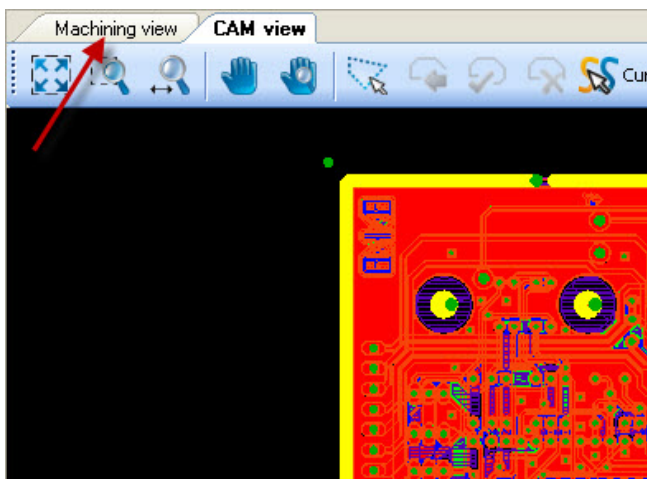


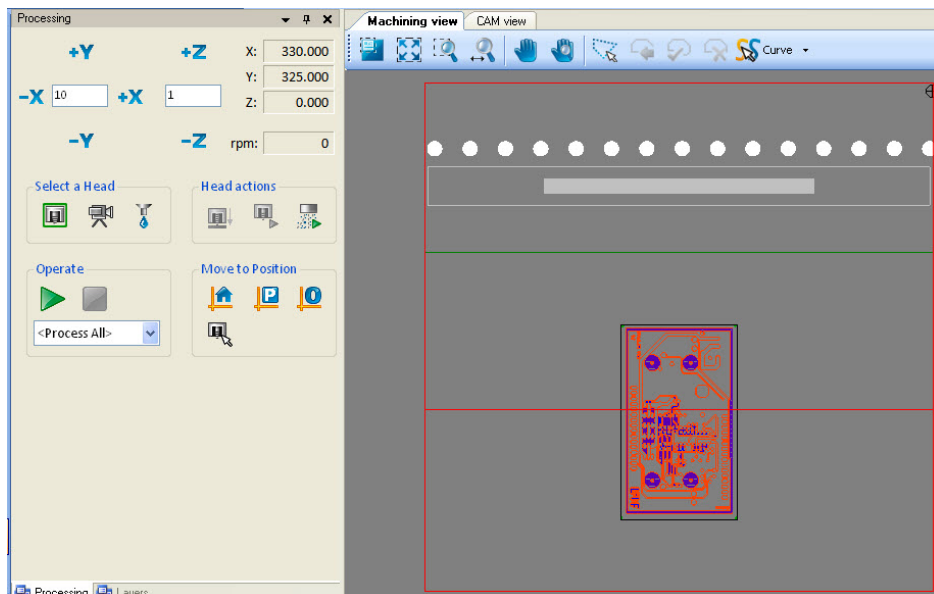
Circuit PRO Machining Side Basic Operations

Note: This document is based on using a 2 sided template with Galvanic Through Hole Plating. Although the document follows a certain set of steps, the steps could vary in order depending on the template chosen by the user.

1. Switch to machine view
 - a. Press the Machine view tab.



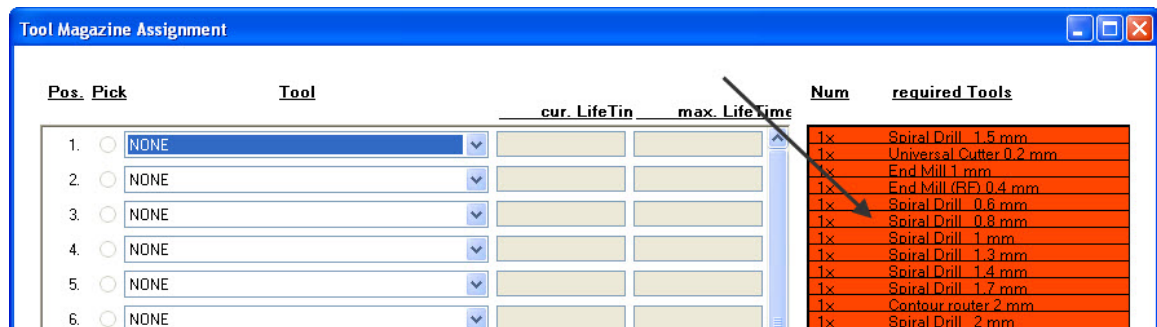
- b. You will see your board on screen.



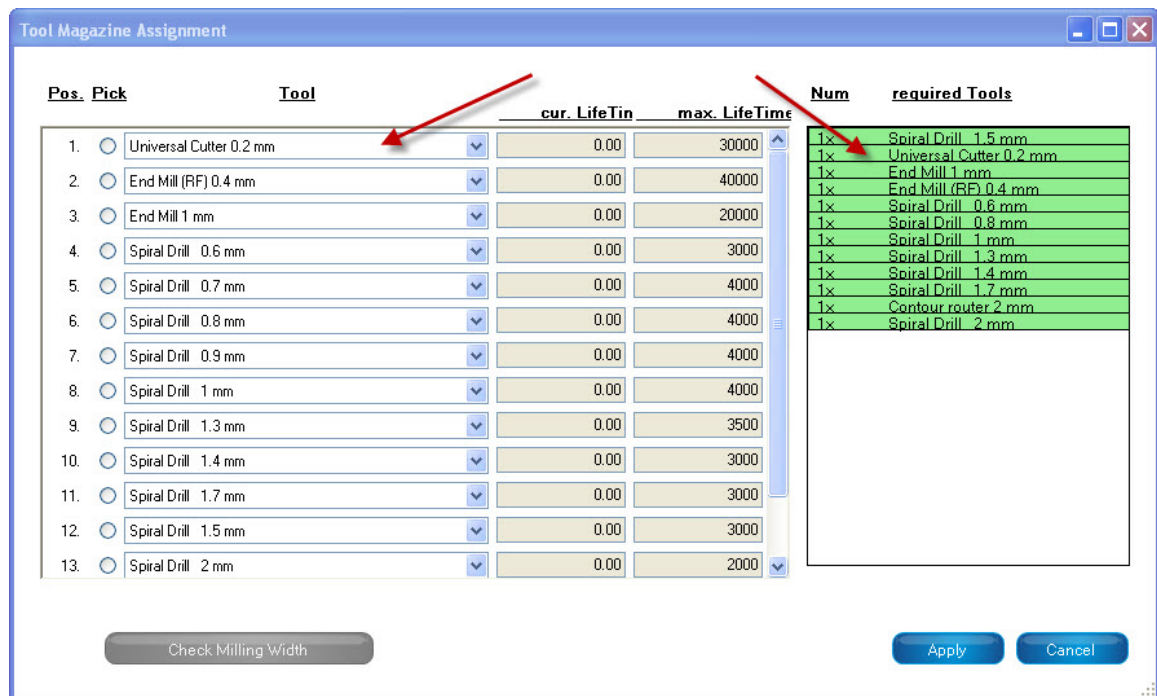
2. Load the toolbar



- Press the toolbox dialogue icon , or go to the edit menu and select tool magazine assignment.
- The required tools will be listed on the right of the screen.



- In each individual tool position dropdown menu on the left, select one of the tools that is listed on the right. Physically place the tool into that tool holder.



Note: As you assign each tool to a tool holder, the background of the required tool column will change from red to green. You will also notice that if you have a tool loaded into the toolbar and it is not required for this design, it will be highlighted in yellow.

- d. Press the apply button.

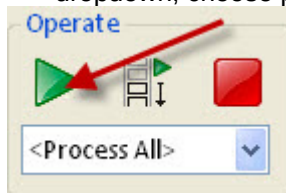


Note: You will notice that the colors of the tool holders on the main layout screen will match the colored rings on the physical tools, as shown below.

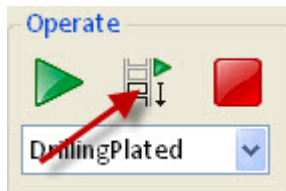


3. Start board production.

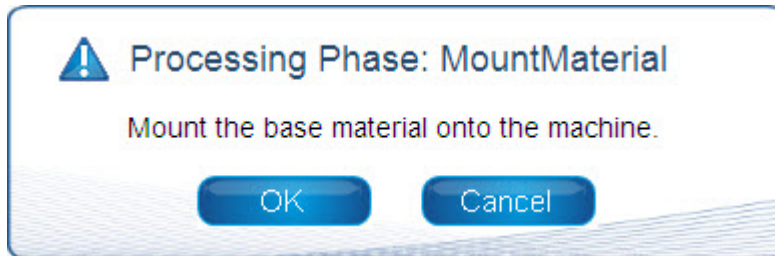
- a. Press the board production wizard icon , or in the phase dropdown, choose process all and press the green play button.



Note: If you wish to start on a different phase and would like to automatically continue to the next sequential phase, select the desired phase in the drop down menu and press the "start selected phase and all following phases" icon, as displayed below.

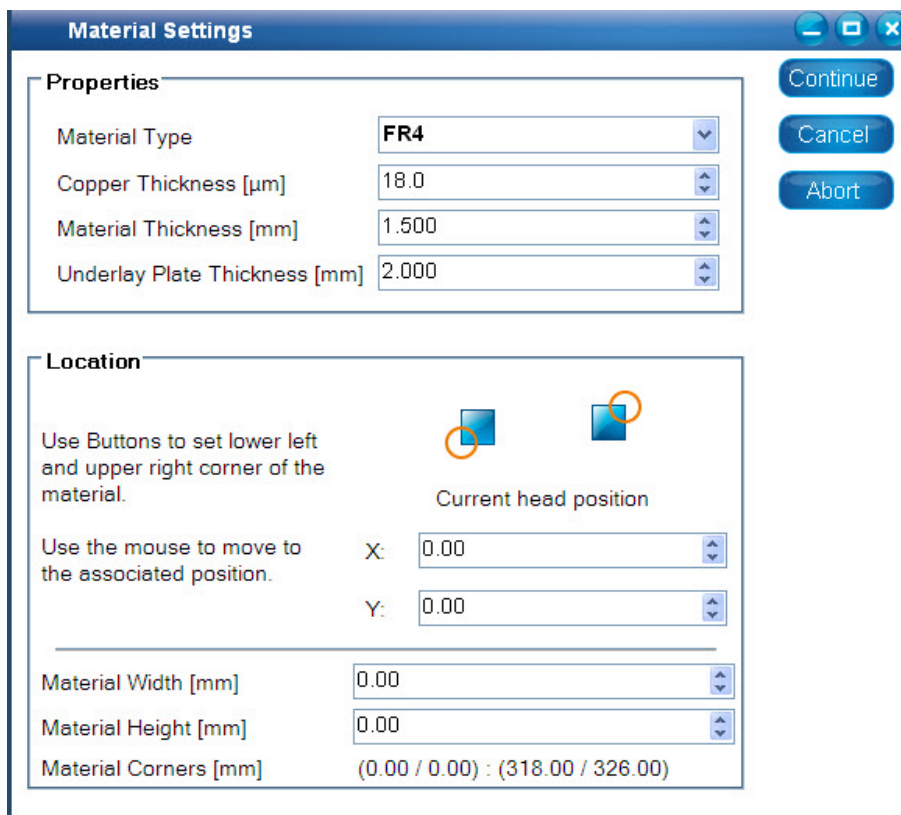


- b. Load material onto the tabletop and press ok.



Note: The machine will automatically move to the pause position.

- c. Enter in the material settings and press continue.



Note: Make sure that you enter the correct copper thickness and overall thickness of the board.

- d. If desired, move the board to the desired location.

Placement

Relative translation [mm]

dx: 124.873 dy: 237.255

Set center

Step and Repeat

Number of copies

X: 1 Y: 1

Spacing between copies [mm][mm]

X: 0 Y: 0

Warning: previous spacing values [0.00 | 0.00] differ from the current value.

Reset

Apply

Continue

Abort

- i. Move the placement window off to the side.
- ii. Single click and drag your design to its new location.
- iii. Press the apply button.

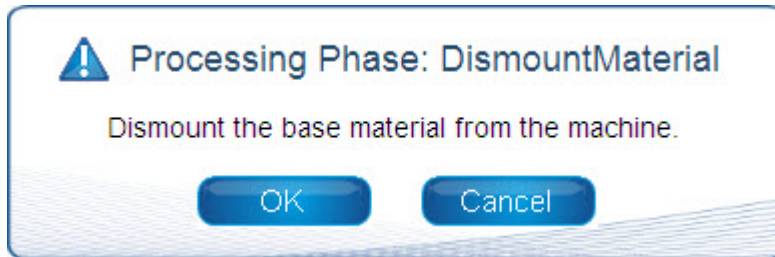
Note: If you desire to create multiples of the same design, in the step and repeat section, enter how many designs you want on each axis. The spacing between copies will automatically be filled. This is the minimum distance between designs. LPKF recommends that you increase the spacing slightly to create a framework between the boards. This will ease the cutting out of the board.

- iv. Press apply
- v. Press the continue button.
- e. The machine will now start creating your design.
- f. The machine will now go and pick up the 1.5mm drill to drill your fiducial holes if you are using them.

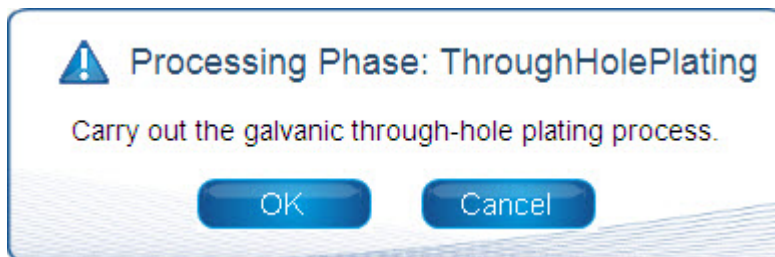
Note: A 3 minute motor warm-up is expected. This warm-up will happen on the first spinning of the motor each day, or after a prolonged idle period.

- g. The machine will now go and pick up the 0.2mm Universal Cutter and center punch all of the via holes.
- h. This machine will automatically transition to the drilling plated phase and drill all of your through holes.

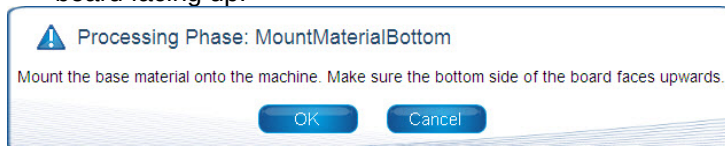
- i. Once the drills are complete, the machine will move to the pause position and prompt you to carry out the galvanic plating (MiniContac plating system).



- j. Remove the material and press ok.
- k. Execute the plating process.



- l. Press ok.
- m. After plating is complete, mount the material back onto the table top with the bottom side of the board facing up.



- n. Press ok.
- o. The machine will then execute reading the fiducials.
- p. Once the fiducials are read in, the machine will automatically transition to the milling bottom phase and start your circuit structuring and removal of excess copper.
- q. When the milling bottom phase is complete, the machine will move to the pause position.
- r. Flip the board over to the top side of the board.

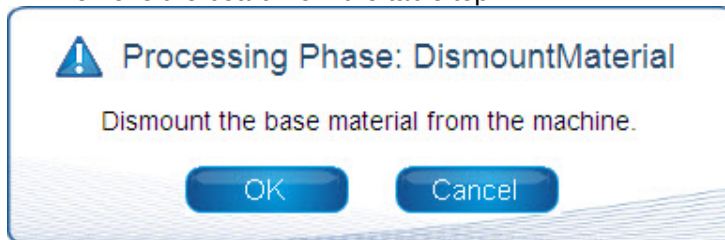


Note: Always flip the board along the X axis. You will also see the display graphically flip the design to the top side.

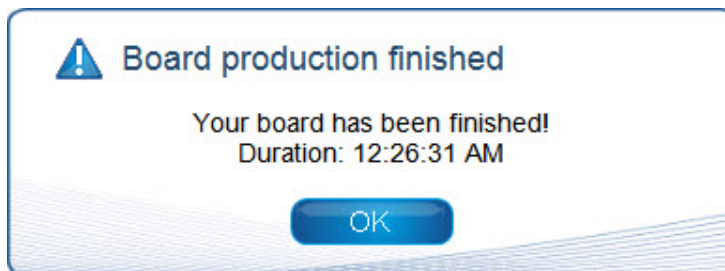
- s. Press ok.
- t. The machine will now read the fiducials from the top side of the board.
- u. Once complete, the machine will automatically transition to the milling top phase and start your circuit structuring and removal of the excess copper.
- v. Once the milling top is complete, the machine will automatically transition to the cutting outside phase to cut your board out of the material.

Note: The machine will pick up the either a 1.0mm or 2.0mm drill (this depends on what diameter contour router was used to cut the perimeter of the board in the CAM side) and drill a starter hole for the contour router. Once the starter holes are drilled, the machine will then pick up the 1.0mm or 2.0mm contour router and cut out your board.

- w. Once the cutting out of the board is complete, the machine will move to the pause position.
- x. Remove the board from the table top.



- y. The machine will now display the total time to create your completed board.



- z. Congratulations, you have created a PCB board.