



Operation Manual TroCAM V2 / AlphaCam V10

-> TroCAM









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



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Installation and Activation

2 Installation and Activation

2.1 Installation

- 1. Start the PC with Administrator rights.
- Insert the installation CD and via autorun the language selection screen will show up. If Autorun does not work, please run the *setup.exe* in the following directory \...\Modele_CD_Trotec_2010R1\Setup_Alphacam_2010

3. Select the required language

🛊 Alphacam 2010 R1 Setup 🔼
Please select a language:
日本語
Deutsch
Dutch
English (United Kingdom)
English (United States)
Français
Italian
Polski
Russian
Spanish
Continue

4. Wait while the setup is configured and prepared









Installation and Activation

5. Accept the License Agreement

Alphacam 2010 R1 - InstallShield Wizard	×
License Agreement Please read the following license agreement carefully.	
The terms of the End User License Agreement ("EULA") set out on the back of the applicable Planit quotation shall apply to your use of this software. A copy of the EULA can be found at www.planit.com/eula.	
I accept the terms of the license agreement	
I do not accept the terms of the license agreement	
InstallShield	—
< <u>B</u> ack <u>N</u> ext > Cancel	

6. Wait while the setup is finished

Alphacam 2010 R1 - InstallShield Wizard	×
Setup Status	
Alphacam 2010 R1 is configuring your new software installation.	
C:\WINDOWS\system32\PVCombo.ocx	
Install©hintd	
	Cancel



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Installation and Activation



7. Finish the Installation with a restart of the PC

Alphacam 2010 R1 - InstallSh	ield Wizard
	InstallShield Wizard Complete The InstallShield Wizard has successfully installed Alphacam 2010 R1. Before you can use the program, you must restart your computer. Yes, I want to restart my computer now. No, I will restart my computer later. Select whether or not you wish to restart your computer now and then click Finish to complete Alphacam 2010 R1 setup.
	KBack Finish Cancel





Installation and Activation

2.2 Activation

Remove an eventually installed old Dongle and have your 6x4-digit servercode ready from your installation CD booklet.

Start TroCAM with administrator rights and the License Activation window will show up.

Kicense Activation	×
Welcome to License Activation. Please follow the simple steps below to request and install your software license. If you have a hardware security device, close this dialog and attach the device to this PC.	
The locking criteria for this machine is:	
The lock code for this machine is: *1JYMWTYDVETTEBR	
Please enter your servercode: 3943 6648 5277 1352 2083 2496	
Email address (optional):	
Submit On-line No Internet Available Close	
Enter servercode and email details.	

Assure that the "locking criteria for this machine" is "Keyless". That means, the license will be linked to the Hardware. If the "locking criteria" is different, it means that a Dongle is plugged. In that case, close the Window, remove the Dongle and restart the activation.

Enter the Servercode which you received with your Installation CD.

If internet is available, the activation is finished with click on "Submit On-line" and you can work with TroCAM.

Without internet connection click on "No Internet Available" and you get a text file with further information and a link. Follow the link to the "Planit" homepage on a PC with internet connection and enter the lock code of your machine and the Server Code. You get a .one file which you should transfer to the Desktop of the TroCAM-PC. With double-click on the .one file the activation is finished and you can work with TroCAM.

Perform the first startup of TroCAM with administrator rights.





TroCAM Main Window

3 TroCAM Main Window



You can customise the appearance of the main window. You can add or remove tools on the toolbar. You can change the positions of the tool bars, command line and project manager. You can change the background colour of the drawing area.

Via right mouse click on a toolbar a list of all active and inactive toolbars is shown.

Via mouse click on the symbol with four dots the toolbar can be moved. Toolbars within the drawing area can be caught and moved via left mouse click on the header bar of the toolbar.

Via right mouse click on the drawing area a context menu is shown.

Via the tool bar "View" different display modes can be selected.

Vie	e۷	٧S										×
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The same buttons can be found in the menu bar.

With the wheel on a mouse the zoom function is activated. Focus is defined by the cursor position.





Configurations

4 Configurations

4.1 Selecting the Postprocessor

During first program start the selection window for the postprocessor opens automatically. Please select PPTrocam.amb.

File Edit View Geometry Utils CAD TroCAM Help W Button Bar Ctrl+N Image: Ctrl+N Image: Ctrl+Ins Image: Ctrl+S Save Ctrl+I Ctrl+I Image: Ctrl+S Image: Ctrl+S Save AS Ctrl+I Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Mupt CAD Ctrl+I Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Output NC Ctrl+I Image: Ctrl+S Image: Ctrl+S Output CAD Ctrl+I Image: Ctrl+S Image: Ctrl+S Output CAD Ctrl+I Image: Ctrl+S Image: Ctrl+S Select Post Ctrl+L Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S Image: Ctrl+S	AC Alp	hacam Essential Mill: Al	bdeckung			
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		Places	Files of type:	Alphacam Mill F	Post	



Configurations

4.2 Configuring the toolbar

Each toolbar has a small black arrow. Clicking on this arrow brings up the *Add or Remove Buttons* menu and a choice of toolbars. By checking or un-checking the buttons, you can select which toolbars are displayed.



Via *Customize* the buttons can be edited. The buttons can be copied and changed. The Symbol can be changed or set to text view.







4.3 Configuring the general settings

In the menu bar *File*, select *Configuration → General*.

General X
Colors Window Layout Dynamic View Simulation Settings Geometry Line Widths Machining
Number of Undos Allowed 10
Default Font 🛱 Arial
Auto-Save Interval (Minutes) 5
Number of Files in Recent File List 4
Save and Show Previews of Drawing Files
Add Previews <u>B</u> emove Previews
✓ Prompt Before Save ☐ Use Pre V6 (Modal) Tool Direction, Lead-In/Out Dialogs
Save Images with Drawing
Images Units 💿 Metric 🛛 C. Inch
OK Cancel

"Settings"

"Number of undos allowed" defines the number of entries that can be undone.

"Default font" specifies the font for all text editing.

"Auto-Save Interval" defines the intervals of automatic saving of the data.

The most recently opened files are listed in the menu *File*.

Display preview for drawing files: Add preview: In "Licomdir" select the directories for which preview

should be active.

Remove preview:

In "Licomdir" select the directories for which preview should be deactivated.

"Prompt Before Save": when active, user is asked if the actual graphics should be overwritten.

"Geometry"

The processing direction – CW or CCW – and start point for circles can be preset here.

"Line Widths"

Use this to set the line width for standard lines when printing out.

"Machining"

The default values for relieve level and safety level are entered here.

"Colours"

The colour adjustments for lines and planes can be made here. The settings can be saved. Reset returns to the original colours.

"Window layout"

Open and save different layouts to adjust the layout of the TroCAM screen to your needs.

"Dynamic View"

Adjust the speed settings for mouse and keyboard move-commands.





Configurations

4.4 Configuring the system folders

In the file menu bar, select configuration / system folder.

Folders	×
System General	
Location of LICOMDAT (SYSTEM files eg Po	sts)
GN	Browse
Location of LICOMDIR (USER files eg Drawin	ngs and NC)
Default Folder for Parametric Macros (not VBA	A)
	Browse
OK	Abbrechen

Here the TroCAM system paths can be changed.

Programs must always be saved in the Licomdir directory.

Additional directories and subdirectories can be created in the Licomdir directory.

4.5 Configuring the background colour for the drawing area

In the View menu bar, select Background Colours.



The background colour can be set using this table.

4.6 Configuring the ruler for the drawing area

In the *View* menu bar, select *Set Limits*. First the bottom left corner will be defined, and after clicking on OK, the upper right corner. In the *View* menu bar, select *Zoom Limits*. Scaling will be adapted to the new ruler.





CAD Geometry

5 CAD Geometry

5.1 Simple 2D-Geometries – lines, arcs, circles, rectangles

🚺 Line:	In the In the	e Geometry menu ba e Command Line , yo	ar, select <i>Line</i> . ou will see the promp	ot:
LINE From X	. 🔟	F1=? Y 0	F1=? OK	

Enter coordinates X and Y, and confirm. Confirm with OK or Enter. Next the *Command Line* will ask for the end point ("LINE To").

LINE To X 200 F1=?	Y 0 F1=	? OK
--------------------	---------	------

In TroCAM, all commands remain active until a new command is selected or the active command is ended with ESC. The previous command can be reactivated with the space bar.

Instead of the ESC button, the right mouse button can be used.

F1 identifies the window as unknown.

As a result, the window below is opened to allow the direction of angle to be entered.

Direction INTO Intersection	×
Direction	ОК
90 101	UNKNOWN
	2 Points
225 315 270	Cancel

Arc:

In the menu bar *Geometry*, select $Arcs \rightarrow 2$ points and radius. In the *Command Line*, you will see the prompt:



Arcs are always constructed counter clockwise. The starting point must be selected accordingly.



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CAD Geometry

You will then be asked for the end point in the Command Line.

ARC: End Point X 0 Y 50 OK

You will be asked for the radius in the Command Line.

ARC: Radius 100	ΟΚ
O Circle:	In the menu bar <i>Geometry</i> , select <i>Circles → Centre and Diameter</i> . In the <i>Command Line</i> , you will see the prompt:
Circle Diameter 200	ΟΚ
Once the diameter h	as been defined, you will be asked for the circle centre.
Circle Centre 🛛 🛛 🖸	Y 0 0K
Rectangle:	In the menu bar <i>Geometry</i> , select <i>Rectangle</i> . In the <i>Command Line</i> , you will see the prompt:
RECTANGLE: Pick First Co	rner X 🚺 Y 0 OK

Once the coordinates of the first corner have been confirmed, you will be asked in the *Command Line* for the second corner, diagonally opposite the first.

Pick Second Corner	×	200	Y	200	OK

Construction: In the menu bar Geometry, select Construction.

When Construction is active, the geometries are drawn in purple rather than green. Construction geometries cannot be edited. They simply serve as guides.

5.2 Special 2D-Geometries

In the menu bar Geometry select Special 2D Geometries



PolygonImage: SlotEllipseJEqui-Spaced HolesBolt Hole CircleImage: SlotEnclosing RectangleInvolute CurveImage: SlotImage: Slot

03/11/2010



Utils



6 Utils

The Utils menu contains a lot of useful auxiliary functions for determining coordinates.



6.1 Object Snaps

Object snaps can only be used in combination with another command. Object snaps do not remain active once they have been executed. In this respect, object snaps are an exception in TroCAM. They have to be reactivated each time except *Ctrl* has been pressed during activation. Use the function keys and buttons described below to activate the object snaps.

In the menu bar Geometry, select Object Snaps.

ľ	END-point of	F6	Se
-0-	MID-point of	F7	Se
•	Arc CENTRE of	F8	Se
+	INTERSECTION of	F9	Se
Ł	TANGENT to	F10	Та
Ł	PERPENDICULAR to	F11	Li
≠	PARALLEL to	F12	Li
0	QUADRANT Point		Q

Select end points of lines and arcs Select middle points of lines and arc Select centre of lines and arcs Select intersections of lines and arcs Tangential intersection of an arc Line perpendicular to a line or arc Line parallel to a line Quadrants of a circle

After an object snap has been selected, the mouse pointer changes to a representation of the active object snap.

A prompt in the Command Line asks you to select a Line or an Arc.

When Auto Snap is active, the mouse pointer automatically jumps to the next possible object snap.



Auto Snap:

In the Utils menu bar, select Auto Snap.

The function is displayed in the Status Line when it is active.

AUTO

Auto Snap can also be activated and deactivated using the Function Key F2.



The functions Orthogonal (ORTHO) and Snap to Grid (SNAP) are displayed in the status line when they are active.

SNAP	ORTHO	

Ortho mode can be activated and deactivated either using this button or with F3.

Snap mode can be activated and deactivated either using this button or with F5.







Utils

6.2 Calculating coordinates and mass sizes

The following auxiliary functions are available for checking X, Y, Z coordinates, angles, lengths and radii.

Distance, Angle: In the *Utils* menu bar, select *Distance / Angle*. In the *Command Line*, you will see the prompt:

The first point is defined by entering the coordinates or by using object snap. The second point is defined in the same way.



The point for which coordinates are required can be selected using Object Snap. The global coordinates of this point are displayed in the **Command Line**.



Radius of: In the *Utils* menu bar, select *Radius of*. In the *Command Line*, you will see the prompt:

RADIUS of (Select Arc)

When you click on the arc with the mouse pointer, the value of the radius is displayed in the command line.

Radius is: 998.0609

6.3 Special functions

In the Utils menu bar, select Special Functions.



Compress Geometries

Generate Border Contours

Delete hidden Contours → Add-Ins



Editing



Editing 7



Break, Join 7.1

Break In the *Edit* menu bar, select *Break*, *Join* → *Break*. Break х Break Geometries C Tool Paths Method Individual Use Cutting Geometries ΟK Cancel

You next have to decide whether Geometries or Tool paths will be broken.

Select Individual to break a single geometry at a specific point.

Use Cutting Geometry causes two geometries to cut each other, one geometry serving as the borderline on whose intersection points the other geometry is broken.

Individual

In the *Command Line*, you will see the prompt:

BREAK: Pick Break Point on Geometry	×	Y 0	ОК
	and the second street of a second street of the second street of the second street of the second street of the	and the second se	

Define the point by using object snap or by entering the coordinates.

Use Cutting Geometry

In the Command Line, you will see the prompt:

BREAK: Select Cutting Geometries Previous Finish (ESC) All

The cutting geometry is the geometry that acts as a borderline. Select the geometries that act as borderlines and end with ESC. In the **Command Line**, you will see the prompt:

BREAK: Geometry to be cut <ESC>=FINISHED

Select the geometries to be broken up and end with ESC. A white cross will appear at the intersection points where the geometry has been broken open.



After ending with ESC, the selected geometries are broken into their individual elements.





Editing

Join

In the *Edit* menu bar, select *Break, Join* -> *Join*. In the *Command Line*, you will see the prompt:

	Commanu	Line, you wil	i see the
JOIN: Select Geometries/Tool Paths	Previous	Finish (ESC)	All I

Select the geometries that are to be joined and end with ESC.

7.2 Erase

🔊 Undo

In the *Edit* menu bar, select *Undo: Entry*.

A window will appear with a list of the functions to be undone, and must be confirmed with **OK** or **Cancel**.

The number of actions to be undone can be defined in the configuration.



In the *Edit* menu bar, select *Erase*. In the *Command Line*, you will see the prompt:

	DELETE: Select	Previous	Finish (ESC)	All
--	----------------	----------	--------------	-----

Use the mouse to click on the geometries to be erased, and end with ESC. A window will appear with the number of geometries to be erased, and must be confirmed with **OK** or **Cancel**. Selecting **All** will erase everything. With **Previous**, the geometries that were selected previously are reselected.

7.3 Move, Copy, Offset



In the *Edit* menu bar, select *Move, Copy* → *Move*. In the *Command Line*, you will see the prompt:

MOVE: Select Previous Finish (ESC) All

Select the geometries to be offset and confirm with ESC. In the *Command Line*, you will see the prompt:

Base Point	×	Y O	OK
Daveroun			7.52

Define the basis point using object snap or by entering the coordinates. In the *Command Line*, you will see the prompt:

Drag to Position or Enter Coordinates X 40	Y 40	OK
--	------	----

Enter the coordinates of the offset point or mark the new position using object snap.



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Editing

In TroCAM, all functions remain active until a new function is selected or the active function is ended with ESC.



In the *Edit* menu bar, select *Move, Copy* \rightarrow *Copy*.

The other steps are the same as for Move, except that here a copy of the geometries is made.



In the *Edit* menu bar, select *Break, Join -> Offset*.

×

With Offset, geometry is offset by a given *Distance*. The original is preserved.

Individual elements, complete geometries or surfaces can be offset.

Individual elements are recreated as construction elements with Offset.

Lines/arcs:

In the Command Line, you will see the prompt:

OFFSET: Select

Select line or arc to be offset. Only one element can be selected. In the *Command Line*, you will see the prompt:

Pick Side to Offset

Click on the side on which the element is to be offset.

Geometry:

In the *Command Line*, you will see the prompt:

OFFSET: Select

Select the geometry to be offset. Only one geometry can be selected at a time. In the *Command Line*, you will see the prompt:

Pick Side to Offset	×	Y O	OK
			and the second se

Click on the side on which the geometry is to be offset with the mouse, or define the side by entering its coordinates.

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Editing

7.4 Rotate, Mirror

Rotate
 In the *Edit* menu bar, select *Move, Copy → Rotate*.
 In the *Command Line*, you will see the prompt:

 ROTATE: Select
 Previous
 Finish (ESC)
 All

Select the geometries to be rotated and confirm with ESC. In the *Command Line*, you will see the prompt:

Base Point	×	0	Y	0	OK
		-			the second se

Enter the coordinates for the centre of rotation In the *Command Line*, you will see the prompt:

Rotation Angle (CW -ve)

The angle for clockwise rotation must be preceded by a minus sign.



In the *Edit* menu bar, select *Move, Copy* → *Mirror* In the *Command Line*, you will see the prompt:

	MIRROR: Select	Previous	Finish (ESC)	AI
--	----------------	----------	--------------	----

Select the geometries to be mirrored and confirm with ESC. In the *Command Line*, you will see the prompt:

First Point of Mirror Line	×	Y 0	OK
----------------------------	---	-----	----

With Mirror, an axis must be defined around which the geometries are mirrored. Once you have defined the first point, you will be prompted to enter the second point:

Second Point of Mirror Line X 40	Y 40	OK
----------------------------------	------	----

A window will then appear asking if the original should be kept. Selecting yes means that a mirrorimage copy of the original is created. Selecting No means that the original is flipped. In both cases the mirror image is rotated around the axis of reflection.





Editing

7.5 Change Element Type



Change In the *Edit* menu bar, select *Change Element Type*.

Change		X
From		
C <u>G</u> eometry	Construction	○ <u>M</u> aterial
◯ <u>T</u> ool Path	○ <u>F</u> eed Cut	C <u>R</u> apid
O <u>D</u> imension	○ Old <u>L</u> ayer	O <u>I</u> ext
_ To		
• Geometry	\mathbf{C} Construction	C <u>M</u> aterial
C Iool Path	C Eeed Cut	C <u>B</u> apid
© <u>D</u> imension	C Active User Layer	C ⊥ext
OK	Cancel	

This table allows an existing element to be changed into another element. For instance, a construction element can be changed into geometry.

Elements can be moved from the original layer into the active layer.

Text as Fonts can be changed to geometry etc.





Operation Manual TroCAM V2 / AlphaCam V10



Import CAD file

8 Import CAD file

Drawings from other CAD systems in DXF and DWG formats can be imported into TroCAM.

DXF is a widely used, standardised file format for digitised 2D drawings.

DWG is the format used by AutoCAD.

8.1 Import files

In the File menu bar, select Input CAD ...

File	Edit	View	Geometry	Utils	CAD							
~	Button Bar											
	New			Ctrl	+N							
6	Open			Ctrl+O								
Ð	Insert.			Ctrl+Ins								
	Save			Ctrl+S								
	Save As											
4 5	Input N	IC										
4	Input C	AD		Ctr	l+I							
	Input I	mage										
PR	Output	NC										
2	Output	CAD										
P S	Select I	Post										
MC	List NC	Code		Ctr	l+L							



Text is not transferred as geometry and a font must be defined for it.

With Join Elements, unwanted line interruptions can be avoided with the appropriate tolerance selection.





Import CAD file

8.2 Convert splines to polyarcs

Any splines in the drawing will be brown lines instead of the usual green for polyarcs. If there are splines, they must be converted to polyarcs before they can be toolpathed.





Change the tolerance to 0.001 and click OK.

Click on All at the Command line and confirm with Finish or ESC.

Check if the transformation was OK

If not, reduce the tolerance to e.g. 0.01 or 0.001 instead of 0.1. If the outcome is fine, delete the splines.





9 Laser Functions and TroCAM Bar

The TroCAM functions can be found as button bar and in the menu bar.



TroCAM V2		×
🐉 🎕 🎕	🕹 👘 🖸 🏴 🖢	i 🔏 😭 🕨

or menu bar

Tro	CAM I	<u>H</u> elp								
# +	Select Material									
X ?	Input Material from Excel									
	Output Material to Excel									
$\mathbf{t}_{\mathbf{r}}^{l}\mathbf{t}$	Tool di	irectio	าร							
æ	Tool directions auto									
Ο	Cutting									
₽	Poach									
≗	Lead I	n/Out								
Z	Edit									
R	Updat	e toolp	aths							
►	Send (EN to P	/lachine							

Find a description of the different functions below.







9.1 Create and select materials in the material database

TroCAM offers a database to save materials. To Create and Save Materials proceed as follows:

Select Materials	In the <i>TroCAM</i> menu	bar, select Sele	ect Materials.	
Colort material TROTEC			×I	
			_	
Material group	Material name	, Pei	Thickness 0 Width 0 Performance 0 formance correction 0 Speed 0 Laser frequency 0	
Edit New Select	Delete		Material group TROTEC	
New group of material Name of the gro OK	up of material	Cancel		
To create a new material g selecting an existing materi the material group window a To create a new material s group, click on NEW and er right area. Click on "safe" v A Folder for each material g material will be created.	roup click on NEW with al group and click on NE and choose a name. elect the desired materia iter the whished settings when finished. group and a file for each	nout EW in al s in the	Select New Cancel	
			→ www.t	roteclaser.com

Trotec Produktions- und Vertriebs GmbH_Linzer Strasse 156, A-4600 Wels, Austria, Technical Support tel_+43 (0)7242 239-7000, fax_+43 (0)7242 239-7380, mailto: techsupport@troteclaser.com





To select a material, mark the material group and material name and click on "Select".

Select material TROTEC	×
Material group	Material name
Trotec_Testmaterial Trotec_Testmaterial1	Trotec_Thickness10mm
Trotec_Testmaterial2	Thickness 10
	Width 0
	Performance 100
	Performance correction 10
	Speed 30
	Laser frequency 1000
	Gas Type 0
Edit New	Delete
Select	Cancel

9.2 Import and Export Material from Excel

Input Material In the TroCAM menu bar, select Input Material from Excel.

Browse to your Excel file with Material data and import it. The format of the Excel file has to be like the one below:

	Microsoft Excel - Materialtable.xls										×I						
:2	Eile	<u>E</u> dit	⊻iew	Inser	: F <u>o</u> rmal	<u>T</u> ools	<u>D</u> ata	<u>W</u> indow	Help					Туре а	a question for help	8	×
	2		19	- 🕜	2	Arial		- 8	- B	ΙU		1 💀 🕎 %	, <u>.</u>	00. 0 0. 0	🚛 🚛 🛄 🗸	🗞 - <u>A</u> -	Ţ
	A1		•	fx	TroCAN	/ Materia	al datas										-
		A				В		C	D	E	F	G		н		J	=
1	TroC/	M Mate	rial data	is TRO	TEC												- 1
2	Mater	ial group	0	Mat	erial name	Parame	eter ->>>	Thickness	Ор Туре	Width	Performance	Performance corre	ction	Speed	Laser frequency	Gas Type	
3	Troted	c_Testr	aterial	Trot	ec_Thickn	ess3mm		3	Cut	0,0001	50		10	50	1000	0	
4	Troted	c_Testr	aterial	Trot	.ec_Thickn	ess5mm		5	Cut	0,0001	80		10	50	1000	0	
5	Troted	c_Testr	aterial1	Trot	ec_Thickn	ess8mm		8	Cut	0,0001	100		10	50	1000	0	
6	Troted	c_Testr	aterial2	Trot	ec_Thickn	ess10mm		10	Cut	0,0001	100		10	30	1000	0	
7																	
8																•	-1
• •	ï ⊦	TRO	TEC / S	Sheet1	/ Sheet2	/ Sheet3	/				•					•	
Rea	dy											Sum=4576			NUM		1

Cutput Material

In the TroCAM menu bar, select Output Material to Excel

An Excel file will be created with name of material group and material name and the according parameters as the table above.





9.3 Tool directions

Ghost Tools

In the View menu bar, select Ghost Tools

Arrows will show up at each tool path showing in which direction and on which side of the line the tool (laser beam) will pass.

Tool Directions In the TroCAM menu bar, select Tool Directions

In the Tool Directions Window you can choose different settings for Open Geometries and Closed Geometries.



Tool Directions auto In the TroCAM menu bar, select Tool Directions auto

The Software will automatically calculate the tool paths. When using this option for more complicated tool paths, always double check the paths. If necessary make manual changes via previous Tool Directions interface.

9.4 Create toolpaths

Cutting In the TroCAM menu bar, select Cutting

In this Machining interface you can select the settings for cutting geometries. You might select another material or adjust the settings of the material directly in this window. The changes in this window will not be saved in the material database but will only be working for the actual jobs.

Machining X	1	
Op No. 1		
Geometries		
© <u>A</u> ll	All:	All Geometries will be processed with the parameters set below
© <u>S</u> elected	Selected:	The geometries have to be selected manually for procession.
C <u>P</u> artial	Partial:	Only parts of a geometry will be processed.
XY Corners		
Straight C Loop	Loop:	The cutting quality on the corners will be improved.
TROTEC_THICKNESS10MM		
Loop Radius 0	Editable par	rameters of the chosen material.
Performance 100		
Performance correction 10		
Speed 30		
Laser frequency 1000		
Gas Type 0		
OK Select material Cancel		

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Laser Functions and TroCAM Bar

In the TroCAM menu bar, select Poach

In this Machining interface you can select the settings for filling (fillet) geometries. You might select another material or adjust the settings of the material directly in this window. The changes in this window will not be saved in the material database but will only be working for the actual jobs.

The setting of pitch and angle might need some experience and tests.

Machining
Op No. 1
Geometries
• All
© <u>S</u> elected
C <u>P</u> artial
Pitch 0.3 Angle 0
TROTEC_THICKNESS10MM
Loop Radius 0
Performance 100
Performance correction 10
Speed 30
Laser frequency 1000
Gas Type 0
OK Select material Cancel

9.5 Lead In/Out

Lead In/Out

In the TroCAM menu bar, select Lead In/Out

The "Lead In/Out" interface will open.

Choose your settings for lead-in and leadout separately. You can select type of the lead (straight line or arc) and according to these selections the length of the line or the radius and approach angle of the arc.

Say OK and select the desired geometries or click on ALL in the command line.

Click on FINISH or press ESC to confirm the command.

/Abtanren		
Einfahren		
C Nichts	Linie	C Bogen
	Anfahren: Länge 5	
- Rausfahren —		
O Nichts	 Linie 	C Bogen
	Abfahren: Länge 5	
Methode		
 Auto 		
C Manuell		
Boge	en An-Abfahren: Radius	0
	Auto Anfahrwinkel :	45
	OK	Abbruch

9.6 Optimize cutting order (manual/auto)

123	
+	Order

In the *Edit* menu bar, select Order

Order Contours	×
Order	
Geometries	C Tool Paths
Method	
 Auto 	C Manual
C Selected Auto	
ОК	Cancel

Choose "Geometries" and "Auto" to do an automatic change of processing order.

If you want to change the order manually, select "Manual" and select the single geometries in the order you want them to be processed.

9.7 Edit toolpath

In the *TroCAM* menu bar, select *Edit*

Mark an operation path and click on "Edit" to change the settings of machining. You may change the order of the paths by marking a path and clicking on the up or down arrow on the right.

Edit	×
Op 1 Cutting TOOL 10 TROTEC_THICKNESS10MM (Blue) Op 2 Cutting TOOL 1 TROTEC_THICKNESS10MM (Blue)	
Edit Cancel	

9.8 Update NC-Paths

Update NC-paths In the TroCAM menu bar select Update NC-Paths.

With this function all tool paths will be adjusted to the changes of geometries.

9.9 Send tool path to the laser

Send to machine

In the TroCAM menu bar, select Send CN to Machine

The NC-program will be sent directly to the machine. The settings of the data transfer have to be done in AlphaEDIT.

Send CN to Machine	×
Machine	
	•
Coordinate	
CAbsolute	Relative
	× [0]
I Home-Position	
	Y D

Choose the right machine and with it the right Post Processor for your machine.

IPC-Configuration

Press this button only if you need to change the settings of the "Intelligent Path Control". For further details please refer to *Trotec IPC (Intelligent Path Control)* on page 49.

Coordinate

Choose relative to process the geometry starting with the 0/0 of the TroCAM drawing area at the actual position of the laser head.

The **Home-position** to drive the laserhead to after job end can be defined additionally.

Save NC-path – with click on this button you can save the generated paths to make them available in future for processing without further handling.

Before you press make sure you focused on the material and positioned the laser head on the desired position.

Generate and send NC Code

With this function the program "findLaser" will be started and the transfer-parameters are registered in Alphaedit.

Resend last NC-Code

With this function the NC-program is sent directly to the machine without activating "find laser".

10 Nesting module

10.1 TroCAM

Start with drawing a "sheet" to nest the shapes to. This might be a rectangle fitting your working area or any other object fitting your material.

Then draw or import your shapes to be nested. Proceed as follows

Nesting:

Select **Nesting module** from the **Utils** menu bar.

	Menu	Bar						
	File	Edit	View	Geometry	Utils	CAD	TroCAM	Help
					~	Button E	ar	ſ
					1	Distance	/Angle	
Nesting	>	<u> </u>			?	Report (Ioordinates	
Nesting Method					3	Radius c	f	
True Shape Nesting						Same X,	Y or Z	
C Rectangular Nesting						Snaps		
C Manual Nesting					3	Set Snap	o/Ortho	
					<u> </u>	Auto Sn	эр	
Select Parts from Screen						Nesting		
						Special F	unctions	
						VBA Mad	ros	→
Load New Nest List					4	Add-Ins		
Items to be Nested								
C Toolpaths								
Geometries								
C Toolpaths and Enclosed Geometries								
OK Cancel								

Select the desired nesting method and define if you want to nest Geometries, Toolpaths or both. Then click on OK.

In the **Command Line**, you will see the prompt: Select SHAPE to Nest (Window or Pick) <ESC>=No More Shapes

Click on the first shape to be nested.

Define the part parameters for the shape.

Define Part Paramete	ers		×
Name of Part Number Required	A Maximu	m possible	
Rotations to try	C <u>1</u>		
 Rotate by intervals of Rotate by these angles only 		5 0 45 135	
Try Mirrored Shape	irst		
Limit number on ea	ch sheet to	1 Cancel	

Number Required: Enter a number if you only want a defined amount of shapes or choose "Maximum possible"

Rotate in intervals of: The part is rotated by the value given until the best position is found.

Rotate through a given angle: The part is rotated sequentially through the given angle until the best position is found.

Try to rotate part first: Normally the first part is nested in its original position. With this option, rotated parts are fitted first.

Priority (1=highest): The parts with the highest priority are nested first, followed by the parts with lower priority e.g. 2, 3, etc.

Select further shapes and proceed as described above until all shapes are selected and defined. Then click on <ESC>.

In the *Command Line*, you will see the prompt:

Select Sheet to Nest into <ESC=No More Sheets>

Click on the nesting sheet on the plot area. If there are several nesting sheets, nesting priority is established according to the order in which they are selected. Define the Sheet parameters.

Define Sheet Parameters	×
How Many of these Sheets ($0 = No$ Limit)	1 .
Sheet Thickness	0
Sheet Material	
WEICHER STAHL	•
OK Cancel	

The prompt **Select nesting sheet** must be closed with ESC, once all the nesting sheets have been selected.

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Define the Nesting Parameters.

Vesting Parameters				
NC Code			Nest List Name	
C Subroutines		💿 Linear	Nesting_A	
Pack to			Special Functions	
C Top-Left	🔿 Тор	🔿 Top-Right	Assisted Nest	
Eeft		🔿 Right	Cut Whole Part Together	
C Bottom-Left	C Bottom	C Bottom-Right	Group Each Part Separately ✓Leave Edge Gap Uncut	
C Custom Angle	180		Minimize Tool Changes	
			Remove Groups	
	Search	Resolution 0.38	Repeat First Row/Column Suppress Final Sort	
Minimum Gap between Paths			- Suppress Redraw	
	Gap at S	heet Edge 1	Try Rotated Part First on all Parts	
Extra Gap at Lead-In Start				
OK Cancel				

NC Code: A subroutine generates shorter NC programs. In the case of control systems with limited memory, a potential "drip feeding" can be avoided in this way.

Pack to: Indicates from which side or corner nesting should begin.

Search resolution: Defines a grid in inches, in which the parts are placed before nesting, and before being placed based on the parameters. The search resolution should not be greater than 20% of the smallest dimension. A too small grid produces longer computing times without any significant improvement in utilisation.

Special Functions: With the following options, it is important to take into account whether only geometries or NC paths are being nested.

Assisted Nest: This option opens a new dialogue window in which all the parts are listed. Each part can be manually set on the nesting plate. Each part placed is removed from the list.

Cut Whole Part Together: With this, each part is finished before the next part is machined. This is used in connection with "first drilling, then inside machining" and linear NC Code.

Drill, then Cut Inner Paths First: All bore holes are first carried out, followed by the work inside the piece.

Group Each Part Separately: Normally, parts consisting of several geometries are created as a group. A part that consists of a single geometry is not defined as a group. With this option, however, these parts are also created as groups.

Leave Edge Gap Uncut: Normally the distance of the parts from the plate edge is equal to a predefined value. With this option, the tool diameter is added to the distance from the plate edge.

Minimise tool changes: The machining sequence is organised around the work tools in order to minimise tool changes.

Order By Part: This means that identical parts are processed first, before processing the next part.

Remove Groups: With this option, no groups are defined. Each geometry is listed individually.

Repeat First Row/Column: Use this when nesting needs to happen in strips.

Nest Small Parts First: When this option is not active, large parts are nested first.

Suppress Redraw: Normally certain steps in the optimisation process are updated on screen. With this option, the screen is only updated at the end of optimisation.

Try Rotated Parts First on all Parts: Normally, the first part is nested in its original position. With this option, rotated parts are used first.

Confirm with OK to create the nesting job.

10.2 TroCAM Nesting Upgrade

```
Nesting:
```

g: Select **Nesting module** from the **Utils** menu bar.

Load Nest List	Retrieve an existing list.
Nest Parts	
<u>Create/Edit Nest List</u>	Create a new nesting list.
Nesting Information	
Save Off-Cut	
Sheet Database	Define and select nesting sheets
Sheet Database	Define and select nesting sheets

Some of these functions are also available in the Project Manager under the *nesting* index.

Nest	Hide Details
Load Nest List	New Nest List

10.2.1 Defining a new nesting job

Depending on the shape of the parts, select either freeform or rectangular method. Free-form will be used for all non-rectangular parts.

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Contour types:

NC paths	Only the NC paths are transferred to the nesting sheet. The geometries are
	not transferred to the nesting sheet.
Geometries	Only closed geometries are nested.

NC paths and inner geometries

ries The NC paths are nested together with the geometries.

After confirmation, a list of files can be assembled for a nesting job (e.g. Licomdir/Tutorial/NestLetters/)

LICOLLIAN	Tutonun				
Select Item to	be Added to Nes	it List <esc>=FINISHED</esc>			? 🗙
Look in: My Recent Documents Desktop My Documents	NestLetters	Letter P.amd Letter Q.amd Letter Q.amd Letter S.amd Letter J.amd Letter U.amd Letter V.amd Letter V.amd Letter V.amd Letter V.amd Letter Y.amd Letter Y.amd Letter Y.amd	← € ☆ ⊞ •		
My Computer My Network Places	Letter L.and Letter M.and Letter N.amd Letter O.amd	Letter A. amd Licom Mill Drawing (*. amd)	•	<u>Open</u> Cancel	

Use Ctrl-A to select the entire list.

Each part, or all selected parts, is defined with the following parameters.

Define Part Paramet	ters	
Name of Part Number Required		L\NestLetters\Letter A.amd
Rotations to try C Don't rotate Rotate by interva	, Is of angles only	15 0 45 135
 ✓ Try Mirrored Shape ✓ Try Rotated Part Fir Priority (1=Highest) ✓ Limit number on each OK 	st 1 h sheet to	1 Cancel

Rotate in intervals of: The part is rotated by the value given until the best position is found.

Rotate through a given angle: The part is rotated sequentially through the given angle until the best position is found.

Try to rotate part first: Normally the first part is nested in its original position. With this option, rotated parts are fitted first.

Priority (1=highest): The parts with the highest priority are nested first, followed by the parts with lower priority e.g. 2, 3, etc.

Next the nesting parameters are defined.

Nesting Parameters		
C Subroutines	• Linear	Nest List Name
Pack to Top-Left Top Left Bottom-Left Bottom Custom Angle 180 Search B	C Top-Right C Right C Bottom-Right	Special Functions Assisted Nest Cut Whole Part Together Drill then Cut Inner Paths First Group Each Part Separately Leave Edge Gap Uncut Minimise Tool Changes Nest Small Parts First Order By Part Remove Groups
Minimum Gap betw Gap at Si Extra Gap at Lea	een Paths 0.5 heet Edge 1 d-In Start 1	Cancel

NC Code: A subroutine generates shorter NC programs. In the case of control systems with limited memory, a potential "drip feeding" can be avoided in this way.

Pack to: Indicates from which side or corner nesting should begin.

Search resolution: Defines a grid in inches, in which the parts are placed before nesting, and before being placed based on the parameters. The search resolution should not be greater than 20% of the smallest dimension. Too small a grid produces longer computing times without any significant improvement in utilisation.

Special Functions: With the following options, it is important to take into account whether only geometries or NC paths are being nested.

Group Each Part Separately: Normally, parts consisting of several geometries are created as a group. A part that consists of a single geometry is not defined as a group. With this option, however, these parts are also created as groups.

Remove Groups: With this option, no groups are defined. Each geometry is listed individually.

Drill, then Cut Inner Paths First: All bore holes are first carried out, followed by the work inside the piece.

Cut Whole Part Together: With this, each part is finished before the next part is machined. This is used in connection with "first drilling, then inside machining" and linear NC Code.

Assisted Nest: This option opens a new dialogue window in which all the parts are listed. Each part can be manually set on the nesting plate. Each part placed is removed from the list.

Nest Small Parts First: When this option is not active, large parts are nested first.

Repeat First Row/Column: Use this when nesting needs to happen in strips.

Suppress Redraw: Normally certain steps in the optimisation process are updated on screen. With this option, the screen is only updated at the end of optimisation.

Suppress Final Sort:

Order By Part: This means that identical parts are processed first, before processing the next part.

Try Rotated Parts First on all Parts: Normally, the first part is nested in its original position. With this option, rotated parts are used first.

Minimise tool changes: The machining sequence is organised around the work tools in order to minimise tool changes.

Leave Edge Gap Uncut: Normally the distance of the parts from the plate edge is equal to a predefined value. With this option, the tool diameter is added to the distance from the plate edge.

Confirm with OK to create the nesting job.

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Nesting module

μ Χ Nesting LASERLETTERS Nest **Re-order Parts** Save NestList Configure Count Existing Parts Add Parts Delete Paste Paste As New List μ x Nesting i New Nest List 1 Letter A Configure Edit Part Manually Nest Part Cut Copy Delete Paste Paste As New List Name Letter A Number Required 5 **Rotation Angle** 15.00 Part Dimensions 23.20 x 22.00 Add Parts Configure Hide Details Nest Load Nest List New Nest List

Use a right mouse click on the nesting job name to access the functions for processing the entire job:

Use a right mouse click on a part's file name to access the functions for processing the individual part.

Clicking on the file name in the Project Manager displays the related parameters in the lower part of the Project Manager (nesting).

Using *configure*, the parameters for each nesting part can be defined.

10.2.2 Nesting sheet data bank

In the Utils menu bar, select the Nesting line -> Nesting sheet data bank.

New material groups can be created by checking the item New sheets and clicking on this button 4

<mark>ใ</mark> Sheet Database Informa	ation					×
New Sheets WEICHHOLZ Off-Cut Sheets	Total Thicknes:	Width	Length	Value Edit She Sheet D Sheet I	User Comment et Data ata Costs/Weights Set Units Material Waterial How Many of these Sheets 6	
				User C	Sheet Thickness 5 mm Sheet Length (X) 1200 mm Sheet Width (Y) 600 mm	

New subgroups can be created by checking a material group and clicking on this button

🔚 Sheet Database Inform	ation						×
New Sheets WEICHHOLZ Off-Cut Sheets	Total	Thickness	Width	Length Si	Value it Sheet I heet Data Sheet Mate Dimensio	User Comment Data Costs/Weights Set Units erial Plastic Finishing How Many of these Sheets 6 Sheet Thickness 5 mm Sheet Length (X) 1200 mm Sheet Width (Y) 600 mm	
					1	OK Cancel	

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10.2.3 Nesting parts

In the Utils menu bar, select the Nesting module line -> Sheet data base.

🔒 Sheet Database Inform	ation						×
🖃 🚞 New Sheets	Total	Thickness	Width	Length	Value	User Comment	
🗄 🗁 WEICHHOLZ							
Off-Cut Sheets							
1	J						_

Select the nesting sheet and click on

this button.

Paste the nesting sheet onto the plot area. If necessary, repeat the process for other nesting sheets.

The nesting sheet can also be drawn in the shape of a geometric rectangle.

Load nest list using the *Utils* menu bar *→ Nesting module* or from the Project manager.

To perform nesting, select the command in the Utils menu bar *> Nesting module > Nesting*, or click on *Nest* in the Project Manager.

Nesting 🔀
Nesting Method
True Shape Nesting
C Rectangular Nesting
C Manual Nesting
Part Selection
C Select Parts from Screen
Use Nest List
New Nest List 1
Items to be Nested
🚱 Toolpaths
C Geometries
C Toolpaths and Enclosed Geometries
OK Cancel

Operation Manual TroCAM V2 / AlphaCam V10

Nesting module

The Command line contains the prompt

Select Next Sheet to Nest into <ESC=No More Sheets>

Click on the nesting sheet on the plot area. If there are several nesting sheets, nesting priority is established according to the order in which they are selected.

Define Part Parameters								
How Many of these Sheets (0 = No Limit)								
Sheet Thickness	5							
Sheet Material								
Plastic Finishing	-							
OK Cancel								

The prompt **Select nesting sheet** must be closed with ESC, once all the nesting sheets have been selected.

Nesting Parameters		× ×
NC Code	Linear	Nest List Name
Pack to Top-Left Top Left Bottom-Left Bottor Custom Angle Sea Minimum Gap E Gap Extra Gap at	C Top-Right C Right n C Bottom-Right C Bottom-Right C C C C C C C C C C C C C C C C C C C	Special Functions Assisted Nest Cut Whole Part Together Drill then Cut Inner Paths First Group Each Part Separately Leave Edge Gap Uncut Minimise Tool Changes Nest Small Parts First Order By Part Remove Groups Repeat First Row/Column Suppress Final Sort Suppress Redraw Try Rotated Part First on all Parts
	ОК	Cancel

The nesting parameters can then be redefined again.

If the result is poor, this may be improved by reducing the **Search resolution** (grid in inches). The smaller the search resolution, the greater the optimisation time. Too small a search resolution can cause a system crash.

10.2.4 Nesting information

In the *Utils* menu bar, select the items *Nesting module* \rightarrow *Nesting information*. The nesting information contains information about the number of nested parts and which nesting sheets they are on.

📑 Nesting Informa	tion for:Shee	t A1					
🗖 🛃 🔜 🗖							
Sheet A1	Part Name	Item Number	On Sheet	Total	Required	File Name	
	From Scr	1	1	1	1	From Screen 1	

10.2.5 Calculation of areas

The calculation of areas is only available from TroCAM Advanced onwards.

Calculate: In the Utils menu bar, select the items calculation of areas → Individually or Nested.

With the Individually option, different areas can be added or subtracted. In other words, parts of areas can be subtracted from a total area, for instance.

AREA: SELECT NEXT PATH		×
	Total 75157.607	Reset
		<u>C</u> ost
	C Subtract	Close

With the *Nested* option, the nesting-sheet area, the parts area and the residual area are displayed. Wastage is given in %.

Nested Sheet	
Sheet 720000	Scrap 720000
Parts 0	% Scrap 100
Close	Cost

The cost calculation gives information about the parts costs and the scrap costs. The costs can be calculated according to area or weight.

Cost Estimate Parts Area = 75157.0	6 🛛 🛛
Weight Weight per Unit Area 1	Weight of Parts 75157.607
Cost	
By Area	
Cost per Unit Area 0.5	
C By Weight	Cost of Scrap 0
Cost per Unit Weight 0	Cost of Parts 37578.803
Close	Re- <u>C</u> alc

Appendix

11 Appendix

11.1 Trotec IPC (Intelligent Path Control)

11.1.1 Working Description

IPC is a tool which takes a "HPGL" file (eg.: "input.txt") and generates a modified new "HPGL" file ("eg.: "output.txt").

IPC changes velocitys and accelerations in a hpgl file and adjusts laserpowers and laser correction values automatically to improve performance of vector cutting and vector engraving.

Benefits of IPC:

- its possible to print a vector job with max machine speed. All velocity and acceleration values are changed to prepare the job for max quality and/or max speed.
 - saved time because the user need not find the optimal velocity and laser correction values
 - o saved time because of improved job performance
 - the configuration is adjustable due xml configuration file
- the quality and performance of very complex jobs is improved uncompareable

Examples	with IPC	without IPC
Arc Quality and high speed	round	oval
Ringing	no ringing	ringing
Laserpower on lines	closed	open
Stuttering	in one line	stuttering

11.1.2 File Description

Following files are necessary for working:

- latool.dll (contains functionality)
- IPC.exe (includes latool.dll and builds interface)
- vbpost_config.xml (contains configuration)
- input.txt (hpgl file)

After Installation of TroCAM V10 one of the following directorys contains the IPC files and the postprocessors of all machines

C:\LICOMDAT\MPOSTS.ALP C:\TROCAM\LICOMDAT\MPOSTS.ALP

Appendix

11.1.3 Configuration

IPC takes info from configuration file: vbpost_config.xml vbpost_config.xml contains acceleration values and allowed max acceleration and velocity changes.

11.1.4 Execution of IPC for Testpurposes

- 1. Take your hpgl file and rename it to "input.txt"
- 2. Copy it into the IPC folder C:\LICOMDAT\MPOSTS.ALP
- 3. Copy your vbpost_config.xml configuration file into the IPC folder LICOMDAT\MPOSTS.ALP or modify the current vbpost_config.xml file.
- 4. Run IPC.exe
- 5. The new file "output.txt" is beeing generated
- 6. optional: check the log file "log.txt"

11.1.5 Execution of IPC within TroCam

IPC is called within visual basic postprocessor automatically.

11.1.6 Change settings of IPC within TroCAM

Click on the button in the TroCAM window "Send CN to Machine" to open the "IPC Configuration" window.

Refer to chapter 11.1.7 *Description of vbpost_config.xml file* on page 51 for further details of the specific values.

Send CN to Machine		×
Machine		
	•	
- Coordinate		
Clahooluta	C Deletive	IPC Configuration
	·• Relative	LA_AV_MAX 3
Home-Position	× 0	LA_MAX_VELOCITY_DIFFERENCE 5
	Y O	LA_CONST_VELOCITY No
		LA_NO_DISCONNECT
		OK Cancel

Appendix

11.1.7 Description of vbpost_config.xml file

<LOOK_AHEAD_XML>

<ACC_TUPELS> // this files are machine dependent <LA_AV0><ACC>1</ACC><T>80</T></LA_AV0> <LA_AV1><ACC>1</ACC><T>60</T></LA_AV1> <LA_AV2><ACC>1</ACC><T>40</T></LA_AV2> <LA_AV3><ACC>1</ACC><T>20</T></LA_AV3> <LA_AV4><ACC>2</ACC><T>80</T></LA_AV4> <LA_AV5><ACC>2</ACC><T>60</T></LA_AV5> <LA_AV6><ACC>3</ACC><T>80</T></LA_AV6> <LA_AV7><ACC>3</ACC><T>60</T></LA_AV7> <LA_AV8><ACC>4</ACC><T>40</T></LA_AV8> <LA_AV9><ACC>4</ACC><T>40</T></LA_AV9> <LA_AV10><ACC>4</ACC><T>50</T></LA_AV10> <LA_AV11><ACC>10</ACC><T>50</T></LA_AV11> <LA_AV12><ACC>10</ACC><T>50</T></LA_AV12> <LA_AV13><ACC>10</ACC><T>50</T></LA_AV13> <LA_AV14><ACC>10</ACC><T>50</T></LA_AV14> <LA_AV15><ACC>10</ACC><T>50</T></LA_AV15> </ACC_TUPELS> <LA_ACC_INDICES> // this is the maximum allowed acceleration - be conservative (high values lead to very bad quality) <LA_AV_MAX_X>3</LA_AV_MAX_X> <LA_AV_MAX_Y>3</LA_AV_MAX_Y> </LA_ACC_INDICES> // this is the maximum allowed velocity difference for every axis (has less influence than the maximum allowed acceleration) <LA_MAX_VELOCITY_DIFFERENCE_X>5</LA_MAX_VELOCITY_DIFFERENCE_X> <LA_MAX_VELOCITY_DIFFERENCE_Y>5</LA_MAX_VELOCITY_DIFFERENCE_Y> // this rs232 values could be ignored (sending due rs232 from ipc is not used) <LA_OUTPUT> <LA_RS232> <LA_RS232_ENABLE>0</LA_RS232_ENABLE> <LA_RS232_PORT>4</LA_RS232_PORT> <LA_RS232_BAUDRATE>19200</LA_RS232_BAUDRATE> <LA_RS232_XONXOFF>1</LA_RS232_XONXOFF> </LA_RS232> <LA_FILE> <LA_OUTPUTDIR>"./"</LA_OUTPUTDIR> <LA_FILENAME>"output.txt"</LA_FILENAME> </LA FILE> </LA_OUTPUT> <LA_START_LABEL>1</LA_START_LABEL> <LA_MAX_CONNECTED_MOVES>200</LA_MAX_CONNECTED_MOVES> // some engravers have scaled velocitys (look for fram) - machine dependent <LA_ACCELERATION_SHIFT>0</LA_ACCELERATION_SHIFT> <LA_OPTIMIZATION> // use relative moves instead of absolute to save memory in machines hardware - quality is the same <LA_RELATIVE_POLYGONS>1</LA_RELATIVE_POLYGONS> // allow acceleration changes in output.txt vs. input.txt <LA_ACCELERATION_CHANGE_ENABLE>1</LA_ACCELERATION_CHANGE_ENABLE> // allow velocity changes in output.txt vs. input.txt <LA_VELOCITY_CHANGE_ENABLE>1</LA_VELOCITY_CHANGE_ENABLE> // could be ignored - is not used <LA_CONST_VELOCITY>0</LA_CONST_VELOCITY> // ipc looks for constant velocity for all contours - could be a benefit when kiss cutting <LA_NO_DISCONNECT>0</LA_NO_DISCONNECT> <LA_CHANGE_CORRECTION_FACTOR>1</LA_CHANGE_CORRECTION_FACTOR> // blending is enabled when 1 - blending works only for vectors and not for circles - could be lead to velocity increase <LA_BLENDING_ENABLE blending_error="5">0</LA_BLENDING_ENABLE>

</LA_OPTIMIZATION> </LOOK_AHEAD_XML>