

Operation Manual

Trotec JobControl X

Basic, Advanced, Expert



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TROTEC cannot be held responsible for any direct or indirect damages, which result from using or working with the products electric circuits or software described herein. The apparatus must be used only by trained and skilled personnel. Before use the manual should be read and followed carefully.

Furthermore TROTEC reserves the right to change or alter any product described herein without prior notice.



In case of a failure please first check the troubleshooting guide in your operation manual. If you should not arrive at a result, please write down all data of engraver (serial number, software version, etc.) and call us from a telephone next to the switched on device.

For queries or technical problems please contact your dealer or TROTEC directly at the above address.

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1 GENERAL

1.1 Computer Requirements



The following recommendation represents the minimum requirements. When using a more powerful computer the graphics are generated and displayed faster and the computing times and the data transfer to the laser are reduced.

Please note that due to the rapid rate of change in information technology, we anticipate that hardware and software competencies will be updated on a regular basis.

- Windows 7® 32/64-bit or
Windows Vista® 32/64-bit (with Service Pack 1 or later) or
Windows XP® 32/64-bit (with Service Pack 2 or later)
Windows 8® 32/64-bit
- Microsoft® .NET framework 3.5
- Adobe® Reader 9.0 or later
- Local administrative privileges (for required software installations)
- GHz processor or faster
- GB RAM or greater (Windows 7, Windows Vista, Windows 8) or
1 GB RAM or greater (Windows XP)
- 80 GB hard drive or larger
- 1024 x 768 resolution monitor or greater
- true color graphics card (24-bit color depth)
- 2 free USB interfaces
- CD-ROM drive

1.2 Installation of the Engraver driver



The installation of the printer driver enables communication of the graphics software with the TROTEC JobControl X version (Basic, Advanced, Expert). This driver is installed automatically during the installation of JobControl X.



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1.3



Installation of Trotec JobControl X

The JobControl software serves for easy operation of your engraver. All functions of the engraver can be controlled and all settings can be performed from the computer. The permanent communication between JobControl software and engraver provides for a smooth flow of the operation process.

The following installation instructions give you a short overview over the installation of the JobControl software. For detailed instructions on the operation of Windows® please refer to the Windows® user guide.

- Start Windows®.
- Insert JobControl X Software CD into the first CD-ROM drive.
- Press "Start" and then on "Run". Press "Browse" and double-click on setup.exe. The program now starts the installation routine and copies all necessary data to the hard disk.
- This completes the installation. Keep the JobControl CD-ROM in a safe place.

1.4 JobControl Software Registration

When you launch JobControl for the first time, you will be asked to register the software.



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Software Registration

Contact your trotec dealer to apply for registration and enter the received key below.

S.N.: S4-1234

				Add key
Key	Feature	Level	valid thru	
-	View	-	-	
-	Activation Key	-	-	
-	Multi Color Option	-	-	
-	Vector ordering	-	-	

Close

In order to use JobControl you will have to enter two codes:



- View
- Activation code

To use the camera feature of JobControl (JobControl Vision) you have to enter the JobControl Vision Code.

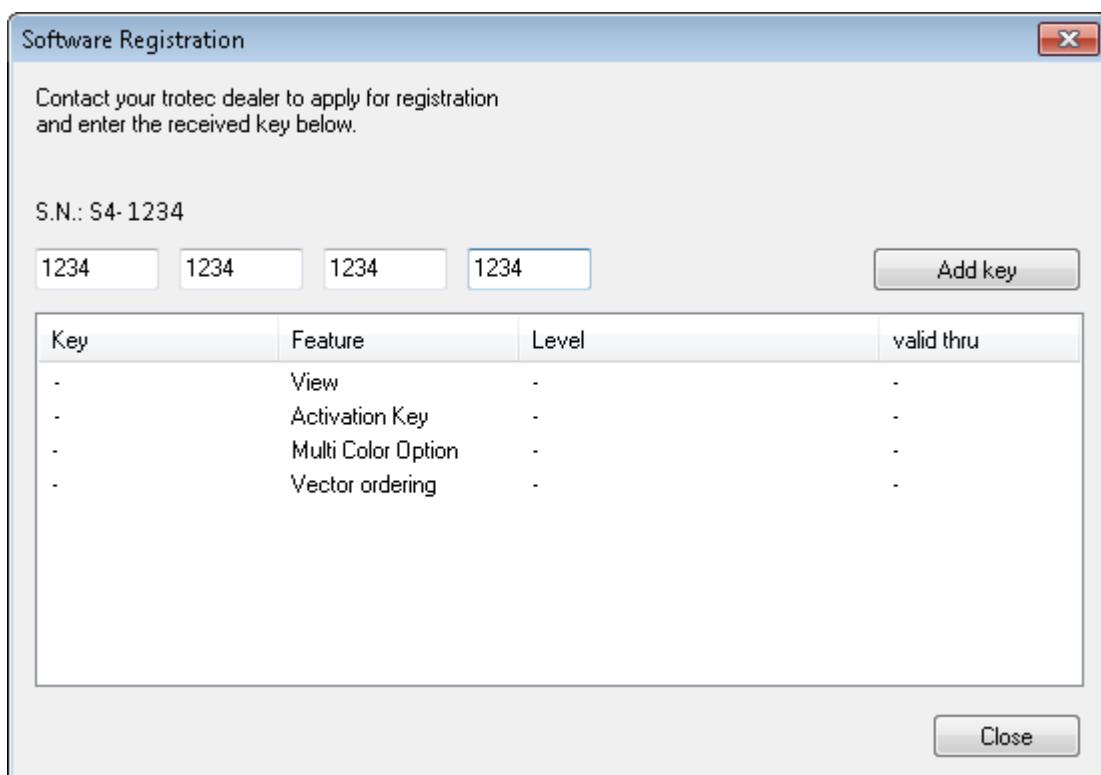
The registration codes are indicated on the document in the JobControl box delivered together with the machine:



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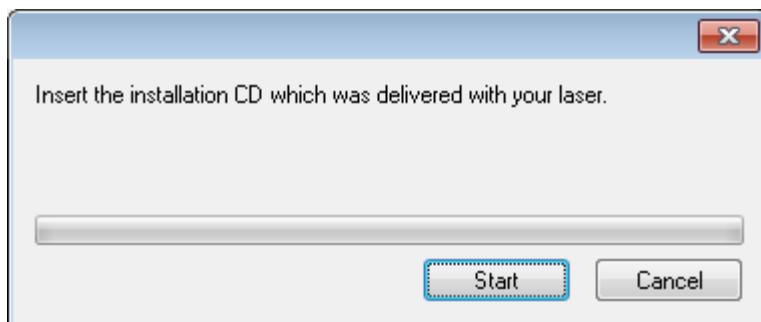
Dear customer,		
this is the software authorization code you ordered together with your Trotec laser.		
First start to install the software from the CD which came with your laser.		
Next enter the code under HELP – SOFTWARE REGISTRATION to get the features you ordered.		
Software view level:	expert	v10
LICENSE KEY: 1234123412341234		
Activation:		
LICENSE KEY: 4321432143214321		
Machine type:	8011 Speedy 300	
Serial number:	S3-2595	



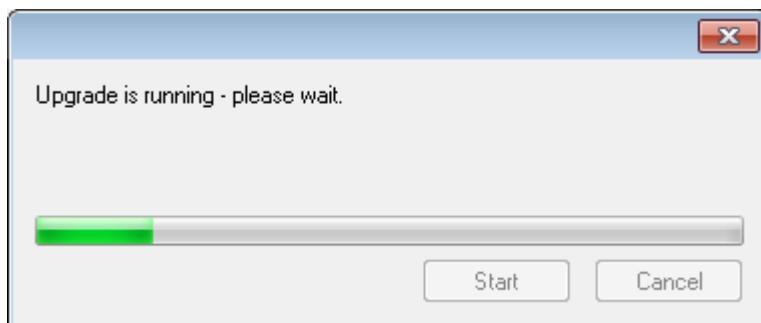
After every code entry the JobControl installation CD must be inserted and the code must be confirmed with Start.



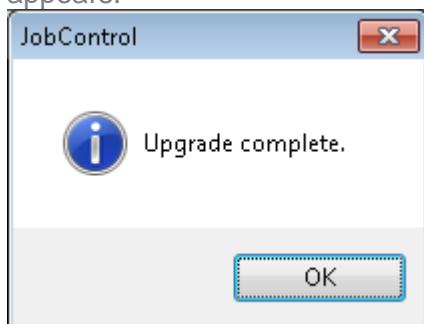
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Once the installation folder of the installation CD has been found the registration can be started by clicking on the Start button.

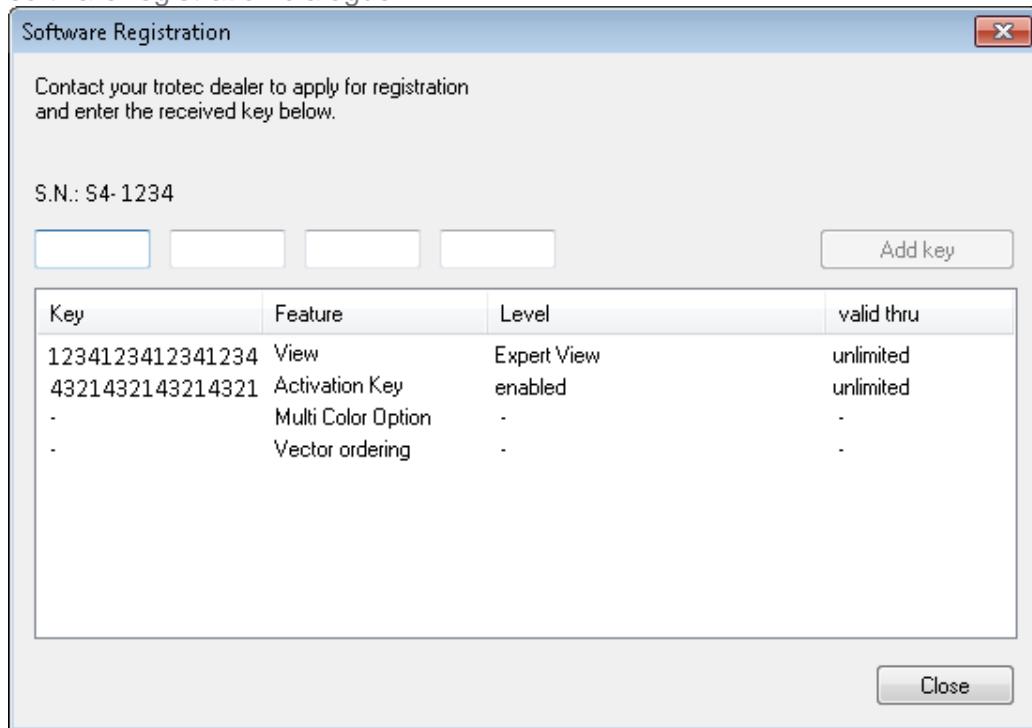


Once the registration of the feature has been finished, the following dialogue appears:



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In order to use JobControl X the code for view and activation must be entered. See software registration dialogue.



1.5 Compatibility



For smooth interaction of different Trotec software it is very important to use identical versions. The first two digits must match. Just the last version number is unimportant (X.X.X).

Example: MCI-Check 10.0.x needs JobControl 10.0.x;
JobControl 10.4.x needs Trotec Driver 10.4.x

Affected software is JobControl, Trotec Printer Driver, MCI-Check, PS2TSF-Converter and JobCreator.

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2 SOFTWARE AND OPERATION

2.1 The Software Concept

The TROTEC software package consists of two parts, the

- Trotec Driver (Engraver driver) and the
- Trotec JobControl

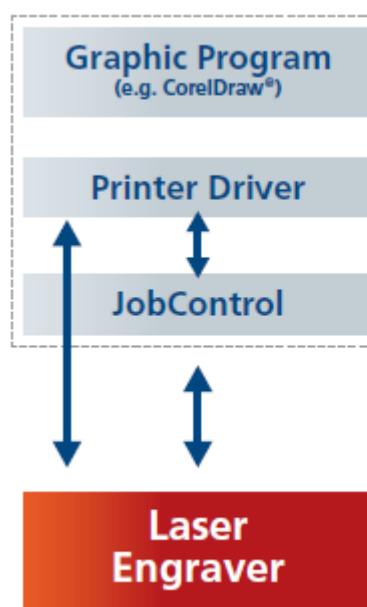


The Trotec Driver creates a printing job from any graphics program for the Trotec-JobControl. This printing job contains the graphic data with the selected resolution and also information, whether it is a rubber die or an engraving job.

In case of a rubber die the graphic data is automatically inverted and mirrored and an optimized cutting line is defined. In the engraver driver you can also select from a number of pre-defined printing templates (plates) (e.g. Stamp 4911), which essentially simplifies operation. The printer driver places the printing job (file) into a pre-defined directory, which is automatically accessed by the JobControl Manager Software.



In the Trotec JobControl the printing job is positioned on a plate and engraved with predefined material parameters. The Trotec JobControl is responsible for the control of the engraving system. With the new Trotec System you can continuously control the engraving progress and important status messages on the screen of your computer.



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2.2 Settings in the Engraver Driver - Overview

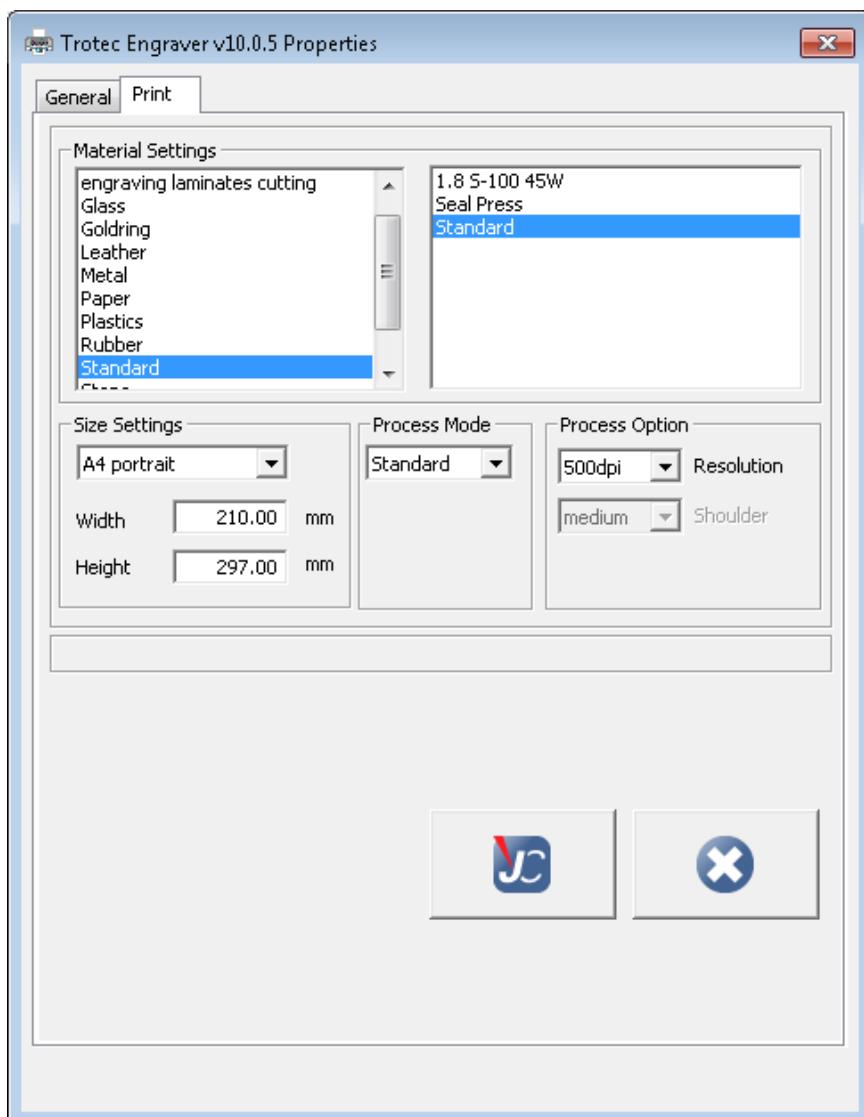
The driver “translates” the graphic into a legible file for the engraver.

File format engraver: jobname.TSF Trotec Spool File

In addition, all driver settings are saved in this file. Using this information the engraver knows how to process the job.

2.3 Overview Basic Driver

This is the basic version.



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The driver allows you to conveniently carry out the required process, process options, size and material settings all on one page.



NOTE: after printing the job the driver prints this automatically in "Quick Print" only, other sophisticated options are not included in this Version like e.g. Rotary attachment , Auto position and so on...

Process Mode and Size Settings for Basic Driver

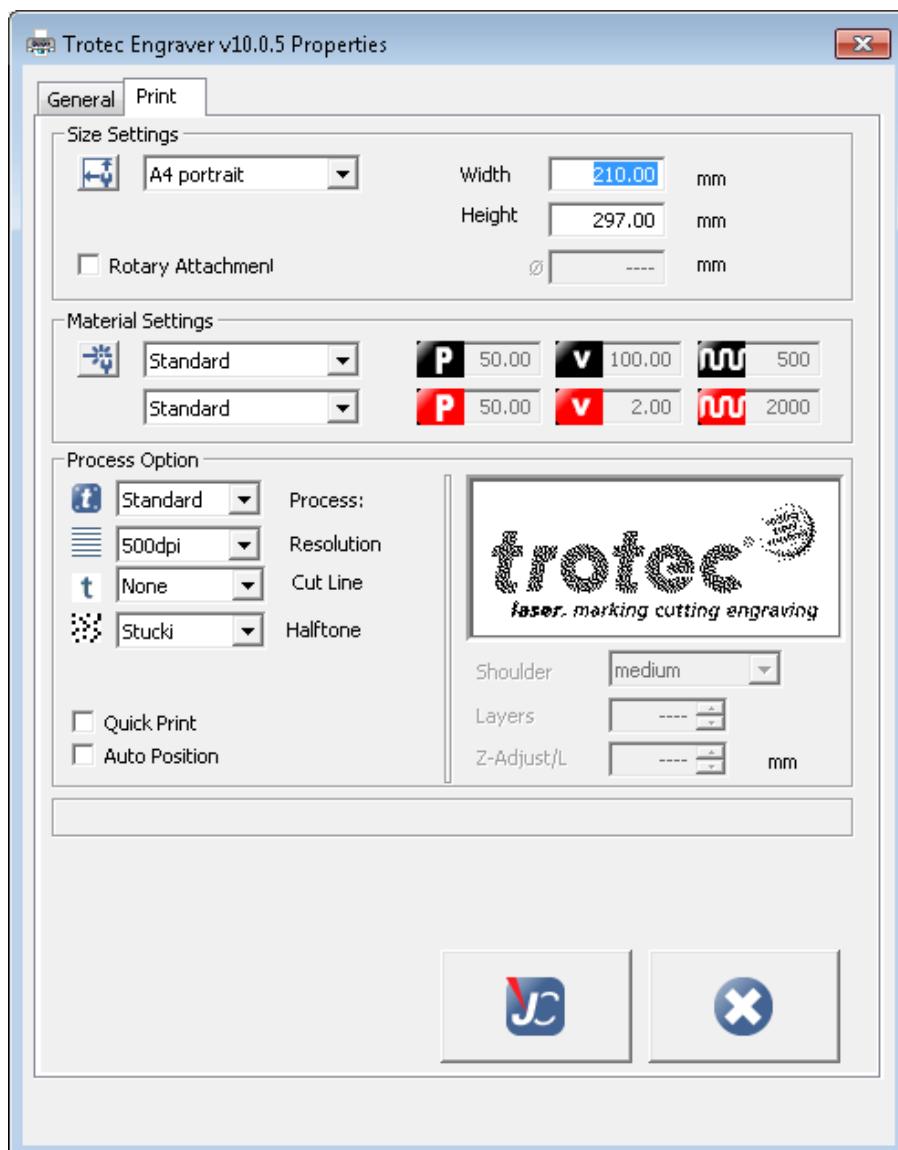
Process = the type of processing. The process selected is displayed in the form of a symbol in the driver's properties window.

Size Settings User-defined Size Width 96.00 mm Height 96.00 mm	Process Mode Standard Standard Stamp	Process Option 500dpi Resolution medium Shoulder
--	--	---

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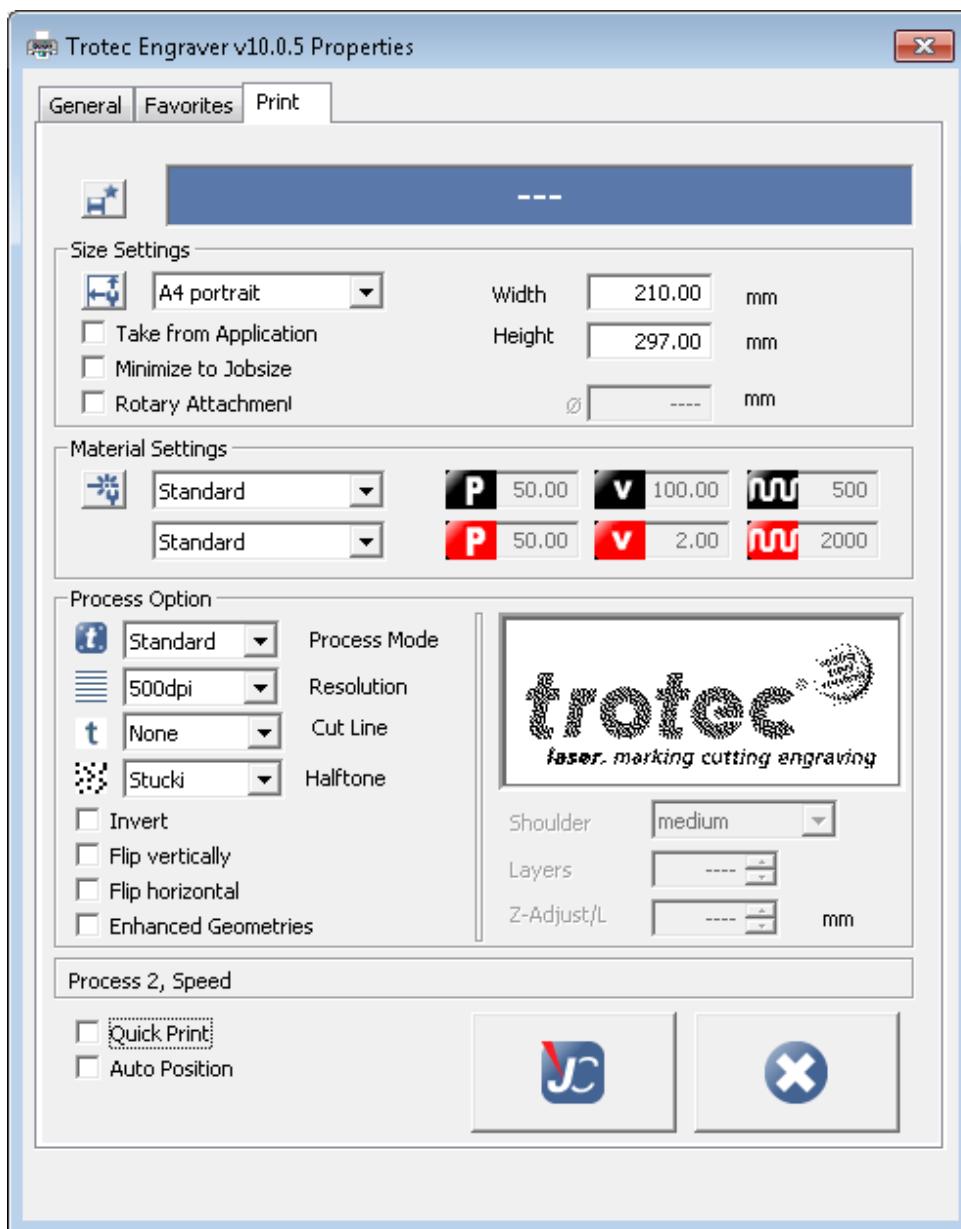
2.4 Overview Advanced Driver

This is the advanced version



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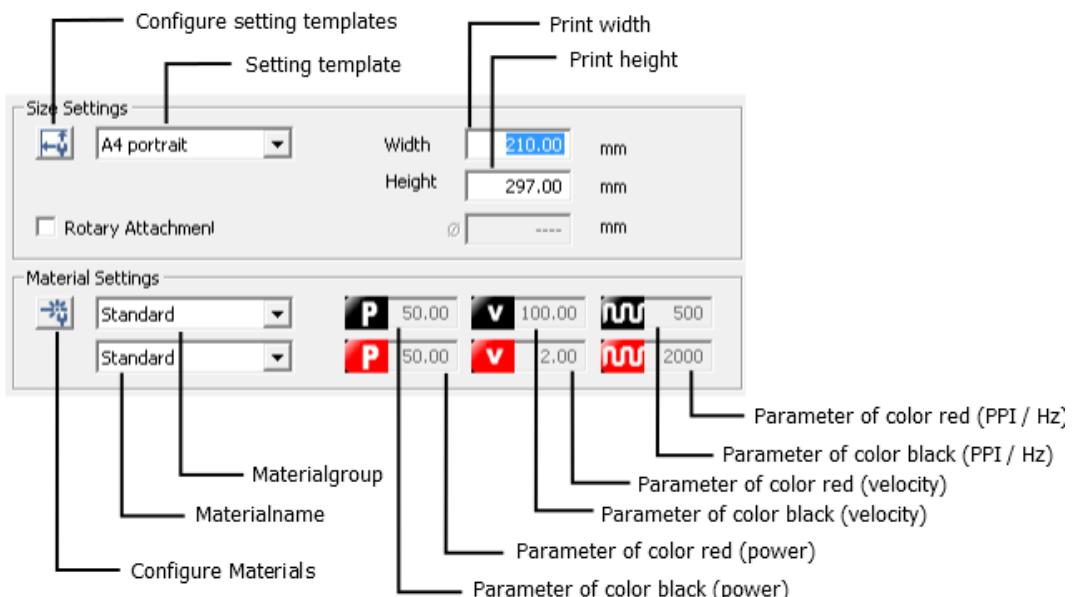
2.5 Overview Expert Driver



As above in this version we can see many sophisticated options which are not available in basic and advanced Drivers.

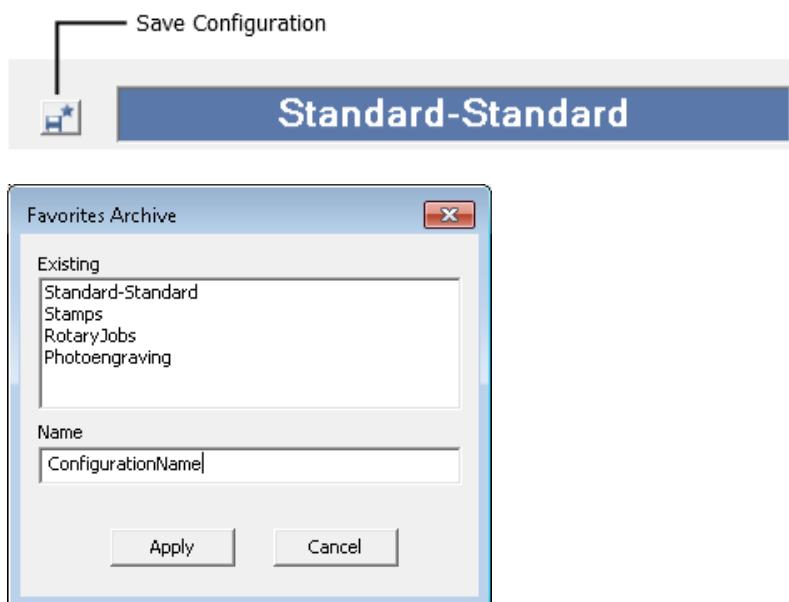
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2.5.1 Size Settings and Material Settings for Expert Driver



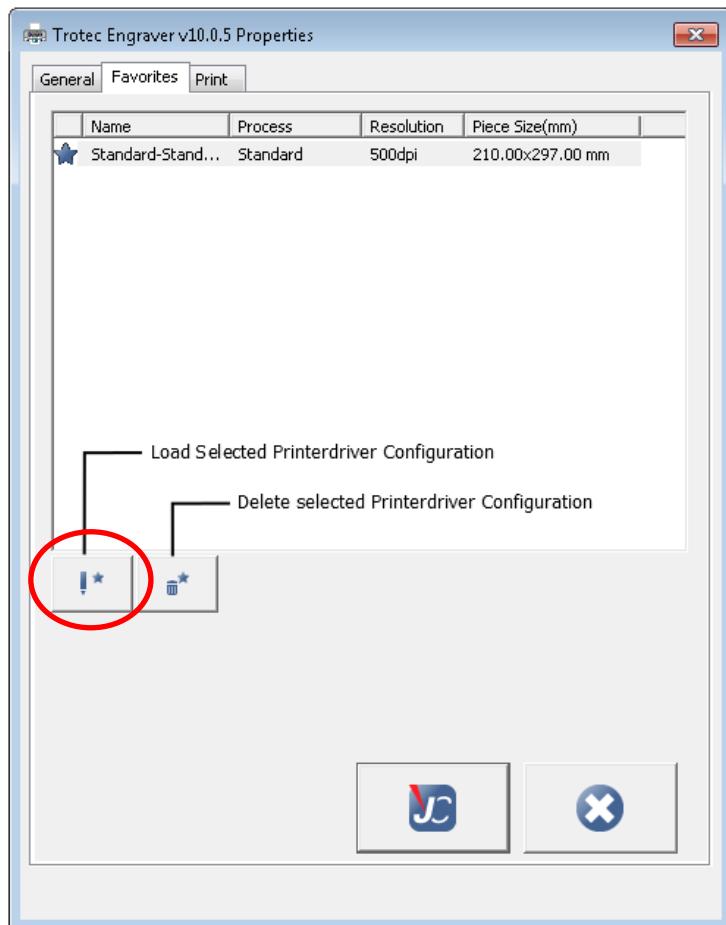
2.5.2 Favorites

It is possible to save printer driver configurations in the favorites archive.
Save printer driver configurations in the print tab.



Load printer driver configurations in the favorites tab

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2.6 Settings in the Engraver Driver – Details

2.6.1 Size Settings

The selection window allows you to open predefined size templates. This will quickly make frequently used job sizes available.

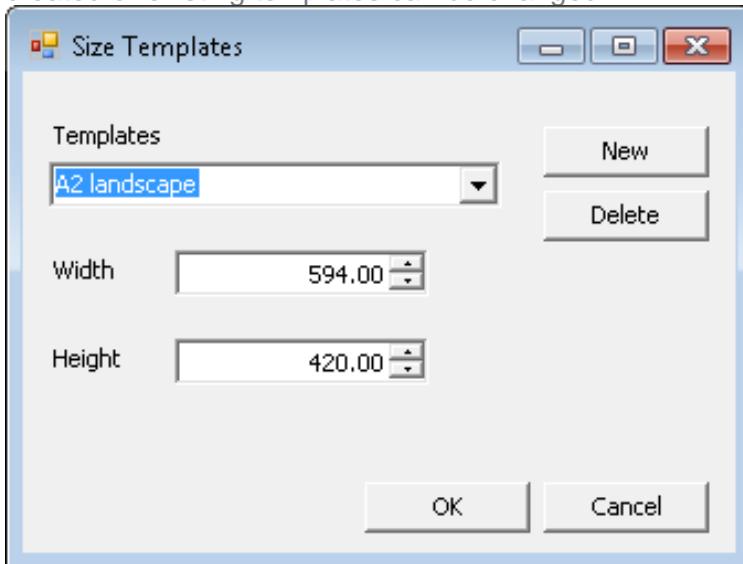


Width, Height

Dimensions of the size template currently opened are displayed either in millimeters or inches (adjustable in the JobControl options).

If the entries in these fields are manually changed, the selection window displays "user-defined-size".

The button left to the Size Templates opens the dialog where new templates can be created or existing templates can be changed.



Take from Application

Printer driver gets job size from application.

Only works with software supporting this function. (E.g. CorelDraw X5 and later versions)

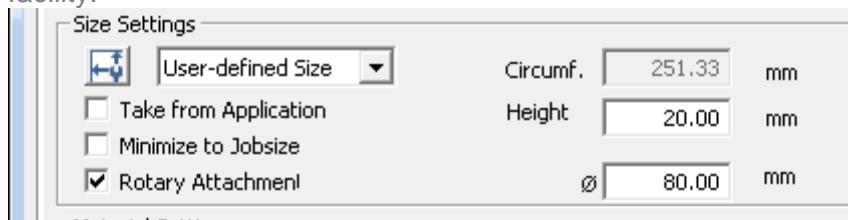
Minimize to Jobsize

Printer driver minimizes Print width and height to artwork size.

To use this feature the width and height of the predefined settings template must be larger than the artwork width and height.

Rotary Attachment

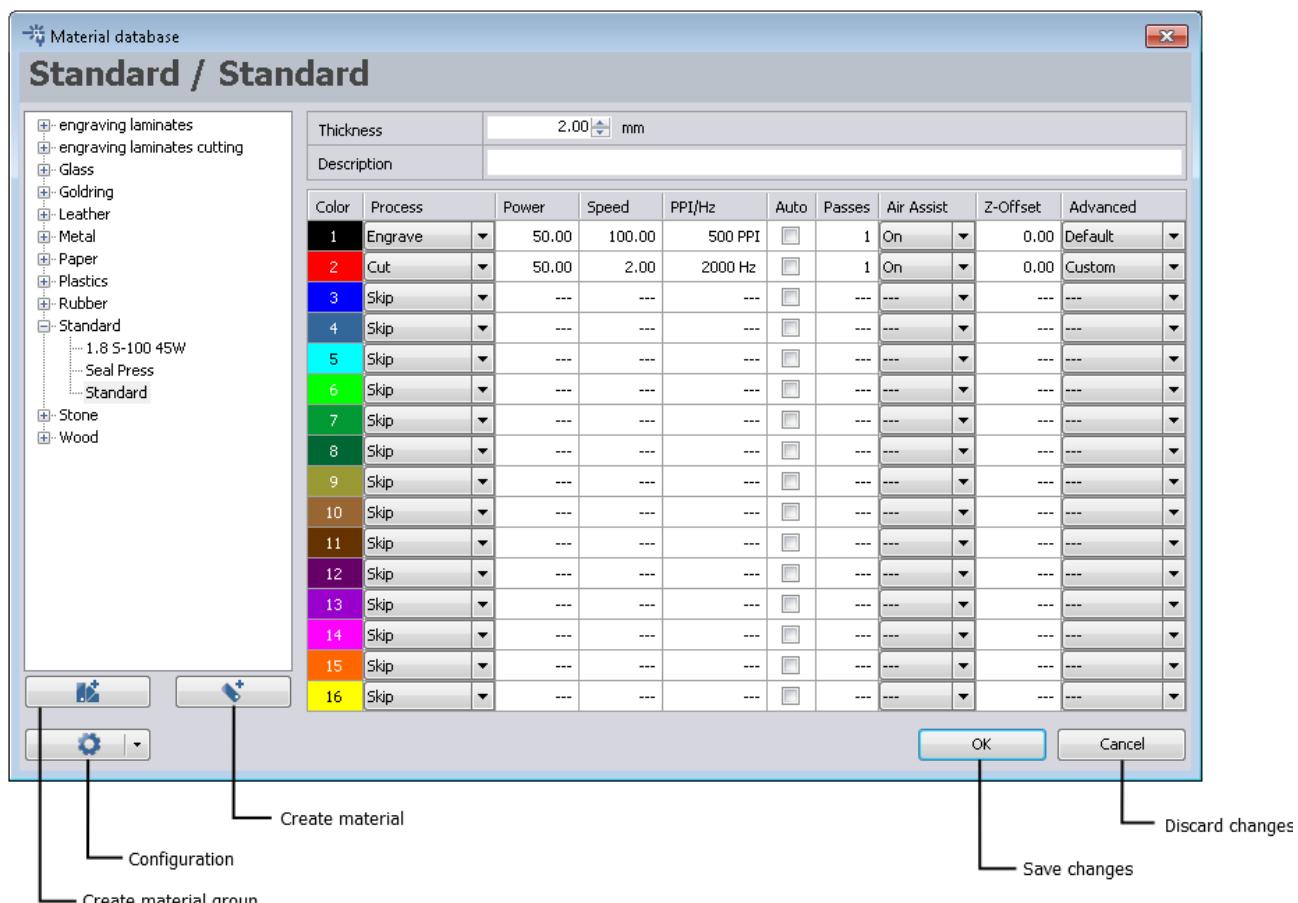
Is used to engrave cylindrical work pieces (e.g. glasses) using the rotary engraving facility.



The display of size/width is changed to circumference. The driver automatically calculates the work piece's circumference using the diameter entered and uses this circumference as new job width. This behavior is very well illustrated in the print preview of the graphics program.

2.6.2 Material Database

You can use pre-defined material settings to achieve best engraving and cutting results. Trotec supplies a large number of standard materials that can easily be updated. New can materials also be added. For a better overview, materials are clustered into material groups.



Create material group:

Add a new material group to your material database using either the create material group button, with a right mouse click or a shortcut. Give a name and hit enter. Material group is now saved and you can now add materials to this new group.

Create / rename / delete material:

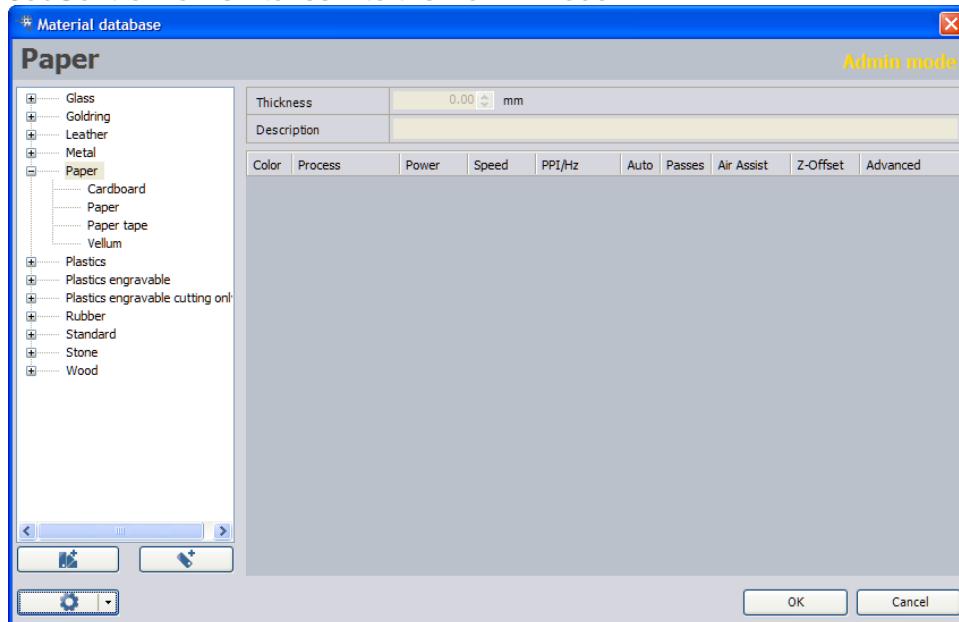
Add new materials to your material database using either the create material button, with a right mouse click or a shortcut. You can either start with a blank material page or copy – paste existing materials and change parameters afterwards.

Materials can be renamed and deleted using the right mouse click.

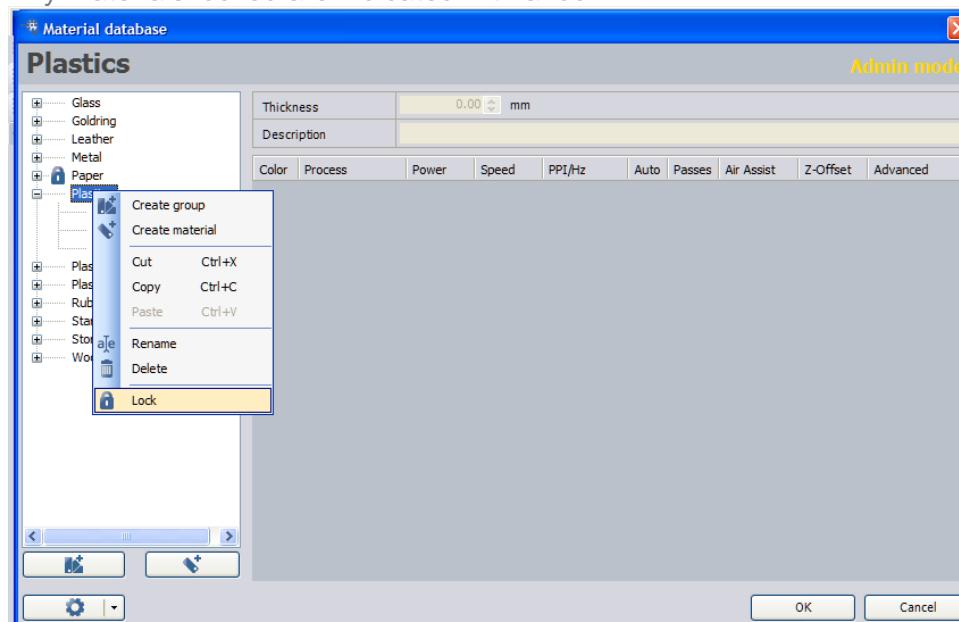


Lock material:

Materials can be prevented from changes by locking them. To do this, you must first set a master password (Configuration – Locking – Set master password). JobControl now switches into the Admin Mode.



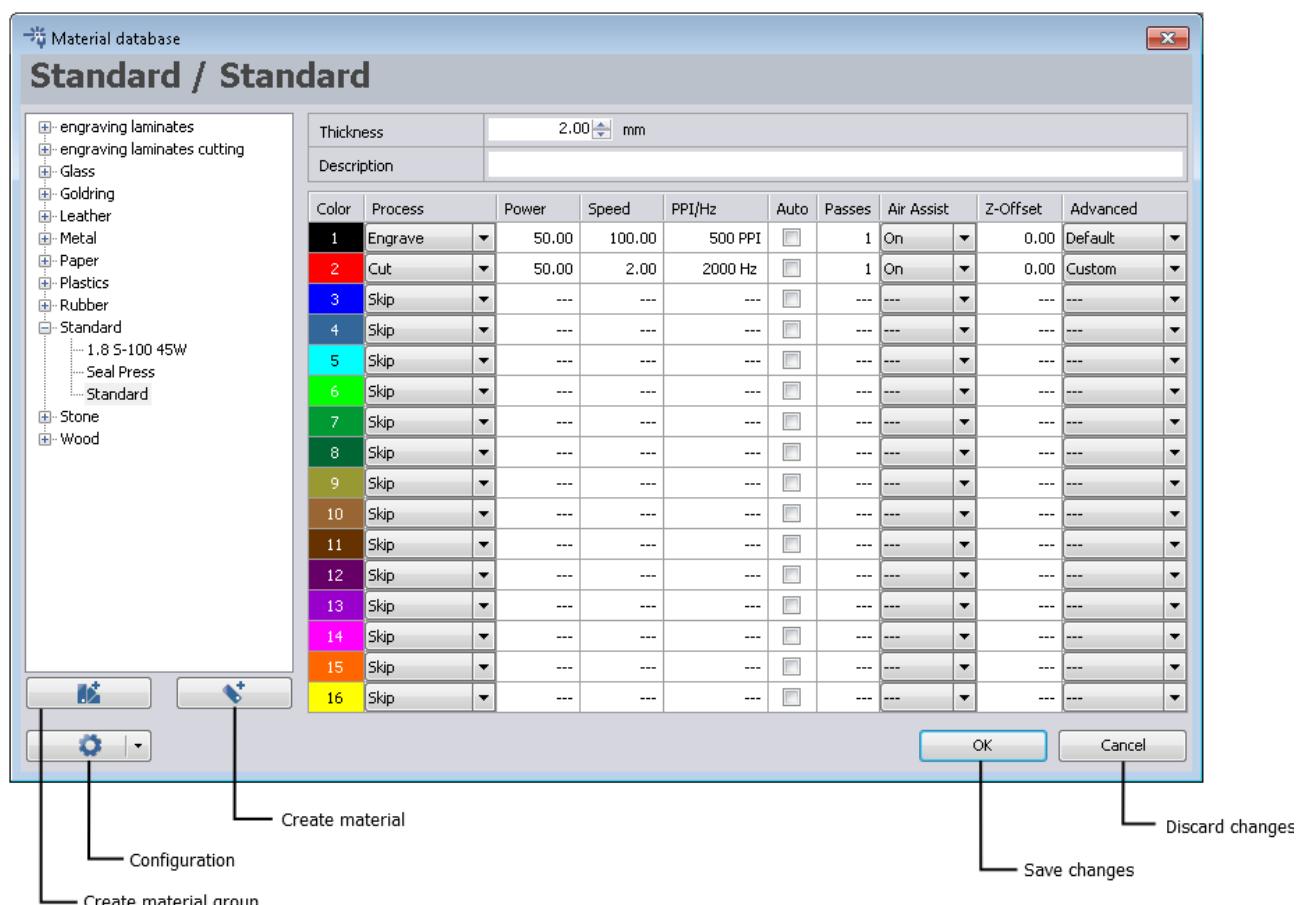
Now you can lock or unlock materials, material groups or the complete database. Any materials locked are indicated with a lock.



If requested, you can change from admin to normal mode via the material configuration button.

2.6.2.1 Material Settings

Within material database you can choose or edit material settings for different materials and applications.



Thickness

Displays the thickness of material either in millimeters or inches.

The value is used optionally to focus on the material surface via JobControl using the autofocus function

Description

If required, text may be entered for each material here, such as supplier, order number, or processing information. (Line feed using Ctrl + Enter key)

Color

There are 16 different colors available which can be adjusted for different processes with different settings.

Move with the mouse over one of the color boxes to display the RGB color components (red/green/blue) at the bottom of the color column.

In addition, a CorelDraw® color palette specifically matched for TROTEC lasers can be found on the installation CD.

By setting the appropriate parameters, an area of application can be assigned to each color, for example black for engraving bitmaps, red for cutting vectors and blue for comments.

Engraving Process Colors are done first and then Cutting Colors are executed.
Processing priority within the same process (Engraving or Cutting): Color 1 then Color 2 then Color 3...

Color	Process	Power	Speed	PPI/Hz	Auto	Passes	Air Assist	Z-Offset	Advanced
1	Engrave	50.00	100.00	500 PPI	<input type="checkbox"/>	1	On	0.00	Default
2	Cut	50.00	2.00	10000 Hz	<input type="checkbox"/>	1	On	0.00	Default
3	Engrave	10.00	1.00	500 PPI	<input type="checkbox"/>	1	Off	0.00	Default
4	Cut	5.00	10.00	10000 Hz	<input type="checkbox"/>	1	Off	0.00	Default

Example: Proceeding sequence: Black (Color 1), Blue (Color 3), Red (Color 2), Blue (Color 4)

Process

Defines, for which process mode the color is intended.

To print a job successfully, the colors have to match the needed Process type before printing the job. If the process mode is incorrect, vector data maybe interpreted as halftone data and vice versa.

To increase processing performance, skip unused colors in the material settings.

- **Engrave, Engrave CO₂, Engrave FLP, Engrave YAG**
The color displayed in this line will be engraved; e.g., fills with this color are processed line-by-line using the parameters set.
Vector objects in this color will be ignored.
For Flexx Laser Systems the name of the cut process also defines the laser source (CO₂, FLP, YAG)
- **Cut, Cut CO₂, Cut FLP, Cut YAG**
The color of this line is only for vectors - for cutting.
Vectors (line width of 0.001 mm or 0.00005 inches) drawn in this color are executed using the laser parameters set.
Fills of the same color will not be processed.
For Flexx Laser Systems the name of the cut process also defines the laser source (CO₂, FLP, YAG)
- **Positioning**
Color will be shown in the WYSIWYG view but is not going to be processed.
This works as a positioning help e.g. to draw & print object frames



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- **RegMark**

This Color defines which contours are used for regmark detection.

The regmark color has to be activated previous to the printing process of the regmark job.



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- **Skip**

Any occurrence of this color in the job will not be considered with either fills or vectors.

Power

Percentage of the maximum laser power.

The engraving depth depends basically on the laser power and speed set.

Increased power as well as decreased speed results in deeper engraving or cutting.
Adjustment range: 0-100% (100% is equivalent to the maximum power of the laser).

Speed

Percentage of the maximum speed.

Important: Cutting speed percentage relates to maximum engraving speed. This means that if your laser machine has a maximum engraving speed of 355 cm per second, setting of 1 % means 3.55 cm per second cutting speed.

PPI

Pulses per inch (laser pulses per inch).

This setting determines the number of laser pulses per inch emitted by the laser.

This occurs depending on the position, e.g. the pulses are always emitted at the same interval irrespective the speed.

Adjustment range: 500 - 1000 PPI

Auto Setting calculates optimum PPI settings automatically.



To obtain a good result, the PPI value must be usually larger than or at least the same as the dpi setting of the printer driver (Process options – Resolution), e.g. a minimum value of 500 PPI should be selected for a resolution of 500 dpi.

Unlike the resolution in dpi, increase in PPI does not have an effect on the engraving time.

Hz

Frequency of laser pulses during cutting. This setting determines the number of laser pulses per second emitted by the laser.

Adjustment range: 1000 - 60000 Hz for CO₂ systems,

10000 – 150000 Hz for YAG systems,

20000 – 80000 Hz for fiber lasers

Additionally YAG systems can use frequency mode for engraving.

Auto

Auto Setting calculates PPI or Hz Settings automatically.

Passes

This value defines how often a color will be repeated.

Repetition passes work for engraving and for cutting processes...



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Air Assist

Allows activation and deactivation of the (optional) air injection for each color separately.

Z-Offset

Controls the Z-axis (table) during processing. This allows e.g. to engrave in focus or refocus work pieces with different height Levels. At the end of processing the table is brought in the same position it was before start. Values are possible from -5 mm / -0,197" (up) to 25 mm / 0,984" (down).



In case of job abort the z-Start position could not be restored. Refocus is necessary.

Advanced



Most functions described herein can be globally set in the JobControl configuration menu. Settings in this configuration menu have priority. This means that any functions activated in the configuration menu cannot be deactivated in the advanced material settings. However, it is possible do add functions as described below.

Correction

Determines the minimum percentage of laser power of the selected laser power which is set during slow movement; for example around curves in vector mode or acceleration phase during engraving mode.

Vector mode:

If the setting of this value is too small, the lines will thin at the ends and in the radius or disappear completely. If the selected correction is too high, the width will strongly increase at the line ends and radius.

Engraving mode (Firmware > 10.09 is necessary):

If the setting of this value is too small, the borders of the engraved image disappear or get less ablated because of material or laser nonlinearity.

If the selected correction is too high, the borders of the engraved image get more ablated then the center of the image.

First step before using correction value is to identify correct power value:

- Start with correction value zero.
- Choose the engraving width that maximum velocity is reached. Engraving width should be more than 400 mm when velocity is 100 percent.



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- Adjust the correction value until the desired appearance is constant over the full engraving width. Correction value 15 is a good choice very often.

Links

Activates the link function for the used color. If links are activated globally in JobControl configuration menu this setting is ignored.

Links are small uncutted bridges between cutlines which prevent the work piece from falling through the work plate. Links are mostly used for cut lines for rubber stamps. General link settings can be defined in JobControl configuration menu.

IPC – Intelligent Path Control

IPC optimizes acceleration and velocity settings of cutting processes in case of performance and quality. IPC does not have any effect for engraving processes. IPC can be adjusted for best speed or best accuracy.



IPC needs perfectly adjusted correction value settings to avoid decreased laser power during vector acceleration phase.

High Quality

Color is processed with high quality mode which means every engraving line has the same length. This setting can lead to significantly increased processing time.

Raster Correction

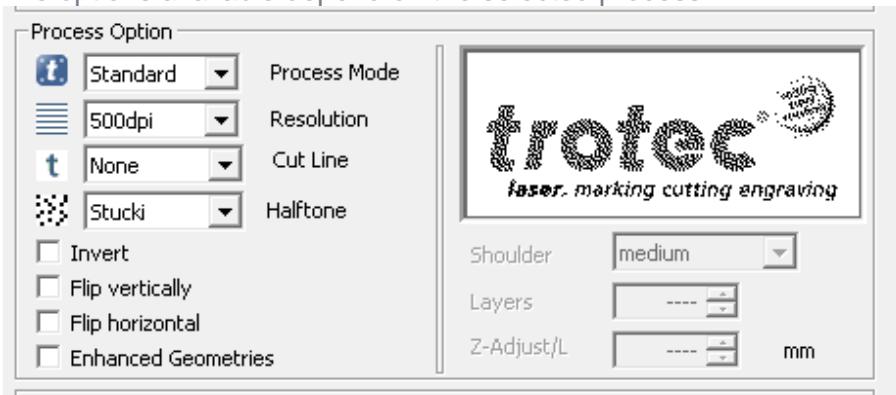
Improves quality of engraving processes.



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2.6.3 Process Options

The options available depend on the selected process.



Process Mode

Standard



Is used for a large number of engraving and cutting jobs. Depending on the material settings (see 2.6.2.1) and process options used, one or several design colors may be used for engraving or cutting.

Stamp



Is used for creating stamp text plates mainly made of laser engravable rubber materials. The data is automatically mirrored and inverted as it is required for the production of stamps. In general, black is the recommended

design color for this processing. When using color or gray-scale graphics, an automatic raster (conversion into black-and-white graphics) is performed. The engraving color in the stamp process is always black! Depending on the material settings (see 2.6.2.1) used, any color is allowed for the cutting lines.

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Relief



automatically converted to gray-scale images during printing.

This process is used for the creation of three-dimensional effects and requires preferably softer materials (e.g. soft wood) allowing high material removal in one pass.

This type of processing controls the laser power depending on the gray-scale value of the graphic. This means, white is processed without power, light areas with low power, dark areas with increased power and black with fully set power. This requires an 8-bit gray-scale graphic (256 gray scale). Color images are

Layer



are then engraved in the appropriate passes (alternating engraving in X and Y direction). The gray-scale value and the passes determine how often a certain dot is engraved.

In addition a z advance (table height adjustment) may be entered in the process options. This z advance of 0.00 to 5.00 mm (0.000 – 0.196 inch) moves the processing table upwards between the engraving passes in order to maintain the correct focus.

This processing method allows three-dimensional engravings with particularly large height variation to be obtained.

With the layer process type, gray-scale graphics are engraved in several passes. The number of passes can be set in the range from 2 to 255 in the JobControl configuration menu. When using this process, the existing gray-scale is divided into the number of passes defined. The gray-scale values

Photo optimized

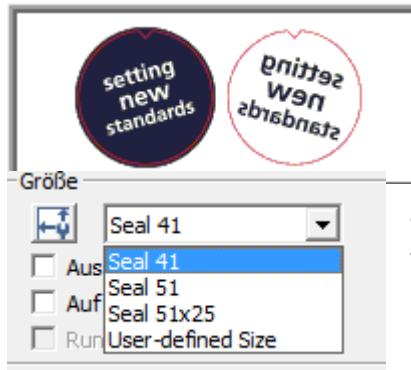


With the photo optimized processing type, high resolution images or photos are printed with special settings to reach maximum quality. Keep in mind that Photo optimized jobs are always processed in high quality mode.

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Seal



This type of processing is used for seal processing.

The grammage of the paper can be chosen.

The most common seal templates are predefined with 41x41, 51x51 and 51x25. If one of them is used the seal cutline is generated automatically.

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Resolution

Selection of the required resolution in dpi (dots per inch). Equivalent to the lines to be engraved per inch (25.4 mm).

A higher value improves the engraving quality, but results in increased engraving depth and longer engraving time using otherwise identical parameters as the laser has to process accordingly more lines.

Setting range: 125, 250, 333, 500, 600, or 1000 dpi



The setting for standard engraving should be 500 dpi. The resolution to be selected largely depends on the material used as well as on the focal length of the lens.

Cut Line

Selection of automatically created cutting lines.

The type of the selected automatic cutting line is displayed as a symbol in the preview.



None – no automatic cutting line will be created



Rectangular – a cutting line will be created which follows exactly the job margin (size)



Circular – a circular cutting line will be created whose size is determined by the job size



Optimized – a cutting line will be created which adjusts to the contour of engraving contents

Automatically created cutting lines are always generated in red (second color in the Material menu; R=255, G=0, B=0). When using automatic cutting lines, please ensure that the activated cutting color is red and has the appropriate parameters.



Automatically created cutting lines have no effect on manual cutting lines (vectors) which may exist in the file.
E.g. automatic and manual cutting lines may be used together or separately.



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If automatic and manual cutting lines are used together in the same job, the user should consider this when creating the graphics. Undesired overlapping of both cutting line types may occur.

The Cut Line: None driver setting does not suppress manually created cutting lines.

Halftone

Halftone = Conversion of gray-scale or color images into black-and-white images creating the impression of a gray-scale image through different dot sizes and dot pitches.

Halftone is not available in Relief and Layer processing types as these processes require gray-scale graphics and therefore halftoning is not desirable.

Ordered Dithering

Standard halftone setting, soft contrasts between the brightness gradients

Stucki, Jarvis, Floyd Steinberg

Advanced Dithering algorithms for photo engraving

Color

Deactivates halftoning by the driver.

Is used when several engraving colors are to be employed or halftoning has already been performed in the application program.

“Color” is not available in the Stamp Mode as black-and-white graphics are always required for creating stamps.

Black & White

Threshold level is used to decide if printed pixel will get black or white.

Invert

Inverts all colors in the printed image

Flip vertically

Flips the printed image vertically

Flip horizontally

Flips the printed image horizontally

Enhanced geometries

Vector data of the printed job contains vectors and arcs which improves the accuracy of round contours significantly. The drawing application has to provide Bezier curve output for the printer driver to use this feature.

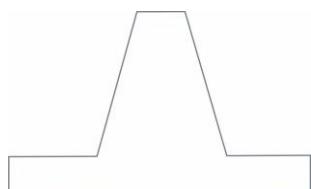


This feature is activated automatically when printing regmark jobs.
(JobControl.Vision)



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Shoulder



Only activated in the Stamp process.
 The available options of shoulder types are steep, medium, flat and other, user definable, shoulder settings.
 Shoulders are used to give letters and characters of a stamp text plate more stability at the base (see graphic on the left)

Layers

Only activated in the Layer process.

The number of engraving layers required (engraving passes) can be set between 2 and 255 in this field.

z-adjust/L

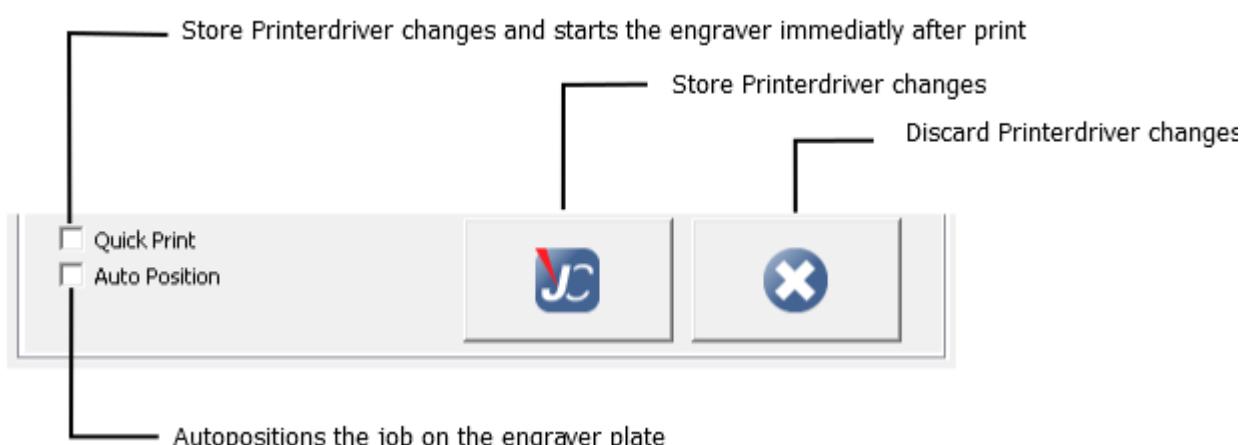
Only activated in the Layer process.

Entry of the up movement of the table carried out once a layer is finished. Setting range: 0.00 to 5.00 mm (0.000 to 0.196 inch).

2.6.4 Control Functions

Auto Position

Jobs, which were printed with Auto Position, are automatically positioned on the plate in the JobControl. Any further Auto Position job will be added onto the plate to the next free space. This function is used to load the plate for later processing.



Quick Print

If you select the Quick Print check box, jobs will be printed without job name and job number query, automatically positioned on the plate in the JobControl and the engraver will start. The job will be deleted once the engraving is completed.

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setting
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standards

This allows a largely automated manufacturing process and reduces the required user actions to a minimum.



If engraver is not turned on, it is not possible to automatically process a Quick Print job. The job will be put into the job queue.



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**Store Printer driver changes**

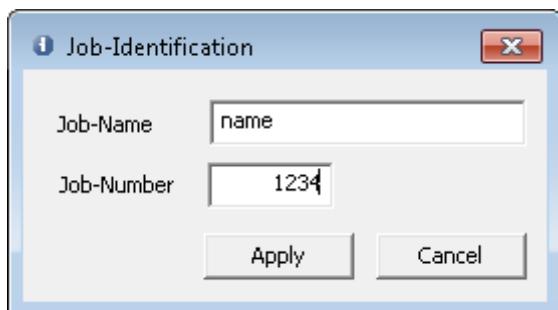
Confirms and saves changes for further use.

Discard Printer driver changes

Discards all changes and exits from the printer driver.



A job name and an optional job number must be entered at the end of the print settings. < > “ / ? | ; \ : must not be used in the job name. The job created will be saved with this name and number and copied to the JobControl where it will be displayed in the queue.



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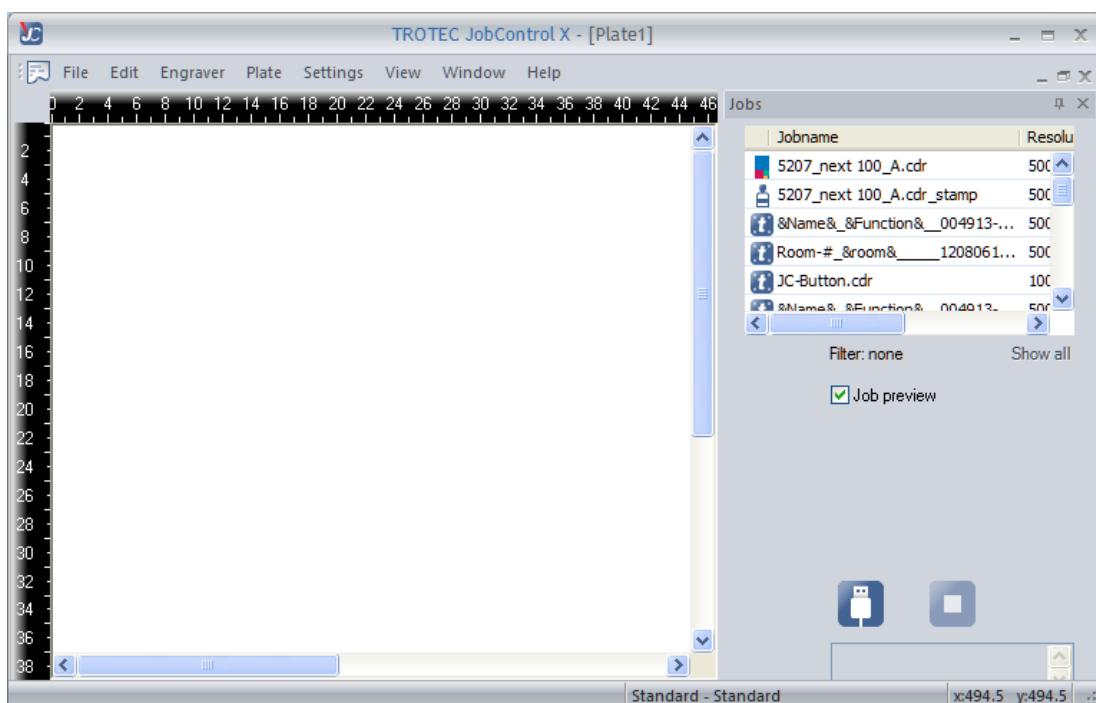
2.7 Using Trotec JobControl

2.7.1 Overview JobControl

Trotec JobControl X has three different versions (Basic, Advanced, Expert).
The TROTEC JobControl carries out the following main tasks:

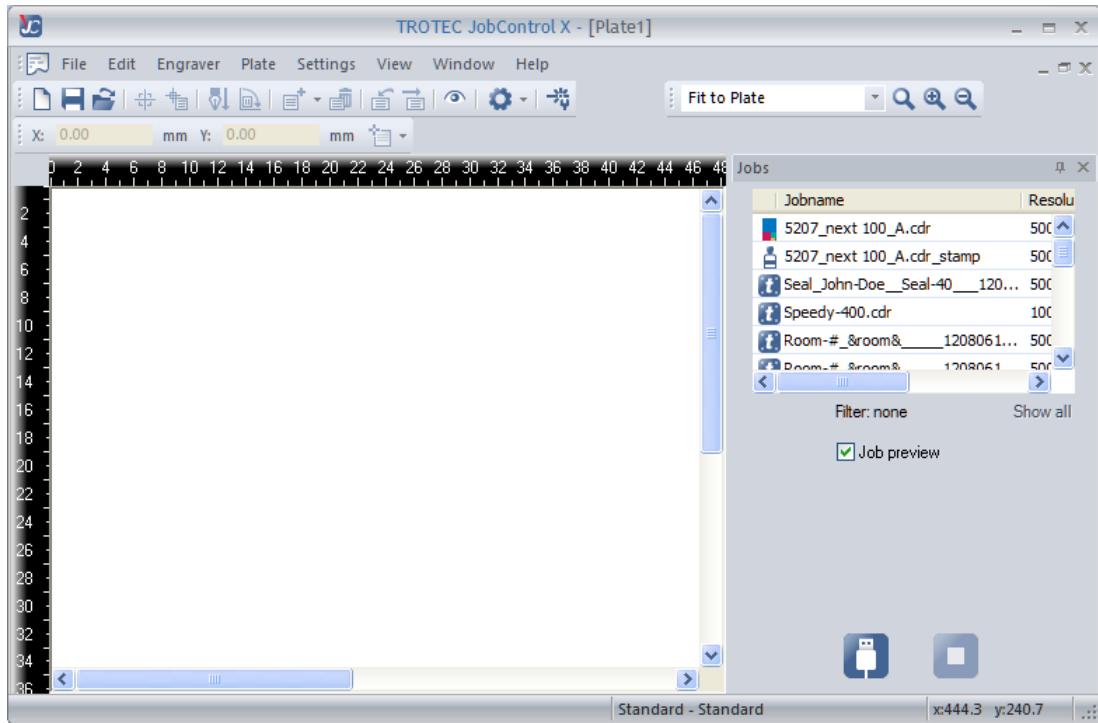
- Managing the jobs created by the driver
- Precise positioning of the jobs
- Transferring the jobs to the engraver
- Visualizing responses from the engraver
- Acquiring job and engraver data
- Controlling the engraver parameters
- Managing the material templates
- Archiving engraving jobs

This is Trotec JobControl X in **Basic** view Version:

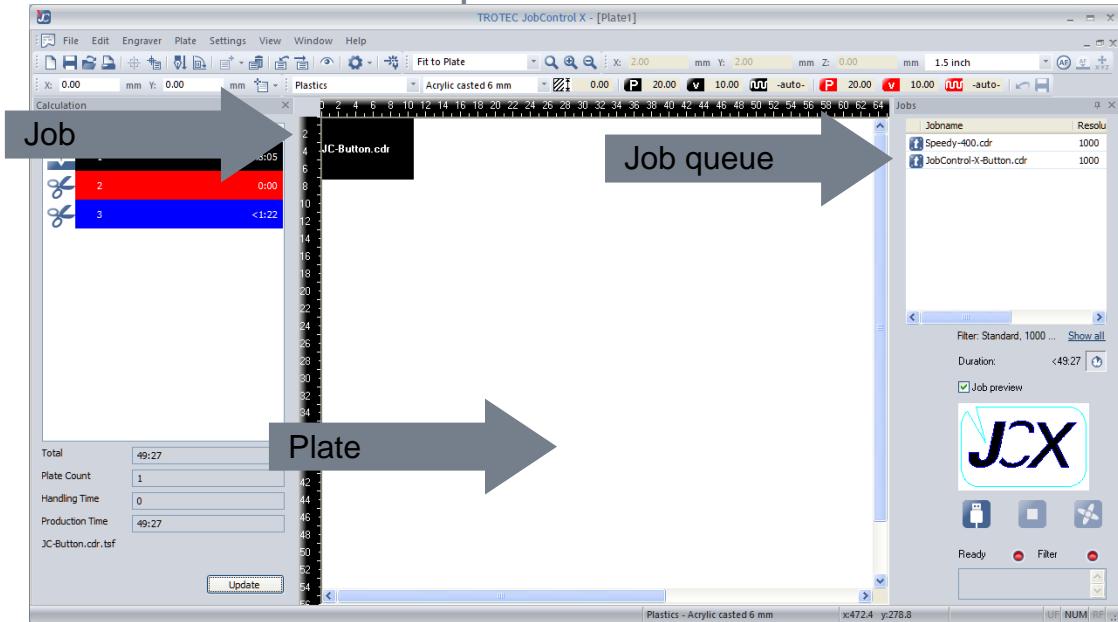


setting
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This is Trotec JobControl X in the **Advanced** view Version:



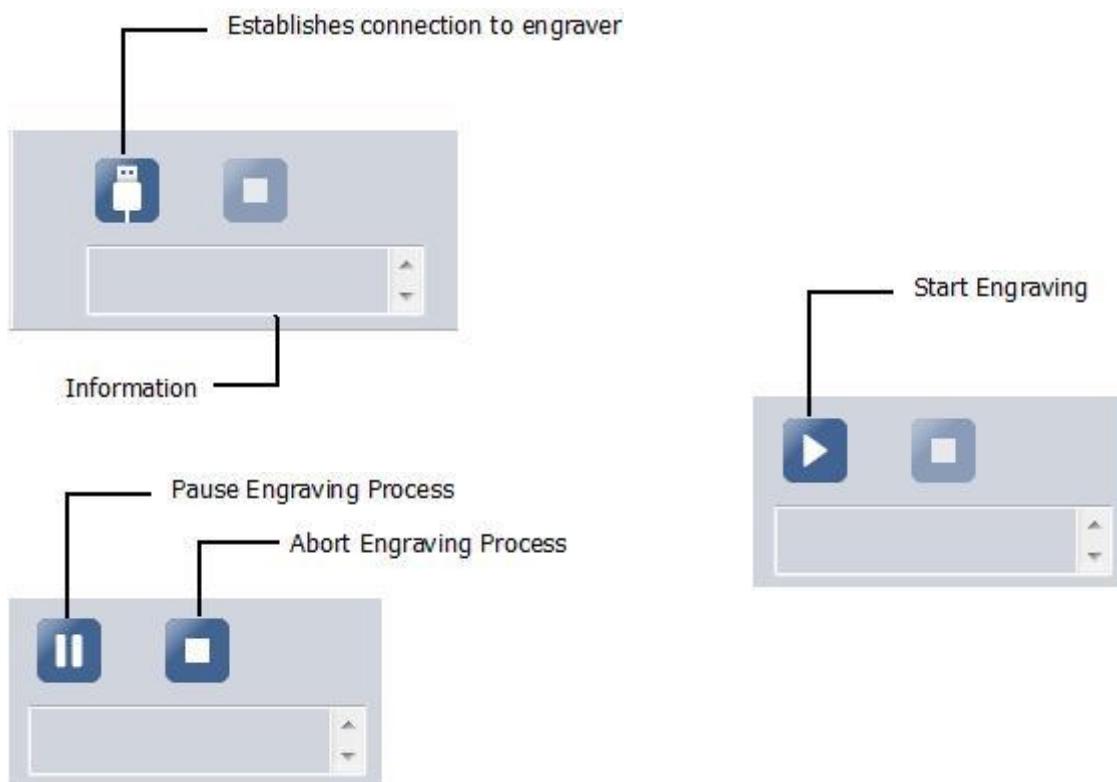
This is Trotec JobControl X in **Expert** view Version:



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2.7.2 General Engraver Control Functions

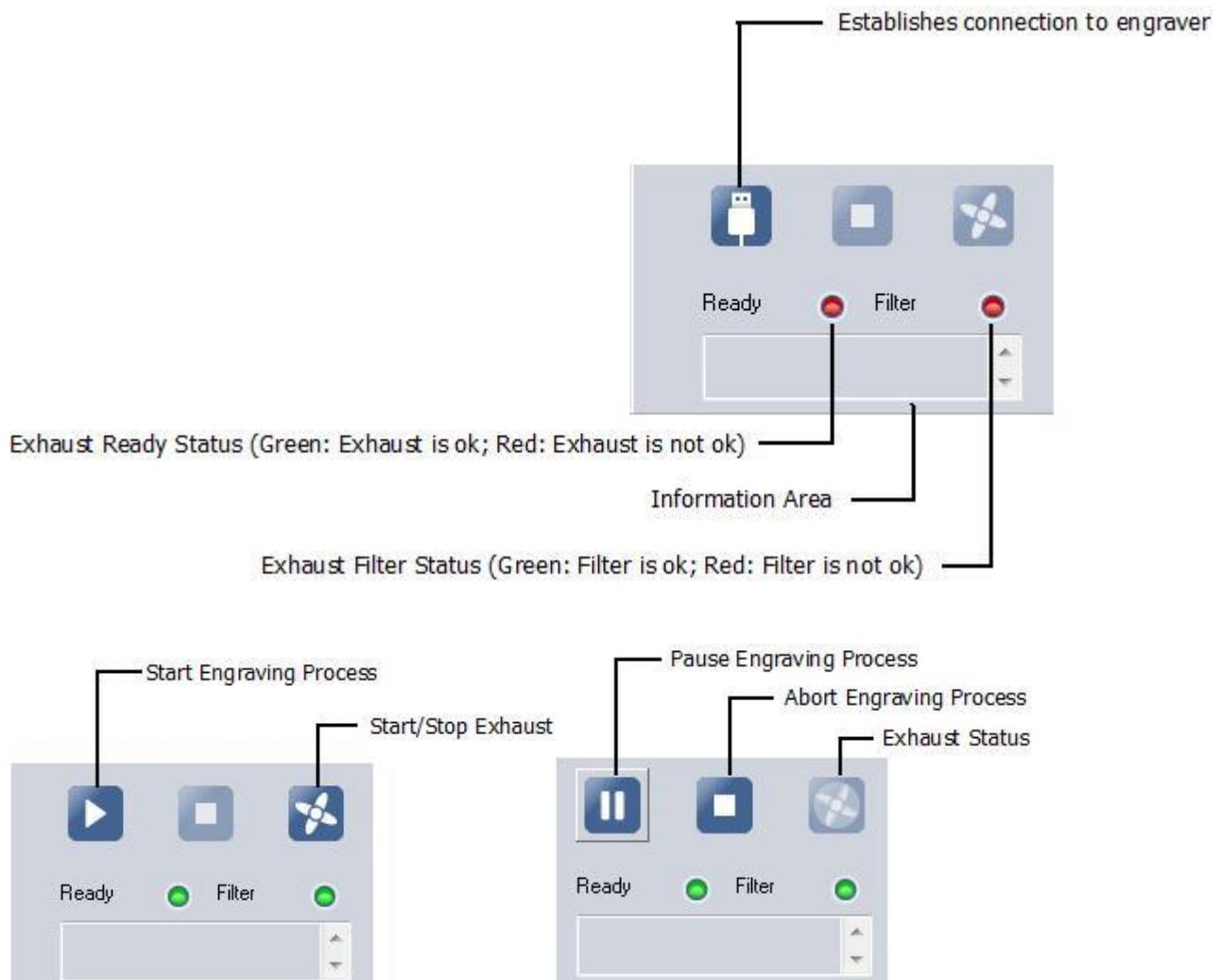
Engraver Control (for Basic, Advanced)



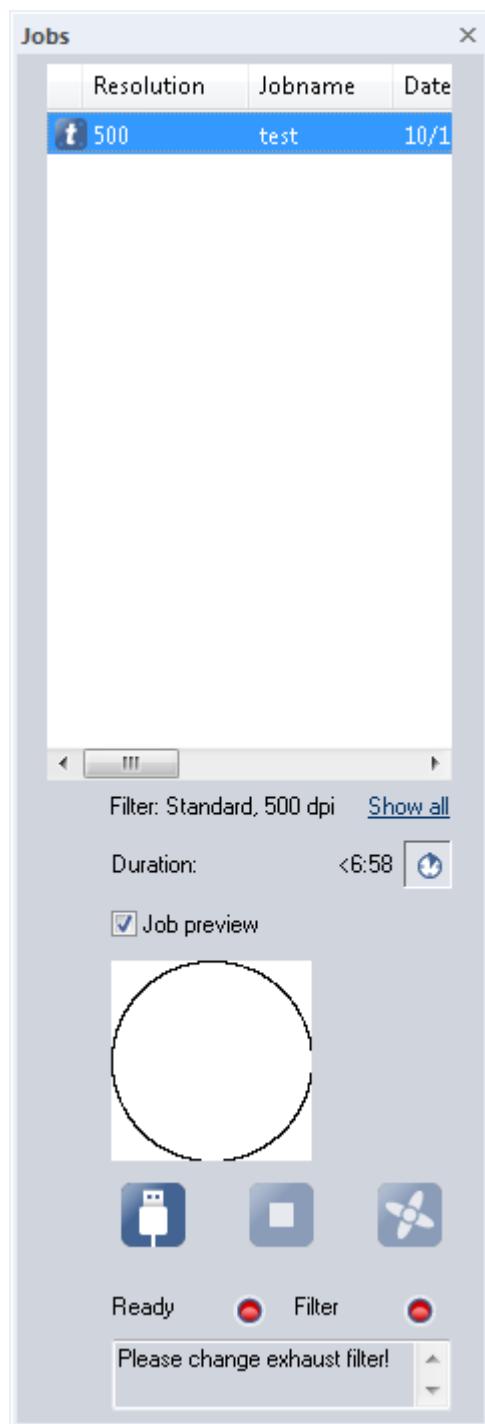
Engraver Control (for Expert)

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Job Preview (for Basic, Advanced, Expert)



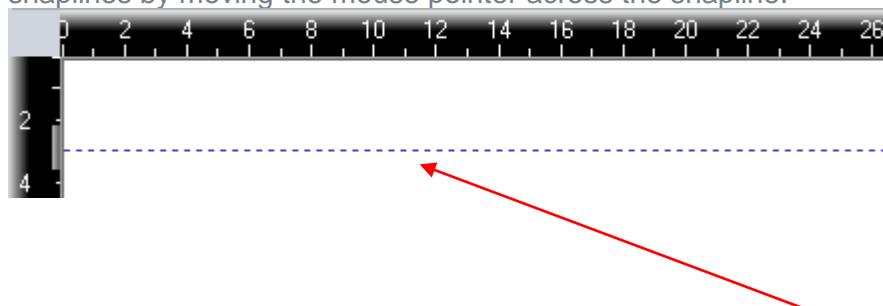
Checkbox and frame for showing a small picture of the above or on plate selected job.

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Drag snaplines (for Expert):

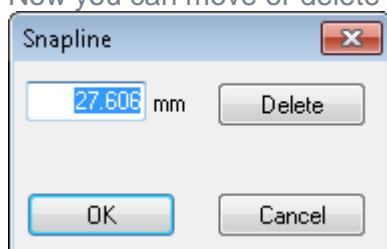
To create a snapline click with the left mouse button on one of the plate rulers (x or y) and hold the click and drag the line over the plate. Drag once positioned snaplines by moving the mouse pointer across the snapline.



Configure snaplines (for Expert): To delete or configure snapline double-click on snapline Rectangle within red circle



Now you can move or delete the snap line



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Side Bar

On the left side of the plate you can dock the side bar which shows tabs for various job information like properties, vectors or process time calculation:



The screenshot shows the software interface with the Side Bar docked on the right side. The Side Bar contains three tabs: Calculation, Job Properties, and Vectors.

Calculation Tab:

- Type: 1, Idx: 1, Timing: <4:09
- Type: 2, Idx: 2, Timing: 0:00
- Total: 4:09
- Plate Count: 1
- Handling Time: 0
- Production Time: 4:09

Job Properties Tab:

- Job name: test
- File name: test.tsf
- Job number: 65
- Job type: Standard
- Materialgroup: Standard
- Material: Standard
- Resolution: 500 dpi
- Size: 1890 x 1890 pixels
96.01 x 96.01 mm
- Vectors: 0
- Rotary Ø: ...

Vectors Tab:

- Cut: 50.00 % Power, 2.00 % Speed, 2000 Hz
- Jobs test

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2.7.3 Detailed Description of JobControl Functions

2.7.3.1 File

New *Ctrl+N*  (for Basic, Advanced, Expert): Creating a new material plate.

Open *Ctrl+O*  (for Advanced, Expert): Opening saved material plate.

Close (for Basic, Advanced, Expert): Close the current plate.

Save *Ctrl+S*  (for Advanced, Expert): Save the current plate with all jobs.

Save as (for Advanced, Expert): Save the plate with a new name.

Print *Ctrl+P*  (for Expert): Printing plate Proof reading.

Print Preview (for Expert): Print Preview for printing.

Print Setup (for Expert): Setting up the printer.

Last File (for Advanced, Expert): Opens the most recently used plate.

Exit (for Basic, Advanced, Expert): Exits the Trotec JobControl.



2.7.3.2 Edit

Select All  for (Basic, Advanced, Expert): Selecting all jobs on the plate.

Repeat Cut Line (for Advanced, Expert): Re-cutting of the selected job if the cutting line is not completely sufficient.

Outline Job(s) (for Basic, Advanced, Expert): The bounding contour of the job is processed in cutting mode without laser power. The velocity of the outline can be defined in the options menu. Helps to check in advance the correct positioning of materials and/or job(s).

2.7.3.3 Engraver

Connect  (for Basic, Advanced, Expert): Establishes a connection with the engraver attached.

Disconnect (for Basic, Advanced, Expert): Cuts established connection with engraver.

Start  (for Basic, Advanced, Expert): Starts the engraving or cutting process.

Pause  (for Basic, Advanced, Expert): Pauses the engraving process.

Resume (for Basic, Advanced, Expert): Continues the interrupted engraving process.

Stop  (for Basic, Advanced, Expert):
Stops the engraving process.

Normal Performance & High Performance (for Basic, Advanced, Expert) :
This two Options are to adjust the engraving velocity Performance
E.g. Speedy 100: Normal Performance is 180 cm/s, High Performance is 280 cm/s
(JobControl X is sold with Normal Performance unless it is ordered with High Performance) and this is valid for all view levels.

Move Laser (for Expert): Adjusts the marking head to the position specified

Move to Marker (for Expert): Adjusts the marking head to the position of the selected marker. (How to set Marker - see Section 2.7.3.4 - Plate).

Focus Laser  (for Basic, Advanced, Expert): Table moves in focus position to the saved thickness of the currently selected material.



2.7.3.4 Plate

Material choice

The material database holds different kind of material groups and named materials. In the material list you can choose one of the saved materials (see "Define Material Template").

Every job has been printed with an associated material.

If you move a job from the job queue on the plate, the plate obtains its material data from the first job positioned on this plate.

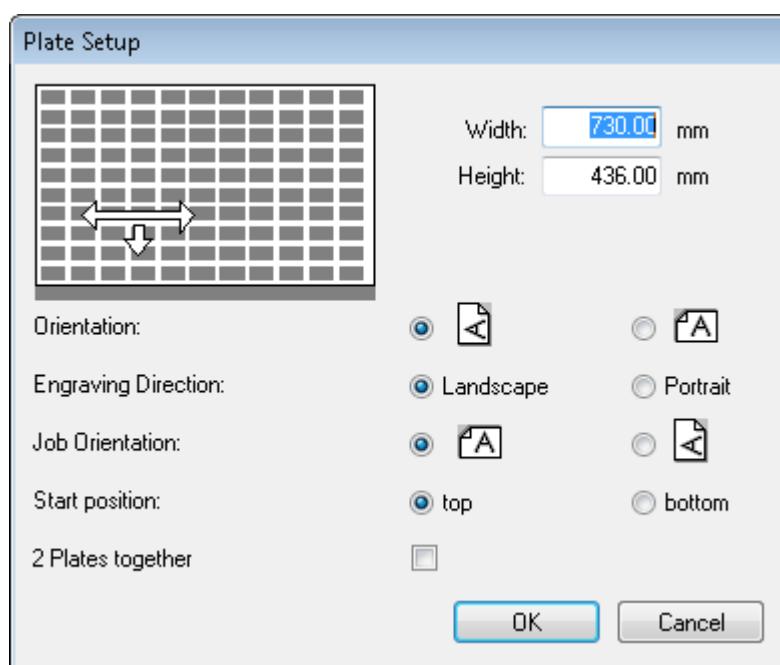
If the job material does not exist it will be pointed out to you that the material data is not matching and the standard material is used.

Material priority

The material selected for the plate always has priority. This means, if you position a job with the material data "Aluminum" on the plate and then select "Plastic" as plate material the job and the plate will be processed with the "Plastic" data.

In addition, you can quickly open a new plate using the *Ctrl+N* shortcut key.

Plate Setup *Ctrl+H*  (for Basic, Advanced, Expert versions)



Defines size and orientation of a material plate.



The Plate Setup dialog is used to customize the plate size, orientation, and material definition for the job being processed.

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Orientation: Determines the orientation of the plate (Portrait or landscape)

Start Position: This means you can start engraving the job from the TOP to the bottom

Or from BOTTOM to the top. This process is helpful on some materials (e.g. laserable plastics or wood) and reduces time and efforts for cleaning.

Engraving Direction: Defines whether the lines are engraved in horizontal or vertical direction during engraving.

Job Orientation: You can select whether the jobs are positioned in portrait or landscape mode. It is advantageous to engrave jobs in the direction of their longest side as the engraving time will be reduced if the engraver has a minimum of interruptions.

Plates together: If this option is selected, two plates are positioned side by side and displayed in the JobControl using a separator.

Position Job  for (Basic, Advanced, Expert): Positions the job(s) marked in the queue on the plate. Select the job you want by clicking once on the job name in the queue. The job is highlighted in color and can now be positioned. It is also possible to position multiple jobs at one time this way.



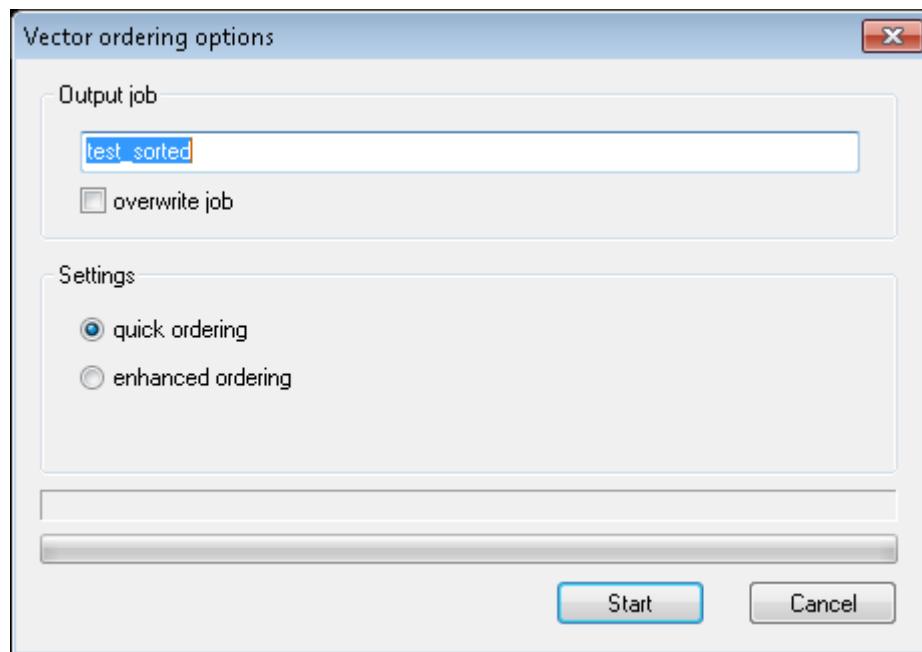
As an alternative solution to position jobs on the plate, you can double click on the appropriate job name or drag the job onto the plate using the mouse.

Position Job Multiple  (for Expert): Multiple positioning of the selected job. This function allows multiple positioning of selected jobs in the queue on the plate up to 100 times.

Duplicate Job **Ctrl+ D** (for Advanced, Expert): Duplicates a marked job in the queue or on the plate.

Vector Ordering (for Expert): Re-orders all vectors within a job file to achieve way-optimized processing. This reduces cutting time.

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Quick ordering is a very fast and easy to use method.

Of course more complex jobs, with a higher number of vectors may require the enhanced ordering method. But bear in mind that the enhanced method is more time consuming.

Enhanced ordering takes two parameters.

Mutation is the number of randomly different copies of the job - each job with another vector order. After creation of n mutations, mutation 1 is compared with mutation 2 ... n, mutation 2 is compared with mutation 3 ... n, and so on. The most optimized mutations are used to create n new mutations. This is repeated for the number of Passes.

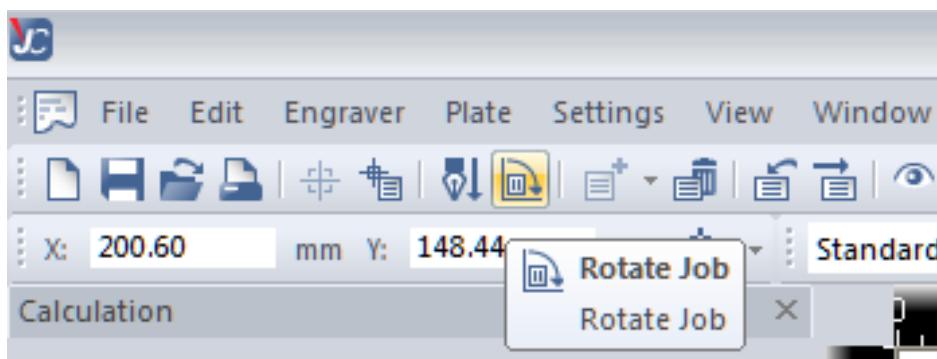
Vector ordering is only functional when the number of vectors is in the range from 3 to 5000.

The cancel button takes only effect between the mutations, before starting a new pass! That's why it does not always react immediately.

Rotate Job (for Expert): Rotate positioned jobs via the context menu or use the toolbar button. Rotation is always 90° (-90° if applied to already rotated jobs).

Remove Job (for Basic, Advanced, Expert): Puts the job back in the queue. Click on the job you want to select and remove it from the plate

Job Reset *Ctrl+R*  (for Advanced, Expert): Resets the job properties. Is required to engrave jobs being already completely processed again. Select the job processed on the plate and then execute "Job Reset".



Delete Job *Del*  (for Basic, Advanced, Expert): Deletes the selected job(s) in all files. This allows you to delete jobs regardless of whether they have already been processed or not. Click on the job on the plate or in the queue and then on "Delete Job".

Add Marker to Plate (for Expert): Sets a marker on the specified position. Markers are displayed as blue crosses on the plate (selected markers are green). Markers are used as positioning aids for jobs. They have magnetic properties in that they are attracted to the corners or the center of the job. The snap feature can be ignored with pressed ALT Key during Job Repositioning with the Mouse.

Delete Marker *Ctrl+Del* (for Expert): Deletes the selected marker.

Job to Marker  (for Expert): Moves selected job to the selected marker

Marker to Job  (for Expert): Sets a marker on the position of the selected job or moves a selected marker to the position of the selected job

Marker to Laser *F8* (for Expert): Sets a marker on the current laser position

Engrave Intermediate (for Expert): Is used to fit in urgent jobs while a process is in progress. The urgent job must be manually positioned and marked before the "Engrave Intermediate" function can be selected. The laser then completes processing the data already in the memory, which may take some seconds. The new job will then be engraved and cut if required. This allows engravings during processing a whole plate.

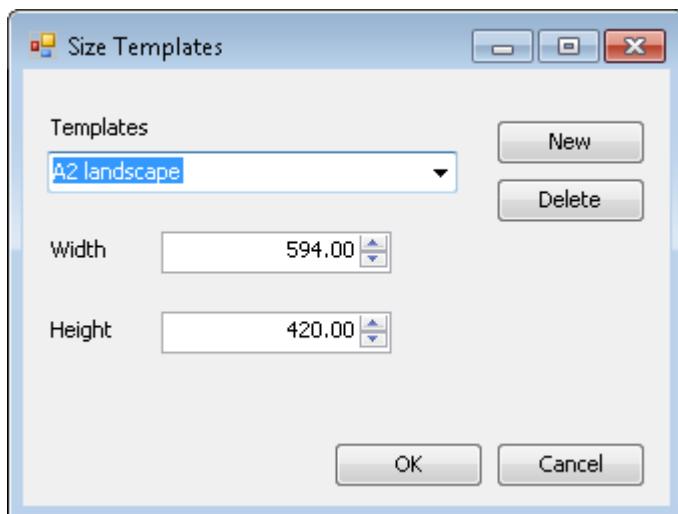


2.7.3.5 Settings

Material Template Setup **Ctrl+M**

Creating, changing and deleting of material templates.
See 2.6.2 for Details

Size Template Setup **Ctrl+W** (for Basic, Advanced, Expert)



Creating, changing and deleting of size templates

Click on a template in the list to select. Settings such as Name and Dimensions may then be changed and saved by clicking on the "OK" button.

To create a new size, click on the "New" button, make the settings, and then save them.

Click on the "OK" button to have the new settings take effect. Click on "Cancel" to undo unwanted changes.



The Define Size Template dialog allows saving of frequently recurring sizes in order to retrieve these from the printer driver.

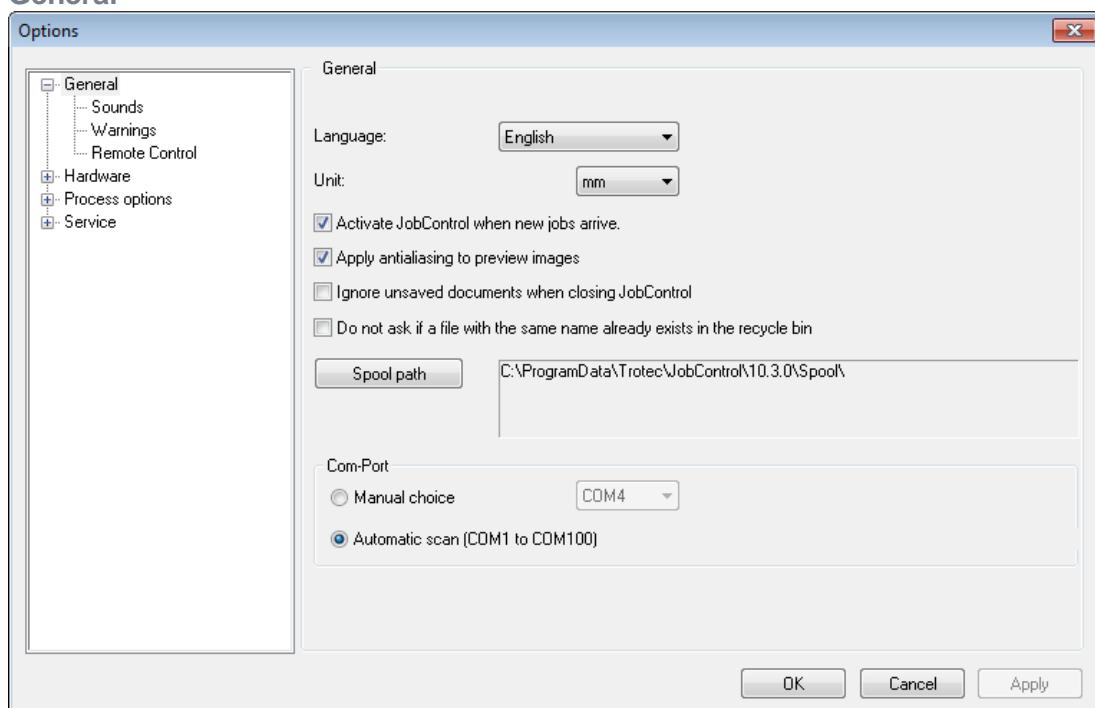
2.7.3.6

2.7.3.6 Options



(for Basic, Advanced, Expert): Set the default values and functions for the laser machine.

General



Language: Defines the user interface language of the printer driver and JobControl

Unit: Indicates whether mm or inches as default

Activate JobControl when new jobs arrive: JobControl starts when the Printer driver prints a Job.

Ignore unsaved documents when closing JobControl: JobControl can be closed without advice to save unsaved documents.

Apply antialiasing to preview images: with enabling this option the preview image quality is increased.

Do not ask if a file with the same name already exists in the recycle bin:

JobControl will not ask if a job with the same name is deleted which already existed in the recycle bin.

Spool path: Path where jobs are placed from printer driver and loaded from JobControl

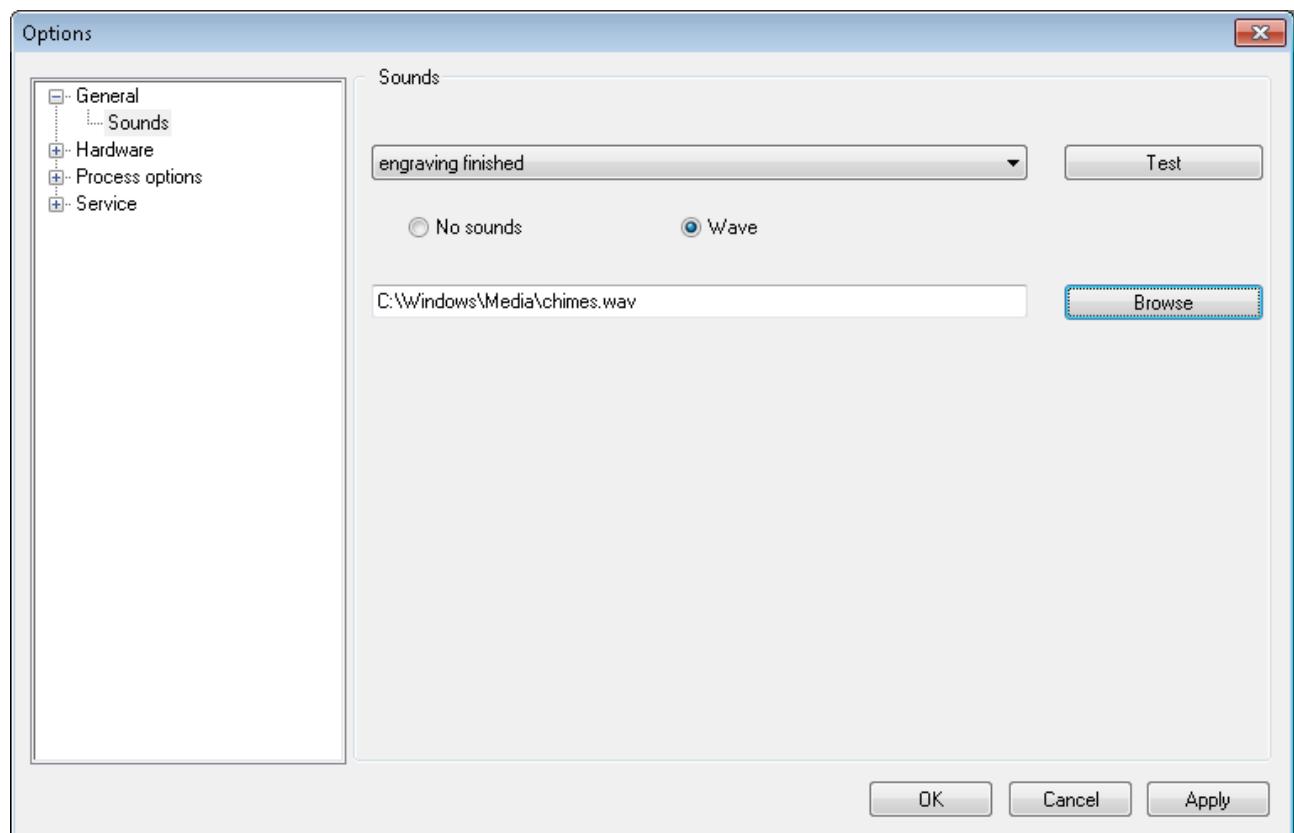
Com-Port: Manual choice: manually select com port for engraver connection (COM1, COM2...)

Automatic scan: detect COM port automatically (default)



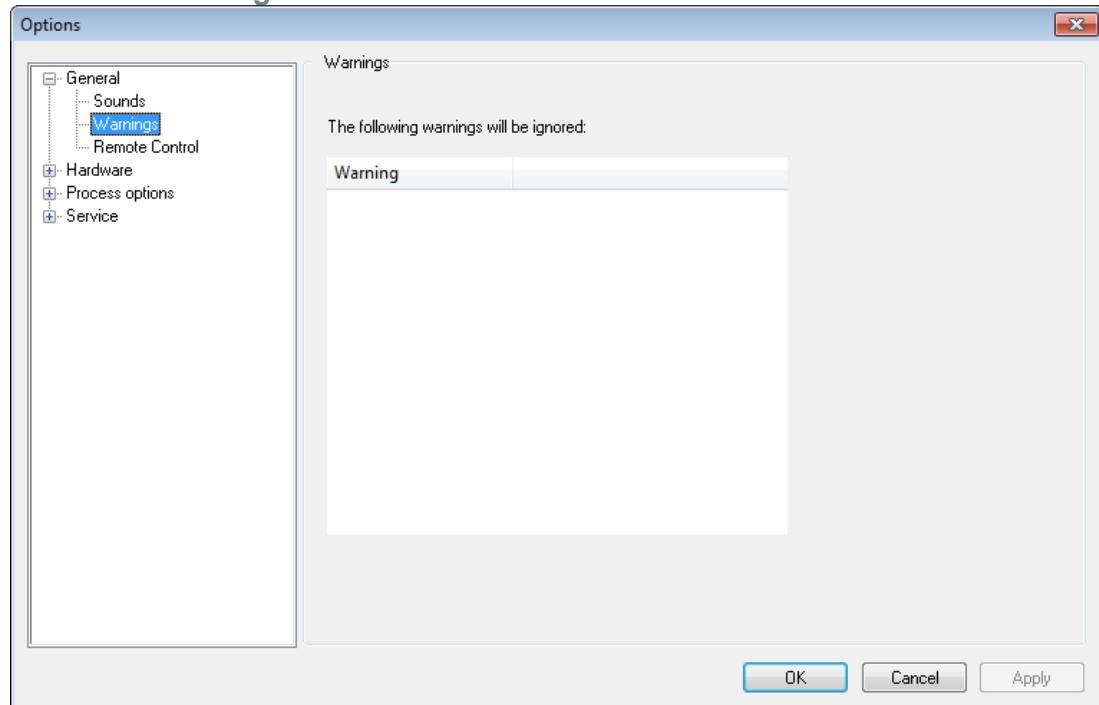
General - Sounds

User defined sounds inform whenever either „engraving finished“ or „machine error“ occurs. This is additional user information in case the PC is located in another room as the engraver. A sound card is required to use this feature.



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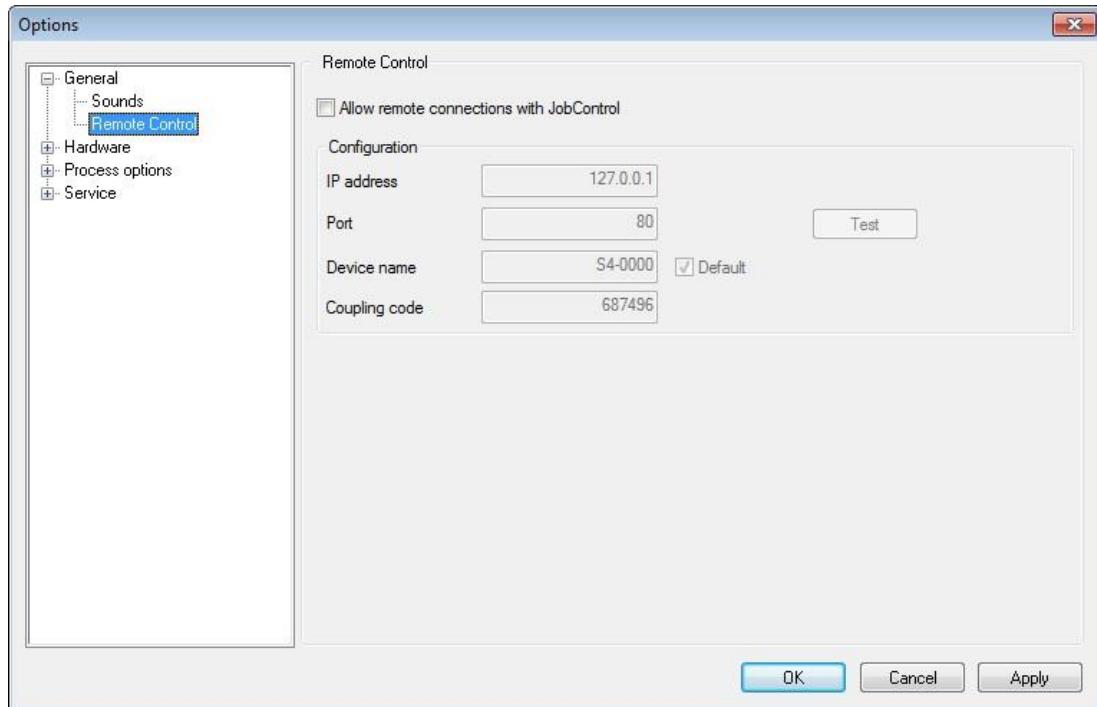
General – Warnings



Ignored warnings are listed here.

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General – Remote Control



Allow Remote connections with JobControl: iPhone app remote access to JobControl is allowed.

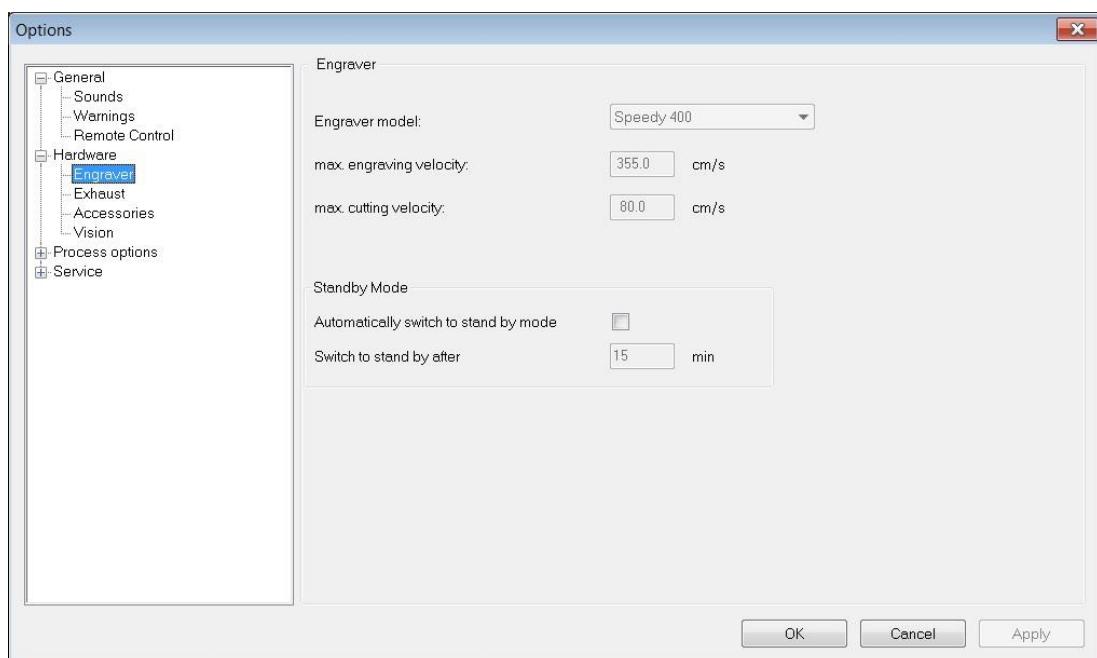
IP address: IP address of the JobControl PC.

Port: Port for connection to app (system administrator recommended)

Device name: detection name of the machine. Maybe important if iphone app is connected to more than one JobControl computers.

Coupling code: this code is necessary for the pairing of JobControl and the iphone app.

Hardware – Engraver



Engraver Model: Defines the type of laser engraver used.



This information must correspond with the machine actually used. Changing the engraver model can result in faulty machine settings, bad engraving results or even machine damages!

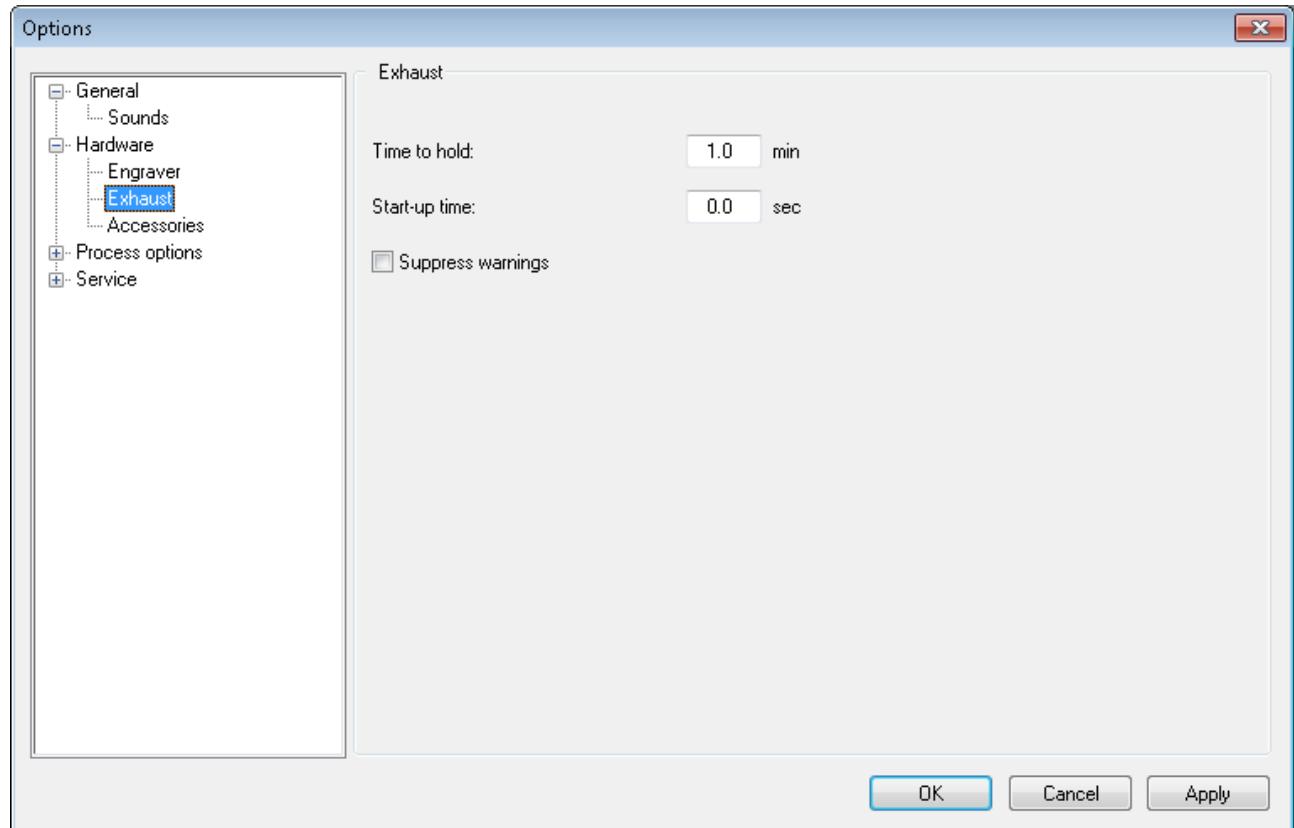
Max. Velocity: Indicates the maximum engraving and cutting speed possible.
(Information field only, no changes possible)

Standby Mode: Switches the laser machine into standby mode after a defined period. Saves energy costs.



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Hardware - Exhaust

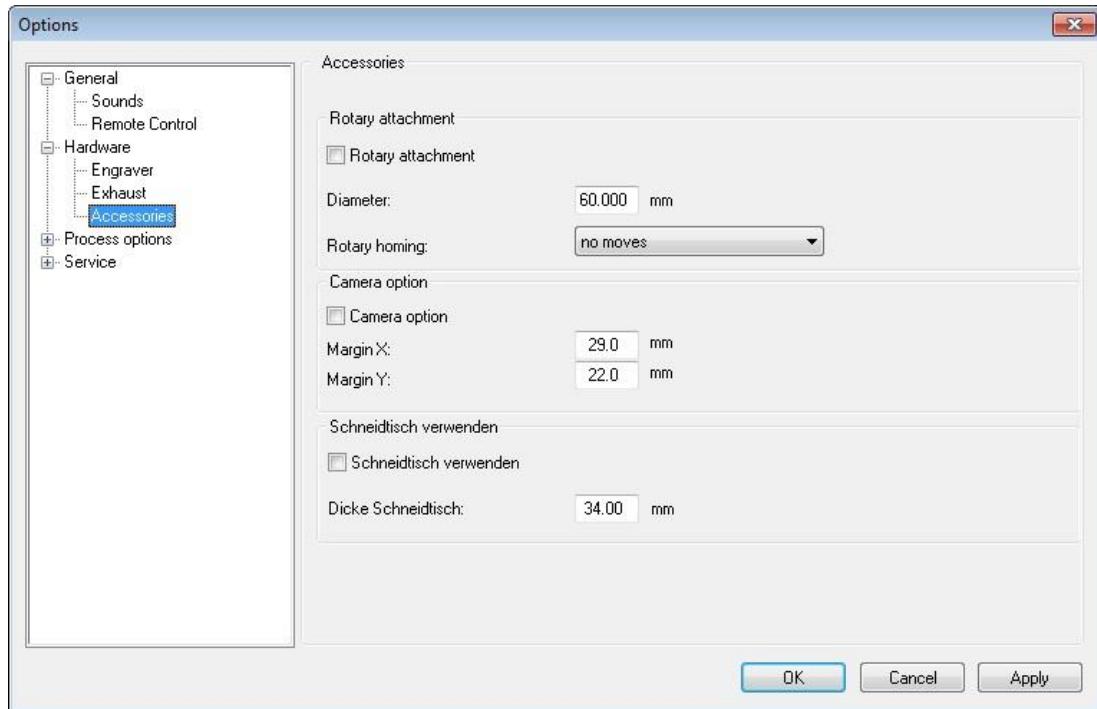


Time to hold: Defines the period how long the exhaust shall continue working after a job has been completed.

Start-up time: Allows the exhaust to start prior to processing jobs

Suppress warnings: Exhaust responses will not be displayed (used for Exhausts not originating from Trotec).

Hardware - Accessories



Rotary Attachment: Activate or deactivate the option

Diameter: Specifies the diameter of the work piece



This page will be automatically completed when positioning a job that has been printed using the "Rotary Attachment" option. However settings can be adjusted here. Changes are only possible when no job is positioned on the plate.

Rotary homing: Homing move configuration for rotary.

- **move to 0° on begin and end:** rotary moves to 0° before and after job has been finished
- **no moves:** rotary doesn't move after job has been finished
- **return to start position:** rotary moves to start position (position before job start) after job has been finished

Camera option: Signals JobControl that an i-cut camera is attached. The plate size in JobControl X is reduced with the defined Margin values. X and Y Moves are limited in firmware automatically to avoid crashes.

Honeycomb table: Activate or deactivate the option.

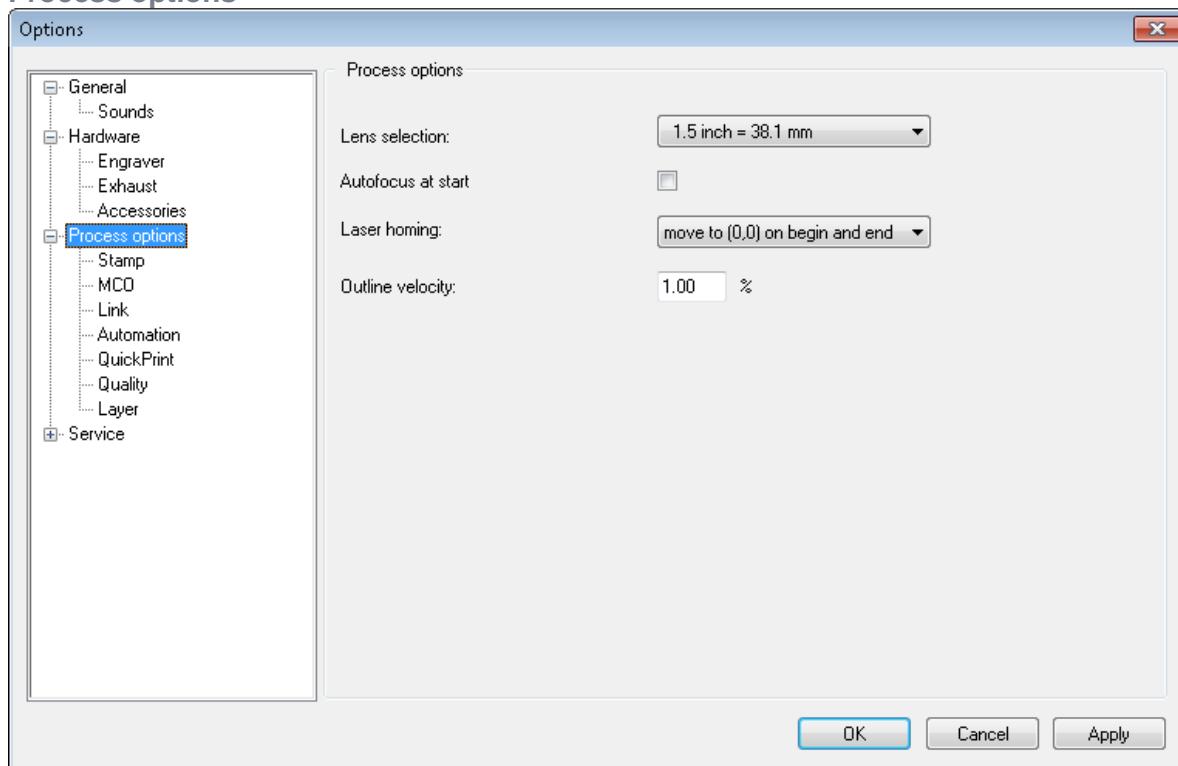
Thickness: Specifies the thickness of the honeycomb table. This value is used for calculation of the software autofocus. Wrong values can lead to head crashes.

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standards

Hardware - Vision
Please refer to the 2.8.4.

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Process options



Lens selection: Shows current lens selection

Autofocus at start: If activated a software autofocus is executed before job start.



Lens type, material thickness and table (cutting table...) have to be adjusted correctly to avoid head crash.

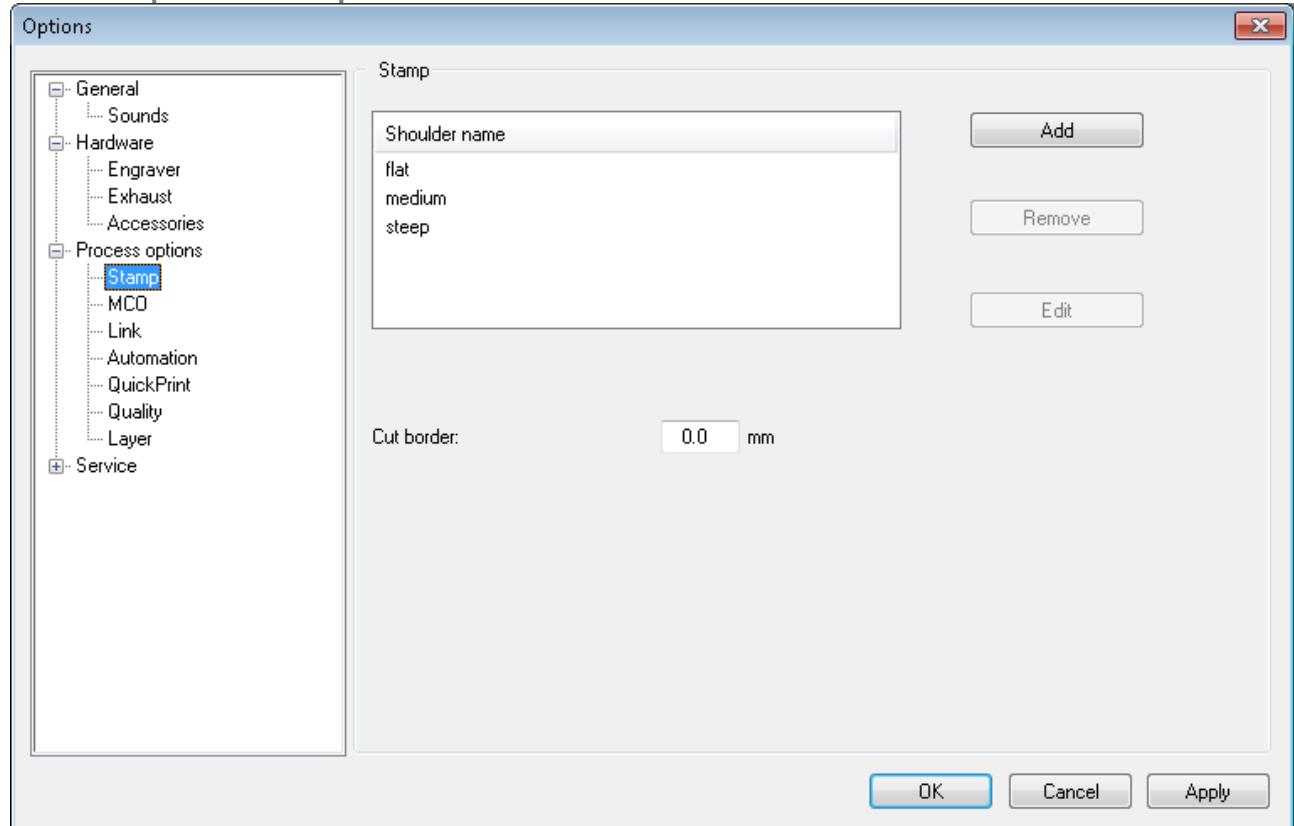
Never put any parts of your body inside the engraver while the table is moving!

Laser homing: Defines the laser position before and after job execution (not for rotary jobs)

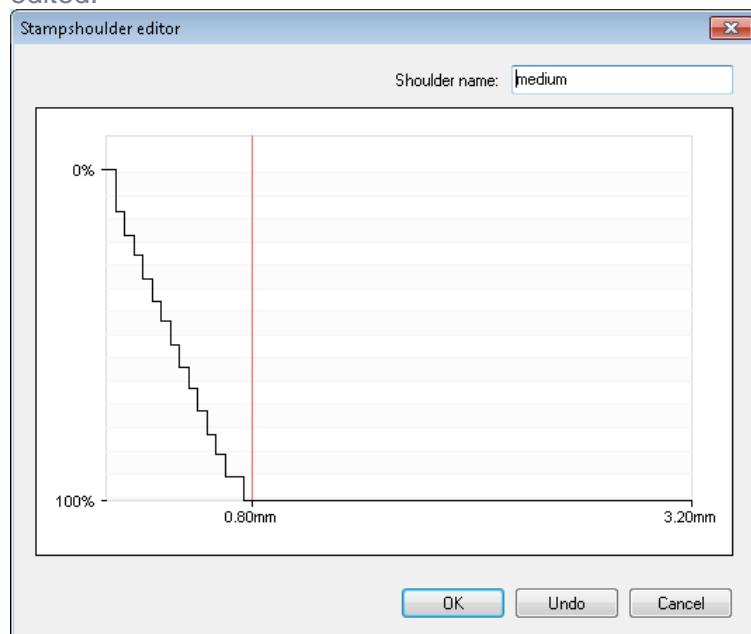
- **move to (0,0) on begin and end:** laser head moves in the top left position (0,0) before and after job has been finished
- **no moves:** laser head doesn't move after job has been finished
- **return to start position:** laser head moves to start position (position before job start) after job has been finished

Outline Velocity: Defines velocity in percent of maximum engraving velocity for the outline functionality.

Process options - Stamp



Shoulders: All shoulders are listed by their name and can be added, removed or edited:



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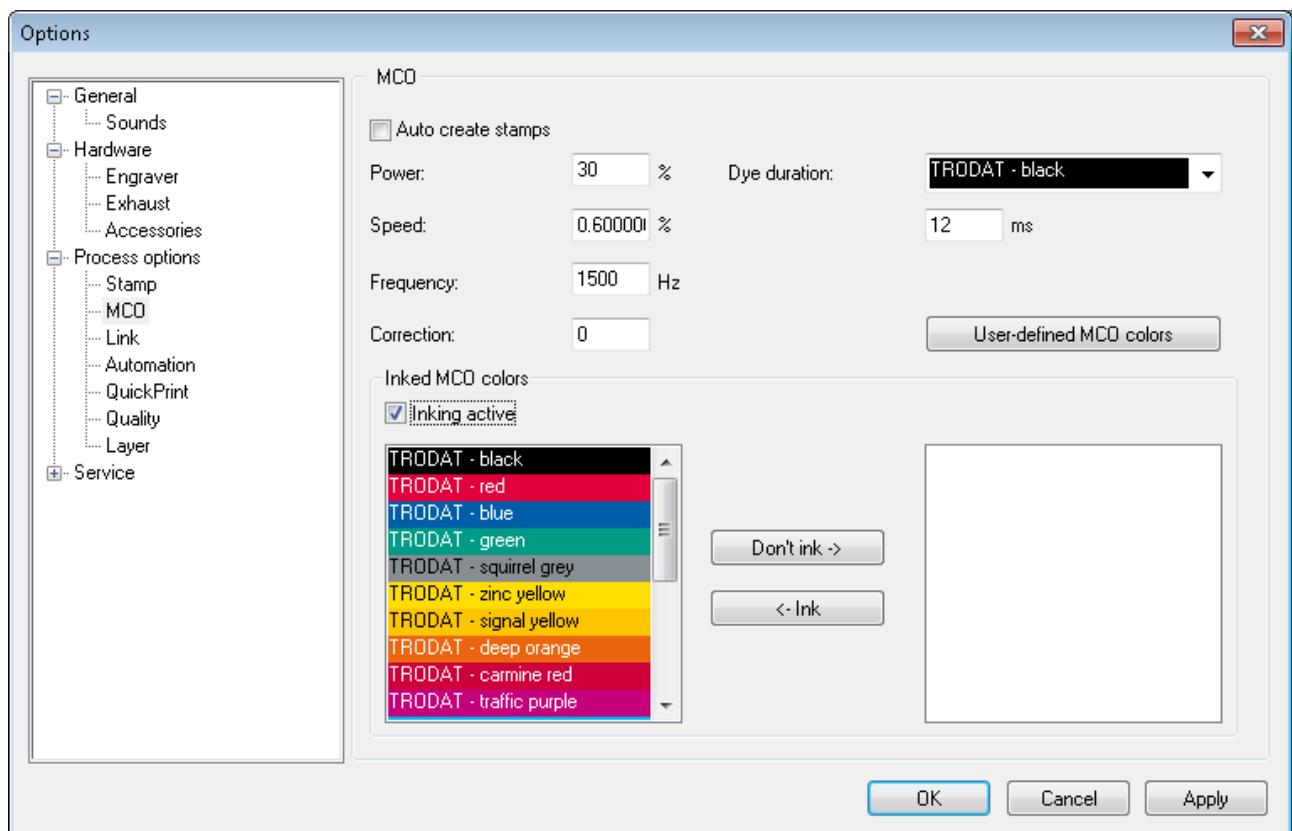
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Cut Border: Distance between cutting line and neighboring job



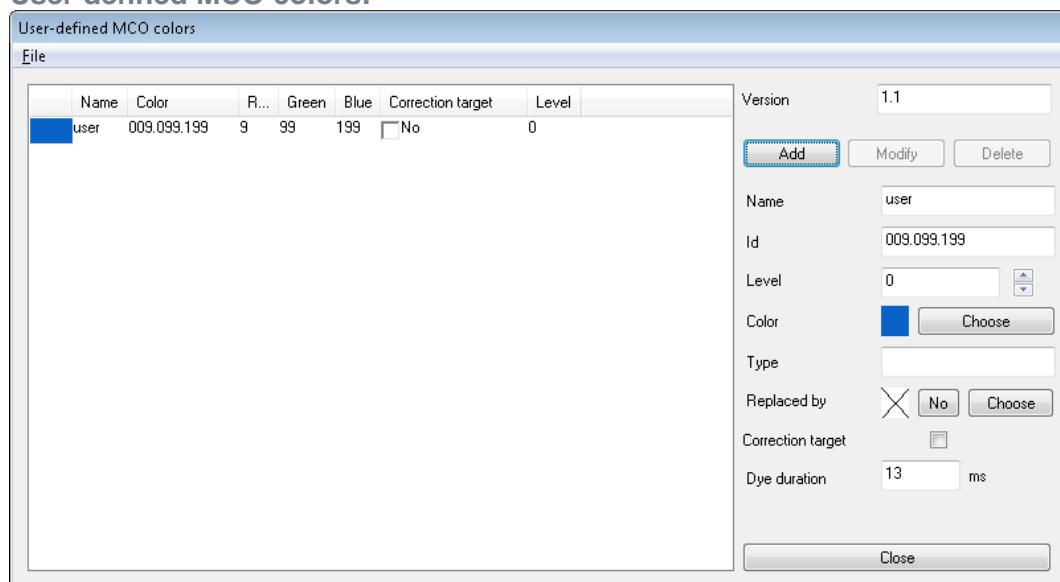
These settings are required for stamps and should only be changed after consulting Trotec Technical Support.

Process options – MCO (Multi Color Option)



Auto create stamps: Automatically create stamps when MCO jobs are processed

- **Power, speed, frequency, correction:** Laser settings for cutting pads of MCO jobs
- **Dyeduration:** The time each MCO color is inked
- **Used MCO colors:** Configuration whether inking is active and which MCO colors are used

User defined MCO colors:


User can add, modify and delete his own MCO colors.

Version: Version of all MCO user colors / MCO user colors file

Name: Name of MCO color

Id: Id of MCO colors (usually “Red.Green.Blue” value)

Level: Field for future use

Color:



Shows assigned RGB color

Choose: Shows RGB color configuration dialog

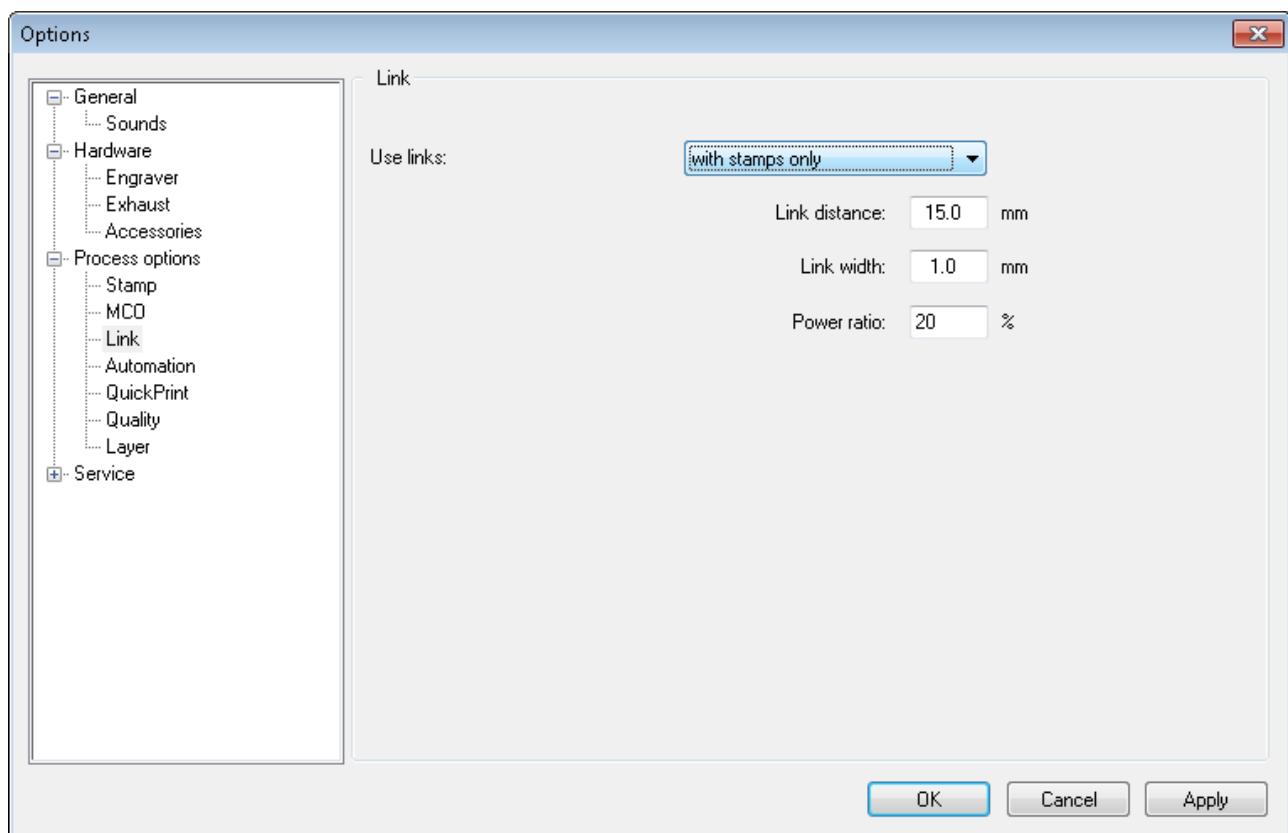
Type: Field for future use

Replaced by: Shows MCO color which replaced this one

Correction Target: Whether this MCO color can be corrected to at time of MCO processing

Dyeduration: Time how long one dye point is inked

Process options – Link



Links are controlled cut-line interruptions. They are used to hold e.g. stamp dies in the sheet material. That way the entire rubber sheet can be removed conveniently after processing.

The distance from one link to another, the link width and the percentage of currently adjusted laser power can be modified.

Use links:

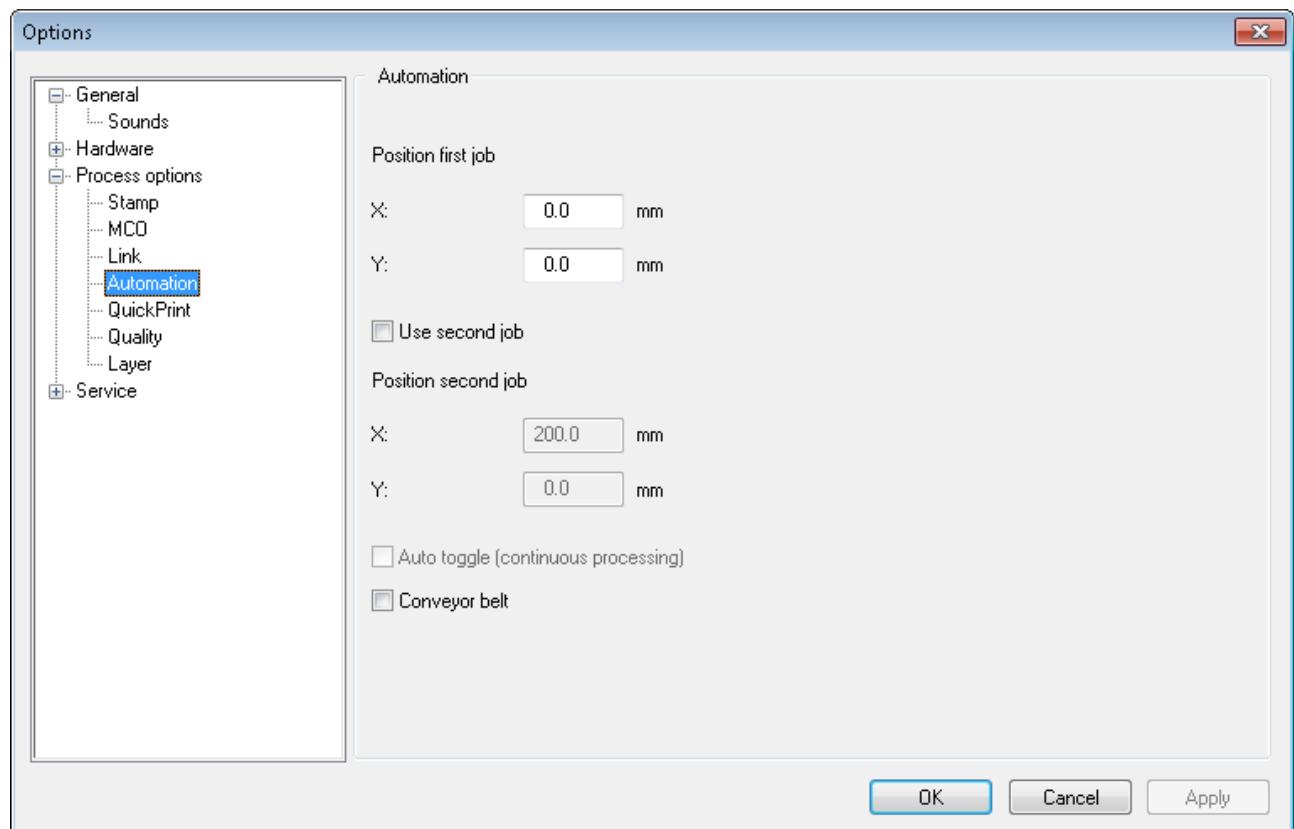
- **never:** don't use links with
- **stamps only:** use links only for stamp cutting processes (recommended)
- **always:** use links for all cutting processes
- **once only:** use links for the next job, then link configuration is changed to never

Link distance: distance between links

Link width: link width

Power ratio: power ratio in percent of max power

Process options – Automation



The following settings influence the automation feature which can be started within right mouse click menu in job queue.

Position first job: Define automation job position

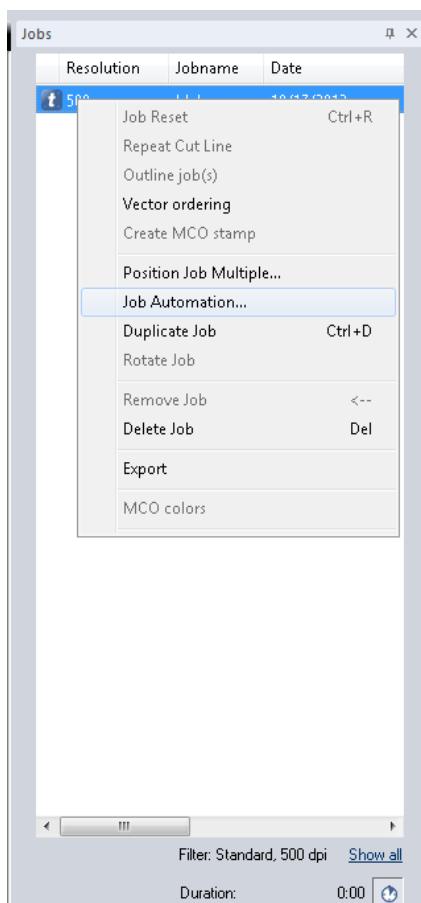
Use second job/Position second job: Defines second automation job position

Auto toggle (continuous processing): This feature toggles between first and second automation position without pause.

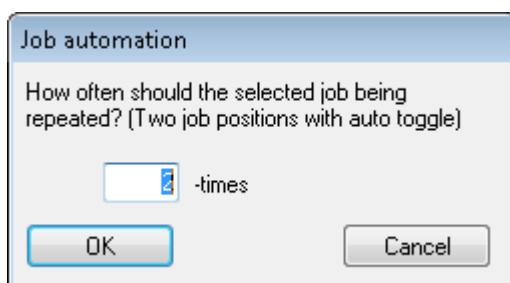
Conveyor belt: This feature needs integration of conveyor belt into engraver.

Start Job Automation

- Empty the JobControl plate, and then open the context menu of the job in the job queue

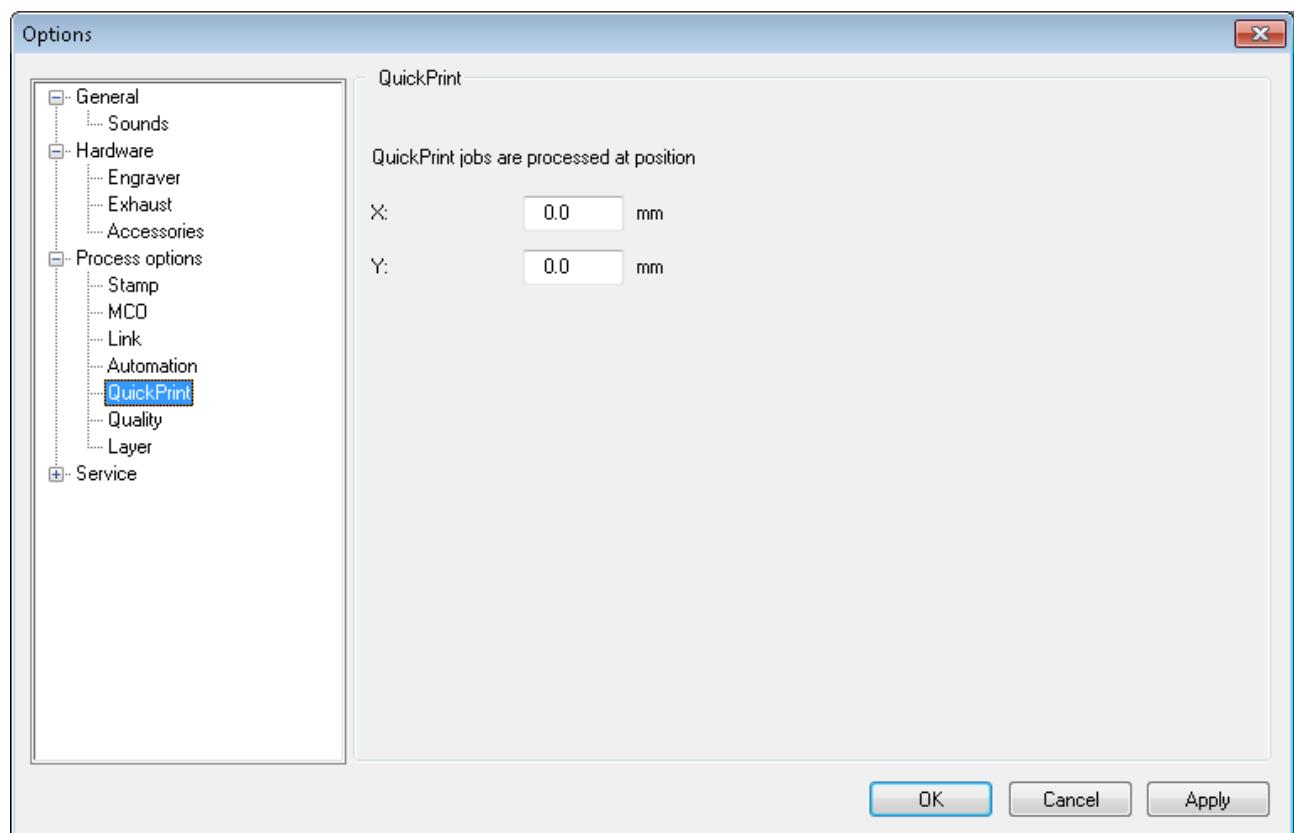


- Click on Job Automation



- Enter how often the job should be processed

Process options – QuickPrint

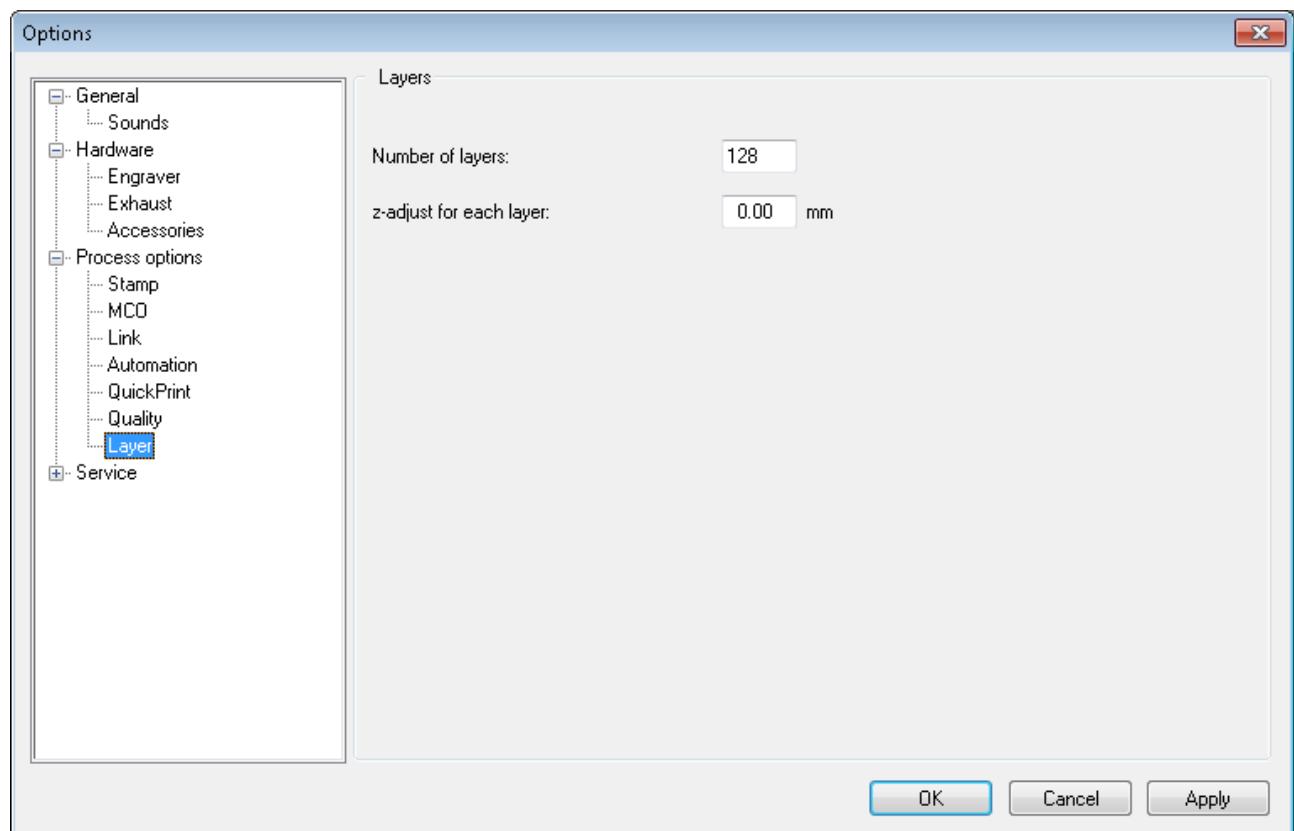


X, Y: Point where QuickPrint-Jobs are placed and processed



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Process options - Layer



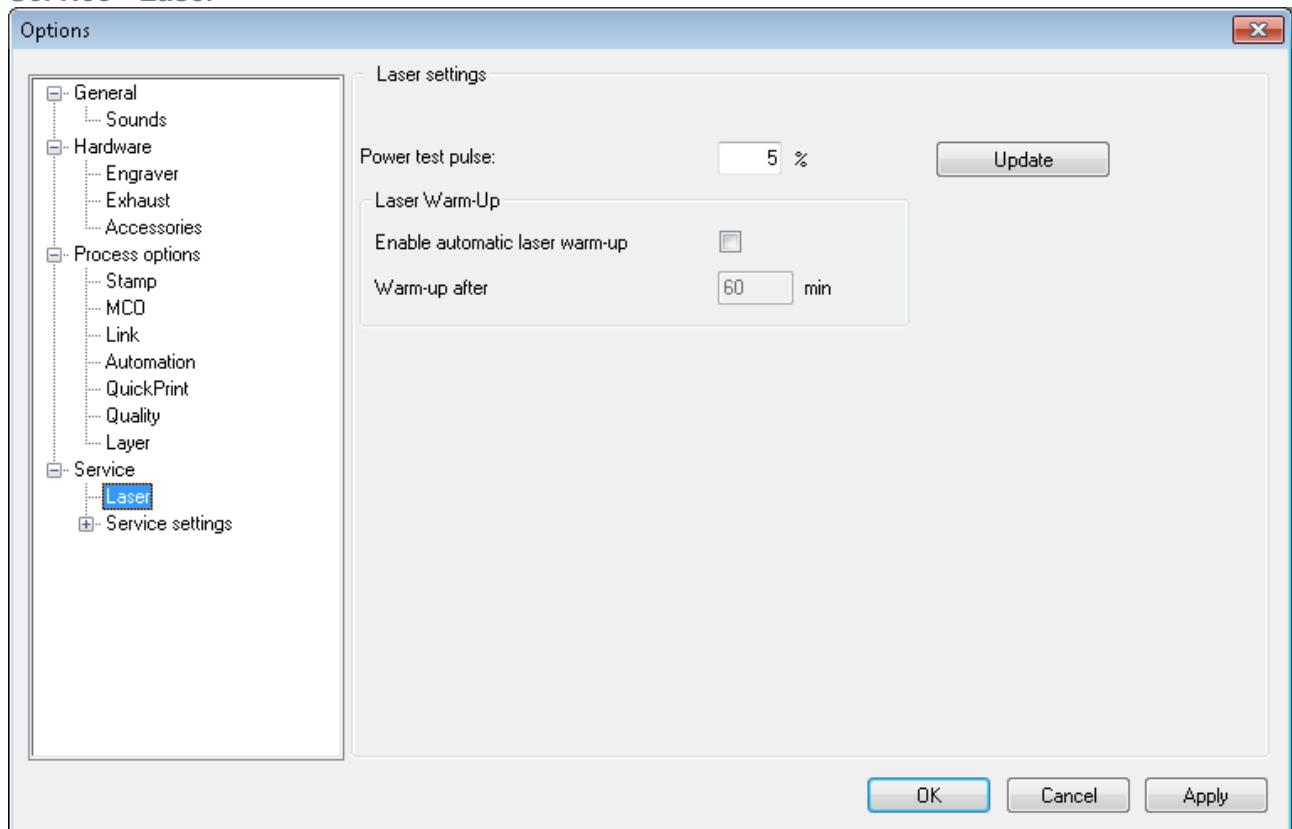
Number of Layers: Specifies the number of layers the engraving should be carried out in. The layers are engraved alternating once in X and once in Y direction.

Z-adjust for each layer: z-adjust between the layers for re-focusing.

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Service (Settings for service personnel only!)

Service - Laser



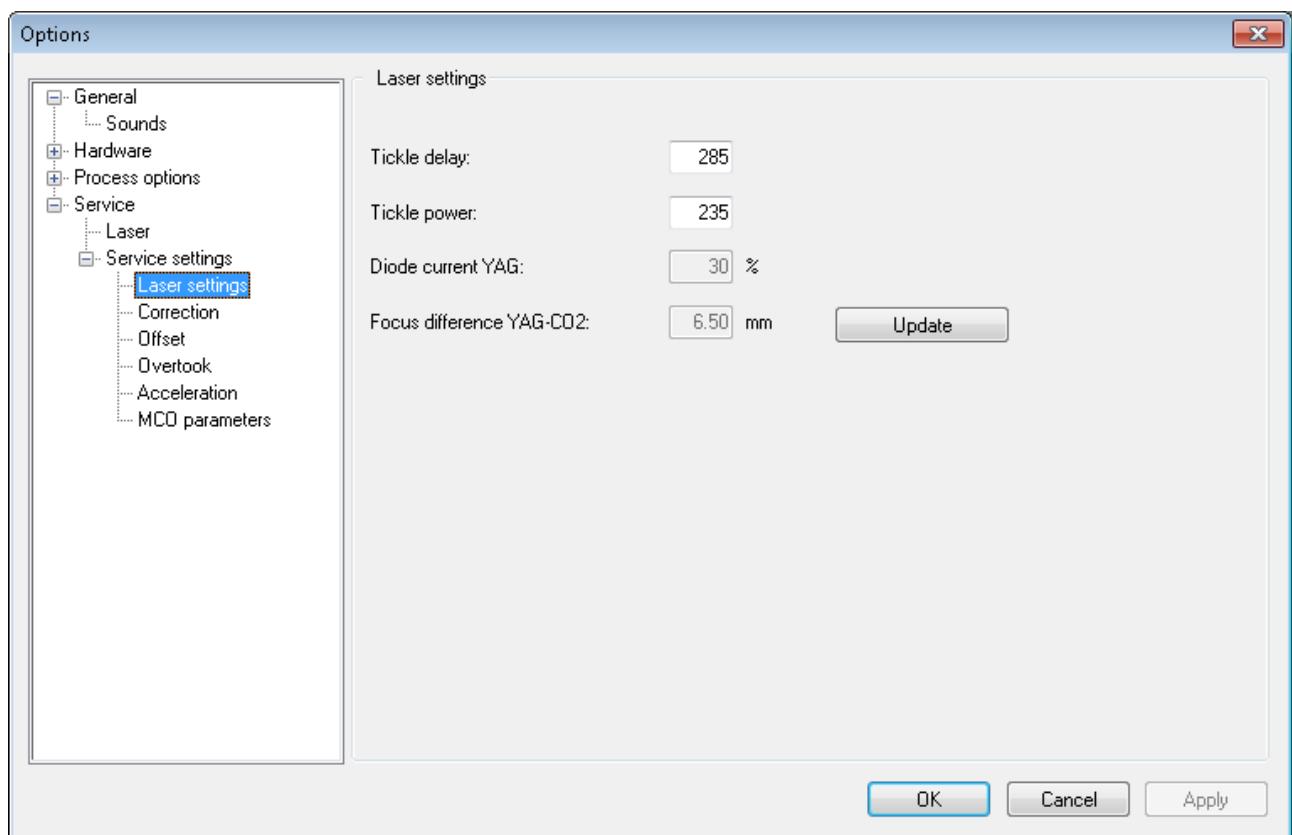
All laser parameters may only be changed after consulting Trotec Technical Support staff!

Power Test Pulse (only CO₂ systems): Sets the test pulse power, only required during service!! If this value is set to 100%, it is the instantaneous power; otherwise the laser power increases continuously.

Laser Warm-Up: Automatic laser warm up for CO₂ systems. This setting helps the laser source to work properly after a longer period of inactivity

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Service - Service settings - Laser settings



Tickle delay (only CO2 laser systems): Should be increased if the stamp appears blurred.

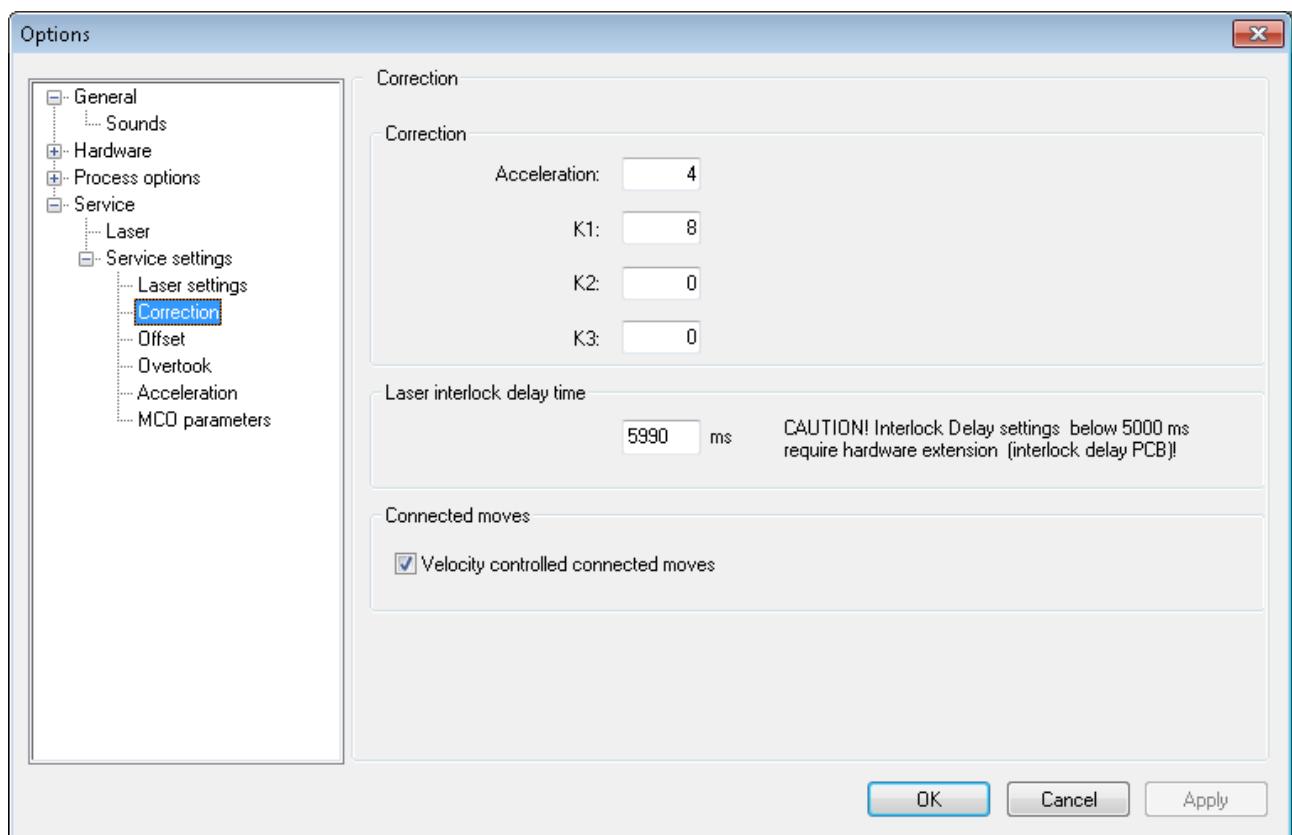
Tickle Power (only CO2 laser systems): Power required to excite the laser tube and put it into standby mode

Update: Writes the changed values to the engraver's memory

Diode Current YAG: (only YAG/fiber laser systems) Threshold current of the laser.

Focus difference YAG-CO2: only for hybrid systems

Service - Service settings – Correction



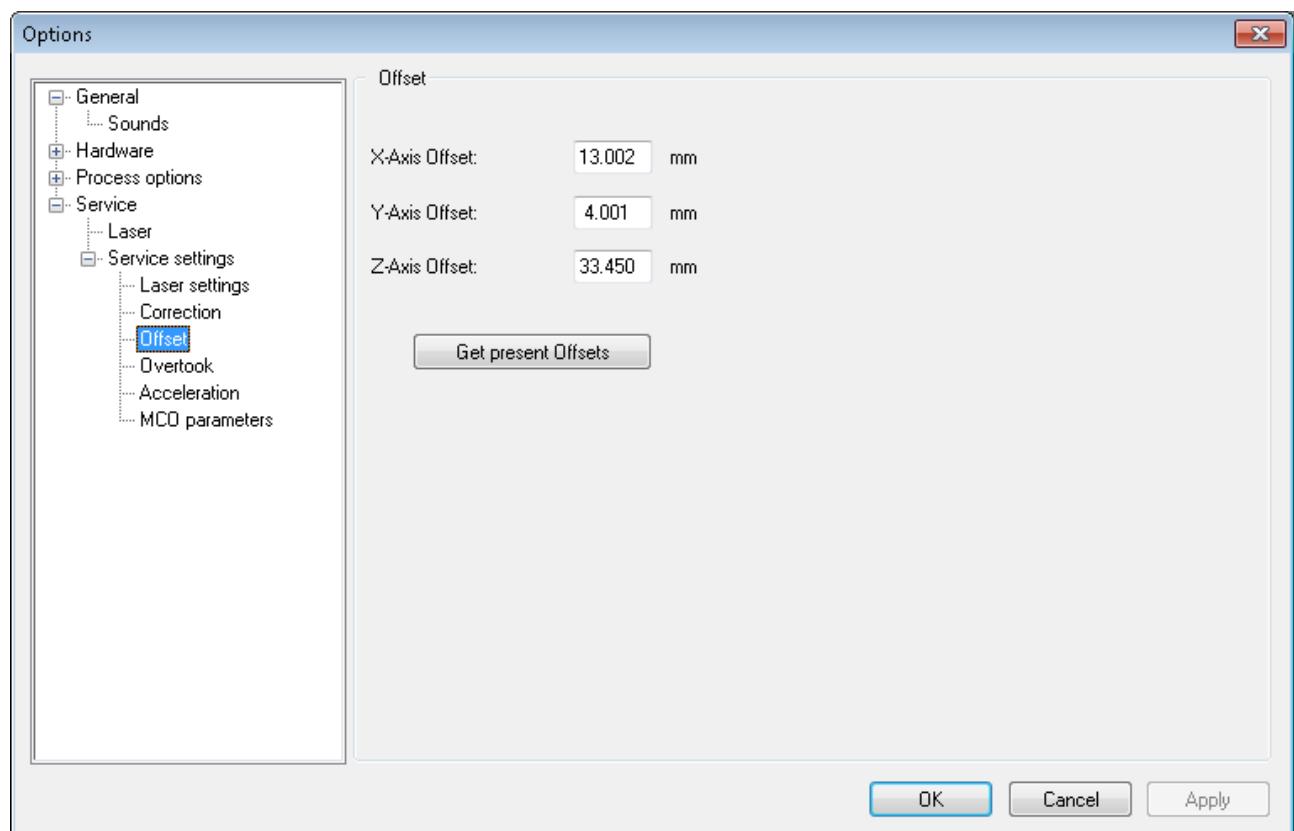
Acceleration, K1, K2, K3: Values which influence graving quality

Laser interlock delay time: Time the laser becomes active after the lid was closed.

Settings below 5000ms require a special hardware extension.

Velocity controlled connected moves: Enable/disable velocity control in firmware.

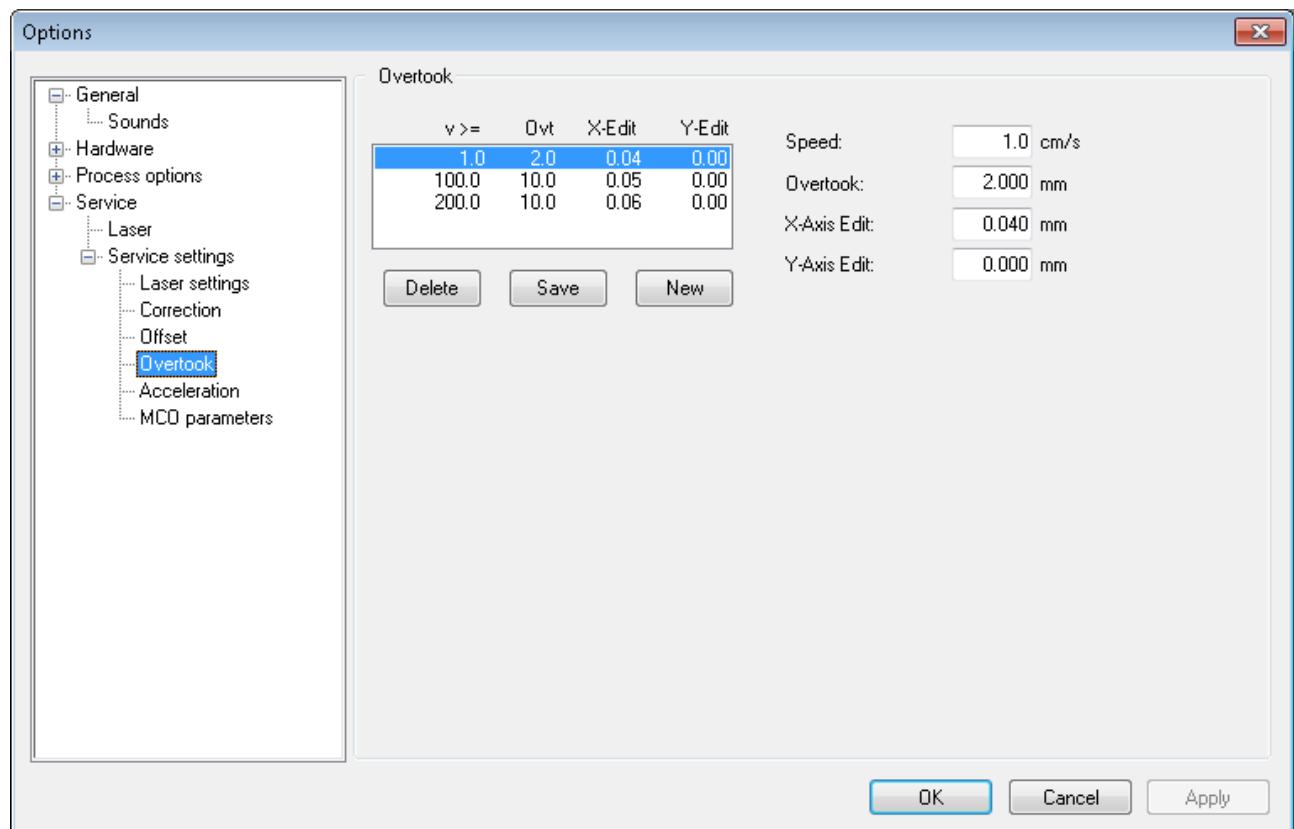
Service - Service settings – Offset



X-Axis offset, Y-Axis offset, Z-Axis offset: Offset values which modify shown X, Y and Z values

Get present offsets: Use current position of laser as offsets

Service – Service settings – Overtook

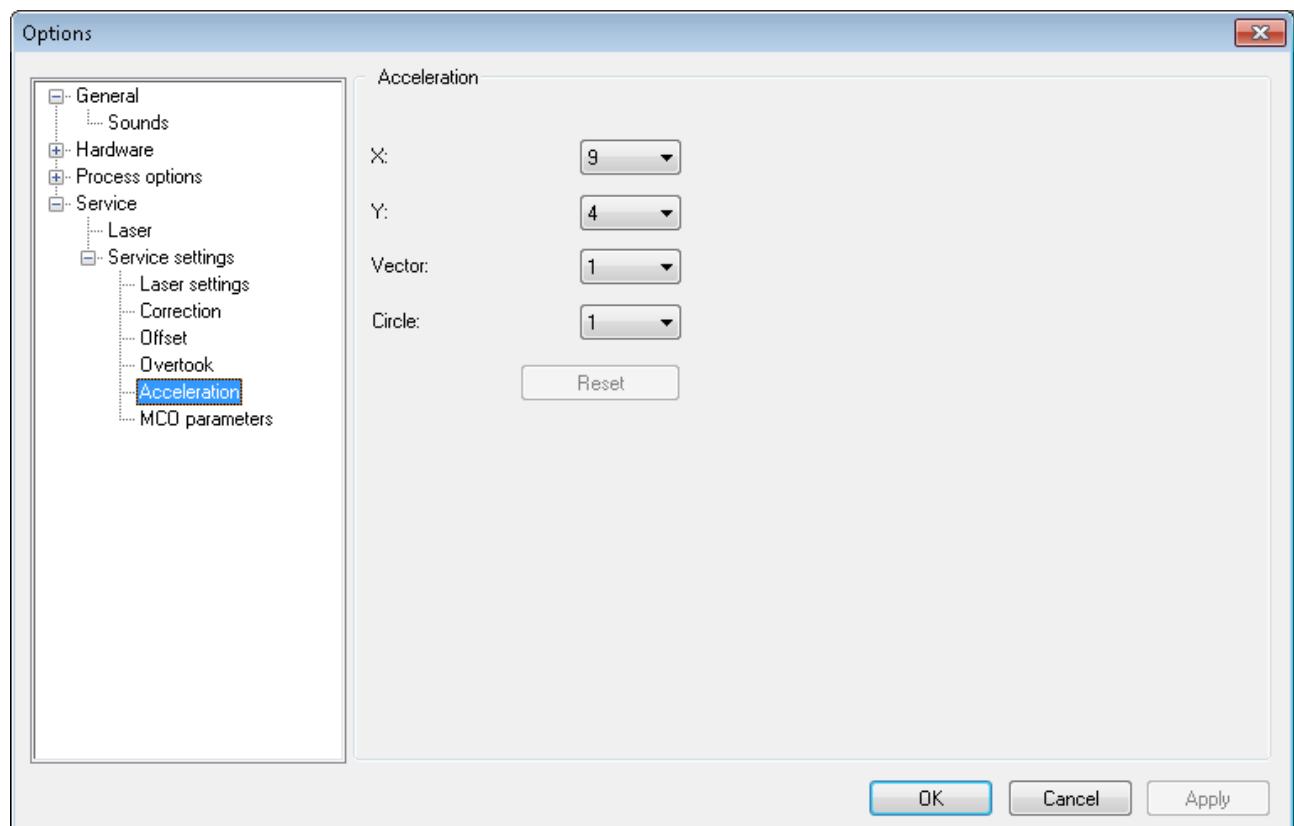


Show and edit correction values for overtook



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Service – Service settings – Acceleration



X, Y, Vector and Circle values for acceleration. Click "Reset" to restore Default Acceleration settings for engraver.



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Service – Service settings - MCO parameters

Options

- General
 - Sounds
- Hardware
- Process options
- Service
 - Laser
 - Service settings
 - Laser settings
 - Correction
 - Offset
 - Overtook
 - Acceleration
 - MCO parameters

MCO Parameters

General parameters

Auto place markers

Pad cut parameters

Ink-pad thickness: mm Air assist

Injector parameters

Offset X: mm Offset Z: mm

Offset Y: mm

Inject parameters

Inking speed: % Additional offset: mm

Inject depth: mm Traversing height: mm

Absorbing time: ms Drip time: ms

Color selector parameters

Offset X: mm Selection move: mm

Offset Y: mm

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Create Service File (for Basic, Advanced, Expert)

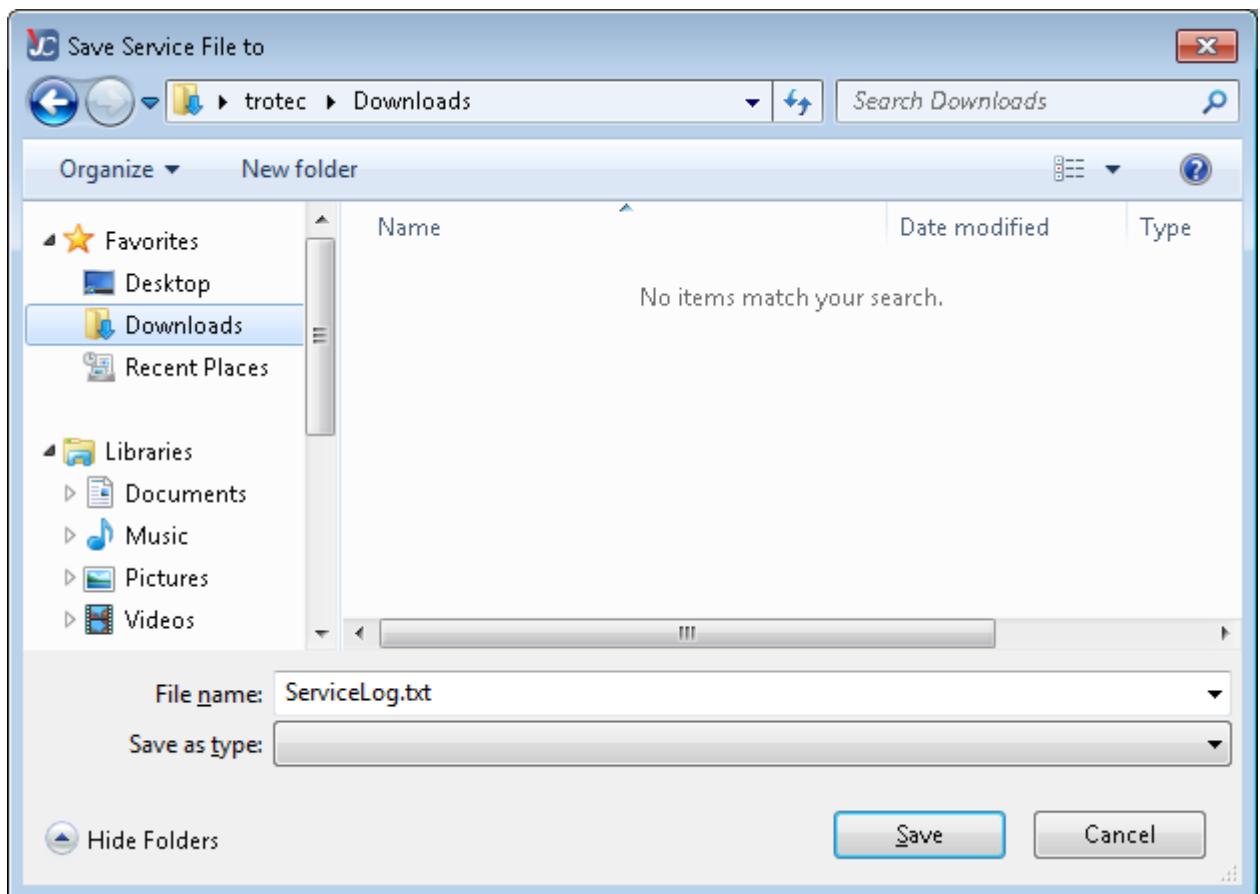
Creates information file (.TSI) of the laser software

In the case of unexpected software problems, this function is used to create a file which allows analyses performed by Trotec Technical Support. This file contains: Material and size templates, laser settings, positioned engraving jobs, and the Trotec software as well as operating system version number. Graphics data may also be included.

Functionality:

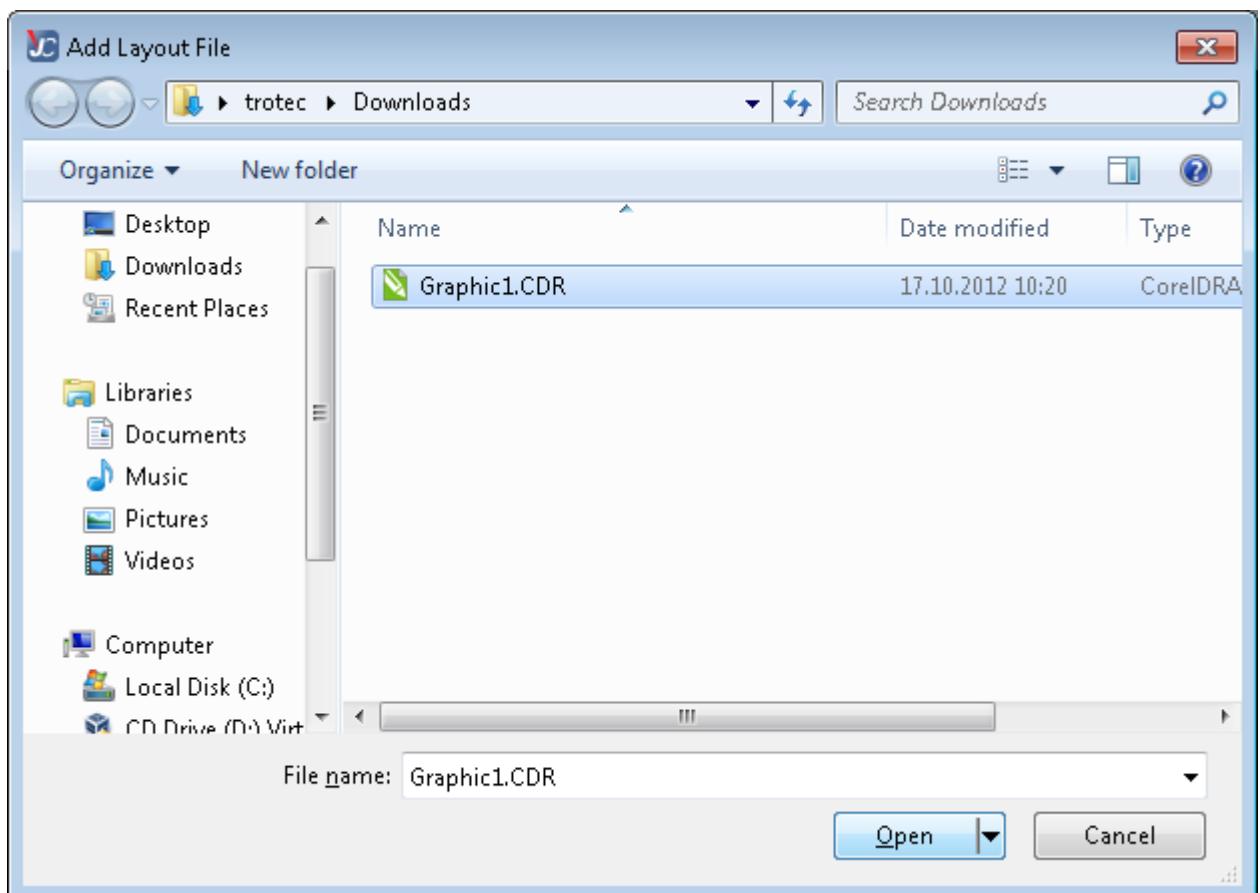
Position the job(s) causing problems on the plate.

Open Create Service File dialog.



Select path for the service file and click on Save.

If required, you may then attach a graphics file.



Select the graphics file used for creating the job and click on Open. Click on Cancel if you do not want to attach a graphics file.

The service file will then be automatically saved in the previously selected path. This file (ServiceLog.txt) should be sent by email or on a disk to Technical Support together with a description of the problem.

Information (Basic, Advanced, Expert)

Shows travel and operating time of the laser as well as engraver model and engraver software version.

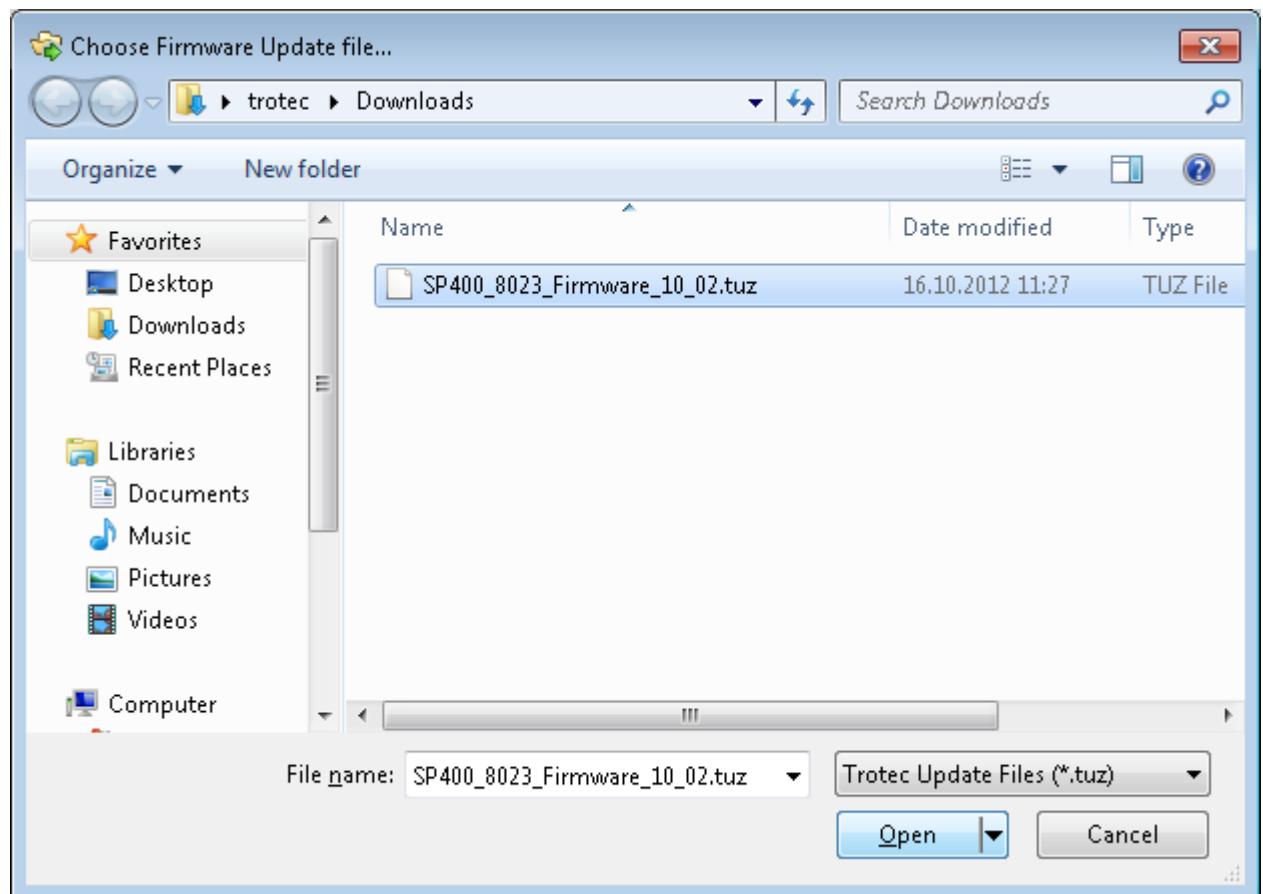
In order to retrieve this information, the connection to the engraver must be established.

Update Firmware

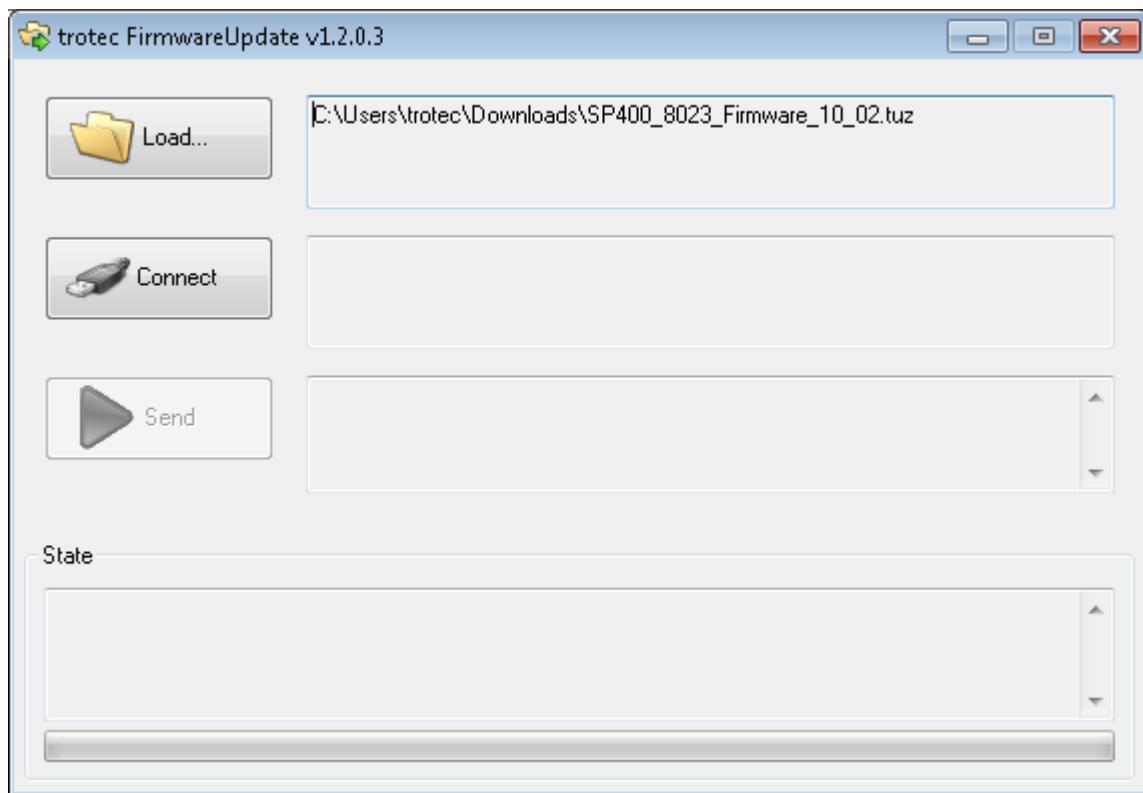
You are prompted to specify the storage location of the TROTEC update file (.TUZ).

Then the settings are changed on the laser engraver itself.

Updating of the engraver software is not permitted unless you are instructed to do so by the TROTEC Technical Support.



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Choose Firmware File.

Connect to Engraver (machine has to be started with open top cover, or referencing has been finished)

Press Send to process Firmware Update.



NEVER ABORT FIRMWARE UPDATE!

Restart the engraver after firmware update has been finished.



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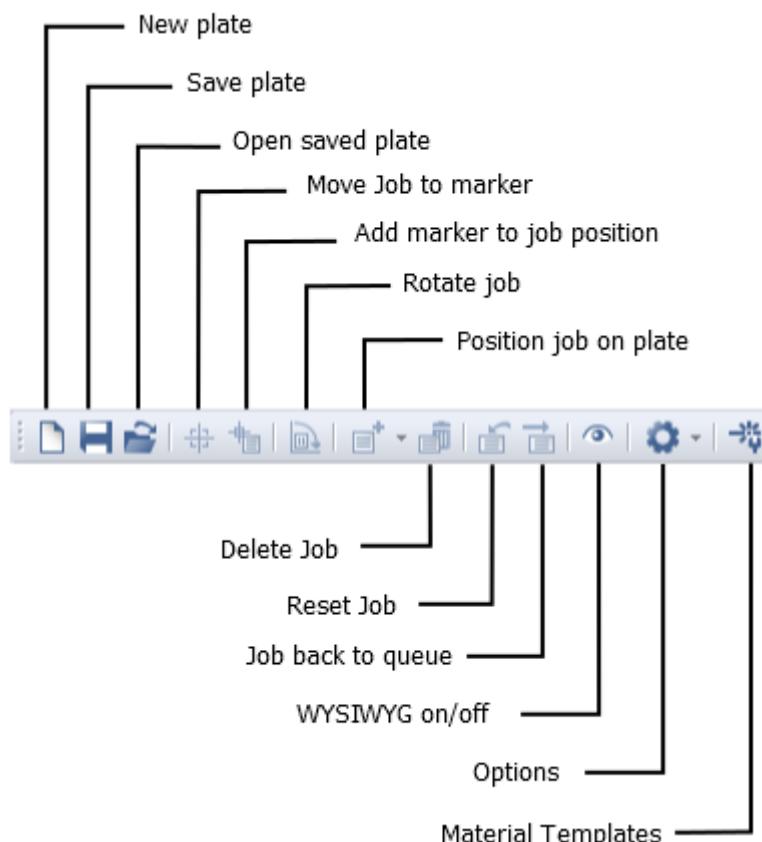
2.7.3.7 View

Status Bar

General information such as the preset material of the active plate is displayed in the status bar.

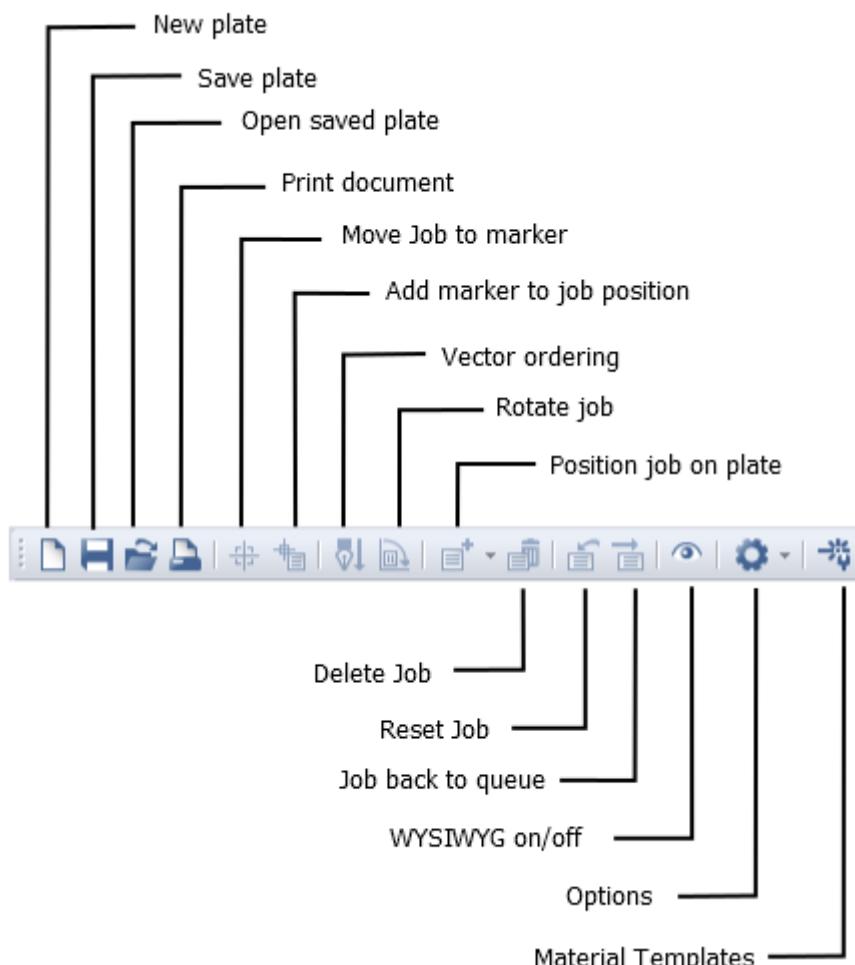
Toolbar JobControl X (for Advanced)

The toolbar provides quick access to commonly used functions.



Toolbar JobControl X (for Expert)

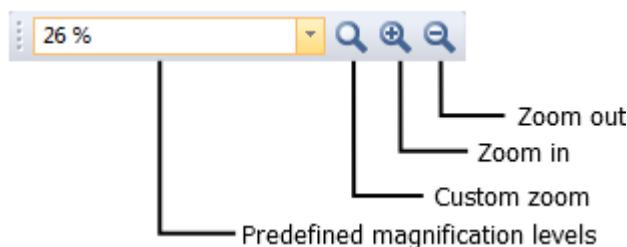
The toolbar provides quick access to commonly used functions.



Zoom (for Advanced, Expert)

The zoom bar enables you to display the plate at the magnification you want. You can use the scroll bars to the right of and beneath the plate to navigate within a magnified plate.

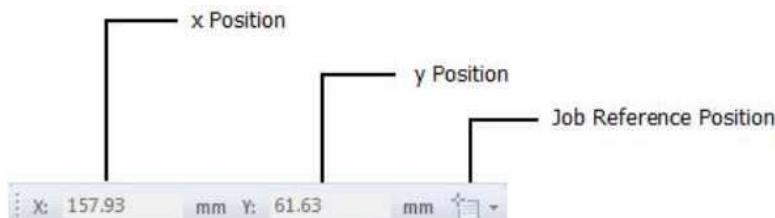
The function keys *F3* and *F4* provide quick access to Zoom Out and Zoom In.



Job Position (for Advanced, Expert)

The job position bar provides information on the X and Y position of a marked job on the plate. Precise job positioning is possible by manual entry of the required coordinates.

Depending on reference selected, the coordinates are either displayed in one of the corners or center of a job.

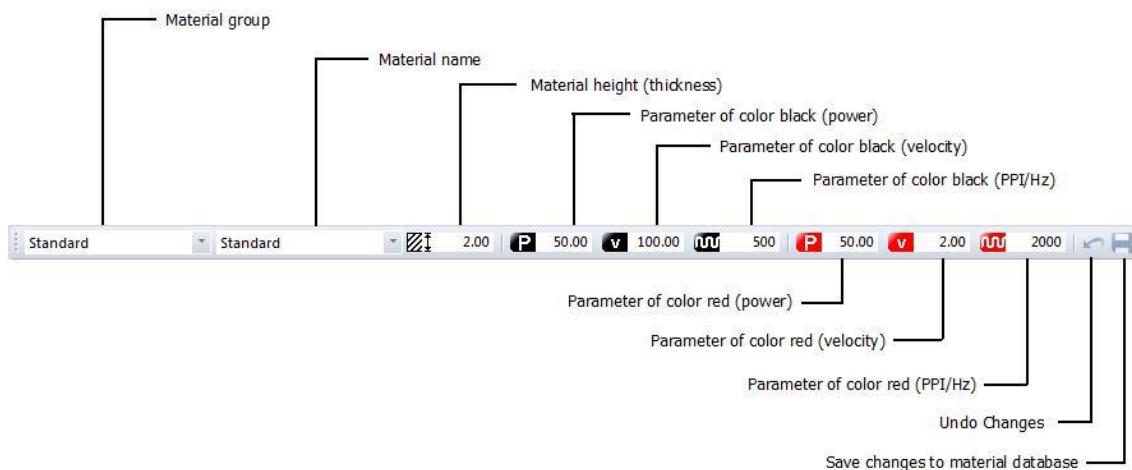


Material Parameter (for Expert)

The material parameter bar displays the main properties of the currently active material. All parameters may be changed. You can undo or save changes using the two buttons on the right.

Changes to power, speed, and PPI/Hz will have an effect on processes being currently in progress with a slight time delay. It is necessary to confirm the change to the value by using the Tab or Return key.

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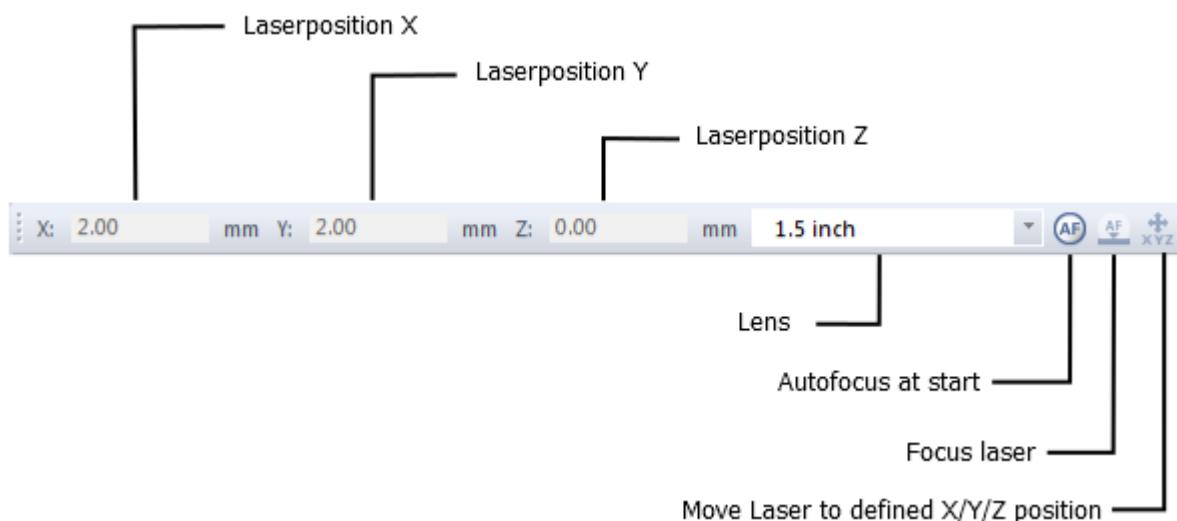


Laser Position (for Expert)

Display of the X, Y and Z axis position.

The Move X/Y/Z button allows moving to any entered absolute position.

Focus Laser moves the table to the focal point, with consideration to material thickness, lens and honeycomb table.



Never press any move-button or Focus Laser button while someone's bodily parts are inside the engraver!

Never put any bodily parts inside the engraver while the table is moving!

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Job Queue (for Basic, Advanced, Expert)

The Job queue displays all jobs which are printed but not positioned on the plate. They are listed in alphabetical order optionally by any columns.

	Jobname	Resolution	Date
	test	500	10/17/2012

Filter: none Show all

You can sort every column with click on the column name. To sort all jobs with there Job name click on Job name with the mouse.

It is possible to modify the columns of the job queue with right mouse button click.

I...	Jobname	Resolution	Date
	test	500	

Icon
 Jobname
 Resolution
 Date
 Date, Time
 Process
 Filename

Filter: none Show all



Icon

Shows the icon of the Job process.

Job name

Shows the job name of the print job. Job name has been defined with printing process.

Resolution

Shows the printing resolution in Dots-per-Inch (DPI). Resolution is defined with printing process.

- **Date:** Date format: system region settings dependent (e.g.: mm/dd/yyyy)
- **Date, Time:** Date format: system region settings dependent (e.g.: mm/dd/yyyy hh:mm)
- **Process:** Standard, Stamp, Layer, Relief, Photo optimized...
- **Filename:** *.tsf filename of printing job

You can move the columns to different position with drag and drop.

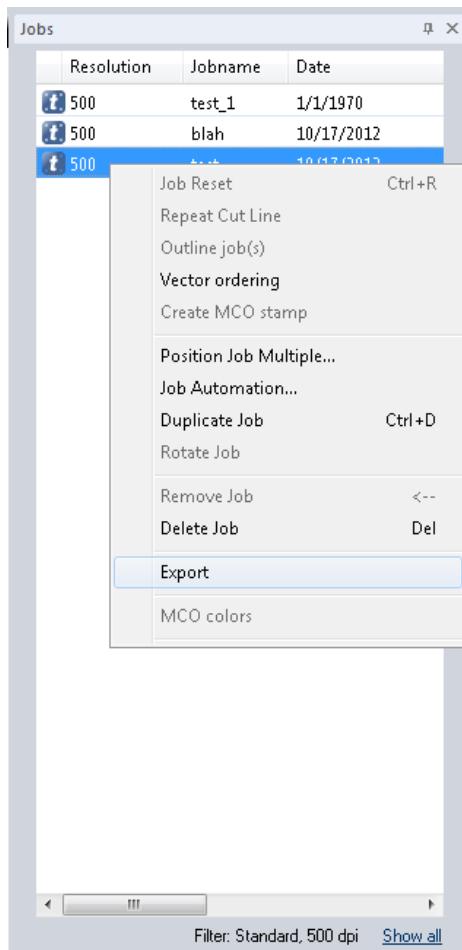
Jobs	Jobname	Resolution	Date
	t test	500	10/17/2012

Filter: none Show all



If a job from the job queue is positioned on the plate, the Filter settings are set to the Resolution of the positioned job.

Export Jobs: Export jobs from within the job queue or plate, by using the context menu. Exported jobs are stored in compressed format (ZIP).



Calculation (for Expert)

Open Calculation Sidebar

Estimated Process Time



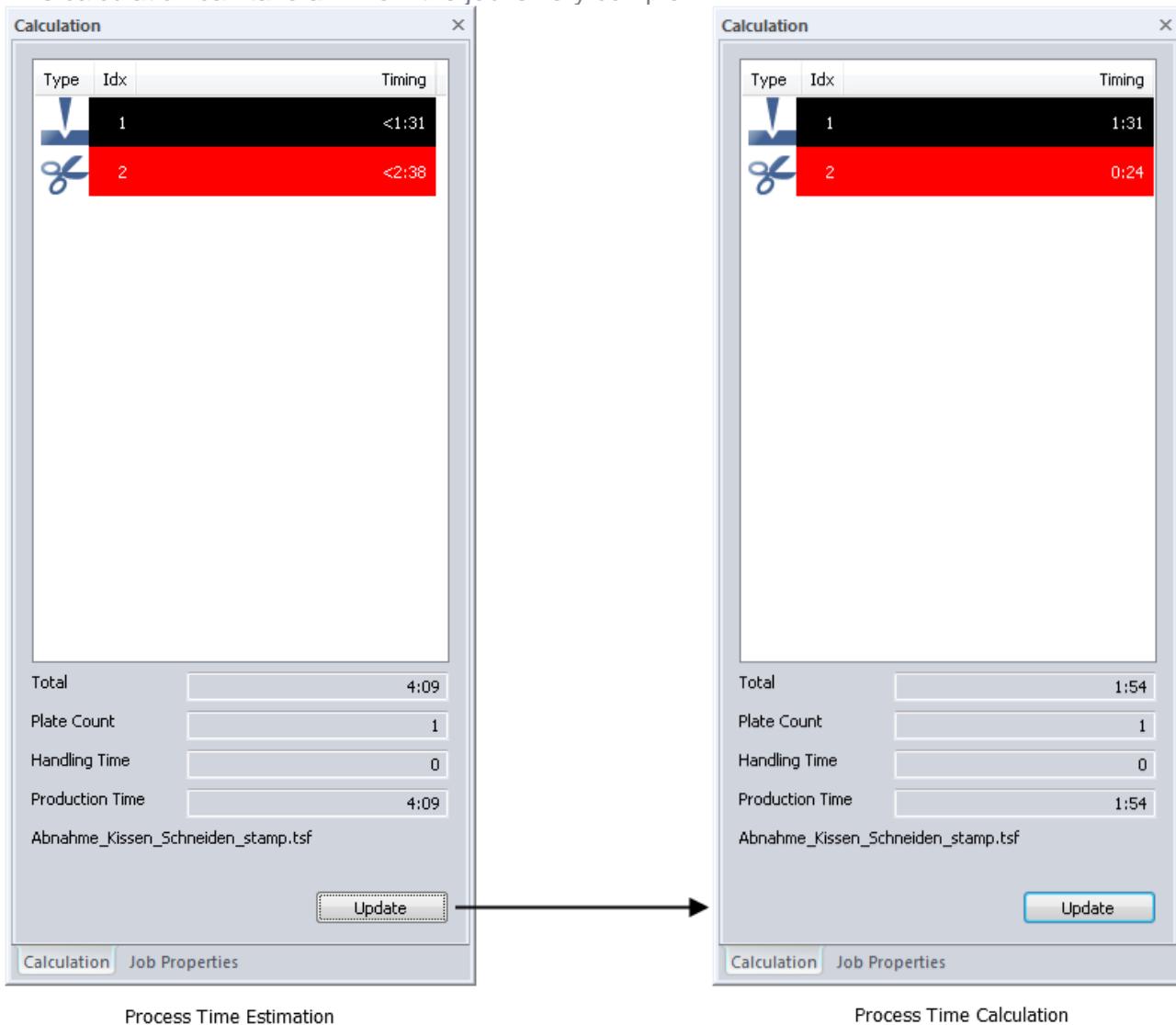
Duration State Identifier

Duration calculation estimates the process time of the selected Job in the queue or on the plate. The estimated time is an indication for the process time but must not meet the real process time.

To get an improved process time forecast open the calculation sidebar and click on Update.

Calculation Sidebar

For improved calculation please open the calculation side bar and click on update.
This calculation can take a while if the job is very complex.



The maximum error between estimated process time and real process time could be more than 100 percent. Only a rough upper bound for the process time has been estimated.

The maximum error between calculated process time and real process is 10 percent.

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The duration state identifier signals the state of the calculation.

<

The process time is estimated. Only a rough upper bound for the process time has been estimated.

*

The process time has been calculated but the process parameters have been changed so the process time has to be calculated again.

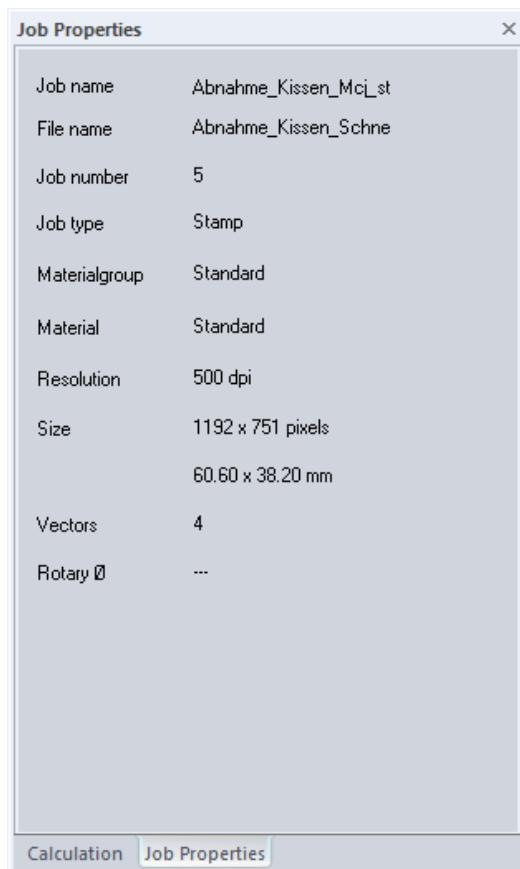
If there's no character in front of the process time the calculation has been executed and calculation time is up-to-date.



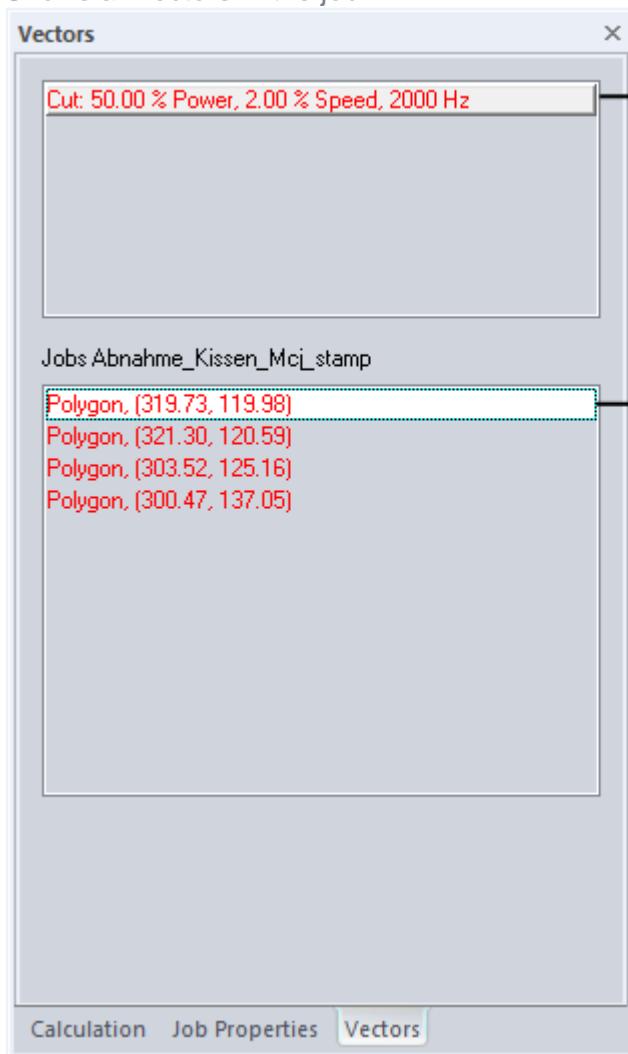
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Properties (for Basic, Advanced, Expert)

Opens the Job Properties Sidebar which shows import info about the selected job on the job queue or plate. The properties include order name, order number, file name, and processing parameters.



Vectors (for Basic, Advanced, Expert)
 Shows all vectors in the job.



Job History (for Advanced, Expert)

Engraver job history

ID-Number	Date	Start	Duration	Jobname	Jobnumber	Filename	Kind	dpi	Power
1	2012-10-22	16-15	00-00-18	blah	64	blah.tsf	Standard	500	50.00
2	2012-10-22	16-16	00-00-20	blah	64	blah.tsf	Standard	500	52.00
3	2012-10-22	16-16	00-00-17	blah	64	blah.tsf	Standard	500	52.00
4	2012-10-23	09-52	00-00-23	5206Segment.cdr	2220	1-14480265-1-240694	MCI Pad	500	50.00

 display entries from: to:

List of all jobs processed with date, processing time, job name, job number, filename, kind, dpi and power. The user may use the list to create statistics or for calculations.

An inbuilt export function creates a file, if required, which can be opened and edited with Microsoft Excel® for example.

Recycle Bin (for Basic, Advanced, Expert)

Recycle Bin

Job	Deleted at
Graphic1 0001.tsf	17.10.12 08:51:54
Graphic1 0002.tsf	17.10.12 08:53:49
Graphic1 0003.tsf	17.10.12 08:54:04
test_1.tsf	19.10.12 13:08:59

Dialog for showing and undeleting already deleted jobs

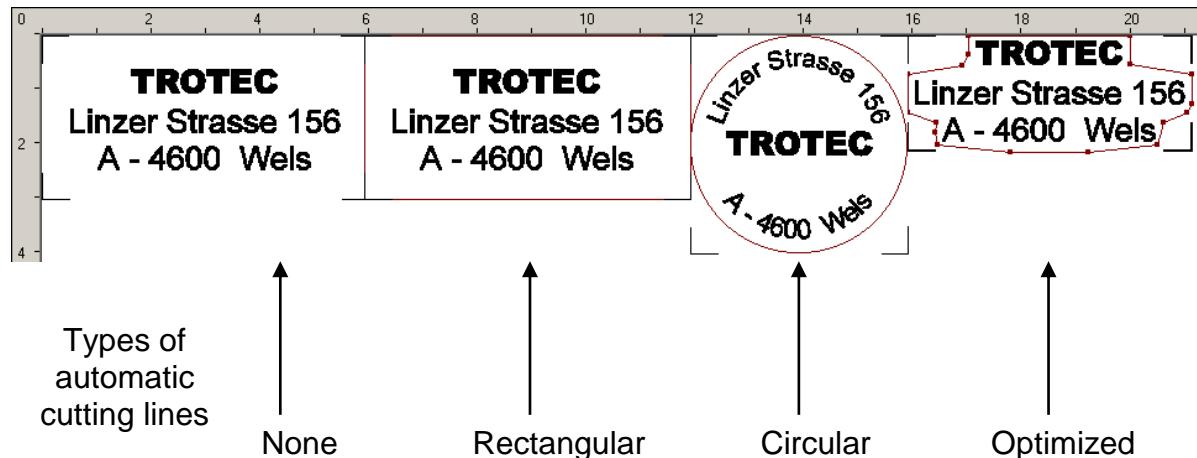


WYSIWYG on/off (for Advanced, Expert)

If WYSIWYG is activated all jobs on the plate will be displayed with their graphic contents. This makes positioning easier and helps searching for jobs. Cutting lines are only displayed if the appropriate color is activated for cutting. This is also used to check if unwanted cutting lines may exist.



With less powerful computers or the display of large complex graphics, image formation may take some seconds. In these cases, it may be useful to deactivate the WYSIWYG function to ensure fast processing.



Here the different types of automatically created cutting lines are very clearly illustrated (see 2.6.3 Process Options, Cut Line).

Stamp Optimization

All four jobs illustrated were created as stamp. The smaller dimensions of the job with the optimized cutting line were obtained by so-called stamp optimization. This reduces the dimensions of a stamp job to the required minimum measure without loosing contents. This allows reducing the material required. The stamp optimization automatically affects all stamp jobs which were printed with optimized cutting line.



2.7.3.8 Window (Basic, Advanced, Expert)

New Window

Opens a new window for the current document.

Cascade

Arranges the windows so they overlap.

Tile

Displays the windows side by side.



2.7.3.9 Help

Help F1

Opens software manual (PDF Reader has to be installed).

Laser Manual

This option opens the Operation Manual for the engraver (PDF Reader has to be installed).

What's New?

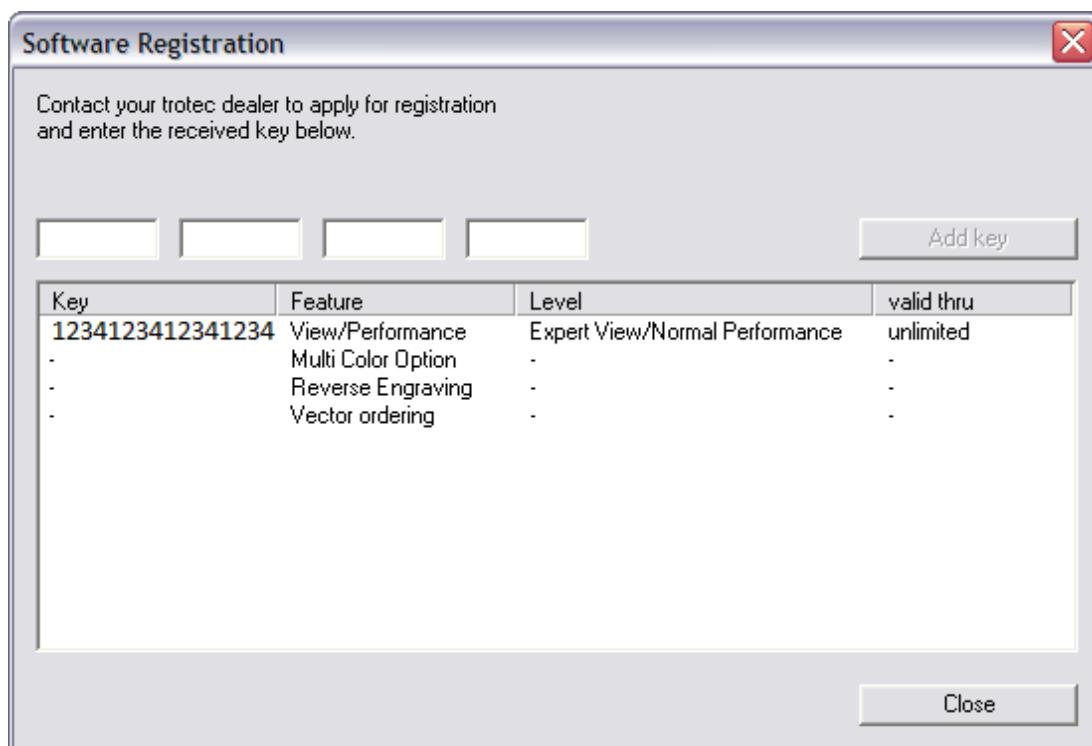
Shows JobControl Release Note (PDF Reader has to be installed)

User Registration

Register your JobControl

Software Registration

This option allows updating the software to different view levels and options.



Trotec on the web

Displays the link to Trotec web (www.troteclaser.com).

About JobControl

Displays program information, Version number and copyright.



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2.8 JobControl Vision

2.8.1 Introduction to JobControl Vision

JobControl Vision Software: precise laser finishing of printed materials.
 Create Print&Cut acrylics, paper, film or cardboard products.

The Vision module uses registration marks to determine the position and rotation of printed sheet material on the working area of the laser.

Additionally, the intelligent JobControl Vision camera recognizes any distortions - linear or non -linear - in the printed graphics.

By applying sophisticated mathematical algorithms the system compensates for the detected print distortions and adjusts the cutting path dynamically to match the artwork. No matter if flexible or rigid materials.

How it works in simple words: The registration marks are printed along the image. The camera - which is attached to the working head - "reads" the registration marks prior to the cutting process and compares the "read" positions on the printed design and the target positions in the original cut file.

Any deviations are adjusted automatically. There is no need for manual alignment which speeds up your production and costly miscuts can be avoided. This guarantees a perfectly cut end product.

Create amazing details and meet tightest tolerances - with Trotec JobControl Vision.

2.8.2 Supported Applications

As for now the applications listed below are capable of sending regmarks to JobControl Vision.

- CorelDraw
- Adobe Illustrator
- Inkscape
- Pdf Reader (please notice that Pdf files must contain Bezier path in order to send regmarks to JobControl Vision)

Applications which are not able to send regmarks to JobControl Vision

- ACad
- SolidWorks

2.8.3 JobControl Vision Workflow How-to

This how-to shows you how to create a basic Print&Cut application in Corel Draw and to cut it out with JobControl Vision.

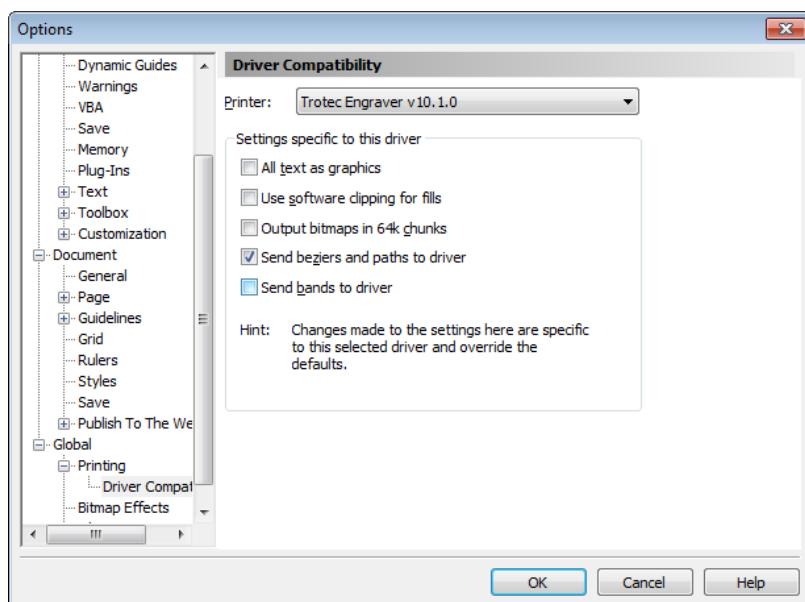
The JobControl Vision workflow can be applied for Adobe Illustrator with some minor changes.

Preconfiguration of Coreldraw

The printing application (e.g. Adobe Illustrator or Coreldraw) needs to support bezier output which have to be activated for the trotec printer driver

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Set up artwork

Open Corel Draw and open a new page with A4 sheet size.
 Create your artwork. In this case we use a part of the Trotec logo.

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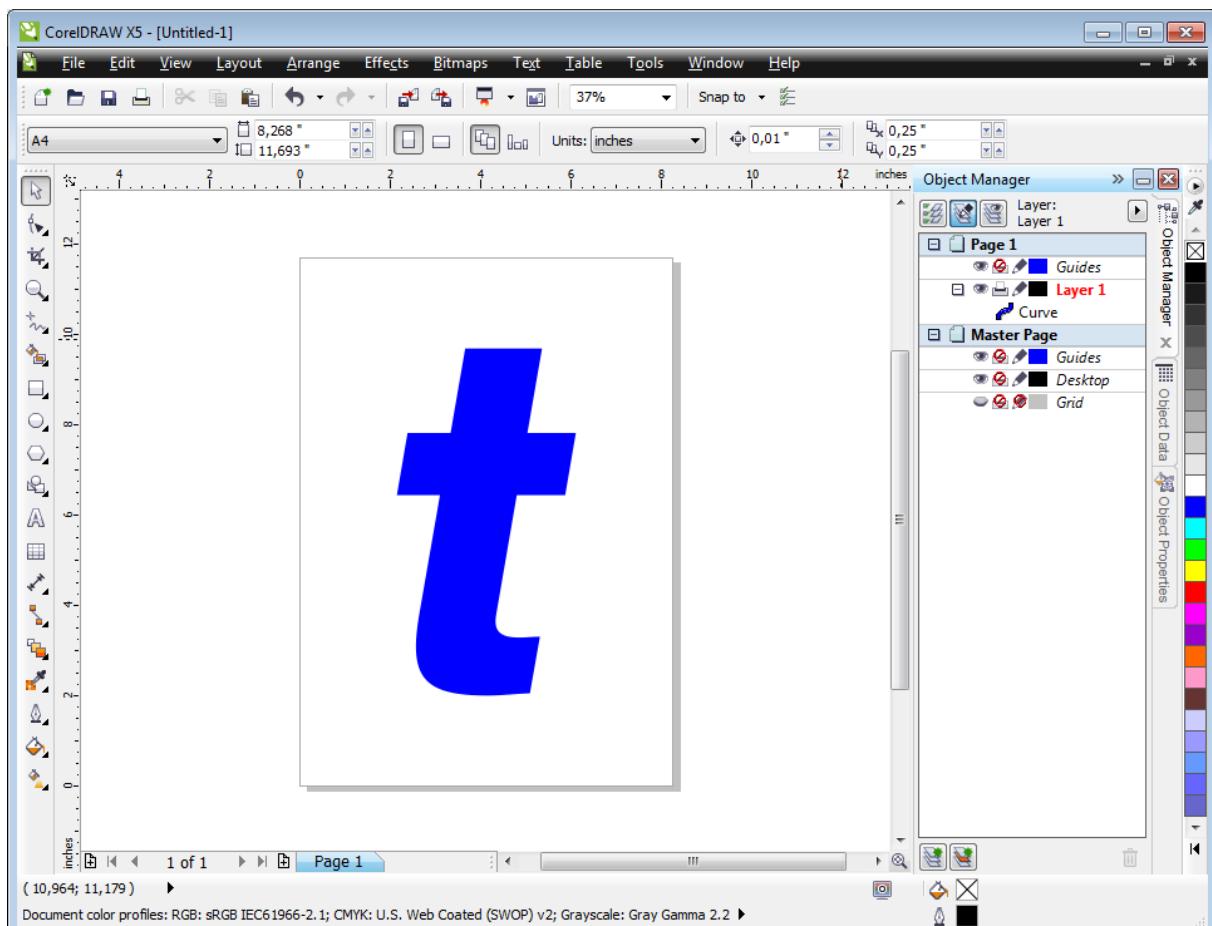


Figure 1: Create artwork in Corel

Add a cut line to your artwork. Use one of the 16 RGB colors from the Trotec color palette with line width "Hairline" for your cut line. In our case we use red.



To make color mapping easier
the trotec color palette can be imported from
the JobControl installation DVD.

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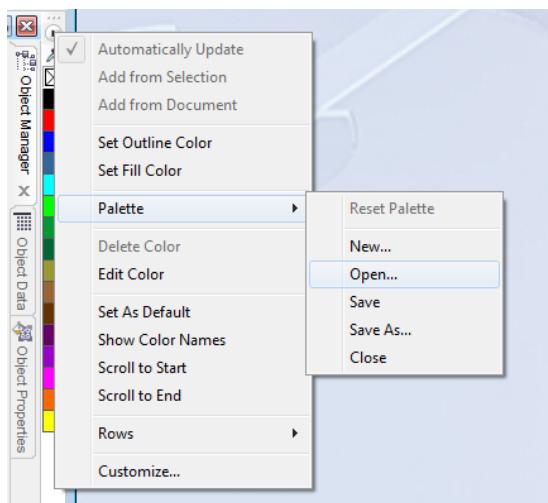


Fig. : Import Trotec color palette from JobControl installation DVD into Corel Draw

Add 3 registration marks in the outer corners of the A4 sheet.
It's recommended to use 6 mm as reg mark diameter.

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Apply a black outline with line width "hairline" and a black fill.

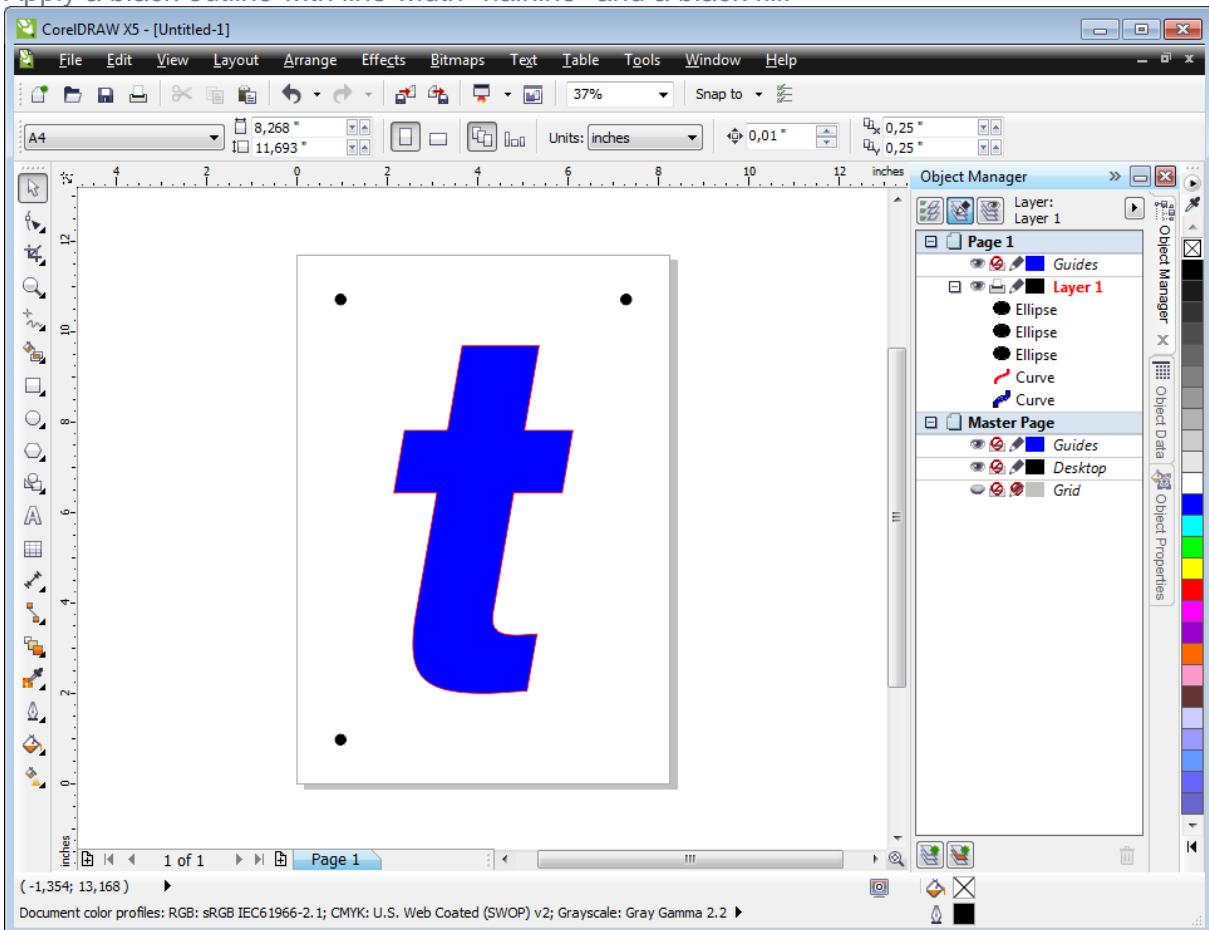
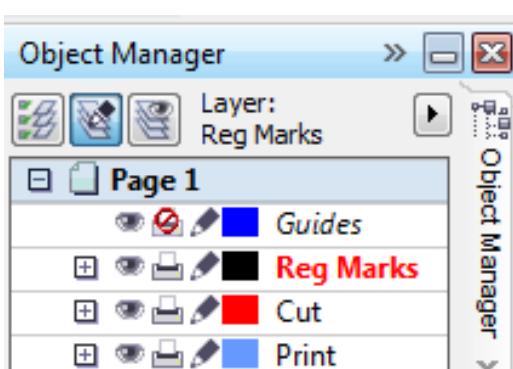


Fig. 2: Artwork, cut line and reg marks on one page
This is our print and laser ready job.



It's recommended to put reg marks, artwork and cut lines on separate layers.
By doing this you can easily enable and disable layers for printing.



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Fig. 3: Artwork, cut line and reg marks on different layers

Prepare and print artwork job to printer

Print the artwork and regmarks on the workpiece.



The job cutlines would interfere with the artwork print so they should not be printed.

With dedicated layers it's straightforward to disable the cutline layer for printing.

Without layers just delete the cut line and undo delete after you have printed your job.

Now export a pdf and send it to the printer or directly print from your Corel.

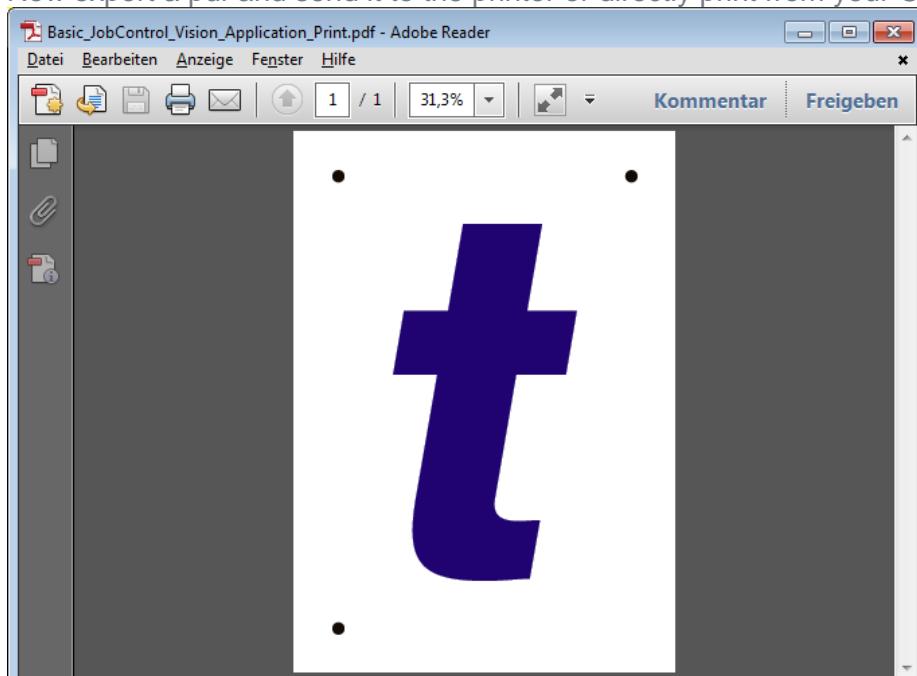


Fig. 4: Exported PDF is ready to print

Prepare and print cutline job to printer

Print the reg marks and cut lines to the laser.



The artwork layer should be disabled for this print.

Now go print. Select Trotec Engraver Printer Driver and open "Preferences" dialog.

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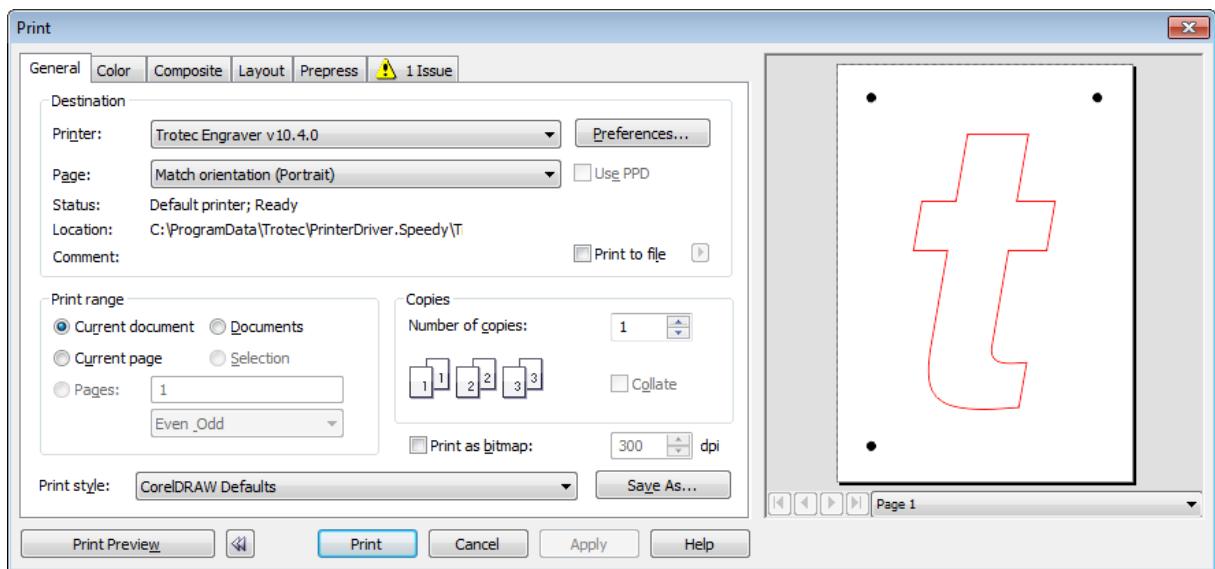


Fig. 4: Print window in Corel Draw

Set page size to A4 format. And open material database.

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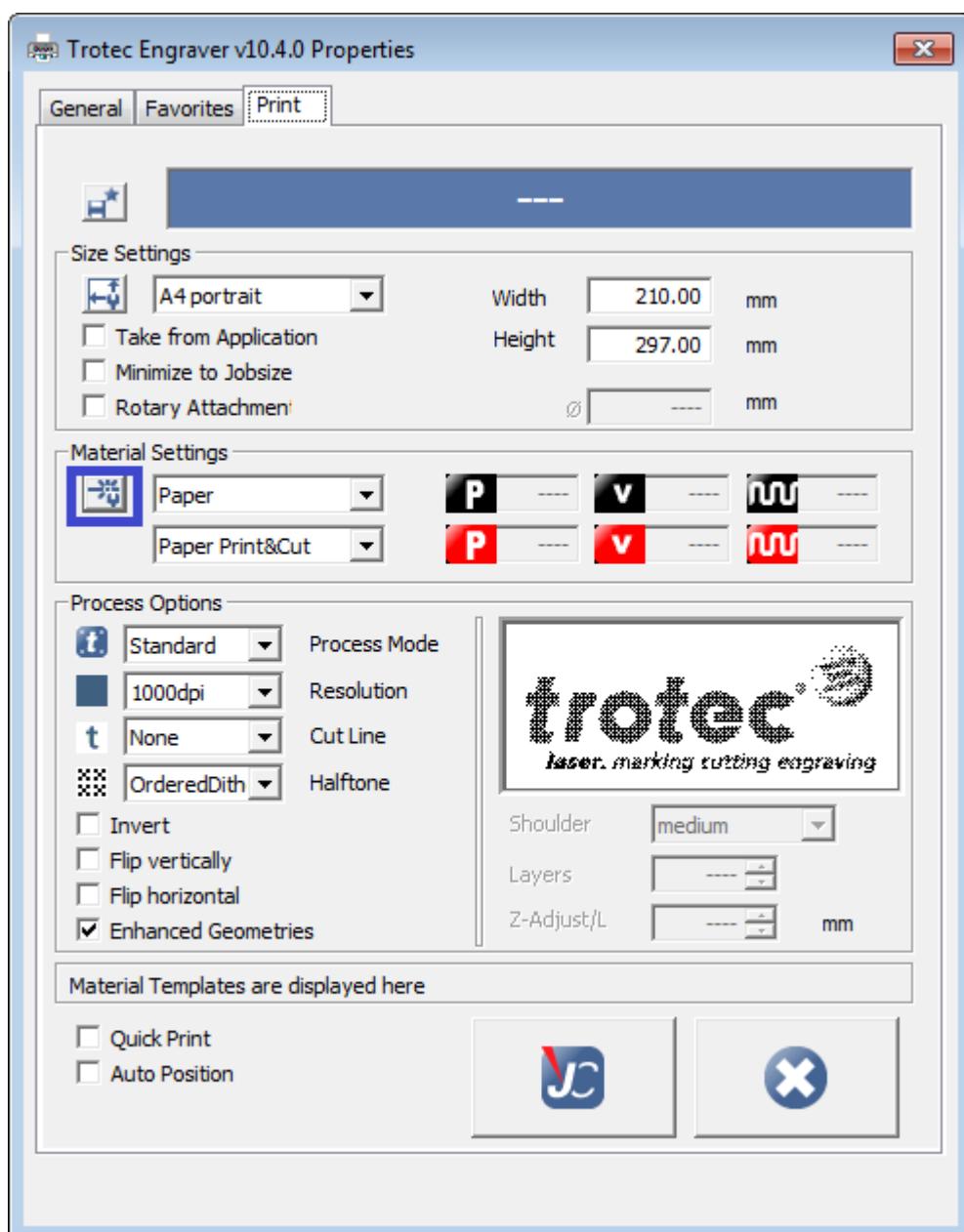


Fig. 5: Trotec printer driver preferences window in Corel Draw

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Select material group "Paper" and create a new material "Paper Print&Cut". For color red select process type cut. Add and adjust your laser parameter for your red cutline. In our case we use a Speedy 400 80 watts and a 1.5" lens. We use 60% power, 1% speed, 1000 hz frequency and air assist on.

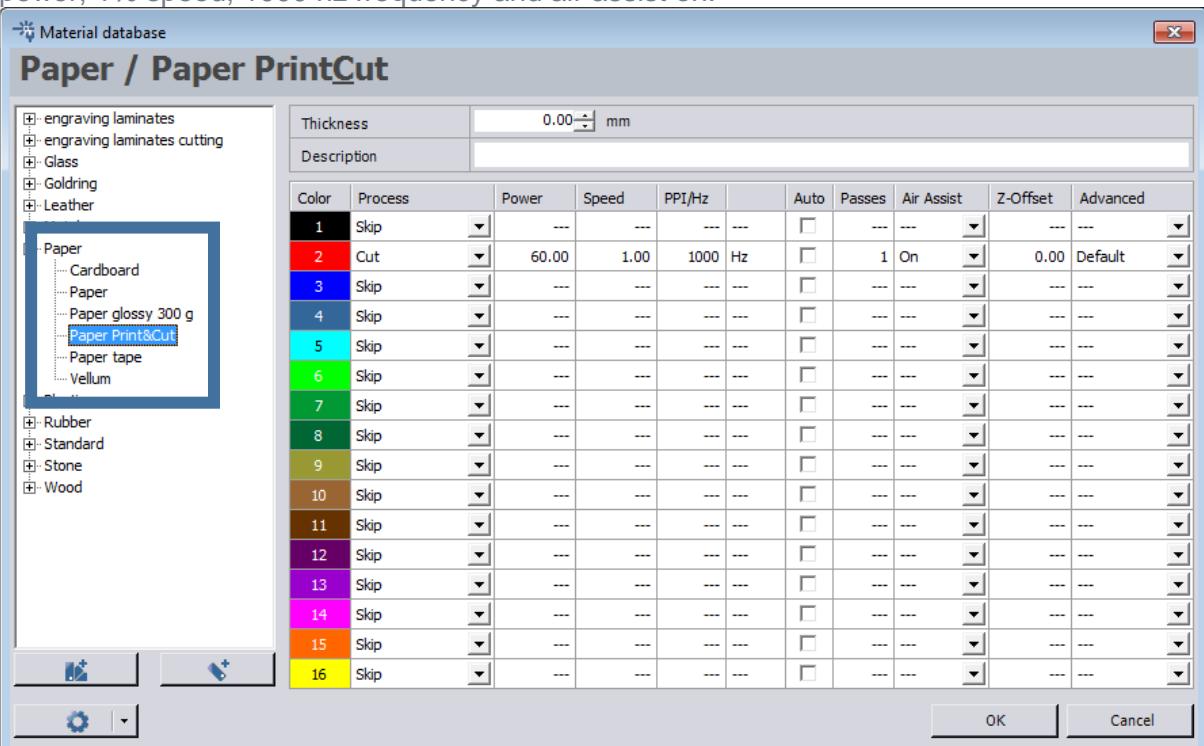


Fig. 6: Trotec material database

For color black select process type reg mark. By doing this JobControl now knows that the black objects are reg marks and the laser job is a vision job.

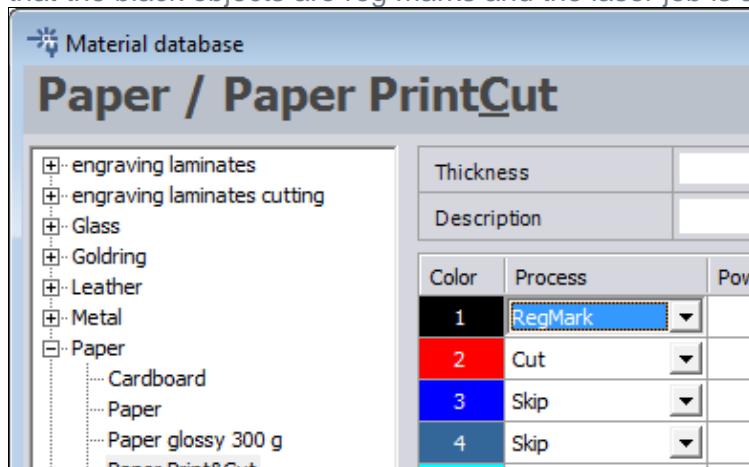


Fig. 7: Select process type "RegMark"

Click the OK then the JC button and you will exit the preferences window.
Click print and the job will be print to the JobControl job queue.

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Checklist for successful printing of regmark jobs

- Bezier curves output has to be activated in graphics software.
- Regmarks have to be defined with circle contours.
- Supported regmark size: 2 - 12 mm
- The contour of the circle needs to be active
- Contour color in the material database has to match the contour color of the regmark.
- Regmark color has to be defined in materialdatabase before printing.
- Contour width needs to be as small as possible (hairline)
- The circle needs to be perfect – ellipses are ignored.
- It's recommended to print the job with 1000 DPI. This improves the accuracy significantly without loss of productivity.

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Prepare Laser and JobControl



Ensure that USB camera is connected to the PC before JobControl start.

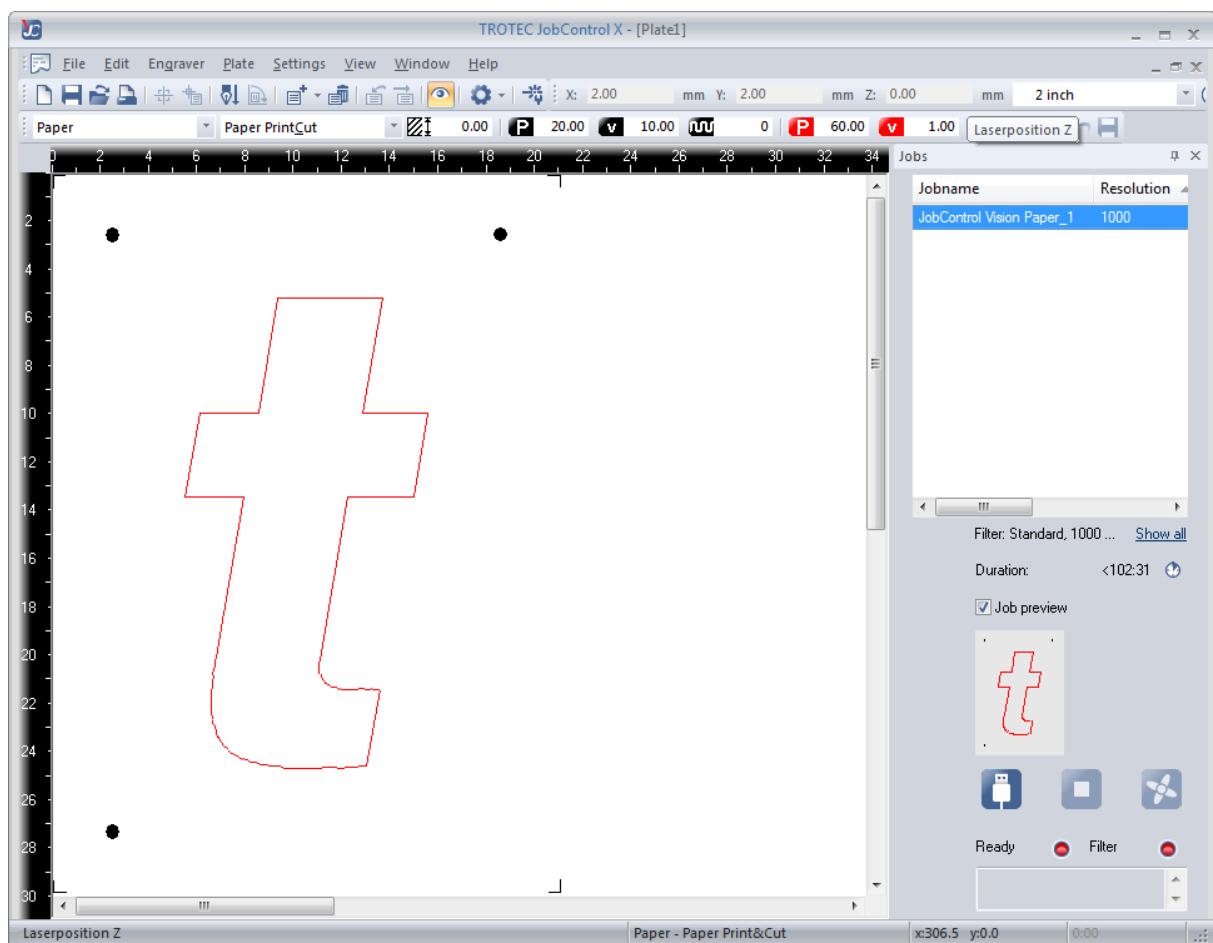
If camera is not attached to the PC and JobControl has already been started please close JobControl, connect the USB camera and restart JobControl.

Connect to the laser.

Take your printed A4 sheet out of your printer and put it on the working area of your Trotec laser. Use a black aluminum cutting grid table or a vacuum table with honeycomb. Check lens for cleanness and focus on the material.

Prepare JobControl

Put your laser job form the queue on the working area. Position it on the working area either at 0/0 or to the position where you printed A4 sheet is in the machine.



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Fig. 8: Laser job on working area of JobControl

Now you are ready to cut the job.

Process the cutting job

Click play.

The JobControl Vision run screen opens.

If the JobControl didn't appear and the cutting of the job starts immediately instead please abort the job and check materialsettings for correct regmark color process enabled.



If there is a good match between job position and workpiece JobControl can find all regmarks automatically. To ensure that this is possible move the laserpointer of the laser to the center of a regmark on the workpiece. Then move the Job on the JobControl Plate so that corresponding regmark positions match.

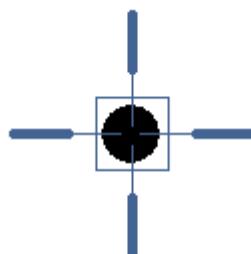


Figure 2: Workpiece regmark matches the corresponding regmark on the plate

If the position does not match you have to interact with the system and teach the system the first reg mark position.

In this case JobControl Vision will indicate the position of the first reg mark.

You have to navigate the camera over the first reg mark by using the keypad on the laser, the software arrow keys or the arrow keys on the computer keyboard.

When the camera center is centered over the first reg mark and the system has recognized the reg mark successfully the reg mark is highlighted with a green circle in the camera window. Then press enter.

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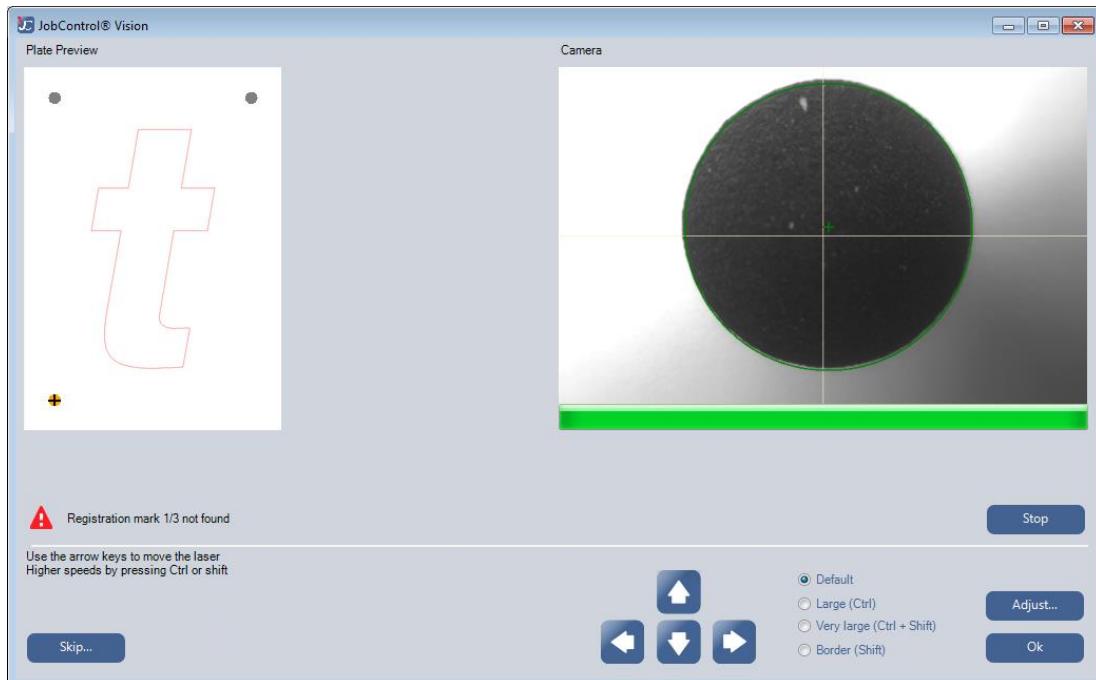


Fig. 10: Camera detects reg mark and is ready to proceed

Now the system travels to the second reg mark.

If the workpiece is not rotated and without heavy distortion the regmark and all other regmarks are read automatically.

If the alignment was not ok or there were print distortions in the job the position of the second reg mark will be off.

You have to teach the system the position of the second reg mark. Do the same procedure as at the first reg mark.

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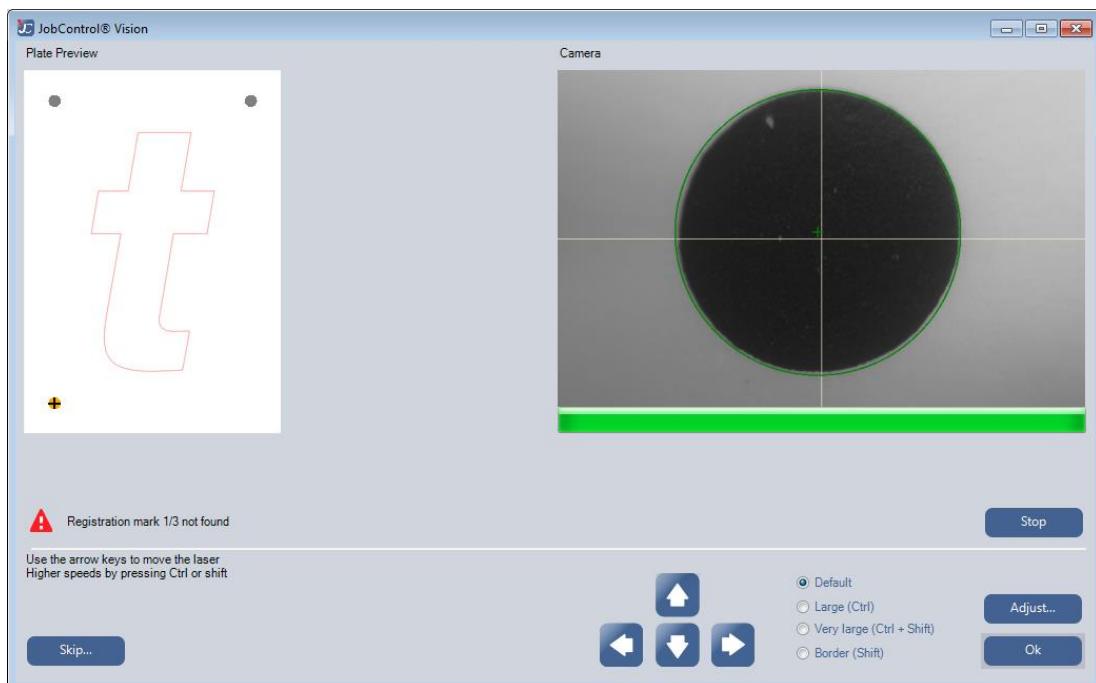


Fig. 11: Second reg mark is indicated because alignment was not correct

After teaching the system the second reg mark it will find the third reg mark automatically and cut the job.

What if my cut does not match my print?

Verify correct compensation strategy. Nonlinear compensation works best in most cases.

Clean camera window and calibrate camera offset. Please see JobControl documentation for camera offset calibration.

What if my reg marks cannot be recognized?

Adjust camera parameters or reset to default parameters.

Exposure: 4, Gamma: 13, Threshold: 24

Clean Camera Window.

Please see JobControl documentation for camera image adjustment.

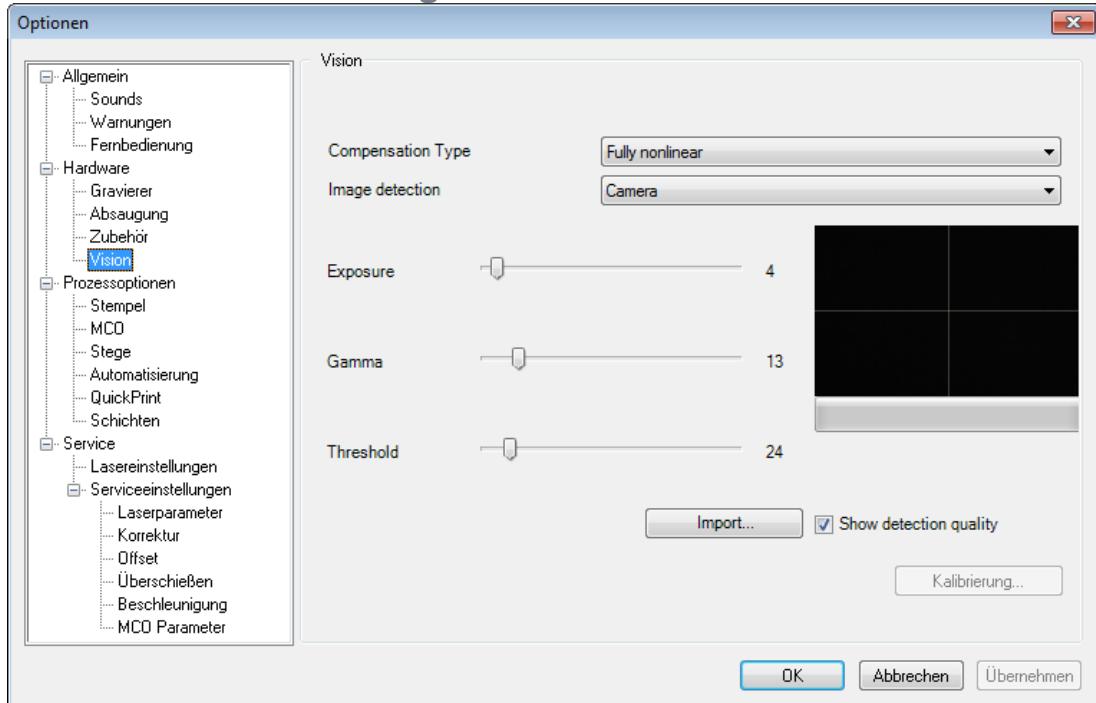
What if a reg mark is damaged and therefore cannot be recognized?

You can manually skip reg marks. This is only possible if you respect the minimum number of reg marks (E. g. if you have 3 reg marks you can skip 2 reg marks - with compensation type position).



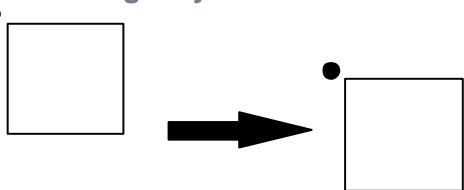


2.8.4 Vision Configuration



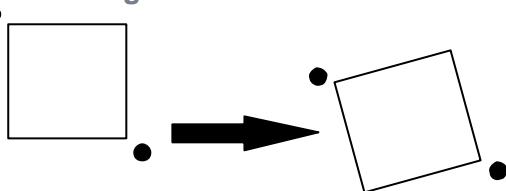
Compensation Type: defines the way the regmarks influence the cutting size, position and distortion.

- **Positioning only:**



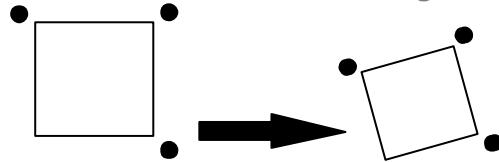
Compensation: only Positioning, (no Scaling, no Shearing, no Rotation)
Minimum number of Regmarks: 1

- **Positioning and Rotation:**



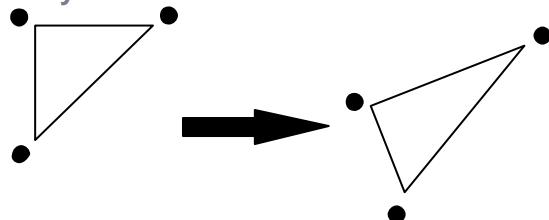
Compensation: Positioning and Rotation (no Scaling, no Shearing)
Minimum number of Regmarks: 2

- **Position, Rotation and Scaling:**



Compensation: Positioning and Rotation and Scaling (no Shearing)
Minimum number of Regmarks: 3

- **Fully nonlinear:**



Compensation: Nonlinear
Minimum number of Regmarks: 3

Image Detection: defines the detection device which is used for regmark detection.

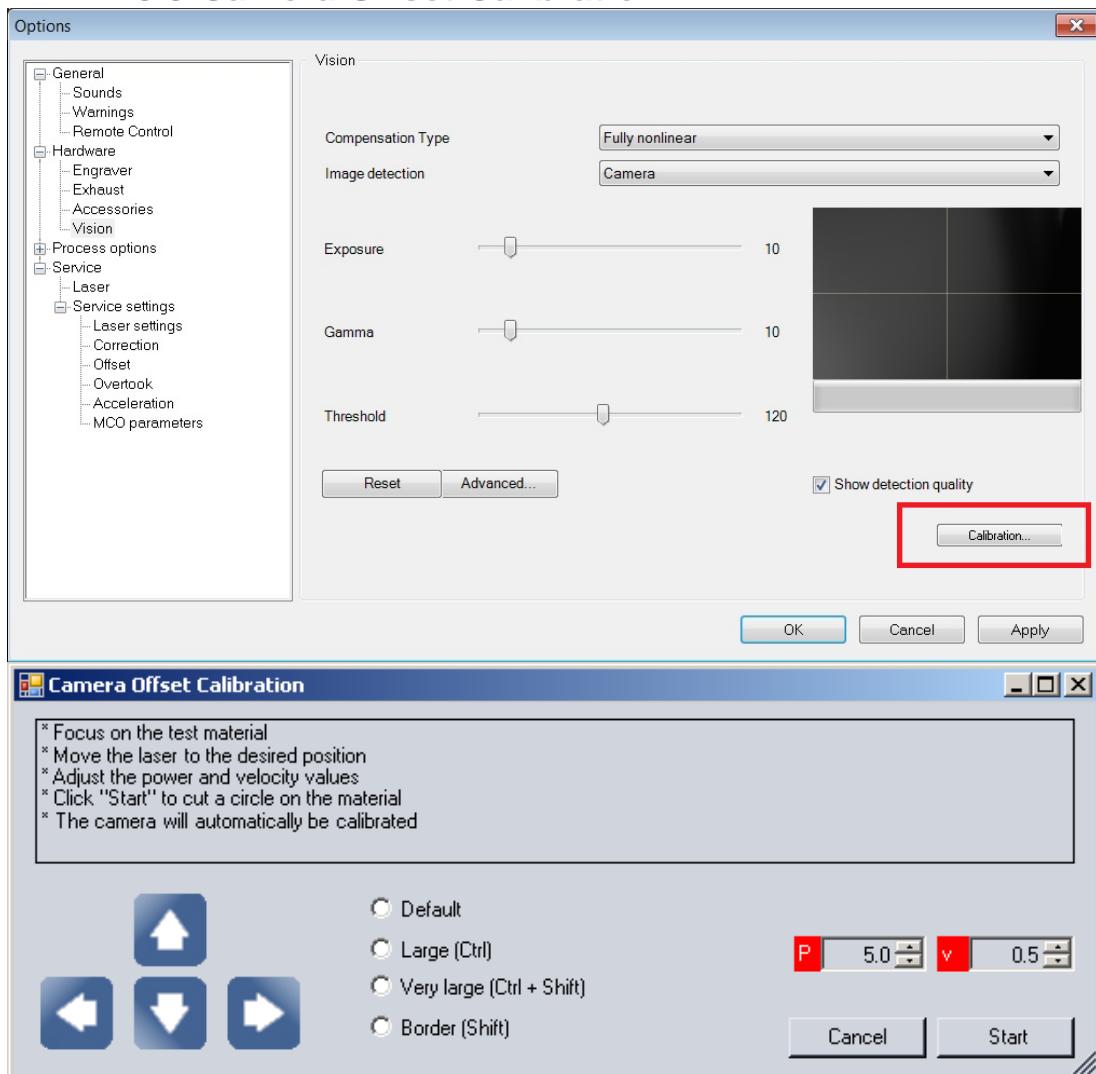
- **Camera:** default setting for JobControl Vision
- **Laserpointer (demo mode):** Instead of the camera the laserpointer can be used to manually detect regmarks. It's recommended to print small crosses inside or instead of the printed regmarks on the workpiece.

Camera Settings:

- **Exposure:**
defines the amount of light which is used for image detection. With camera light attached this value is generally lower than without.
- **Gamma:**
this value influences the illuminance of the camera image.
- **Threshold:**
this value is used for regmark detection algorithm to decide whether a regmark is found or not.
- **Advanced...:** load camera configuration file



2.8.5 Camera Offset Calibration



Camera calibration automatically estimates the difference between laser head and camera.

Camera calibration needs to be done under following circumstances:

- Common
 - It's recommended to calibrate the camera once a week.
 - After first installation of JobControl Vision
 - After Camera lense focal point has been changed because of different reasons:
 - camera lense has been changed or readjusted.
 - working defocused without materialdatabase defocus feature leads to a different camera lense focal point.
In this case the camera calibration needs to be done defocussed to or use defocus values in materialdatabase.

- Constant discrepancy of cut path in one or two directions has been detected.
- Rarely
 - After laser beam alignment
 - After replacement of camera with different camera

Insert the calibration material into the machine.

The material needs to be cutable, markable or engraveable because the camera needs to recognize the processed circle.

For CO₂ Laser machines this is usually a blank piece of paper or anodized aluminum.



Calibration on anodized aluminum has to be done without camera illumination because of backreflection.
Exposure: 70, Gamma: 5, Threshold: 220 are verified values for good detection of the cutted regmark in this case.

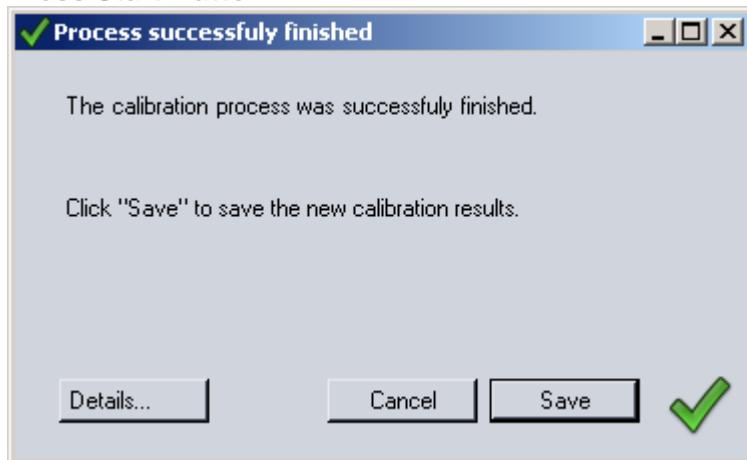
For Fiber Laser machines anodized aluminum can be used too.

Focus on the calibration material

Adjust the power and velocity values

The values P=5 and v = 0.5 may work for a blank piece of paper.

Press Start Button



The calibration routine has finished press Save to store the new camera offset settings.

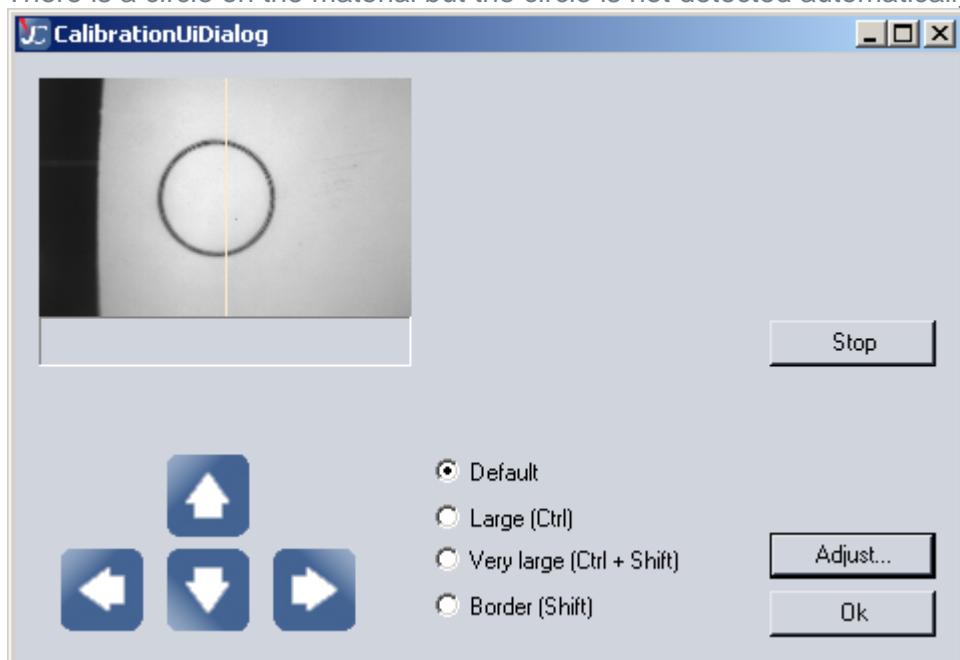
Common Issues

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- The cutted circle is not detected automatically. Move to the circle manually with software cursor keys or with machine cursor keys.



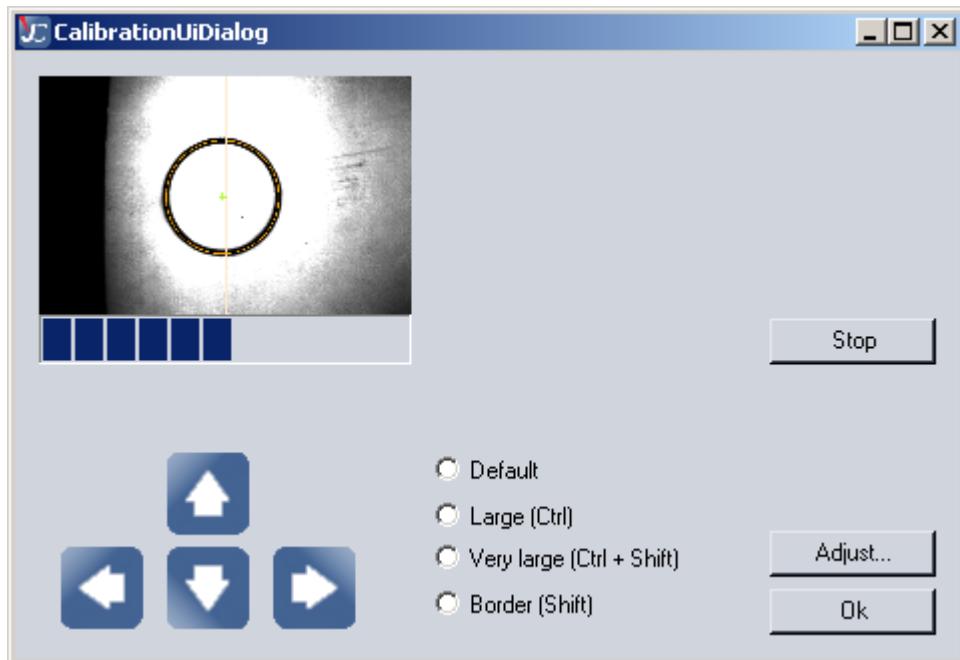
- There is no circle on the material. Repeat the calibration routine with increased power settings or with different material.
- There is a circle on the material but the circle is not detected automatically.



Readjust camera with Adjust... Button

Press Ok

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Drücken Sie Ok

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2.9 JobControl Vision Hardware Guide

2.9.1 Vision Camera

JobControl Vision System uses a high quality USB camera device with special plug system which allows removing of camera without any loss of time.



JobControl Vision Camera system with LED/protection adapter.

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2.9.2 Camera Connection

Before working with the JobControl Vision System ensure that the USB repeater is connected on the backside of the laser machine which connects the camera with the PC.



Before Running JobControl Vision Software ensure that the camera is connected to the PC with USB repeater successfully.
It's not possible to connect the camera for the first time whilst running JobControl Vision. In this case restart JobControl Software.

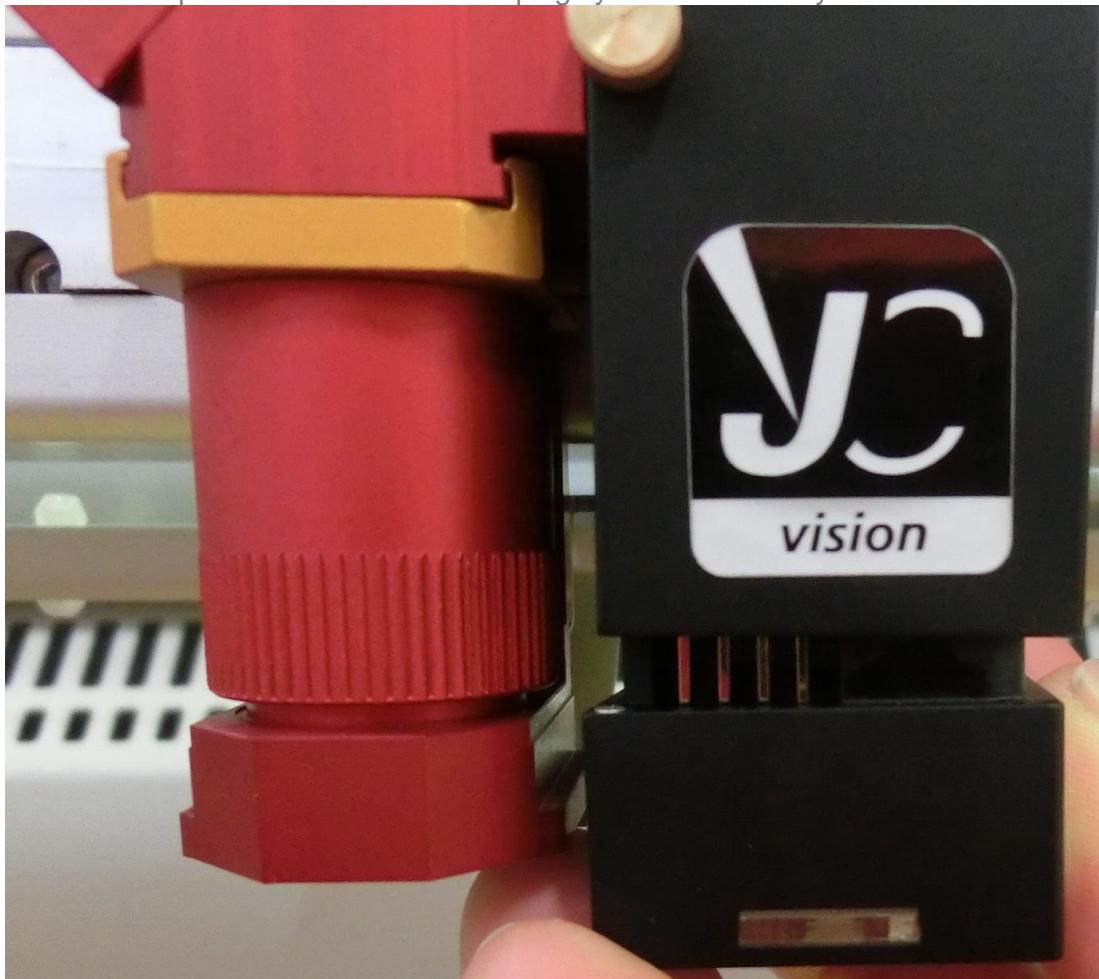
2.9.3 Camera LED adapter

The JobControl Vision System is delivered with a LED adapter for camera illumination.



Be aware that laser processing with camera without LED adapter can contaminate camera optics.

The LED adapter can be attached with plug system without any screws.



Cleaning of LED adapter

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LED adapter needs to be clean because contamination can negatively influence the camera detection.

The acrylic glass of the LED adapter can be cleaned with window cleaner but avoid aggressive materials like acetone because of blurring.

2.9.4 Removing of the camera

To remove the camera first open the 2 fixing screws and then pull the camera out of the plug system.

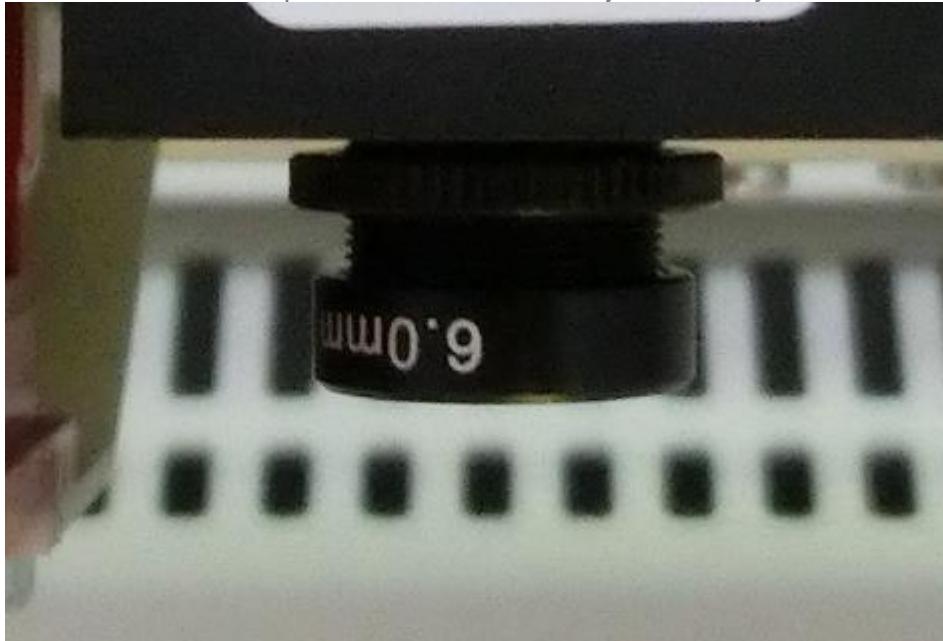


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2.9.5 Camera Sharpness Adjustment

The camera sharpness is preadjusted for laser delivery configuration so it's no demand to change this setting in general.

But it may be possible that special applications or different laser lenses need different camera sharpness. So this can be adjusted easily.



The adjustment is typically done with attached camera and with JobControl Vision camera view. The laser is focused on the workpiece and the camera view should show a workpiece regmark.

First untighten the black fixing wheel of the optic and then turn the optics until the workpiece regmark is perfectly sharp.

Tighten the fixing wheel to preserve the sharpness settings of the camera.

If laser processing with camera but without LED adapter occurs it's highly recommended to check camera optics for contamination.

To remove camera optics contamination please clean the camera lens with laser lens cleaner carefully.



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2.10 Information about the use of Graphics Software

2.10.1 Contours and Fills

The TROTEC printer driver differentiates between raster mode (engraving) and vector mode (cutting) by the type of the graphics used and the selected process in the used material colors.

For laser cutting, set the line generated in the graphics program to the smallest line width possible. Assign the color you want to this line – Red is very common – and chose a cutting process for the red color. The printer driver interprets these objects as vectors and cuts them. If objects are to be cut, always be aware that the driver may interpret a contour which is too thick as fill.

If a thin red line is printed with engraving process for color red the resulting job does not include any vectors because the red lines are rastered (halftoned) and can only be engraved not cutted.

If engraved and cut objects are combined, different colors are used for the fills and contours as engraving requires power values different to cutting. Objects to be engraved are therefore usually drawn with a black fill and cutting lines as red contours.

2.10.2 Image Processing Order

When cutting and engraving graphics, the laser carries out all engravings first and then all cuttings. All black filled objects for example are engraved first and then all red contours are cut. Unlike engraving, the cutting is done in the order the contours were drawn. There are two different ways to define the cutting order. You can either draw them exactly in the order they should be cut or you select “Arrange” in the graphics program and place them “behind” the other objects with this function in order to cut the contour you want first. As a third option you can assign different colors from the TROTEC material templates to the cutting lines. They will then be cut exactly in the order listed in the templates.

2.10.3 Overlapping Fills

If graphics contain overlapping black filled areas, the driver will automatically filter these so that these overlapping areas will not be engraved twice. The whole filled area of the object lying on top and only the visible part of the object located underneath are engraved. The end result is like a print view. White can be used as a very helpful drawing tool. As the laser does not engrave white areas (this is the background color), these can be used to block unwanted engraving areas from filled areas or bitmaps.

Overlapping Outlines

The TROTEC printer driver does not filter overlapping outlines. If one red outline is placed on top of another, both contours are cut by the laser. This is a helpful function, when thick materials are to be cut. To use this function, double an outline.

setting
new
standards

Another possibility is to set the "Cut ... passes" option in the "Job" tab of the engraver driver to "2". This function can also be set with the "Job Setup" menu command in the TROTEC JobControl.

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2.10.4 Hidden Vectors in Graphics

The TROTEC printer driver does not automatically filter outlines, which are, for example, overlapped by objects such as fills. If hidden red outlines are located under a black filled area, the laser will first engrave the fill and then cut along the hidden outline.

2.10.5 Power Control through Color Selection

The TROTEC JobControl allows the selection of 16 different colors in the material templates to specify 16 different power levels during cutting or engraving. When using this function, the colors in the graphics program must match exactly the colors listed in the TROTEC JobControl (on using Corel draw make sure that color management is „OFF“). In some graphics programs these Basic colors are already predefined, with other programs, you must define each color separately with its RGB components first. If the 16 driver colors are not automatically available in the software, use the values in the following list:

No	Color	RGB Color Model			CMYK Color Model			
		R Red	G Green	B Blue	C Cyan	M Magenta	Y Yellow	K Black
1	Black	0	0	0	0	0	0	100
2	Red	255	0	0	0	100	100	0
3	Blue	0	0	255	100	100	0	0
4	Desert	51	102	153	40	20	0	40
5	Cyan	0	255	255	100	0	0	0
6	Green	0	255	0	100	0	100	0
7	Grass	0	153	51	60	0	40	40
8	Forest	0	102	51	40	0	20	60
9	Olive	153	153	51	0	0	40	40
10	Brown	153	102	51	0	20	40	40
11	Walnut	102	51	0	0	20	40	60
12	Plum	102	0	102	0	40	0	60
13	Purple	153	0	204	20	80	0	20
14	Magen	255	0	255	0	100	0	0
15	Orang	255	102	0	0	60	100	0
16	Yellow	255	255	0	0	0	100	0

2.10.6 Bitmap and Vector Images

A bitmap is a pattern of points that form a picture similar to the ones in newspapers.

Bitmaps can be generated by scanning of pictures or by drawing in a bitmap processing program. In the bitmap format thicker lines and surfaces are also represented as individual points.

There are two major kinds of bitmaps: monochrome and gray-scale bitmaps.

Monochrome bitmaps are 1-bit black-and-white pictures (scanned line drawings), gray-scale bitmaps are 8-bit pictures (scanned photographs).

2.10.7 Scanning of Pictures

When scanning black-and-white pictures, select a high dpi resolution as the pictures turn out sharper. 300 dpi is the recommended minimum resolution to scan line drawings (monochrome bitmaps), but usually 600 dpi provides a much higher image quality. Gray-scale bitmaps should always be scanned at 300 dpi. Scanning with more dpi does not provide better image quality and needs more memory. As a rule-of-thumb photographs should be scanned with 300 dpi and line drawings with 600 dpi. Don't hesitate to experiment with different scan resolutions and note the results.

There are different bitmap data formats as e.g. TIF, BMP or PCX. The format makes no difference to the printer driver. The difference lies in the way bitmaps are stored on the hard disk of your computer.

2.10.8 Vectorizing

Most graphics programs cannot edit bitmaps directly. Some Basic functions as zooming in and out or mirroring may be possible, but individual image pixels cannot be altered. For this purpose a special image processing program is required as e.g. Photo Shop®.

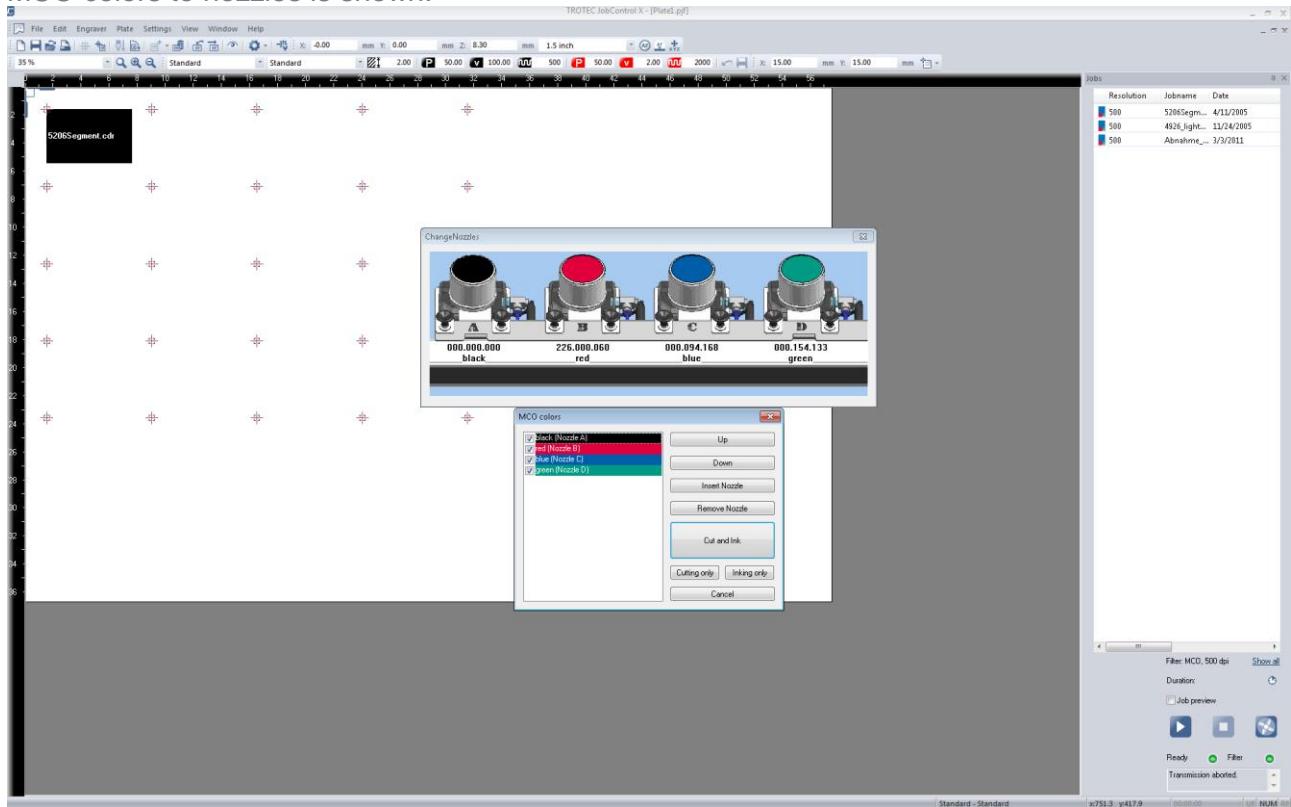




2.10.9 Multicolor Option - MCO2

MCO2 processing now supports more than 4 MCO colors with defining user MCO colors.

At the beginning of a MCO graving the nozzle configuration dialog for customizing MCO colors to nozzles is shown:

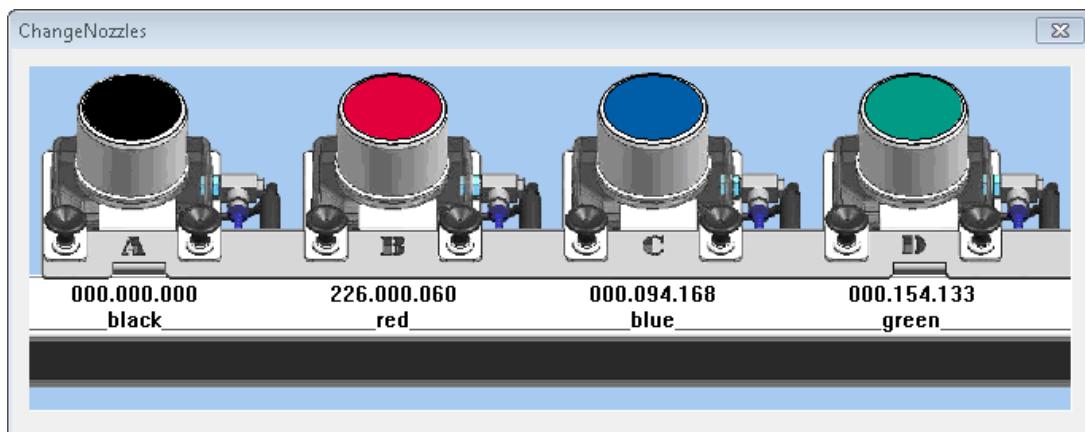


The checklist box shows all MCO colors for the selected jobs and can be configured via the checkboxes, Up/Down, Insert empty Nozzle/Remove empty Nozzle (for leaving a nozzle without MCO color e.g. nozzle is broken).

“Cut and Ink” cuts all pads firstly and then inks every MCO color. “Only Ink” omits the cutting step.

After every 4 MCO colors a dialog informs you to change the nozzles.

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2.10.10 List of available shortcuts

Function Key	Description
F1	Help
Ctrl + -	Zoom Out
Ctrl + +	Zoom In
Ctrl + 0	Zoom to Plate
Shift + F4	
Alt + 0	Zoom to Jobs
F4	
F8	Marker to Laser
Ctrl + N	New Plate
Ctrl + O	Open Plate
Ctrl + S	Save Plate
Ctrl + P	Print
Ctrl + A	Select all Jobs on Plate
Ctrl + R	Reset selected Jobs
Ctrl + G	Start
F12	
Ctrl + F	Pause
Ctrl + E	Stop
Ctrl + H	Plate Setup
Ctrl + D	Duplicate Job (either on plate or in job queue)
Del	Delete Selected Job(s)
Ctrl + Del	Delete Selected Marker
Ctrl + M	Material Template Setup
Ctrl + W	Size Template Setup
← (backspace)	Put Job back in Queue
Ctrl + Space	Rotate Job
Ctrl + L	Connect to Laser
Ctrl + J	Options

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