

PCB Prototyping – From Simple to Complex

LPKF Prototyping Equipment at Rohde & Schwarz



PCB Prototyping with Circuit Board Plotter and Laser System

The Munich, Germany-based technology group Rohde & Schwarz develops, produces, and markets electronic capital goods. For PCB prototyping, the developers rely on systems from LPKF. Currently in use are the LPKF ProtoLaser S4 and the ProtoMat 100 circuit board plotter. Rohde & Schwarz also uses a Contac S4 for through-hole plating. We spoke with Florian Antretter, Head of Central Services Electromechanical at Rohde & Schwarz, about the benefits of in-house prototyping.

Which applications and materials is the development work using LPKF systems in the lab focused on?

In the development workshop at the Rohde & Schwarz Munich location, the productive bandwidth that we process with the LPKF ProtoLaser S4 ranges from simple adapter boards to complex HF boards.

The PCB material spectrum is very wide; diverse materials, such as Rogers, FR4, and Teflon, with various thicknesses can be processed.

What, in your opinion, is so special about in-house prototyping and where in particular do you profit from the LPKF systems for prototype fabrication?

With the right equipment, test circuit boards and test structures can be fabricated quickly in an in-house lab. As a result, the technology stays in the company and external fabrication is not necessary. We therefore do not have to give out sensitive data outside the company, and the otherwise cost-intensive classic board fabrication process for prototypes and test patterns is eliminated for many applications. The performance of the machines for laser structuring of fine structures on boards from production is also convincing. The main aspects that speak in favor of on-site prototyping are the fast processes and results for developers.

Can you give an example of an application in which the LPKF laser system opened up new possibilities for you?

We originally manufactured the boards with the LPKF ProtoMat H100. This was and still is a very good machine. For many standard applications, the circuit board plotter is a perfect and uncomplicated solution. Holes can also be drilled reliably with it. However, throughput times were often quite long for our applications. Besides that, new, thin materials are especially difficult to process with the circuit board plotter, as we found out. Milling of prototypes with fine structures on thin, soft Teflon materials, for example, could only be accomplished with a great deal of effort and did not yield the desired results. With the LPKF ProtoLaser S4, this is no longer a problem. Manufacturing is a lot faster than before and dispenses with wear tools and the associated costs for retooling and additional tools. Due to technical limitations imposed by such things as the milling head diameter, particularly fine structures with very thin traces and spaces were not possible. With the ProtoLaser S4, they are easy to produce. This is a decisive advantage, especially in HF development.

Do you use the LPKF prototyping machines for internal projects only, or do you also offer services within the company or also for external companies?

The development workshop at the Munich location uses the ProtoLaser S4 mainly for fabricating prototypes and test patterns for developers and design engineers at the Munich location. However, these services are also made good use of by other Rohde & Schwarz locations.

About Rohde & Schwarz

The Munich, Germany-based technology group Rohde & Schwarz develops, produces, and markets a wide range of electronic capital goods for business and the public sector. Focus is on solutions that contribute to a safe and connected world. Rohde & Schwarz is an independent private company that finances its growth from its own means. Because the group does not have to think in terms of quarters, it can plan sustainably over the long term.

The company was established over 85 years ago by university friends Dr. Lothar Rohde and Dr. Hermann Schwarz. As of June 30, 2021, the workforce numbered around 13,000. The group generated revenue of 2.28 billion euros in fiscal 2020–21 (July to June).

Rohde & Schwarz organizes its activities into four business fields, with products aligned to the needs of dedicated markets: Test and Measurement; Broadcast and Media; Aerospace, Defense, and Security; and Networks and Cybersecurity.



The LPKF ProtoLaser S4 laser system is compact and mobile and can easily fit in the lab.

The LPKF ProtoLaser S4 Laser System

The ProtoLaser S4 is a valuable tool in the electronics lab. It is predestined for structuring laminated circuit boards but can also process thin materials easily, rapidly, and precisely. In the shortest amount of time, the compact laser system generates precise, fine structures for complex PCBs – as single items or in low volumes, without masks and without tools. The ProtoLaser S4 is equipped with a laser source with a wavelength of 532 nm and a vision system. The intuitive LPKF Circuit-Pro CAM software is preinstalled on the integrated computer.

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