



# LVR GUI Reference

Layout Verification Reporter

Graphics view, error browser, Tcl console and AMS Layout Editor

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LVR 2.0 · Documentation Rev A  
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# Revision History

| Revision | Date        | Product | Summary                                                                                                                                                                                             |
|----------|-------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rev A    | August 2026 | 2.0     | First release. Documents the main window, Tcl console, configuration dialog, error browser, graphics view, histogram window, AMS Layout Editor and installer, with an interface-to-command mapping. |

This document describes LVR 2.0 (build 2.0.0). Verify against the release notes for the build you are running.

# Contents

|                                        |           |
|----------------------------------------|-----------|
| <b>1 Overview</b>                      | <b>6</b>  |
| 1.1 Launching the interface            | 6         |
| 1.2 Colour convention                  | 6         |
| <b>2 Main Window</b>                   | <b>7</b>  |
| 2.1 Menu bar                           | 7         |
| 2.2 Left action column                 | 8         |
| 2.3 Control Panel                      | 8         |
| 2.4 Selection Panel                    | 9         |
| 2.5 Command List panel                 | 9         |
| 2.6 Editor Panel                       | 10        |
| <b>3 Tcl Console and Message Panel</b> | <b>11</b> |
| 3.1 Sourcing a script                  | 11        |
| 3.2 Message Panel severities           | 11        |
| <b>4 Configuration Dialog</b>          | <b>13</b> |
| 4.1 Run Settings tab                   | 13        |
| 4.2 Rules tab                          | 13        |
| 4.3 Input tab                          | 14        |
| 4.4 Output tab                         | 14        |
| 4.5 Options tab                        | 14        |
| <b>5 Error Browser</b>                 | <b>15</b> |
| 5.1 Errors and Warnings tab            | 15        |
| 5.2 Marker Browser tab                 | 16        |
| 5.3 Summary Report tab                 | 16        |
| 5.4 Histograms tab                     | 17        |
| 5.5 LVS-specific views                 | 18        |
| <b>6 Graphics View</b>                 | <b>21</b> |

|                                                              |           |
|--------------------------------------------------------------|-----------|
| 6.1 Navigation . . . . .                                     | 21        |
| 6.2 FindObjects dialog . . . . .                             | 21        |
| 6.3 Connectivity view . . . . .                              | 22        |
| 6.4 Preferences . . . . .                                    | 22        |
| <b>7 Histogram Window . . . . .</b>                          | <b>24</b> |
| <b>8 AMS Layout Editor . . . . .</b>                         | <b>25</b> |
| 8.1 Tool palette . . . . .                                   | 25        |
| 8.2 Creating geometry . . . . .                              | 26        |
| 8.3 Hierarchy navigation . . . . .                           | 26        |
| 8.4 Editing an instantiated cell . . . . .                   | 27        |
| 8.5 Layer management . . . . .                               | 28        |
| 8.6 Selection Details . . . . .                              | 29        |
| 8.7 Editor limitations . . . . .                             | 30        |
| <b>9 Installer . . . . .</b>                                 | <b>31</b> |
| <b>Appendix A Interface to Command Equivalents . . . . .</b> | <b>33</b> |

# 1 Overview

The LVR graphical interface is a single application presenting four top-level surfaces: the **main window**, which holds the layout canvas and its docked panels; the **Error Browser**, which presents results; the **Tcl console**, which accepts commands interactively; and the **AMS Layout Editor**, which edits geometry in place. All four operate on the same in-memory database, so a fix applied in the editor can be re-verified without leaving the tool.

The interface opens when a script reaches `load_gui`, or when LVR is launched without a script argument. A script containing `cmd_line_only` never opens it and requires no display.

## 1.1 Launching the interface

| Method          | Invocation                                                  | When to use                                                                                  |
|-----------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Script then GUI | % LVR run.cmd (script ends in <code>load_gui</code> )       | Normal batch-then-review flow. The run completes, then the interface opens on the results.   |
| GUI then script | % LVR then source the script from the Tcl panel             | Interactive work where the script is being developed or modified between runs.               |
| GUI only        | % LVR then use the Configuration dialog                     | First-time use, or where a run is defined entirely through form fields rather than a script. |
| Headless        | % LVR run.cmd (script contains <code>cmd_line_only</code> ) | Regression and CI. No display required.                                                      |

## 1.2 Colour convention

The interface uses colour to signal which mode is active, so that a screenshot or a glance at the screen identifies the context unambiguously. This prevents the most common error in multi-modal CAD tools, which is performing an action in the wrong mode.

| Theme | Surface                                          | Meaning                                                                               |
|-------|--------------------------------------------------|---------------------------------------------------------------------------------------|
| Amber | Main window, Error Browser, Tcl console          | Verification mode. The database is read-only; results are being computed or reviewed. |
| Teal  | AMS Layout Editor                                | Editing mode. Geometry can be modified.                                               |
| Green | Main window canvas in ERC and connectivity views | Connectivity overlay is active; shapes are coloured by net rather than by layer.      |
| Red   | Marker highlight, Command List when empty        | Attention: a violation, a selection, or an unset required field.                      |

## 2 Main Window

The main window is the primary workspace. A menu bar spans the top, a vertical action column sits at the left, and the layout canvas occupies the centre with dockable panels arranged around it.

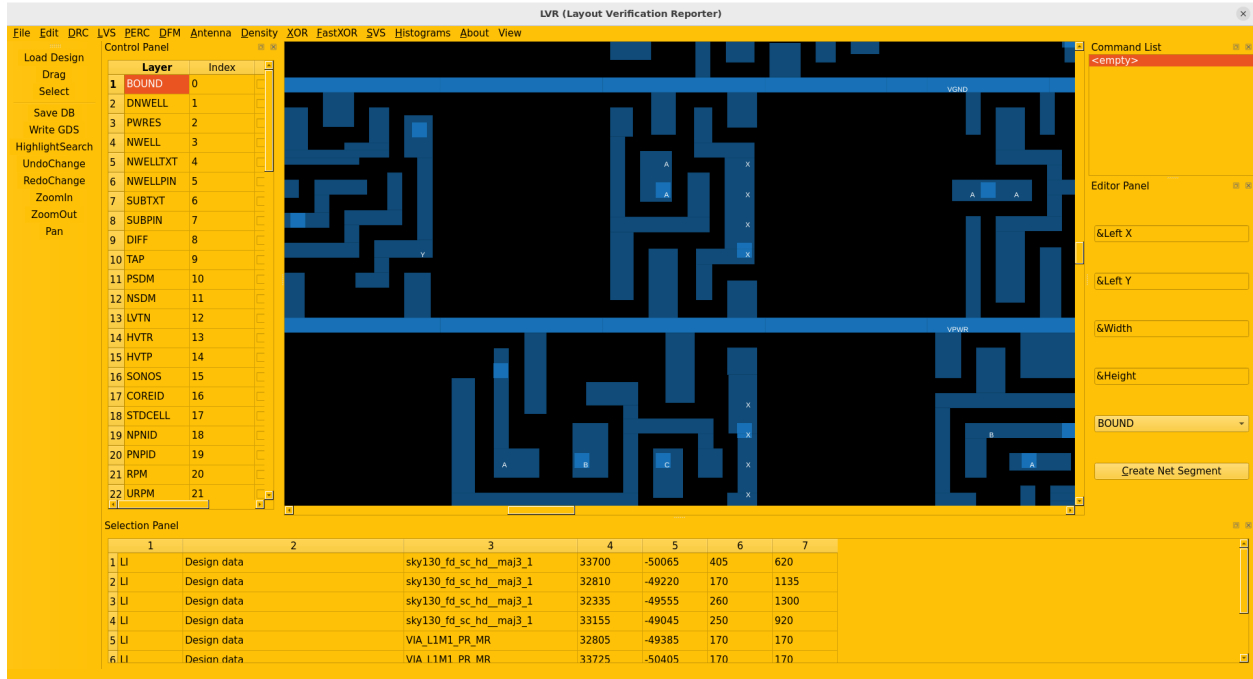


Figure 1. Main window in DRC mode. Menu bar, left action column, Control Panel with the layer table, layout canvas, Command List and Editor Panel at the right, Selection Panel below.

### 2.1 Menu bar

The menu bar exposes one menu per engine plus the general File, Edit and View menus. Selecting an engine menu switches the Error Browser to that engine's result set and changes which summary tab is presented.

| Menu    | Contents                                                                    |
|---------|-----------------------------------------------------------------------------|
| File    | Load design, save database, write GDS, open and save command scripts, exit. |
| Edit    | Preferences, undo and redo of editor changes, clipboard operations.         |
| DRC     | Run and review design rule check results; open the DRC Error Browser.       |
| LVS     | Run and review layout-versus-schematic results; open the LVS Error Browser. |
| PERC    | Programmable electrical rule checks.                                        |
| DFM     | Design-for-manufacturability results.                                       |
| Antenna | Antenna ratio check results.                                                |
| Density | Metal and diffusion density results.                                        |
| XOR     | Full-precision layout difference results.                                   |
| FastXOR | Accelerated screening difference results.                                   |
| SVS     | Schematic-versus-schematic comparison results.                              |

| Menu       | Contents                                                        |
|------------|-----------------------------------------------------------------|
| Histograms | Marker distribution charts and the spatial heat map.            |
| View       | Panel visibility, zoom and fit controls, layer display presets. |
| About      | Version, build identifier and licence information.              |

## 2.2 Left action column

The action column holds the operations used most often during review. It remains visible in every mode.

| Element          | Function                                                                                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------|
| Load Design      | Opens a layout file into the current database.                                                                           |
| Drag             | Pan mode. Dragging the canvas moves the view.                                                                            |
| Select           | Selection mode. Clicking a shape selects it and populates the Selection Panel; dragging defines a rubber-band selection. |
| Save DB          | Writes the current database, including any edits, to disk.                                                               |
| Write GDS        | Exports the current database to a GDSII file.                                                                            |
| HighlightSearch  | Opens the FindObjects dialog to locate geometry by layer, net, cell or coordinate.                                       |
| UndoChange       | Reverts the last editing operation.                                                                                      |
| RedoChange       | Reapplies a reverted editing operation.                                                                                  |
| ZoomIn / ZoomOut | Magnification, centred on the cursor.                                                                                    |
| Pan              | Recentres the view.                                                                                                      |

## 2.3 Control Panel

The Control Panel is the layer table. Each row carries a layer name, its index, and a visibility checkbox. Only checked layers are rendered, which is the primary means of reducing visual clutter on a dense design. Layer names are those declared by the rule deck or by the `lvr_layer` commands, so they match the foundry design rule manual.



Figure 2. Control Panel and Selection Panel. The layer table drives canvas rendering; the Selection Panel below reports the properties of whatever is currently selected.

## 2.4 Selection Panel

The Selection Panel populates whenever geometry is selected in the canvas and hides when nothing is selected. It reports one row per selected object.

| Element                  | Function                                                     |
|--------------------------|--------------------------------------------------------------|
| Type                     | Object class: Cell, Net, Marker, Rectangle, Polygon or Path. |
| Name                     | Instance or net name.                                        |
| Instance                 | Owning instance, where the object belongs to a placed cell.  |
| PinName                  | Associated pin, where the object forms part of a terminal.   |
| LayerName                | Process layer the object is drawn on.                        |
| Bottom-Left Corner X / Y | Origin in database units.                                    |
| Width / Height           | Bounding box dimensions in database units.                   |

## 2.5 Command List panel

The Command List records the commands executed in the current session, in order. An empty list is shown in red as <empty>. The panel doubles as a transcript: a session driven interactively through the interface can be read back

from this panel and saved as a reusable script.

## 2.6 Editor Panel

The Editor Panel creates geometry directly on the canvas without entering the full AMS Layout Editor. It takes a left X, left Y, width and height in database units, plus a target layer from the dropdown, and creates the shape with the Create Net Segment button.

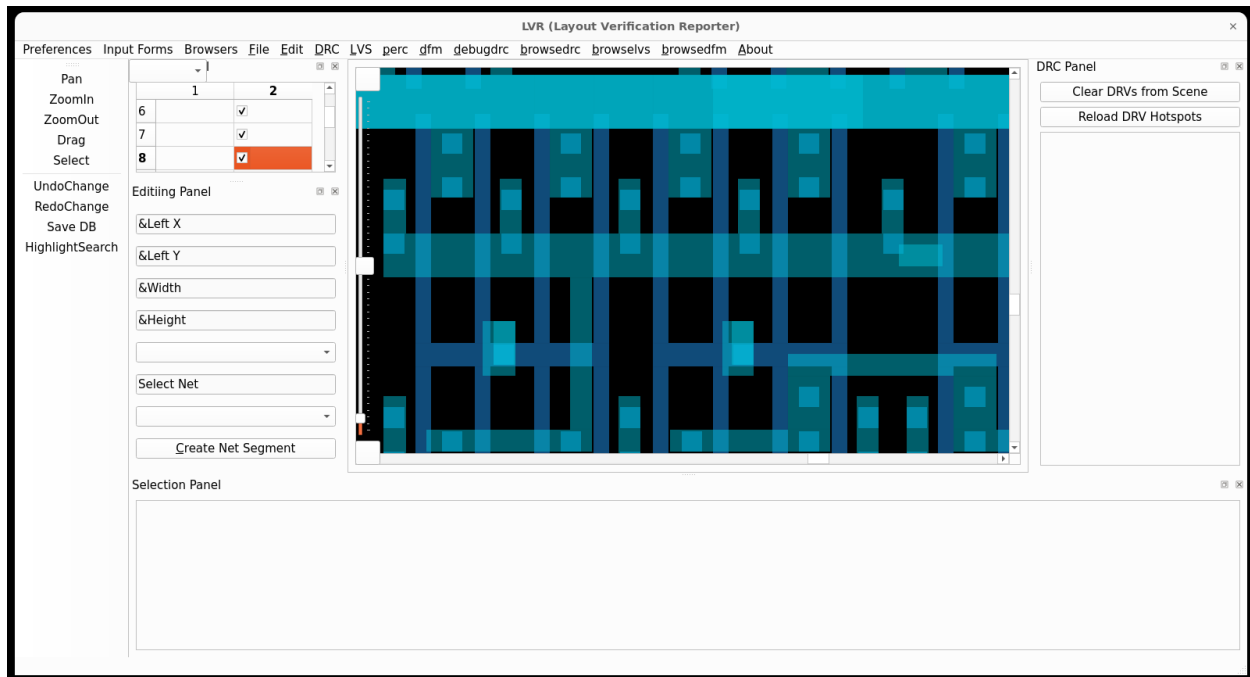


Figure 3. Editor Panel with the coordinate and dimension fields, layer selector and Create Net Segment action. The DRC Panel at the right offers Clear DRAn Point Scene and Reload DRC Hotspots.

## 3 Tcl Console and Message Panel

The Tcl console accepts the same commands a script file contains, entered one at a time. It is the fastest way to adjust one setting and re-run without editing a file, and it is how a script is sourced in the GUI-first workflow.

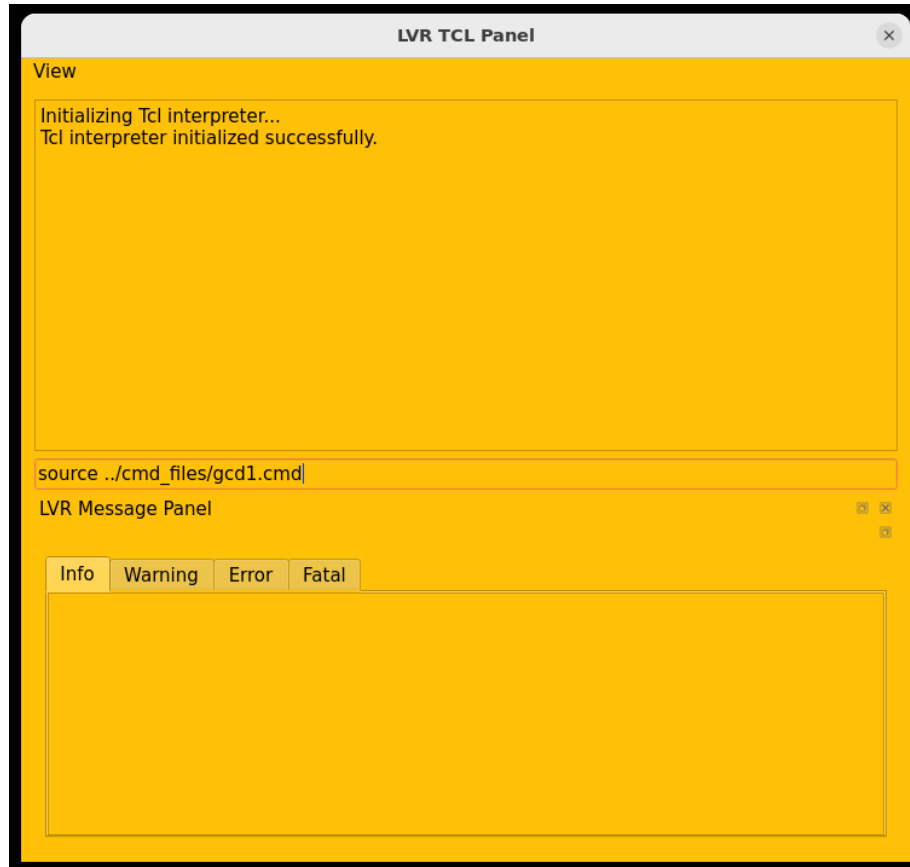


Figure 4. Tcl Panel and Message Panel. The upper pane reports interpreter status; the entry field below sources a script; the Message Panel filters output by severity.

### 3.1 Sourcing a script

Launch LVR with no arguments, then enter the source command in the Tcl panel entry field:

```
source ../cmd_files/gcd1.cmd
```

Every command in the file executes in order, exactly as it would in a batch run. Because the interpreter persists, further commands can be entered afterwards to adjust settings and re-run individual stages.

### 3.2 Message Panel severities

The Message Panel groups output into four tabs. Selecting a tab filters the stream to that severity, which is what makes a long run's output tractable.

| Tab  | Severity      | Meaning                                           |
|------|---------------|---------------------------------------------------|
| Info | Informational | Progress and configuration echoes. Normal output. |

| Tab     | Severity | Meaning                                                                                                                     |
|---------|----------|-----------------------------------------------------------------------------------------------------------------------------|
| Warning | Advisory | A condition that did not stop the run but may affect results, such as a rule referencing an empty layer.                    |
| Error   | Error    | A rule violation or a run-level failure. The run continues.                                                                 |
| Fatal   | Fatal    | The run cannot continue. Typically a missing input file, an unparseable rule deck, or a top cell not present in the layout. |

## 4 Configuration Dialog

The Configuration dialog defines a run through form fields rather than a script. It is organised into five tabs reached from the navigation list at the left. Cancel discards changes, Apply saves them without running, and Submit saves and starts the run.

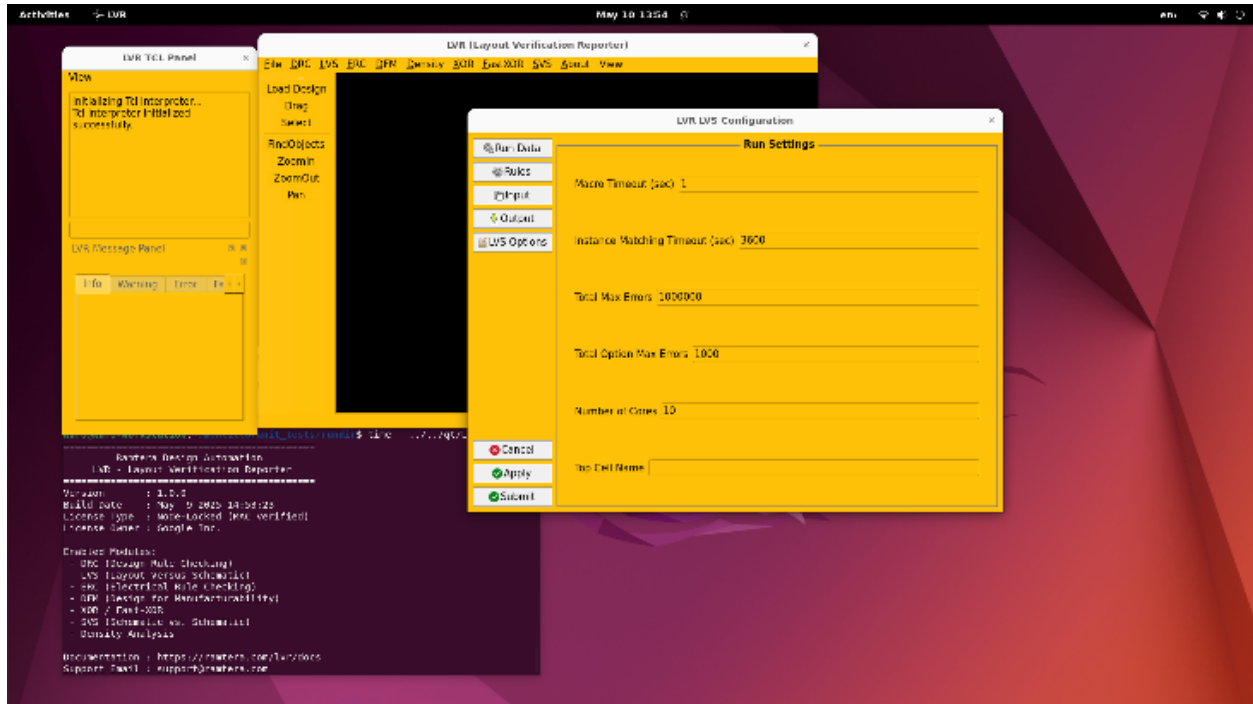


Figure 5. LVR Configuration dialog showing the Run Settings tab with the navigation list at the left and Cancel, Apply and Submit at the bottom.

### 4.1 Run Settings tab

| Element                         | Function                                                                                                                                                                       |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Macro Timeout (sec)             | Maximum time to resolve any single macro block. Prevents a complex macro from stalling the run. Equivalent to <code>set_lvs_macro_timeout</code> .                             |
| Instance Matching Timeout (sec) | Upper bound on the instance-to-instance comparison stage. 3600 is normally sufficient for a large hierarchical design. Equivalent to <code>set_lvs_inst_match_timeout</code> . |
| Number of Cores                 | Worker pool size. Equivalent to <code>set_num_cores</code> .                                                                                                                   |
| Top Cell Name                   | Hierarchical root for both layout and schematic. Mandatory, and must match the cell present in both databases. Equivalent to <code>set_top</code> .                            |

### 4.2 Rules tab

| Element    | Function                                                                                                                                                                      |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technology | Dropdown of available technology nodes. Selecting the correct node determines layer interpretation and device recognition defaults. Equivalent to <code>set_technode</code> . |

| Element  | Function                                                                                                                                                                                  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LRF File | Rule file defining layer mapping, device recognition and net extraction. The <code>...&lt;/code&gt;</code> button opens a file browser. Equivalent to <code>read_lrf&lt;/code&gt;.</code> |

Rule files are parsed before execution, so a syntax error is reported here rather than partway through a long run. Technology and rule file must correspond; a mismatch produces a high error count that looks like a layout problem but is a setup problem.

### 4.3 Input tab

| Element           | Function                                                                         |
|-------------------|----------------------------------------------------------------------------------|
| Module-SPICE File | Flattened SPICE netlist for the schematic side.                                  |
| Verilog Netlist   | Structural Verilog reference, where the comparison is against gate-level source. |
| Macro CDL Library | Resolves hard-macro and black-box references.                                    |
| GDS File1         | Layout database. Must contain the top cell and all child instances.              |

### 4.4 Output tab

| Element           | Function                                                                                          |
|-------------------|---------------------------------------------------------------------------------------------------|
| Error Report File | Detailed error log: mismatches, shorts, opens, macro failures.                                    |
| Report File       | Summary report with pass or fail status, suited to automation.                                    |
| Markers File      | Layout coordinates of every error marker, for display in the graphics view or an external viewer. |

Reports are produced only on successful completion. An empty or absent output file after a run means the run did not reach the reporting stage; check the Fatal tab of the Message Panel first.

### 4.5 Options tab

| Element                 | Function                                                                                                      |
|-------------------------|---------------------------------------------------------------------------------------------------------------|
| Enable Ports            | Includes top-level ports in the comparison. Required for any block that will be integrated at a higher level. |
| Use DATC Flow           | Aligns output format and check selection with the public DATC LVS benchmark definitions.                      |
| Check Shorts            | Detects unintended connections between nets.                                                                  |
| Check Open              | Detects electrically discontinuous nets.                                                                      |
| Check Macro             | Verifies macro-level block connections.                                                                       |
| Check Instance Matching | Pairs each layout instance with its schematic counterpart.                                                    |
| Check Unconnected Pins  | Detects floating or unconnected pins.                                                                         |

All options are enabled by default. Disabling one removes both its runtime cost and its findings, so a run with checks disabled must not be presented as a full LVS result.

## 5 Error Browser

The Error Browser presents results. It opens per engine, and its third tab is named for that engine — DRC Summary Report, LVS Summary Report, ERC Summary Report and so on. The four tabs are consistent across every engine.

| Tab                        | Purpose                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------|
| Errors and Warnings        | The message stream, grouped by error code and collapsible by category. Read this first.                        |
| Marker Browser             | One row per violation with its coordinates. Double-clicking a row centres that violation in the layout canvas. |
| <Engine><br>Summary Report | Aggregated counts by rule plus the run environment: tool version, technology node, hierarchy mode, timing.     |
| Histograms                 | Distribution of markers across rules and a spatial heat map showing where violations cluster on the die.       |

### 5.1 Errors and Warnings tab

Violations are grouped by error code — LVS017 for shorts, LVS018 for opens, DRC\_ERR001 and so on — with each group collapsible. Grouping is what makes a run with thousands of markers reviewable: the categories reveal immediately whether the failures are one systematic problem or many independent ones.

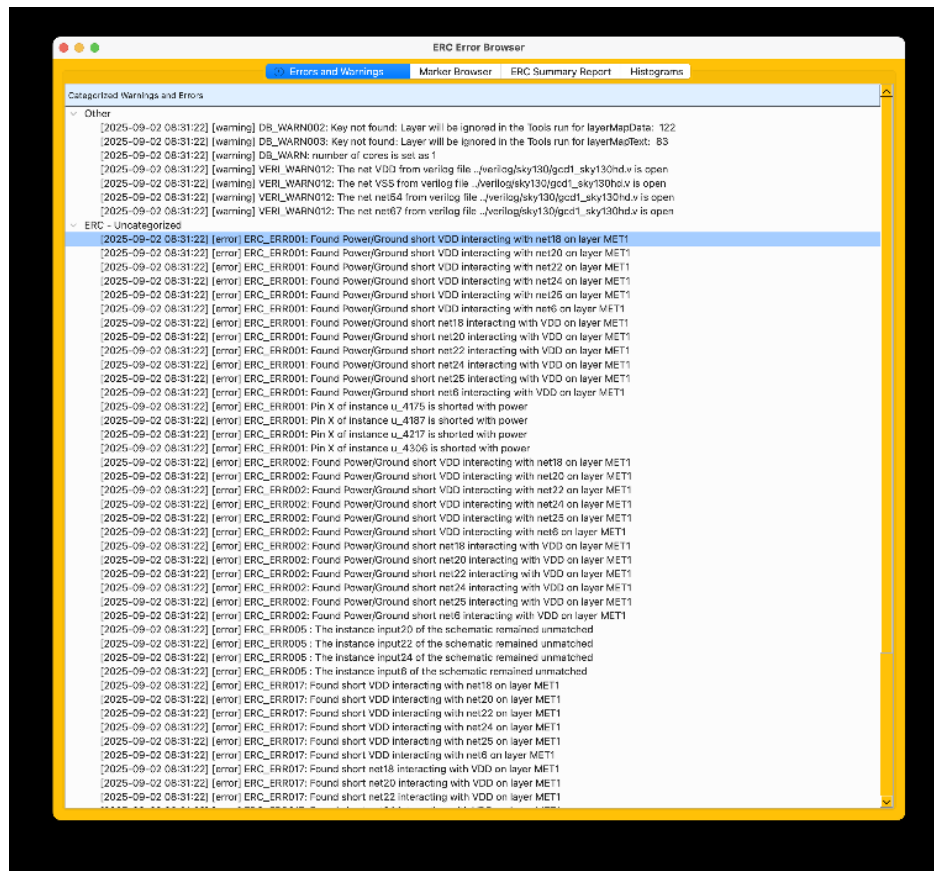


Figure 6. Errors and Warnings tab. Messages are grouped by category with per-message timestamps; the highlighted row is selected and its marker is centred in the layout.

## 5.2 Marker Browser tab

The Marker Browser enumerates violations one per row. Selecting a row highlights the corresponding geometry in the canvas and populates the Selection Panel. Two controls sit above the table: **Clear Markers from Scene** removes the overlay without discarding results, and **Single Marker Display Mode** shows only the selected marker, which is essential when violations overlap densely.

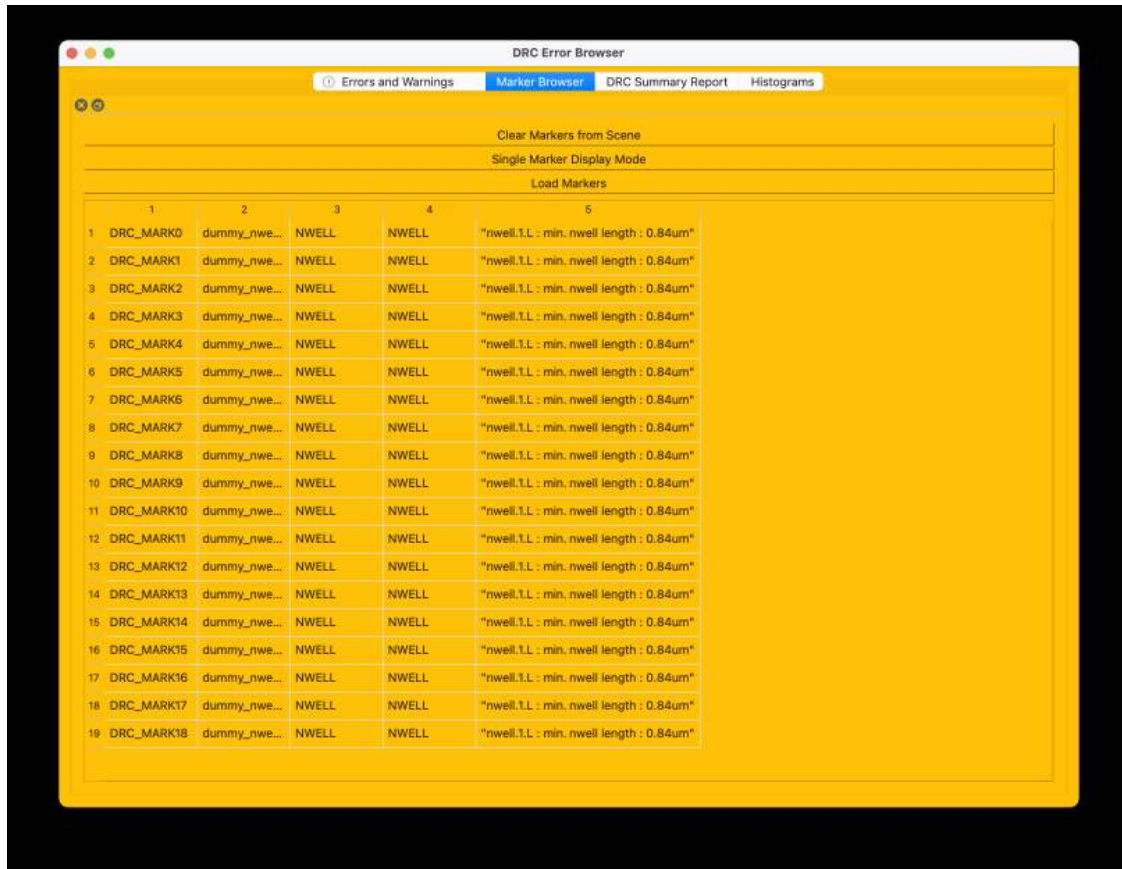


Figure 7. Marker Browser populated with DRC markers. Each row carries the rule identifier, the cell, the layer and the rule caption text.

## 5.3 Summary Report tab

The Summary Report aggregates the run. It records the environment the run executed in, per-rule error counts, and performance metrics by stage. This is the tab to capture for a sign-off record, because it ties results to the exact tool version and rule deck that produced them.

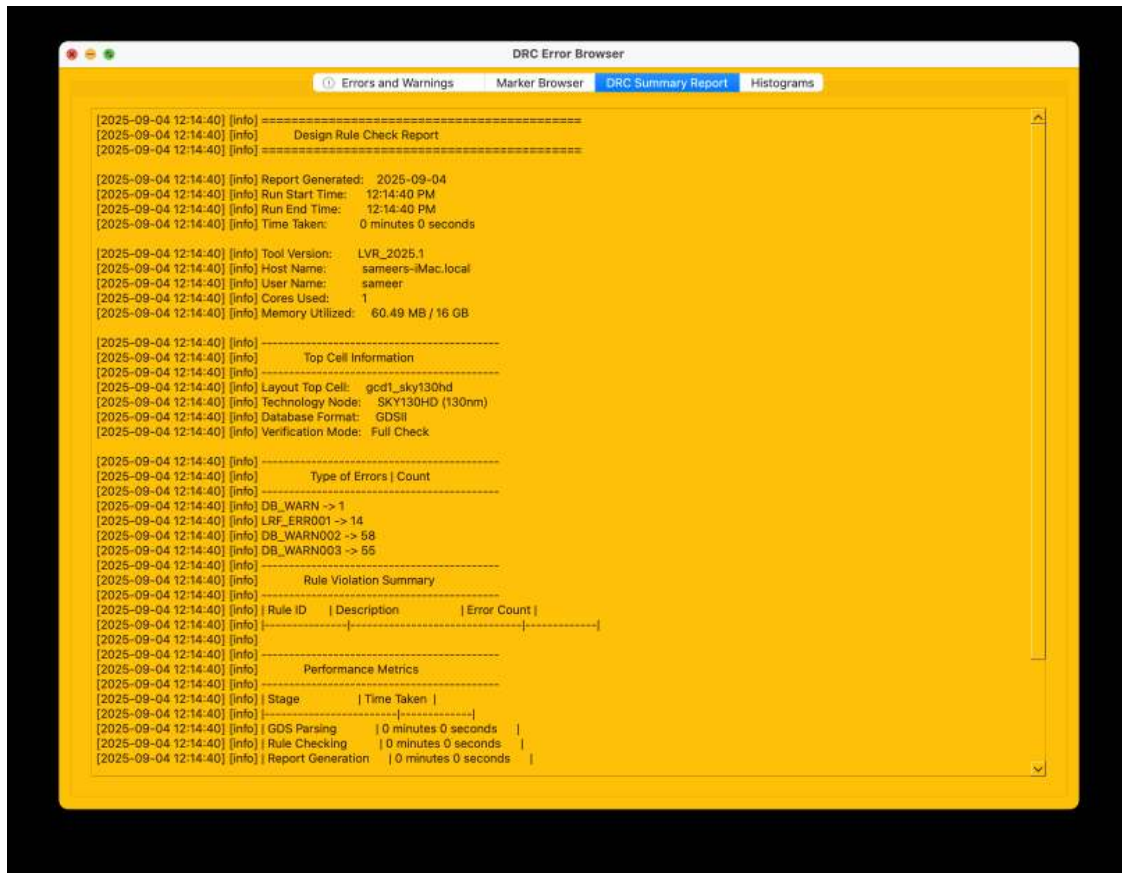


Figure 8. DRC Summary Report. Report generation timestamp, tool version, layout and rule file names, technology node, database format, hierarchy mode, per-rule error counts and stage timing.

## 5.4 Histograms tab

The Histograms tab presents two views. The bar chart gives the distribution of markers across bins, revealing whether failures concentrate in a few rules or spread evenly. The heat map below plots marker density spatially across the die: a hot region usually indicates one block or one repeated cell is responsible for most of the count.

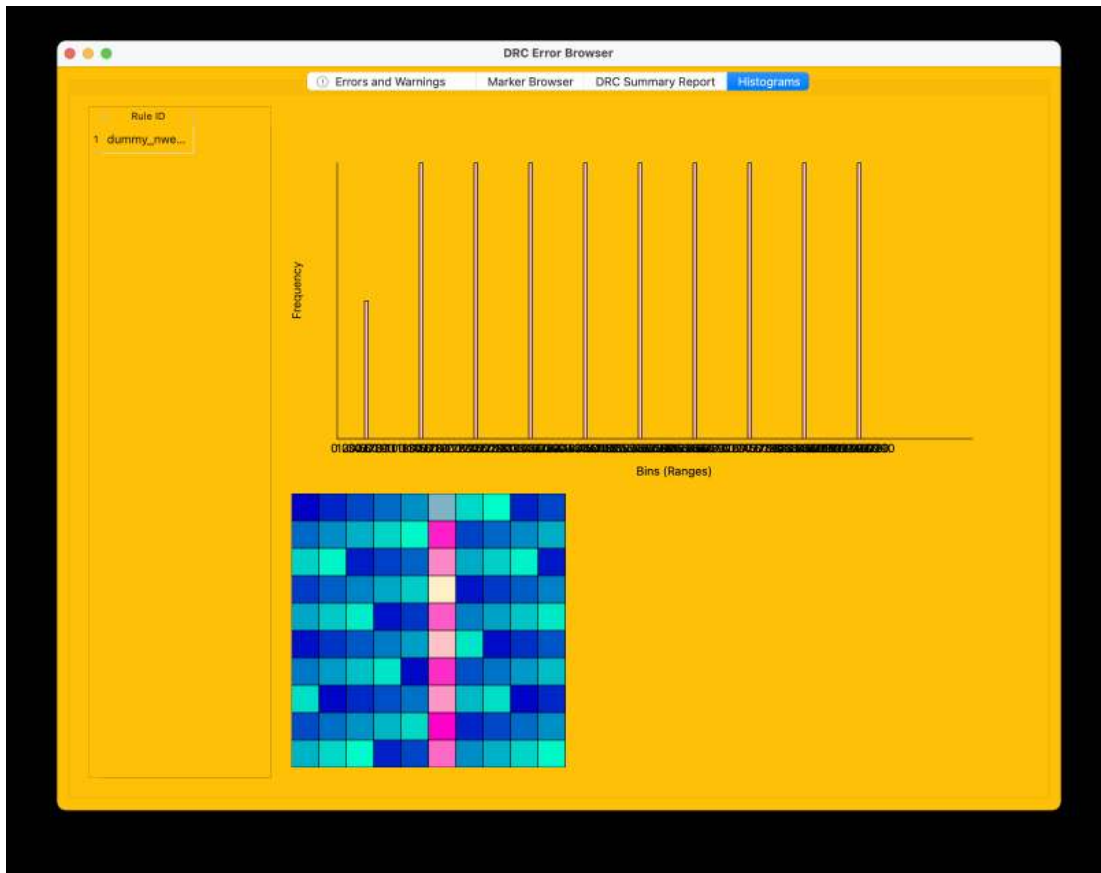


Figure 9. Histograms tab. Marker frequency by bin above, spatial density heat map below.

Bin count is set by `set_num_bins`. A higher count gives finer spatial resolution at the cost of a noisier chart.

## 5.5 LVS-specific views

In LVS mode the Histograms tab replaces the generic bins with three categories — **SHORTS**, **OPEN** and **UNCONNECTED PINS** — which is the natural decomposition of an LVS failure.

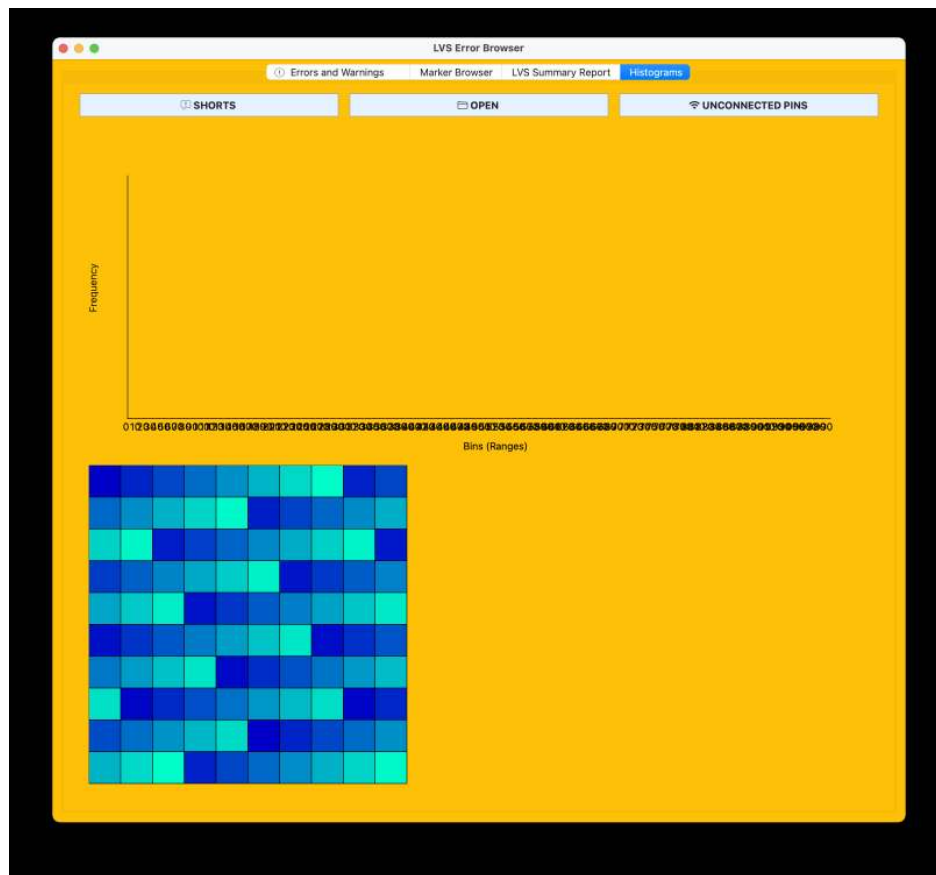


Figure 10. LVS Histograms tab with the shorts, opens and unconnected pin categories and the spatial density map.

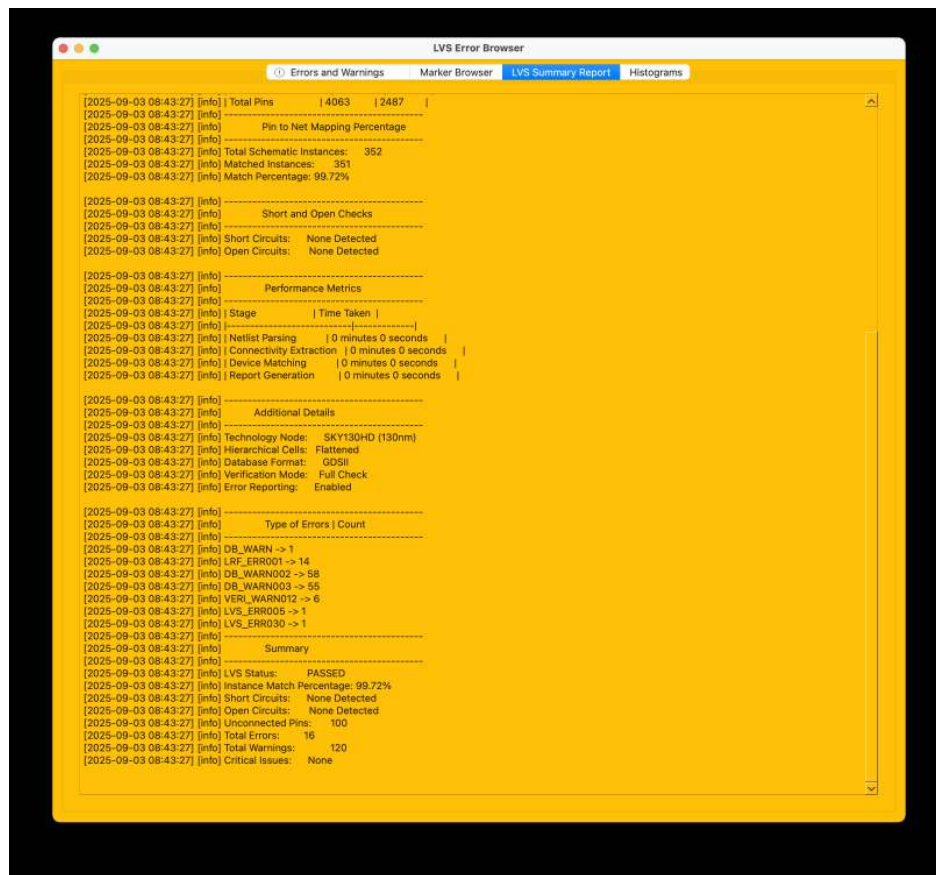


Figure 11. LVS Summary Report. Short and open counts, device and instance match percentages, net and device totals, and per-stage timing.

## 6 Graphics View

The canvas renders the layout with each layer in its assigned colour. Rendering is incremental, so navigation stays responsive on full-chip designs. The coordinate system follows the GDSII convention with Y increasing upward in the display.

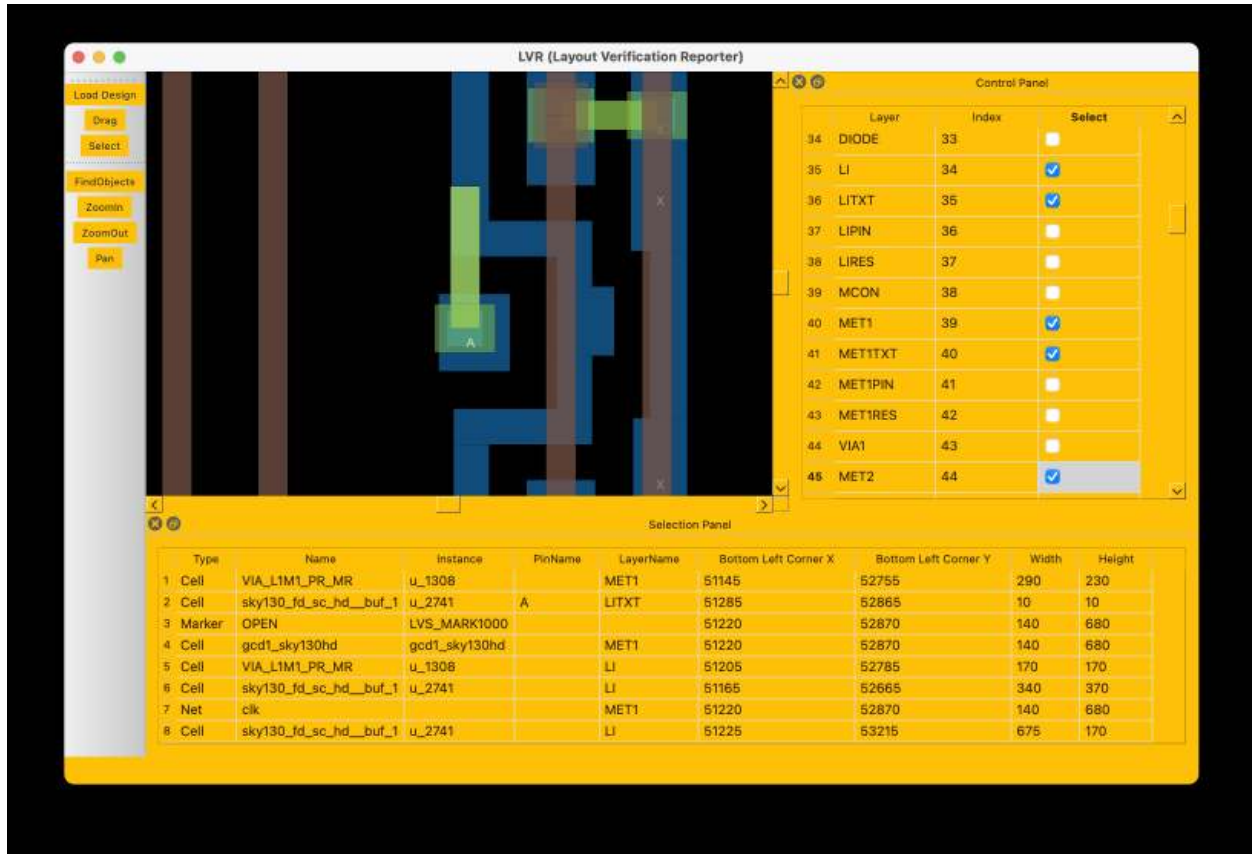


Figure 12. Graphics view with a marker selected. The violating geometry is highlighted, the Control Panel shows which layers are rendered, and the Selection Panel enumerates every object involved in the marker.

### 6.1 Navigation

| Element                   | Function                                                     |
|---------------------------|--------------------------------------------------------------|
| Zoom In / Zoom Out        | Magnify or reduce, centred on the cursor.                    |
| Fit                       | Zoom to the full design extent.                              |
| Drag                      | Pan the view.                                                |
| Double-click a marker row | Centre that violation in the canvas at review magnification. |

### 6.2 FindObjects dialog

Reached from HighlightSearch in the action column, the FindObjects dialog locates geometry by layer, net name, cell name or coordinate. Results appear in the Search Result view, and selecting a result highlights it in the canvas. This

is the practical way to reach a specific net in a design too large to navigate visually.

### 6.3 Connectivity view

In ERC and connectivity modes the canvas colours shapes by net rather than by layer, so that an entire electrical net is visible as one colour across every layer it occupies. This makes a short between two nets immediately apparent as a single connected region in a colour that should not exist.



Figure 13. Connectivity view. Shapes are coloured by net; the Selection Panel reports the nets and pins involved in the highlighted region.

### 6.4 Preferences

Edit > Preferences configures how markers are presented. The settings persist between sessions.



Figure 14. Preferences dialog for DRC.

| Element                             | Function                                                                                                                          |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Total Marker Limit                  | Maximum markers loaded into the scene across all rules. Bounds memory on a run with very high marker counts.                      |
| Marker Limit Per Rule               | Maximum markers loaded for any single rule.                                                                                       |
| Rule Color / Text / Histogram Color | Per-category colour assignment for markers, their labels and the histogram series.                                                |
| Marker Autohighlight                | Automatically highlights all ruleset markers on selection.                                                                        |
| Clear Previous Markers              | Removes the previous marker set when a new result loads.                                                                          |
| Zoom Mode                           | Zoom to Marker factor and Pan to Marker behaviour when a marker row is activated. No View Change leaves the viewport where it is. |
| Error Marker                        | Whether the cell, the tag, or an edit-in-place field is shown at the marker.                                                      |
| Tree Mode                           | Groups the error tree by Cell or Rule, and whether the rule name and caption are shown.                                           |
| Error Mode                          | Show Error Only suppresses warnings from the marker set.                                                                          |
| Exit confirmation                   | Prompts before closing. Show New Result in New Tab preserves the previous result set; Compact Mode reduces row height.            |

## 7 Histogram Window

Opened from the Histograms menu, this window presents the full set of distribution analyses independently of the Error Browser. The list at the left selects which analysis is charted; the bar chart and heat map update together.

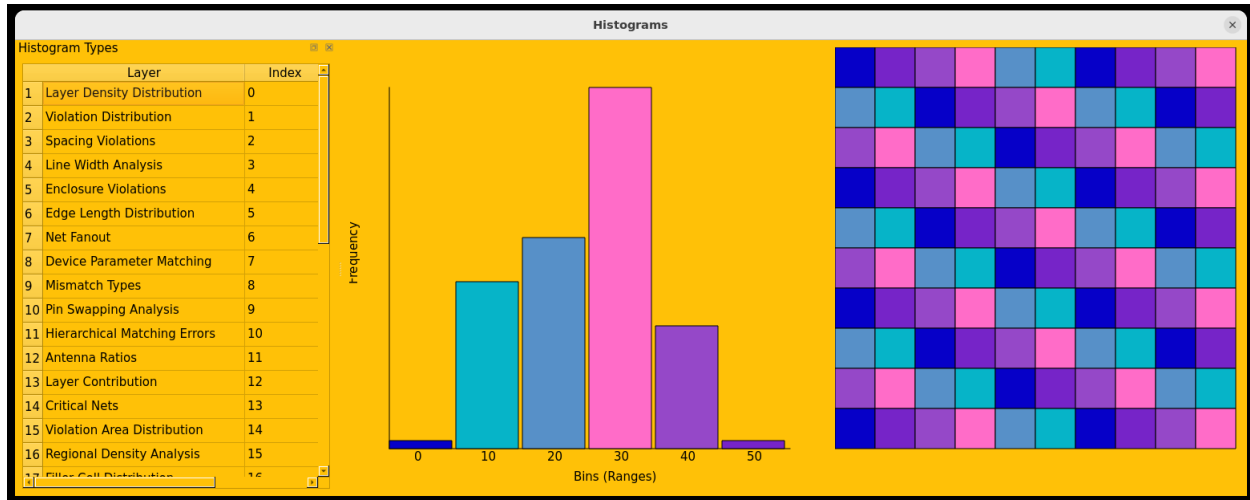


Figure 15. Histogram window. Analysis selector at the left, frequency chart centre, spatial density map at the right.

Available analyses include layer density distribution, violation distribution, spacing distribution, line width analysis, enclosure violations, edge length distribution, net fanout, device orientation matching, antenna ratio, hierarchical matching errors, pin swapping analysis, violation area distribution and regional density analysis. Selecting an analysis whose data the current run did not produce shows an empty chart rather than an error.

# 8 AMS Layout Editor

The AMS Layout Editor edits geometry inside LVR, removing the round trip to a separate layout tool. A violation can be inspected, corrected and re-verified in one session. The editor is themed teal to distinguish it unmistakably from the amber verification surfaces.

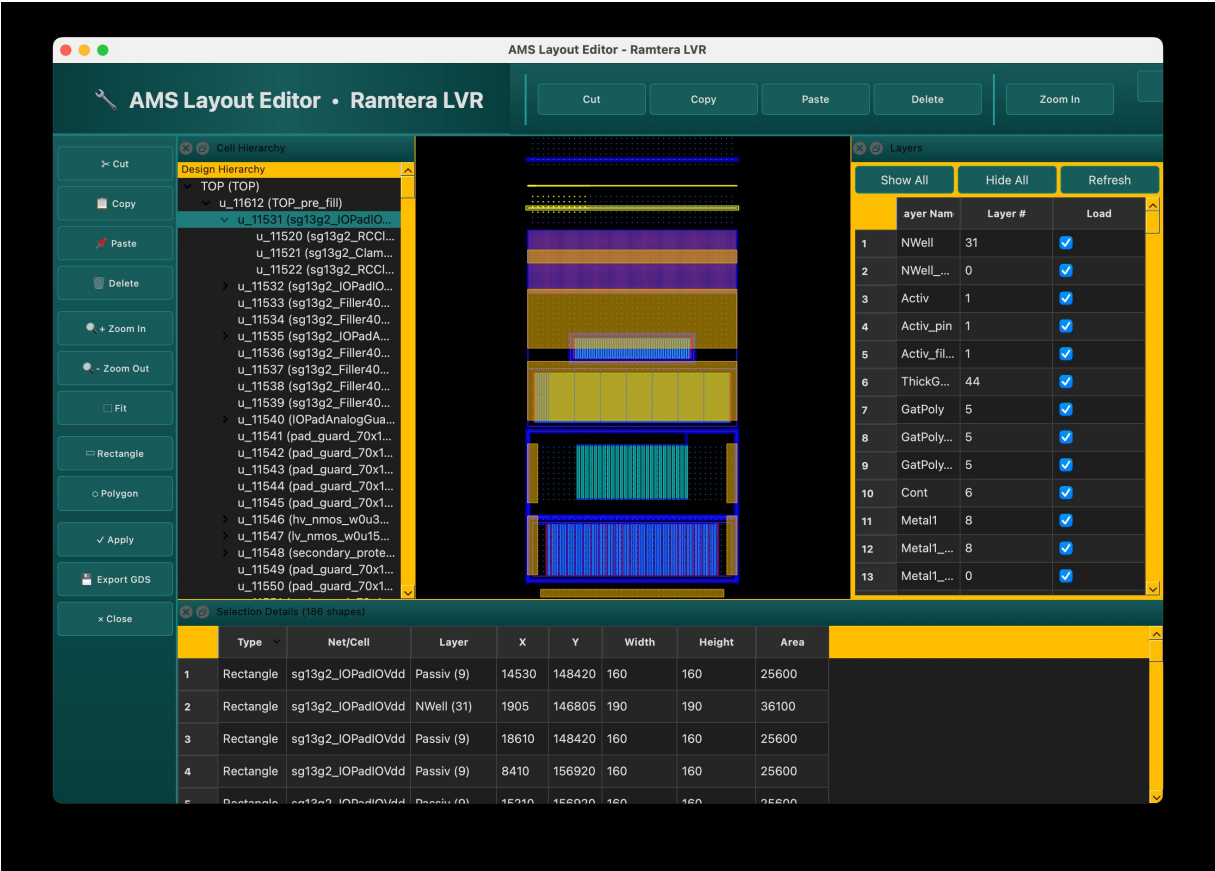


Figure 16. AMS Layout Editor. Top banner and quick-action toolbar, left tool palette, Cell Hierarchy tree, layout canvas, Layers dock and Selection Details table.

## 8.1 Tool palette

The left palette consolidates every editing operation into one vertical column, grouped by function.

| Element                     | Function                                                                                |
|-----------------------------|-----------------------------------------------------------------------------------------|
| Cut / Copy / Paste / Delete | Clipboard operations on the current selection.                                          |
| Zoom In / Zoom Out / Fit    | View controls.                                                                          |
| Rectangle                   | Creates a rectangle. Opens the Create Rectangle dialog.                                 |
| Polygon                     | Creates an arbitrary polygon by vertex placement.                                       |
| Apply                       | Commits pending edits to the database, making them visible to the verification engines. |
| Export GDS                  | Writes the edited database to a GDSII file.                                             |

| Element | Function                                             |
|---------|------------------------------------------------------|
| Close   | Exits the editor and returns to the main LVR window. |

The quick-action toolbar across the top duplicates Cut, Copy, Paste, Delete, Zoom In, Zoom Out and Fit, so that the most frequent operations are reachable without crossing the window.

## 8.2 Creating geometry

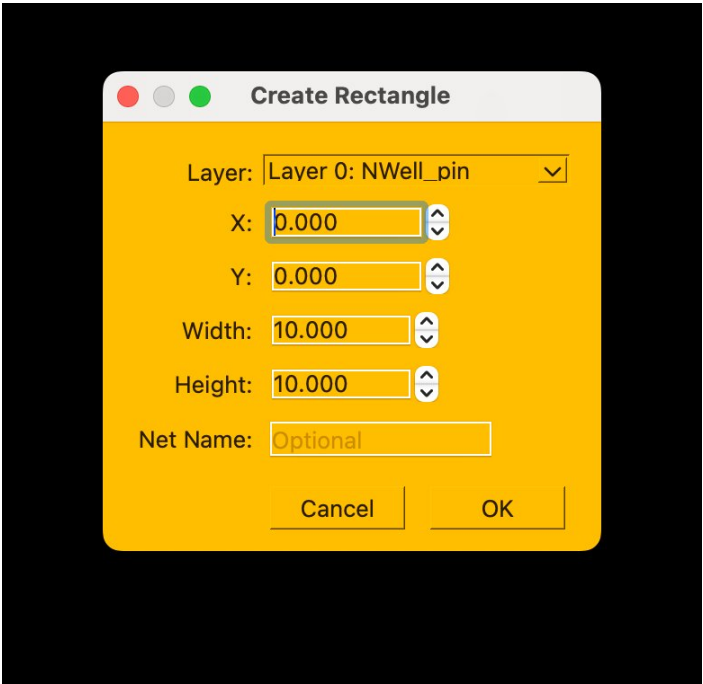


Figure 17. Create Rectangle dialog. Layer selector showing layer number and name, X and Y origin, width and height, and an optional net name.

Coordinates and dimensions are entered at database-unit resolution, so geometry can be placed exactly rather than approximately. The optional Net Name field associates the new shape with a net, which is what allows the change to be checked by LVS on the next run rather than appearing as unconnected metal.

## 8.3 Hierarchy navigation



Figure 18. Cell Hierarchy tree. Each node shows the instance name followed by the cell name in parentheses.

The tree gives a navigable view of the whole design. Expanding a node reveals its children; right-clicking offers View/Edit This Cell, Expand All and Collapse All. Selecting a cell isolates it for editing, which is how a specific block is debugged inside a large SoC without loading everything else.

## 8.4 Editing an instantiated cell

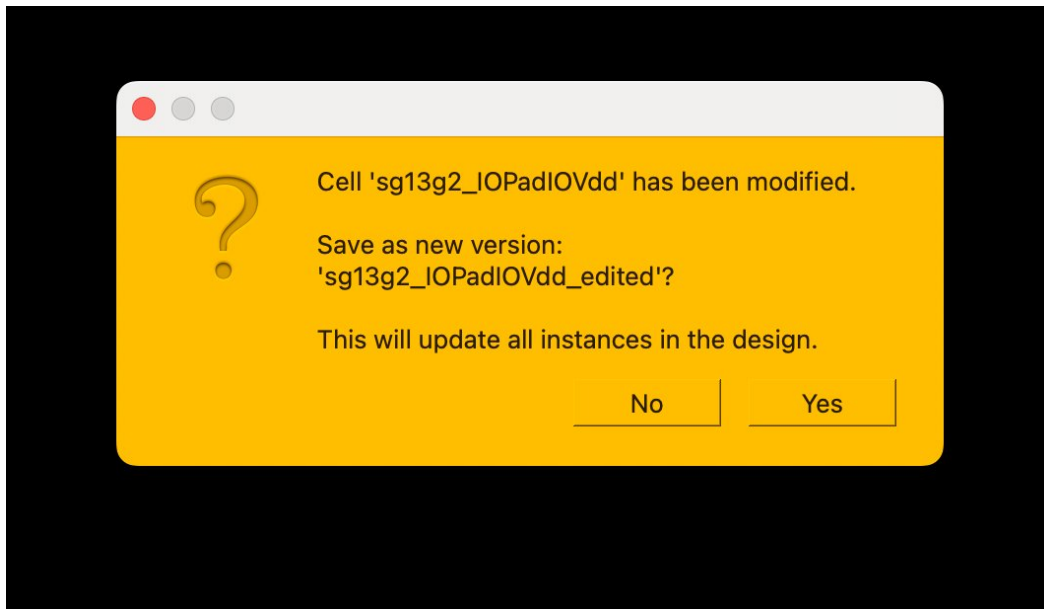


Figure 19. Sub-cell modification prompt. Editing a cell that has parent instances offers to save the result as a new version.

When a cell instantiated more than once is modified, LVR offers to save the result as a new version with an `_edited` suffix rather than altering the original. Confirming updates every instance to reference the new version; the original cell is left untouched, so library integrity is preserved. This automates the export, replace and re-import cycle that the same change would require in a Calibre or IC Validator flow.

## 8.5 Layer management



Figure 20. Layers dock with Show All, Hide All and Refresh, and a per-layer Load checkbox.

Layers load on demand when checked, which keeps memory bounded on large designs. Layer names follow the foundry design rule manual, and the table distinguishes drawing layers from their pin, text and fill counterparts on the same layer number.

8.6 Selection Details

| Selection Details (38 shapes) |           |          |             |          |       |         |        |            |
|-------------------------------|-----------|----------|-------------|----------|-------|---------|--------|------------|
|                               | Type      | Net/Cell | Layer       | X        | Y     | Width   | Height | Area       |
| 1                             | Rectangle | —        | Metal2 (10) | -618000  | 50400 | 3000    | 108000 | 324000000  |
| 2                             | Rectangle | —        | Metal1 (8)  | -618000  | 50400 | 86000   | 108000 | 2147483647 |
| 3                             | Rectangle | —        | Metal2 (10) | -1096800 | 29200 | 1043600 | 4200   | 2147483647 |
| 4                             | Rectangle | —        | Metal1 (8)  | -1096800 | 29200 | 1043600 | 4200   | 2147483647 |

Figure 21. Selection Details table, reporting one row per selected shape.

| Element  | Function                                   |
|----------|--------------------------------------------|
| Type     | Rectangle, Polygon or Path.                |
| Net/Cell | Net name or owning cell instance.          |
| Layer    | Layer name with its number in parentheses. |

| Element       | Function                                |
|---------------|-----------------------------------------|
| X, Y          | Bottom-left corner in database units.   |
| Width, Height | Bounding box dimensions.                |
| Area          | Computed area in square database units. |

Columns are sortable, multiple selection is supported, and selecting a row highlights the corresponding shape in the canvas. The panel hides when nothing is selected.

## 8.7 Editor limitations

| Item                 | Behaviour                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Undo / redo scope    | Undo and redo apply to editor operations within the current session. They do not revert changes already committed with Apply. |
| Formats              | GDSII and OASIS.                                                                                                              |
| Coordinate precision | 1 nm; the database unit is configurable.                                                                                      |
| Layer count          | 4096 maximum.                                                                                                                 |
| Hierarchy depth      | Unlimited.                                                                                                                    |
| Platform             | Linux and macOS 11 or later. Qt 6 with hardware acceleration.                                                                 |
| Memory               | 16 GB minimum; 64 GB recommended for full-chip designs.                                                                       |

# 9 Installer

LVR ships with a graphical installer built on the Qt Installer Framework. The navigation list at the left shows progress through the six steps.

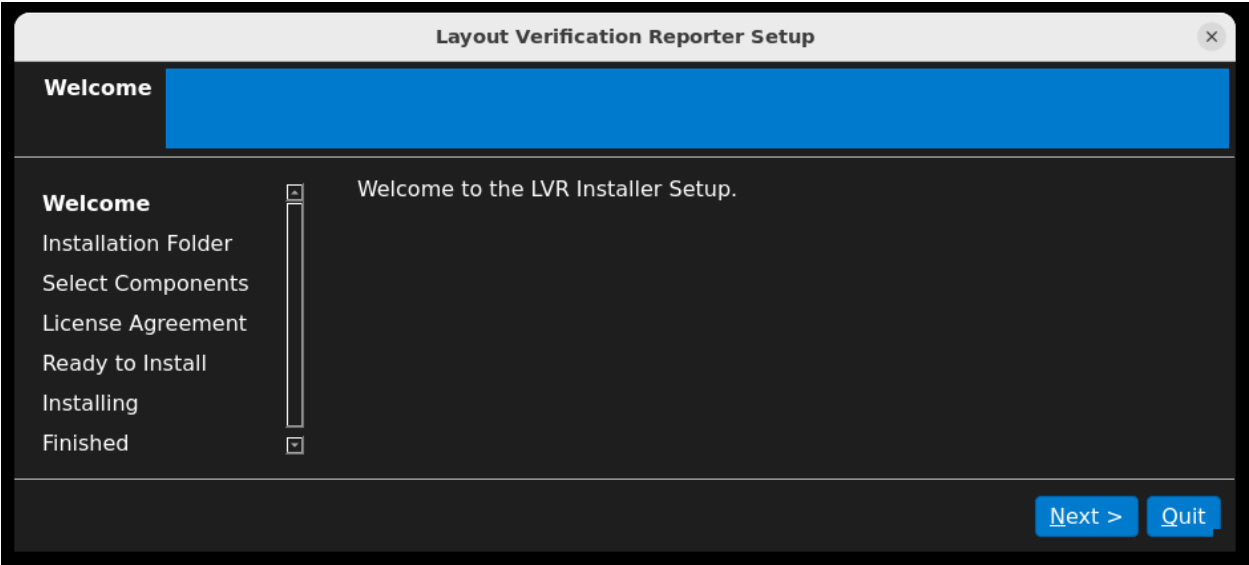


Figure 22. Installer welcome page.

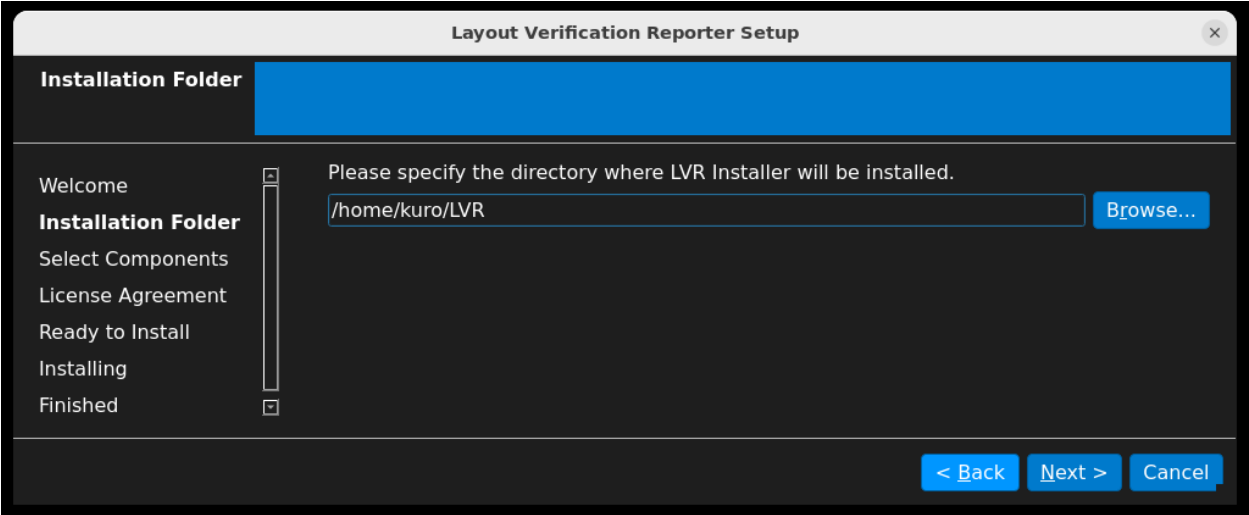


Figure 23. Installation folder selection. The default is /opt/lvr or a path under the user's home directory.

| Step | Page                | Action                                                                                          |
|------|---------------------|-------------------------------------------------------------------------------------------------|
| 1    | Welcome             | Click Next.                                                                                     |
| 2    | License Agreement   | Accept the terms to continue.                                                                   |
| 3    | Installation Folder | Choose a path the user can write to. Default <code>/opt/lvr</code> or <code>\$HOME/LVR</code> . |

| Step | Page                    | Action                                                                                                                    |
|------|-------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 4    | Dependency Installation | On Red Hat-based systems the installer runs <code>dnf</code> or <code>yum</code> to install the Qt runtime, Tcl and Perl. |
| 5    | Select Components       | All components are preselected. Click Next.                                                                               |
| 6    | Finished                | Click Finish.                                                                                                             |

After installation the executable is at `/opt/lvr/bin/LVR` and the environment can be prepared with:

```
source /opt/lvr/setup_env.sh
```

## Appendix A Interface to Command Equivalents

Every interface control has a command equivalent, so a session established interactively can be reproduced as a script. This table gives the mapping for the controls most often used.

| Interface control                                        | Command equivalent         |
|----------------------------------------------------------|----------------------------|
| Configuration & Run Settings & Top Cell Name             | set_top                    |
| Configuration & Run Settings & Number of Cores           | set_num_cores              |
| Configuration & Run Settings & Macro Timeout             | set_lvs_macro_timeout      |
| Configuration & Run Settings & Instance Matching Timeout | set_lvs_inst_match_timeout |
| Configuration & Rules & Technology                       | set_technode               |
| Configuration & Rules & LRF File                         | read_lrf                   |
| Configuration & Input & Module-SPICE File                | set_lvs_spice_file         |
| Configuration & Input & Verilog Netlist                  | set_lvs_verilog_file       |
| Configuration & Input & Macro CDL Library                | set_lvs_macros_cdl_file    |
| Configuration & Input & GDS File1                        | read_gds                   |
| Configuration & Output & Error Report File               | set_lvs_report_file        |
| Configuration & Output & Markers File                    | set_lvs_marker_file        |
| Configuration & Options & Enable Ports                   | lvs_enable_ports           |
| Configuration & Options & Check Shorts                   | lvs_check_shorts           |
| Configuration & Options & Check Open                     | lvs_check_open             |
| Configuration & Options & Check Macro                    | lvs_check_macro            |
| Configuration & Options & Check Unconnected Pins         | lvs_check_unconnected_pins |
| Configuration & Options & Use DATC Flow                  | lvs_use_datc_flow          |
| Control Panel & single layer visible                     | gui_display_single_layer   |
| Control Panel & all layers visible                       | gui_display_all_layers     |
| Preferences & histogram bin count                        | set_num_bins               |
| XOR results loaded into canvas                           | set_gui_xor_result         |
| Action column & Write GDS                                | write_gds                  |
| Opening the interface                                    | load_gui                   |
| Suppressing the interface                                | cmd_line_only              |