PROTEUS PCB DESIGN

Manual Routing in Proteus combines Push and Shove routing with Follow Me Routing (Hug mode), providing ease of use and flexibility for all routing situations.

Productive PCB Design Tools

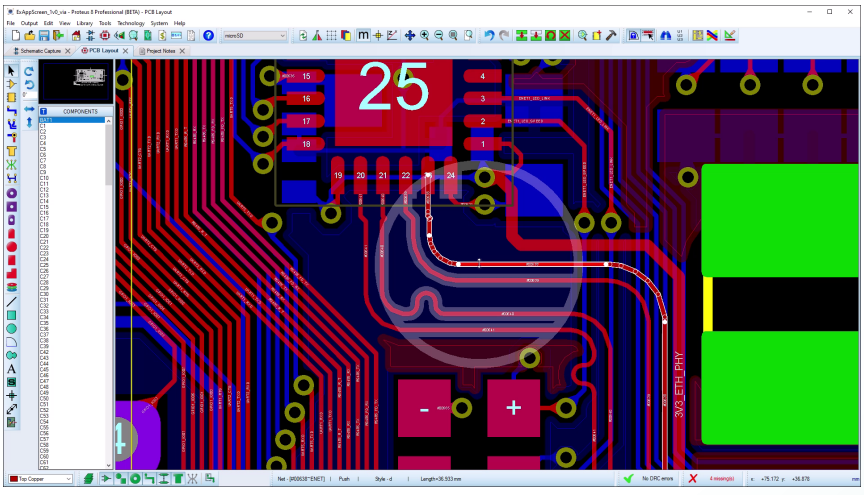
Manual route placement is one of the most labour intensive parts of board layout. Increasing board density and smaller component footprints on modern PCB's makes correct routing of the board ever more complex and important.

Proteus is well equipped to help engineers place and edit routes efficiently. There are two main placement mods, namely Push mode and traditional Follow-me Routing mode. The former allows the route being placed to move other tracks (and optionally vias) out of the way while the latter is more akin to a hug mode which will obey design rule clearances but will not affect other objects on the PCB. Keyboard shortcuts enable you to seamlessly switch between routing modes and choose your cornering mode (curved or mitred) at any time.

Also included is a predictive algorithm that plots a 'shadow track' ahead of the current mouse position showing you how to get to the nearest legal destination without violating design rules. This shadow track will update as the user guides placement towards the intended destination with the mouse. When the shadow track looks right it can be completed automatically by pressing the ENTER key, saving a huge amount of time with simple connections.

For critical nets Proteus comes with full support for serpentine routing. This allows the user to automatically length match routes either to each other or to a target distance. This technology is then coupled with advanced design rules and a dedicated route placement mode to support differential pairs. When needed, differential pairs are automatically phase matched (skew reduction) to keep the signals equal and opposite for as much of the transit time as possible. A live matchgroup viewer and dedicated diff pair and length match reports make it easy to audit and inspect the high speed signal lines on the PCB.

Finally, a wide range of supporting features such as dynamic teardrops and track tapers are included as standard. Vias can be blind/buried or through hole as defined by your layer stackup and defined drill passes; non-functional pad removal and resin filling options are also available.



"PCB design is our business. We review PCB layout software on an ongoing basis and Labcenter has topped the list for the last 10 years. Certainly the most productive and very, very affordable. We have licences for other very expensive products but they don't get much use."

Donald Kay - Don Alan Pty

PCB LAYOUT

Route with curved corners or standard mitres and convert between them after placement.





Full support for high speed net tuning and differential pair routing.



PUSH AND SHOVE

Push and Shove Routing is the default manual routing mode and allows the track being placed to push other tracks and vias out of the way to make space. All pushed objects will obey the currently set design rules and you can rewind the pushing operation by moving the mouse backwards.

Follow-Me-Routing (FMR) mode is also a fully design rule aware routing mode but will treat all objects as immovable. It's useful for hugging tracks and where you want total control over all route topology. You can toggle between modes at any time, including during route placement, via the SHIFT+P keyboard shortcut or in the Route Command Centre.



ROUTE EDITING

Basic route editing is very simple and works by dragging segments. If you drag a horizontal or vertical segment of the route it will move horizontally or vertically and preserve the angle between adjacent segments. Similarly, if you drag on a diagonal segment it will move such that the angle to the adjacent segments is preserved.

By default, route editing is fully design rule aware, making it easy to tidy up routes and maximise space on the layout. This can be toggled via keyboard shortcut or in the route command centre. When turned off you can move the route anywhere and Visual DRC highlighting will warn you of illegal route placement.



VISUAL DRC

Visual DRC provides a viewport around the mouse inside which all objects are expanded by their design rule clearance. This instantly lets you see whether the route being placed/edited can move where you want it to go and then take action such as toggling push mode or changing track style to squeeze through a tight gap.

Visual DRC has a secondary role when design rule aware route editing is switched off, acting as a guide to legal route editing. Objects inside the viewport area will highlight if they come into violation with the route being edited and the viewport border will highlight if a violation occurs anywhere along the route.



ROUTE COMMAND CENTRE

The Route Command Centre is the home for all route placement editing and configuration options in Proteus. It can be launched from the Tools Menu or, more commonly, via the 'R' keyboard shortcut. Importantly the keyboard shortcut can launch the dialogue form while in the middle of placing or editing a route meaning that you can make changes or adapt the routing modes at any time.

The route commmand centre also provides options for on-the-fly track width changes, design rule aware route editing configuration and the visualisation of design rule clearances (Visual DRC).

Support for teardrops and track tapers including auto-regeneration after edit.





Easily specify non-functional pads and resin filled vias.

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