TROTEC PRODUKTIONS UND VERTRIEBS GMBH
Linzer Straße 156
A – 4600 Wels
AUSTRIA

Tel.: ++43/7242/239-7000
Fax: ++43/7242/239-7380
E-Mail: techsupport@troteclaser.com

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)
- 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) 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)
- 1 free USB interface
- 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.
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**
If you launch the JobControl the first time you will be asked to register the software.
In order to use JobControl you will have to enter two codes:

- View
- Activation code

The registration codes are indicated on the document in the JobControl box delivered together with the machine:
After every code entry the JobControl installation CD must be inserted and the code must be confirmed with Start.

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:

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 10.2.x needs Trotec Driver 10.2.x

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

![Diagram of software and operation process]

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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.
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 is 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.
2.4 Overview Advanced Driver

This is the advanced version

![Advanced Driver Interface](image-url)
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.
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.

Save Configuration

Standard-Standard

Favorites Archive

Name
Configuration Name

Apply Cancel

Load printer driver configurations in the favorites tab
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.

<table>
<thead>
<tr>
<th>Size Settings</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4 portrait</td>
<td>210.00 mm</td>
<td>297.00 mm</td>
</tr>
</tbody>
</table>

**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...

<table>
<thead>
<tr>
<th>Color</th>
<th>Process</th>
<th>Power</th>
<th>Speed</th>
<th>PPI/Hz</th>
<th>Auto</th>
<th>Passes</th>
<th>Air Assist</th>
<th>Z-Offset</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engrave</td>
<td>50.00</td>
<td>100.00</td>
<td>500 PPI</td>
<td>Off</td>
<td>1</td>
<td>On</td>
<td>0.00</td>
<td>Default</td>
</tr>
<tr>
<td>2</td>
<td>Cut</td>
<td>50.00</td>
<td>2.00</td>
<td>10000 Hz</td>
<td>Off</td>
<td>1</td>
<td>On</td>
<td>0.00</td>
<td>Default</td>
</tr>
<tr>
<td>3</td>
<td>Engrave</td>
<td>10.00</td>
<td>1.00</td>
<td>500 PPI</td>
<td>Off</td>
<td>1</td>
<td>Off</td>
<td>0.00</td>
<td>Default</td>
</tr>
<tr>
<td>4</td>
<td>Cut</td>
<td>5.00</td>
<td>10.00</td>
<td>10000 Hz</td>
<td>Off</td>
<td>1</td>
<td>Off</td>
<td>0.00</td>
<td>Default</td>
</tr>
</tbody>
</table>

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
• **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

To obtain a good result, the PPI value should 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. Unlike engraving, with cutting it is not necessary to create fine contours by means of resolution. In this case, the position sensitive control used with the PPI can therefore be replaced by a set frequency.
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...

**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 to add functions as described below.

**Correction**
Only available for cutting actions and if the color has been selected for cutting.
Determines the minimum percentage of laser power of the selected laser power which is set during slow movement; for example around curves.

This parameter is required for materials, which have no linear behavior during laser processing (e.g. coated metals).
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.

**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.
This setting is ignored if high quality mode is globally enabled in the JobControl configuration menu.

**Raster Correction**
Improves quality of engraving processes.
This setting is ignored for cutting processes or if raster correction is enabled globally in JobControl configuration menu.
2.6.3 Process Options

The options available depend on the selected process.

<table>
<thead>
<tr>
<th>Process Option</th>
<th>Process Mode</th>
<th>Standard</th>
<th>Resolution</th>
<th>Cut Line</th>
<th>Halftone</th>
<th>Shoulder</th>
<th>Layers</th>
<th>Z-AdjustL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>500dpi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stucki</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.
Relief

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 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.

Layer

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 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.

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.
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

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.
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.

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

![Advanced view](image1)

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

![Expert view](image2)
2.7.2 General Engraver Control Functions

Engraver Control (for Basic, Advanced)

- Establishes connection to engraver
- Information
- Pause Engraving Process
- Abort Engraving Process

Engraver Control (for Expert)

- Start Engraving
Establishes connection to engraver

Exhaust Ready Status (Green: Exhaust is ok; Red: Exhaust is not ok)

Exhaust Filter Status (Green: Filter is ok; Red: Filter is not ok)

Start Engraving Process
Start/Stop Exhaust
Pause Engraving Process
Abort Engraving Process
Exhaust Status

Information Area
Job Preview (for Basic, Advanced, Expert)

Checkbox and frame for showing a small picture of the above or on plate selected job.
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
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:
2.7.3 Detailed Description of JobControl Functions

2.7.3.1 File

**New** $\text{Ctrl}+\text{N}$ (for Basic, Advanced, Expert): Creating a new material plate.

**Open** $\text{Ctrl}+\text{O}$ (for Advanced, Expert): Opening saved material plate.

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

**Save** $\text{Ctrl}+\text{S}$ (for Advanced, Expert): Save the current plate with all jobs.

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

**Print** $\text{Ctrl}+\text{P}$ (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 $Ctrl+\text{A}$ 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 $Ctrl+\text{L}$ (for Basic, Advanced, Expert): Establishes a connection with the engraver attached.

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

Start $Ctrl+\text{G}$ (for Basic, Advanced, Expert): Starts the engraving or cutting process.

Pause $Ctrl+\text{F}$ (for Basic, Advanced, Expert): Pauses the engraving process.

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

Stop $Ctrl+\text{E}$ (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.
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 reduced cutting time.
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 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 $Ctrl + Space$ (for Expert): Rotate positioned jobs via the context menu or use the toolbar button. Rotation is always $90^\circ$ ($-90^\circ$ if applied to already rotated jobs).

Remove Job $\leftarrow$ (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** *(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 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.
- **Ignore unsaved documents when closing JobControl**: JobControl can be closed without advice to save unsaved documents.
- **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)

---

Language: Defines the user interface language of the printer driver and JobControl.
Unit: Indicates whether mm or inches as default.
Ignore unsaved documents when closing JobControl: JobControl can be closed without advice to save unsaved documents.
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.
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.
Hardware - Exhaust

Options

- General
- Sounds
- Hardware
  - Engraver
  - Exhaust
- Accessories
- Process options
- Service

Exhaust

- Time to hold: 1.0 min
- Start-up time: 0.0 sec
- Suppress warnings

**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.

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.
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.
- 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:
**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.
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
Process options – Quality

Raster Correction: Improves the quality of images rastered during engraving.

High Quality Engraving: All positioned jobs are done with constant stroke length. This kind of engraving is more time-consuming.

IPC Cutting Optimization (IPC – Intelligent Path Control) improves the acceleration and velocity of cutting jobs in case of performance and/or quality.

- **Off**: IPC is globally disabled, but can be enabled in material database for different colors
- **Optimize Cutting Speed**: IPC is globally enabled for optimum cutting speed. IPC change in material database doesn’t have any effect.
- **Optimize Contour Accuracy**: IPC is globally enabled for optimum contour accuracy (precision). IPC change in material database doesn’t have any effect.

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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.
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.
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
Service – Service settings – Acceleration

X, Y, Vector and Circle values for acceleration. Click "Reset" to restore Default Acceleration settings for engraver.
Service – Service settings - MCO parameters

Options

MCO Parameters:

General parameters:

Pad cut parameters:
- Ink pad thickness: 7.30 mm
- Air assist

Injector parameters:
- Offset X: 87.810 mm
- Offset Z: 3.231 mm
- Offset Y: 7.230 mm

Inject parameters:
- Inking speed: 15 %
- Additional offset: 0.000 mm
- Injet depth: 2.01 mm
- Traversing height: 5.00 mm
- Absorbing time: 500 ms
- Dup time: 1000 ms

Color selector parameters:
- Offset X: 36.773 mm
- Offset Y: 416.151 mm

Get selector position

Test

OK Cancel Apply
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.TSI) 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.
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.
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.

Diagram:
- New plate
- Save plate
- Open saved plate
- Move Job to marker
- Add marker to job position
- Rotate job
- Position job on plate
- Delete Job
- Reset Job
- Job back to queue
- WYSIWYG on/off
- Options
- Material Templates
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.
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!
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.

You can sort every column with click on the column name. To sort all jobs with their 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.
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: mm/dd/yyyy
- **Date, Time**: Date format: 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.

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).
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.
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.
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.

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

Jobs Abnahme_Kissen_MG_stamp
- Polygon, (313.73, 119.96)
- Polygon, (321.30, 120.59)
- Polygon, (303.52, 125.16)
- Polygon, (300.47, 137.05)

Activated Cutting Process Colors

Shows all vectors/polygons in the job
Job History (for Advanced, Expert)

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)

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.
2.8 Information about the use of Graphics Software

2.8.1 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.

2.8.2 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.

2.8.3 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. 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.
2.8.4 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.

2.8.5 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:

<table>
<thead>
<tr>
<th>No</th>
<th>Color</th>
<th>RGB Color Model</th>
<th>CMYK Color Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R Red</td>
<td>G Green</td>
</tr>
<tr>
<td>1</td>
<td>Black</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
<td>255</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Desert</td>
<td>51</td>
<td>102</td>
</tr>
<tr>
<td>5</td>
<td>Cyan</td>
<td>0</td>
<td>255</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>0</td>
<td>255</td>
</tr>
<tr>
<td>7</td>
<td>Grass</td>
<td>0</td>
<td>153</td>
</tr>
<tr>
<td>8</td>
<td>Forest</td>
<td>0</td>
<td>102</td>
</tr>
<tr>
<td>9</td>
<td>Olive</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>10</td>
<td>Brown</td>
<td>153</td>
<td>102</td>
</tr>
<tr>
<td>11</td>
<td>Walnut</td>
<td>102</td>
<td>51</td>
</tr>
<tr>
<td>12</td>
<td>Plum</td>
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<tr>
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<td>Purple</td>
<td>153</td>
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<td>14</td>
<td>Magen</td>
<td>255</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Orange</td>
<td>255</td>
<td>102</td>
</tr>
<tr>
<td>16</td>
<td>Yellow</td>
<td>255</td>
<td>255</td>
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2.8.6 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).

2.8.7 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.

2.8.8 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®.
2.8.9 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.
### 2.8.10 List of available shortcuts

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<td>Ctrl + -</td>
<td>Zoom Out</td>
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<tr>
<td>Ctrl + +</td>
<td>Zoom In</td>
</tr>
<tr>
<td>Ctrl + 0</td>
<td>Zoom to Plate</td>
</tr>
<tr>
<td>Shift + F4</td>
<td></td>
</tr>
<tr>
<td>Alt + 0</td>
<td>Zoom to Jobs</td>
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<td>F4</td>
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<td>F8</td>
<td>Marker to Laser</td>
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<td>Ctrl + N</td>
<td>New Plate</td>
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<td>Ctrl + O</td>
<td>Open Plate</td>
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<td>Ctrl + S</td>
<td>Save Plate</td>
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<td>Ctrl + P</td>
<td>Print</td>
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<tr>
<td>Ctrl + A</td>
<td>Select all Jobs on Plate</td>
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<tr>
<td>Ctrl + R</td>
<td>Reset selected Jobs</td>
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<tr>
<td>Ctrl + G</td>
<td>Start</td>
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<td>F12</td>
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<td>Ctrl + F</td>
<td>Pause</td>
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<td>Ctrl + E</td>
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<tr>
<td>Ctrl + H</td>
<td>Plate Setup</td>
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<tr>
<td>Ctrl + D</td>
<td>Duplicate Job (either on plate or in job queue)</td>
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<tr>
<td>Del</td>
<td>Delete Selected Job(s)</td>
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<tr>
<td>Ctrl + Del</td>
<td>Delete Selected Marker</td>
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<tr>
<td>Ctrl + M</td>
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<td>Ctrl + W</td>
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<td>Ctrl + Space</td>
<td>Rotate Job</td>
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<td>Ctrl + L</td>
<td>Connect to Laser</td>
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<td>Ctrl + J</td>
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