# Protel 99

SmartTeam TECHNOLOGY

SmartDoc TECHNOLOGY

SmartTool TECHNOLOGY

Designed for Microsoft® Windows NT® Windows 98

Protel®
Making Electronic Design Easy™

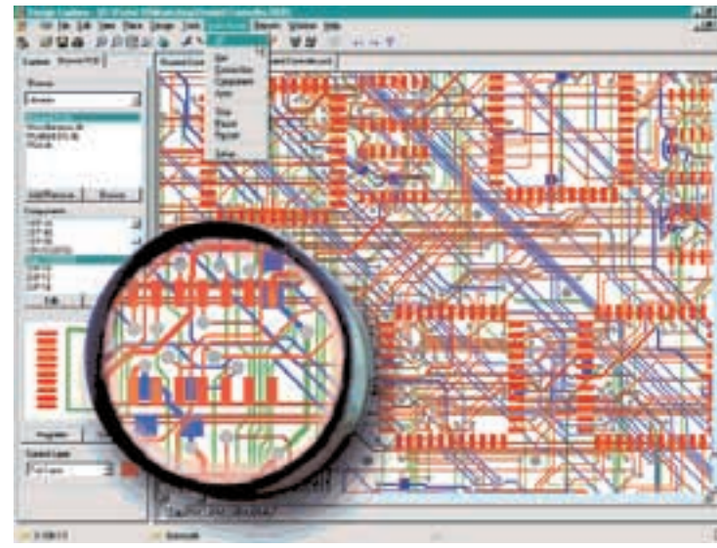
# Intelligent shape-based autorouting –

Protel 99's Autorouter sets a new benchmark in autorouting technology. An intelligent Autorouter that is easy to use, yet produces routing like that of a professional board designer.

Protel's Autorouter is the first to combine the power of shape-based routing with intelligent board analysis and automatic router setup. This potent combination comes closer to matching the efforts of an experienced designer than any other available routing technology.

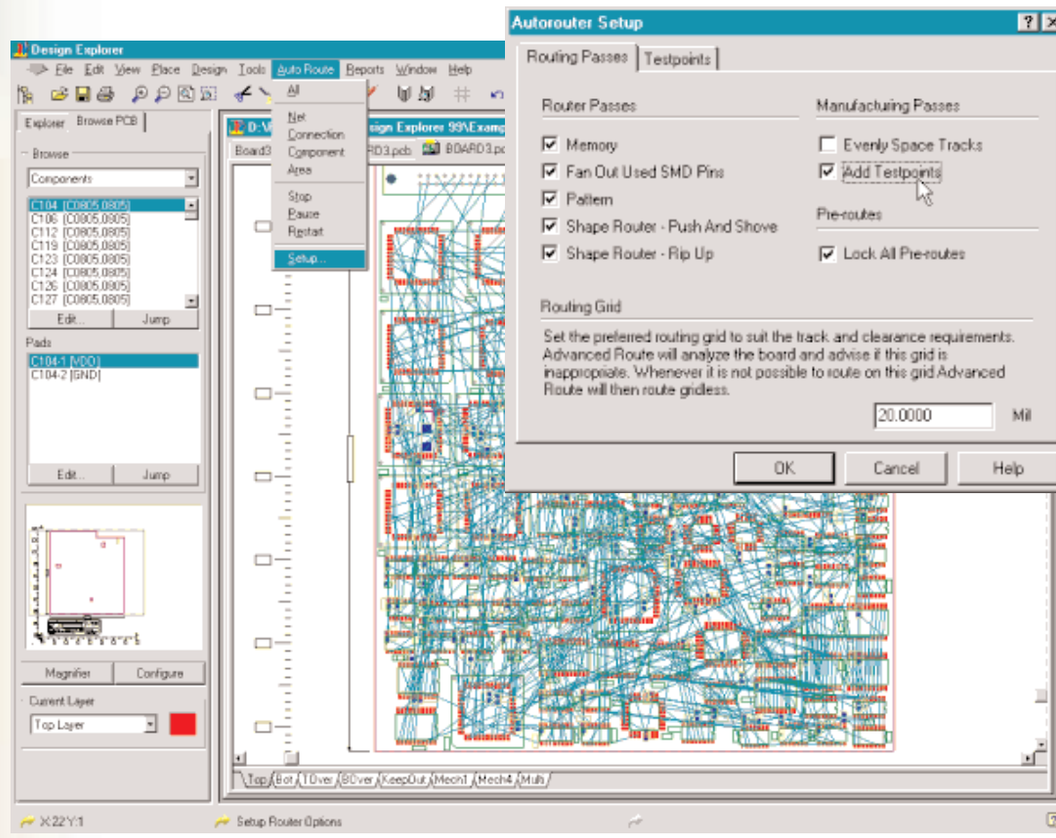
## The power of shape-based autorouting

Today's designers know there are only two classes of autorouter – shape-based and all the rest. Bred from the latest thinking in routing algorithms, Protel's shape-based technology has the power to tackle today's denser, SMT-based designs. Protel 99's Autorouter uses a unique 'polygonal shapes' concept to extend the capabilities of traditional shape-based routing by adding, for example, the ability to route diagonal segments and to assign a different routing angle to each PCB layer.



Protel 99's intelligent shape-based autorouter uses polygonal shapes and advanced algorithms to give true 45° routing that follows the contours of your board. True 45° routing means Protel 99 can easily cope with today's and tomorrow's fine-pitch technology.

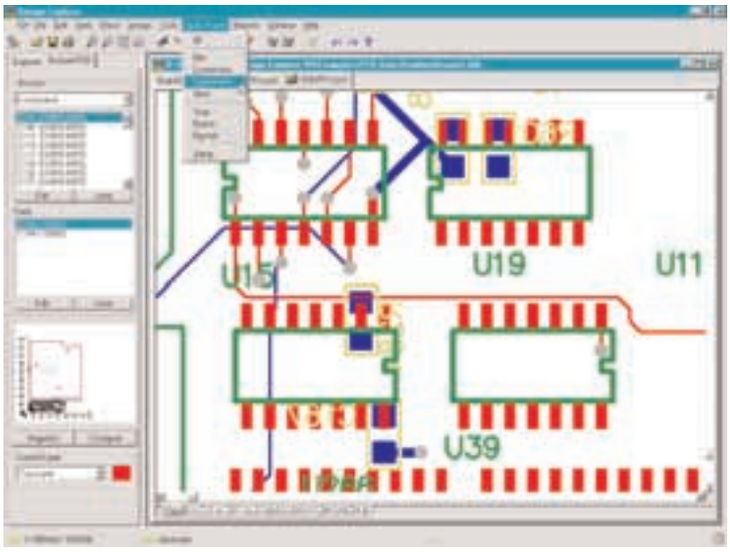
Fine-pitch components in both metric and imperial pin spacings, physically dense layouts, and double-sided component placement pose no problems for Protel 99's Autorouter. Because it uses shape-based algorithms, the Autorouter is not bound to a routing grid. It automatically uses the best strategy to route your design to 100% completion.




Simple and intuitive setup makes it easy to achieve professional autorouting results. Protel 99's autorouter analyzes your design and automatically chooses the best routing strategy, without the need for a lengthy manual setup process.

# robust power with elegant simplicity

The full power of Protel's autorouter is at your fingertips at all times as you design your board. Selectively route nets, connections, components or a defined area of your board. Because the autorouter works directly in the PCB design window, there's no time-consuming netlist import/export to deal with.




And despite its underlying power, Protel 99's Autorouter is simple to setup and run. There are no cryptic configuration files to edit, no maze of setup options to negotiate – simply click a button and the Autorouter analyzes your design and chooses the best routing strategy. It follows your design rules and constraints, easily routing large and complex SMT or through-hole boards.

The Autorouter's advanced shape-based algorithm supports polygonal shapes with a variable number of sides. The use of complex polygonal shapes means better use of board real estate and the ability to route diagonally – you get neater, cleaner and shorter routing results, like that of a professional board designer.

## Intelligent board analysis for easy setup

Protel 99's autorouter analyzes your board and automatically chooses the right routing strategy, giving consistently high completion rates without any complex setup procedure. The router looks at the packaging technology used, the number and density of components, the number of board layers, and many other parameters to select the combination of routing passes that best suits your design.

This intelligent analysis of your board means you don't have to spend time on trial-and-error router runs. You get professional results first time, regardless of your board design technology.

Protel 99 makes autorouter setup easy.

## Seamless integration with the PCB editor

Protel 99's Autorouter seamlessly integrates into the Protel 99 design environment. Layout your board and define the design rules in the PCB editor, then start the Autorouter. It's as simple as that. The board is routed directly in the PCB window – no interfacing, no translators, no hassles. Sit back, relax and watch Protel 99 route your board in record time with fantastic results.

## Powerful routing passes

To achieve high-quality, fast, 100% completion, Protel 99's Autorouter includes heuristic routers, a two-layer power and ground router, a memory router, a dispersion or fan-out router, a family of different pattern routers, a push-and-shove routing algorithm, a rip up algorithm, and a manufacturing pass which spreads tracks to equalize spacing once routing is complete.

When the Autorouter is started it automatically analyzes your design and chooses the best combination of routing passes. This gives high completion rates without the need for any complicated manual setup.

## Adaptively updates costs as the board is routed

Protel 99's Autorouter uses the concept of costs to apply a completion strategy to the routing process. This is done by assigning relative costs for each choice the router makes.

After analyzing the board and selecting a cost model, the Autorouter has the ability to adaptively update costs as the board is routed. In addition, Protel 99's Autorouter dynamically costs the connection order, allowing the system to route connections in a sequence which produces the highest completion rate for a given design.

## Fully interactive routing tools

Integrated into Protel 99's PCB editor is a fully-functional set of interactive routing features that put the full power of the Autorouter at your fingertips during manual routing. Use these features to selectively autoroute a single connection, a net, all connections to a component, or all connections in an area.

You can also use Protel 99's full array of powerful interactive manual routing tools to pre-place tracks prior to starting the autorouting process. The autorouter can then be directed to lock all pre-routes in place before routing.

Protel 99's superb Autorouter technology gives you the power to produce professional results with unbeatable ease of use.

## Feature Highlights

- *Seamless integration with Protel 99's PCB Editor - the board is routed directly in the PCB window*
- *Follows design rules defined in Protel 99's PCB Editor*
- *Complex shape-based autorouting, either gridded or gridless*
- *Angled direction-per-layer routing with six non-orthogonal directions*
- *In-built design analysis and routing strategy selection - simply tell the router to start*
- *Contention routing*
- *Quality autorouting, produces results comparable to that of a professional board designer*
- *Fast, 100% completion autorouting*
- *Automatic test point generation utilizing existing vias and pads or special test point pads*
- *Adaptively updates costs as the board is routed*
- *Full array of routing algorithms*
- *Fully-interactive routing tools*

## Specifications

***Routing method:***
*Polygonal shape-based*

***Routing passes:***
*Memory; Fan out; Pattern; Push-&-Shove; Rip up; Track spacing; Testpoint addition*

***Max. Components:*** *2000*

***Max. Pins/Component:*** *5000*

***Max. Nets:*** *10,000*

***Max. Connections:*** *16,000*

***Contact your local sales office today for your FREE Protel 99 30-Day Trial CD.***