

Institute of Making



Intro



We have two laser cutters you can use to cut, score or engrave a range of materials. Materials you can work with:

Woods including laser ply, paper, card, fabric, acrylic, laser rubber.

Materials to that may not be cut on the lasers due to toxic fumes etc:
MDF, PVC, Ply wood (that isn't laser ply) or Metal.

Basic Workflow

Create vector design in Illustrator-> Choose laser settings -> Cut/Score/Engrave

You should use Illustrator create your files and send them to the laser cutters. Illustrator is a vector graphics package made by Adobe and can be used to easily create shapes and lines for cutting and scoring. In a vector package images and shapes are represented as points in space with lines or arcs between these points. This is different to pixel based programs, such as Photoshop, where images are represented as individual pixel colours. Vector files can be scaled without affecting quality.

The laser cutters have their own control software called VLS. This software interprets the data from Illustrator to control the laser cutter. This software is used to set the material and material thickness (as measured by the calipers).

Once the settings are correct for your material and thickness you can turn on the extraction and start the cutting/scoring/engraving.

New Project

Name	Date modified	Type
Blank Templates	25/06/2014 13:04	File folder
Club	25/06/2014 13:04	File folder
Film	25/06/2014 13:04	File folder
FlexSkins	25/06/2014 13:04	File folder
Japanese Templates	25/06/2014 13:04	File folder
Tech	25/06/2014 13:04	File folder
LASER-BED	14/03/2013 11:22	Adobe Illustrator ..

When starting a new project, please remember to go to start -> new from template and choose the laser bed template. This will ensure that your project is in RGB colour space and that the size of the artboard is the same as the bed of the laser. If you have already created your design in a document that wasn't started from a template please copy it from that document into a new template file.

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Import

You can import other vector files into Illustrator. Some programs (such as Rhino) allow you to save directly to .ai (Illustrator format), there are also formats such as DXF which can be used to transfer designs between different graphics packages. When importing a DXF into an Illustrator project be sure to select the same scale it was saved at. Ask a technician for help transferring your file from a CAD program to Illustrator.

Cut/Score/Engrave

CUT
Score
Engrave

You can use different colours in Illustrator to tell the laser cutter what you want it to do. The laser can cut, score or engrave. Cutting cuts all the way through a material, scoring scores lines into a material without cutting all the way through and engraving takes off an area of the surface of the material.

Cut and Score lines need to have their stroke weight set to 0.001mm.

Cut lines to be RED (255,0,0) and score lines need to be BLUE (0,0,255).

Anything else in your document, that is not a red or blue line of 0.001mm will be engraved. You can import images or photos for engraving as well.

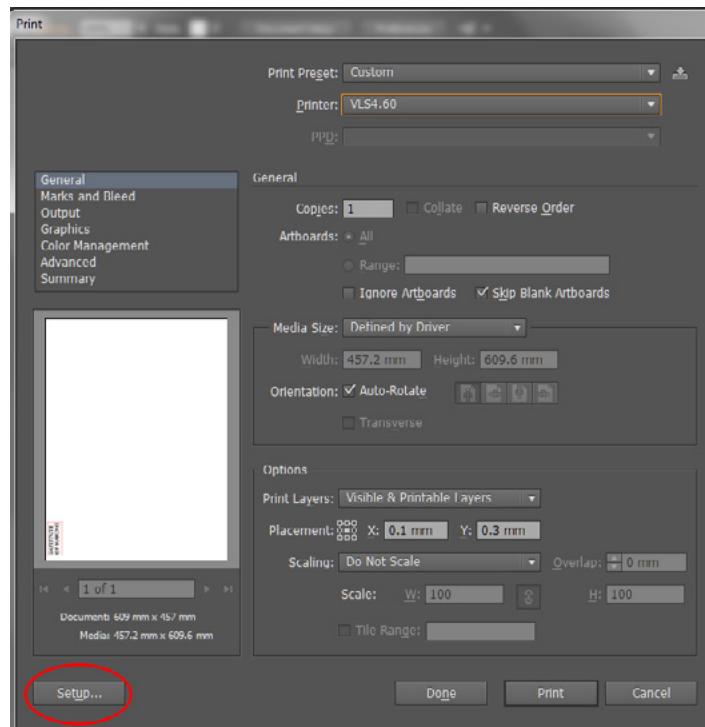
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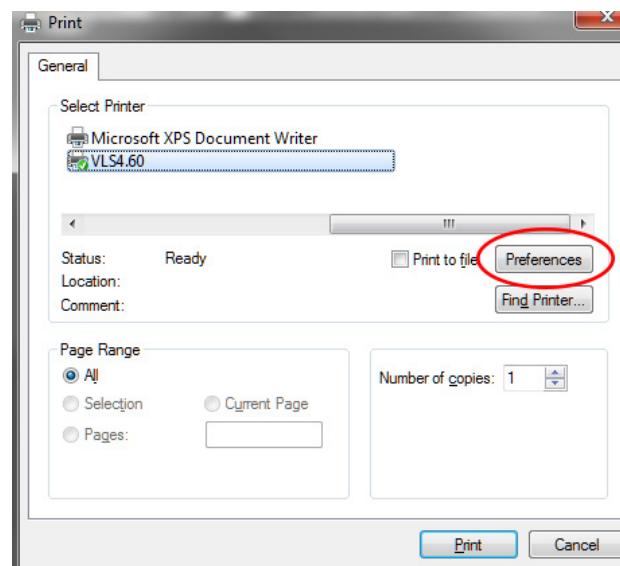
Send to laser

The next step is to send your design to the laser cutter. To do this click file print.

On the first page click setup...



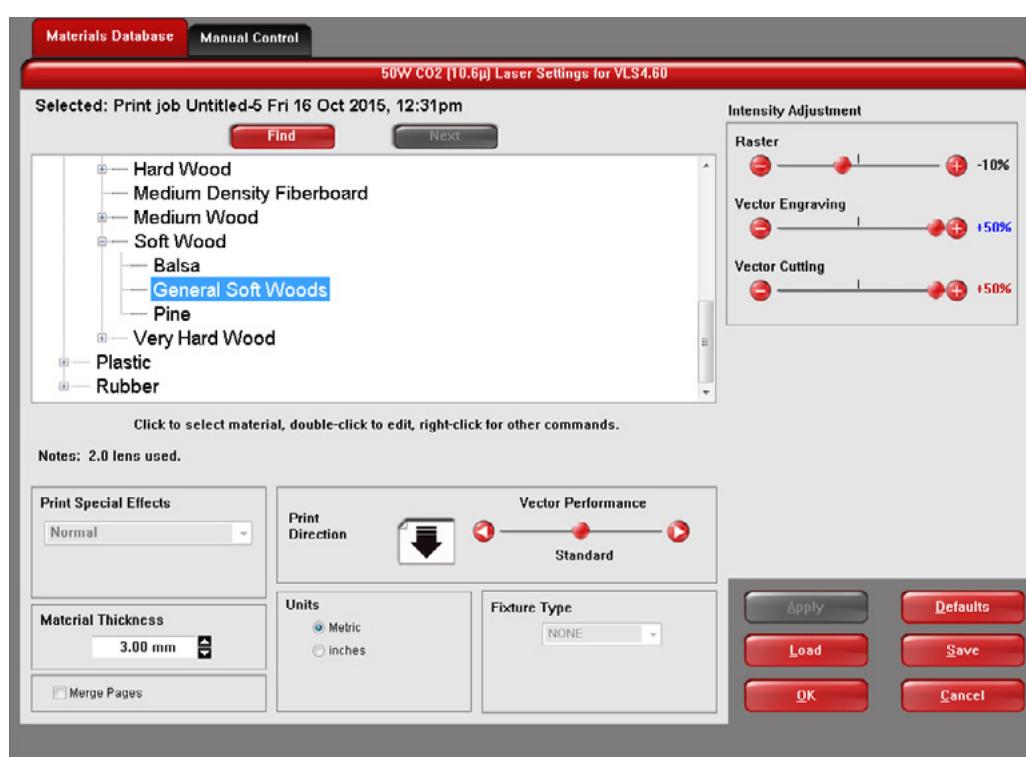
On the second page, click preferences to bring up the laser settings page.



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Laser settings



The laser settings page has a few options for your to configure.

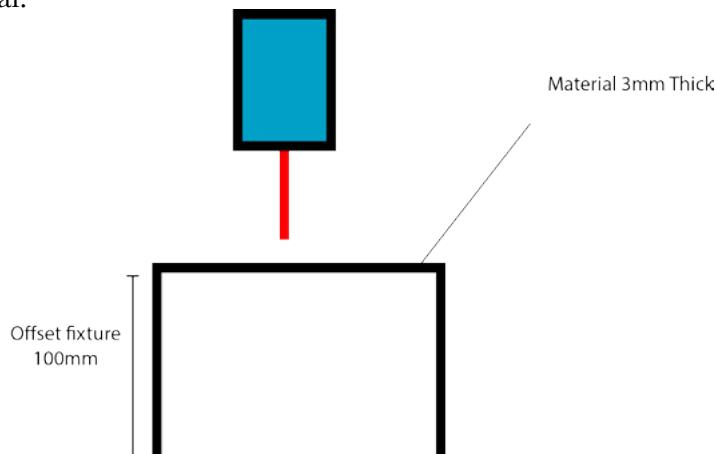
First chose a material from the list, click the + next to the group names to expand the whole list. If you can't find your material in the list ask a technician for help.

Once you have chosen your material you need to set the Material Thickness. This is the total thickness of your chosen material. If you need to measure it use the calipers next to the laser cutter.

At the top right of the page are three sliders, Raster (Engrave), Vector Engraving (Score) and Vector Cutting (Cut). The sliders change the power settings for the three laser operations. You won't usually need to adjust these presets but if, for example, your job is not cutting all the way through, you could try raising the value for Vector Cutting.

The final setting on this page is Fixture Type. This setting will offset the whole bed, for example to accomodate a piece of acrylic that has been bent. In this situation the offset is the total height of the object minus the thickness of the material.

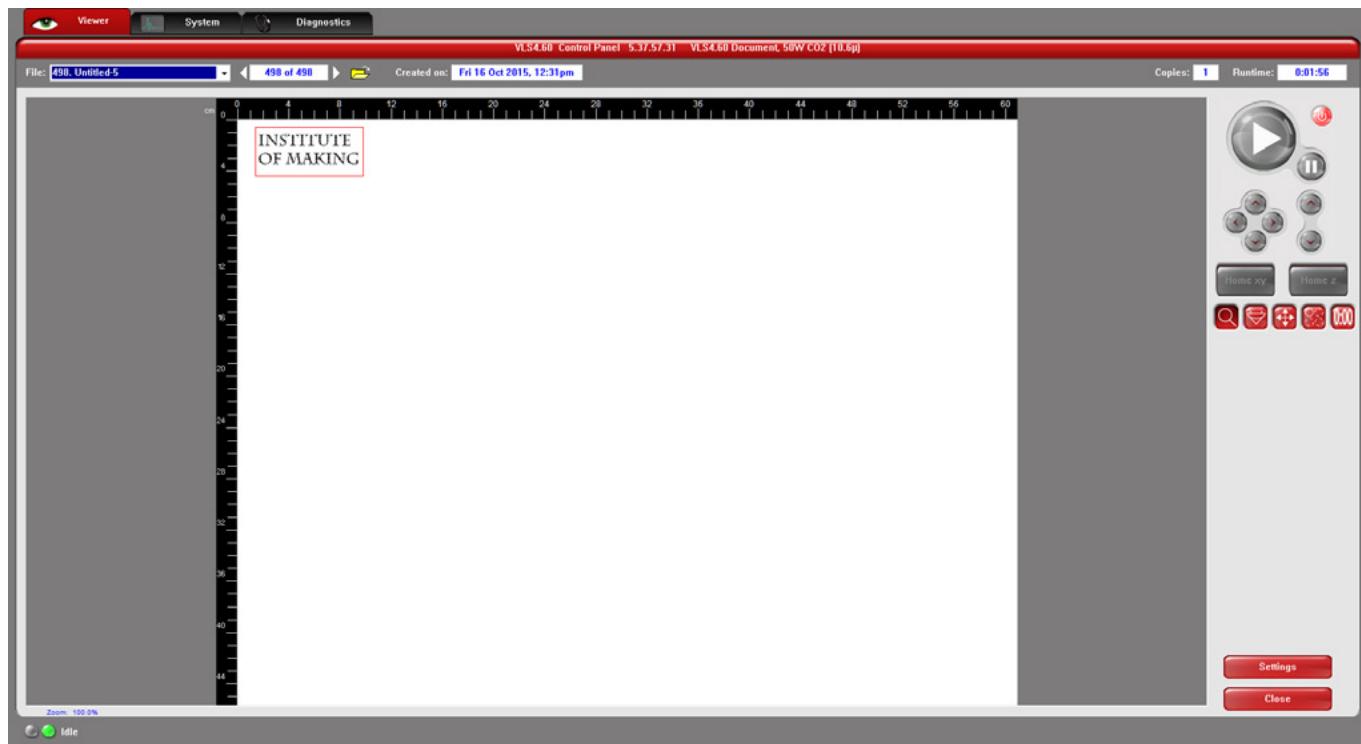
In this example the material is 3mm
the total height is 103mm so the
offset becomes 100mm.



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Once you have finished setting up the material, thickness and other settings, click OK. Then print, and print again on the next page. This should bring up the Laser control software.



The laser control software should show a preview of your design. This is a good point to check that you have the correct line weights and colours. The sections that are red or blue should appear in that colour on this preview. If you see lines that are supposed to be red or blue coming up as black or grey please go back to your illustrator file and double check you have it set up right.



The icons from left to right are:

Zoom - Zoom in to inspect an area of your design

Move - Move the design around the bed (it is best to do this in illustrator and resend it to software)

Focus View - Click an area on the screen to move the laser head to that position on the bed. (please note you need to adjust the bed height down before doing this if there isn't enough space for the laser head to pass over the top of your material)

Multiply - Create copies of your design, again it is best to do this in illustrator.

Estimate time - Estimate how long the job will take.

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Run Job

Before you start the machine running please turn on the extraction. For the large laser the extraction is below the screen, for the small laser it is the unit underneath the laser.

Then press the play button to start cutting.

Pause job by clicking pause button.

Resume the job by clicking the pause button again, if you click play it will start again from the beginning.

Safety

- Don't walk away from the laser while it is running.
- Don't stare directly at the beam.
- Make sure extraction is on and lid is closed before cutting.
- If something catches fire - pause the machine to allow the extraction to extinguish the fire and then alert a member of staff.
- Don't laser cut any of the banned materials, if in doubt please ask! This is for the benefit of your health and that of our staff and other members.

Waste

Please put laser cuttable offcut materials of a decent size in the scraps bin, located in the opposite corner of the mezzanine to the laser cutters.

Please put small unusable acrylic scraps in the acrylic bin, to the right of the small laser.

Extra Info

Makercase.com is a great free website for generating laser cuttable plans for boxes and other cases.

Geargenerator.com is a cool website that generates laser cuttable gears. Ask a technician if you want to use our login for this.

Thingiverse, while mainly for 3d printable files, has a lot of projects you can download and make, this is a good place to get some ideas and learn what is capable on the laser cutter.