Mixed PCB layouts in CircuitPro PM

TechNote

Order code: 10076729
Version: 1.0

LPKF
Laser & Electronics

Contents

1 Purpose of this TechNote

This document describes how to work with mixed PCB layouts in CircuitPro PM 2.3.

This TechNote contains specific warning messages for particular instruction steps. A detailed documentation for the appropriate system as well as further documentations for the software used can be found in the system documents. Please note that this TechNote does not substitute the detailed documentation for your system.

- Before you start working with the system, read the detailed documentation first.
- To guarantee a safe and trouble-free system operation observe and follow the information, instructions and safety notes in the detailed documentation.

1.1 Target group

This TechNote is solely intended for the target group Customers of the LPKF Laser & Electronics AG.

1.2 Scope

The following table lists the scopes of this TechNote:

General scope	Specific scope
Product scope	RP
System	ProtoMat SII, ProtoMat E
Further product scopes and systems (optional)	–
Hardware component	–
Software component	CircuitPro PM 2.3
Additional information	–

Table 1: Scope

1.3 Relevant documentations

The following table lists the relevant documentations that are significant for the contents of the TechNote:

Documentation	Order code
LPKF ProtoMat S Manual	10000447
ProtoMat E34/E44 User manual	10053639
LPKF ProtoMat E33 Manual	10000448
CircuitPro PM 2.3 Compendium	10046163
CircuitPro PM 2.1 How-to guides	10011141

Table 2: Relevant documentations

2 Working with mixed PCB layouts

This chapter describes how to import and process mixed PCB layouts at the same time into CircuitPro PM 2.3.

You can produce **single-sided PCBs** and **double-sided PCBs** when working with mixed PCB layouts in CircuitPro PM 2.3. You **cannot** produce multi-layer PCBs when working with mixed PCB layouts.

The following steps are performed in this tutorial:

- Preparing the individual PCB layouts
- Importing the individual PCB layouts
- Processing mixed PCBs

Preparing the individual PCB layouts

Before importing PCB layouts into a single project, it is essential that you **calculate toolpaths** for every individual PCB layout. It is also necessary to **save** every individual PCB layout in the **.cbf** format.

1. Design your PCB layouts in a PCB design software.
2. Switch the ProtoMat on.
3. Turn on the PC that is connected to the ProtoMat.
4. Double-click on the desktop icon of the CircuitPro PM 2.3 and wait for the ProtoMat to connect and initialize.

☐ The dialog *Connection steps* opens.

5. Click on [OK].

☐ The dialog *New document* opens:

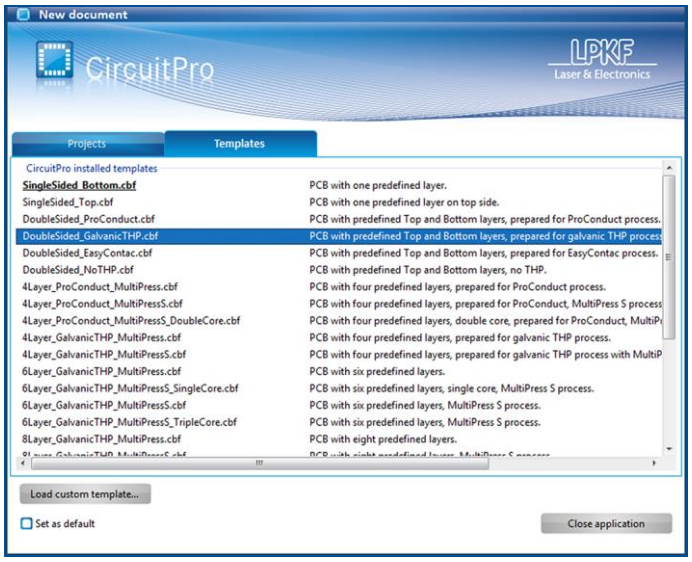


Fig. 1: Dialog *New document*

6. In the tab *Templates* select the desired template (in this example the template *DoubleSided_GalvanicTHP.cbf.*).
7. Click on *File* > *Import* or on .
8. Select the files you want to import and click on [Open].

- ☐ The data should automatically be assigned to the correct layers and the dialog *Import* is displayed.

9. Click on [OK].

- ☐ The data have been imported and the layout is displayed in the *CAM view*.

10. Click on *Toolpath* > *Technology Dialog* or on .

- ☐ The *Technology Dialog* is displayed.

11. Set the desired *Insulation Method*, *Contour Routing Method* and toolpath settings.
12. Click on [Start].

- ☐ The dialog *Computation Results* is displayed.

13. Click on [Close].

- ☐ The toolpaths have been calculated.

14. Click on *File* > *Save as*…
15. Select a suitable folder, name the file and click on [Save].

- ☐ The file has been saved in the **.cbf** format.

16. Click on *File* > *New* or on .
17. Repeat steps 6 to 15 to prepare all the other individual PCB layouts.

Make sure you use **the same template** for each imported PCB layout!

- ☑ The individual PCB layouts have been prepared.

For detailed information on preparing a PCB layout refer to the CircuitPro PM 2.1 How-to guides, Part I, chapters 1.1 to 1.7.

Importing the individual PCB layouts

Note that **this project is an example**. Your project will be displayed differently.

1. Click on *File* > *Import toolpaths*…
2. Navigate to the folder that contains the files in the .cbf format you generated in the previous steps.
3. Select the first .cbf file and click on [Open].

☐ The first layout is displayed in the *CAM view* (the following figure shows an example used for this tutorial):

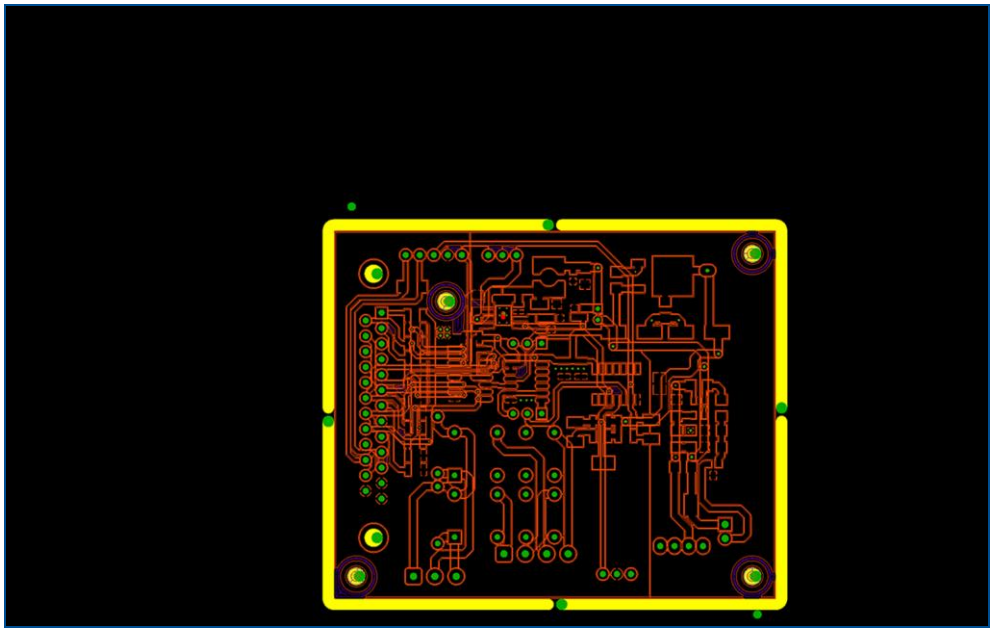


Fig. 2: *CAM view* of the first PCB layout

4. Repeat steps 1 to 3 for all the other .cbf files you wish to import.

☐ All layouts are displayed in the *CAM view*:

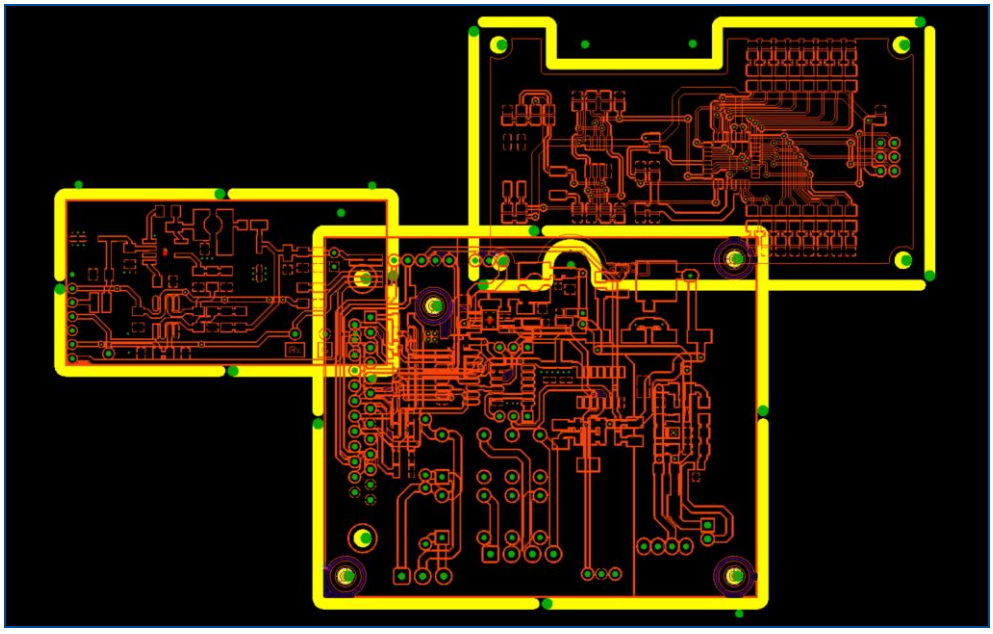


Fig. 3: *CAM view* of all the imported PCB layouts

In the *CAM view*, the imported layouts may be displayed on top of each other or very far apart. They may also partly overlap (as in this example).
After that, you set the **position of the layouts** on the base material in the *Machining view*. The following steps explain how to perform this.

5. Switch to the *Machining view*.

☐ The layouts are displayed in the center of the base material frame:

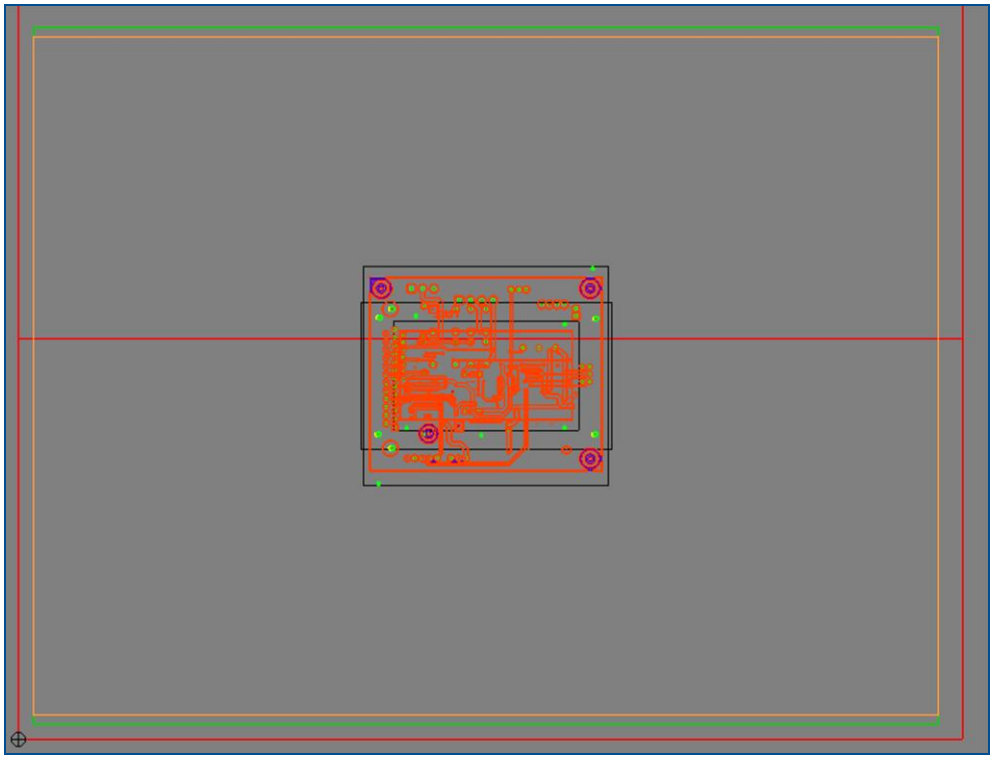


Fig. 4: Machining view of the PCB layouts

6. Right-click on the layouts.

☐ The following context menu is displayed:

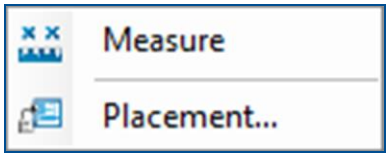


Fig. 5: Context menu

7. In the context menu, click on *Placement…*

☐ The following dialog is displayed:

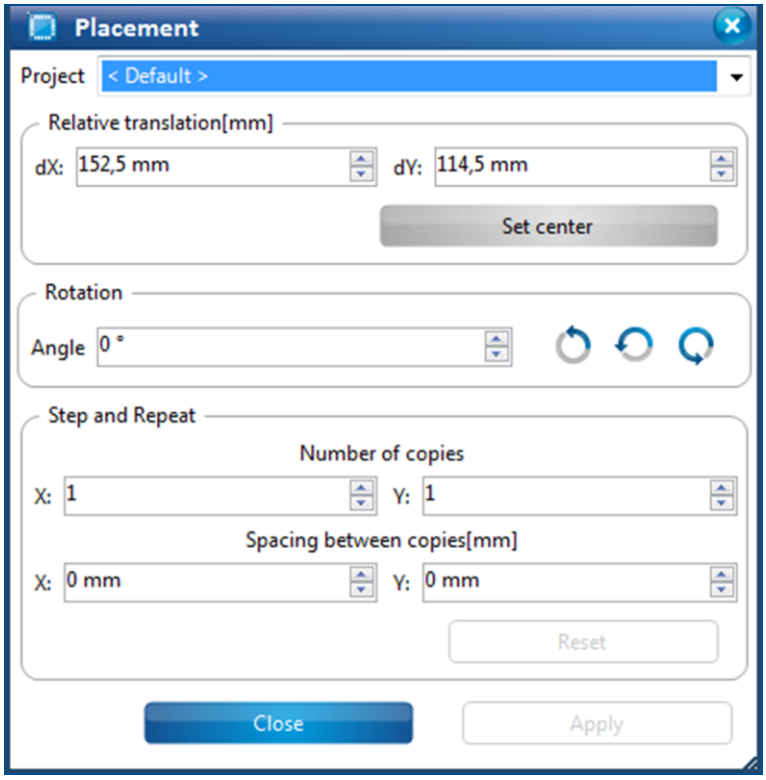


Fig. 6: Dialog *Placement*

8. Move the dialog *Placement* to the side to get a better overview of the layouts.
9. Select one of the layouts using the drop-down list (in this example *Imported_PCB_layout_example_1.cbf*):

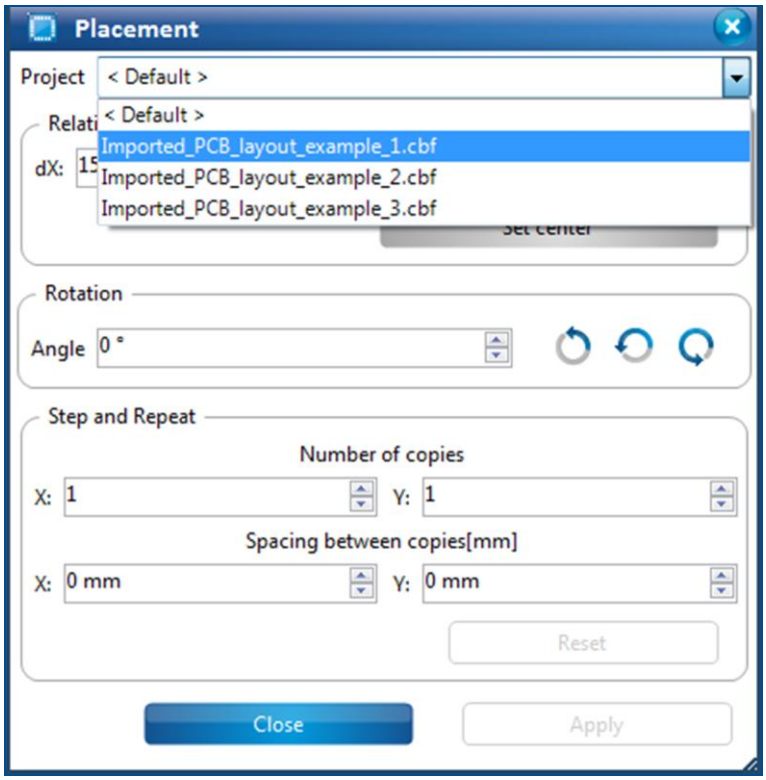


Fig. 7: Selecting the layout

☐ The layout has been selected.

10. Move the selected layout to the desired position using one of the following methods:
    - Drag & drop the layout;
    - Enter the *dX* and *dY* coordinates in the group *Relative translation[mm]* and click on [Apply].

☐ The layout has been moved:

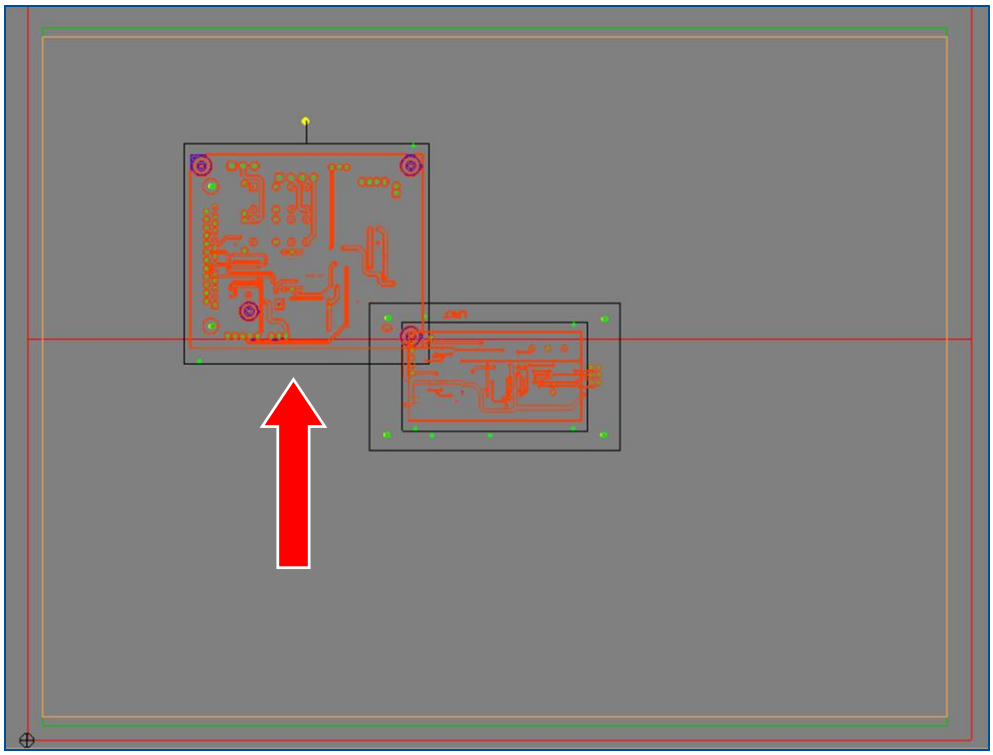


Fig. 8: Layout moved

Should you wish to position the layout in the center of the base material, click on [Set center].

11. Repeat steps 9 and 10 to select and move the other layouts.

☐ The view changes as follows:

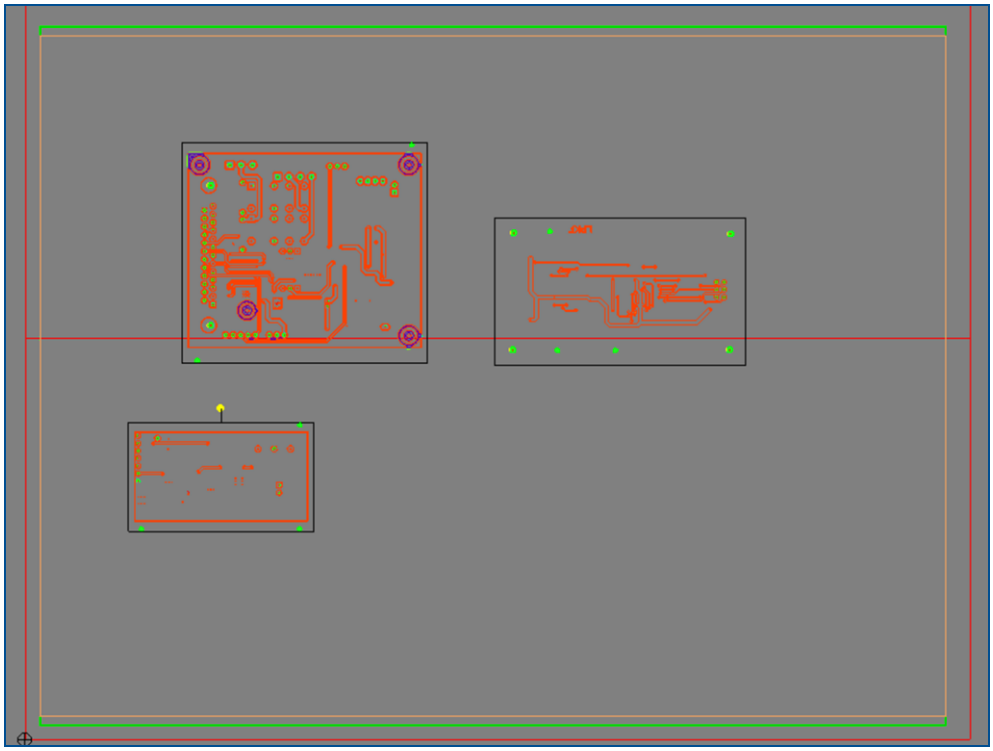


Fig. 9: Layouts moved

In this example, one of the layouts is **rotated** and one is **multiplied**.

12. Select the layout to be rotated (in this example *Imported_PCB_layout_example_3.cbf*).

13. Enter the *Angle* in the group *Rotation* (in this example **90°**):

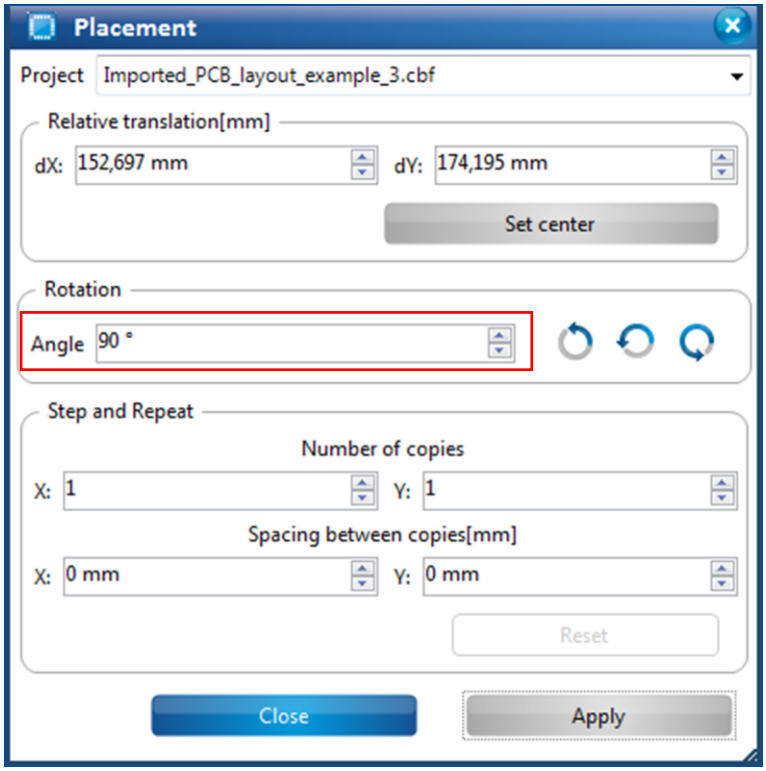


Fig. 10: Angle entered

14. Click on [Apply].

☐ The layout has been rotated:

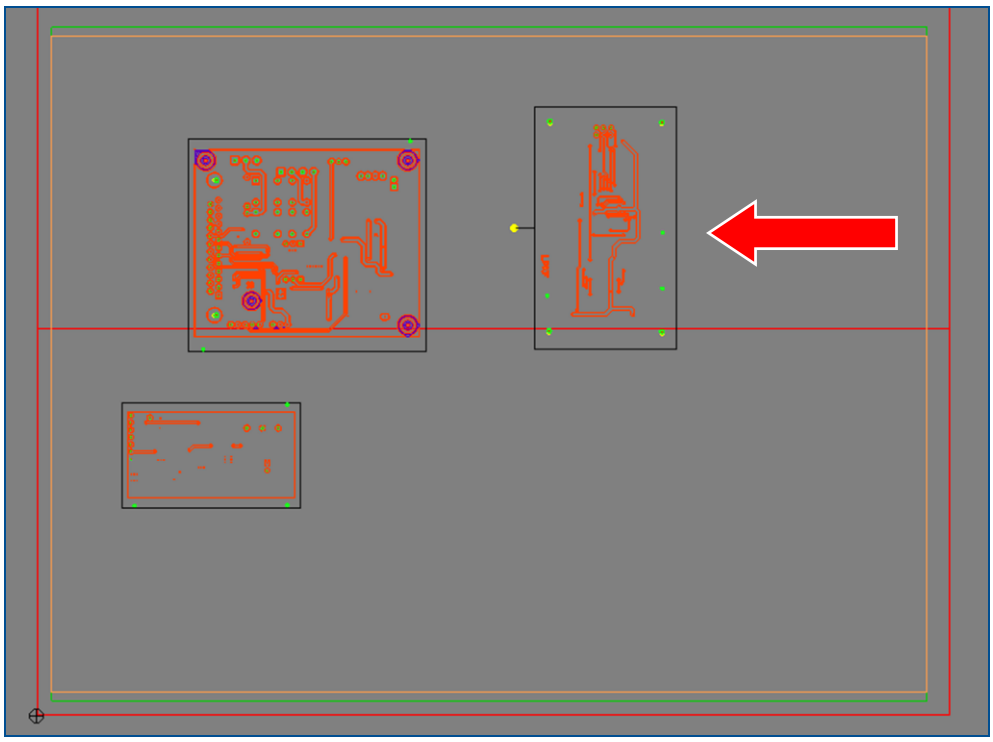


Fig. 11: Layout rotated

15. Select the layout to be multiplied (in this example the *Imported_PCB_layout_example_2.cbf* has been selected).
16. Enter the *Number of copies* and *Spacing between copies[mm]* in the group *Step and Repeat* (in this example **4 copies** and **2 mm spacing** between copies along the x-axis have been entered):

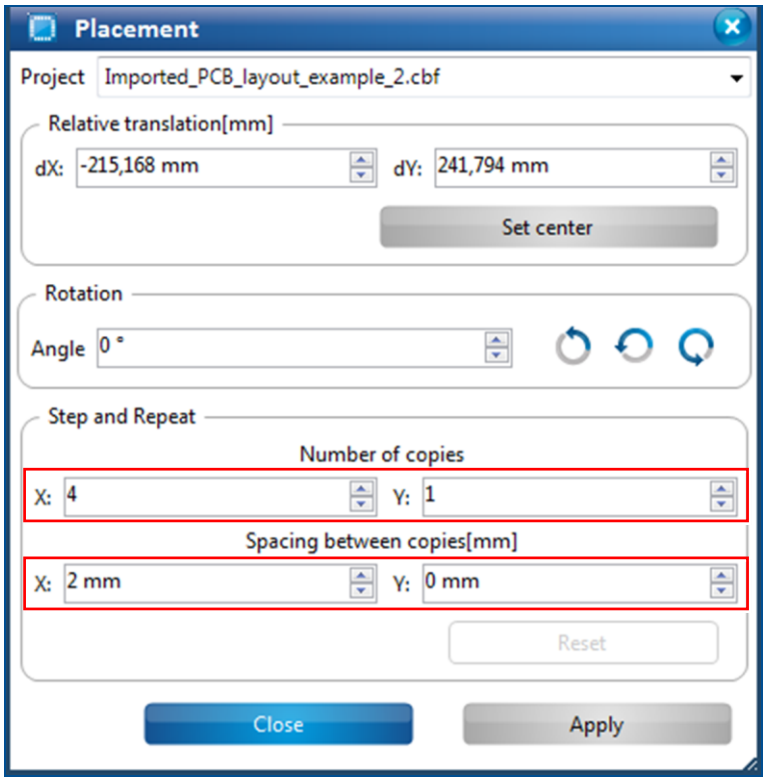


Fig. 12: ***Number of copies*** **and** ***Spacing between copies*** **entered**

☐ The layout has been multiplied:

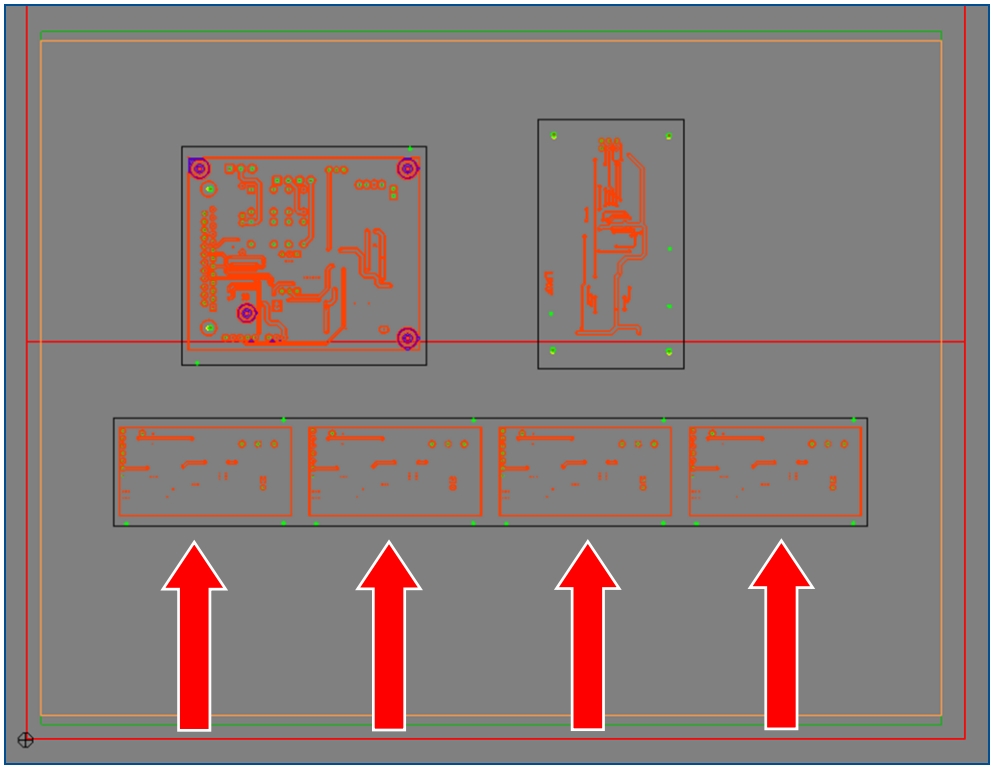


Fig. 13: Layout multiplied

17. Click on [Close].
18. Click on *File* > *Save as...*
19. Select a suitable folder, name your project and click on [Save].

☑ The individual PCB layouts have been imported.

Processing mixed PCBs

1. Load the tool magazine and assign the tools to positions.
2. Click on *Machining* > *Process all* or on ▶.
3. Mount the base material onto the ProtoMat processing table.
4. Follow the instructions from CircuitPro PM 2.3.

☐ The ProtoMat processes the mixed PCBs.

5. Remove the base material from the ProtoMat.
6. Break or cut the breakout tabs.

☑ The mixed PCBs have been processed.

For detailed information on loading the tool magazine and assigning the tools as well as on the ProtoMat phases refer to the CircuitPro PM 2.1 How-to guides, Part I, chapters 1.8 and 1.9.

3 Customer service

For technical information contact our LPKF Service. Visit our website for further information: http://www.lpkf.com

Support via contact form or email

If you want to send an email to the LPKF Service, use the contact form on our website:

http://www.lpkf.com/support/contact.htm

Or contact us via email: support.rp@lpkf.com

Phone support

You can also reach the LPKF Service via phone or fax:

Phone: +49 5131 7095-0

Fax: +49 5131 7095-90

Postal address

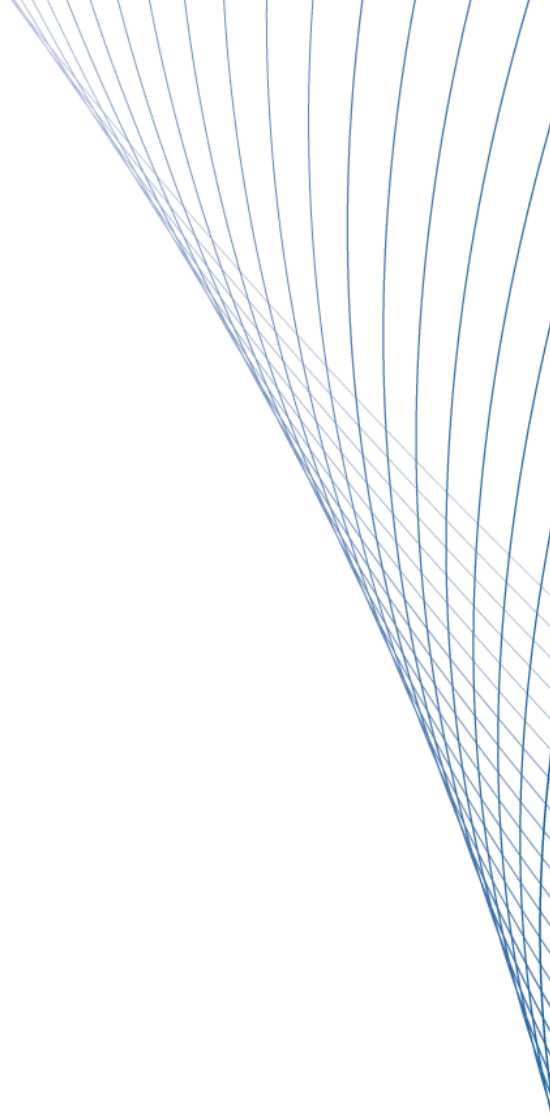
LPKF Laser & Electronics AG

Osteriede 7

30827 Garbsen

Germany

In our continuous effort to improve our documentation we are asking you to give us your feedback if you notice any discrepancy when working with the system, or if you have any comments or suggestions for improvement.



LPKF Laser & Electronics AG
Osteriede 7
30827 Garbsen
Germany

Phone: +49 5131 7095-0
Fax: +49 5131 7095-90

www.lpkf.com