# Leiterplatten-entflechtung als Dienstleistung

| Dienstleister (repräsentierte Diensleister) | verwendete PCB-Designtools | Anzahl der Leiterplattenentwickler im Unternehmen | direkt vom Stromablaufplan/Datenträger | von der Entwicklungsskizze | CAD-Layout: interaktiv | CAD-Layout: automatisch | Ausarbeitung von Design bzw. Grobspezifikationen | EMV-gerechtes Design | High-Speed-Design | Simulation der Leiterplatten (Impedanz, Wärmeleitung etc.) | SMD-Technik | MCM-Technik | BGA-/µBGA-Technik | Buried-Via-Technik | Microvia-Technik | impedanzkontrollierte Leitungen | Twisted-Pair/Differential-Pair | Embedded Components (im Layout integrierte Bauteile) | das Unternehmen ist auch direkt beim Kunden tätig | Archivierung der Daten: Dauer in Jahren | auf CD | auf DVD | auf Blu-ray | auf Festplatte | auf anderen Speichermedien | Fertigung der Leiterplatten: durch externe Dienstleister | eigene Fertigung | verwendete Dateiformate: Gerber / Extended Gerber | Sieb & Meyer | Excellon | DXF/DWG | PDF | IDF | ODB++ | Excel (XLS, CSV) | Pick & Place | PS (PostScript) | HPGL | ASCII | sonstige |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A2ooo Industrie-Elektronik**, www.a2oooelektronik.de | Altium Designer | 2 | ● | ● | | | ● | ● | | | ● | | ● | ● | ● | ● | ● | | | 10 | | ● | | ● | | ● | ● | | ● | | ● | ● | ● | | | ● | ● | ● |
| **ACD Elektronik**, www.acd-gruppe.de | CadStar | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | 20 | | | | ● | ● | | ● | | ● | | ● | | ● | | ● | ● | |
| **af inventions**, www.af-inventions.de | Altium Designer | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | ● | | | ● | | ● | | | | | | ● |
| **Aki System-Electronic**, www.aki-electronic.de | Power PCB | 1 | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | 3 | ● | | | ● | | ● | | | ● | ● | ● | ● | ● | | ● | ● | ● |
| **alpha-board**, www.alpha-board.de | Mentor Expedition, Mentor Boardstation, PADS, Altium Designer | 7 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | >10 | | | | ● | | ● | | ● | ● | ● | ● | ● | ● | | | | |
| **AMB Electronic**, www.amb-electronic.de | PADS | 1 | ● | ● | ● | ● | ● | | | | ● | | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | |
| **AMOtronics**, www.amotronics.de | Integra Station, Mentor Expedition | 5 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | ● | | | ● | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **a.p. micro electronic**, www.ap.micro.de | | 1 | ● | | ● | | ● | ● | | ● | ● | | ● | ● | | ● | ● | | ● | 15 | ● | | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Appel Elektronik**, www.appel-gmbh.de | Protel, Altium Designer | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 15 | | | | ● | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Ascot**, www.ascot-gmbh.de | Altium, OrCAD, Eagle | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | 20 | ● | ● | | | ● | ● | | ● | ● | ● | ● | ● | ● | | | | |
| **Asetronics**, www.asetronics.ch | Altium | 3 | ● | ● | ● | ● | | ● | | ● | ● | | ● | ● | ● | ● | ● | | | 10 | ● | | | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● |
| **AS-Konstruktion**, www.as-konstruktion.de | RUN, BAE, Altium | | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 25 | ● | ● | | ● | ● | ● | | ● | ● | | ● | ● | | ● | ● | ● |
| **AutoMeter**, www.autometer.de | Eagle | 3 | ● | ● | ● | | ● | ● | | | ● | | | | | | | | | | | ● | | ● | ● | ● | | ● | ● | | | | | ● | ● | |
| **bebro electronic**, www.bebro.de | Altium Designer, Mentor Expedition, Eagle | 4 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | ● | 30 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| **beka print electronic**, www.beka-print.de | | 3 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | ● | ● | | 15 | | ● | | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **BesteQ**, www.bessteq.de | Altium, Protel, Eagle | 6 | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 | | | | ● | ● | ● | | ● | ● | | ● | ● | ● | ● | | | |
| **BMK Group**, www.bmk-group.de | Altium, Mentor Expedition, Design Capture | 4 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | 10 | | | | ● | | ● | | | ● | ● | ● | ● | ● | | | ● | |
| **Bode Industrie- und Marineelektronik**, www.bode-elektronik.de | Eagle | 2 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | | 10 | | | | ● | | ● | | | ● | ● | ● | ● | ● | | | | |
| **Brückmann Elektronik**, www.brueckmann-gmbh.de | Altium Designer, Integra Station, OrCAD, Eagle | 4 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | | | 10 | | | | ● | | ● | | | ● | ● | ● | ● | | ● | | | |
| **BSK Datentechnik**, www.bsk-germany.com | Mentor Expedition PCB, Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | | | | | 10 | ● | ● | | ● | | ● | | | ● | ● | ● | ● | ● | | | ● | ● |
| **BuS Elektronik**, www.bus-elektronik.de | PADS | 7 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | 15 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **CAD-electronic**, www.cad-electronic.de | P-CAD | | ● | ● | ● | | ● | ● | ● | | ● | | ● | | | ● | ● | | ● | 10 | | | | ● | | ● | | | ● | | ● | | | | | |
| **CAD-Service**, www.cadservicegmbh.de | Altium, Protel, Mentor Expedition | 4 | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | ● | 15 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **CAD-UL**, www.cad-ul.de | Altium, Ariadne, Eagle, PADS | 5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 10 | | | | ● | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **CAE Automation**, www.cae-automation.de | Mentor Expedition, Zuken CR 5000, Altium Designer | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 5 | ● | ● | | ● | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Ciboard electronic**, www.ciboard.de | Mentor Expedition, PADS, Altium | 4 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 10 | ● | | | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Computechnic**, www.computechnic.ch | Cadstar | 2 | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | | | | ● | | | 10 | | | | ● | ● | | ● | ● | ● | | ● | | ● | | | | |
| **CoSynth**, www.cosynth.com | Eagle, TopoR | 1 | ● | ● | ● | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● | | ● | 5 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | ● | ● |
| **Cremers CAD-Technik**, www.cremers-cad.de | Cadstar, PADS, Altium, Eagle, Target, Ariadne, TopCAD | 2 | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| **developTronic**, www.developtronic.de | Altium Designer | 1 | ● | ● | ● | | ● | ● | | | ● | | | | | | | ● | | 5 | ● | ● | | ● | | ● | | | ● | | ● | | ● | ● | | ● | |
| **Dia-Log**, www.dia-log.de | Altium/Protel | 1 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | | | >10 | ● | | | ● | ● | ● | | | ● | | ● | ● | ● | ● | ● | ● | |
| **dikon elektronik**, www.dikon-elektronik.de | Altium Designer | 2 | ● | ● | ● | ● | ● | ● | | | ● | | ● | ● | ● | | ● | | | >10 | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Dittrich & Greipl**, www.dittrich-greipl.com (Technagon) | OrCAD | 2 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | | | | ● | | | 10 | ● | ● | | ● | ● | | ● | ● | | | ● | ● | ● | | | | |
| **Dold**, www.dold-regler.de | Bartels | 1 | ● | ● | ● | ● | ● | ● | | | ● | | | ● | ● | | ● | | | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | | | ● | ● |
| **dresden elektronik**, www.dresden-elektronik.de | Altium Designer | 3 | ● | ● | | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | ● | | | ● | | ● | ● | ● | | ● | | |
| **Dyconex**, www.dyconex.com | Ucamco | 15 | | | | ● | | | | | ● | | ● | ● | ● | | | | ● | | | | | | ● | | ● | ● | | ● | | ● | ● | | | | |
| **Ebru**, www.ebru.de | Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | ≥20 | | ● | | ● | | ● | ● | | | ● | ● | | ● | ● | ● | | ● |
| **ECAD-Büro Donker**, www.e-d-o.de | Visula, Cadstar, Expedition | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | | |
| **Eisenlohr Industrie-Elektronik**, www.eisenlohr.de | Eagle, Protel DXP, Altium Designer | | ● | ● | ● | ● | ● | ● | | | ● | | | ● | | | | | | 10 | | | | ● | | ● | | | ● | ● | ● | ● | ● | | ● | ● | ● |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ekxon International**, www.ekxon.hk | OrCAD | 5 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | ● | ● | 20 | | ● | | ● | | | | ● | ● | | | | | ● | | | ● | |
| **Elec-Con technology**, www.elec-con.com | PADS, Integra, Eagle | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | 10 | ● | ● | | ● | | | | ● | ● | | ● | ● | ● | | | ● | | ● |
| **Electronic Design**, www.electronic-design-gmbh.de | Expedition, Design Capture, RangerXL, Veribest VB98 | 2 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | >10 | ● | | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| **eLPe design**, www.eLPe-design.de | Cadstar, Eagle | 3 | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | ● | 10 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | ● | ● | ● | |
| **Eltroplan**, www.eltroplan.com | Mentor Expedition, Altium Designer | 6 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **ergo: elektronik**, www.ergo-elektronik.de | Ariadne, Protel | 4 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | >10 | ● | | | ● | | ● | | ● | ● | ● | | ● | | | ● | ● | | |
| **Erni ES**, www.erni-es.com | Mentor Expedition | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | | 10 | ● | ● | | | ● | ● | | ● | ● | ● | ● | ● | | | ● | ● | ● | ● |
| **ES&S Oliver Reiners**, www.esskabel.de | Eagle | 2 | | | | | | | | | ● | | | | | | | | | | | | | | ● | ● | | | ● | ● | ● | ● | | ● | | | | |
| **Ferger, Klaus**, www.ferger-elektronik.de | Eagle | 1 | ● | ● | ● | | ● | ● | | | ● | | ● | ● | ● | | | | | ● | 10 | ● | | | ● | | ● | | ● | ● | ● | | ● | | | ● | ● | ● | |
| **FEW Bauer**, www.few-bauer.de | Eagle, Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | 10 | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| **FlowCAD EDA-Software**, www.flowcad.de | OrCAD, Allegro | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 5-10 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **frimotronik**, www.frimotronik.de | Cadstar | 1 | ● | ● | ● | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | 10 | | | | ● | ● | ● | | ● | | | | ● | | ● | | | | |
| **GCD Printlayout**, www.gcd-printlayout.de | Mentor-Boardstation, -Expedition, Visula, CR5000, Altium Designer, Eagle | 21 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | >5 | | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **GED**, www.ged-pcb-mcm | Mentor Expedition, PADS Altium, Pulsonix, CADstar Nextro Integre | 12 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 | | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Gemac**, www.gemac-chemnitz.de | Altium, Mentor | 3 | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10 | | | | ● | ● | ● | | ● | | | | ● | ● | ● | | | | ● |
| **Glück Engineering**, www.glueck-engineering.de | Altium Designer, Eagle, P-CAD, andere konvertierbar | 8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 | | | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| **Hartmann Elektronik**, www.hartmann-elektronik.de | | 5 | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● |
| **Hegemann**, www.hegemann.com | Graffy | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | | 15 | | | | ● | ● | ● | | ● | | | | ● | | ● | ● | | | |
| **Heger**, www.hegergmbh.com | OrCAD, Protel, Eagle | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 5 | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **hegotec**, www.hegotec.de | | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | | | ● | 10 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Heinen Elektronik**, www.heinen-elektronik.de | OrCAD/Allegro | 3 | ● | ● | ● | | ● | ● | | | ● | | ● | | | | | | | | 25 | | | | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● |
| **hema electronic**, www.hema.de | Cadstar, Pulsonix | 2 | ● | ● | ● | | ● | ● | ● | | ● | | ● | | | | ● | ● | | | 15 | ● | ● | | ● | | ● | | ● | | ● | ● | ● | | | ● | ● | | |
| **Hertrich**, www.hertrich-elektronik.de | Eagle | 3 | ● | ● | ● | ● | ● | ● | | | ● | | | | | | | | | | 10 | | | | ● | | | ● | ● | | ● | ● | | | ● | | | ● | |
| **High Q Electronic Service**, www.highQ-electronic.de | Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 20 | | | | ● | | ● | | ● | | ● | ● | | | ● | ● | | | ● |
| **HK Messsysteme**, www.pci-tools.com | Eagle | 2 | ● | ● | ● | | ● | ● | ● | | ● | | ● | | ● | ● | ● | | | | 25 | | | | ● | ● | | | ● | | | | | | | | | | ● |
| **hse-electronics**, www.hse-electronics.com | Altium Designer, Protel | 2 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | ● | ● | ● | | | 10 | | ● | | ● | | ● | | ● | | | ● | | ● | | ● | | | ● |
| **Hund, Helmut**, www.hund.de | Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | 20 | ● | ● | | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **IBV**, www.ibv-systems.de | Altium Designer | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10 | | | | ● | | ● | | ● | ● | ● | ● | ● | ● | | | | | |
| **Iftest**, www.iftest.ch | Mentor Graphics, Altium Designer | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | 10 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Jost, Rainer, Dipl.-Ing.**, www.jost-messtechnik.de | Eagle | 1 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | n.V. | | | | | | ● | | ● | ● | ● | | | | | | | | |
| **Kanis, W. Ing-Büro,** www.kanis.de | Eagle | 1 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | 10 | | | | ● | | ● | | ● | ● | | | | | | | | | |
| **Katek**, www.katek.de | PADS | 3 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | 10 | ● | ● | | ● | | ● | | ● | | ● | | ● | | ● | ● | | | |
| **Kmega**, www.kmega.de | Altium | 4 | ● | ● | ● | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | 10 | | ● | | ● | ● | ● | | ● | | | ● | | ● | | | | | ● |
| **KM-Gehäusetech**, www.km-gehaeusetech.de | Caddy | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | ● | 10 | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | ● |
| **Kolter Electronic**, www.kolter.de | Protel, OrCAD | 1 | | ● | ● | | | ● | | | ● | | | ● | | | | | | | 10 | ● | | | ● | ● | ● | | ● | | | | | | | | | | |
| **Kuttig Electronic**, www.kuttig.de | Altium Designer, Eagle | 5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Lacon Embedded**, www.lacon-embedded.de | Altium Designer, Eagle | | ● | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | ● | ● | ● | ● | | | 10 | | | | | ● | | ● | ● | | ● | ● | | | ● | | | | |
| **LeitOn**, www.leiton.de (DSP Technology) | Protel, Altium, Eagle | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | 10 | | | | ● | | ● | ● | ● | ● | ● | | | ● | | ● | | |
| **Letron electronic**, www.letron-electronic.com | Altium Designer | 2 | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | | | | 10 | ● | ● | | ● | | ● | | ● | | ● | ● | ● | | | ● | ● | | |
| **M&F Engineering**, www.m-f.ch | Altium Designer | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | 10 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

# Leiterplatten-entflechtung als Dienstleistung

| Dienstleister (repräsentierte Diensleister) | verwendete PCB-Designtools | Anzahl der Leiterplattenentwickler im Unternehmen | direkt vom Stromablaufplan/Datenträger | von der Entwicklungsskizze | CAD-Layout: interaktiv | CAD-Layout: automatisch | Ausarbeitung von Design bzw. Grobspezifikationen | EMV-gerechtes Design | High-Speed-Design | Simulation der Leiterplatten (Impedanz, Wärmeleitung etc.) | SMD-Technik | MCM-Technik | BGA-/µBGA-Technik | Buried-Via-Technik | Microvia-Technik | impedanzkontrollierte Leitungen | Twisted-Pair/Differential-Pair | Embedded Components (im Layout integrierte Bauteile) | das Unternehmen ist auch direkt beim Kunden tätig | Archivierung der Daten: Dauer in Jahren | Archivierung der Daten: auf CD | Archivierung der Daten: auf DVD | Archivierung der Daten: auf Blu-ray | Archivierung der Daten: auf Festplatte | Archivierung der Daten: auf anderen Speichermedien | Fertigung der Leiterplatten: durch externe Dienstleister | Fertigung der Leiterplatten: eigene Fertigung | verwendete Dateiformate: Gerber / Extended Gerber | verwendete Dateiformate: Sieb & Meyer | verwendete Dateiformate: Excellon | verwendete Dateiformate: DXF/DWG | verwendete Dateiformate: PDF | verwendete Dateiformate: IDF | verwendete Dateiformate: ODB++ | verwendete Dateiformate: Excel (XLS, CSV) | verwendete Dateiformate: Pick & Place | verwendete Dateiformate: PS (PostScript) | verwendete Dateiformate: HPGL | verwendete Dateiformate: ASCII | verwendete Dateiformate: sonstige |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Matthias Mansfeld Elektronik**, www.mansfeld-elektronik.de | Cadstar | 1 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | n.V. | ● | | | ● | | ● | | ● | | ● | ● | ● | ● | | ● | ● |
| **MAZeT**, www.mazet.de | Visula | 5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | >10 | | ● | | | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **mechapro**, www.mechapro.de | Eagle | 1 | ● | ● | | | ● | ● | | | ● | | | | | | | | | | | | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | |
| **microSYST Systemelectronic**, www.microsyst.de | Altium Designer | 2 | ● | ● | ● | | ● | ● | | | ● | ● | ● | | | | | | | | 10 | | | | | ● | ● | | ● | | | ● | ● | | | | |
| **MKC Michels & Kleberhoff**, www.mkc-gmbh.de | Altium Designer | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | | ● | 20 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | ● |
| **Moll-electronic**, www.moll-electronic.de | Bartels | 1 | ● | ● | ● | ● | | | | | ● | ● | | | | | | | | | 10 | | | | ● | | ● | | ● | ● | ● | | ● | | | | |
| **MÜT**, www.muet-gmbh.de | Eagle, Kontron | 2 | ● | ● | ● | ● | ● | ● | | | ● | | | | | | | | | | 10 | | | | ● | ● | ● | | ● | | | | | ● | | | |
| **Neways**, www.neways.de | Altium Designer | 5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 10 | | | | ● | | | ● | ● | ● | | ● | ● | ● | | | ● |
| **Nolde, Ralf, Ing.-Büro**, www.rnolde.de | Eagle | 1 | ● | ● | ● | | ● | ● | | | ● | | | | | | | | | | 10 | ● | | | ● | | ● | | ● | | ● | | | | | | ● |
| **NT-Electronics**, www.nt-electronics.de | Mentor Expedition | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 5 | ● | | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| **Obtronic**, www.obtronic.com | Altium, Pulsonix, Integra | 4 | ● | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 10 | | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **PL Pro Layout**, www.pl-prolayout.de | CADstar, Altium Designer, Baneer, Eagle | 4 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 20 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **Press-Finish**, www.pressfinish.de | P-CAD | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 10 | ● | ● | | ● | | ● | | ● | ● | ● | | ● | ● | | | |
| **Print-Elektronik**, www.print-elektronik.de | Mentor Integra, Cadence, TopCAD | 1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | >25 | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **ProDesign Electronic**, www.prodesign-europe.com | OrCAD, Allegro, Altium Designer, Integra | 8 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **PSi Engineering**, www.psi-engineering.de | Cadence Allegro, OrCAD | 2 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | ● | | ● | ● | | ● | ● | ● | | ● | | | | | ● | ● |
| **Q-print electronic**, www.q-print.de | Altium, Integra, Eagle, EasyPC, Target | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | 10 | ● | ● | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Remcos**, www.remcos.ch | Allegro, OrCAD | 1 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | | ● | | | ● | ● | ● | | ● | ● | ● | | ● | | | | |
| **richterlayout**, www.richterlayout.de | Eagle | 1 | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 5 | ● | | | ● | ● | | | ● | ● | ● | ● | ● | | ● | ● |
| **riese electronic**, www.riese-electronic.de | PADS | 3 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | ● | 10 | | | | ● | | | ● | ● | ● | ● | | ● | | ● | ● |
| **Rossmanith, Helmut**, www.rossmanith.de | Altium Designer, Protel, Eagle | 3 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | | | 10 | ● | ● | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Rotec technology**, www.rotec.de | Cadence/OrCAD | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 10 | | ● | | ● | ● | ● | | ● | | ● | ● | ● | | | | |
| **SAM Sensor-Analyse-Messtechnik**, www.sam-frankfurt.de | Eagle | 2 | ● | ● | ● | ● | ● | | | | ● | | | | | | | | ● | ● | 99 | | | | ● | ● | ● | | ● | | ● | | | | | | ● |
| **Sandner, Ing.-Büro für Elektrotechnik**, www.ksandner.de | HPEGS | 1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | | | | ● | | ● | ● | ● | ● | | ● | ● | ● | |
| **Schäfer, Jürgen**, www.jscad.com | Mentor Expedition | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 5 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Schmid mme**, www.schmid-mme.de | Altium Designer, P-CAD | 3 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | | ● | 15 | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | | ● | |
| **Seidel-Elektronik**, www.seidelelektronik.de | Eagle | 1 | ● | ● | ● | ● | ● | ● | | | ● | | | ● | ● | | | | | | | ● | | | ● | | ● | ● | ● | ● | ● | | ● | | | | |
| **SET Steiner Elektronik Technologie**, www.set.bg | | | | | | ● | | | | | | | | | | | | | | | | ● | | | ● | | ● | ● | ● | ● | ● | | | | | | ● |
| **solvimus**, www.solvimus.de | Altium Designer, Eagle | 2 | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | | | 10 | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● |
| **Stocad**, www.stocad.de | PADS, Veribest | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10 | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | | ● | |
| **Synertronixx**, www.synertronixx.de | Eagle | 2 | ● | ● | ● | | ● | ● | ● | | ● | | ● | ● | ● | ● | ● | ● | | | 5 | ● | ● | | ● | | ● | | ● | | ● | ● | | | ● | ● | ● |
| **SyWiTec Bamberg & Monsees**, www.sywitec.de | | | | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | ● | ● | 4 | | | | | | ● | | ● | | ● | ● | ● | | | | |
| **Taube Electronic**, www.taube-electronic.de | Altium, VCAM, Polar | 2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | 10 | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **tecnotron elektronik**, www.tecnotron.de | Pulsonix, PADS, Expedition, CR5000, Boardstation, Altium | 19 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | >10 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Teleconnect**, www.teleconnect.de | Mentor, Cadence, Altium, Eagle | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | 10 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **th-Elektronik-Design**, www.th-ed.de | RUN-EDS, Altium Designer | 1 | ● | ● | ● | ● | | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | 30 | ● | ● | | ● | | ● | | | ● | ● | ● | ● | | | | |
| **TQ-Group**, www.tq-group.com | Integra, PADS, Expedition, Altium | 10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | >15 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Trenew Electronic**, www.trenew.eu | P-CAD, Altium Designer | 2 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | | 5 | | | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | | ● |
| **Tuchscherer Elektronik**, www.tuchscherer.de | PADS, TopCad, Eagle | 3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | 15 | ● | ● | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Turck duotec**, www.turck-duotec.com | Mentor, PADS | 5 | ● | ● | ● | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | |

# Leiterplatten-entflechtung als Dienstleistung

| **Dienstleister** (repräsentierte Diensleister) | **verwendete PCB-Designtools** | Anzahl der Leiterplattenentwickler im Unternehmen | direkt vom Stromablaufplan/Datenträger | von der Entwicklungsskizze | CAD-Layout: interaktiv | CAD-Layout: automatisch | Ausarbeitung von Design bzw. Grobspezifikationen | EMV-gerechtes Design | High-Speed-Design | Simulation der Leiterplatten (Impedanz, Wärmeleitung etc.) | SMD-Technik | MCM-Technik | BGA-/µBGA-Technik | Buried-Via-Technik | Microvia-Technik | impedanzkontrollierte Leitungen | Twisted-Pair/Differential-Pair | Embedded Components (im Layout integrierte Bauteile) | das Unternehmen ist auch direkt beim Kunden tätig | Archivierung der Daten: Dauer in Jahren | Archivierung der Daten: auf CD | Archivierung der Daten: auf DVD | Archivierung der Daten: auf Blu-ray | Archivierung der Daten: auf Festplatte | Archivierung der Daten: auf anderen Speichermedien | Fertigung der Leiterplatten: durch externe Dienstleister | Fertigung der Leiterplatten: eigene Fertigung | verwendete Dateiformate: Gerber / Extended Gerber | verwendete Dateiformate: Sieb & Meyer | verwendete Dateiformate: Excellon | verwendete Dateiformate: DXF/DWG | verwendete Dateiformate: PDF | verwendete Dateiformate: IDF | verwendete Dateiformate: ODB++ | verwendete Dateiformate: Excel (XLS, CSV) | verwendete Dateiformate: Pick & Place | verwendete Dateiformate: PS (PostScript) | verwendete Dateiformate: HPGL | verwendete Dateiformate: ASCII | verwendete Dateiformate: sonstige |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VTQ Videotronik**, www.vtq.de | Altium Summer 09 | 7 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | 10 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **WesTest**, www.westest.de | EDWin XP | 4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | 10 | | | | ● | | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● |
| **wireless netcontrol**, www.wireless-netcontrol.com | Eagle, Target | 1 | ● | ● | | | ● | | | | ● | | ● | | | | | | | 15 | ● | ● | | ● | | ● | | ● | | | ● | | | ● | | | ● | ● |
| **Wöhr, Richard**, www.woehrgmbh.de | | | ● | ● | ● | ● | ● | ● | | | ● | | | | | | | | | 10 | ● | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | | | ● | ● | ● | |
| **Yamaichi Electronics**, www.yamaichi.eu | Altium Designer | 5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Zollner Elektronik**, www.zollner.de | Mentor Boardstation, Mentor Expedition, Cadence Allegro | 8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | >15 | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |