

2 Getting Started

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Launching L-Edit

To launch L-Edit, click the **Start** button on the Windows taskbar and navigate to the L-Edit installation directory (in default installation, in **Programs > Tanner L-Edit Pro > L-Edit Pro**

You can also double-click the L-Edit icon on your desktop, which looks like this:



Setup Files

Every L-Edit design file contains basic information such as a layer list, technology settings, and module-specific options for SPR, DRC, and Extract. Collectively, this information is known as the “setup.” You can transfer this information between design files using **File > Replace Setup** and **File > Export Setup**. See [L-Edit Setup on page 1-81](#) for further information.

When you launch L-Edit, the program attempts to locate the file **ledit.tdb** and read it for setup information. If it does not find this file in the current directory, L-Edit searches the directory where the executable is located. If **L-Edit** does not locate **ledit.tdb**, it displays a warning.

With or without setup information from **ledit.tdb**, when L-Edit launches it creates a new file (**Layout1**) with one cell, **Cell0**.

To start L-Edit with information from a specific setup file, double-click the TDB file in Windows Explorer. L-Edit will launch with that file's setup loaded. If you then create a new file, it will inherit the setup of the previously opened file.

Command-Line Arguments

L-Edit may be launched with or without command-line arguments. If a command-line argument is not specified, L-Edit starts with a new empty layout file modeled after **ledit.tdb**.

To launch L-Edit with a command-line argument, click the **Start** button on the Windows taskbar and select **Run**. Use the **Browse** button and navigate to the directory that contains **ledit.exe**.

L-Edit uses the following command-line arguments:

- The names of the TDB files to open. TDB files specified on the command line open with the number of layout windows they had when last saved.
- The **-f** flag to ignore configuration files. For more information, see [Application Parameters on page 1-111](#).
- The **-f1** flag to ignore registry information. The **-f1** option restores all L-Edit settings that are not file-specific to their default state.

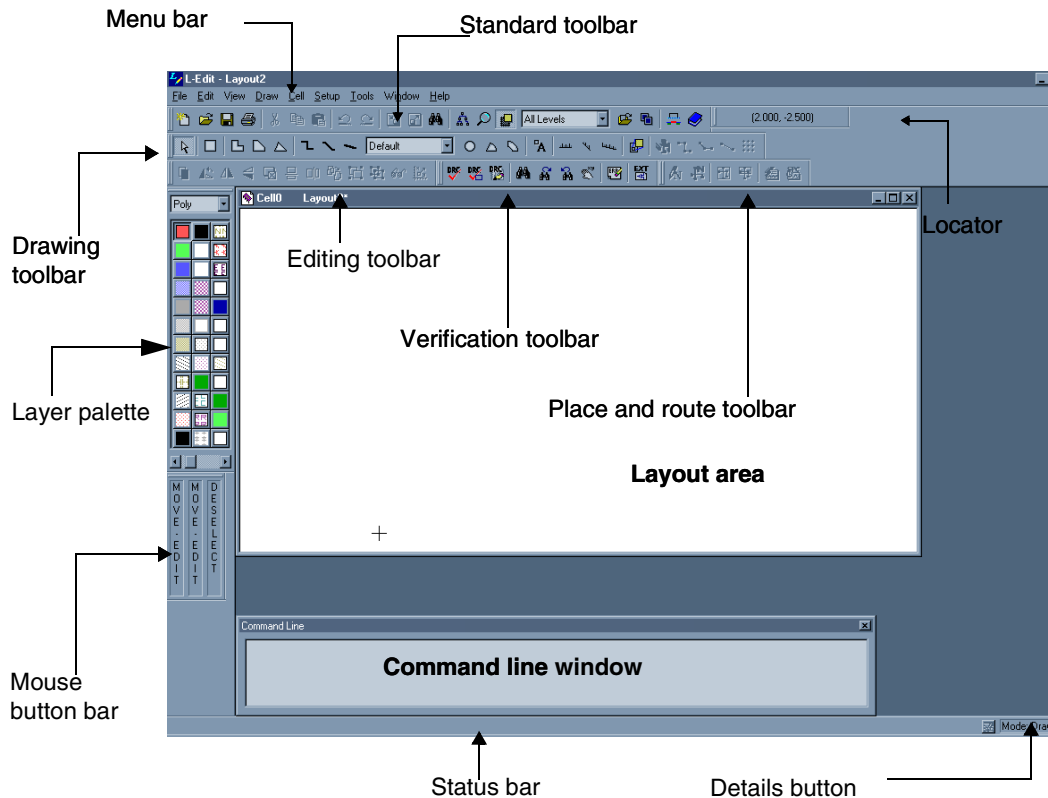
- The **-n** flag to hide the splash screen. The L-Edit splash screen will not be displayed during routine product initialization.
- The **-d** flag to prevent a change to the current default directory. The **-d** keeps the last used directory as the default. Without this flag, L-Edit sets the current directory to that of the last TDB file specified on the command line.
- The **d <dir name>** flag to change the current directory to the one specified.
- The **-s** flag to prevent file association. Normally, L-Edit sets the file association for TDB files to itself whenever it is launched (using the **-r** option below). The **-s** option prevents this automatic file association. This option is useful, for example, if you have L-Edit version 8.3 but prefer that your TDB files launch version 8.22. In that case you would open version 8.22 as normal to establish the file association. Then, each time you launch version 8.3 you would do so from the command line using the **-s** flag to prevent a new file association.
- The **-r** flag to associate TDB files with L-Edit and then exit. The **-r** option associates the TDB file extension with the version of L-Edit shown on the command line, but does not launch the product—L-Edit exits immediately after TDB association is completed. This is the default product setting. This flag can be used in batch scripts. It cannot be used with **-s** flag.

User Interface

The L-Edit interface has the following major components:

- Menu bar (adjoined to the title bar)
- Standard toolbar
- Editing toolbar
- Drawing toolbar
- Verification toolbar
- Place and route toolbar
- Layer palette
- Status Bar
- Mouse button bar
- Locator
- Layout area
- Command line interface

The application interface is displayed on the next page. Each of the components is described in the following sections.



Title Bar and Menu Bar

The *title bar* indicates the active file and cell. The *menu bar*, the horizontal space at the top of the screen, contains the titles of the L-Edit command menus.



File Edit View Draw Cell Setup Tools Window Help

File	Commands for creating, opening, saving, and printing files
Edit	Commands for copying, deleting, selecting, finding, and textual editing
View	Commands for expanding, contracting, and shifting the view
Draw	Commands for transforming design elements
Cell	Commands for creating, manipulating, and instancing cells
Setup	Commands for customizing setup parameters for the application, design, layers, color palette, and tools

Tools	Commands for examining XrefCells, creating and clearing generated layers, DRC, placing and routing the design, extracting a netlist, viewing a cross-section, and running L-Edit macros
Window	Commands for displaying document windows
Help	Commands for accessing online user guides and general information about L-Edit and Tanner EDA

Arranging Windows

The **Window** menu contains commands for manipulating L-Edit document windows and text windows.

If you have multiple windows open, you can bring one of them to the front by selecting it from the list at the bottom of this menu.

Window > Cascade arranges windows in overlapping fashion, starting from the top left corner of the display area, so that the title bars are visible. The active window remains active (in front).

Window > Tile Horizontally arranges windows from top to bottom in non-overlapping fashion, resizing them to fill the display area.


Window > Tile Vertically arranges windows from left to right in non-overlapping fashion, resizing them to fill the display area.

Window > Arrange Icons arranges icons of minimized windows in rows starting at the bottom left of the display area.

Window > Close All Except Active closes all open windows except for the active window.

Window > (open window list) lists all open files in the order they were opened. The active file is indicated with a check (✓).

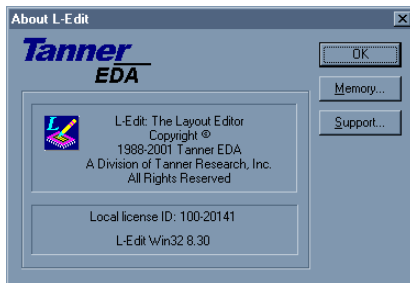
Getting Help

To access the documentation, press the help button () or select one of the following **Help** menu commands:

- **Layout Editor**
- **Placement and Routing**
- **Design Verification**
- **UPI**

L-Edit will start Adobe Acrobat™ Reader and open the online manual.

To determine what version of L-Edit you are using, choose **Help > About L-Edit**. L-Edit displays the following dialog:

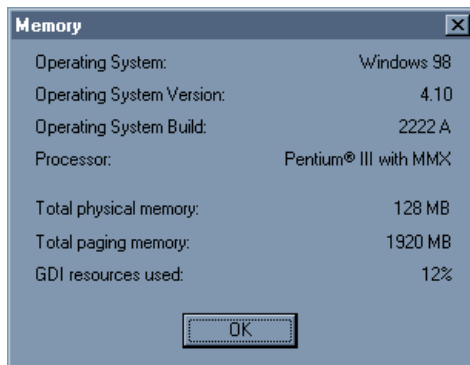


Click **Support** to display how to contact Tanner EDA Technical Support.



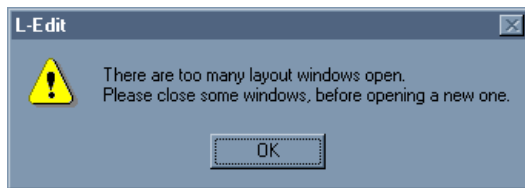
This dialog also provides additional version information, which you will need if you contact Technical Support

Click **Memory** to view information on your computer's operating system. L-Edit displays the following dialog:



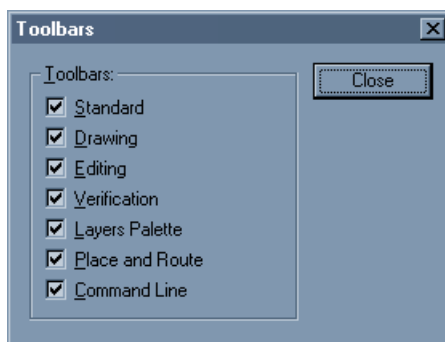
GDI stands for graphics device interface. If the **GDI resources used** value is above 95%, it is possible that L-Edit will render at less than optimal speed and will cease caching of instances. The best way to avoid this type of slowing is to close one or more layout windows.

If you have too many windows open in L-Edit you will get the following warning:



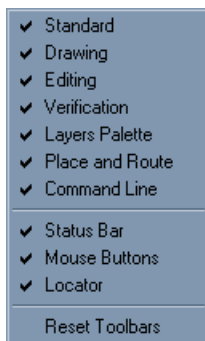
Toolbars

L-Edit utilizes six different toolbars, which you can show and hide using **View > Toolbars**.

















You can also show and hide toolbars through a context-sensitive menu. To activate the menu, position the pointer anywhere in a toolbar and click the right mouse button. The menu is dynamic and will reflect whatever toolbars and

options (for example, on the Drawing toolbar) are available for your L-Edit configuration.















You can move and resize all toolbars. To undock a toolbar, click on one of its edges and drag it to another position. L-Edit maintains whatever changes you make to a toolbar's location and size when you exit the program. If you move or resize toolbars within an L-Edit session and want to return them to the positions they occupied at the start of the session, use **Reset Toolbars** in the pop-up menu shown above.

Standard Toolbar

<i>Button</i>	<i>Menu Command</i>
	File > New
	File > Open
	File > Save
	File > Print
	Edit > Cut
	Edit > Copy
	Edit > Paste
	Edit > Undo
	Edit > Redo
	Edit > Edit In-Place > Push Into
	Edit > Edit In-Place > Pop Out
	Edit > Find
	View > Design Navigator
	View > Zoom > Mouse

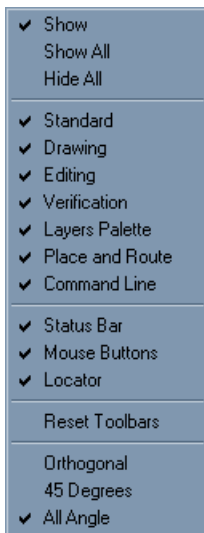
Button***Menu Command*****View > Insides > Toggle Insides****View > Hierarchy Level****Cell > Open****Cell > Copy****Tools > Cross-Section****Help > L-Edit User Guide**

Editing Toolbar

<i>Button</i>	<i>Menu Command</i>
	Edit > Duplicate
	Draw > Rotate
	Draw > Flip > Horizontal
	Draw > Flip > Vertical
	Draw > Nibble
	Draw > Slice > Horizontal
	Draw > Slice > Vertical
	Draw > Merge
	Draw > Group
	Draw > Ungroup
	Edit > Edit Object(s)
	Draw > Move By














Drawing Toolbar










The Drawing toolbar contains buttons for orthogonal, 45 degree, and all angle objects. To display only a single set of the buttons, right-click the Drawing toolbar and select **Orthogonal**, **45 Degrees**, or **All Angle** from the resulting menu.













(For information on **Show**, **Show All**, and **Hide All** in the Drawing toolbar pop-up menu, see [Showing and Hiding Objects on page 1-224](#).)

The following buttons are available on the Drawing toolbar:







<i>Button</i>	<i>Object</i>
	Cursor tool
	Box
	Orthogonal polygon
	45-degree polygon
	All-angle polygon
	Orthogonal wire
	45-degree wire
	All-angle wire
	Wire width
	Circle
	Pie Wedge
	Torus
	Port

<i>Button</i>	<i>Object</i>
	90 degree ruler
	45 degree ruler
	All angle ruler
	Instance (Cell > Instance)
	Highlight (BPR only)
	Orthogonal routing wire (BPR only)
	45 degree routing wire (BPR only)
	All angle routing wire (BPR only)
	Use routing grid (BPR only)

Verification Toolbar

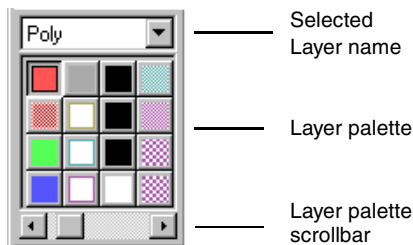
<i>Button</i>	<i>Menu Command</i>
	Tools > DRC
	Tools > DRC Box
	Tools > DRC > Setup
	Edit > Find
	Edit > Find Next
	Edit > Find Previous
	View > Goto
	Tools > Clear Error Layer
	Tools > Extract
	Tools > LVS

Place and Route Toolbar

<i>Button</i>	<i>Operation</i>
	Tools > BPR > Netlist Navigator
	Select nets or connections
	Tools > BPR > Route All
	Tools > BPR > Unroute All
	Tools > BPR > Timing Analysis
	Tools > BPR > Signal Integrity

Layer Palette

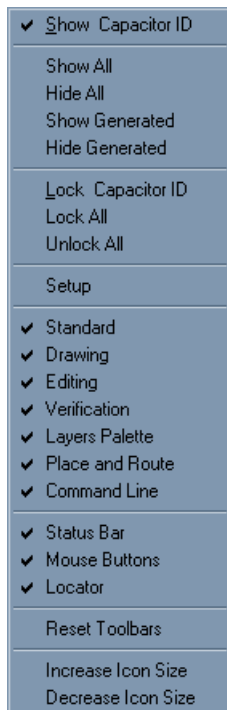
The *Layer palette* is displayed below:



L-Edit supports an unlimited number of technology layers. They are displayed in the Layer palette as an arrangement of square icons that represent the available layers. The icons show the color and pattern each layer assumes the layout. As the pointer moves over an icon, the name of the layer appears in the status bar.

You can resize the Layer palette or use the scroll bar at the bottom of the Layer palette to view additional layers not visible in the current display. Clicking the scroll bar arrows shifts the layer display over by one column for each click.

Using the right-click pop-up menu associated with the Layer palette, you can show, hide, or lock layers, open the **Setup Layers** dialog, and change the size of the icons in the Layer palette. To activate the menu, position the pointer anywhere in the Layer palette and click the MENU (right) mouse button.



For information on **Show [Layer name]**, **Show All**, **Hide All**, **Show Generated**, and **Hide Generated**, see [Showing and Hiding Layers on page 1-230](#).

Lock [Layer name] refers to the layer icon the pointer is positioned over at the time you activate the menu. When you execute this command, you cannot draw, move, or edit objects on the specified layer. Use **Lock All** or **Unlock All** to lock or unlock all layers, respectively.

When a layer is locked, L-Edit indicates this status in two ways:

- A check mark appears next to **Lock [Layer name]**
- The layer icon in the Layer palette is cross-hatched:



To change the size of the layer icons in the Layer palette, use **Increase Icon Size** or **Decrease Icon Size**. The size of the icons changes by two pixels each time you select the command.

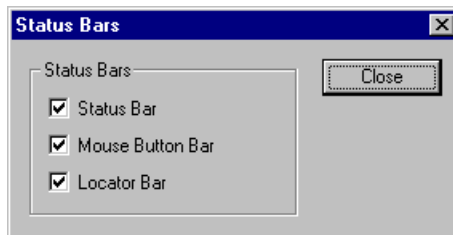
Note:

To set layer icons in the Layer palette to a specific size, use **Setup > Application—General** and select the desired size in the **Layer icon size** drop-down list.

Select **Setup** to open the **Setup Layers** dialog. You can also open the dialog by positioning the pointer over any layer icon and double-clicking the CHOOSE (left) mouse button. The layer whose icon you double-click will be highlighted in the **Setup Layers** dialog.

Status Bars

There are three status bars associated with L-Edit: the status bar, the mouse button bar, and the locator. To show and hide a status bar, use **View > Status Bars**.



Status Bar

The *status bar*, located at the bottom of the L-Edit window, displays context-sensitive information about items in the interface.




The status bar contains two panes. The left pane displays regular L-Edit status as indicated in the following table:

<i>Action</i>	<i>Description</i>
When the pointer is in the Layer palette:	The name of the layer pointed to. For generated layers, the Boolean formula for that layer.
When a menu command is highlighted:	A description of the command
When a single object is selected:	The type, layer, and size of the object. For cell instances and arrays, the name of the instanced cell.
When multiple objects are selected:	The count, by type, of the selected items (for example, 4 boxes, 1 circle, 3 ports, and 1 instance).
When the pointer is in a toolbar:	The function of the pointed-to tool

<i>Action</i>	<i>Description</i>
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All other times:	Ready
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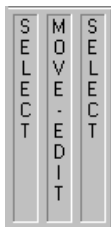
The Details button () creates a text file containing a textual description of the selected object, such as **Box, A=1082.25, P=154.0000, W=58.5000, H=18.5000 on Layer 'Poly'**.

The right pane displays the L-Edit mode. Possible modes are:

- Drawing (default)
- Nibble
- DRC Box
- Zoom Box (for **View > Zoom > Mouse** command)
- Assisted Manual Route (BPR only)
- Highlight (BPR only)

Mouse Button Bar

The mouse button bar displays the current function of each mouse button.



The mouse buttons function differently depending on the location of the mouse in the application and the current L-Edit mode (drawing, editing, zooming, etc.).

Locator

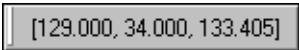
In default mode, the *locator* provides the location of the pointer relative to the absolute origin in locator units. The absolute origin is at the coordinates (0,0), and it is indicated by a cross in the layout area.

You can set the relationship between locator units and any physical unit in the **Setup Design—Technology** and **Setup Design—Grid** dialogs. (For more information, see [Technology Parameters on page 1-134](#) and [Grid Parameters on page 1-138](#).)

Through the relationship that you set up between locator units and physical units, you can indirectly determine physical lengths in your layout. For example, if 1 locator unit = 1 micron, then a location of (a, b) refers to coordinates in locator units and also indirectly in microns.

A rectangular display box with a light gray background and a thin black border. Inside, the text "[-15, 10]" is displayed in a black, monospaced font.

When you press **Q**, the locator changes to *relative coordinate display* mode.

A rectangular display box with a light gray background and a thin black border. Inside, the text "[129.000, 34.000, 133.405]" is displayed in a black, monospaced font.

In this mode, the locator displays the coordinates of the pointer's position relative to its initial position when **Q** was pressed. The third number represents the distance between the pointer's current position and its initial position when **Q** was pressed. When you press **Q** again, the display goes back to the default mode.

Note:

In relative coordinate display mode, the pointer position is displayed in brackets **[]** rather than in parentheses **()**.

Layout Area

The area available for drawing objects is called the *layout area*. The origin of the coordinate system (0,0) is indicated with a cross-hair marker, which you can hide or display using **View > Display > Origin**. An optional display grid provides a set of convenient locating points, which you can hide or display using **View > Display > Grid**. You can adjust the spacing of the grid points using **Setup Design—Grid**.

Coordinate System

L-Edit uses *locator units* to report object dimensions and coordinates. The program also uses locator units to set the display grid, mouse snap grid, and BPR routing grid.

For its own computation, L-Edit uses *internal units* (30-bit signed integers). The relation between internal units, locator units, and physical (technology) units is defined in the following manner:

- Physical units are mapped to internal units in **Setup Design—Technology**
- Locator units are mapped to internal units in **Setup Design—Grid**

For further information on defining these units, see [Design Setup on page 1-130](#).

Command Line Interface

In addition to menu items and keyboard shortcuts, L-Edit includes a command line interface that allows textual entry of basic commands and their associated coordinates. This window allows for repeatable, coordinate-specific object manipulations and command scripting with text files.

See [Command Line Editing on page 1-308](#) for instructions on using this tool.