

## OrCAD PCB Designer

Comprehensive PCB solution with advanced place and route technology

The OrCAD® PCB design solution provides everything you need to take your PCB designs from concept to production. Truly scalable and production-proven in every EDA industry, the OrCAD PCB Designer Standard and OrCAD PCB Designer Professional products help you stay competitive in today's electronics market—managing the challenges of shorter design cycles, tighter project requirements, and faster time to market to achieve your design goals.

### Overview

The OrCAD PCB products, OrCAD PCB Designer Standard and OrCAD PCB Designer Professional, provide a tiered, scalable PCB design solution that delivers advanced capabilities and highly integrated flows. Whether your designs are simple or more sophisticated with higher densities, complex rules, mixed-signal circuits, and/or standards-based interfaces, the OrCAD PCB design solution has everything you need to increase your team's productivity and efficiency while reducing your overall costs and time to market.

The OrCAD PCB design solution can not only be tailored to address your specific design needs but also your budget requirements; maximizing your investment with a low cost of entry and ownership. The powerful, tightly integrated PCB design technologies include schematic capture, librarian tools, PCB editing/routing, Constraint Manager, signal integrity (Professional), autorouting (Professional), and optional mixed-signal circuit simulation. Easy-to-use and intuitive, they offer exceptional value and future-proof scalability to the Cadence® Allegro® series of PCB design products.

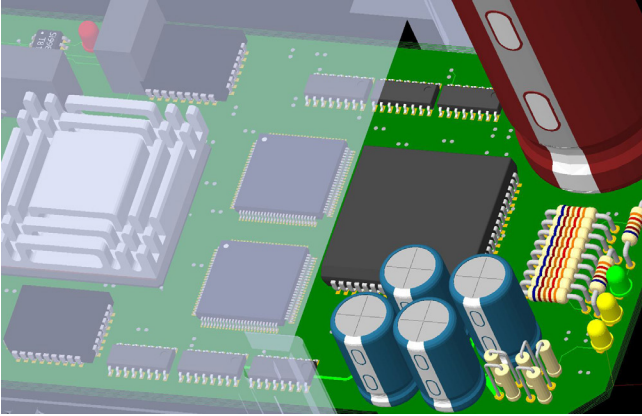
Built on a common database architecture, use model, and library, the OrCAD PCB design solution is fully scalable within both the OrCAD and Allegro PCB solutions, giving you the ability to expand as your designs and design challenges increase in complexity.

### Highlights

- Proven, scalable, easy-to-use PCB editing and routing solution that grows as design challenges and requirements evolve
- Tight application integration and a comprehensive feature set delivers a complete solution to take PCB designs from concept to production, increasing productivity and ensuring data integrity
- Constraint Manager provides real-time validation and status of physical/spacing, samenet, region, differential pair, and length rules to help ensure first-time success
- Automatic and interactive etch editing and place deliver intelligent automation to maintain user control while maximizing productivity
- Dynamic shapes technology offers real-time copper pour plowing and healing to eliminate error-prone manual voiding and rework
- Support for IPC-2581, STEP, and IDX bring a level of intelligence and integration that streamlines manufacturing and MCAD-ECAD flows

### Place and Route Features

At the heart of the OrCAD PCB design solution is OrCAD PCB Editor, an easy-to-use, interactive place-and-route environment for creating and editing simple to complex PCBs. The extensive feature set addresses a wide range of today's modern design and manufacturability challenges. This powerful and flexible set of features includes automatic, schematic-driven floorplanning and interactive placement, intelligent interactive routing, dynamic shapes, placement replication, simple and advanced rules



*STEP models provide a realistic three dimensional representation of your design*

(including differential pairs, length, region, layer, etc.), STEP model support and 3D viewing, and MCAD-ECAD (interfaces for manufacturing and mechanical CAD).

### Floorplanning and placement

Automatic, schematic-driven floorplanning and interactive-placement capabilities are designed to accelerate parts placement. Components or subcircuits are assigned to specific “rooms” during design entry to facilitate automatic floor-planning. In interactive placement, components can be filtered and selected in a wide variety of ways to streamline the placement process: by reference designator, device package and footprint style, associated net name, part number, or the schematic sheet/page number.

### Interactive etch editing

Interactive routing capabilities deliver controlled automation while maximizing routing productivity. Real-time, shape-based, and any-angle push and shove routing methods address a wide array of routing challenges. The routing engine optimizes traces by either pushing obstacles or following contours while dynamically jumping over obstacles such as vias or component pins. Routing modes include “shove-preferred,” “hug-preferred,” or “hug-only.” The shove-preferred mode constructs the optimum trace path while dynamically pushing obstacles or automatically “jumping” over obstacles such as pins or vias. The hug-preferred mode is the perfect solution when a databus must be constructed. In this mode, the trace contour follows other traces as a priority and only pushes aside or jumps over obstacles when there is no other option.

### Dynamic shapes

Dynamic shape technology offers real-time copper pour plowing and healing functionality. Shape parameters can be applied at three different levels: global, shape instance, and object-level hierarchies. Traces, vias, and components added to a dynamic shape will automatically plow and void through the shape. When items are removed, the shape automatically fills back in. Dynamic shapes do not require batch autovoicing or other post-processing steps after edits are made.

### Placement replication and reuse

Intelligent placement replication technology enables you to automatically place and route replicated circuits using a seed circuit that is applied to other circuit instances within the design. Changes made to the seed circuit are automatically propagated to the duplicated circuits. Circuit templates with “known-good” placement and routing can be reused in other designs with similar circuits.

### Constraint Manager

Design rules and electrical and physical constraints are more critical to your projects’ success than ever before. Dealing with all the complexities of the rules and constraints of a modern design requires a powerful constraint management system capable of covering all the aspects of creation, management, and validation. The OrCAD PCB constraint management system displays physical/spacing, samenet, region, and differential pair and length rules along with their status (based on the current state of the design) in real time and is available at all stages of the layout process. Each worksheet provides a spreadsheet interface that enables you to easily define, manage, and validate the different rules in a hierarchical fashion.

The constraint management system is completely integrated within the OrCAD PCB design solution, and constraints can be validated in real time as the design process proceeds. The result of the validation process is a graphical representation of whether constraints pass (highlighted in green) or fail (highlighted in red). This approach allows you to immediately see the progress of the design in the spreadsheets, as well as the impact of any design changes.

### 3D Display and Visualization

The OrCAD 3D viewer environment gives you the ability to see a realistic, three-dimensional representation of your design. The environment supports several filtering options, camera views, graphic display options such as solid, transparency and wireframe, and controls for panning, zooming, and spinning the display. 3D viewing also supports the display of complex via structures or isolated sections of the board for viewing more details. With support for the STEP format and models, the OrCAD PCB design solution supports the import of model-accurate component and mechanical elements, such as an enclosure, to view in the context of your PCB project. This allows you to perform visual clearance checks to detect clashes early on and ensure you will have proper fit when you move to manufacture.

### PCB Manufacturing

The OrCAD PCB design solution supports a full suite of phototooling and bare-board fabrication, and test outputs can be generated including Gerber 274x, NC drill, and bare-board test in a variety of formats. The OrCAD PCB design solution also supports the industry initiative toward Gerber-less manufacturing through the export (and import) of design data in the

IPC-2581 format. The IPC-2581 data is passed in a single file that creates accurate and reliable manufacturing data for high-quality manufacturing. You have a choice to export a subset of the design data for protecting design IP.

## Design Solutions and Flows

### Layout signal integrity analysis

Included with OrCAD PCB Designer Professional, routed or unrouted topologies can be extracted directly from the PCB design database enabling you to simulate critical nets to validate that the layout work matches the pre-route requirements. Topology extraction is performed at three key stages for signal-quality analysis: during part placement, after routing critical nets, and after final routing of the design. Topologies are extracted back into the same canvas that was used to analyze the net, during pre-route, and the routed signal's analysis is compared to the expected results. The extraction includes a detailed electrical representation of how the net was physically implemented, including models for trace cross-sectional characteristics, routing layers, via models, and trace lengths. If the results do not match, the routed board can be modified and the net re-analyzed.

### MCAD-ECAD collaboration

The IDX-based ECAD-MCAD collaboration in the OrCAD PCB design solution allows you to intelligently and interactively synchronize on incremental changes between the electrical and mechanical design environments. Unlike interim file formats such as IDF and DXF, IDX formats give you the ability to preview and analyze changes graphically before accepting or rejecting the data. Additionally, designers in both environments can choose to accept or reject the proposed changes on an object-by-object basis as well as offer counter-proposal changes. This level of interaction provides a degree of control and collaboration that was previously not possible and helps ensure the two environments remain in sync. This also helps to avoid any miscommunication that can result in rework and significantly improves the chances of first-time success.

### Automatic routing

OrCAD PCB Designer Professional is tightly integrated with Cadence SPECCTRA® for OrCAD, the market-leading PCB solution for automatic and auto-interactive interconnect routing. Designed to handle routing challenges from simple designs to high-density PCBs requiring complex design rules, SPECCTRA for OrCAD uses powerful shape-based algorithms to make the most efficient use of the routing area. The results are increased completion rates, higher productivity, and shorter design cycle times. SPECCTRA for OrCAD provides two powerful tools for interconnect routing: a route editor and an autorouter as well as an extensive rule set to control a wide range of routing constraints.

### Future-Proof Scalability

Unlike other PCB design solutions, the OrCAD PCB design solution has the ability to grow with your evolving technology challenges and as your place and route needs change. Based on Allegro® PCB design technology, the OrCAD PCB design solution provides the security of scalability to meet those challenges easily. Features and technologies are shared across the OrCAD and Allegro product lines, allowing products to be easily upgraded and expanded without the need to translate databases or libraries, learn new applications, or change use models.

For the latest product or release information, visit us at [www.ortcad.com](http://www.ortcad.com) or contact your local Cadence Channel Partner.

### Sales, Technical Support, and Training

The OrCAD product line is owned by Cadence Design Systems, Inc., and is supported by a worldwide network of Cadence Channel Partners (VARs). For sales, technical support, or training, contact your local channel partner. For a complete list of authorized channel partners, visit [www.ortcad.com/CCP-Listing](http://www.ortcad.com/CCP-Listing).