

# LPKF CircuitCAM and BoardMaster

## Comprehensive software package

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Each LPKF circuit board plotter includes a comprehensive software package for importing data from any PCB layout CAD package and controlling the circuit board plotter. This software is designed to be simple to use, perfectly matched to the hardware, and compatible with all standard CAD programs.

**LPKF CircuitCAM PCB** imports design data from virtually every known design package, and allows the user to modify or change the layout on-the-fly.

**LPKF BoardMaster** prepares layout files to send to any LPKF circuit board plotter. Additionally, LPKF BoardMaster allows the layout to be manipulated – such as duplication, rotation, or tiling. LPKF BoardMaster also controls the LPKF circuit board plotter.

These minor variations of the software are used in specialized applications:

**LPKF CircuitCAM Lite** is a version of CircuitCAM PCB, optimized for the more economical LPKF ProtoMat S42.

**LPKF CircuitMaster** is a version of BoardMaster PCB that is optimized for full control of the LPKF ProtoLaser 200.

# LPKF CircuitCAM – the software interface to your CAD/EDA system

## Simple and functional

A software wizard guides even inexperienced users through the program sequence step-by-step, from data import, through path generation, to the export of production data. LPKF CircuitCAM processes the same data and data files required by a commercial board fabricator. CircuitCAM automatically imports aperture tables and tool lists, followed by Gerber and NC drilling files:

- **Data import:** Imports Gerber®, GerberX, HP-GL™, Excellon®, Sieb & Meier, DXF, Barco®, ODB++®
- **Data export:** Exports Gerber®, GerberX, HP-GL™, LMD, Excellon®, DXF formats
- **Intelligent insulation:** This process guarantees removal of copper using various automatic and individually adjustable insulation options, reducing milling time and increasing tool life, with up to four different tools per insulation strategy and freely definable rub-outs – including polygons.

- **Design rule check:** Checks track/gap spaces.
- **Auto contour routing:** Automatically generates routing paths with definable breakout tabs.
- **Auto ground plane:** Automatically generates ground planes.
- **Direct drawing input:** Draws simple front panels or printed circuit boards.
- **Editing directly:** For example, modifying line-widths, changing hole diameters, shifting holes, adding copper areas, etc.
- **Software wizard:** Integrated program assistant guides the user and reduces the learning curve.
- **True type fonts:** CircuitCAM understands TTF and TTC during text functions.
- **Auto assign:** Automatically assigns production phases/tools for BoardMaster.
- **Machining order control:** Modifies cutting direction and sequence.



## Specification table

	LPKF CircuitCAM LITE	LPKF CircuitCAM PCB
<b>Import formats</b>	Gerber Standard (RS-274-D), Extended Gerber (RS-274-X), Excellon NC Drill (version 1 and 2), Sieb & Meier NC Drill, HP-GL™	Gerber Standard (RS-274-D), Extended Gerber (RS-274-X), Excellon NC Drill (version 1 and 2), Sieb & Meier NC Drill, HP-GL™, Barco® DPF, AutoCAD™ DXF, ODB ++®
<b>Supported shapes</b>	Circle, square, rectangle (also rounded or angled), octagon, oval, marker, IEC 1182 (1000-1024) including thermal reliefs, fiducials, etc., special (arbitrary definable)	
<b>Export formats</b>	LPKF BoardMaster (LMD)	LPKF BoardMaster (LMD), Gerber Standard (RS-274-D), Gerber Extended (RS-274-X), Excellon NC Drill, HP-GL™, DXF
<b>Editing functions</b>	Original modification, relocating, duplicating, rotating, mirroring, erasing, extending/severing lines, line/path extension/shortening, line path/segment parallel shifting, line path/object polygon conversion (Fill), curve linking/closing	
<b>Special functions</b>	Contour routing path generator with breakout tabs	Routing path generator with breakout tabs, volume operations, joining/separating objects, step & repeat (multiple PCB), polygon cut-out, ground plane generation with defined clearance, batch functions
<b>Display functions</b>	Zoom window (freely definable), zoom in/out, overview, redraw, individual layers selectable/visible, panning (keyboard), layer in solid/outline/center line display, 16 pre-set colors (up to 16 million freely available), different colors for tracks and pads of the same layer, different colors for insulation tools	
<b>Marker functions</b>	Single element, total layer, all layers, pad groups, selection and limiting to specific layers possible for lines/polygons/circles/rectangles/pads/holes (multiple choice and restriction to specific layers possible)	
<b>Graphic functions</b>	Lines (open/closed), circle, polygon, rectangle, pad, hole, text (TTF, TTC)	
<b>Control functions</b>	Measuring	Measuring, design rule check
<b>Insulation methods</b>	Single insulation method, additional multiple insulation of pads, removal of residual copper spikes (spike option), milling out of large insulation areas (rub-out), concentric or in serpentine maintaining minimum insulation spaces, zone insulation (only PCB version), inverse insulation	
<b>Insulation tools</b>	1-2 tools	1-4 tools
<b>Languages</b>	English, German, French, Spanish, Japanese and Chinese	
<b>Hard-/software requirements</b>	Microsoft® Windows® 2000/XP, 1.2 GHz processor or better, min. 512 MB RAM, screen resolution min. XGA	
<b>Supplied with</b>	LPKF ProtoMat S42 *	LPKF ProtoMat S62, S100, H100, M60, X60 and ProtoLaser 200

\* Upgrade from LITE to PCB available. Specifications subject to change.

## LPKF BoardMaster – the powerful and comfortable control software

LPKF's BoardMaster software combines a user-friendly interface with precision process control. The software accepts milling and drilling data created by CircuitCAM, as well as HP-GL™ files from various design software packages.



### User-friendly operating interface

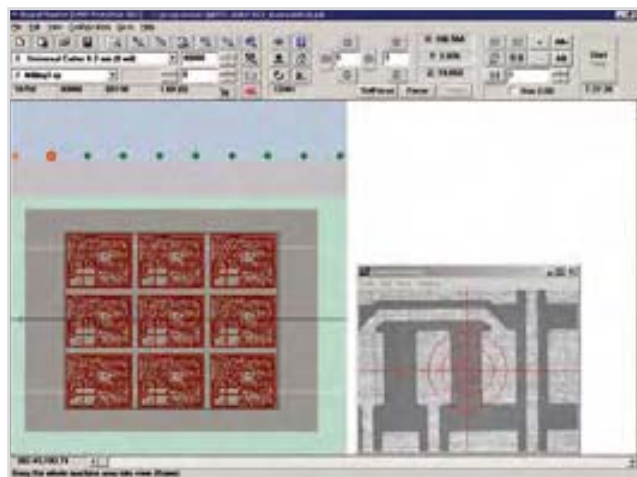
BoardMaster's WYSIWYG interface shows all milling and drilling data as well as the size of the base material. Simple mouse clicks rotate and move layouts, as well as creating step-and-repeat copies of layouts on the workpiece. BoardMaster constantly displays process status.

### Intelligent tool management

LPKF BoardMaster controls all tool parameters, such as feed rate and tool RPM. BoardMaster monitors bit life and prompts for a tool change at appropriate times. Tool changes are kept at a minimum by BoardMaster's optimizing monitoring process.

### Automatic data transmission

All processing phases and associated tool data are transferred directly from CircuitCAM to BoardMaster. Production can start immediately.



## Specification table

LPKF BoardMaster	
<b>Import formats</b>	LPKF-Mill-Drill (*.LMD), HP-GL™
<b>Control</b>	All ProtoMat circuit board plotters
<b>Display functions</b>	WYSIWYG display of machining data, zoom in/out/working area/projects, previous view, all viewing methods available at all times, even during the machining process, graphical display of the current head position
<b>Placement functions</b>	Copy, move, step and repeat, handles multiple artworks and placements simultaneously
<b>Selection methods</b>	Total production phase, specific tools, individual drill holes/lines/segments, selection from/up to a specific hole/line segment
<b>Tool management</b>	RPM and head down time, travel speed, registering and saving actual tool life, initiating the tool change procedure if tool lifetime is exceeded, working mode profiles customized for ProtoMat models
<b>Tool library</b>	Unlimited, individual library for different material types, individual customizable parameters
<b>Programming material size</b>	Positioning with corner coordinates, with the mouse, coordinates input via keyboard, option of saving frequently used material sizes
<b>Languages</b>	English, German, Spanish, Japanese, French, Chinese
<b>Other</b>	Acoustic signal at end of production phase and display of production time remaining, estimated production time is displayed before start, integration of a camera option with automatic fiducial recognition, Check for broken tools
<b>Hardware and software requirements</b>	Microsoft® Windows® 2000/XP, 1.2 GHz processor or better, min. 256 MB RAM , screen resolution XGA, serial port or USB

Specifications subject to change.