is a burn, it is automatically removed:



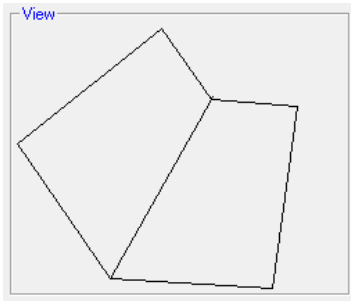
Subsequently, a window appears where you can create the common cut:



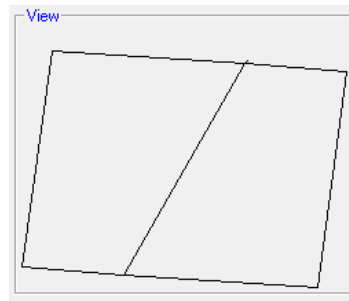
Before using the common cut, its technology requires setting the compensation size that you need to determine according to the real size of the cutting chink. This is the only case (together with other technological functions for the construction of which a common edge is used and that are described in the following chapters) where you need to set the compensation size already at the stage of preparing the configuration on the desktop. The created construction does not include any compensation (as a function added because of the machine) anymore because it is included in the design dimensions. For example, the dimensions of the original rectangle of 200 x 100 mm will be 202 x 102 mm after a common cut is created so that the final

dimensions of the product match. The above mentioned fact is also mentioned in the information window under button ,Warning‘.

Then, you need to select the common edge; you do it right in the preview by using the left button. This way a pair is created; the second component is mirrored about the selected edge. If you switch to option ,Asymmetrically‘, you can mirror it even about the other axis and select a more appropriate variant this way, for example:



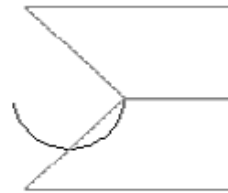
Symmetrically



Asymmetrically

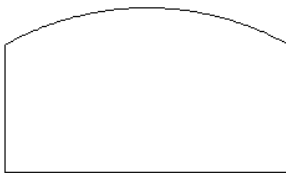
You can use options ,1. Burn Point‘ and ,2. Burn Point‘ to choose where to place the access of the burn and where to place the exit. Set the burn parameters in the right part of the window; every change is immediately reflected in the preview.

ATTENTION, in case that an acute angle is between components, a circle burn could interfere into one of the components.

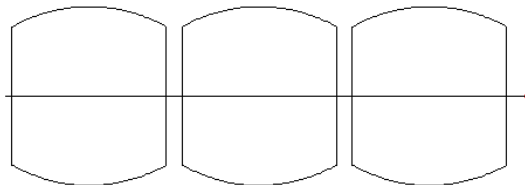


Wrong burn

The last option of this window is to create a so called ladder by setting a larger number of pairs. The distance between these pairs is determined by parameter ,Join Line Length‘. As a result of this, you can get, for example, the following construction:



Original component



Ladder of six components (3 joined pairs)

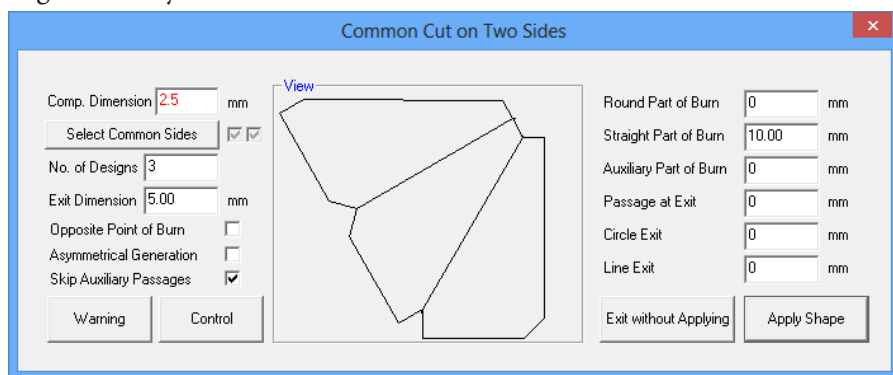
Use button ,Apply Ladder' to send the construction (no matter if one pair only or more) to the desktop where you place it in the standard way. The entire construction is unchangeable (including the burn) and behaves as one component; if you want to adjust it in any way, you need to create the common cut again.

The common cut as well as other technological functions that take advantage of a common edge or edges means considerable savings - the whole construction requires only one burn and you also save an essential length of the cut. But, you cannot always use these functions or only with certain restrictions. For example, with plasma machines that require cutting clockwise, the lower part of the cut edge would be cut in corners in the second component, which, however, does not have to be visible with narrow material. You also need to think about the fact that potential holes in these constructions are, of course, cut first; when a large number of pieces are connected, the material might move in a certain way due to heat, for example, and as a result of this, the position of holes in individual components might not be quite exact.

2.9.6. Common Cut on Two Sides

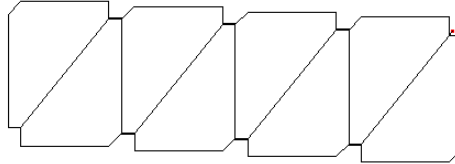
This function is also on the main toolbar and has the following icon: 

This technological function is very similar to preceding function ,Common Cut', **including all conditions and restrictions that are mentioned there.** The first difference is that in the preview, you do not choose only one edge but two edges that will be utilized as common (and about which the component will be mirrored) and that is why the design has to have at least two straight edges so that you can use this function.



Common Cut on Two Sides	
Comp. Dimension	2.5 mm
Select Common Sides	<input checked="" type="checkbox"/>
No. of Designs	3
Exit Dimension	5.00 mm
Opposite Point of Burn	<input type="checkbox"/>
Asymmetrical Generation	<input type="checkbox"/>
Skip Auxiliary Passages	<input checked="" type="checkbox"/>
<div>Warning Control</div>	
View	
Round Part of Burn	0 mm
Straight Part of Burn	10.00 mm
Auxiliary Part of Burn	0 mm
Passage at Exit	0 mm
Circle Exit	0 mm
Line Exit	0 mm
<div>Exit without Applying Apply Shape</div>	

The second difference is that you do not join individual pairs but you can connect a larger number of components and set the distance between the auxiliary passages and the component, or leave out these passages. For example, the result can look like this:



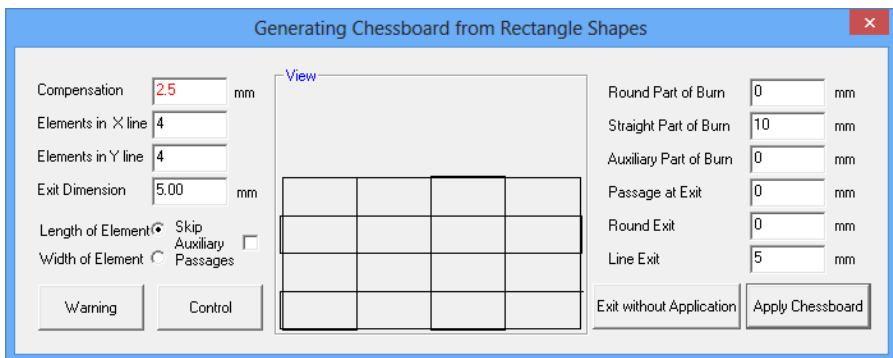
2.9.7. Chessboard Generating

This function is also on the main toolbar and has the following icon: 

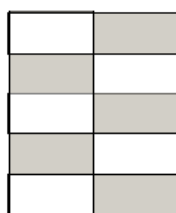
The chessboard is another technological function using common edges in order to save the cut and number of burns. Please read chapter 2.9.5 ,Common Cut‘ where you will find important information and restrictions that result from this fact.

The design where you want to apply the chessboard has to consist of four line segments where the opposite sides have to be parallel which means that it must be a rectangle or a square or a rhomboid.

The window where you create the chessboard is also very similar:



Besides the size of cutting chink (compensation), you set the number of elements in axis X and Y of which the chessboard will consist. You can also set the exit dimension of the auxiliary passages or leave these passages out. You can also choose if the designs shall be of the landscape or portrait orientation. These are examples of final constructions:



*Elements in X line: 2
Elements in Y line: 5*

landscape variant



*Elements in X line: 5, Elements in Y line: 2
portrait variant*

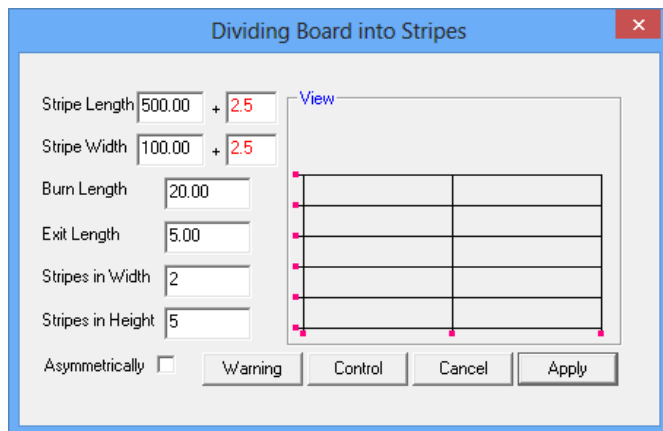
Burn parameters are set on the right. Use button ‚Apply Chessboard‘ to send and subsequently place the chessboard on the desktop.

2.9.8. Stripes Generating

This function is also on the main toolbar and has the following icon:



This technological function works with the common cut as well (and that is why it is necessary to set the compensation size here, see chapter 2.9.5); but it does not require any source design, it creates its own rectangles or squares, which follow one after the other, in order to cut the plate in a simple way. After you select this, the following window appears:



This is where you set the length and width of stripes, the length of the burn and exit, and the number of stripes in axis X and Y. If you tick option ‚Asymmetrically‘, the burns and exit are alternately on the left/right or down/up.

Use button ‚Apply‘ to load the construction on the desktop where you can choose its position.

Note: Circumstances permitting (the board is perfectly right-angled and the technology allows 'side' access), you can utilize the material edges to substitute the first cuts. In such a case, place the stripes in the way that they correspond to the board edge (either by zooming in or by setting the exact position by using the coordinates after you right-click on the stripes on the desktop) and remove the two edges you do not need by applying function 'Deleting the Element', see chapter 2.10.16. After that, it is natural that you cannot move the stripes on the desktop any more.

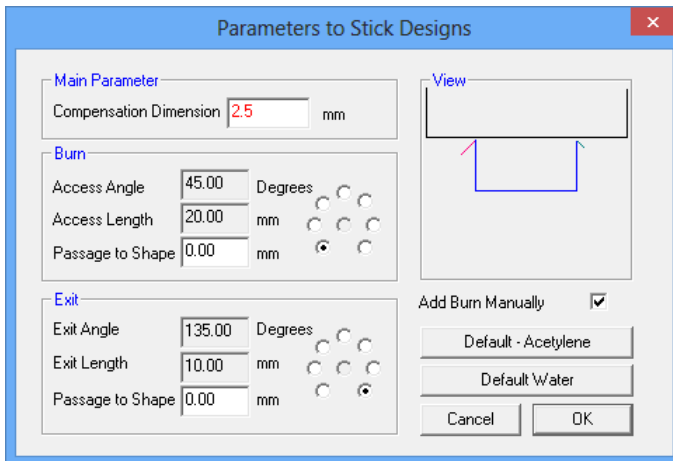
2.9.9. Sticking Pieces

This function is also on the main toolbar and has the following icon: 

While the other functions utilizing common cuts concerned only one design, 'Sticking Pieces' enables you to join various designs on the desktop or to stick a design to the edge of the plate. It is easy to perform but the construction is more complex from the technological point of view. As this function does not lower the number of burns, use it rather in situations where the cut is expensive (e.g. water ray).

As with all constructions where there is at least one common edge, it is important to take into account the compensation (for details see chapter 2.9.5 - 'Common Cut'). In this case, the designs are not larger by the compensation but it is taken into consideration for the edge that is being stuck.

In window 'Parameters to Stick Designs', the compensation is determined as the 'Main Parameter':



Parameters to Stick Designs

Main Parameter

Compensation Dimension mm

Burn

Access Angle Degrees

Access Length mm

Passage to Shape mm

Exit

Exit Angle Degrees

Exit Length mm

Passage to Shape mm

View

Add Burn Manually ☒

Default - Acetylene

Default Water

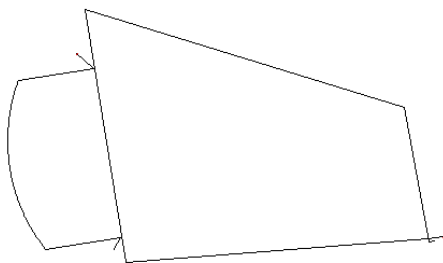
Cancel OK

When sticking designs, one edge becomes a part of the edge of the other design or of the plate edge and you need to adapt adding burns to this situation.

Use button ‚Default Water‘ for sticking without burns; variant ‚Default-Acetylene‘ includes switched manual burns; it means that they are proposed to you so that you can add them after the components are stuck, and you determine their length and angle by your mouse; only passage value is taken from the table.

If you untick Add Burn Manually, you set the access length and access angle and exit length and exit angle in the tables on the left. The changes are shown in the preview straight away.

Press ‚OK‘ to confirm the setting of the determined parameters and continue sticking edges together on the desktop. The first edge that you mark is the edge of the design to which you will stick another component (or plate edge). The second edge that you mark is the edge of the design that you want to join (you do not need to solve the angle of individual edges, the program will turn them to each other automatically). Then, just use your mouse to select the place where you want to position the second detail and confirm the connection by a left-click.



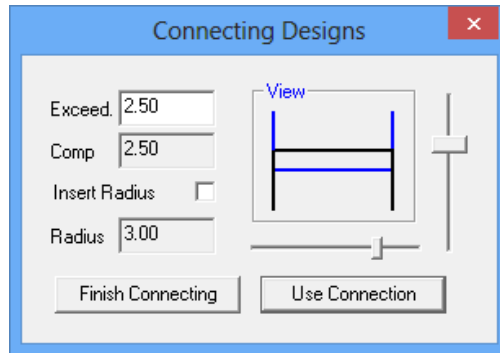
Example of two stuck components with added burns

2.9.10. Connecting Designs

This function is also on the main toolbar and has the following icon:



The command is used to connect two designs for a common burn. You can connect only outer shapes of designs this way. The ‚Length‘ (exceeding part) depends on the compensation. The order of the designs in which you mark them for connection is also essential. If the order selected this way does not suit, you can use Undo to return and correct the connection.

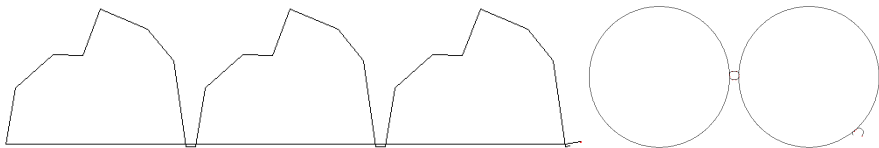


You set the size and parameters of the connection in above shown window ,Connecting Designs‘ (when using it for the first time, it appears on its own, later, you can return into it by a right-click).

You can add the values manually or use the slide bars around the preview. If you set negative values, a connection can substitute the function of bridges where the cut pieces remain in the material. A connection does not have to be only a straight line; you can also add an inserted radius (suitable for a case where there is no acute edge in the designs where you could place a connection).

Implement the connection by a left-click on the desktop in the order in which you want to cut the subsequent components; first, you mark the first and second component and then, you place a connection on the selected place. This way, you can connect even more designs one by one (you connect the first pair with another design, etc.) then, you will add only one burn to the entire construction.

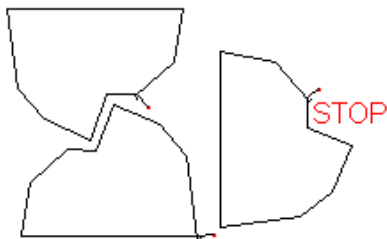
Here are some examples of how to use connecting:



2.9.11. Insert Stop

This is a command that add a so called stop to the configuration. It means that after you mark a design, the machine stops automatically after it has been cut (not all machines support this function). This function is used, for example, when large sets of components are cut in order to control some first pieces, or when cutting with more burners where you need to switch off some burners in the middle of the configuration and finish cutting the rest of the configuration by one burner only, or the other way round.








It is easy to use, after you select this command, just use the cursor to mark the design you need after which the machine shall stop, and the program will label it by word ,STOP'. You can cancel the stop by using the function again on the same design.



2.9.12. Blok

This is a simple command that unifies all designs on the desktop into one design. A window with the number of unified designs appears; you can go back by using one step back.

2.10. Menu Modifications

Modifications	Nesting	Setting	Help	Exit
	One Step Back (max.100)		Ctrl+Z	
	One Step Forward		Ctrl+Y	
	Breaking Jet - Display			
	Cut Particular Burns			
	Correct Particular Burns		Alt+F2	
	Cut Board			
	Change Order of Holes			
	Change Compensation			
	Place on Board			
	Copy Designs			
	Correct Position			
	Delete Design			
	Delete All Designs		Del	
	Cutting Order of Designs			
	Divide into More Designs			
	Particular Elements			▶
	Rotate Configuration at 90 °		Ctrl+R	
	Mirror Configuration about the X-axis		Alt+X	
	Compress			▶
	Convert Old Databases			
	Multiple Converting of Directory			

2.10.1. One Step Back

This function is also on the main toolbar and has the following icon:



This is a standard function that returns the changes made on the desktop one step back. If you use it from the main toolbar, there is also a drop-down arrow at the icon - use it to open an overview of preceding states of the desktop in the side panel and if you click on one of them, you can return more steps back at once.

2.10.2. One Step Forward

This function is also on the main toolbar and has the following icon:



This function is used to restore operations cancelled by using function 'One Step Back'. Each use of this function implements one step again.

2.10.3. Breaking Jet - Display

You can switch this function on or off. This is control for the user the machine of whom is liable to jet breaking in the course of quick shift passages. It happens that cut pieces or inner holes are distorted and if the jet passes over these parts, the jet might break. This function indicates this possibility and such risky passages are displayed in red on the desktop.

2.10.4. Cutting Particular Burns

This is a complement of the group of the main toolbar commands that are used to remove burns. When removing burns, the program always cuts the burns from the entire design or from the whole configuration. Use this command to cut only the burn that you select by your mouse no matter if in an inner hole or in an outer contour.

2.10.5. Correcting Particular Burns

This function corrects a specific burn quickly. It is useful, for example, in a case where you have a reason (inappropriate position, unsuitable type, or maybe after 'Breaking Jet' control - see chapter 2.10.3) to modify a burn in just one of more holes of a design. You just left-click to select a specific burn and immediately, a new burn is proposed to be added.

You can change burns in holes and in outer contours as well.

2.10.6. Cutting Board

This function is also on the main toolbar and has the following icon:



'Cut Board' is an auxiliary function used to create rests. The difference is that

the limits set by this command become a part of the cut configuration. After the designs have been cut, the remaining material is cut off the ‚frame‘ right by the machine in the place that you select.

Use the left button to add individual line segments following each other (with pressed key ‚Shift‘, they keep their perpendicular shape). Use the right button to finish the cut.

A cut that is created this way is, from the point of view of the program, the same as any other design, so you can move it, for example, or modify it by using modifications of individual elements (see chapter 2.10.16), but you also need to pay attention to its cutting order because it should be placed at the end (after generation, it will, but if you, for example, replace an element in the configuration, the order of the cut would move as well).

If you want to apply the cut (it is usually suitable in cases where the cut is cheap and separating the frame from the plate this way is practical); of course, it is good to implement it even before generating a rest. This rest will utilize the cut as its own limits and its shape will correspond exactly to the real plate.

2.10.7. Changing Order of Holes

This function is also on the main toolbar and has the following icon:



You will use this function in the case where you have specific requirements for the order of cut holes. When uploading or when creating a design, the Wrykrys program optimises the order of holes automatically so that there is no useless passage from one side of the component to the other and so that the holes are cut systematically. However, the conditions may change considerably by adding burns or there may be other technological reasons to cut holes in a certain order. That is why you can change the order by using this function.

First, left-click on the design where the changes will be applied. It will be highlighted by a colour and then, continue left-clicking on its individual contours in the order in which you wish to cut them. If you make a mistake, you can step back by a right-click. After you mark the last but one contour, the editing of the piece in question is finished and the order of holes is saved.

ATTENTION - you can use this function to change even the automatically selected order that determines that holes are always cut first and only after that the outer shape!

2.10.8. Changing Compensation

The control of the added compensation should be already done in the Internal CAD system in the course of importing DXF files, or during drawing, however, you can still change the compensation on the desktop when creating a cutting configuration.

After you select the command, use the left-button to switch between outer, inner or no (cut right in the contour) compensation in the designs on the desktop.

The basic rule should be that inner holes have inner compensation and outer contours have outer compensation, which is automatically applied by WRYKRYs on loaded and created details (if these are correct closed shapes). Thus, this command is designed to be used mainly to modify compensation in intentionally open shapes, or maybe, when cutting holes into final semi-finished products where there is, for example, only a circle on the desktop and the program takes it as an independent component, but in reality, you want to cut it as a hole. In such a case, first, you switch the compensation to the inner one and only after that, you add a burn (it will be proposed according to the compensation, it means from the inner side).

2.10.9. Placing on the Board

This function is also on the main toolbar and has the following icon:



This is the first one of the group of four commands used for handling the designs on the desktop. This function is selected by default right after you start the program or after you exit any other function by using key ,Esc‘.

This function enables you to left-click right on the plate to choose one of the already placed pieces and load its exact copy ,to the cursor‘, it means including burns, rotation, etc. After that, you can position the new design on the plate. How to handle pieces ,on the cursor‘ and how to position them is described in the opening part of this guide in chapter 2.1 - ,Working Desktop‘. You can select even more than only one design either by holding the left button and moving the mouse over the details required, or by holding key ,Shift‘ and marking the details one by one by using the left button. Again, the selected group of designs is also loaded ,to the cursor‘ and you place it as a whole in the same way.

2.10.10. Copying Designs

This function is also on the main toolbar and has the following icon: 

This function is used to copy a design or a group of designs on the desktop in perpendicular directions.

After you mark a design (in the same way as in preceding chapter ,Placing on the Board'), you move your mouse to determine the direction and number of copies. When copying, the determined space between the pieces and the plate edge is respected (see chapter 2.12.2 - ,Basic Generating Parameters'). You can modify this space in the course of copying at once by using keys ,+' and ,-' to make the changes faster, but you need to pay attention to the technological requirements of the given situation.

At the cursor, there is also a caption displayed showing the calculation of the number of pieces in the following format:

number of pieces already placed on the desktop - number of pieces created by copying = total

Left-click to confirm copying.

2.10.11. Correcting Position

This function is also on the main toolbar and has the following icon: 

After you select this mode, left-click to load the design that is marked on the desktop ,to the cursor' and you can rotate and move it according to your own choice. How to handle pieces ,on the cursor' and how to position them is described in the opening part of this guide in chapter 2.1 - ,Working Desktop'. Even here, you can mark the whole group of designs as described in the preceding chapters.

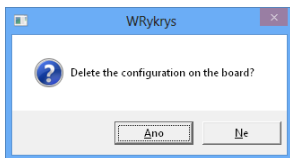
2.10.12. Deleting Design

This function is also on the main toolbar and has the following icon: 

After you select this function, use the left button to delete a design or more designs on the desktop. If you hold the button, you delete all the pieces that your cursor passes over. If you delete any designs by mistake, you can return by using one step back.

2.10.13. Deleting All Designs

This is a simple command that deletes the whole content of the desktop. Usually, you use it when you finish working with the current configuration (you save it to the database, export the code for the machine) and you want to start a new configuration. To make sure, before deleting, the program asks the following question:



2.10.14. Cutting Order of Designs

This function is also on the main toolbar and has the following icon:



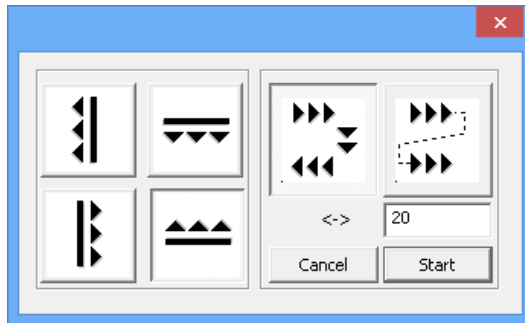
This function is used to determine the cutting order of the designs in the configuration on the desktop. The order that is created, on its own, respects the rule that the last component that you move and place on the desktop is the last in the order. So, if you, for example, load three designs from the database one by one and place them one next to the other, the order will be probably correct, but when generating, you usually handle the pieces repeatedly and as a consequence of this, the order is broken. That is why, after you finish positioning the designs (and also after you use automatic generation), you should, in the end, determine the appropriate order so that the machine cuts the configuration systematically, or according to other technological requirements (e.g. not to cut for too long in one place in order to prevent material overheating, etc.).

In case of manual generation of the order, there are two ways how to proceed. The first variant consists in left-clicking in order to mark a detail that shall be the first in the order, and continuing left-clicking in order to determine the order for the entire configuration. You can also hold the left button and this way, mark, for example, a whole line of details faster. In case you mark a detail by mistake, you can return by a right-click. You can finish determining the order whenever you need by pressing key 'Esc'; in such a case the order that you have already determined (details marked in red) is saved and the remaining details follow them in the unchanged order.

While the first variant is usually used to determine the entire order, the second one is designed for minor changes. It is based on the fact that first, you right-click not left-click. After that, the order of all details preceding the selected part is marked and kept automatically. Then, you perform marking in the same way as in the first case - you left-click to continue marking, and right-click to return.

It is suitable to use it, for example, in a case where you have a finished configuration with determined order and you want to add a piece in the middle of it subsequently, for example, into a hole of another component. But, the newly placed or moved detail is put (according to the above mentioned rule) at the end of the order automatically. In order not to rework the entire order, you just right-click to select the detail that precedes the one that you want to insert newly, then, left-click to mark the added part and finish the operation by key ,Esc'. The other order is kept and the new part is inserted ,in the middle' of the order. For control, you can use, for example, the function of simulation drawing (chapter 2.8.2).

The second option is to use the automatic cutting order. It is only accessible if you use the icon in the main toolbar, or the drop-down arrow by this icon. After you select it, the following window opens:



You choose the direction there in which you want to proceed during cutting in the plate (from the left to the right, from the bottom to the top,...), the width of the imaginary ,stripes' in mm on the right; in the course of cutting generation, the program will move along them in the determined direction. The smaller value you set, the more strictly the direction determined in the left part will be respected (so during cutting from the left to the right, in fact, only one column of the pile of designs will be always cut). If you select a wider stripe, it is possible that with the selected procedure from the left to the right, first, some smaller designs will be cut one next to the other (up to the stripe width). The switches on the right determine if the machine shall return by quick shift after one stripe is cut, and cut every other stripe from the same side (the second variant), or if it should start cutting in the opposite direction alternately (the first variant); this way, you save passages, but it does not have

to be advantageous, for example, because of the heat distribution. After you confirm by button ‚Start‘, a new cutting order is created and the simulation drawing starts straight away so that you could check the cutting order. Pay due attention to it; if the cutting order is selected in the inappropriate way, a defective product might be produced!

2.10.15. Dividing into More Designs

This function is also on the main toolbar and has the following icon: 

This function is used to divide designs into more parts. From the point of view of the program, the only condition is that the design shall contain two or more contours that you can separate one from the others, it means that it is, for example, possible to separate holes from the outer shape of a detail, etc. However, it is practical to use mainly in two situations. The first one is a situation where you load an item on the desktop (for example a DXF file) that contains one or more designs. But they will behave as one single design and you need to divide them into separate details. The procedure is as follows: first, left-click wherever on the selected design and it will be coloured. Then, mark (again left-clicking) individual contours of the detail that you want to ‚separate‘ from the rest of the design (ATTENTION, the cutting order in which you mark the contours is important because they will remain in the given order even after their separation, it means that first, you need to mark possible holes and only then, the outer shape of the separated detail). After marking, you confirm the separation by key ‚Enter‘. You can repeat the procedure to separate other designs one by one.

The second situation can be that you have a configuration in the format for your machine and you need to take one of its details (it is good to save the finished configurations into the database, thus, you can prevent this situation). In such a situation, you can load this configuration on the desktop via ‚DXF,...‘ card (see chapter 2.2.3) or by using Import CNC (chapter 2.2.3) and then, divide individual designs in the manual way described above, or you can perform automatic division - by either holding key ‚Ctrl‘ already in the course of initiating the function and thus, you will divide all the designs on the desktop automatically, or first, select the function and then, use key ‚Ctrl‘ and, at the same time, left-click on the whole design and the program will also try to divide it automatically.

2.10.16. Modifying Design in InterCAD

This function is also on the main toolbar and has the following icon: 

This function is also on the main toolbar and has the following icon:

Modifying Design in InterCAD system enables you to reload a design into the internal drawing program and make changes there or finish it. We recommend you to load designs **without added burns**. If you do not save the design under a different name, it keeps, when you send it back to the desktop, the one under which it was loaded into the internal CAD. So, you can change a finished design or save a detail under a different name into the database after you make modifications.

2.10.17. Particular Elements

This is a group of four commands that are used to edit particular elements directly on the desktop. It is not a full-blown design editing (which is done via sending a design into InterCAD, see the preceding chapter), but just a quick modification in specific situations.

There are the following commands at your disposal:

Particular Elements		
Rotate Configuration at 90 °	Ctrl+R	Delete Element Shift+D
Mirror Configuration about the X-axis	Alt+X	Edit Element Shift+E
Compress		Add Element Shift+A
		Move Joins

Randomly, you can use them in the following situations:

- There is a design with a small hole on your desktop and subsequently, you realize that it will not be cut. You can delete it straight away using Deleting Element.
- You have a component in thick material (for example for acetylene) and you need to add a long burn (let's say 60 mm) which is, however, not suitable for the given position and you would prefer a burn ,round the corner' consisting of two parts. You do not need to use the complex way of creating a strictly defined burn - you add a classic modifiable burn of, for example, 20 mm and use Add Element to connect its second part (it is automatic that the program ,fixes' a new line segment to the end point of the original burn and displays the length of the added line segment in the lower Status bar). I needed, you can adjust it by using Edit Element.

- You have performed ,Cutting Board‘ (see chapter 2.10.6) but you have not selected the right shape in any place. You do not need to delete the cut and create it again; by using Move Joins, you can adjust its shape easily according to your needs.

2.10.18. Rotating Configuration at 90°

This is a simple command that rotates the entire configuration on the desktop at 90° anti-clockwise. Of course, you can perform rotation repeatedly.

2.10.19. Mirroring Configuration about the X-axis

This command is used to mirror the whole configuration on the desktop about the horizontal axis. ATTENTION - if you have added burns to your designs already, even their orientation is reversed (it is the same as in the case where you use the right button to turn a design with a burn ,on the cursor‘ in the course of its positioning), and so, the left compensation changes into the right compensation and the other way round, which might be undesirable.

2.10.20. Compressing

This is a group of four commands for ,compressing‘ designs on the desktop:

Compress	▶	Compress to the Left	Alt+ <-
Convert Old Databases		Compress to the Right	Alt+ ->
Multiple Converting of Directory		Compress Downwards	Alt+ v
		Compress Upwards	Alt+ ^

The program will try to move all the components on the desktop in the selected direction (while respecting the space between individual parts set in ,Basic Generating Parameters‘ - see chapter 2.12.2); you can use this function, for example, in the case where you have made this space smaller and you want to make smaller the distances between the components.

2.10.21. Converting Old Databases

Nowadays, this command is not practically used any more - in the first versions of the Wrykrys program, or in DOS version RYKRYs, databases were of a different format with extension *. PSV (or in the DOS version, file ,bankadet.dat‘ was an active database where you need to change the extension to PSV); in case you have such a database, you can convert it into

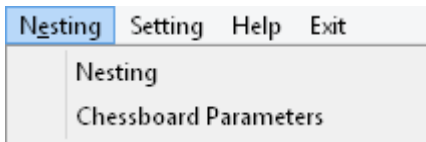
the new format (with extension *.NFD) by using this command. The original database remains conserved and a copy of it is created in the new format.

2.10.22. Multiple Converting of Directory

This enlarges the preceding command - in case that you have more databases in the old format (*.PSV), you can convert the whole directory into the new format at once.

Again, the original databases remain conserved and new databases are created having extension *. NFD.

2.11. Menu Nesting

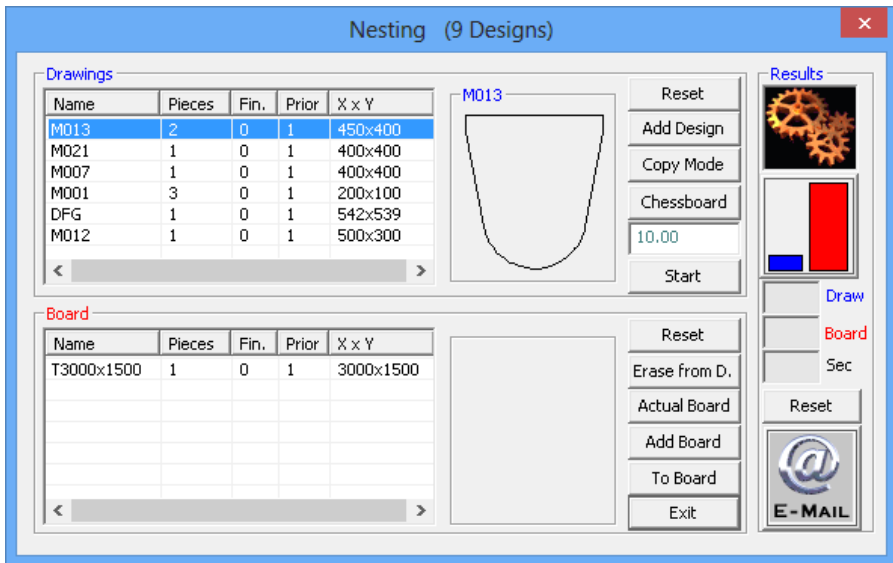


2.11.1. Nesting

This function is also on the main toolbar and has the following icon:



The first option of this menu is Nesting itself, or automatic generation. After you select it, the following window appears:



The window is divided into two sections. The ,Blue‘ part represents drawings that you want to put together, the ,red‘ part represents boards; it means the material that you will use in the course of assembly.

During a new setting, you should erase the both tables by using button ,Reset‘. Then, select the items that you will put together. Use button ,Add Design‘ to minimize the nesting window and use the ,hand‘ cursor to select a design of your own choice on the desktop, from a database, from macros or DXF files. This way, you select all designs you need one by one.

You can add boards in two ways, either by button ,Actual Board‘ which will add on the list a board of the same dimensions that you have set on the desktop, or by button ,Add Board‘ - then, you can use the ,hand‘ cursor again to select an item of your own choice (for example, even a rest of another board, or an entire board of different dimensions by using a rectangle macro). Another way how to choose is the so called ,Copy Mode‘ that will move items and even numbers of pieces into both tables as they are at the moment on the desktop.

After you select individual items, you can modify the numbers of pieces and their priority directly in the tables (a higher value means that the design or the board will be used sooner).

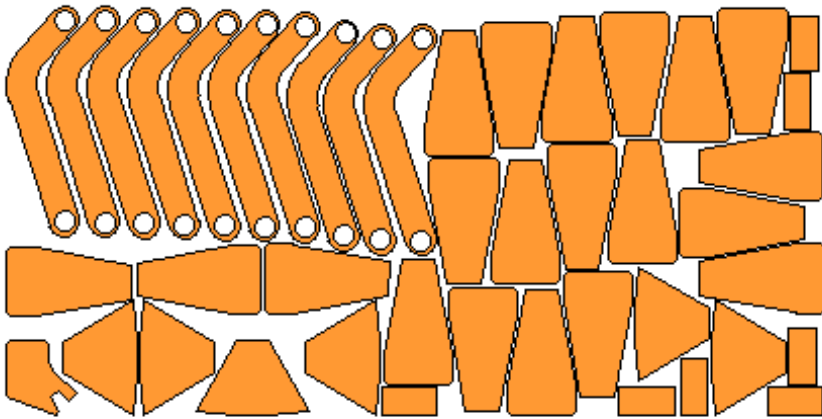
On the right, there are two colourful columns for your information which signal the total area of set drawings and boards. It is just a comparison of areas, so it is clear that if both columns are of the same height, the quantity of material is not sufficient because utilization will never be 100%.

If you are not restricted by the number of boards, you can set their number at a value of your own choice, the program will use the quantity needed.

If you do not select a sufficient quantity of material, the program will put together only the possible number of pieces with regard to the determined material, which, subsequently, will appear in columns ,Fin.‘ (finished) in the table of drawings.

The last key parameter needed for assembly is the space size between components (here, the same one is used even for the space at the edge of the board); you will set this in the field above button ,Start‘. Subsequently, you start the assembly.

The assembled configuration or configurations are saved right into the current database:



NEST004_1X_72.5%

A nesting configuration has its own colour and also a strictly determined name in the following format:

NEST order number _ number of pieces of this board _ net percentage utilization of the applied board

Do not forget that the given result does not have to be and, in fact, even cannot be the best possible layout of the selected designs; the program has to perform a certain simplification in order to reach the results in a reasonable time horizon (it rotates individual components only at a certain angle, and the like). However, this algorithm was modified in the past (and also will be in the future probably) in order to achieve the best results. At present, there are two different internal methods used independently and the result with better utilization is applied.

Anyway, final nesting configurations are not configurations that can be used for the cutting machine straight away. If you wanted to use them in the form in which they are, you need to load them on the desktop and perform at least two operations - add burns (nesting always works with designs that have no burns) and set the cutting order (nesting does not solve it in any special way, so it can but does not have to be appropriate).

Nesting does not have to be just a tool how to create 'real' configurations intended for a machine; you can use it, for example, as a quick option to estimate and order the material needed or it can give you an interesting feedback when you compare results of your manual generating and automatic generating done by using function 'Copy Mode'.

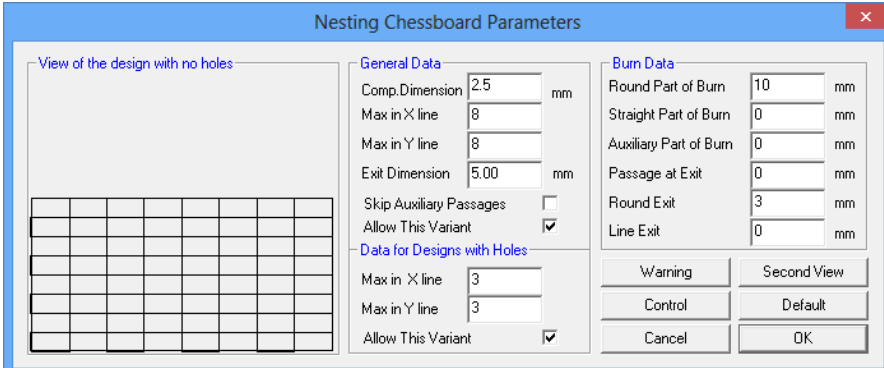
In window ,Nesting', there are also other options that have not been described yet. It is button ,Chessboard' that is used to set the application of the so called chessboards in the automatic generation mode and that is described right in the following chapter. Then, it is button ,Erase from D.' that you can use to erase all configurations created by using nesting from the current database. The last button is option ,To Board' that is a part of the Board section. You will use it in a situation where you use a rest; use this button to transfer a selected shape to the desktop and then, you can load spread designs from the database into it so that you could see exactly which way the shape is utilized.

2.11.2. Chessboard Parameters

This function is also on the main toolbar and has the following icon: 

Chessboard Parameters for automatic generation represent the second option of the Nesting Menu. What are chessboards and how to create them manually is described in chapter 2.9.7 - ,Generating Chessboard'. In this option, you just determine if and under what conditions these chessboards are to be used even during automatic generation.

Setting is done in the following window:



Nesting Chessboard Parameters

View of the design with no holes

General Data

Comp. Dimension	2.5	mm
Max in X line	8	
Max in Y line	8	
Exit Dimension	5.00	mm
Skip Auxiliary Passages	<input type="checkbox"/>	
Allow This Variant	<input checked="" type="checkbox"/>	

Data for Designs with Holes

Max in X line	3
Max in Y line	3
Allow This Variant	<input checked="" type="checkbox"/>

Burn Data

Round Part of Burn	10	mm
Straight Part of Burn	0	mm
Auxiliary Part of Burn	0	mm
Passage at Exit	0	mm
Round Exit	3	mm
Line Exit	0	mm

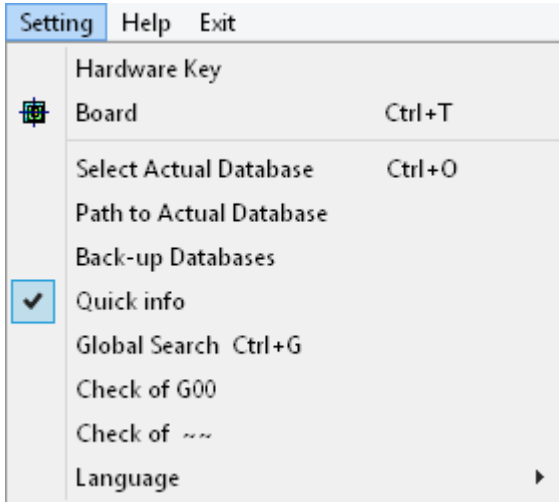
Warning Second View
Control Default
Cancel OK

As this is a construction that takes advantage of the common cut, it is necessary (if you want to use this variant) to set the exact size of the cutting chink (for more details about the common cut in chapter 2.9.5).

You also determine the maximum size of the created chessboard and other parameters (including the burn) that are identical to creating chessboards manually as mentioned above. There is also a possibility to set a different (it

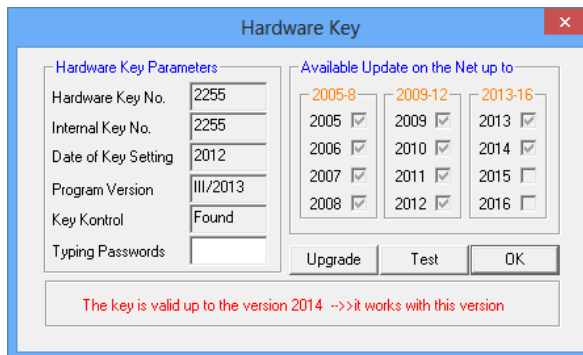
usually means lower) maximum chessboard size in case that you deal with components with holes, or to forbid this variant completely. Or, you can forbid both variants and the program will not try to create any chessboards in the course of automatic generation.

2.12. Menu Setting



2.12.1. Hardware Key

This window contains the information about your hardware key that protects the program (if there is no hardware key, it only works as a demo with no possibility to export the code for the machine). If the key is connected and its driver has been installed correctly, its parameters are loaded in the table:



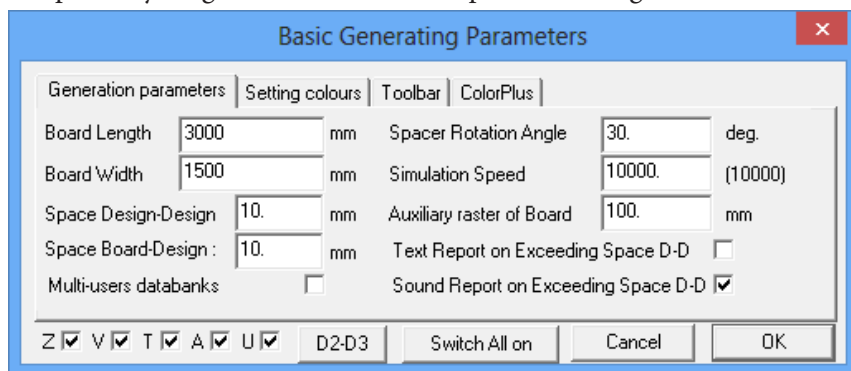
The most essential is the 'Internal Key Number' that is unique and you need to provide it, for example, in case you want to upgrade to a new version - on the basis of this, the passwords for upgrading that you enter in the field in the bottom (and confirm by key 'Enter') are generated.

The right side indicates up to which version you can upgrade free of charge (this table is always relevant only if you open it from the newest version because it is not possible to say in advance which internal number will correspond to the milestone between individual years).

2.12.2. Board

This function is also on the main toolbar and has the following icon: 

This command opens window 'Basic Generating Parameters' mentioned in lots of parts of the present guide. You set not only working parameters there but also displaying of a lot of things on the desktop of the Wrykrys program. Besides selecting this command from the menu and main toolbar, you can also open it by a right-click on the desktop outside designs.



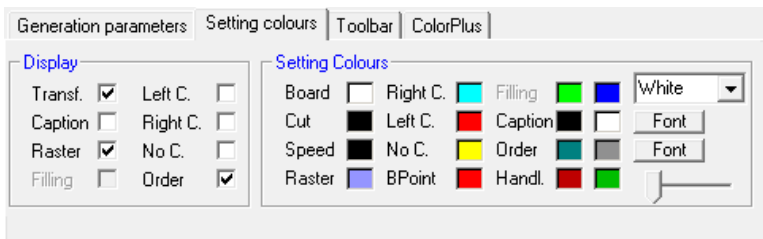
The first card **Generation parameters** contains the most fundamental values needed to work on the desktop. In fact, before every generation, you need to set the Board Length and Width, which is a rectangle that serves as a 'stop' in the course of placing details. Then, you set the space between designs and space between designs and the board edge. This space is used during placing designs on the desktop and in the course of moving, copying them, etc. If you do not respect the set space while placing a design, on the right, you can select the way how this will be signalled: either by a text signal (an informative window opens) or by a sound signal.

Do not forget that it is just a preset value of spaces; a **modification made there does not influence the current layout of the components on the desktop in any way**. If you change the value to a lower one, subsequently, you can perform **Compressing** (see chapter 2.10.20), if you set a higher value, you have no other option than to move the individual designs on the desktop manually once again. That is why you always need to set the right value before starting generating. It is best to ask the producer of the machine to provide you with the appropriate value (it depends on the technology used, cutting chink, material thickness, etc.).

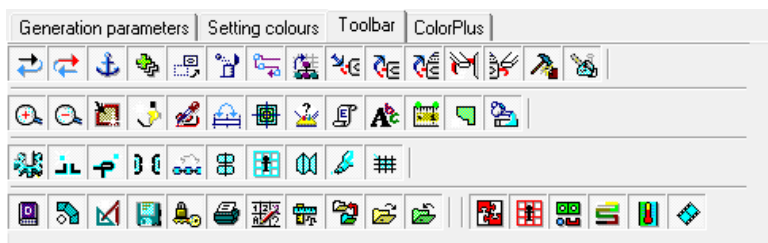
In the right column, you also set the 'Spacer Rotation Angle' that is used in the course of handling pieces 'on the cursor' during placing on the desktop. Then, there is the default 'Simulation Speed' (see chapter 2.8.2 - 'Redraw Simulated') and Auxiliary Raster of Board if this one is switched on in the next card 'Setting colours'.



The last option of this card is 'Multi-users databanks'. This option is switched off by default because when working with a local database it only overloads the system unnecessarily. Switch this option on in case that there are more people working with databases at the same time and you need to update continuously (it means before the next restart of Wrykrys) their content while there are some changes made by a different user.

The second card is **Setting colours**. From here, you can display quick shifts (passages in between components), name captions, orientation raster, highlight designs with the left, right or no compensation or display order numbers of details permanently on the desktop. On the right, you can set colours of your own choice for these and other features.



The third card is **Toolbar** where all icons of the main toolbar of the Wrykrys program are displayed. If there are any functions that you do not use, you can left-click there to deactivate them.



The forth and last card is ColorPlus that is used to set fill colours and textures, or to determine colour passage for designs on the desktop. You can also switch these fill colours and textures on and off in the main toolbar -  for textures and  for a colour passage. The colour passage corresponds with the determined cutting order and so, you can use it for a quick visual control of how systematic the cutting order is.

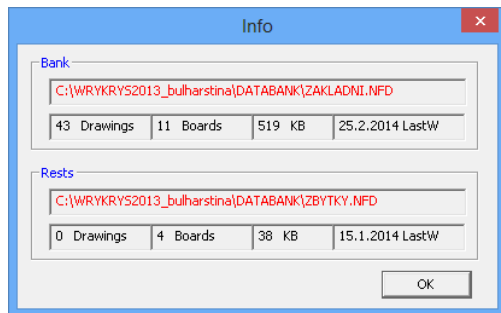
Besides that, the lower part of the window contains options ,Z/V/T/A/U' that you can use to switch off the whole groups of icons on the main toolbar, and button ,D2-D3' that switches the design of the icons (flat/relief).

2.12.3. Select Actual Database

Use this command to choose a database (a file with extension *.NFD) that you want to work with. This way, you can even create a new database if you enter a new file name. You can also initiate the relevant icon right on card Bank in the side panel.

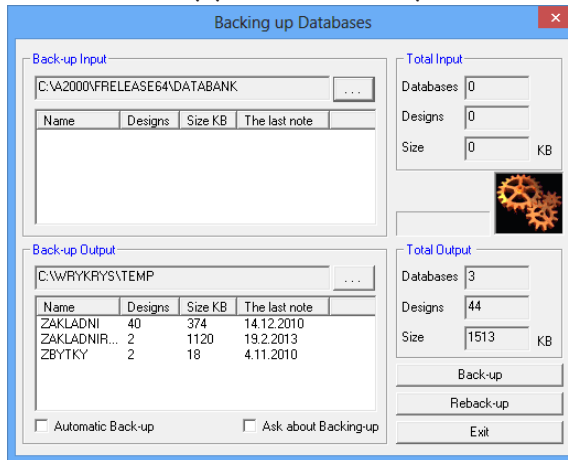
2.12.4. Path to Actual Database

This command will open a window for you where the path to the currently selected database of designs and configurations is displayed and also the path to the database of rests. There are also some figures about these databases at your disposal:



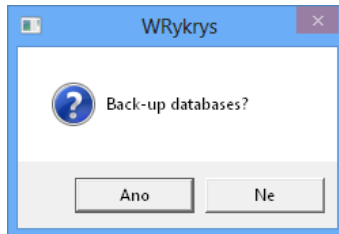
2.12.5. Backing-up Databases

Use this window to set the way you want to save your databases:



You need to select two directories - Input directory where your databases are saved (standard is C:\WRYKRYs\DATABANK\) and Output directory which means a place where you want to save backups.

Option 'Automatic Back-up' is used to copy databases from the Input to the Output directory each time the program is switched off. If you tick 'Ask about Backing-up', a question appears before copying:



Use button 'Back-up' to perform backing-up immediately on your own. If you use button 'Reback-up', databases are reloaded from the backup instead of your current ones. So, be careful so that you do not overwrite your actual database by an older backup by mistake because you would lose a part of your work.

Of course, there is also another way how to back-up databases either manually or by using the appropriate software; it is just a common file saved on the disc.

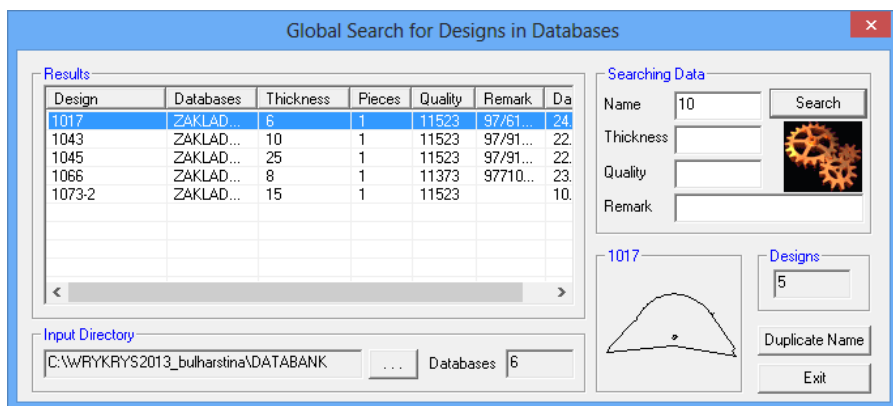
2.12.6. Quick Info

This option is either ticked or unticked. If it is ticked and you go on a design on the desktop, in a short time, information about its name, number of pieces on the desktop and its weight is displayed (based on the set material thickness and weight 1 dm³ in the upper Presetting Bar, it means that if you did not enter the real material thickness, the weight will not correspond to the reality).

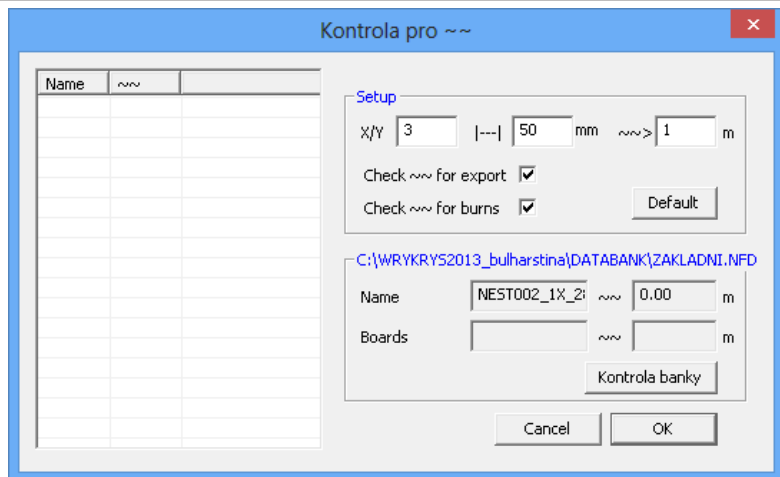


2.12.7. Global Search

This function is useful for those users who have designs and configurations in more databases. This window enables you to search in the whole directory, or all databases that are saved there, and to look up designs that correspond to determined parameters. The results also show configurations that contain the design of the given name.



So it is easy to find out in which database the design or configuration that you are looking for is saved. After you select an item on the list, you can even see its preview.



You can set the ratios of sides from which the control is performed (it means that the program will not warn you about, for example, squares where the distortion prerequisite is significantly lower) and the limit average distance of its edges from the adjacent, already cut components or from the board edge. Then, you can set the minimum number of such ‚wrong‘ edges that the program has to find so that the warning and this window appear during export. Below, you can switch on/off the entire control during export and you can also use this mode in the course of adding burns. In this case, the edges that should be cut last are displayed in red and a red square shows the place in the proximity of which the burn should be positioned (while respecting the given cutting direction).

The essential thing is that the cutting order is set correctly otherwise the final image will be nonsense. Of course, it is always necessary to proceed according to programmer's sense and his experience with the given technology (with some of them, this problem will not occur at all probably); it is just a tool that will make your work faster and that can warn you against a potential problem.

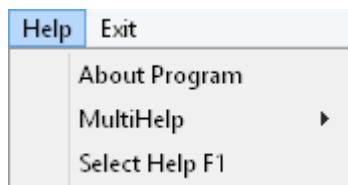
In the lower part of the window, you can perform this control even for configurations saved in the actual database.

You can also initiate displaying of critical edges on the desktop by key F8 whenever you need or by using function ‚Redraw Board‘ while holding key ‚Ctrl‘.

2.12.11. Language

Use this option to switch the whole program into your selected language. At present, there are the following 9 languages at your disposal: Czech, English, Polish, Russian, German, Hungarian, Croatian, French, and Rumanian.

2.13. Menu Help



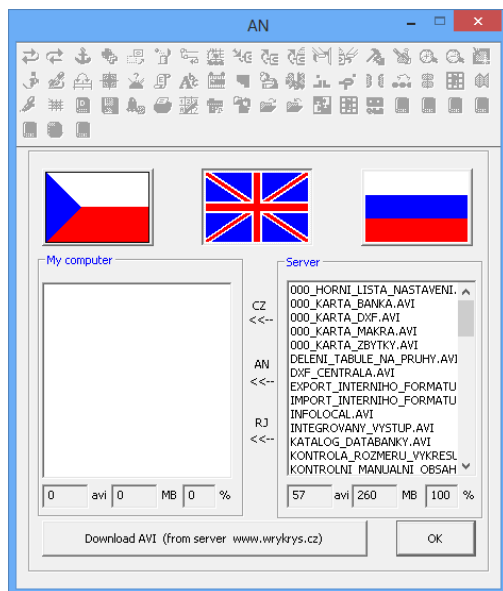
2.12.10. About Program

This is a window with information about the currently running version of the Wrykrys program; there is also the address and e-mail contact to our company at your disposal.



2.13.1. MultiHelp

This Help subcategory comprises a multimedia help (at your disposal in Czech, English and Russian); it means videos with a voice-over showing examples how to use most of the Wrykrys program functions. Besides videos concerning the cards of the side panel inputs (Bank, Macros,...) and the Presetting Bar (Toolbar), there is also a window that you can use to download individual videos from our server (in case of installation from the DVD, these are already included in it; in case of installing the version from the Internet, you need to download them additionally using this way because of its size) and subsequently, you can start them in your default Windows player by pressing the appropriate icon.



2.13.2. Select Help

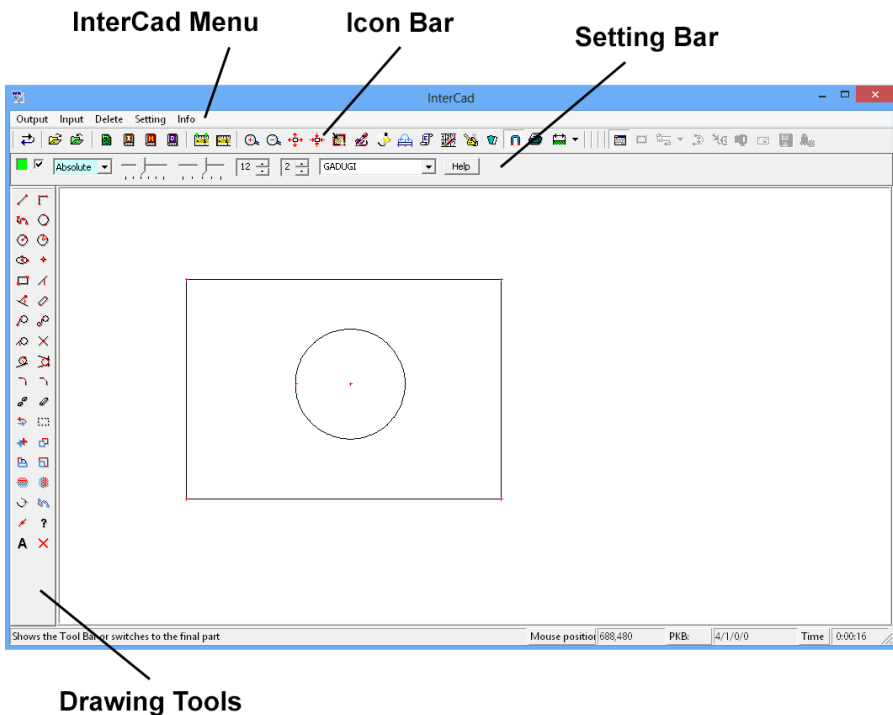
You can use this command to open the e-help of the Wrykrys program. Its content is more or less identical to this guide.

3. INTERCAD

InterCAD, or the Internal CAD system, is an individual subprogram that is used to create or edit individual details and (in most cases) to save them into the Wrykrys program database. You can also use InterCAD to import files from other CAD systems or vector graphic programs (for example AutoCAD, CorelDraw,...) in the DXF format or (in newer versions with the AutoDesk RealDWG module installed) also in the DWG format.

No matter if you create a new design or modify a loaded one, there is the standard spectrum of drawing tools at your disposal on the left and some more editing, controlling and informative functions in the toolbar in the upper part.

All these commands are described in the following subchapters.



3.1. InterCAD Menus

Output Input Delete Setting Info

3.1.1. Output and Input

These two menus contain functions to either load or save details. All of them are at your disposal on the InterCAD icon bar and are described in the relevant chapters.

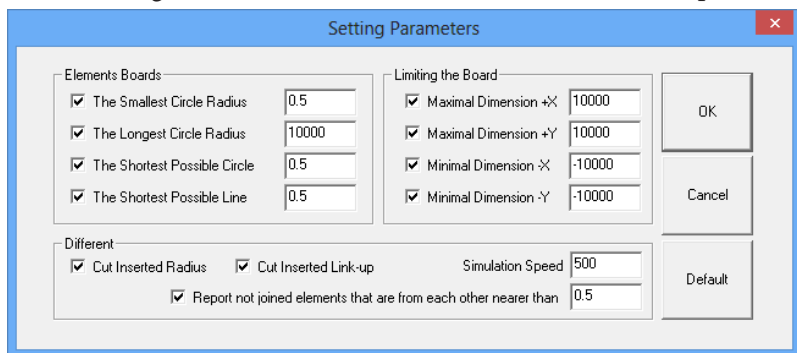
3.1.2. Delete

You will, probably, use command ‚Delete Board‘ most often in situations where you want to start to draw a new design. If you load finished designs, you do not need to delete the board because when loading, a question appears automatically asking you if you want to delete the content of the board.

There is also an option to delete all lines, circles, points or created dimension figures (if you want to delete particular elements, use functions intended to delete parts of the elements or the whole elements that are in the drawing tools menu).

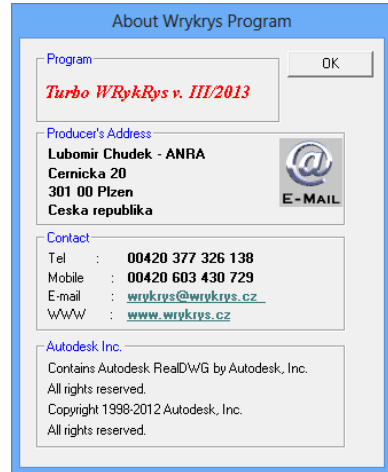
3.1.3. Setting

Choose option ‚Work Parameters‘ to find a setting window where you can define different limit values concerning the elements on your desktop. Most of the machines have problems with certain extreme situations (for example, a part of the circle of a radius of hundreds of meters, line segments shorter than 0.01 mm, and the like) and that is why, based on your experience with your machine, you can set maximum and minimum values there and when these are exceeded a window pops-up to warn you. Then, you can also set automatic cutting of ‚corners‘ after a radius is inserted or link-up.



3.1.4. Info

This is a window containing information about the program version and contact to its author.



3.2. InterCAD Icon Bar

This toolbar comprises two parts. The first one includes import functions and other tools used when creating a design. The other one is intended for final modifications and export.



3.2.1. Initial State



After you enter incorrect values or use particular tools in the course of creating a design, there is an option to step back. This command cancels the last performed action.

3.2.2. Load and Save the Source File



You can use these commands to load/save a design on the desktop from/into a separate file with *.NSP extension. This format can only be read by the Internal CAD system of the Wrykrys program. You can also go back to a semi-finished design and, subsequently, make any modifications of your own choice.

3.2.3. Load DXF File



Use this command to import details into InterCAD that have already been created in another CAD system (for example, AutoCAD). After you click on this icon, the standard Windows dialogue opens to select a file. If you also have the Autodesk RealDWG module for WRYKRY, besides *.DXF you can switch the type of file to *.DWG. After the design is loaded to the desktop, windows warning you about exceeding work parameters open if need be (see setting in chapter 3.1.3).

Loaded designs should not contain any writing, dimension figures or other labels, but just the shape that you need to cut. The contour itself should be divided into individual elements (machines can only work with circles and line segments; for this reason, potential ellipses or other curves such as a spline need to be divided into short line segments by the program, that is why you need to pay increased attention to the control of such details).

3.2.4. Show Catalogue of DXF Files



This command shows a DXF panel on the right that is described in chapter 2.2.3. The only difference is that the selected design is loaded to the InterCAD desktop where you can adjust it subsequently.

3.2.5. Load Macro



This command also displays a panel on the right (described in chapter 2.2.2.). Again, the difference is that the selected macro is loaded to the Internal CAD system desktop to be edited there.

3.2.6. Database Catalogue

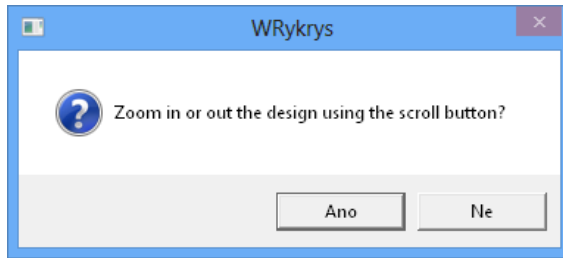


This command opens the catalogue of the current database (see chapter 2.7.1) where you can select a design saved before and reload it to the InterCAD desktop.

3.2.7. Controlling Joint Points Only/All Points



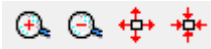
The mechanism of controlling the design dimensions is described in detail in chapter 2.8.6. InterCAD contains one more option. If, in the course of controlling, you move the scroll button, the following question is displayed:



If you select ,Yes', you can use the scroll button to adjust the design dimensions on the selected dimension figure directly. The default modification is 0.01 mm/step; if you hold key ,Shift', it is 0.1mm; if you hold key ,Ctrl', it is 1mm; and if you hold both the keys simultaneously, it is 10 mm.

Right-click to confirm the modification and the design is enlarged proportionally or becomes smaller (it means that if, for example, you mark a dimension figure of 100 mm and adjust it by the scroll button to 200 mm, the design doubles).

3.2.8. Cut-outs, Zooming-in, Zooming-out



This is a group of commands intended for zooming-in/zooming-out the displayed area. In fact, if you use a mouse with a scroll button, you do not need them. The mouse with a scroll button behaves in the same way here as on the WRYKRYs program desktop - you use the scroll button to zoom in/out what is displayed while the centre is in the cursor position; if you hold the scroll button (or the middle button), you can move the desktop; if you double click, the design is centred.

3.2.9. Redrawing the Desktop



This is a simple command that redraws what is displayed on the InterCAD desktop. This way, you can cancel compensation displaying, or cutting order drawing, for example.

3.2.10. Drawing Compensation



This is the same command as the one on the Wrykrys program main desktop (see chapter 2.8.3), however, in this phase, there are no burns added to the design, so the cutting order direction is not determined either, and that is why the colour distinguishing the left and right compensation has no adequate value.

3.2.11. Simulation Drawing



This is a simplified form of the simulation drawing from the Wrykrys program main desktop (see chapter 2.8.2). Individual contours are drawn in the order that the InterCAD has chosen automatically. You can influence the cutting direction by adding a burn later; as far as the cutting order of holes is concerned, you can adjust it in the final phase of InterCAD before saving the design.

3.2.12. Numbering the Order



Use this command to number all contours on the InterCAD main desktop, or more precisely, all their join points. So, you can see their sequence from the order numbers. Regarding the cutting direction and cutting order, the same rules as in the preceding chapter apply here.

3.2.13. Abstract of Coordinates



This is an informative function. The window shows an abstract of the code (as it will be in the export for the machine) of the design on the desktop in the current selected output format.

3.2.14. Calculating Particular Designs



This function is used to display and save or print a calculation of the design on the desktop. The principle of the window is the same as in the case of calculating whole configurations (which is used more often, probably), see chapter 2.8.7.

3.2.15. Cutting Designs

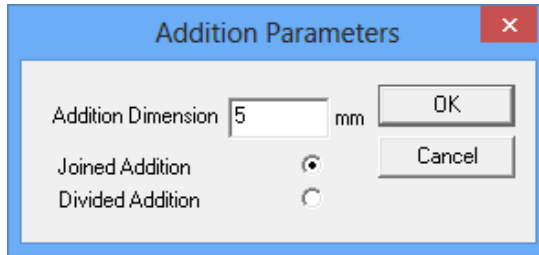


Cutting Designs enables you to divide a design into separate parts that you need to cut separately. In the bottom bar, determine the coordinates of the dividing points (as you do when using drawing tools) or select points right on the desktop. This function is mainly used with very large semi-finished products that are welded together afterwards.

3.2.16. Addition on the Desktop



In some situations, you need to add a technological addition to a finished or imported design to process it further. With this command, you first left-click to mark the parts of the design where the addition will be added. Then, you right-click to get the table where you set its parameters.



Besides the dimension, you choose the type of addition. It is either joined (it is joined to each other) or divided (added areas are only in directions that are perpendicular to marked edges, for example, for bending). Confirm your setting by button ,OK‘ and the marked edges on the desktop will be enlarged subsequently (in case of an outer shape) or reduced (in case of holes).

3.2.17. Elements Are Joined in End Points



This is an active function that is switched on by default when starting InterCAD. In this state, you cursor is a ,target‘, and when you use drawing tools, you do not always need to re-enter the coordinates of the points. If you already have the join point you need on the desktop, left-click in its proximity so that it is used and its coordinates filled in automatically. If the function is switched off, the standard cursor is used and there is no such ,attachment‘.

3.2.18. Output to the Printer



This command will print the design on the InterCAD desktop.

3.2.19. Apply Dimension Lines to Design



This function is used to add dimension figures to the design on the desktop. These dimension figures are only intended for subsequent printing of a design with dimension figures, when creating a configuration and, of course, they do not appear in the code itself. Use the drop-down arrow to select the type of dimension figures that you want to use (perpendicular, pitched, radius, diameter, and angle). Then, select the elements on the desktop to which you want to apply dimension figures. Adjust the font size and number of decimal places to which the dimension figures are rounded on the InterCAD presetting bar (see chapter 3.3.)

The second part of the toolbar comprises the icons that become accessible only after editing of the design shape has been finished. These are functions that are used to, for example, change cutting order of individual parts, modify compensation, and the like. Then, there are functions directly for the output. You finish editing and make the final part accessible by the first icon of this group:

3.2.20. Reveal or Conceal the Toolbar



This command activates the icons of the second part of the toolbar and, on the contrary, deactivates the drawing tools on the left. So, use it when your design is already drawn and you want to save it.

If you relick on it, you return to the editing mode, but be careful, if you used some functions from the final part in the meantime (compensation changes, cutting order changes, ...), it initiates reset into the state selected automatically.

3.2.21. Changing the Compensation of Curves

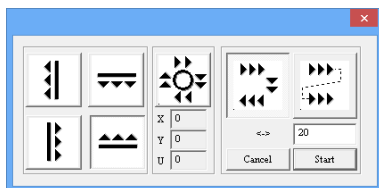


Use this command to change the compensation of individual contours of the design on the desktop. Under normal circumstances (it means correct closed shape), the compensation should be inner in holes and outer in outer shapes automatically (see also chapter 2.10.8.). If you need to adjust it for any reason, select this function and switch it by left-clicking (left/right/no).

3.2.22. Changing the Cutting Order



Use this command to change the cutting order of individual contours of the design on the desktop. Primarily, it deals with setting the order of holes if you do not like the automatically selected order, in theory, you can even prefer an outer shape to holes. There are two ways of how to change the cutting order - either you select this function and then, you left-click to adjust the cutting order manually on the desktop or (especially when you deal, for example, with a strainer with thousands of holes) you choose the automatic cutting order setting by using the drop-down arrow:



In principle, this setting works in the same way as the automatic cutting order on the Wrykrys program main desktop (see chapter 2.10.14.).

3.2.23. Changing the Start Point



Use this command to change the initial and end points of unclosed curves. After you select this function, start points are displayed in green and end points in red on the desktop (you can set the permanent displaying of these points on the InterCAD presetting bar - see chapter 3.3.) and then, left-click to switch these points on the selected curve.

In common situations (closed shape), there are no start points in the design; you set the beginning of cutting later by adding a burn.

3.2.24. Add Burn Manually

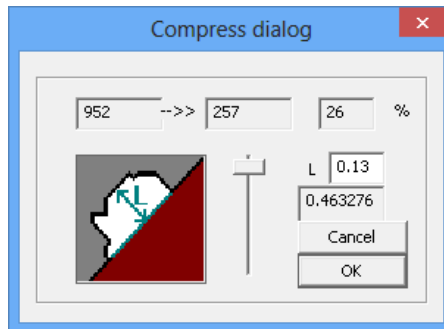


This is the same function for adding a burn as you can find on the Wrykrys program main desktop (see chapter 2.9.4.3.). It is placed here so that it is possible to export a separate design right for the machine and cut it correctly. However, you usually only export the whole configurations, and that is why it is more suitable to add burns only on the desktop (at this moment, you do not know the direction of the design, where it will be placed, etc.), and send them to the desktop or to the database without any burn.

3.2.25. Compression



This function is used to ,simplify‘ the shape on the desktop. In the window displayed, you can use the slide bar to adjust the compression ,roughness‘ - in the upper part of the window, you can see the initial and new number of elements, and on the desktop; the new shape is displayed in red, while the initial one is black.



3.2.26. Sending a Design to the Desktop



This is the first output option. You can send the finished design to the Wrykrys program main desktop and place it into a configuration there. If you deal with a newly created design, give it a name before you send it:

Identification Name to Be Sent

If you deal with a loaded finished design (send from the desktop, loaded DXF, etc.), it keeps its original name.

3.2.27. Exporting a Design to Disc



This function opens the integrated output (see chapter 5) where you can save only one separate design in the machine format.

3.2.28. Saving a Design to Database



The third (and most often used) way of saving a design is entering it into the internal WRYKRYs program database. In most cases, this is the most practical output because you can save all designs in the database first and then, you can put them together on the desktop one by one. In the same time, you save them in order to be able to correct them if need be.

After you select this icon, the window where you determine parameters is displayed:

Saving to Database Parameters [X]

Saving Data

Name

Thickness

Pieces

Quality

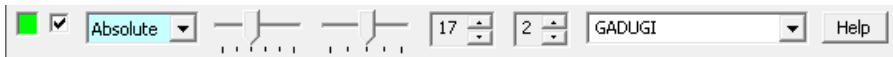
Remark

View

Cancel OK

Individual parameters are the same as when saving configurations from the main desktop (and they are described in detail in chapter 2.6.3); the only thing that is obligatory here is to enter a name (up to 23 alphanumeric character).

3.3. InterCAD Setting Bar



On this bar, you can find several settings concerning especially displaying. The first colour field informs you if the shape on the desktop is closed (green colour) or not (red colour). If it is not closed and the adjacent option is ticked, initial and end points of individual curves are displayed on the desktop - this option is useful in the course of loading DXF files, thus, it is easy to reveal possible exceeding/unfinished curves and you can correct them with drawing tools.

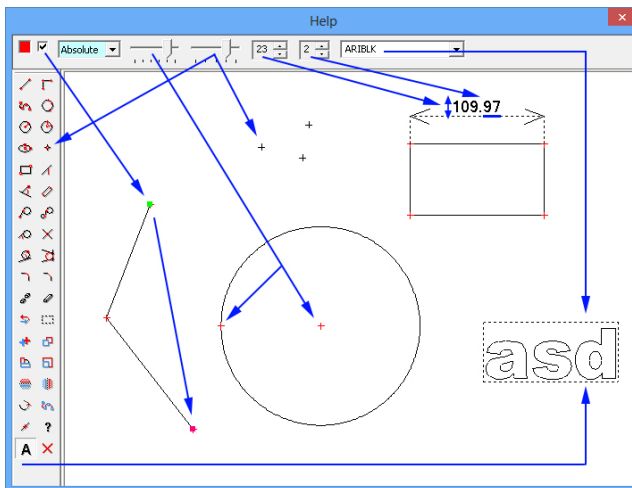
The next option is use to switch between absolute (always from 0) or accrued (from the last point) addition of coordinates for drawing tools.

The first slide bar sets the display size of automatically created joint (red) points on the desktop, the second one displaying of manually created (black) points.

The two numeric values are used to set parameters of dimension figures; the first one refers to the font size, the second one to the number of decimal places.

The menu containing the font names serves to select the font of created writing (see chapter 3.4.35.).

Button 'Help' conceals a picture showing the above described context.



3.4. InterCAD Drawing Tools

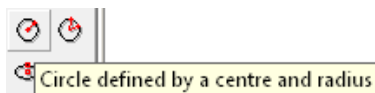
The Internal CAD system drawing uses the two-dimensional Cartesian Coordinate System. The X-axis refers to the horizontal distance and the Y-axis the vertical one. The origin is in the point where the both coordinates equal zero.

Enter the coordinates using your keyboard into the relevant fields that appear in the lower bar after you select one of the tools. The unit used is (as everywhere in the program) millimetres. You can even enter decimal figures of your own choice (during dimension control, the values are rounded to 2 decimal places, but internally, more of them are kept). You can also enter even whole expressions by using the standard mathematical operators (, +, -, *, /, ^).

According to the setting in the presetting bar, the coordinates are entered either all absolutely from the origin or from the first determined point. For example, for a rectangle with accrued setting, you can enter values X100, Y100 and again X100, Y100 and you create a square 100x100mm. In case of absolute determining, you would create nothing, or more precisely, just a point. To get the same square, you would need to set parameters X100, Y100 and opposite point X200, Y200.

Instead of entering the coordinates by using the keyboard, you can select them by using your mouse right on the desktop (recommended with active function 'magnet', see chapter 3.2.17.). With some functions that do not need only coordinates, it is necessary to use the mouse - for example, when constructing a tangent - first, you select the coordinates of the first point of the line segment and then, you need to choose a circle on the desktop to which the tangent is drawn.

The parameters that are necessary for the given tool are indicated on its icon and when you place your cursor over it, they are also mentioned in the following caption:



After you select this function, 3 fields are displayed in the lower bar; it is clear from them that first, you enter the coordinates of the centre and last, the radius of the circle.

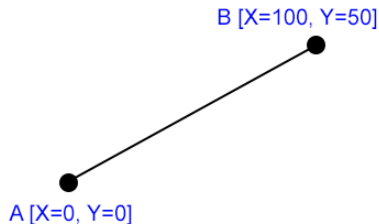
X		Y		R	
---	--	---	--	---	--

The specific procedure for individual tools is described in this chapter.

3.4.1. Line Defined by Two Points



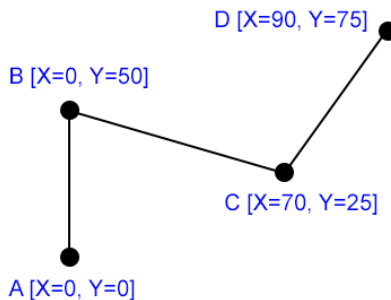
This is the first and easiest command used to create a line segment defined by coordinates of two end points. You can type the coordinates or you can select the point(s) on the desktop by your mouse. If you determine values X0, Y0 and X100, Y50, you will get the following line segment:



3.4.2. Attached Lines Defined by End Points



This tool is similar to the preceding one. Defining the first line segment is identical, the difference consists in the fact that the function does not finish but you continue determining other and other points into which the line segments are drawn. This way, you can create for example the following refracted line:



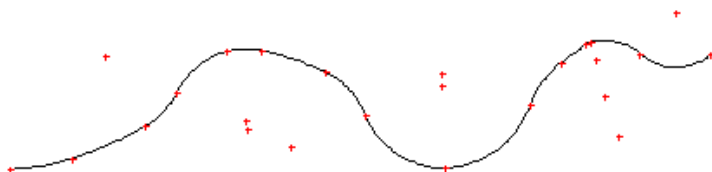
To stop determining, use the right button or key ,Esc' (the same applies even to the other tools).

3.4.3. Inserting Circles among Points



This function is used to create splines. As we have already mentioned in this guide, cutting machines can only work with lines or circles. That is why a spline consists of smaller or larger arcs. You can select coordinates of individual points on the desktop or set them manually.

The two first points determine the distance and limit the first part of the spline and only the third point determines the inserted circle. Logarithmic splines reflect the symmetry of the points through which they pass. As a result of this, you can get, for example, the following spline:



3.4.4. Circle Defined by Three points in the Contour



As it is clear from the name, in this case, you define a circle by three points in its contour. You can set them from the keyboard using coordinates or you can select them on the desktop by your mouse (if need be, by using any combination of these inputs).

3.4.5. Circle Defined by a Centre and Radius



In practice, this is obviously the most applied way of constructing a circle. First, you determine coordinates of its centre and then, its radius. In both cases, you can use your mouse again - both for selecting the centre and for selecting the point through which the circle shall pass, which determines its radius.

3.4.6. Circle Defined by Two Points and a Radius

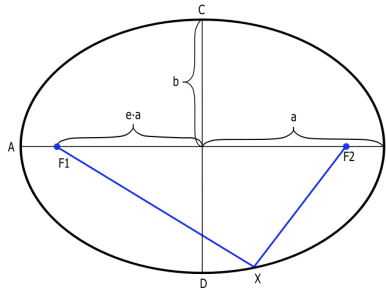


Another way of creating a circle is determining two points in its contour and its radius. This is practical in case that we have a constructed chord of the circle - by using its end points and determining the radius, we can apply this function to construct a circle.

3.4.7. Defining an Ellipse



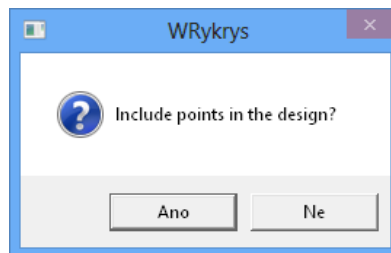
To enable cutting machines to cut an ellipse, the Internal CAD system uses an algorithm to create it which substitutes the ellipse shape by a lot of arcs linked to each other. To define the ellipse, first, select the end points of the major axis and then, one end point of the minor axis (on the picture, points A, B and C or D one by one).



3.4.8. Point Defined by Coordinates X and Y



This is a simple command used to create a point with defined coordinates. You can utilize a point created in such a way for other constructions on the desktop (you can select it by your mouse while joining in end points is switched on, see chapter 3.2.17.) or you can use them as points intended for drilling, marking, etc., depending on what your machine can do. These settings are made only in the export phase (see chapter 5 - Integrated output); but after you create a design (or more precisely, after you finish editing it by button ,Reveal or Conceal the Toolbar', see chapter 3.2.20.) you need to confirm the following question:



If you select ,Yes', the points become a part of the design and you can utilize them using the above mentioned manner. If these were only auxiliary points, you select ,No' and the points will be removed.

3.4.9. Rectangle Defined by Two Points

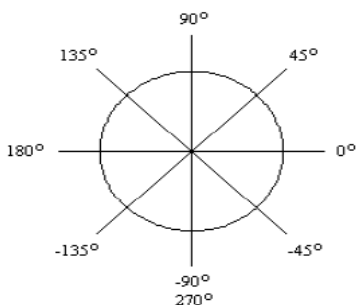


This is a very frequently used tool to define the rectangle, if need be, the square. You define the coordinates of two opposite corners, it means the end points of its diagonal (so, for example, the lower left corner and upper right corner) while the sides of the rectangle are always horizontal/vertical (the difference between the X-axis and Y-axis coordinate of the first and second point defines the length and width of the rectangle. If you want to construct an inclined rectangle, you can rotate it subsequently, or you need to create it by using different tools (line defined by an angle, parallel).

3.4.10. Line Defined by a Point and Angle



In practice, this tool is used very often to create a line segment by defining its initial point and an angle. Set the angle size in degrees, which you can see in the picture. You can also see there that you can even set a negative value (it means -90° is the same as 270°).



After you set the point and angle, you need to use your mouse to select the length of the line segment right on the desktop, it means 'extend' it to the place required. If need be, you can remove any undesirable exceeding part subsequently by applying function 'Deleting a part of the element', see chapter 3.4.21.

3.4.11. Line Going through a Point at an Angle to Another Line



You will use this function, for example, when you want to construct a perpendicular from a point to a line that you have on the desktop. First, you select a point (using coordinates or your mouse) and then, you use your mouse to choose a line on the desktop. So, before you apply this function, you need to have at least one line on the desktop. Last, you set the angle between the new line segment and the selected line (it means 90° for a perpendicular).

3.4.12. Line Parallel to Another Line



This tool is used to construct parallels. You need to have at least one different line on the desktop. First, use your mouse to select the original line on the desktop and then, set the distance. Positive values construct a parallel upwards, or more precisely, to the right, negative values downwards, or more precisely, to the left. Instead of numeric setting of the distance, you can also use your mouse to choose the point through which the parallel line (parallel) shall pass right on the desktop.

3.4.13. Tangential Line from a Point in the Circle

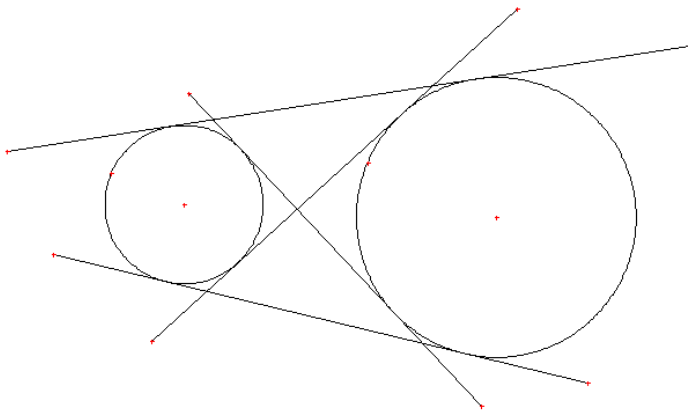


Before you use this function, you need on the desktop at least one created circle or arc to which you will construct the tangent. First, you select the initial point and then, you use your mouse to select a circle on the desktop, or more precisely, the part of it where the tangent should pass. There are two possible tangents; the program selects automatically the variant which is nearer to the place that you have marked by your cursor.

3.4.14. Tangential Line between Two Circles



If you have at least two circles constructed on the desktop, you can create a tangential line to them. Again, use your mouse to click on the part of the first circle and then, on the part of the second circle where you want to have the tangential point (in total, there are 4 possibilities). After you select both circles, the program constructs the tangent automatically. You can see all the possibilities in the following picture:



3.4.15. Tangent line to a Circle at an Angle



The last construction of a tangent line is a tangent at a defined angle. First, you mark the part of the circle where the tangent line should touch the circle. Then (as if you define a line by a point and angle, see chapter 3.4.10), you define the angle required and use your mouse to determine the length of the constructed line segment on the desktop.

3.4.16. Point as a Point of Intersection of Two Elements



Use this command to construct an auxiliary point in the place of intersection of two elements (line-line, line-circle, circle-circle). There may be two such intersections; the program will construct the one that is nearer to the selected place. In practice, this function is not needed so often because if you do not need to keep both the elements complete, you can cut one of them (see chapter 3.4.21) and a join (red) point will be created automatically which you can utilize for other constructions on the desktop.

3.4.17. Circle Tangential to a Line and going through a Point

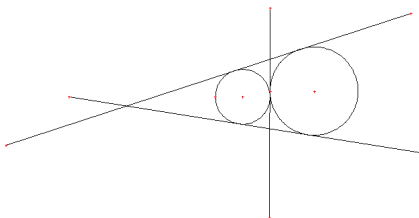


In practice, this is, probably, a way of constructing a circle that is not so often used, however, if you use it, you can prevent useless complex construction. The function is similar to defining the circle by using two points and radius, but instead of the second point, you select a line on the desktop. After you define the radius, the program will construct a circle that touches the selected line. If you set a too small radius, it will not be possible to construct the circle.

3.4.18. Tangential Circle to Three Lines



This is a circle defined by three lines on the desktop where the circle touches the three lines (for example, a circle inscribed into a triangle). It is obvious that the only condition is that all three lines cannot be parallel. Again, there are two options (see the picture); the program will select the circle that is nearer to the places that you marked by your mouse.



3.4.19. Radius Inserted between Two Elements



This is a very often used function that inserts a radius between two selected elements and (if it is determined like that in the setting, see chapter 3.1.3) cuts their exceeding parts. Typically, it is used, for example, with a rectangle that should have round corners - first, you select its two adjacent sides and then, you determine the numeric value for the inserted radius. If you want to create more rounded parts that are the same, you do not need to set this value again, during repeated setting, you can mark two elements and left-click for the third time to automatically use the last defined value for the radius.

You do not always have to deal with only two lines, you can insert a radius even between two circles or as a connection of a line to a circle.

3.4.20. Link-up Inserted between Two Elements

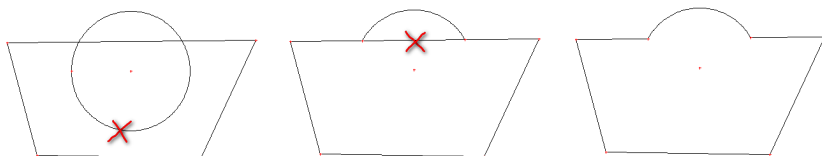


The principle of this function is the same as when inserting a radius. But after you select two elements, you do not define the radius but parameter V' which refers to the distance between the intersections of the selected elements. Typically, it is used with rectangles where we can use this way to insert a link-up to its corners at 45° . It also applies here that we do not have to define value V' repeatedly if this one is constant. After you select the elements, you just left-click for the third time to use the last defined link-up size.

3.4.21. Deleting a Part of the Element




This command is used to delete a part of a line or circle on the desktop. Left-click on one of the elements to delete a part of it to the nearest intersection (or touch) with another element. If you use this repeatedly, you can create the correct component from already constructed elements:




In the course of constructing a component, this function is used for many purposes - cutting a line defined by an angle, constructing an arc from an entire defined circle, removing exceeding parts of line segments that cross each other, etc.


3.4.22. Deleting the Whole Element

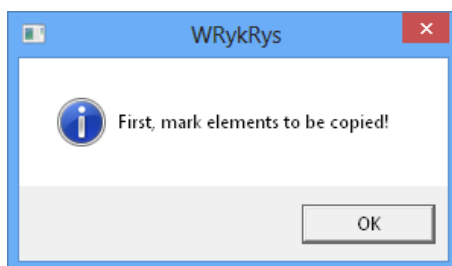
 This is simple deleting of the whole element of your own choice that is on the desktop. In the course of constructing, you will, probably, use this command less frequently than deleting just a part of the element, usually, when you want to delete an element which serves just as an auxiliary one, or if you defined, for example, the wrong parameters of a circle.

3.4.23. Successive Return to Elements Erased by Rubber

 This is a reverse function of the two preceding commands (deleting a part of the element, or more precisely, deleting the whole element). Use this command to restore one by one all deleted line segments, circles and points that you have deleted that way.

3.4.24. Marking Elements for Further Operations

 This command precedes six following operations that work with a selected group of elements. You select possible elements either separately (by left-clicking on an element on the desktop) or together (by holding the left button and choosing the selection area). You can combine these ways as you want; selected elements are subsequently distinguished by colour from each other. You can cancel a marked element by a repeated left-click. Operations with a group (copying, moving, rotating, changing the size, mirroring) marked this way are described in the relevant chapters; if you did not mark any elements, the appropriate warning will appear:

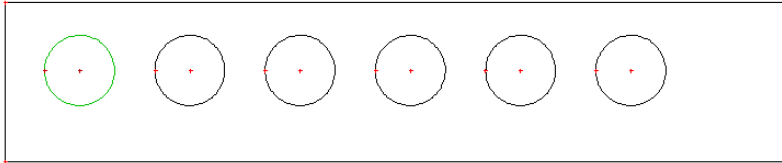


Besides the mentioned operations, you can delete marked elements by using key ‚Delete‘.

3.4.25. Copying a Group of Elements



After you mark a group of elements (see 3.4.24.), you can copy them. You can determine the copying distance and direction either by your mouse directly on the desktop and using two points of reference, or you define the X and Y distance using the values in the lower bar. Third parameter ,N‘ refers to the number of copies (the same distance is used repeatedly). You can see a fivefold copy of a circle in the following picture:



The orientation and size of the copied elements always remain the same. The created copies become independent elements, so any changes performed in the ,original‘ are not reflected on the copies.

3.4.26. Moving a Group of Elements to Another Position



The way of defining this function is completely the same as when copying a group of elements (there is just no parameter ,N‘ that would refer to the number). Select the direction and distance using points on the desktop, or by defining values X and Y. After that, all marked elements are moved to the new position.

3.4.27. Rotating Group of Elements



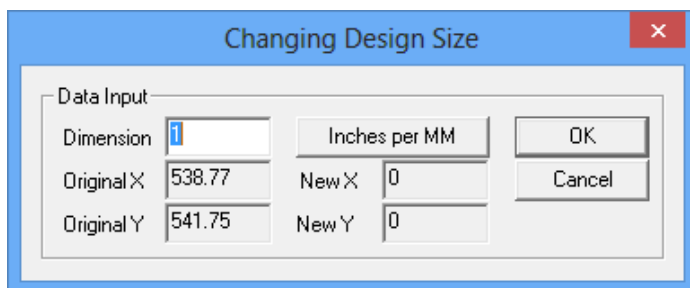
This function is used to rotate a marked group of elements about a selected point. Select the point either by your mouse or by defining the coordinates and then, determine the rotation on the desktop or by using a defined angle (the value rises anti-clockwise). If you want to remove the original group, you can delete it by key ,Delete‘ or by using tool ,Deleting the Whole Element‘ at the moment where this group is still marked.

3.4.28. Zooming out or Zooming in a Design



This tool enables you to enlarge or diminish selected elements on the desktop, but usually, you mark the whole design, for example in case that you have loaded a DXF design that was not in 1:1 scale (the other way of how to modify the scale in InterCAD is by using dimension control, see chapter 3.2.7).

After you choose this function, the following window appears:



The dialog box titled "Changing Design Size" has a blue header bar with a red close button. It contains a "Data Input" section with the following fields:

Dimension	1	Inches per MM	OK
Original X	538.77	New X	0
Original Y	541.75	New Y	0

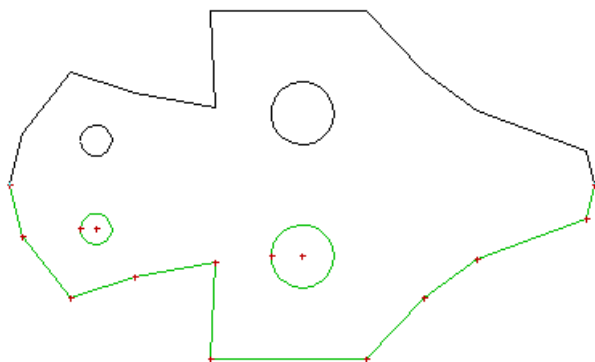
There is also a "Cancel" button.

In field ,Dimension *', you set the coefficient by which the design dimensions are multiplied, or more precisely, the marked groups. So, if you want to diminish the design by one half, you set ,0.5', if you want to enlarge it three times, you set ,3'. Button ,Inches per MM' completes value ,25.4' for the conversion of the design the units of which were inches. The fields at the bottom show the original and new dimensions of the marked selection area.

3.4.29. Mirroring Group of Elements about the X-axis



This command is used to mirror a marked group of elements about the horizontal axis. You define the place of mirroring using a point selected on the desktop or defined by coordinates, but the X coordinate is irrelevant in this case. What is essential is the Y coordinate through which the horizontal axis of symmetry passes. For example, the result might look like this:



3.4.30. Mirroring Group of Elements about the Y-axis



This command work in the same way as mirroring about the X-axis, but the essential one is the X coordinate of the selected point through which the vertical axis of symmetry passes.

3.4.31. Prolonging Line or Circle

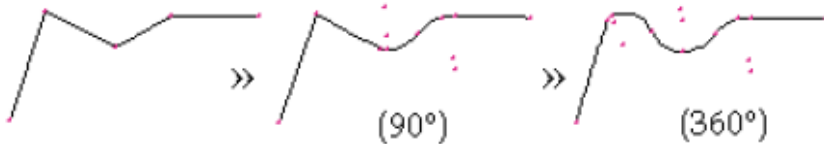


This is a very useful function which is used to change the length of a line segment or arc on the desktop. You just left-click on the part that you want to prolong (or, on the contrary, shorten) and re-click to confirm the new size. In the course of constructing, the most frequent use of this function is in situations where you find out that the newly created element (for example, a line at a defined angle) does not cross the line segment created before. So, you can use this way to prolong the line segment and remove exceeding parts using function ,deleting a part of the element'. Also, by combining these two tools, you can adjust a wrongly loaded DXF file quickly and easily (with an incomplete corner, etc.) and thus, create the correct closed shape.

3.4.32. Sleeking-down the Contour



Using this command, you can ,sleek down' a contour created from lines attached to each other. After you use this function, circles are inserted in the contour. After you initiate the command, you set the sleeking angle which determines from which angle between the line segments the sleeking-down shall apply.



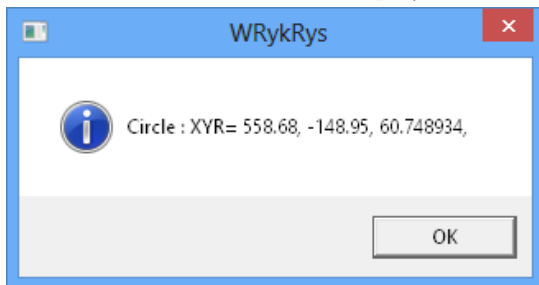
3.4.33. Plotting a Point in the Half of the Element



This is a simple command used to create an auxiliary point in the centre of an element that you select on the desktop using the left button. You can use this point for further constructions, or if need be, it is possible to include it into a design (as well as a point defined by coordinates, see chapter 3.4.8).

3.4.34. Figure Information on Elements

? This is an informative function used to display information about an element on the desktop which you select using the left button. For line segments, the absolute coordinates of the end points are shown, for circles, the coordinates of the centre and radius are displayed.

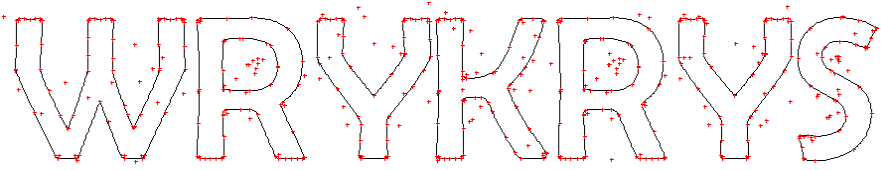


You cannot use this function to change the displayed values in any way.

3.4.35. Captioning Designs

A This is a function that is used to create captions of your own choice. These captions are not very suitable for labelling design (using marking head, engraving, etc.) because it is a full-blown font and not only a simple font intended for marking (when marking, use function 'Generation Captions' from the Wrykrys program main desktop, see chapter 2.6.4.). So, you will use it in a situation where you really want to produce whole letters (for example, for signs) or to have a caption as a hole in a prepared rectangle and use it as a pattern for spraying ink, etc.

After you select this function, use your mouse on the desktop to choose one corner of the area where you want to position the caption, then you type on the keyboard the text needed and again, use your mouse to confirm the second corner and thus, also the caption size which adapts to this area continuously. In the course of writing, you can change the font applied either in the InterCAD Setting Bar (see chapter 3.3.) or by using the scroll button of your mouse. The font menu corresponds to all truetype fonts (*.ttf) that are installed in the Windows system. After you confirm, this font is converted into line segments and circles so that the machine could produce the caption (that is why there is a large number of join points around the caption - these are centres of the circles used).



3.4.36. Reveal or Conceal the Toolbar

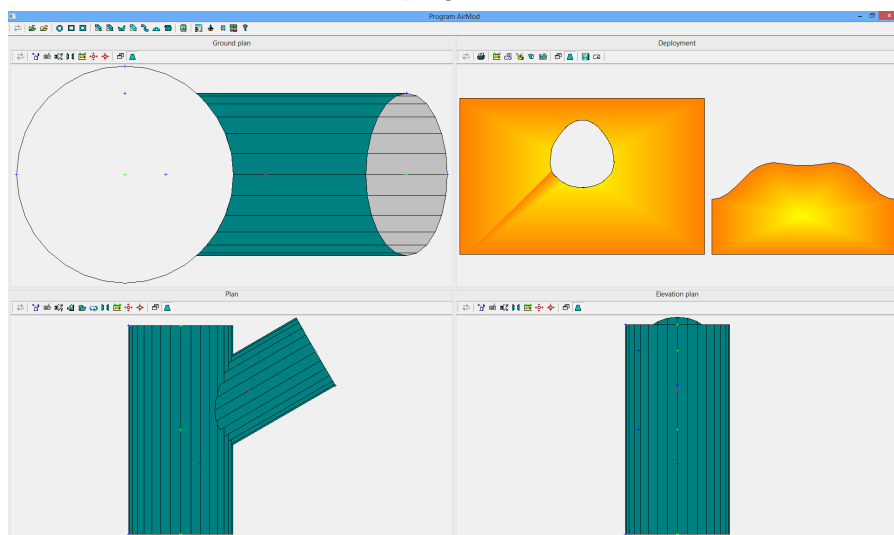


This is the function intended to finish design editing - it is completely identical with the command in the InterCAD Icon Bar (chapter 3.2.20.); you can use the function from both places.

4. AirMod

This is a special module that solves air conditioning issues; it means that it enables you to create deployed shapes of atypical elements that need more than just the basic spectrum of air conditioning macros from the main part of the Wrykrys program. It deals with three basic elements - round ducts, square ducts and transition between round and square ducts. These elements are processed and the final air conditioning shape is created. You can cut the final deployment or attach additions for riveting to it.

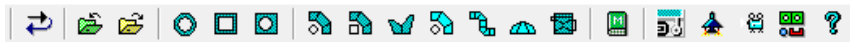
The main window of the AirMod program looks like as follows:



In the upper part, there is the AirMod Icon Bar, below, there are four views of the create element - ground plan, plan, elevation plan and the final deployed shape.

4.1. AirMod Icon Bar

In this bar, you will find commands intended to create individual elements from which the ducts will consist, AirMod catalogue of macros and other functions.



4.1.1. One Step Back



The first icon is command 'One Step Back'. Use it to reverse the last change made on the desktop. Its capacity is 50 steps.

4.1.2. Load the Source File



If you want to return to a duct you are working on or have the possibility to execute later modifications on a finished shape, you can save the duct into a separate file (with extension *.VZZ) that you can load into AirMod later using this command.

4.1.3. Save the Source File



As describe in the preceding chapter, you can use this command to save current ducts from AirMod into a separate file to which you can return later.

4.1.4. Determining Round Ducts



The first basic components are round ducts. You can initiate it using shortcut key 'Ctrl+K'. After you select it, the following window appears:

Setting Cone Parameters

Obligatory Data

Lower Circle Diameter

Upper Circle Diameter

Elevation

Total Shift

X Y Z

Total Rotation

X Z ~

Compulsory Data

Upper Base Shift X Z [mm]

Lower Base Shift X Z [mm]

Upper Base Angle 1 2 [degrees]

Lower Base Angle 1 2 [degrees]

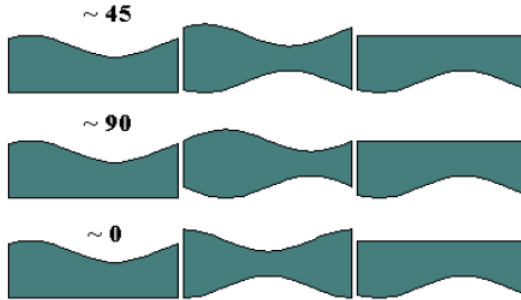
Upper Base Deflection 1 2 [degrees]

Lower Base Deflection 1 2 [degrees]

SL KX P1 P2

Cancel OK

You complete the obligatory information to determine the basic cone shape - lower and upper circle diameter and its elevation. Besides obligatory information, you can also shift the defined cone from zero in axis X, Y and Z. Use the shift, if you have more elements on the desktop and you work with them. The same also applies to total rotation. You rotate the whole component either around the X-axis or around the Z-axis. Value '~' (start) is set in the place where you want the cone to be joined and it determines the final shape of the deployment:



You will utilize this information in the course of joining and creating air conditioning shapes from more components. The additional (optional) parameters in the second part of the window finish the shape of the cone; they determine shifts of individual bases in the ,X' and ,Z' axes, angles and base deflection (1 is in the ,X' axis and 2 is in the ,Z' axis), then, you can divide a deployment into more parts (parameter ,KX') and add additions to one or the other edge (,P1', ,P2').

After you confirm the parameters, the new component is displayed on the desktop from all three views and in its deployed shape. It is possible to modify the created component subsequently either directly in the views or by means parameter change. It is described in chapter 4.2. - ,Modification of Created Ducts'.

4.1.5. Determining Rectangle Ducts



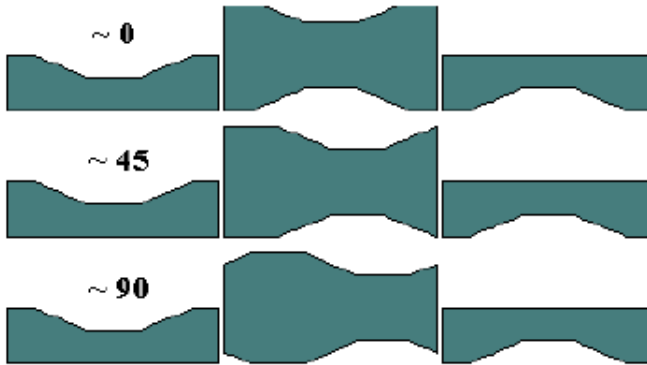
The second basic components are rectangle ducts. You can initiate it using shortcut key ,Ctrl - H'.

Setting Parameters of Square Ducts

Obligatory Data		Compulsory Data	
Lower Base Length	100	Upper Base Shift X	Z [mm]
Lower Base Width	100	Lower Base Shift X	Z [mm]
Upper Base Length	150	Upper Base Angle 1	2 [degrees]
Upper Base Width	150	Lower Base Angle 1	2 [degrees]
Elevation	300	Upper Base Deflection 1	2 [degrees]
Total Shift		Lower Base Deflection 1	2 [degrees]
X	Y Z	SL	KX P1 P2
Total Rotation			
X	Z		

Cancel OK

The obligatory parameters are dimensions of both bases and elevation of the ducts there. The other parameters are identical to round ducts. Again, value ,~' influences the place of joining, it means the form of the final deployment:



4.1.6. Determining a Transition Curve



The last basic component is the so called transition curve (shortcut key ,Ctrl - P' which creates transition between the round and rectangle ducts. One base is formed by a square or rectangle and the other by a circle. The obligatory parameters are dimensions of one base, diameter of the other base, elevation of the transition and definition which side is round and which rectangle.

Setting Transition Curve Parameters

Obligatory Data		Compulsory Data	
Square Base Length	100	Upper Base Shift X	Z [mm]
Square Base Width	100	Lower Base Shift X	Z [mm]
Round Base Diameter	150	Upper Base Deflection 1	2 [degrees]
Transition Curve	300	Lower Base Deflection 1	2 [degrees]
Upper Circle	<input checked="" type="radio"/>	SL	KX P1 P2
Lower Circle	<input type="radio"/>		
Total Shift		Total Rotation	
X	Y Z	X Z	~

Cancel OK

4.1.7. Bends, bifurcation,...



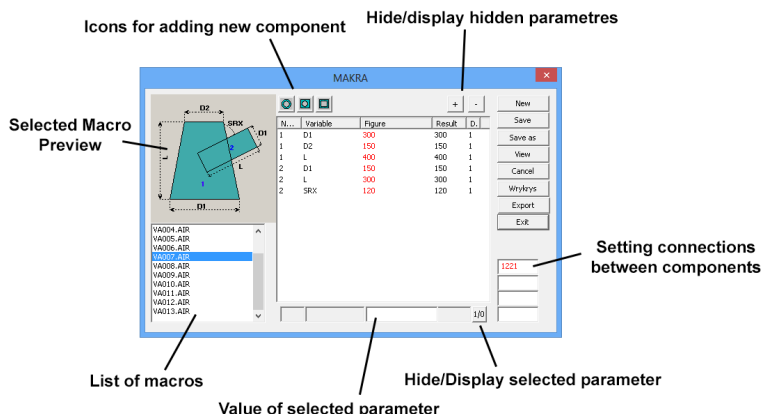
This is a group of most frequently used combinations intended to create bends from round or rectangle components, bifurcation of ducts (the so called trousers), front of the ducts, etc. These functions save your work when creating individual basic elements and their connection. The relevant parameters are always marked in the preview in the window where you define the selected duct.

4.1.8. Catalogue of Pre-defined Macros



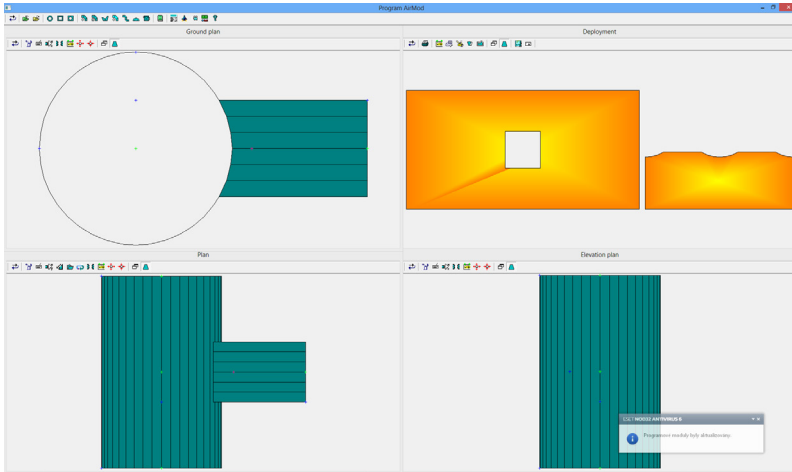
The AirMod module contains its own catalogue of macros. This catalogue comprises the most often applied air conditioning elements. The format of these macros is different from the format of macros found in the main Wrykrys program, but their definition is similar. After you select a macro in the catalogue, a preview with parameters is displayed that you need to define. Use button 'View' to update the final construction and deployed shape on the AirMod desktop, use button 'Wrykrys' to send this deployed shape to the main desktop of the Wrykrys program, and use button 'Export' to send it directly to the integrated output in order to save it in the format of the machine.

It is even possible to create your own air conditioning macros, but not by means of Macro Editor (it is used to create macros for the main Wrykrys program) but by directly using this catalogue.



4.1.8.1. Creating Air Conditioning Macro

As a model macro, in four steps, we create a configuration consisting of two components - a round and rectangle duct - formed in the 'T' shape. So, the result will look like as follows:



Step 1. - create a new macro and select components

The first step consists in creating a new empty macro using button 'New', then, select the components of which the macro will be comprised. There are three at our disposal: round duct, transition curve, rectangle duct. In our case, we can use one round and one rectangle duct. Select those using the left button; and the basic editable parameters of both components are added into the table with parameters:

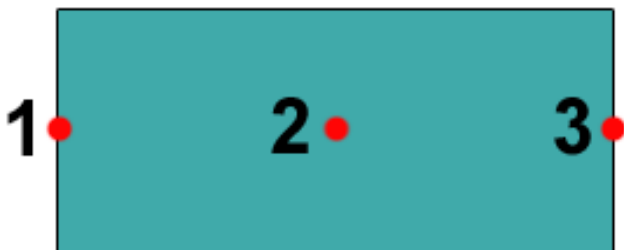
Number	Variable	Figure	Result	Display
1	D1	200	200	1
1	D2	200	200	1
1	L	400	400	1
2	A1	200	200	1
2	B1	200	200	1
2	A2	100	100	1
2	B2	100	100	1
2	L	300	300	1

Every line includes the following information:

- number of the element to which the parameter refers (in our case, all lines with number 1 concern parameters of the round duct and all lines with number 2 refer to parameters of the rectangle duct)
- name of the parameter
- editable value of the parameter
- final value - it is possible to enter parameters with relation to another parameter of the given component, for example, the diameter of the lower base of the round duct D1 is 200 mm, the diameter of the upper base D2 is entered as $D1*2$ and the final value of the parameter is, at that moment, 400 mm (and it changes depending on parameter D1)
- indication 'Display' which determines if the selected parameter will be defined in the course of applying the macro and thus, if it shall be displayed in the table of parameters; if you set value 1, the parameter is displayed, if you set value 0, it is hidden; use button '1/0' to switch between these two values; it is possible to display hidden parameters using button '+', and hide again using button '-'

Step 2. - set connections and orientation of the components

The next thing that you need to determine is the way of connecting individual components to each other and the way how they will be rotated to each other. Every component has three points in which it can be connected - both edges and the centre. If you see the component from the side, these are numbered one after the other as follows:



In our case, we enter chain 1221 into the connection field which means that the **first component** (round duct) will be connected to the **second component** (rectangle duct) in the **second point** (centre of the first component) and in the **first point** (edge of the rectangle duct).

Now, we need to set the rotation of the second component at 90° to create the required form ,T'. To do that, we need to adjust parameter ,SRX' (find the list of parameters at the end of this chapter) of the component number 2. But this parameter is not displayed by default, so we need to open the menu using button ,+', find the line we need and adjust its value:

2	SRX	90	0
---	-----	----	---

Besides that, it would be good to adjust parameter ,SU' of the component number 1 to 180, which makes the cut-out shift to the middle of the deployed shape so that the cut-out is not divided into two halves:

1	SU	180	0
---	----	-----	---

In the course of creating a macro, you can click on button ,View' at any time and make sure that the result is correct.

Step 3. - set parameters

The basic conception is finished and we also need to define which parameters will be at user's disposal in the course of determining a macro.

Close the menu of parameters using button ,-' to see which of them are displayed at the moment. These should be parameters ,D1', ,D2' and ,L' for the first component and ,A1', ,B1', ,A2', ,B2' and ,L' for the second component. To make it more simple, we want cylindrical round duct, so we choose parameter ,D2' of the first component and enter ,D1' as its value and hide it using button ,1/0'. Thus, for round ducts, we will only define one diameter (the second one will be the same automatically) and the length. For the rectangle duct, we make a similar modification; if we have square bases of the same size, we keep displayed only parameters ,A1' and ,L', and set value ,A1' for parameters ,B1', ,A2' and ,B2' and hide them.

If need be, we can adjust default values of the parameters so that there are no nonsensical shapes. As a result, the final table with parameters can look like as follows:

Number	Variable	Figure	Result	Display
1	D1	250	250	1
1	L	400	400	1
2	A1	125	125	1
2	L	300	300	1

The view should be correct now.

Step 4. - save the macro, create a picture

Save the finished macro among the others using button ,Save as'; air conditioning macros are saved in directory ../WRYKRYs/AIRMODMAKRA and their extension is *.AIR. If you also want to have a preview of the given macro, you need to create a picture of the same name as you have given to the macro and save it in the same directory with extension .BMP. The picture should be of the same size as pictures of the original macros that you can find in the mentioned directory ../WRYKRYs/ AIRMODMAKRA and use them as example when creating your own pictures.

4.1.8.2. Summary of Parameter Shortcuts

Round Duct

D1 - diameter of the lower base [mm]

D2 - diameter of the upper base [mm]

Rectangle Duct

A1 - length of the first edge of the lower base [mm]

B1 - length of the second edge of the lower base [mm]

A2 - length of the first edge of the upper base [mm]

B2 - length of the second edge of the upper base [mm]

Transition Curve

D - diameter of the round base [mm]

A - length of the first edge of the rectangle base [mm]

B - length of the second edge of the rectangle base [mm]

Ori - orientation of the transition curve (it determines which side shall be round and which rectangle, valid values 1/-1)

Common Parameters

L – length [mm]

PHZX – shift of the upper base in the X-axis [mm]

PHZZ – shift of the upper base in the Z-axis [mm]

PSZX – shift of the lower base in the X-axis [mm]

PSZZ – shift of the lower base in the Z-axis [mm]

UHZY – angle of the upper base in the Y-axis [°]

UHZZ – angle of the upper base in the Z-axis [°]

USZY – angle of the lower base in the Y-axis [°]

USZZ – angle of the lower base in the Z-axis [°]

NHZY – deflection of the upper base in the Y-axis [°]

NHZZ – deflection of the upper base in the Z-axis [°]

NSZY – deflection of the lower base in the Y-axis [°]

NSZZ – deflection of the lower base in the Z-axis [°]

SRX – total rotation in the X-axis [°]

SRZ – total rotation in the Z-axis [°]

SPX – total shift in the X-axis [mm]

SPY – total shift in the Y-axis [mm]

SPZ – total shift in the Z-axis [mm]

SU - refers to the place where the deployed shape will be divided; it is determined in degrees (view from above)

P1 – addition in the first direction [mm]

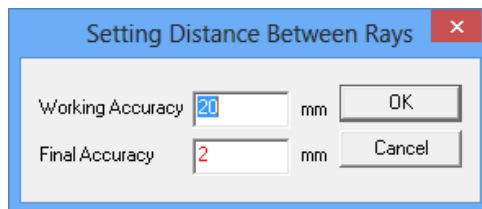
P2 – addition in the second direction [mm]

KX - number of pieces into which the deployed shape will be divided

4.1.9. Setting the Work and Final Accuracy



AirMod has considerable demands on calculation performance of the computer. That is why calculations are made in two different accuracies. The so called ,working' accuracy is used for displaying previews and handling them, the ,final' accuracy is used for creating shapes and exporting them. You can set the both values here (lower value means ,finer' division, meaning higher accuracy).



4.1.10. Display in the Final Accuracy



Use this command to switch on/off displaying previews in the final accuracy instead of working accuracy (see the description in the previous chapter). Depending on your computer performance, the previews might be redrawn more slowly during displaying the final accuracy.

4.1.11. Load Demo Deployments



You can find some example ducts there which are used as aids and which help you to learn about the program possibilities. You can even use the example ducts; you just select ,No' when you are asked if you want the demo examples to continue and then, just adjust parameters of individual elements in the preview.

4.2. Modification of Created Ducts

By individual views of created ducts, there is a toolbar that you can use to adjust or remove individual created elements.



Besides the common ,One Step Back', you can:

- delete the whole element
- edit parameters using the keyboard (this icon opens a window for you containing parameters of the selected element, and you can adjust them according to your choice)
- move the element
- cut or deflect the base of the element
- rotate elements

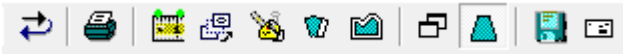
It is suitable to use these mentioned tools (where you move/rotate elements right in the view using your mouse) in situations where you do not know which parameter to define when determining a new element. You can ,approximately' determine the design there, or if need be reciprocal position of more elements and then, you adjust easily exact values using ,Editing Parameters on the Keyboard' because you can see which values change when you make a given modification.

Besides this, you can maximise any of the views to the whole screen (which is also possible if you double left-click right on the view area) and display/hide the coloured surface area of the duct.

You can also make a dimension control; the principle of the control is the same as in other parts of the program.

4.3. Modification and Export of a Deployed Shape

The view of the deployed shape has a different toolbar from the other views. You can execute some modifications there before exporting the deployment.



Again, besides the common ,One Step Back', you can:

- print the deployed shape
- control the dimensions
- adjust the reciprocal position of individual components (if there are more of them)
- divide the component into more parts
- add additions (for riveting, for round bends)

Use the last two icons to export the deployed shape either using right the integrated output or sending the deployed shape to the main desktop of the Wrykrys program where you can place it into any configuration.

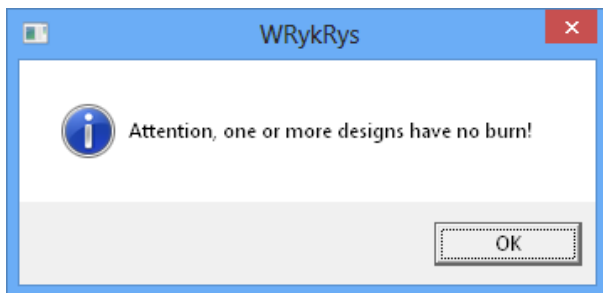
5. Integrated Output

The Integrated Output is the principal part of the Wrykrys program (usually started using command ,Export to Disc'); it is a subprogram used to generate a code from components and configurations that you have created in the main program. The code differs considerably depending on the machine you use. This chapter is divided into two parts. The first one contains general description of the Integrated output user interface, the second one the procedure of creating a new post processor (it means, in fact, new format of the output code). The second part is mainly designed for machine producers who need, for example, adapt the code to a new control system (add new functions, etc.), however, it can also help a common user to become familiar with the post processor structure and even the code. However, if you have an optimised post processor for the machine at your disposal, you do not need to study this chapter in detail.

If you access the Integrated output using the common way, meaning by exporting the configuration from the main desktop of the Wrykrys program (besides that, it is possible to start the integrated output directly even from other places, for example, from InterCAD or AirMod), there are some control mechanisms running before it opens:

1. Controlling Burns

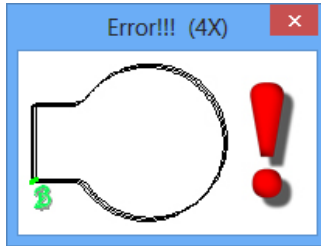
If there are one or more components in the configuration that do not have any burn, the following warning is displayed:



At the same time, the relevant components are highlighted in red on the desktop.

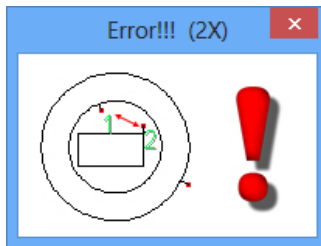
2. Controlling Overlap

If there are components on the desktop that are completely on the same position (which can, for example, result from reloading a configuration from the database without deleting the desktop), the program warns you using the following picture symbolizing overlap designs. Again, these are highlighted in red on the desktop.



3. Controlling Order

This is a cutting order control executed in case there are some components inserted into a hole of another design. It is logical that the inner component should be produced first, if it is the other way round, a picture appears warning you against that and the relevant components are highlighted in red on the desktop.



4. and 5. G00 Control and ~~ Control

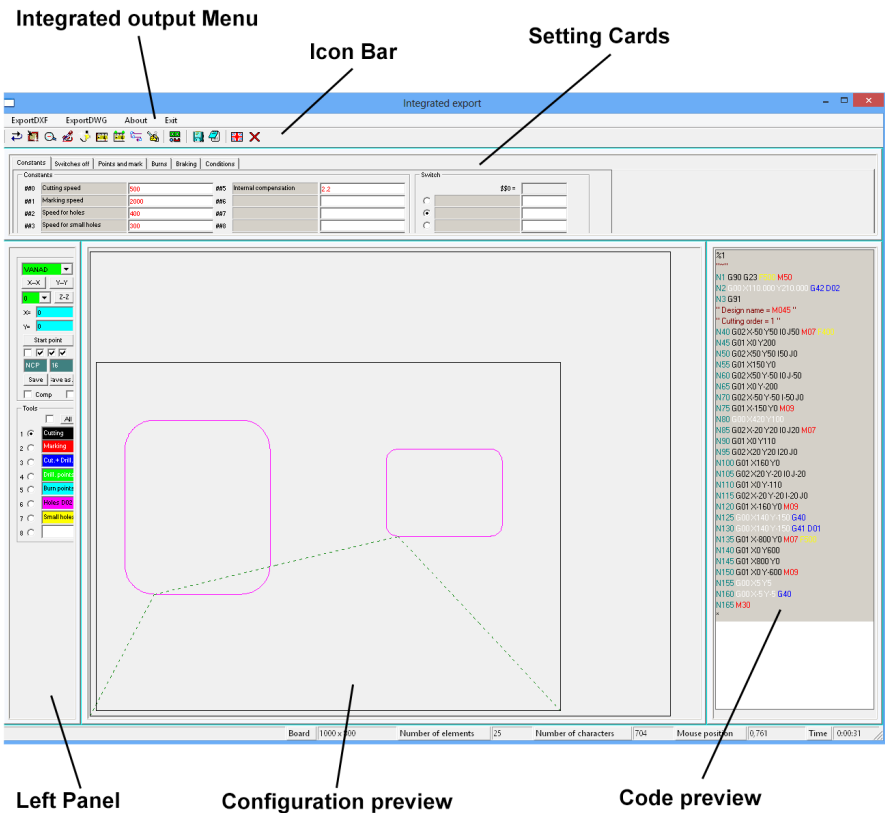
These types of control run only if they are switched on. You can find the description of their function and setting in chapter 2.12.8., or more precisely, 2.12.9.

After the control, the Integrated output starts, however, if you do not deal with an atypical case and you do not have any of the 'errors' in the configuration intentionally, you should (especially in case of the 1st and 2nd warning) return to the desktop and correct the problem.

5.1. Code Setting and Export

This part deals with different setting that you can execute in the Integrated output before exporting the code for the machine. The setting possibilities differ significantly depending on the possibilities of your machine. **It is very common that you do not implement any setting in the Integrated output at all or almost any (cutting speed, compensation and other issues are only solved in the control system of the machine). After that, you just save the code using icon ,Export the configuration' in the icon bar.** In the following chapters, we give examples of issues that you can modify or set before export if need be.

This is the main screen of the Integrated output:



5.1.1. Integrated Output Menu

ExportDXF ExportDWG About Exit

The Integrated Output Menu only contains shortcuts for direct export in format *.DXF and (if Autodesk RealDWG module is installed) also *.DWG, a window comprising information about the program and a command intended to exit Integrated output.

5.1.2. Integrated Output Icon Bar

This bar includes mainly informative functions that are also at your disposal on the main desktop of the Wrykrys program and that are described in the relevant chapters.

5.1.2.1. Initial State



Use this command to reset changes that you have made in the Integrated output and you return to the state in which you loaded the configuration into the Integrated output.

5.1.2.2. Redrawing the Desktop



This command redraws the area of the configuration view. This is a similar function to the one that is on the main desktop of the Wrykrys program.

5.1.2.3. Cancelling the Cut-out



This command cancels the cut-out and centres the configuration in the preview. You can also do this using a double click of the middle button (scroll button) on the preview area.

5.1.2.4. Drawing Compensation



This is a similar function to the one that is on the main desktop of the Wrykrys program.

5.1.2.5. Simulation Drawing



This is a similar function to the one that is on the main desktop of the Wrykrys program. Individual components are outlined in red in the cutting order and direction in which they will be cut.

5.1.2.6. Controlling All/Joint Points



This is the same control as the one that is at your disposal, for example, on the main desktop or in InterCAD.

5.1.2.7. Changing the Cutting Order



This function differs from the changing the cutting order on the main desktop. It determines the cutting order of entire pieces in the configuration there, but here, it is the only way how to change the cutting order of individual elements no matter which design they belong to. So, in specific situations, you can set, for example, cutting holes of two components first and only then the inner shape of the first and second piece.

After you select this function, simply left-click to mark individual contours right in the configuration preview.

5.1.2.8. Cutting Designs



This function is also different from the one that is at your disposal in InterCAD. While it divides a design into two separate components there, here, it only deals with dividing a selected element in the point that you determine by left-clicking on the configuration preview. So, in atypical situations, you can divide, for example, one line segment into three smaller ones and match each part with a different tool.

5.1.2.9. Setting Colours

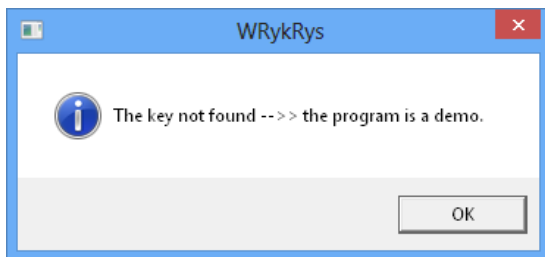


Similarly to the main desktop, this icon enables you to switch on or off the fill colours on the desktop.

5.1.2.10. Export the Configuration



This is the final export of the code for the machine. To export, you need to have a valid hardware key. If the program cannot find it, the following warning appears:



In the opposite case, the standard window for saving files is displayed.

5.1.2.11. Notepad



It is also possible to display (and if need be, adjust manually and subsequently save) the code in notepad. Of course, to do that, you also need to have the HW key connected.

5.1.2.12. Language



It switches between post processor languages (tool and constant captions, etc.). These languages do not have to be always at your disposal; captions are directly parts of individual post processors not of the program itself.

5.1.2.13. Exit this Application



Use this command to exit the Integrated output.

5.1.3. Setting Cards of the Integrated Output

These are six cards summarizing in topics various possibilities of changes, modifications and setting.

5.1.3.1. Constants

Constants	Switches off	Points and mark	Burns	Braking	Conditions																																						
<div> <div> <div>Constants</div> <table> <tr> <td>#0</td> <td>Internal compensation</td> <td>2.1</td> <td>#5</td> <td></td> <td></td> </tr> <tr> <td>#1</td> <td></td> <td></td> <td>#6</td> <td></td> <td></td> </tr> <tr> <td>#2</td> <td></td> <td></td> <td>#7</td> <td></td> <td></td> </tr> <tr> <td>#3</td> <td></td> <td></td> <td>#8</td> <td></td> <td></td> </tr> <tr> <td>#4</td> <td></td> <td></td> <td>#9</td> <td></td> <td></td> </tr> </table> </div> <div> <div>Switch</div> <table> <tr> <td>\$\$\$ =</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table> </div> </div>						#0	Internal compensation	2.1	#5			#1			#6			#2			#7			#3			#8			#4			#9			\$\$\$ =							
#0	Internal compensation	2.1	#5																																								
#1			#6																																								
#2			#7																																								
#3			#8																																								
#4			#9																																								
\$\$\$ =																																											

Use this card to set values of constants (##0 - ##9) to which individual machines refer. Usually, you can find, for example, cutting speed, size of internally added compensation there, but also the name of the programmer who has created the configuration and which is mentioned in brackets in the code header.

Section 'Switch' allows you to change the switch value (see the other card) to one that you have selected.

5.1.3.2. Switches Off

Constants	Switches off	Points and mark	Burns	Braking	Conditions																														
<div> <div> <div>Switches1</div> <table> <tr> <td><input checked="" type="checkbox"/> \$\$\$1</td> <td></td> <td>N_G0 X0 Y0</td> </tr> <tr> <td><input type="checkbox"/> \$\$\$2</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$3</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$4</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$5</td> <td></td> <td></td> </tr> </table> </div> <div> <div>Switches2</div> <table> <tr> <td><input type="checkbox"/> \$\$\$6</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$7</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$8</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$9</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> \$\$\$:</td> <td></td> <td></td> </tr> </table> </div> </div>						<input checked="" type="checkbox"/> \$\$\$1		N_G0 X0 Y0	<input type="checkbox"/> \$\$\$2			<input type="checkbox"/> \$\$\$3			<input type="checkbox"/> \$\$\$4			<input type="checkbox"/> \$\$\$5			<input type="checkbox"/> \$\$\$6			<input type="checkbox"/> \$\$\$7			<input type="checkbox"/> \$\$\$8			<input type="checkbox"/> \$\$\$9			<input type="checkbox"/> \$\$\$:		
<input checked="" type="checkbox"/> \$\$\$1		N_G0 X0 Y0																																	
<input type="checkbox"/> \$\$\$2																																			
<input type="checkbox"/> \$\$\$3																																			
<input type="checkbox"/> \$\$\$4																																			
<input type="checkbox"/> \$\$\$5																																			
<input type="checkbox"/> \$\$\$6																																			
<input type="checkbox"/> \$\$\$7																																			
<input type="checkbox"/> \$\$\$8																																			
<input type="checkbox"/> \$\$\$9																																			
<input type="checkbox"/> \$\$\$:																																			

This card is similar to constants. You also set values here which are referred to by references placed in the post processor setting (with prefix \$\$) but you can switch them off. Typically, you use this when applying abrasive to water ray.

5.1.3.3. Points and Marks

This card enables you to create marks from prepared points or, for example, transform small holes into a point or mark and match it to an appropriate tool (drilling, engraving, and marking, ... according to the possibilities of your machine).

In section 'Generating Mark', set the type (you can more at the same time) of mark and its size and also the number of repeating if this is needed for the given technology. In case of repeating, you can always choose the start from the centre of the mark.

In section 'Multiple Change', use button 'Substitute Points' to transfer prepared or created points into the selected level (tool), and if one of the marks is selected, these marks are created from all points simultaneously.

In section 'Individual Changes', you can transform individual holes or contours into a point or mark (in case of an entire contour into an initial point, in case of a round hole into its centre). First, select the type of transformation and then, left-click directly on the configuration preview to determine the contours. The new point or mark is automatically put into the tool that is selected in the left panel at that moment (see chapter 5.1.4).

In section 'Multiple Changes', you can transform all circles having a radius corresponding to the defined interval into a point or mark.

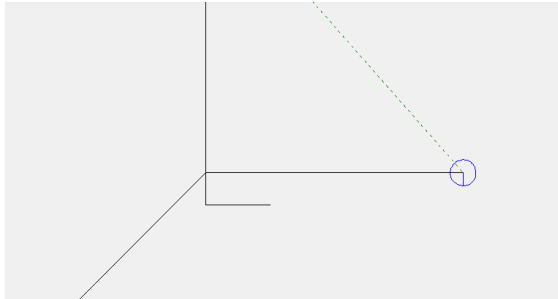
'Display Points' sets visual size of the points in the configuration preview.

Transformation 'Komp=0' is used to transfer all objects that have zero compensation into a selected tool. It is useful, for example, when generating captions on the main desktop (see chapter 2.6.4.). Thus, you move all captions to the required level by a single click.

5.1.3.4. Burns

Constants	Switches off	Points and mark	Burns	Braking	Conditions
<div> <div> Round Burn Data <div> Radius: 1 </div> <div> No. of Circles: 1 </div> <div> Tool: 4 </div> </div> <div> Calculating No. of Circles <div> 1 × 270 = 6.28318530718 </div> </div> <div> Info <div> Burns: 16 </div> <div> 0 </div> <div> Add Everywhere </div> </div> </div>					

This card is used to create the so called round burns in initial points of individual designs (meaning in places where there is the standard burn added). Round burns are used with water ray for example. In section ,Round Burn Data', set the radius of the circle and their number (they repeat in the same place) and the tool that will be used for the round burns. You can also set the number of circles needed automatically by means of defining the time needed to cut the material and the speed of the given machine in section ,Calculation number of circles'. Section ,Info' displays the total number of burns in the current configuration and the speed of the selected machine. Use button ,Add Everywhere' to add the round burns to the configuration:



5.1.3.5. Braking

Constants	Switches off	Points and mark	Burns	Braking	Conditions																												
<div> <div> Braking in Corners <div> <div>1 2 3 15 deg.</div> <div>Distance 8 5 2 5 mm</div> <div>Tools 6 7 8 Add Everywhere</div> </div> <div> Braking before Intersection <div>4 7 Brake Everywhere</div> </div> </div> <div> Braking Radiuses <div>0 <R< 100</div> <div>Tool 7</div> <div>Number 12</div> <div>Brake</div> </div> <div> Tool Speed <table border="1"> <tr><td>1.</td><td>0</td><td>5.</td><td>0</td></tr> <tr><td>2.</td><td>0</td><td>6.</td><td>0</td></tr> <tr><td>3.</td><td>0</td><td>7.</td><td>0</td></tr> <tr><td>4.</td><td>0</td><td>8.</td><td>0</td></tr> </table> <div>Reset</div> </div> <div> Plasma <table border="1"> <tr><td>5</td><td>7</td><td>Apply</td></tr> <tr><td>5</td><td>7</td><td>Apply</td></tr> <tr><td>5</td><td>7</td><td>Apply</td></tr> <tr><td>5</td><td>7</td><td>Apply</td></tr> </table> <div>Apply all</div> </div> <div> </div> </div>						1.	0	5.	0	2.	0	6.	0	3.	0	7.	0	4.	0	8.	0	5	7	Apply	5	7	Apply	5	7	Apply	5	7	Apply
1.	0	5.	0																														
2.	0	6.	0																														
3.	0	7.	0																														
4.	0	8.	0																														
5	7	Apply																															
5	7	Apply																															
5	7	Apply																															
5	7	Apply																															

This is a large card used to apply braking tools in the form of change in different situations. Braking is often treated only in the control system of the machine, but the automatic solution does not always have to be sufficient and you need to add various functions in certain places (it does not have to be just a change of speed).

Section ‚Braking in Corners‘ is used to set up to three-phase braking in the design corners. Switch on individual parts by putting a cross into the relevant field and set the distance before the corner where the tool shall be activated and the tool number. Then, define the angle for corners from which braking shall be applied and if need be, the limit size of the ‚corner element‘ - if the element is shorter, braking continues to the next element. Then, you add Braking using button ‚Add Everywhere‘.

Use section ‚Braking before Intersection‘ to change a tool in the place of intersection of two elements (burn passage, loop, etc.). Into the first field, enter the distance from the intersection in which the tool is activated, in the second field, the tool number. The original tool returns in the place of intersection. If you need the changed tool over the entire intersection (for example, with some machines where you use this way to switch off the elevation control), enter a negative value into the first field - its length will be used, but the centre of the changed part will be in the place of intersection (so, for example, if we have a defined value ‚-10‘, the tool will be applied 5 mm before and 5 mm after the intersection).

Apply by using button ‚Brake Everywhere‘.

Section ‚Braking Radiuses‘ is used to simply match a selected tool to all arcs having the size of the defined interval. The informative field shows the number of radiuses that will be changed after you press button ‚Brake‘.

Section ‚Tool Speed‘ is just informative and contains values of constants to which individual tools refer (if it is set so in the post processor, the speed field can be used, for example, even for a different function and then, there will be nonsensical information displayed here).

Section ‚Plasma‘ deals with changing tools in places of access and exit of burns. With some plasma machines, functions for progressive switching off, switching off the elevation control or even braking are used. This is the place where you can always set, according to your choice, the distance and tool number for the access/exit of the burn in an inner hole or in an outer shape and use these changes either for a selected part (button ‚Apply‘ for every line) or for all (button ‚Apply all‘).

In all cases of adding braking, the tool changes are reflected in colour in the configuration preview straight away and the code in the preview on the right changes as well.

5.1.3.6. Conditions

The screenshot shows the 'Conditions' tab in the Wrykrys software. It is divided into two main sections: 'Specifying Compensation' and 'Text Colour'.

Specifying Compensation: This section contains a checkbox labeled 'R<=' which is checked. Below it are four input fields: the first contains '1', the second contains '20', the third contains '6', and the fourth contains '7'.

Text Colour: This section contains a grid of color swatches, each with a checkbox to its left. The checked colors are teal (labeled '3,4'), blue (labeled '30;29;38'), yellow (labeled '5,6'), red (labeled 'JM;P0'), and red (labeled '7,8'). Other colors like green, blue, black, and grey are also present but not checked.

In section 'Specifying Compensation', you can classify the outer shape, holes and small holes into various levels. If you activate the function, the tool with the number in the first field will be used for the outer shape, for holes having the radius higher than the defined value, the tool defined in the second field, and for smaller holes, the tool from the last field (with holes that are not round, the size of their circumference is used to assess their size and then, they are calculated as circles).

You do not need to use this function only in case of different compensation of holes; it is possible to have even a different speed with another tool, or if need be, other functions.

So, according to the setting in the figure, tool number 1 is used for the outer shape, tool number 6 for larger holes and tool number 7 for small holes. For example, if you wanted a different tool just for small holes, you can enter 1, 1, 7.

Section 'Text Colour' is used to make the code preview on the right more clear. You set the beginning of the chain that you want to highlight (if you tick the next field, only lines with the whole exact chain) and choose a colour. You can enter more values divided by semicolons into one field (for example, all 'M' functions in red, 'G' functions in blue, etc.).

5.1.4. Left Panel of the Integrated Output

This panel contains both the tools and several functions intended to modify the configuration and output and we will describe them one by one.

The first drop-down menu is used to choose a post processor (meaning output format). The option is taken from the setting on the main desktop of the Wrykrys program; here, you can just change it at once.

#PESTALL

X-X Y-Y

0 Z-Z

X= 0

Y= 0

Start point

☐ ☒ ☒ ☒

NCP 16

Save Save as

☐ Comp ☐

Tools

☒ All

1 ☒ Cutting

2 ☐ Marking

3 ☐ Drilling

4 ☐ Punching

5 ☐ 2.comp

6 ☐ Holes

7 ☐ Small hol.

8 ☐

Buttons ,X<<>>X' and ,Y<<>>Y' mirror all designs on the desktop about the selected axis.

The drop-down menu below enables you to rotate the whole configuration at 90/180/270°. Adjacent button ,<<->' shifts all designs within the set dimensions of the board into all corners (and back).

In the two blue fields, you can change coordinates of the start point (its default position is in the lower left corner), or you can select the start point manually on the preview after you press button ,Start point' (after that, the coordinates are filled in automatically).

The four check boxes are used for the following functions:

- return to the start point for cutting the entire configuration
- include the ,cut' into the configuration; if you switch off this one, the whole code will only contain individual points in the places of burns
- include burns (concerns round burns added in card ,Burns' in the Integrated output); this is the way how to switch them off
- include points (you can, for example, prepare points for drilling/marking, but finally, you do not need to use them - this is the way how to remove the points from the code)

In the next two dark fields, you define the extension of the exported file with the code and the maximum length of its name (for older machines with the DOS system usually 8 characters).

Buttons ,Save' and ,Save as' save all setting changes made in the current post processor, or more precisely, save the new post processor.

If you tick box ,Comp', you add compensation right to the dimensions of all designs (the post processor needs to be set correctly and you need to define the correct size of the chink in the constants otherwise a defective product is produced!).

At that moment, functions intended to add compensation on the machine are removed from the code. For security reasons, you cannot save this function on the constant basis in the post processor, but if you tick the adjacent field, there will be a warning during export without any added compensation (you can save this setting).

Next, there is only the section with the tools. You can select any of them and add it to any objects. Use button ,All‘ to match the tool with all elements in the configuration. You can also match the selected tool directly on the preview using the left button either with entire closed contours or (if the field next to button ,All‘ is ticked) with only individual line segments and circles. After being marked, an element in the preview turns to the relevant colour and appropriate changes are also made in the code - straight away, the line that refers to the marked element is highlighted in the code (and the other way round, you can go through the code and the relevant elements are highlighted in red on the preview).

5.2. Creating a Post Processor

This section deals with creating and modifying the post processor. If you use WRYKRYs only as a user, you will not usually need to modify the post processor in any way. You can either use one from the default spectrum of output formats or you will be supplied with the necessary post processor adapted to your machine by its producer.

If you want to start to modify or create a new post processor, we recommend you not to change the default post processor, but save its copy (in WRYKRYs, post processors are saved in subdirectory FILTRYNEW and these are files with extension *.nfd, or if need be, with new post processors, these are several files with the same name and with prefix # and with extensions *.nvf and *.###).

Physically, you create a new post processor by copying one of the existing files under a new name (either directly the one that you want to modify or even in the situation where you want to create a new post processor, it is good to use a ,similar‘ one, it means, for example, a different post processor in essi format or in G-code, etc.). After you restart WRYKRYs, the new post processor is displayed in the output menu. You can also save the new post processor directly in the Integrated output using button ,Save as‘ on the left panel.

This chapter is divided into two parts - the first one contains the description of setting the original post processors, the second one the description of setting new post processors with prefix # which take some basic issues from the same table as the original ones, but setting individual tools and their functions is implemented in a different window that enables you to create even more complex code structure.

5.2.1. Original Post Processors

The original format of post processors has been used since the Integrated output was created, it means since 2005.

All its setting of the code format and even of individual functions is done in this table that is accessible by 'pulling' the boundary between the left panel and the preview window in the Integrated output:

The screenshot shows the 'Original Post Processors' settings window. It includes sections for Line, Options, F5, Control, Circle, and a Tools table. The Line section has checkboxes for N, P, F, and G01/G00, with X and Y coordinate fields. The Options section has fields for X1, Y1, Z1, and checkboxes for I, J, K, R, U. The F5 section has checkboxes for F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F24, F25, F26, F27, F28, F29, F30, F31, F32, F33, F34, F35, F36, F37, F38, F39, F40, F41, F42, F43, F44, F45, F46, F47, F48, F49, F50, F51, F52, F53, F54, F55, F56, F57, F58, F59, F60, F61, F62, F63, F64, F65, F66, F67, F68, F69, F70, F71, F72, F73, F74, F75, F76, F77, F78, F79, F80, F81, F82, F83, F84, F85, F86, F87, F88, F89, F90, F91, F92, F93, F94, F95, F96, F97, F98, F99, F100. The Control section has radio buttons for Essi, Dxf, Hpgl, Szo, and Iso. The Circle section has checkboxes for N, P, F, and G01/G00, with X and Y coordinate fields. The Tools table has columns for Tools, All, 5, 6, 29, 30, 7, 8, 38, On, Off, F, LK, PK. The table contains rows for Cutting, Marking, Cut + Drill, Drill points, Burn points, Holes D02, and Small holes, with checkboxes for each tool and field.

Almost all fields here have a tooltip (after you place the cursor on them) so you can find their meaning right in the program. We will go through individual sections together.

Note: All check boxes ,N' switch on/off block (line) numbering of the code for relevant elements.

In the first section ,Line', you set the function on the line with the tool switched on (it means the cut of a line segment) and the other way round, with the tool switched off (quick shift). For example, with G-code, G01 or more precisely, G00 is standard. Then, you also set the prefix for the X and Y coordinate of the shift there (for G-code, it is X and Y; in the Essi-format, prefixes are not used, so you leave the fields here empty).

Below, you can find section ,Circle' where you set the function for the circle with the anti-clockwise or more precisely, clockwise orientation (for G-code, G03, or more precisely, G02). What you also choose here is the way in which the circles are defined - the most common variant is using its centre. Again (typically for G-code), you can set the prefix for the X and Y coordinates of the centre which are ,I' and ,J' in standard situations. In the adjacent field, you can also make a cross if the centre of the circle is defined absolutely (from point 0 - the beginning of the whole configuration), or relatively, from the point where the circle starts (it often happens that an absolutely defined code has centres of circles defined relatively).

Other possibilities of defining circles are using its radius or using its angle (for example, used by HPGL format).

In section ,Options', there are three fields - the first one is used to multiply values in the code by a defined coefficient, the second one determines the number of decimal places, the third one is used to add any character at the end of the line (with HPGL, a semicolon, for example).

The G-code is not usually multiplied and it uses a different number of decimal places (three most often). The Essi format is multiplied by ten in standard situations and does not use any decimal places.

Under these fields, there is a line of eight check boxes:

The 1st box determines if quick shifts (passages) shall be divided into halves in the code, which enables you to add two functions to them at the end of the lines. The field also has a third position (ticked and grey) where the quick shift is divided only in the case where the tool is changed in the course of it (for example, a passage from a hole that is in a different level to an outer shape).

The 2nd box enables you to divide whole circles into halves.

The 3rd box is used to remove all spaces in the code so that, for example, line ,G01 X200 Y0 M07' becomes ,G01X200Y0M07'.

The 4th box determines omitting zero coordinates (in fact, only with a relatively defined code; the zero value will not, probably, appear during absolute definition). The result is, for example, the change from code ,G01 X0 Y-100' to ,G01 Y-100'. This box (as well as the preceding 3rd box) is primarily used to reduce the length of the code, however, if we take into consideration

the way we use today to transfer data into machines and capacity of storage media, this loses its meaning partially (from the point of view of its functionality, no machines should be blocked if you omit the zero coordinate). The 5th box is used to leave out useless final zeros in decimal numbers (it means, for example, 14 instead of 14.000 or 10.2 instead of 10.200). Of course, this also reduces the length of the code and there is no doubt that the code is clearer without useless zeros, so this option is usually applied. From the point of view of the functionality, the machine should not be blocked by any of these variants.

The 6th box switches off or on ,+' before a positive shift. It is not used for the G-code (positive values have no sign, negative ones are with ,-' ; for the Essi format, you need to insert ,+' because there are no prefixes ,X' and ,Y' used, and signs ,+' and ,-' divide individual values from each other.

The 7th box is used to divide lines and circles into halves. In the same way as the first box for quick shift, it is necessary for switching on the tool on one line and switching it off on the second line (if the functions are not inserted on separate lines).

The 8th box determines if the coordinates are defined absolutely or relatively (an exception are coordinates that define centres of circles; their setting is done separately - see the previous paragraph).

Section ,F5' is used to set notes in the code. Notes, text in the code, are ignored by the machine during cutting' they are usually used to identify individual components or, in the code header, to enter some information (board dimensions, author of the configuration, and the like).

The three first check boxes determine if you want to insert notes with the component name and its cutting order in the configuration automatically into the code (use the third position of the switch to insert a description in the opposite order), then, if you want to insert note (set below) dividers before or after the note or on a separate line, and the last box determines if you want the blocks with notes to be numbered.

Two fields below set note dividers (for the G-code, these are usually parentheses or quotation marks, in the Essi format, function ,3' and ,4').

In the two last fields, you set description of automatic notes containing the design name and its cutting order.

Section ,Stop‘ has only one field where you set the function that is inserted into the code in the place where you have inserted stops into your configuration (see chapter 2.9.11). But the machine needs to support such a possibility. In the G-code, it is usually function M00 or M01.

The ,Control‘ section does not directly influence the exported code, but it is used to select the correct code format in the course of its reloading. When you export the code, for your control, it is reloaded automatically and highlighted in red over your configuration. If you selected a different type of code, the control reload would not work. So, you just need to switch to the correct format of the code that you are generating.

Section ,Max. radius‘ is used to set the maximum radius of circles and arcs in the code. Some machines can have problems with an extremely large radius. If you switch on this option here and set, for example, 50000 mm, after this radius is exceeded, the relevant arcs will be divided into line segments.

The two lines below are used to enter any chain to the beginning or more precisely, to the end of the whole code. The check box to the right of them hides the whole upper part of the window where constants, points, etc. are set, if you do not want to use them in the given post processor. Use button ,Reset‘ to delete the whole content of the post processor.

In the lower part, there is a table with definitions of individual tools. Each line corresponds to the given tool from the left panel; the column heading describes individual functions (the description is taken from the Essi code - 5 is the beginning of the quick shift, 6 is the end of the quick shift, 29 is left compensation, 30 right compensation, 7 is the beginning of the cut, 8 end of the cut; you insert ,On‘ during the first use of the tool and ,Off‘ during the last one. Column ,F‘ is usually used to set the speed; ,LK‘ and ,PK‘ are values that you use when you switch on the internal compensation (usually, there are references to settable constants ##0-##X here). The switches in the heading determine if the functions shall be inserted to separate lines or to the end of the lines.

You can use sign ,*‘ as a newline.

You can give individual tools any names (you can type right into the colourful fields on the left panel). They are in total 8 at your disposal; the number you will use depends on your needs and machine possibilities. After you start the Integrated output, everything is always in the level of machine no. 1 (except

for the set ,specifying compensation' on card Conditions), after that you can use various automatic or manual ways to transfer individual parts to levels of other ones (for example, for drilling head, engraving, cutting points, and the like).

After you finish setting the post processor, do not forget to save the changes made.

5.2.2. New Post Processors (with prefix #)

This is a new type of post processor that was added to the program in 2008. It enables you to create a more complex code structure and its creation is intuitive - you enter individual functions de facto directly into their positions. On the disc, the post processor is created by a pair of files that have the same name and prefix # and extensions *.### (contains a new window with tool definitions) and *.nvf (contains the same table as the original post processors from which some basic settings are taken). When creating a new post processor, you need to copy both these files under new names (# at the beginning of the name is compulsory; it is according to this that the program finds out that it deals with this type).

The following issues are taken by the new type of post processor from the table of settings ,under the preview' (see preceding chapter):

- from section ,Line' and ,Circle', prefixes for individual coordinates (X,Y or if need be, I, J) and setting of relative/absolute coordinates for circles
- the whole section ,Options' except for the final character on the line (including the setting of relative/absolute coordinates)
- in section ,F5', switching on note insertion, but not the setting of its format
- in section ,Stop', the relevant function
- section ,Control' for reloading
- setting of the maximum radius
- the table with functions of individual tools **only for reloading configurations**, so it is good to fill in at least the functions for the start/end of the cut so that it is possible to load the correct shapes (using card ,DXF,...' in the main program)

You set all other issues in the window that is only accessible for post processors with prefix # and that you can open by double left-clicking on the preview area.

First, we will describe individual sections of this window.

In the left part, there is a list of functions or groups of functions that you will use wherever in the code. You can set them in any order; in the code structure, you just refer to them using the order number of the relevant line (they are up to 40 at your disposal, to switch to the other side, use the button in the lower left corner).

Besides these functions, in almost every post processor, you will use the automatic function ‚KOMP_DEL_ALWAYS‘ and ‚KOMP_ADD_ALWAYS‘ which removes or, on the contrary, adds the appropriate (left or right) compensation, or more precisely, the function that you have set for it in section ‚Compensation‘. Another integrated function is ‚TOOL_ADD_CHANGE‘ that inserts the function from section ‚Change of tool‘ at the moment where the tool changes in the course of one component.

Besides that - similarly to the original format of post processors - you can refer to constants ##0 - ##9 and it is also possible to make a newline within one written line; instead of a star, use sequence ‚\n‘.

In the middle of the window, you will find sections ‚Fast feed‘ for quick shift and ‚Line Circle‘ for line segments and circles. It is in there that you define the code structure.

In the section for quick shift, you set if the first quick shift at the given level shall be divided or altogether (switch 1 or 2); below, the same applies to all further quick shifts except for the first one.

Field ,X,Y...' indicates the place where the coordinate is placed in the code and you can place any reference by it and determine its position. So, you can insert the function before the quick shift on a separate line, before or after the quick shift on the same line, or behind the quick shift on a separate line; in case of a divided quick shift, even in between its two parts.

The section for line segments and circles functions in a similar way. There are three fields before the first coordinate at the given level (here, for example, you switch on the compensation and cut, it means that you place a reference here on the line with automatic function ,KOMP_ADD_ALWAYS' and then, a reference to the function that your machine uses to start cutting), after that, you can match different functions with the first and second line with coordinates (section 1 and 2), then to all the following ones (section S) and then, even to the last but one and last one (section -2 and -1) and finally, there are three lines again after the last coordinate (switching off the cut, compensation,...).

Section ,Compensation' has already been mentioned. You set functions intended to remove and add the left of right compensation there. The field description stems from the G-code (functions G40, G41 and G42), in case of the Essi format, you would fill in functions 38, 29 and 30 there. Below, in this section, you can set the code structure for a case where the compensation would change in the course of one component.

Below compensation setting, you will find the section where you can set numbering of blocks (lines of the code). You can select a prefix for numbering (with the G-code, it is ,N' typically) and the initial value and accrued value (usually, multiples of five, ten and the like are used).

There is also section ,Change of tool' where you define the functions used in the course of tool change (activated by automatic function ,TOOL_ADD_CHANGE' and also (similarly to compensation) the code structure in case of a tool change in the course of cutting one component.

In section ,Note', you define the note structure', in section ,Point', the code structure for points (for point cutting, or if need be, functions for drilling, etc.).

The two large fields are used to enter the initial and final chain of the whole code. You can also take advantage of some automatic functions there such as ,TABX' (board length), ,TABY' (board width), ,DATE' (current system date), or WRITETHICK (the set material thickness from the main desktop of the program). In lower left part, there are eight buttons that you use to switch between settings for individual tools (colours and order correspond to the tools in the left panel of the Integrated output).

The basic setting of a simple Essi code might look like as follows:

The screenshot shows the WRYKRY software interface for setting an Essi code. On the left is a list of functions numbered 1 to 20. Functions 5, 6, 7, and 8 are highlighted. The main area is divided into three sections: 'Fast feed', 'Line Circle', and 'Compensation'. The 'Fast feed' section has checkboxes for 'N' and 'X.Y' for lines 1, 2, and 3. The 'Line Circle' section has checkboxes for 'N' and 'X.Y....' for lines 1, 2, 3, 4, 5, 6, and 7. The 'Compensation' section has input fields for G40 (38), G41 (29), and G42 (30). The 'Numering of line' section has checkboxes for 'N', 'Start', and 'Plus'. The 'Last line' section has a text input field.

In the list of functions, function ,5' (beginning of quick shift), ,6' (end of quick shift), ,7' (beginning of cutting), ,8' (end of cutting) and adding and removing compensation are set. Functions intended for compensation are set in section ,Compensation' - ,38' for finishing the compensation and ,29' and ,30' for the left or more precisely, the right compensation.

Quick shifts are switched to not divided in the case of the first and even the other passages, and there is a reference to line 1 before them and behind them a reference to line 2, meaning functions ,5' and ,6'. For line segments and circles, lines 5 and 3 are inserted (meaning addition of the needed compensation using function ,29' or ,30') and function ,7' for the beginning of cutting and at the end, lines 4 and 6, which is the end of cutting (function ,8') and removing compensation (function ,38').

You can copy the first tool that has been set this way into all other tools using button ,Copy 1->8' and then, execute necessary changes within them.

Use button Clear All to delete the content of all tools, use button ,Clear 1' to delete only the current selected one.

6. Macro Editor

Application MacEdit is used to create, modify, view, and export macros applied by the Wrykrys program. To create macros, you can use both simple geometric constructions consisting of lines, points and circles, and more complex constructions based on calculations of analytic geometry, or if need be, combination of both the possibilities. Especially combining both ways opens undreamed possibilities and enables you to create almost any macros. The philosophy of creating macros is as follows: a macro consists of a sequence of orientated segments which determine the cutting path. These segments can be defined using elements of different types of which some are visual and others are hidden. Hidden elements comprise macro parameters (attributes such as length, position or angle that are set by the user before the macro is drawn in order to specify its final form) and mathematical expressions (auxiliary calculations calculating the position or dimensions of another element). Visual elements comprise graphic objects (point, line, and circle) and the already mentioned segments (orientated line segment or round arc).

6.1. Name Convention

Macro elements (parameters, mathematical expressions, graphic objects and segments) are represented by names in the macro editor. These names are constructed as names of variables in most programming languages - it means they can contain letters, numbers and underscore sign. The first place of the name cannot contain numbers (it means that the name cannot start with a number).

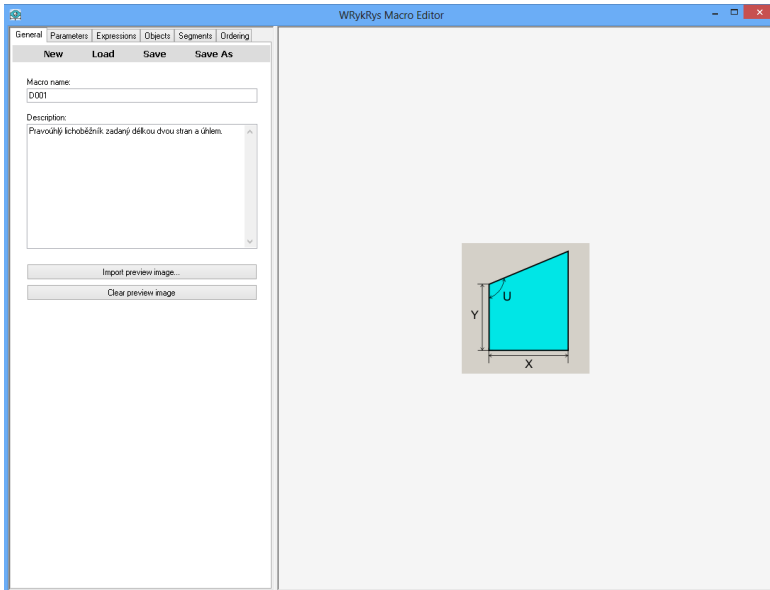
The name of the element must be unique within macros; you cannot give the same name to two elements not even in the case that they are of a different type - so, you cannot have, for example, a parameter called ,A' and a segment with the same name ,A'. Names are not ,case sensitive', it means that they do not react to capital letters. For example, parameter ,XStred' is the same as ,xstred' or ,XSTRED'.

6.2. User Interface

The window of the application is divided into two main parts. The left panel contains detailed information about the macro and elements of which it consists. There are in total six bookmarks that you can switch using cards in the heading. The right part of the window is intended for the macro preview where you can highlight the macro elements that are being edited.

6.2.1. Bookmark General

Bookmark ‚General‘ contains the file menu of the application and header information about macro. The file menu is situated on the bar below bookmarks and it consists of commands intended to create new macros (New), to load an existing macro from a file (Load), to save the edited macro under the current name (Save) and to save the macro under a new name (Save as). Header information of the macro - you fill in its name and description (a more detailed comment describing what the macro represents) into the fields under the main menu. Both the chains are used to improve user's orientation in the macro library and they are not connected to the file name where the macro is saved. Also, you can match a macro with a preview - raster picture that shows the macro design and the meaning of parameters in a schematic way. As a preview, you can use any picture in format JPG, BMP, PNG or TIF. To import it, use button ‚Import preview image...‘. You can modify an existing macro preview whenever you need using a new import or by removing it completely using button ‚Clear preview image‘.



6.2.2. Bookmark Parameters

Macro parameters are data concerning the length, position or angle of rotation that are used to define an object or a part of it. These are input data that you need to define before generating the cutting path; only their definition fully specifies the final arc shape. Each parameter is characterised by its name, default value and physical dimensions (units).

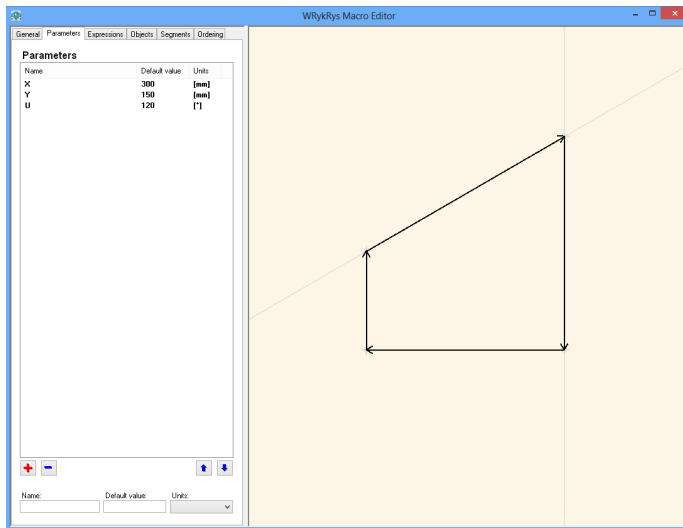
The list that you can find in bookmark ‚Parameters‘ shows all defined parameters together with their characteristics. If you select a parameter from the list, its characteristic appears in the entry fields under the list where you can modify the values according to your needs. The changes of the values are always accepted when you move the focus to another entry field by pressing key ENTER or by marking another parameter in the list. Also, if you switch to another bookmark, the changed values are accepted. On the contrary, you can cancel unwanted changes in any entry field (this applies even for entry fields on the other bookmarks) by pressing key ESC.

You can add parameters by pressing button ‚+‘. If you have not currently marked any other parameter, the pre-filled values from the entry fields on the bookmark are taken. If these values have not been defined or you have marked another existing parameter, a new default parameter is generated with name ‚ParamXXX‘ where XXX refers to the order number of the parameter.

You can remove a marked parameter from the list using button ‚-‘. Other buttons with arrows are used to move a selected parameter up or down in the list. Thus, they enable you to logically classify and group parameters according to their meaning or alphabetically. The defined cutting order is even maintained in the input dialogue window of the Wrykrys program during generation of the cutting path.

A parameter that is specified completely and correctly is displayed in bold in the list. In the opposite case (where it cannot be evaluated), it is displayed in brown and red and using normal font.

The initial value of the parameter is used both for its preliminary displaying during macro creation and in the dialogue window of application WRyKRys during placing the macro into the design. So, the user does not have to define all macro parameters manually - in places where there are no values defined, the initial values are used; the user only sets the parameters the value of which he wants to modify. The initial value of the parameter can be both a simple number and a mathematical expression. You can find details how to create expressions in the following chapter.



6.2.3. Bookmark Expressions

Expressions within application MacEdit are rules that match a variable of a certain name with a value set by a mathematical calculation.

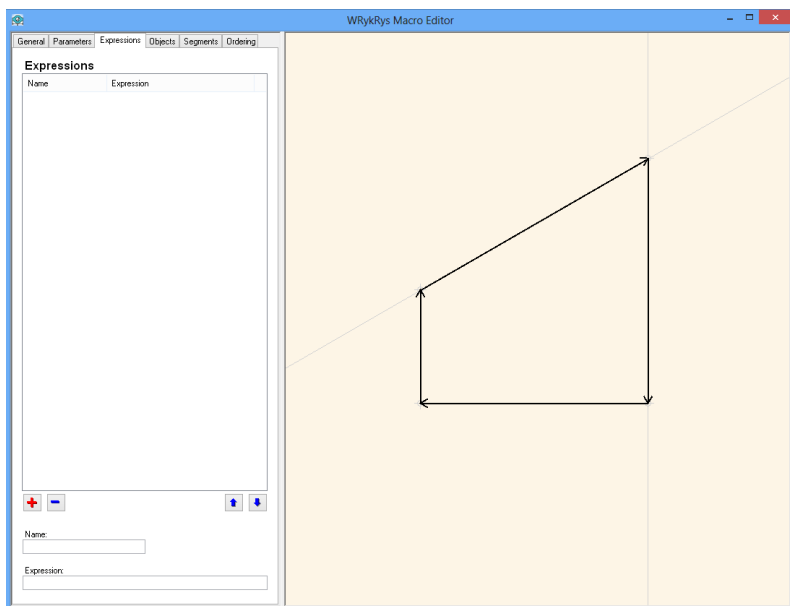
You work within bookmark Expressions using the same philosophy as for bookmark ,Parameters'. It means that all defined expressions are mentioned in a list in which you can mark one of them. Afterwards, you can move, edit or delete it. The newly created expression has a name determined by the user or generated by default in format XXXX where XXX refers to the order number of the expression.

The creation of the expression corresponds to commonly used mathematical notations. You can use both operations (addition, subtraction, multiplication and division) and some commonly used functions. You can end parts of the expression by parentheses. The list of available operators and functions is summarised in table 1.

As arguments of expressions, you can use constants (numbers), parameters, names of other expressions or attributes of graphical objects and segments. The meaning of individual attributes is described in special chapter ,5. Attributes of Graphic Objects and Segments'. Let us just mention now that attributes reflect properties of graphic objects and segments and are entered in dot notation - element name followed by a dot and attribute name. For example: Kruznicel.CenterX.

In the course of creating an expression, you need to take into consideration the physical dimension of operators and combine them with the operators of corresponding dimensions (you cannot add ,apples and pears')! As we have already mentioned in section ,Parameters', physical parameters of all elements are strictly monitored in the whole editor. That is why you always need to make sure that the created expression is entered in the correct way not only from the mathematical point of view (correct syntax) but also if dimension combination of arguments of the expression is possible - it means if the expression has the real physical meaning. The expression is evaluated correctly only if both mentioned conditions are met.

What is also worth mentioning is the use of constants (numbers) inside expressions. A number is understood as an ,adaptable constant' and during evaluation, it takes the dimension of operator with which it interacts in its default unit. For the length, the default units are millimetres, for the angle, degrees. It means that we can write, for example: $A+10$ and A will be a length expression of the dimension of millimetres, A will be understood as 10 mm. If A is in metres, it is still a length value and 10 will be understood as 10 mm as well (millimetres are default length unit). In another case, if A is in degrees or (radians), 10 will be understood as 10° .



Function	Meaning	Physical dimensions of operators	Physical dimension of the result	Example
()	Parentheses – influence priority of the functions being performed	Any, Reciprocal correspondence	Corresponds to the input	$(A+B)*C$
-	Unary minus – negative input value	Any	Corresponds to the input	-A
+	Addition	Any, Reciprocal correspondence	Corresponds to the input	A+C+D
-	Subtraction	Any, Reciprocal correspondence	Corresponds to the input	PositionX-D.X
*	Multiplication	Any	Product of input dimensions	k*AngleAlpha
/	Division	Any	Quotient of input parameters	Alpha/3
ABS	Absolute value	Any	Corresponds to the input	ABS(-20°k)
SQR	Square	Any	Square of the input dimension	SQR(A)
SQRT	Square root	Any, the result must be a whole-number dimension	Square root of the input dimension	SQRT(A*B)
LOG	Common logarithm	Any	Corresponds to the input	LOG(1000)
LN	Natural logarithm	Any	Corresponds to the input	LN(K.CenterX)
SIN	Sine	Any angular	Nondimensional	SIN(L1.Alpha)
COS	Cosine	Any angular	Nondimensional	COS(Alpha+Beta/2)
TAN	Tangent	Any angular	Nondimensional	TAN(k*Alpha)
COTG	Cotangent	Any angular	Nondimensional	COTG(Beta)
ARCSIN	Arcus Sine	Nondimensional	Angular (degrees)	ARCSIN(0.5)
ARCCOS	Arcus Cosine	Nondimensional	Angular (degrees)	ARCCOS(D)
ARCTAN	Arcus Tangent	Nondimensional	Angular (degrees)	ARCTAN(A/B)

6.2.4. Bookmark Objects

Within the MacEdit application, notion objects means simple geometric objects such as points, lines and circles used as auxiliary construction elements. Based on these auxiliary elements, you define, in the next step, segments (orientated line segments and round arcs) the sequence of which forms the final cutting path of the macro.

In the upper part of the window, there is a list of already defined objects. The type of object (point, line, and circle) is shown by an icon to the left of its name. If you select one item from the list, entry fields defining the properties of the marked object will be displayed in the lower part of the bookmark. Unlike parameters and expressions, this part is variable and the displayed fields differ according to the type of the marked object and the way in which this object is defined. Entry fields that define the properties of the object may be of the following three types:

- field intended for one numeric value. These are for example, X and Y coordinates of the centre of the circle, slope of the line and the like. You can also use these fields to enter a name of a parameter or expression (or if need be, directly a mathematical expression constructed according to the rules mentioned in section 'Bookmark Expressions', when evaluating this expression, you get the number corresponding to physical dimensions). It is also possible to set an attribute of another element (with the corresponding physical dimensions, of course).
- field intended for a reference to another existing object. These fields are in the form of combo boxes. They are filled in with a name of an existing object which is sometimes restricted to a certain type of object (for example, points only or lines only). You will find the list of usable objects if you open the menu list of the combo box.

- field specifying the position or shape of the final object if the object is not defined clearly (for example, a tangent to the circle defined by a circle and a point lying outside the circle. This task has two solutions; the role of the entry field is to determine clearly which of the two options will be applied). In this field, there is a list from which you choose an integer specifying the solution variant. In particular situations, interpretation of this number is individual and it is described in detail together with all possibilities how to define objects in chapter 6.3 - Construction of Graphic Objects.

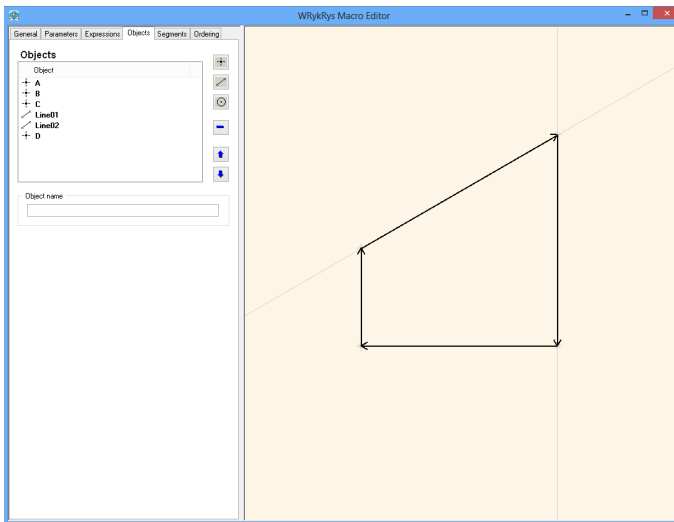
We create a new graphic object (point, line or circle) by pressing the button bearing the icon of a point, line or circle to the right of the list of objects. As soon as an object has been created, you cannot change its type (for example, to change a point to a line). However, you can use the switch buttons (radio buttons) in group 'Placement' to change the way the object is defined.

The object is displayed in brown and red until it is defined correctly. After you have specified all necessary properties and verified that it is really possible to construct the object, its name appears in bold and in black. To define objects correctly, you need to respect the corresponding dimensions of the defined and requested values. Also, you need to avoid cyclic references such as: we construct point A using point B and point B using point A. The program detects such cyclic references and it is not possible to use further an object defined this way. You can delete an object you have marked from the list using button '-'. The order of the objects can be changed using the buttons with arrows. An alternate way of creating or deleting objects is using the pop-up menu of the list of objects (you can open it by a right-click on the list). Furthermore, the pop-up menu mentioned also enables you to clone the marked object - it means to copy its complete definition under a new name. This way, the user can quickly define more objects that only differ from the original object slightly.

To define a macro, you usually need a higher number of auxiliary graphic objects. Sometimes, the high number of objects overlapping each other may cause that the preview is not so clear. That is why you can hide less important objects by a double click on the name of the object in the list of objects. The hidden (not visible) object is indicated in a weaker grey font. If you double click repeatedly, the object becomes visible again.

Some properties of the graphic objects can be determined in an interactive way using the mouse (typically, these are references to another object or coordinates of a point).

For items where this way of definition is supported, the entry field becomes green upon its activation. And the objects that may be used are highlighted in green in the preview panel. If you left-click, you can select one of these objects subsequently; the relevant value is transferred into the entry field automatically. In case that you set coordinates of a point, both coordinates of the point (X and Y) are filled in by one click. If there are more acceptable objects merging in the preview in the course of selection, your click opens a pop-up menu with a list of all acceptable objects that are under the cursor. Afterwards, you can select the object required from the list.

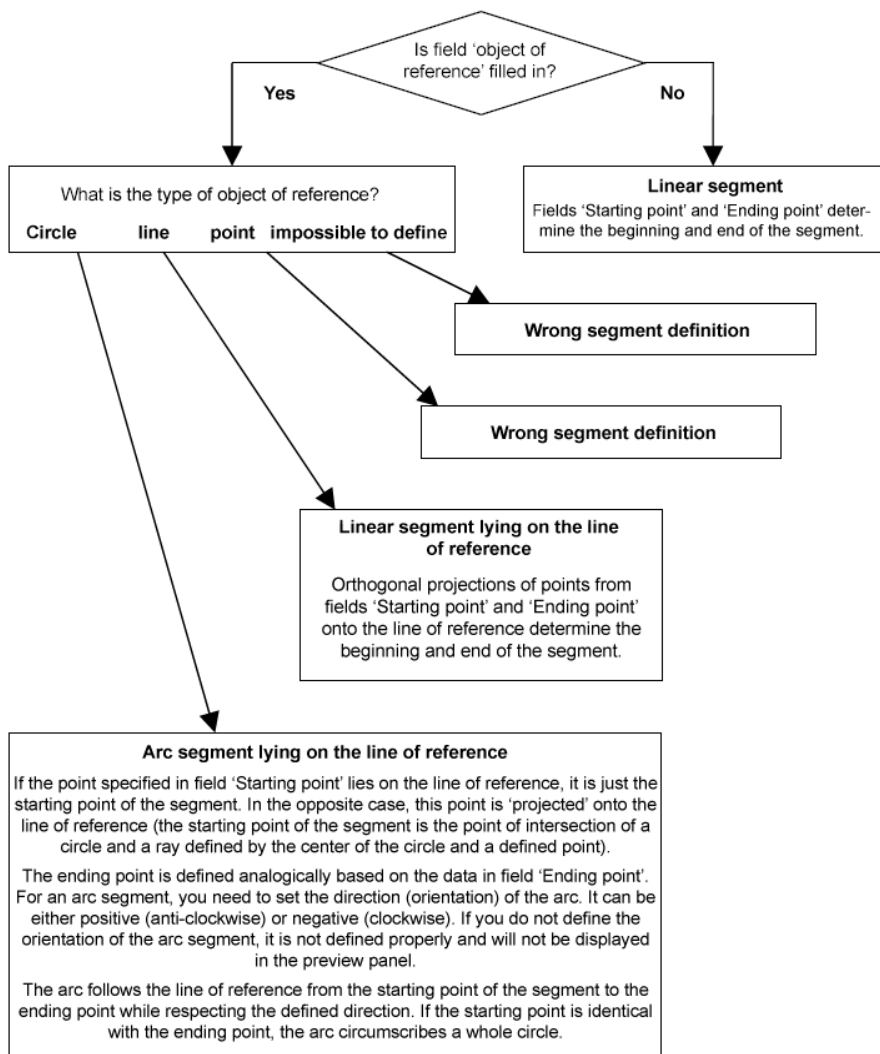


6.2.5. Bookmark Segments


Segments represent limited orientated sections of the cut path. Linear (direct) segments and segments in the shape of round arcs are supported. For each segment, there is also an additional information if the flame is switched on in the course of the movement of the cutting head and if compensation is activated (and if yes, which one).

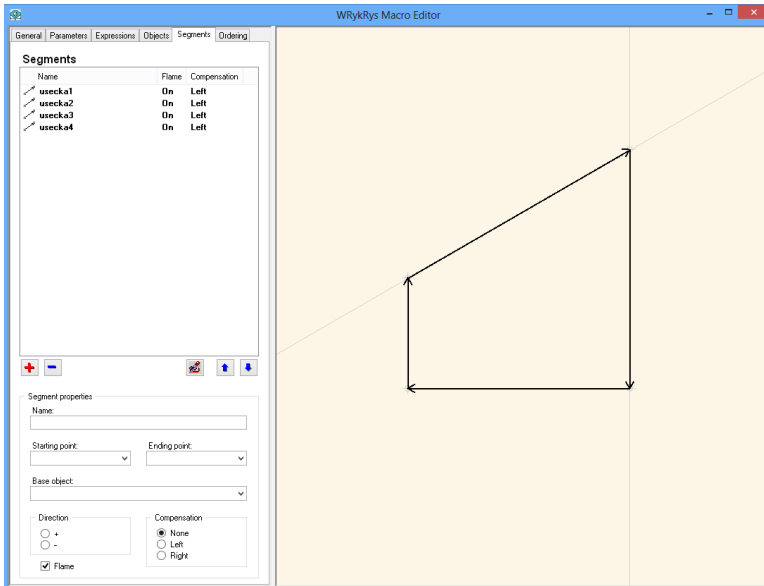
You can view all defined segments in the list in the upper part of the bookmark. The icons to the left of the segment names indicate the type of segment - if it is a linear or arc segment and in case of an arc segment, also its orientation. The list also indicates information about the flame and type of compensation used.

Properties of a marked segment are displayed in detail in the entry fields below the list where you can also modify them. The way you complete fields 'Starting point', 'Ending point' and 'Base object' defines the type and position of the final segment. The following diagram shows how the segments are interpreted depending on the way you complete these fields:



The buttons below the list of segments have analogical functions like on the previous bookmarks. You can add a new segment using button '+'. You can remove a marked segment using button '-' or move it up or down by arrow buttons.

There is a new button  that allows or forbids displaying compensation of segments in the preview. If it is up, the compensation is not displayed, if you press the button, and the other way round, the compensation display becomes activated. A segment with no compensation is shown with a grey contour around the segment, the right compensation with a narrow turquoise line to the right of the segment path and the left one with a red line to the left of the segment.




6.2.6. Bookmark Ordering


The last step of defining a macro is to determine the cutting order of the segments. By default, the cutting order is identical with the segment order in bookmark 'Segments' while all defined segments are used. But sometimes, it is useful (for example, for testing reasons, temporary modifications and the like) to have a possibility to remove a part of the segments and for the definition of the cutting path, use only a subset of the defined segments or if need be, to put this subset to an order that is different from the one that is on bookmark 'Segments'. It is this

purpose that the list on bookmark ,Ordering' is used for. If you do not modify it manually, the MacEdit application keeps it synchronised with the list of segments on bookmark ,Segments' - even in a case that you move segments on bookmark ,Segments' up or down, add new ones or remove the current ones. However, if the user modifies the cutting order of the segments manually (or if need be, their choice) on bookmark ,Ordering', this user order has priority and there is no synchronisation kept any more (only newly defined segments are added even to the list on bookmark ,Ordering').

You can handle the list on bookmark ,Ordering' in the same way as you do in preceding cases. You can add a new segment (or more precisely, reference to a segment defined on bookmark ,Segments') using button ,+' while you need to determine a name of a correctly defined existing segment. Such a segment appears in bold and in black on the list afterwards. If the segment name determined does not exist or the segment is not defined correctly, it is displayed in brown and red font. It is also possible to set the segment name interactively - it means using your mouse to select from the preview panel (which is indicated by green filling of the entry field ,Segment name' and highlighting acceptable segments in the preview).

You can remove a marked segment using button ,-' . It is necessary to say that the real definition of the segment is not removed. The segment is only removed from the cutting path of the macro, but it remains defined in a valid way and you can insert it again into the path later. You can move a marked segment in the list using arrow buttons.

The button  is intended for cutting simulation. Press this button to start the simulation in the course of which segments of the macro are marked one by one (both on the list on the bookmark and in the preview panel), which visualises the course of cutting illustratively.

The button  shows/hides the compensation of the segments in the preview. This function is identical with the same button in panel ,Segments'. Segments without compensation are displayed with a grey contour around the segment. The right compensation is shown with a narrow turquoise line to the right of the segment path and the left one with a narrow red line to the left of the segment.

When handling segments on the list (especially when removing them and when changing the cutting order), you can notice that the list reacts to the

modification required in a way different from the preceding bookmarks - before or after the segment that is being handled, the so called virtual segment appears in italics or, on the contrary, disappears. This segment is generated automatically by the application and it indicates that the segments that follow one after the other are not connected together physically (it means that the end of the preceding segment is not connected to the beginning of the following one). You cannot modify virtual segments, move them on the list, nor delete them - they are generated and calculated in a completely automatic way depending on the fact if the following segments are connected to each other physically or not. If they are not connected, a virtual segment is generated between them (which means, in practice, movement of the cutting head without the flame switched on) from the end point of the first segment to the start point of the second segment. Virtual segments are displayed in dashed line in the preview and what is more, only if bookmark ,Ordering' is activated.

6.2.7. Preview Panel

The right part of the window comprises a panel with the preview of the macro that you are constructing. Only if bookmark ,General' is activated, this panel is substituted by an imported raster image with an illustrative indication of the meaning of the macro parameters (this image also represents the macro in the list of macros of the Wrykrys program).

The macro preview displays all visual elements of the macro - it means graphic objects and segments. Graphic objects (points, lines and circles) are shown in narrow grey line. Segments are displayed in a thicker black line. If bookmark ,Ordering , is active, the drawing also shows virtual segments (which are hidden on the other bookmarks) - these are displayed in grey dashed line. If any of virtual elements is marked on the list, it is also highlighted in the preview - in a thicker brown and red line. In case of the interactive way of defining values (focus on one of the entry fields that support interactive definition), acceptable elements are shown in a thicker green line.

If you move your mouse over the preview panel, a tooltip is displayed - a small window right next to the cursor that indicates names and types of elements under the cursor point. First, the element name is mentioned, second, the type in parentheses. The following types of element are supported: point, line, circle, linear segment, arc segment, virtual segment (labelled as automatic).

You can handle the macro preview in an intuitive way while some taken actions are context-dependent - for example, when defining values into entry fields of the objects.

Use the left button of your mouse to interactively select an element from the preview on bookmarks ,Objects', ,Segments' and ,Ordering'. Entry fields that support interactive choice from the preview panel are filled in green when activated. Elements that you can insert into these fields are also highlighted in green in the preview. Just left-click on one of the highlighted elements to insert it into the entry field. If there are more acceptable elements under the mouse cursor, left-click to open a pop-up menu with a list of all acceptable elements. Afterwards, you can select an element you require from this menu.

The scroll button of the mouse has several functions. Scroll it to zoom in/out the preview (zoom). Double click with the scroll button to get automatic zoom - this modifies the macro preview in the way that the whole macro can be seen (and covers the maximum possible part of the panel). Press the scroll button and drag to move the visible part of the macro. To make it more clear, when you drag it, you can see where the visible part of the cut-out will be moved.

Right-click on the preview panel to open a context pop-up menu (but only if the cursor is placed on an element). There is always option ,Mark' an element at your disposal. All the elements that are under the cursor are mentioned and you can choose one of them to mark it. In case you need to go to another bookmark (for example, selecting a segment while bookmark ,Objects' is active), the bookmark is changed automatically as well. Depending on the fact if and which entry field is active, sometimes, option ,Mark' is completed by option ,Insert element'. If the field is intended for an element, this option contains a list of acceptable elements. If it is intended for an expression, section ,Insert element' comprises a hierarchically classified menu of all attributes that you can use. If you decide to select an attribute from the menu, it can save you the time consuming definition when using the keyboard. Even repeated insertion of attributes into one entry field is supported - the user just joins, using operators, the attributes that have been inserted one by one, or if need be, inserts them as arguments into brackets in functions. This way, it is possible to create even more complex mathematical expressions very quickly. Insertion using the context pop-up menu is supported for entry fields on all bookmarks.

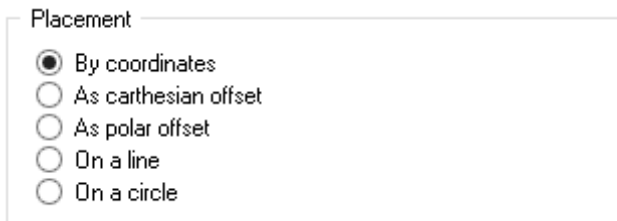
6.3. Construction of Graphic Objects

The MacEdit application offers a lot of various ways how to construct a point, line or circle. First, on bookmark ‚Objects‘, select an option how to determine every graphic object. To do so, use the switch buttons (radio buttons) within ‚Placement‘. This menu changes with every type of object (point, line, and circle). Follow the description in the following paragraphs to enter values into the entry fields that specify the object properties. Regarding the fields intended for a numeric value, you can enter not only a number there but also a name of a parameter or expression or if need be, a more complex mathematical expression. You just need to bear in mind that the physical dimensions of the result must be identical with the requested dimensions of the input. Within calculations, you can use attributes of already defined elements, which opens wide possibilities for macro definition (you can, for example, use slope of the line that has been geometrically constructed before as a tangent to the circle and the like).

It is also necessary to mention that despite the fact that a line is displayed as not orientated in the preview, internally, it is presented as orientated (i.e. with indication of the direction in which it passes). This is necessary in order to exactly specify and describe positions of other objects that depend on this line (for example, a point lying in the right half-plane towards the line, second intersection of the line with a circle and the like).

6.3.1. Points

You can determine points classically using Cartesian Coordinates, towards another point with offset (which is mentioned either in Cartesian or Polar coordinates), or using another object - a line or circle.



If you define a point using a line, there are possibilities to define the point as an intersection with another line, intersection with a circle or by defining a distance from a reference point. A point defined by a circle can be defined as an intersection with another circle or by determining an angular distance on the arc of the circle.

6.3.2. Lines

The MacEdit application enables you to define a line using six different ways. You can see them in the picture. As we have mentioned, lines have to be understood as orientated. The direction in which a line is orientated is described separately for every way of definition.

Placement

- ☒ 2 points
- ☐ Point and slope
- ☐ Point and angle to another line
- ☐ Distance from parallel line
- ☐ Point and tangent circle
- ☐ 2 tangential circles

6.3.3. Circles

You can define a circle using seven different ways. You can see them in the picture.

Placement

- ☒ Center point and radius
- ☐ Center point and point on the circle
- ☐ Center point and tangent line
- ☐ Center point and tangent circle
- ☐ 2 points on the circle and radius
- ☐ 2 intersecting lines and radius
- ☐ 2 tangent circles and radius

7. Thermosim

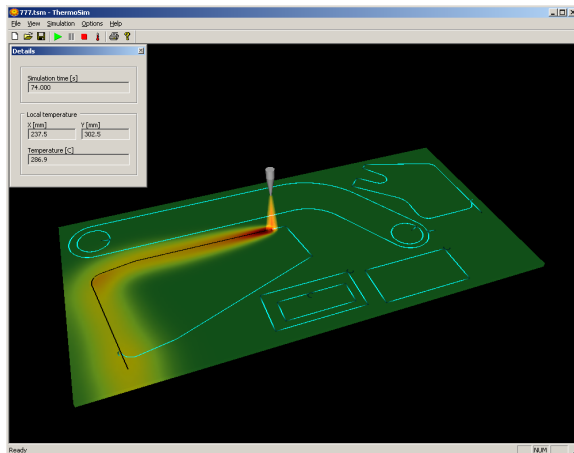
Interactive application ThermoSim is used to simulate the development of the thermal field in the course of cutting work pieces from metal sheets. The calculation is done using the method of final elements in a 2D field. The sheet is divided into elements in the shape of a cuboid with an elevation equal to the metal plate thickness and with a square base the dimensions of which you can set.

7.1. Graphic Boundary

The largest part of the application window represents a preview of the metal sheet being processed with an indicated cutting path. The already cut path is in black; the part of the path that will be cut is coloured in shades of light blue. The shade of the blue indicates the cutting speed that may, depending on the parameter setting, be lower in acute angles or arcs of a small radius. The darker is the tone, the lower is the speed.

A small dockable window ,Details‘ shows information about the simulation time and about the point on the cursor position - its position towards the lower left corner of the plate and temperature in the given place.

ThermoSim gives you two possibilities how to view the plate in process - standard mode which visualises the temperature in the given simulated moment and view of maximum temperatures which always displays maximum temperature reached in the given point in the course of the whole cutting process. You can switch between these two modes using menu ,View | Maximal temperatures view‘ or the button with a thermometer symbol on the toolbar.



You can move the view of the metal plate (classical drag & drop operation where you drag an image using the left button of your mouse), rotate it (drag & drop using the right button) or zoom it in or out (scroll button of your mouse).

Parameters of the cutting process and simulation are editable in two dockable windows 'Sheet & simulation properties' and 'Process properties'. You can display/hide the windows using appropriate commands from menu 'View'.

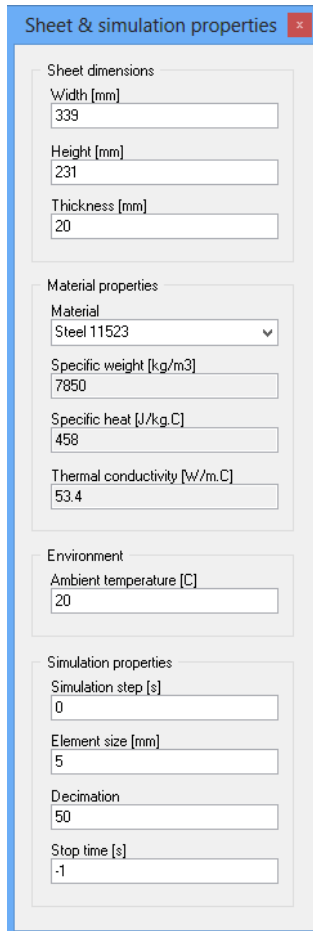
In window 'Sheet & simulation properties', you can set dimensions of the sheet in process (section 'Sheet dimensions').

Next, in section 'Material properties', set physical parameters of the metal of which the sheet is made - they comprise density (specific weight), specific heat capacity (specific heat) and thermal conductivity (thermal conductivity). You can also select material from a list of predefined material in combo 'Material'; physical parameters are set automatically afterwards.

Section 'Environment' represents the influence of the surroundings and contains only one parameter - ambient temperature.

The last section includes simulation parameters, 'Simulation properties'. The length of iteration step (simulation step) determines the interval in which individual iterations are calculated. The element size (element size) defines the side length of the square base of the elementary cuboid into which the whole sheet in process is divided in order to use calculation based on the finite element method. The shorter is the iteration step and the smaller is the element size, the more exact are the simulation results. But you need to preserve the following relationship between parameters so that the simulation is stable:

$$t_{step} < \frac{a \cdot R_{air} \cdot c_{air}}{4 \cdot FF} \approx 20,295 \cdot a$$



Sheet & simulation properties ✕

Sheet dimensions

Width [mm]
339

Height [mm]
231

Thickness [mm]
20

Material properties

Material
Steel 11523 ▼

Specific weight [kg/m3]
7850

Specific heat [J/kg.C]
458

Thermal conductivity [W/m.C]
53.4

Environment

Ambient temperature [C]
20

Simulation properties

Simulation step [s]
0

Element size [mm]
5

Decimation
50

Stop time [s]
-1

while t_{step} is simulation step
 a is element size
 R_{air} is air density
 c_{air} is air specific heat capacity
 FF is the so called 'film transfer factor' - coefficient intended for heat transfer between the metal and air (taken as a constant for the given ambience)

Parameter 'Decimation' determines the ratio between displayed iterations and iterations that will be only used internally as an intermediate result. If this value is, for example, 5, every fifth picture will be displayed (and if need be, added into the video). If you set this parameter appropriately, you can fasten the calculation and video generation process considerably.

In the last parameter, you can set simulation stop time (stop time). After this stop time has been reached, the simulation stops automatically.

In the second window with parameters - 'Process properties', you can set various parameters of the cutting process. The burn method (Burn method) determines the type of separation of workpieces. At present, there are two preset values for separation using acetylene and plasma. It is possible to specify any user type of separation, but then, you need to set parameters of the 'flame' - radius of the flame (flame radius) that transfers the workpiece heat and its calorific value (flame heating power).

In the next section, you determine cutting speed (burn speed), shift speed (movement speed) where only the head of the burner moves with the flame switched off, and time of burn ((burn-off time).

Section 'Slow down parameters' specifies to which speed to slow down (slow to) in case of passages and how far from the passage to start decelerate (length to slow). The speed of the final deceleration is given in percentage towards the cutting speed.

The last section 'Slow down' says which situations to consider as passages and so, where you need to slow down the burner speed. Among such situations, there may be either an angle that is more acute than the set limit (direction change) or an arc with a radius smaller than the set limit (tiny arcs).

Process properties

Process

Burn method
Acetylen

Flame radius [mm]
14

Flame heating power [W]
10000

Speed

Burn speed [mm/min]
700

Movement speed [mm/min]
10000

Burn-off time [s]
10

Slow down parameters

Slow to [%]
10

Length to slow [mm]
20

Slow on

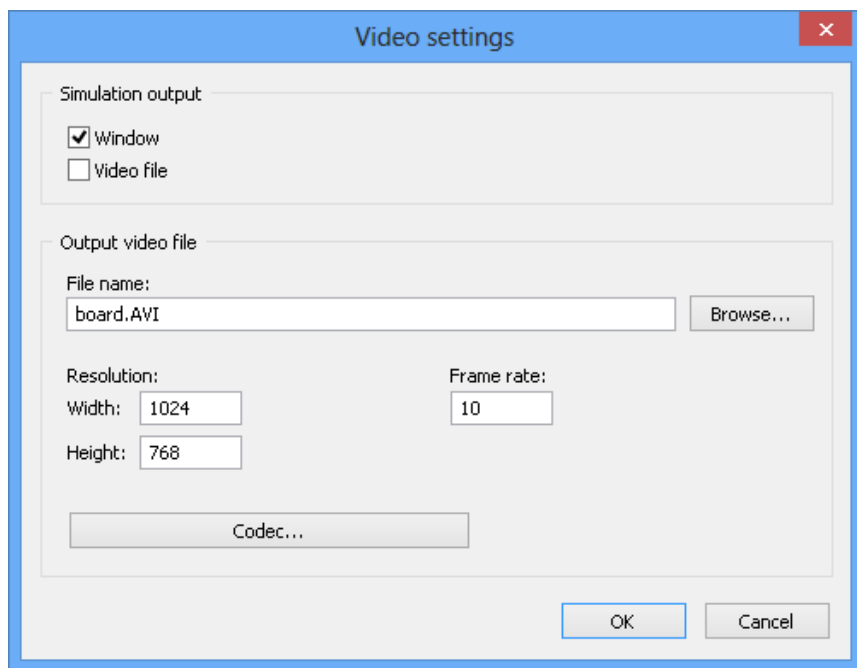
☒ Direction change
Bigger than [deg]
15

☒ Tiny arcs
Radius under [mm]
15

7.2. Video Rendering

Besides output to the window, you can redirect the simulation output to a video file. You can set parameters of the output video file in dialogue window ,Video settings' that you open from menu ,Options | Video settings'. The check boxes in section ,Simulation output' determine where to direct the simulation output. Field ,Window' is just informative; in crucial moments, drawing into the window is always performed. However, if you untick the box, you can prevent renumbering of the window after every iteration step and thus, accelerate possible video generation. A video file is only generated in case that box ,Video file' is ticked.

Lower section ,Output video file' specifies the name of the output video file (file name), video dimensions in pixels (width, height) and video play speed in pictures per second (frame rate). Last but not least, you can create and configure the codec for video compression - using button ,Codec...'.



8. Shortcut Keys

Adding Burns

- q = switches between the ways of access (line/circle)
- w = enlarging access
- e = shortening access
- r = switches between the ways of exit (line/circle)
- t = enlarging exit
- y/z = shortening exit
- u = enlarging passage
- i = shortening passage
- o = change of access direction (compensation – left or right)

Functions Intended for Handling Components on the Desktop

- a = placing on board
- s = copying designs
- d = correcting position
- f = deleting design

Switching between Cards on the Input Side Panel

- z/y = database card
- x = macros card
- c = DXF files card
- v = rests card
- b = 1-X card (if there are more configurations)

Particular elements

- Shift+A = Add element
- Shift+E = Edit element
- Shift+D = Delete element
- Shift+W = Move joins

General

- Alt+F2 = correcting particular burns
- Alt+F3 = saving to database
- Alt+F4 = exiting the program
- Alt+F5 = add burns manually to one design
- Alt+F6 = cut all burns
- 2x scroll button of the mouse or “;” = cancelling the cut-out and centring the configuration

- DELETE from the keyboard = deleting all designs from the desktop
- Ctrl+R = rotating configuration at 90°
- Alt+X = mirroring configuration about the X-axis
- Alt+arrow on the keyboard = compression in a given direction
- Alt+S = Simulation
- Shift+S = Adding stops
- Ctrl+Z = Undo
- Ctrl+Y = Redo
- Ctrl+T = Board setting
- Ctrl+Alt+T = Automatically set board dimensions according to the drawings
- Ctrl+O = Selecting actual database
- Ctrl+G = Global search
- Ctrl+F = Invoicing
- Ctrl+B = Store
- Ctrl+I = InterCad
- Ctrl+P = Print
- Ctrl+D = Database catalogue
- Ctrl+K = Drawing compensation
- Ctrl+L = Checking number of pieces
- Ctrl+N = New plate
- Ctrl+A = load all drawings from the desktop „on the cursor“
- Ctrl+C = copy the drawing „on the cursor“ to the clipboard
- Ctrl+V = load the drawing from the clipboard „on the cursor“
- Ctrl+M, Ctrl+J, Ctrl+H = select the drawing for 3D moduls
- F1 = Initiating help
- F2 = Initiating multimedia help (if at disposal) for the icon over which the cursor is placed
- F3 = InfoLocal
- F4 = switching between unfinished configurations if there are any (card ,1-X‘ on the input panel)
- F5 = switching between positions of the input panel
- F6 = ColorPlus (textures on the desktop)
- F7 = Loading DXF altogether (DXF switchboard)
- F8 = Displaying potentially dangerous edges (risking distortion), stems from function ,Control ~~, see chapter 2.12.9166
- F11 or Shift+“;“ = Check of G123 on the desktop
- Ctrl+Alt+K = Check of order and burns on the desktop

Technical support

- telephone: +420605913813 (in Czech)
- email: suchy@wrykrys.cz (in Czech and English)

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

