Universal Laser Systems VLS3.50

Training Manual

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Prerequisites & Safety

- 1) Prior to becoming a certified VLS3.50 user, the <u>laser safety learning module</u> must be completed. After completion, the certificate must be uploaded <u>here</u>.
 - a) Christopher Browne is Installation Supervisor, and Elizabeth Logsdon is the PI
- 2) Email a copy of the certificate named as "lastname_firstname.pdf" to a trainer.
- 3) Watch the instructional video here: <u>https://youtu.be/wEhy9Ukyp1w</u>
- 4) The user must pass this quiz to be a certified user (quiz found here)
- 5) The user must then schedule an in person training session with one of the TAs (Dave, Phani, Polly)
- 6) Only certified laser users can use the VLS3.50 without staff presence.
- 7) Only acrylic may be cut, other materials require prior approval.
- 8) The ventilation must be on before a job starts.
- 9) Report any damage the laser, honeycomb surface, or other components.
- 10) In case of **fire**: Click the laser pause button, and DO NOT OPEN the laser bed until you have a fire extinguisher. Call security at <u>410-516-7777</u>

Pre-Job Checklist

- 1) Are you laser certified?
- 2) Is the ventilation turned on?
- 3) Was the material thickness entered while printing?
- 4) Is the laser aligned to the corners of the workpiece?Is the material acrylic or otherwise approved by staff?
- 5) Is the rest of the honeycomb clear of any obstructions?

- 6) Does the drawing look correct, with only black (raster), red (cut), and blue (etch) elements?
- 7) Did you complete the <u>usage log</u>?

Basic Usage

Preparing a Drawing in CorelDRAW

A drawing can be prepared from within CorelDRAW using a combination of shapes, lines, and graphics. Alternatively, previously exported drawings can be imported (see <u>Exporting Drawings</u>).

In CorelDRAW, colors are interpreted by the laser cutter as different laser settings. All lines should be <u>hairline</u>. The colors most jobs will need are below.

Object Color	RGB	Description
Red	(255, 0, 0)	<u>Cut</u> the material. The outline of a shape should be red in most cases
Blue	(0, 0, 255)	Etch the material
Black	(0, 0, 0)	Rasterize graphics. The appearance depends on the material.

Creating a New Drawing

- 1) Open CorelDRAW
- 2) File \rightarrow New Page
- 3) Check that the Page Size is 24" x 12" (609 mm x 304 mm)
- 4) Check that the Color Mode is RGB
- 5) Create the new document

Create a New Document	×
Name:	Untitled-1
Preset destination:	Custom 🔹 🖬 📋
Size	Custom
Width:	24.0 " 💼 inches 💌
Height:	12.0 "
Number of pages:	1 *
Primary color mode:	RGB 🔻
Rendering resolution:	- dpi
Preview mode:	Enhanced 👻
☆ Color settings	
RGB profile:	sRGB IEC61966-2.1
CMYK profile:	U.S. Web Coated (SWOP) v2
Grayscale profile:	Dot Gain 20% 👻
Rendering intent:	Relative colorimetric 🔹
☆ Description	
Lets you select the preview your document.	mode that most resembles the final output of
Do not show this dialog	again
	OK Cancel Help

Editing A Drawing

After creating a new document, there is a blank canvas. Here, a drawing can be made to cut, using the above mentioned colors. Several tools that are important to know are listed below.



Tool	Description
Pointer	Use this tool to select and move objects
Shapes	Basic shapes can be used to create your drawing
Text	Use this to include rasterized text into the drawing
Line Thickness	The thickness of a line. This should always be hairline for the laser
Color Palette	Use the palette to quickly color lines red, blue, and black. Left click fills in the object, whereas right click only colors the path.

Importing Drawing Elements

After exporting from a different program, use the File \rightarrow Import menu item to bring in external objects into the drawing. Alternatively, drag and drop into the document. When importing documents there are some features that may help.

- 1) An imported object will automatically be grouped. Right click an object to Ungroup, allowing you to edit individual objects, paths, and elements. For example, when importing a SolidWorks file, an object must be ungrouped to remove the SolidWorks logo.
- 2) Images must be black and white. They can be edited before being imported, or by using the Edit Bitmap feature of CorelDRAW.
- 3) The imported elements must be colored appropriately using the color palette.

Printing a Completed Drawing

After the drawing is completed, it can be printed. This is a 2 step process, sending the print job and configuring the laser.

- 1) File \rightarrow Print
- 2) Select the Printer as the VLS3.50, and click Preferences.

Printer: VLS3.50		•	Preferences	
Status: Location: Comment:	Ready UCP-1		Print to file	
Print range Image: Current page Documents Pages: I Image: Image Even & Odd Image: Image		Copies Number of copies:	1 ×	
		Print as bitmap:	300 📩 dpi	

3) In the preferences dialog, check that the correct material is selected (usually Continuously Cast Acrylic) and enter the thickness of the acrylic.

	introl			
	L	aser Settings for VLS3.50		
Selected: Standard Material Continuous Cast Acrylic 303002 Intensity Adjustment				
	Find Time International Contraction		Raster	
- Continuous Cas	t Acrylic		- •	
Extruded Acrylic			Vector Engraving	
- Microsurface Plas	DC		0 +	
Polycarbonate			Vector Cutting	
Polyester			0 •	() =N
Polypropylene				
Polystyrene POM (Dekin IV)			1	
B POM (Delinin*)				
Click to select material, double click to edit, right click for other commands.				
Notes:				
Print Special Effects		Vector Performance	7	
Normal •	Print Direction	00		
	•	Standard		
	Units	Fixture Type	apply .	Defaults
A series	C Mattic	NONE .		
0.227	· inchés		Losd	Save
IT Merge Pages	1-Touch Laser Photo		0K	Cancel

- 4) Click OK to submit the print job.
- 5) Open the laser control panel by using the taskbar icon in the bottom right corner. The control panel should appear with the printed objects in view.





- 6) Check that the ventilation is turned on.
- 7) The control panel contains several useful tools as listed below



Icon	Tool	Description
Ø	Position Laser	When this tool is selected, you can click on the canvas to position the laser. The laser will have a red light turned on, useful for alignment.
(Position Object	When this tool is selected, the objects in the canvas can be moved.
0:00	Estimated Length	In this tab, click Start to compute the estimated job time.
	Start	Click this to start the print job. If the laser is open, it will trace the job without cutting.

Align the Workpiece & Print

- 1) Place the object in the control panel randomly. Do not always use the top left corner to reduce wear on the belts.
- 2) Using the Position Laser tool, select the top left corner of the object.
- 3) After the laser has moved, align the top left corner of the workpiece to the red light.

- 4) Check that all 4 corners are on the workpiece
- 5) Check that the ventilation is on and start

Post-Print Steps

- 1) Turn off the ventilation.
- 2) Remove the cut pieces of acrylic from the work bed. Any unusable scrap should be thrown away, whereas useable pieces should be placed in the drawer directly below the laser.
- 3) Ensure that the laser cutter is closed.

FAQ

1) Where can I find materials?

Acrylic can be found in the drawer directly below the laser cutter, which can be freely used for BME projects. Add any scrap to this drawer. If supply is running low, contact a TA or DS staff.

2) How can I schedule training? Contact a trainer or DS staff to schedule a training session.

Resources

Laser Safety: http://labsafety.jhu.edu/wp-content/uploads/2015/07/Laser-Safety-Manual-REV1.pdf

VLS3.50 Product Page: https://www.ulsinc.com/build/manual-select-platform

Tutorial Videos:

- 1) Exporting from CorelDRAW: <u>https://www.youtube.com/watch?v=F6-y1lsLhfc</u>
- 2) ULS Quick Start Guide: <u>https://www.youtube.com/watch?v=Oa-DkAnhH8g</u>