

Roland CNC Router Quick Reference Guide

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1. Material and Machine Bed Preparation

Note: After opening and closing the machine door, the user will have to press “Enter” on the machine to continue.

Before you begin, ensure that the machine has been recently cleaned: that the swarf has been cleaned out from the catch-box, and that the machine has been thoroughly vacuumed.

Note: When cleaning this machine, it is important to use the correct safety gear, such as a dust mask, and eye protection.

Make sure you have your model prepared beforehand. The maximum dimensions for a model are **400 mm** by **305 mm** by **100 mm**.

1. Select an appropriate material for your model.

The materials that we provide are Styrene Foam, High Density Polyurethane Foam, and MDF Wood blocks. Any other materials you wish to use will have to be provided yourself. Check with a Creative Technologist whether a material will be suitable for use in the machine, but most woods and foams should be suitable. Metal cannot be routed in this machine.

2. It is generally important to **place a sacrificial bed down under the material block you are using**. This is typically a shallow board of MDF or foam used to protect the machine table. This will typically be secured to the machine table using plenty of double sided tape. Try to use a sacrificial bed of the same or similar material that you are creating your model from.

3. Next, you must **securely attach your material to the sacrificial bed**. This may be done with double sided tape for heavy materials like wood, or may be done with duct tape on the sides of the work piece for lighter materials such as foams. When securing both your material and the sacrificial bed, it is important to align the left front corners to the table, as we will be using this particular corner as the origin point.

2. Origin Set-up

i. Open up VPanel from the Desktop menu, or task tray, if it is already running.

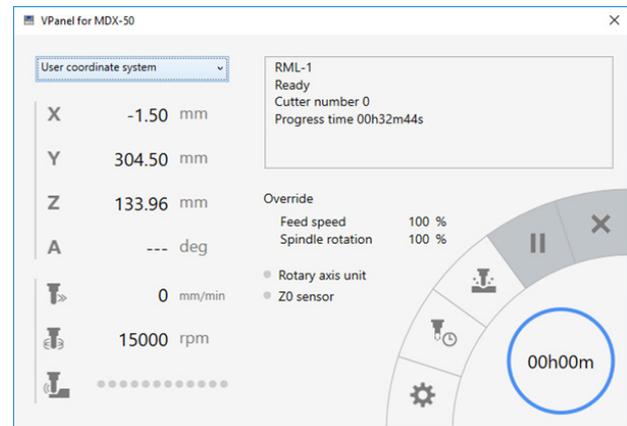


Figure 1: VPanel home screen

ii. Select the Settings icon, and navigate to “Origin”.

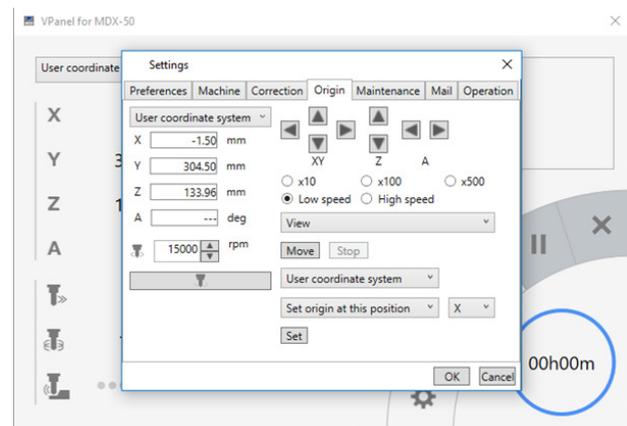


Figure 2: Navigating to Origin screen

iii. Go to the machine, and load a tool bit manually by tapping the menu key twice, and selecting an appropriate tool bit. A good idea is to load the longest tool bit that you will be using, in this case, tool bit 1.

iv. From the three lowest drop down menus, select “User coordinate system”, and “Set origin at this position”, and “XY”. Note: we will not be setting up the Z origin at this point.

v. Go to the machine, and tap the X key, and rotate the machine wheel to set the X origin for your material block. Do the same with the Y key to set the Y origin. Note: Do not attempt to set the Z origin at this point.

vi. Try to align the centre of the tool bit to the left front corner of your block. Once you have manually aligned the XY origin adequately, tap the “Set” button to set this as the XY origin.



vii. To set the Z origin, we will need to be careful not to damage the tool bit, so we will be rotating the spindle while we move the tool up and down. This will result in the removal of a very small amount of material from the upper surface of our material block, about 0.01-0.03 mm. Note: Make sure that you select Z from the drop down menu beside “Set origin at this position”.

viii. Referring to Figure 3, tap the highlighted button, which starts the rotation of the spindle. 15000 RPM should be a reasonable speed for the spindle. On the machine, manually move the tool along the Z axis until you reach about 2 cm from the top surface of your panel.



Figure 3: Setting rotation speed and highlighted button

ix. Use the highlighted downward button with the speed set to x100 until you are about 3-5 mm away from the piece, then lower the speed to x10 for the last few mm. As you approach the material, make sure to only tap the button, not to hold it down, and to keep your ears active. As the tool piece connects with your material, you will be able to hear a change in the sound that the tool piece makes. Tap the “Set” button at this point to set this as your Z origin, then return the tool piece upward by using the upward button.

Note: Be careful to not use the machine wheel to drive the tool bit upward until you are sufficiently far away from your material block.

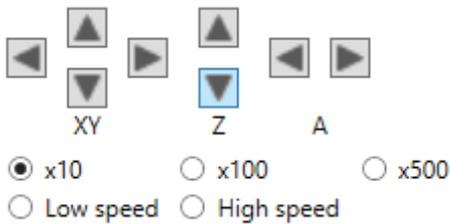


Figure 4: Adjusting Z axis speed to x10

3. Model Preparation

Open up SRP player, and upload your model. Your model should be expressed as an stl file.

Make sure that your model dimensions are within the limits of your workpiece size. The workpiece refers to the allowable cutting volume of your material block. For reference, the maximum allowable size for a material block is 400 mm by 305 mm by 100 mm.

Make sure that your model is oriented such that all the detail you wish to route is facing upwards.

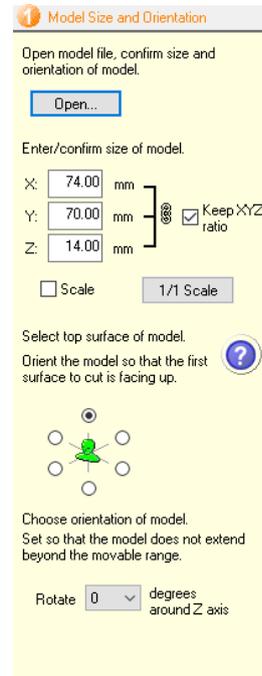


Figure 5: Model dimensions within limits of workpiece size

Select the options that are most appropriate to your model. If you are creating a piece that will have to be flipped and cut on the opposite face, you may need to add support structures to your model.

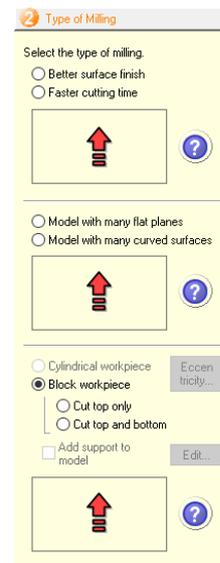


Figure 6: Select most appropriate option for model



You will need to select the material for your model in the Create Tool Path screen, as well as the workpiece size. The numbers in brackets beside the text boxes represent the minimum allowable sizes for the workpiece. However, it is advisable to add around 30 mm to the X and Y minimums, for reasons that will be explained later. Account for the full height of your material for the Z size. Note: Do not include the sacrificial plate in your size measurements. In most cases, it will be best appropriate to align your model placement to the top. Use the drop down menu under “Select the model placement”, and select “Align Top”.

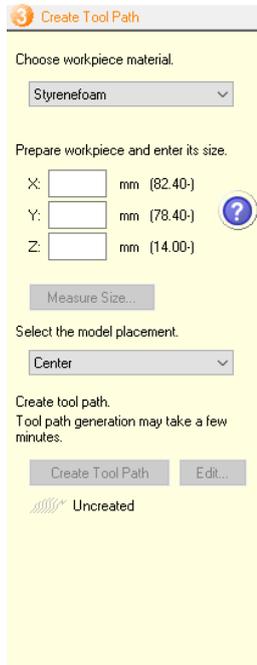


Figure 7: Select material and workpiece size in Create Tool Path

Beside “Create Tool Path”, enter the “Edit” menu.

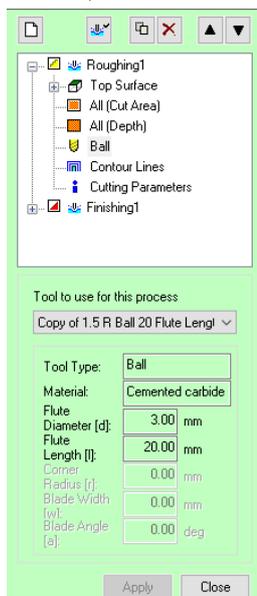


Figure 8: Edit menu

In this menu, under the Roughing pass, you will want to change the tool bit to the largest one possible, in most cases, this will be the tool bit 1, which is a 6mm D 42mm Flute Length.

Then, go to Modeling Form under Top Surface. Tap the “Automatically” button beside “Add a margin”, and ensure that this check box is selected. It is advisable to add a little bit more to your margins, so, while in this case, the minimum allowable margin is 7.2 mm, we will use 10 mm for each of our margins. If we are using any of the smaller bits, we will need to also make a slope. 10 degrees should be a reasonable slope. This is also why we needed to add extra to the X and Y minimums when we marked the workpiece size, so that this slope can be made in the workpiece.

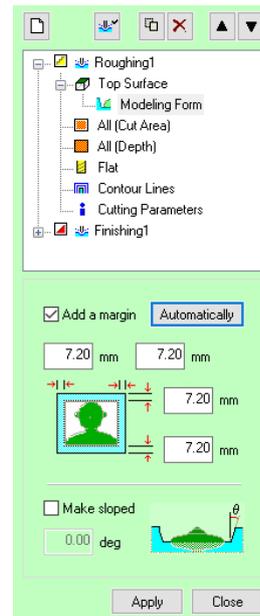


Figure 9: Minimum allowable margin of 7.20 which should be changed

Make sure that the Cut Area and Depth settings are set to “All”.

Then, make sure that all the settings are identical for the Finishing Pass, except select a more appropriate tool for finishing, such as a curved large or curved small tool.

Close the Edit menu, and tap “Create Tool Path”.

Preview your results in the next menu, then prepare to cut in the final menu.



Make sure that the appropriate tools are installed, an example shown in Figure 10.

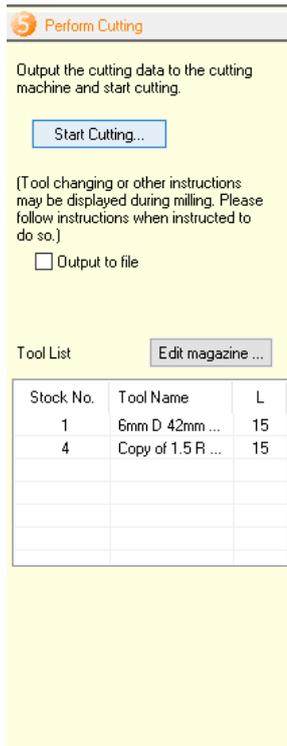


Figure 10: Appropriate tools installed for model

And also check that the correct origin is selected, as seen in Figure 11.

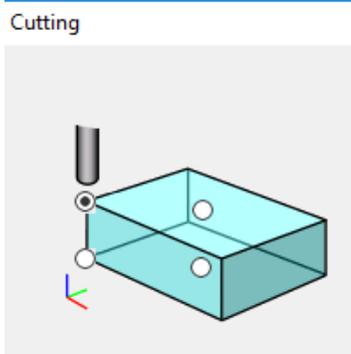


Figure 11: Origin set to front left corner

Click next, then next again to start cutting!

