



SIEMENS EDA

Calibre® RealTime Digital User's Manual

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Chapter 1

Calibre RealTime Digital Introduction

The Calibre® RealTime Digital interface integrates flat Calibre® nmDRC™ with supported place and route design tools so that a Calibre nmDRC run can be started directly from the design tool. Calibre RealTime Digital loads the complete Calibre rule file, but “check recipes” give you control over what checks are executed for each Calibre run. Calibre nmDRC is run on a selected region of the design.

The output of a Calibre RealTime Digital run is the set of results from the rule checks that were run. These results are highlighted in the design tool, providing immediate feedback if a design change violates a rule check. Only results from the main results database (RDB) are included; auxiliary or side RDBs are not created.

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Calibre RealTime Digital Requirements

Certain requirements for the design tool, environment variables, and Calibre rule file must be met before running Calibre RealTime Digital.

- **Design Tool Requirements**

Calibre RealTime Digital is supported for the following design tools:

- Cadence® Innovus™ version 16.22, 16.23, 16.24, or 17.11 with Calibre version 2017.4 or later. See “[Calibre RealTime Digital in Cadence Innovus](#)” on page 83.

The Calibre integration must be loaded; see “[Tcl Script for Calibre Interface to Cadence Innovus](#)” on page 85.

- Synopsys® IC Compiler™ II version M-2016.12-SP2 or later, with Calibre version 2018.2_41 or later. See “[Calibre RealTime Digital in IC Compiler II](#)” on page 125.

The Calibre integration must be loaded; see “[Tcl Script for Calibre Interface to IC Compiler II](#)” on page 127.

- **Calibre Requirements**

- Calibre version 2017.3 or later; a later version of Calibre may be required depending on the specific design tool version or for specific Calibre RealTime features.

- The environment variable MGC_HOME or CALIBRE_HOME is set to the location of the Calibre software tree. See “[Setting the CALIBRE_HOME Environment Variable](#)” in the *Calibre Administrator’s Guide* for details.
- A writable directory for temporary files created by Calibre RealTime Digital. By default the temporary directory is `$MGC_HOME/tmp`; to use a different location, define the environment variable MGC_TMPDIR to point to the desired temporary directory.
- The Calibre RealTime Digital product license. The license is acquired when the Calibre RealTime Digital Toolbar is displayed.

Additional Calibre licenses are required for some Calibre features. See the section “[Licensing Physical Verification Products](#)” in the *Calibre Administrator’s Guide* for details.

- **Rule File Requirements**

An SVRF rule file suitable for Calibre nmDRC is required.

A [Layer](#) statement specifying a name for an original layer is required to use the “Visible layer checks” and “Visible layer only checks” selections in the Edit Recipe dialog box. See “[Check Recipes in Calibre RealTime Digital](#)” on page 61 for more information.

See “[Differences Between Calibre nmDRC and Calibre RealTime Digital](#)” on page 16 for information on supported and unsupported SVRF statements and operations.

Differences Between Calibre nmDRC and Calibre RealTime Digital

The Calibre RealTime Digital platform integrates flat Calibre nmDRC with supported design tools so that Calibre nmDRC can be run directly from the design tool. Calibre and Calibre RealTime Digital differ in run mode support, layout processing, SVRF command support, and result output.

Calibre RealTime Digital is designed to work best on a limited region of the layout and provide immediate results. Calibre RealTime Digital is not intended for sign-off or tapeout DRC verification.

Calibre RealTime Digital differs from a command-line invocation of Calibre nmDRC as follows:

Run Mode and Execution

- Calibre RealTime Digital runs in flat mode.
- Check selection is controlled by check recipes in Calibre RealTime Digital.

[DRC \[Un\]Select Check](#) statements are not obeyed except when using the “Checks selected in the rules file” check recipe; see “[Check Selection Recipes in Calibre RealTime Digital](#)” on page 61.

Layout Processing

- Property information included with a layout is not exported to Calibre RealTime Digital.

As a result, operations that make use of user-defined property attachments in the layout do not perform as expected. For example, DFM Property operating on properties in the rule file works, but DFM Property operating on user-defined property attachments in the layout does not work.

SVRF Support

Complete details for SVRF command support are discussed in “[Support for SVRF Statements in Calibre RealTime Digital](#)” on page 267.

DRC Results

- Auxiliary or side RDBs are not generated. For example, the Density operation can be used to generate results output but not to generate a side RDB (the RDB keyword).
- Density and connectivity checks that are run on a small region of the design may give different results than a similar run in batch Calibre or a run on the complete design.

Density and connectivity checks are intended to run on the complete design, while Calibre RealTime Digital is intended to run on a limited region of the design. See “[Density Checks in Calibre RealTime Digital](#)” on page 24 for more information.

If Density checks are run, then the window size returned by Calibre RealTime Digital is bigger than the window size returned by a Calibre batch run. This difference does not affect the accuracy of the results.

Caution



A tapeout or sign-off Calibre nmDRC run should always be done using batch Calibre to ensure that all results are reported.

Terms and Definitions in Calibre RealTime Digital

Certain terms and concepts, such as check selection recipe, halo, run configuration, and run context, are used when discussing Calibre RealTime Digital operation.

Run Configuration

A run configuration is the settings in the Calibre RealTime Options dialog box that control a run, such as the rule file, layer map file, and check recipe. Multiple run configurations can be defined. The run configuration can be selected in the toolbar, making it easy to switch between configurations.

Multiple run configurations can be used in the following configuration run modes:

- **Single** — Run only the currently selected configuration when a run is started.
- **Serial** — Run each configuration selected in the “Configuration Run Control” dialog box in order.

See [“Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus”](#) on page 91.

Check Selection Recipe

A check selection recipe is a set of rules for selecting the checks to execute for a Calibre nmDRC run. See [“Check Selection Recipes in Calibre RealTime Digital”](#) on page 61 for more information.

Session Configuration File

Calibre RealTime Digital run configurations, option settings, and check recipe definitions are saved in the Calibre RealTime Digital session configuration file. The configuration file is saved automatically and named *.realtime.cfg*. The configuration file is saved in your home directory by default; however, you may specify a different location for the configuration file.


See [“Session Configuration File in Calibre RealTime Digital”](#) on page 26.

Halo

Halos are used to ensure that new errors caused by changes in the geometry get reported, and false errors caused by edge effects are not reported. A halo expands the area around a region selected for a DRC run so that surrounding geometries are included. Halos are used for all Calibre RealTime Digital runs.

The optimum halo size depends on the technology node and the typical constraints being checked in the run. A halo size of 1 user unit (the default) is usually appropriate for 45 nm technology; a smaller halo size is probably needed for smaller technology nodes. See the section [“Halo Usage in Calibre RealTime Digital”](#) on page 21 for more information.

Run Context

The run context refers to the window for the Calibre nmDRC run, including information such as the library, cell, and view, depending on the design tool. You can click the  button in the toolbar to zoom to the window for the most recent Calibre RealTime Digital run.

DRC Run Type

Calibre RealTime Digital runs flat Calibre nmDRC and executes the rule checks selected in the check recipe for the current run configuration. Calibre RealTime Digital runs Calibre nmDRC on the area visible in the design window extended by the halo region. All shapes which intersect the resulting region are included in the run.

- **Run DRC in Window**— Runs Calibre nmDRC on the area visible in the design window extended by the halo region. All shapes which intersect the resulting region are included in the run.
- **Run DRC in Cell**— Runs Calibre nmDRC on the open block.
- **Run DRC in Area** — Runs Calibre nmDRC on an area you select in the design tool. Only supported in Synopsys IC Compiler II.

The maximum number of polygons that Calibre RealTime Digital processes can be set in the Calibre RealTime Options dialog box; the default is 50,000, and the maximum is 3 million.

Documentation Syntax Conventions

The command descriptions use font properties and several metacharacters to document the command syntax.

Table 1-1. Syntax Conventions

Convention	Description
Bold	Bold fonts indicate a required item.
<i>Italic</i>	Italic fonts indicate a user-supplied argument.
Monospace	Monospace fonts indicate a shell command, line of code, or URL. A bold monospace font identifies text you enter.
<u>Underline</u>	Underlining indicates either the default argument or the default value of an argument.
UPPercase	For certain case-insensitive commands, uppercase indicates the minimum keyword characters. In most cases, you may omit the lowercase letters and abbreviate the keyword.
[]	Brackets enclose optional arguments. Do not include the brackets when entering the command unless they are quoted.
{ }	Braces enclose arguments to show grouping. Do not include the braces when entering the command unless they are quoted.
‘ ’	Quotes enclose metacharacters that are to be entered literally. Do not include single quotes when entering braces or brackets in a command.
or	Vertical bars indicate a choice between items. Do not include the bars when entering the command.
...	Three dots (an ellipsis) follows an argument or group of arguments that may appear more than once. Do not include the ellipsis when entering the command.
Example: DEvice { <i>element_name</i> [‘(’ <i>model_name</i> ‘)’] } <i>device_layer</i> { <i>pin_layer</i> [‘(’ <i>pin_name</i> ‘)’] ... } [‘<’ <i>auxiliary_layer</i> ‘>’ ...] [‘(’ <i>swap_list</i> ‘)’ ...] [<u>BY NET</u> BY SHAPE]	

Chapter 2

Calibre RealTime Digital Basics

All integrations of Calibre RealTime Digital share some basic methodology, such as halo usage and configuration file usage. Some integrations support API control for setting options and controlling environment variables.

See “[Check Selection Recipes in Calibre RealTime Digital](#)” on page 61 for information on check selection recipes.

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Halo Usage in Calibre RealTime Digital

Halos ensure that new errors caused by changes in the geometry are reported, and false errors caused by edge effects are not reported. Halos are used for all Calibre RealTime Digital runs. Each time Calibre RealTime Digital runs Calibre nmDRC, a halo expands the area around the region selected for the run so that surrounding geometries are included.

In order to remove false errors due to edge effects, a “trim region” is defined and results that are fully outside the trim region are discarded.

The different halo usages and trim regions are summarized here:

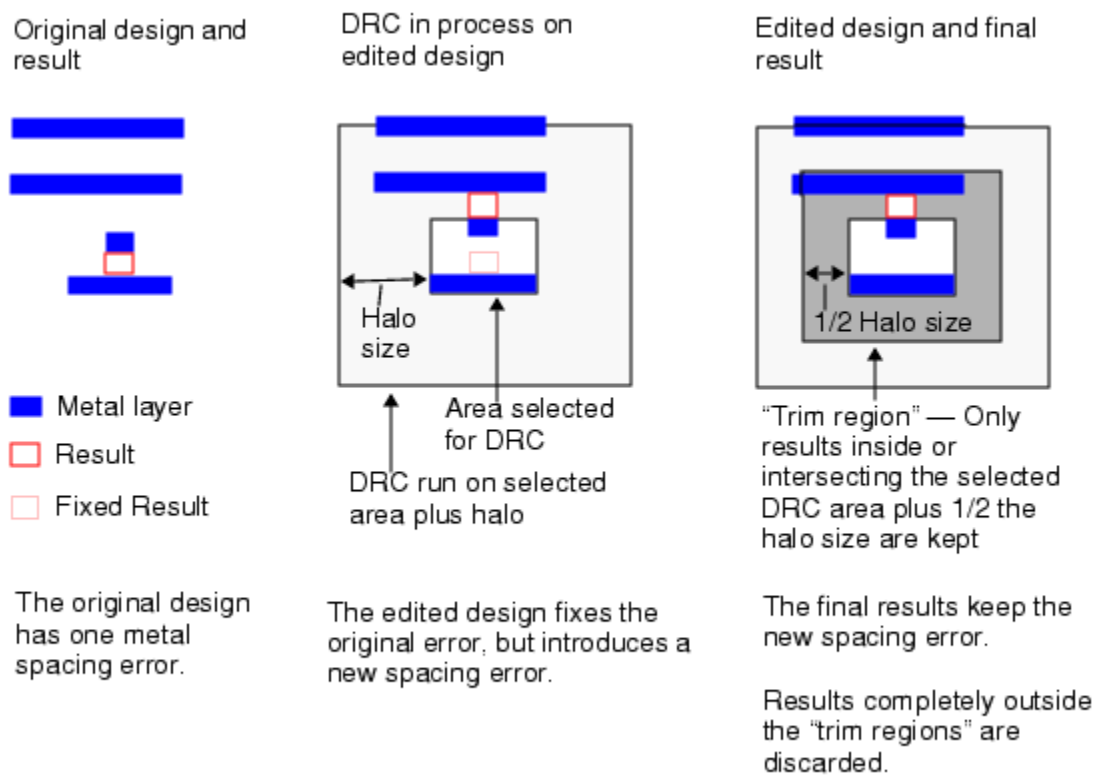
- **Standard Halo Usage** — The trim region is defined as the region selected for the DRC run *plus half the specified halo size*. Results that are fully outside the trim region are discarded.
- **Reduced Trim Region** — The trim region is equal to the region for the DRC run when the environment variable MGC_REALTIME_USE_WINDOW_AS_TRIM_REGION is set.

- **Keep Enclosing Results** — Results that fully enclose the trim region are discarded by default. Enclosing results are included when the environment variable `MGC_REALTIME_INCLUDE_RESULTS_ENCOMPASSING_WINDOW` is defined.

Standard Halo Usage

Standard halo usage is shown in the following figure. Standard halo usage is in effect when no environment variables related to halo and trim region are set. The trim region is set to the region selected for the DRC run plus half the specified halo size, and results that are fully outside the trim region are discarded.

Figure 2-1. Calibre RealTime Digital Operation With Halo



Without a halo, new errors introduced by a design change may not be detected; however, a halo that is too small may cause false errors to be reported.

A halo size of 1 user unit (the default) is usually appropriate for 45 nm technology; a smaller halo size is typically needed for smaller technology nodes. The halo size is set in the Calibre RealTime Options dialog box.

Reduced Trim Region

Set the environment variable `MGC_REALTIME_USE_WINDOW_AS_TRIM_REGION` to define the trim region as equal to the region for the DRC run.

When `MGC_REALTIME_USE_WINDOW_AS_TRIM_REGION` is defined, only DRC results that are inside or overlap the window for the DRC run are kept. Referring to the last diagram in [Figure 2-1](#), the new result is discarded if the trim region is set equal to the region of the DRC run.

Note



The mode with `MGC_REALTIME_USE_WINDOW_AS_TRIM_REGION` defined is similar to what is used by Calibre Interactive Area DRC runs.

Keep Enclosing Results

Results that fully enclose the trim region are discarded by default. You can include such results by defining the environment variable `MGC_REALTIME_INCLUDE_RESULTS_ENCOMPASSING_WINDOW`.

For example, if the new result is a polygon that surrounds the trim region, it is discarded unless you define `MGC_REALTIME_INCLUDE_RESULTS_ENCOMPASSING_WINDOW`.

Density Checks in Calibre RealTime Digital

As with other rule checks, Density checks in Calibre RealTime Digital analyze the visible region in the layout window plus a halo region or the current cell, depending on whether **Run DRC in Window** or **Run DRC in Cell** is clicked. Although the Density results are accurate for the specific run context, the results may differ from those of a Calibre batch run or a Calibre RealTime Digital run with a different run context.

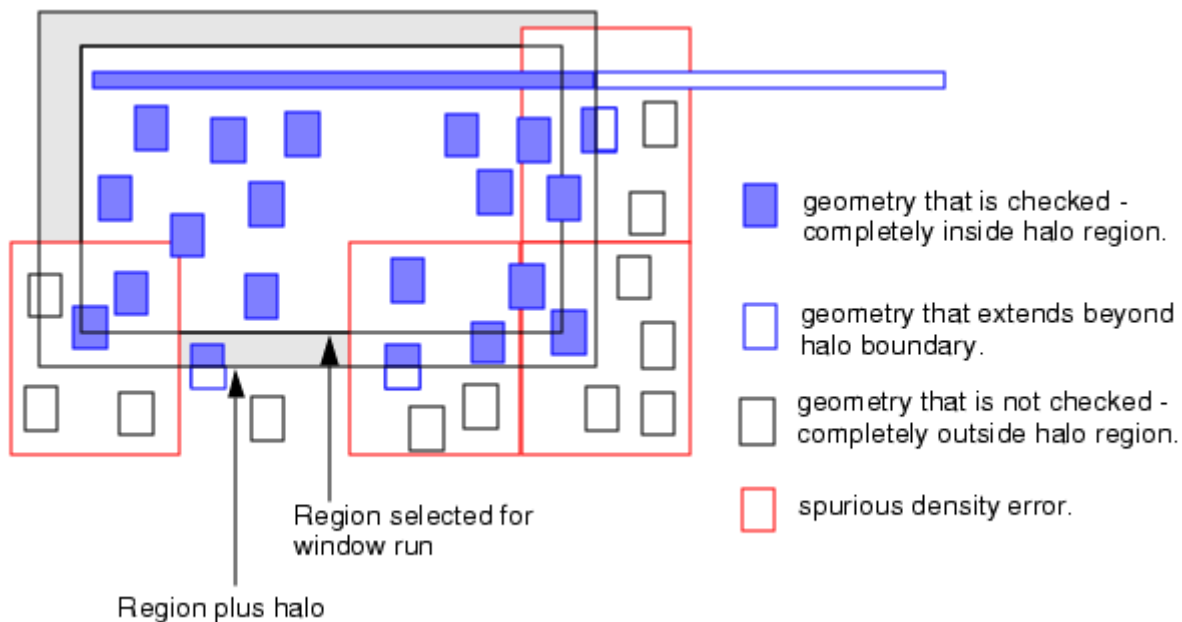
Spurious Boundary Results From Density Checks in Calibre RealTime Digital 24

Spurious Boundary Results From Density Checks in Calibre RealTime Digital

Density checks may give spurious results in Calibre RealTime Digital if they are run on a small region of the design.

The following figure illustrates how spurious results can occur from a [Density](#) check.


Figure 2-2. Spurious Density Results in Calibre RealTime Digital Window Run



If a polygon extends outside the halo region, only the portion of the geometry within the halo region is analyzed.

In a typical scenario, a Calibre run on the complete design may return zero density results. However, a Calibre RealTime Digital run on a small region of the design may return spurious density results at the boundaries of the region, and these results are kept if they intersect the

“trim region” (see [Figure 2-1](#) on page 22 in the topic “[Halo Usage in Calibre RealTime Digital](#)”). Results completely outside the trim region are discarded.

The  toolbar button zooms to the window region for the most recent Calibre RealTime Digital run. If the window returns to the complete design or any context that includes the region of these spurious results, the spurious results are counted in the total results reported for the context.

Thus, the number of results for the design may appear to increase when density or connectivity checks are included in a run done on a small region of the design.

Session Configuration File in Calibre RealTime Digital

Calibre RealTime Digital run configurations, option settings, and check recipe definitions are saved in the Calibre RealTime Digital session configuration file. The configuration file is saved automatically and named `.realtime.cfg`. The configuration file is saved in your home directory by default; however, you may specify a different location for the configuration file.

You can delete `.realtime.cfg` to return to the default session configuration; however, this will also delete the custom check recipe definitions contained in the configuration file and any [Run Configurations](#).

Calibre RealTime Digital supports multilevel session configuration files, which enable you to read configuration files from multiple directories and define the order of precedence. Multilevel configuration files can be used by an administrator group to manage options settings for project teams.

Caution



Editing the session configuration file is not recommended unless setting up multilevel configuration files.

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Location of the Calibre RealTime Digital Session Configuration File

The Calibre RealTime Digital session configuration file is saved in your home directory by default. It can also be saved in a user-defined directory. The configuration file is named `.realtime.cfg`.

The location of the configuration file is determined as follows:

- **Home directory** (default) — Your home directory is the default location of the configuration file. No action is needed if you are not using multilevel configuration file support.

If you are using multilevel configuration file support, `$HOME` must be listed as one of the directories in `MGC_REALTIME_CONFIG_DIRS`; see “[Environment Variable for Multilevel Session Configuration File in Calibre RealTime Digital](#)” on page 28.

- **User-defined directory** — Include `WRITE=directory` in the definition of `MGC_REALTIME_CONFIG_DIRS` to instruct Calibre RealTime Digital to write the updated configuration file to *directory*.

For example, to save the configuration file to the */proj/design1/RTcfg* directory:

```
setenv MGC_REALTIME_CONFIG_DIRS WRITE=/proj/design1/RTcfg
```

In the preceding example the configuration file is both read from and saved to the directory specified by `WRITE=`. (Multilevel configuration files are not specified in the preceding example, however, `WRITE=` is supported in multilevel configuration file support.)

Multilevel Session Configuration File Support in Calibre RealTime Digital

Calibre RealTime Digital supports reading the session configuration file from a specified directory or multiple directories. If configuration files are located in multiple directories, the order of precedence is set with the environment variable `MGC_REALTIME_CONFIG_DIRS`. This feature allows system and project administrators to define settings for a group or project while still allowing settings to be adjusted by individual users.

You can also save the session configuration file in a directory other than your home directory.

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Environment Variable for Multilevel Session Configuration File in Calibre RealTime Digital

The `MGC_REALTIME_CONFIG_DIRS` environment variable specifies a list of one or more directories separated by a colon (:), where each directory contains a `.realtime.cfg` file. The order of precedence is from left to right, as with the Unix `$PATH` variable.

`MGC_REALTIME_CONFIG_DIRS` also specifies the location of the writable session configuration file for saving updated configuration settings.

The following two examples explain the use of `MGC_REALTIME_CONFIG_DIRS`:

Example 1 — Writable configuration file in `$HOME`:

```
setenv MGC_REALTIME_CONFIG_DIRS dir1:dir2:$HOME
```

Example 2 — Writable configuration file in user-defined directory:

```
setenv MGC_REALTIME_CONFIG_DIRS dir1:dir2:WRITE=cfg_dir
```

Each of the directories `dir1`, `dir2`, `$HOME`, and `cfg_dir` contains a `.realtime.cfg` file.

Precedence

The order of precedence is from left to right. In both examples the settings from `dir1` take precedence over those from `dir2` if there is a conflict.

Location of Writable Configuration File

The writable configuration file is specified with either `$HOME` (Example 1) or `WRITE=cfg_dir` (Example 2). Changes to the Calibre RealTime Digital configuration settings are saved to this directory, subject to the rules described in “Saving Options.” If both `$HOME` and the `WRITE`

keyword are specified, the WRITE keyword takes precedence. If MGC_REALTIME_CONFIG_DIRS is defined and neither *\$HOME* or the WRITE keyword is specified, then changes to the configuration are not saved.

Saving Options

In general, and referring to Example 1, the user may change any option during the Calibre RealTime Digital session, but only options that are not defined in *dir1* or *dir2* are saved to the configuration file in *\$HOME*.

The following statements describe in detail the rules for saving changes to Calibre RealTime Digital settings:

- Individual options are saved only if they are not defined in a configuration file that has higher precedence than the writable configuration file.

If the writable configuration file includes an option that is overridden by a configuration file with higher precedence, then the option is removed from the writable configuration file the first time it is saved.

- Individual options that are not defined in any configuration file are saved to the writable configuration file.

Options not defined in any configuration file are added to the writable configuration file the first time it is saved. If *\$HOME* or WRITE=*cfg_dir* has higher precedence than other directories listed in MGC_REALTIME_CONFIG_DIRS, this may cause unexpected results.

See [Figure 2-3](#) for an illustration of these rules.

Check Recipe Handling

User-defined check recipes are handled differently depending on whether they are defined in the writable configuration file or in a read-only configuration file.

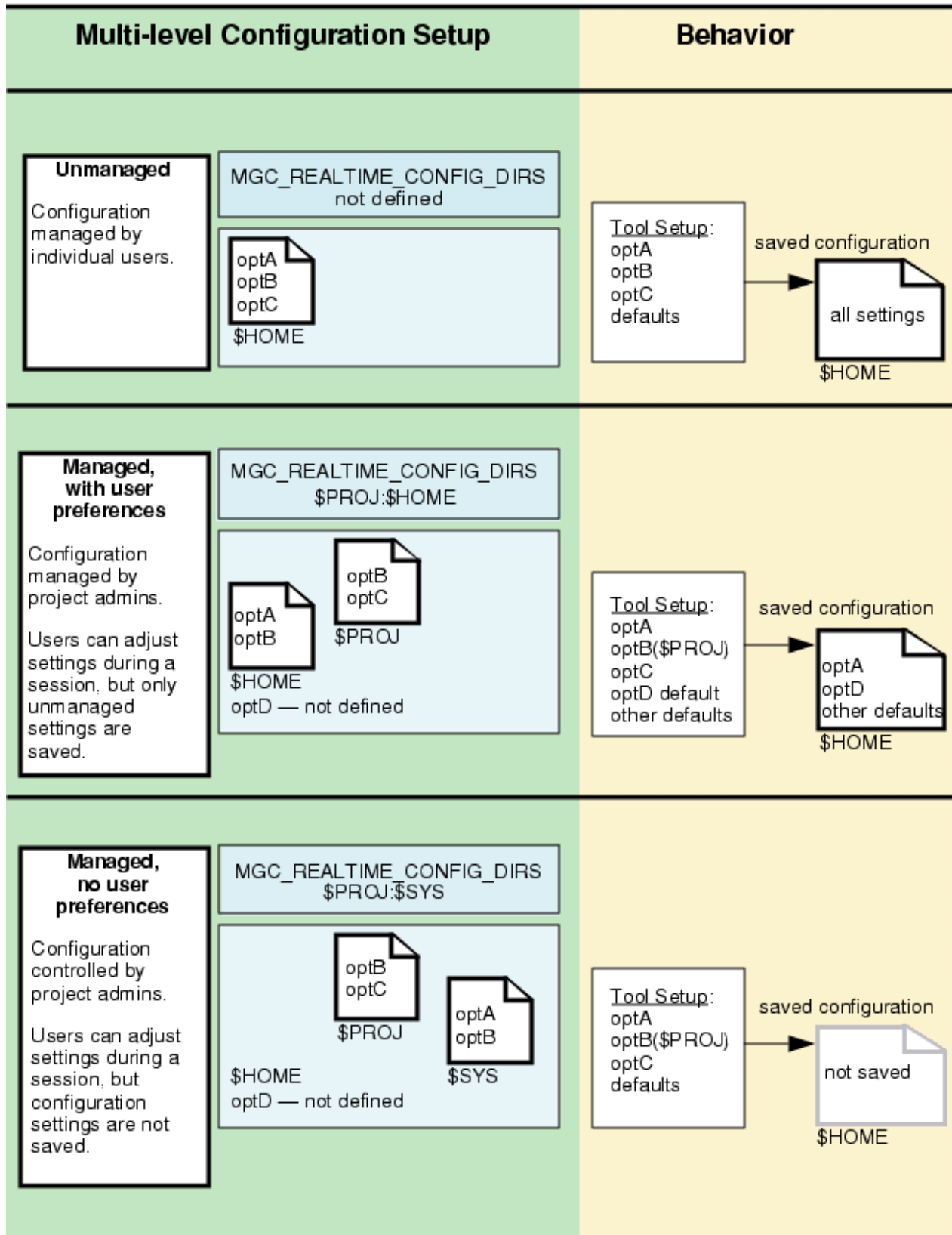
- **Writable configuration file** — Check recipes defined in the writable configuration file may be edited, and these recipes appear in the USER RECIPES category in the “Check selection recipe” dropdown list.
- **Read-only configuration file** — Check recipes defined in read-only configuration files appear in the BUILT-IN RECIPES section and may not be edited. To edit these recipes, create a copy with a unique name and edit and save the recipe as a new user-defined recipe.

Referring to Example 1, check recipes defined in *dir1/.realtime.cfg* appear in the BUILT-IN RECIPES section and cannot be edited. Check recipes defined in *\$HOME/.realtime.cfg* appear in the USER RECIPES section and can be edited. New check recipes are saved to the configuration file in *\$HOME*.

Editing Configuration Files

It is necessary to edit the configuration files to make full use of multilevel configuration files; see “[Creating Multilevel Configuration Files in Calibre RealTime Digital](#)” on page 32 for instructions.

Figure 2-3. Multilevel Configuration Files in Calibre RealTime Digital



Creating Multilevel Configuration Files in Calibre RealTime Digital

You can create and define multilevel configuration files for Calibre RealTime Digital. This allows Calibre RealTime Digital to read settings from more than one configuration file.

Note



These instructions assume that the writable configuration file is in your *\$HOME* directory. See “[Environment Variable for Multilevel Session Configuration File in Calibre RealTime Digital](#)” on page 28 for information on using the WRITE keyword to specify a different location for the writable configuration file.

Prerequisites

- You are using Calibre RealTime Digital with a design tool that supports multilevel configuration files; see “[Multilevel Session Configuration File Support in Calibre RealTime Digital](#)” on page 28.

Procedure

1. Specify that the configuration file is written to *\$HOME* (the default). For example (in the csh shell):

```
unsetenv MGC_REALTIME_CONFIG_DIRS
```

2. Create the configuration file using the following steps:

- a. Rename the existing configuration file:

```
mv ~/.realtime.cfg ~/.realtime.cfg_saveme
```

This removes the configuration file, which causes Calibre RealTime Digital to open with default settings. If you skip this step, the tool opens with the settings in *\$HOME/.realtime.cfg*, and later steps overwrite the configuration file.

- b. Save a configuration file with your desired settings as follows:
 - i. Invoke your design tool with Calibre RealTime Digital enabled.
 - ii. Open the Calibre RealTime Options dialog box and set options.
 - iii. Create any system-configured check recipes. (Check recipes should always be created and edited using the Calibre RealTime Recipe Editor dialog box.)
 - iv. Delete user-defined check recipes that are not needed.
 - v. Exit Calibre RealTime Digital.
- c. Open the configuration file at *\$HOME/.realtime.cfg* in a text editor. The option settings consist of lines similar to the following:

```
<halo_size>1<halo_size>
```


d. Delete the complete line for option settings that meet the following criteria:

- The option is set by a higher precedence configuration file.
- You are editing a project-level configuration file (one that will not be saved in *\$HOME*), and the option is allowed to be saved by the user.

If you want users to be able to save the active recipe, delete the line starting with `<active_recipe>`; this option is near the end of the configuration file.

e. Save the configuration file to the desired directory with the name *.realtime.cfg*.

3. Repeat Step 2 for as many configuration files as needed.
4. When you are done creating configuration files, place the desired user-level configuration file in *\$HOME* if needed.
5. Define `MGC_REALTIME_CONFIG_DIRS` with the desired precedence for configuration files. For example:

```
setenv MGC_REALTIME_CONFIG_DIRS $PROJ:$HOME
```

where *\$PROJ* defines the project-level location. See [Figure 2-3](#) on page 31 in “[Environment Variable for Multilevel Session Configuration File in Calibre RealTime Digital](#).”

Examples

The following Calibre RealTime Digital Configuration file sets the rule file and layer map file and defines one user recipe. It has one run configuration.

```
<realtime>
<options>
  <version>3</version>
  <multi_config_run_mode>Single</multi_config_run_mode>
  <configurations>
    <Default_configuration>
      <rule_file>/user/45_design/rules</rule_file>
      <layer_map_file>/user/45_design/streamOut.map</layer_map_file>
      <enable_layer_map_file>1</enable_layer_map_file>
      <layer_map_mode>MERGE</layer_map_mode>
      <selected_to_run>1</selected_to_run>
      <active_recipe>Selected_no_dens_conn</active_recipe>
    </Default_configuration>
  </configurations>
  <active_configuration>Default configuration</active_configuration>
```

```
<user_recipes>
  <recipe>
    <name>Selected_no_dens_conn</name>
    <operations>
      <group_unselect>all</group_unselect>
      <group_select>rule_file</group_select>
      <group_unselect>connectivity</group_unselect>
      <group_unselect>density</group_unselect>
    </operations>
  </recipe>
</user_recipes>
</options>
</realtime>
```

To use this configuration file to set project-level defaults, it is placed in the directory */user/45_design*, then multilevel configuration is defined as follows:

```
setenv MGC_REALTIME_CONFIG_DIRS /user/45_design:$HOME
```

When a user starts Calibre RealTime Digital, the rule file and layer map file are set. The recipe *Selected_no_dens_conn* is defined and listed with the built-in recipes; it cannot be edited. The user can change all settings during the Calibre RealTime Digital session, but only settings not defined in the above configuration file are saved to *\$HOME/.realtime.cfg* on exit.

License Timeout for Calibre RealTime Digital

The Calibre RealTime Digital license is checked out when you start a Calibre RealTime Digital run. You can set the timeout period for the Calibre RealTime Digital license. The license timeout period also applies to the Calibre RealTime Results window.

License timeout is set with the following environment variable:

- **MGC_REALTIME_RELEASE_LICENSE_TIME**

Sets the timeout period for the Calibre RealTime Digital license. The license is released after the specified timeout period if there is no activity. The license timeout also applies to the Calibre® RVE™ license used for the Calibre RealTime Results Window.

The default time unit is hours. You can specify the unit of time as hours, minutes, or seconds by appending h, m, or s to the time; a space between the time and the unit indicator is optional. The unit indicator may be a word—only the first character is used, therefore “sec”, “seconds”, and “s” all indicate seconds as the time unit. The “h” to indicate hours is optional, as the default time unit is hours.

The following examples all set a license timeout of 18 minutes:

```
setenv MGC_REALTIME_RELEASE_LICENSE_TIME 0.3
setenv MGC_REALTIME_RELEASE_LICENSE_TIME 18m
setenv MGC_REALTIME_RELEASE_LICENSE_TIME "18 min"
```

The default timeout is 15 minutes if MGC_REALTIME_RELEASE_LICENSE_TIME is not defined. The minimum timeout is also 15 minutes. If a timeout of less than 15 minutes is specified, the timeout is still set to 15 minutes.


Viewing Results in the Calibre RealTime Digital Results Window

You can view results from a Calibre RealTime Digital run in the Calibre RealTime Digital Results window, which is similar to Calibre RVE for DRC. The window includes a tree and details view, a check text pane, and controls for highlighting. Some standard keyboard hotkeys (shortcuts) for highlighting and result navigation are defined.

Prerequisites

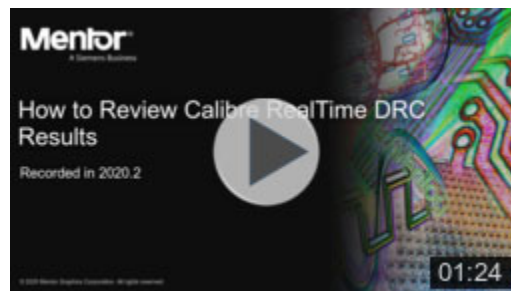
- You have completed a Calibre RealTime Digital run. See [“Running Calibre RealTime Digital in IC Compiler II”](#) on page 135 or [“Running Calibre RealTime Digital in Cadence Innovus”](#) on page 95.
- You have a Calibre RVE license. See [“License Timeout for Calibre RealTime Digital”](#) on page 34 for setting the license timeout period.

Tip

 Enable “Launch RealTime results viewer automatically” at the top of the Calibre RealTime Options dialog box to have the Calibre RealTime Digital Results window open automatically after a run.

Video

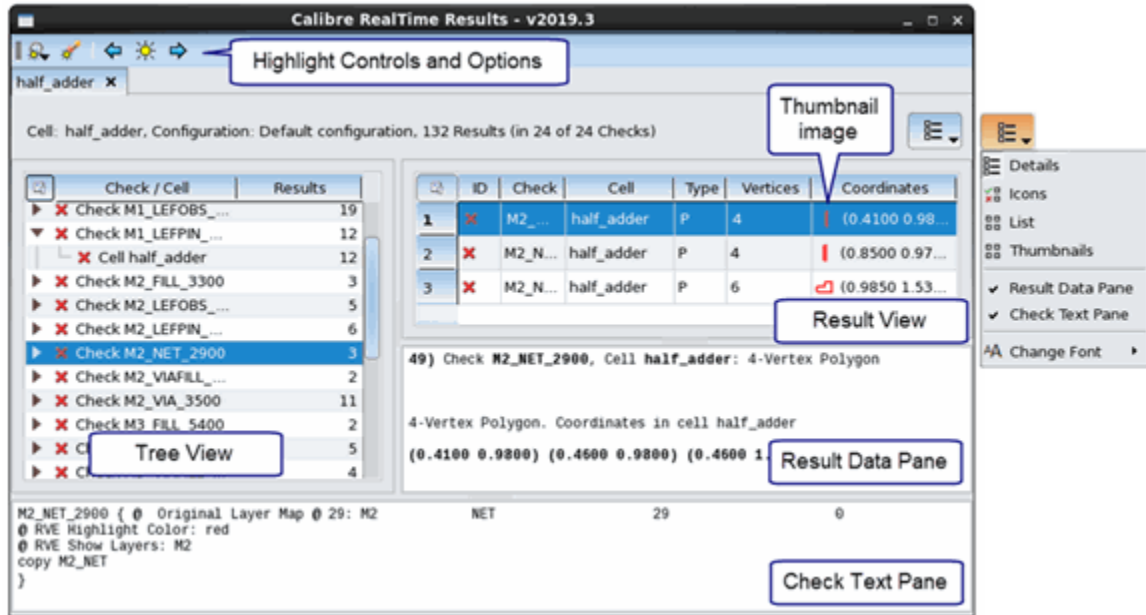
The video “How to Review Calibre RealTime DRC Results” demonstrates basic procedures in reviewing results using the Calibre RealTime results viewer.






Procedure

1. Click the  toolbar icon to open the Calibre RealTime Digital Results window if it did not open automatically.

The results are shown in a window that is similar to Calibre RVE for DRC. Results from different cells are shown in different result tabs. If you are using multiple [Run Configurations](#), results from different configurations are displayed in different result tabs.



2. Set highlighting options with the  dropdown menu in the upper left corner.
3. Set font size with the Change Font option under the  dropdown menu in the upper right corner. The default font size is Normal. Changing this configuration impacts the size of the text in all tabs and panes.
4. Click the icon at the upper right (above the result view) to set the result view format; the icon image indicates the current result view format.
5. To highlight a result, double-click a result in the result view or click the highlight icon .

You can use the following keyboard shortcuts (hotkeys):

Table 2-1. Keyboard Shortcuts in Calibre RealTime Digital Results Window

Keyboard Shortcut	Description
H, h	Highlight the current result, or the selection in the tree view if no result is selected.
F4	Clear highlights.
Left arrow, p, P	Move selection in Result View to previous result (up) and highlight.

Table 2-1. Keyboard Shortcuts in Calibre RealTime Digital Results Window

Keyboard Shortcut	Description
Right arrow, n, N	Move selection in Result View to next result (down) and highlight.
Ctrl-up arrow, Ctrl-down arrow	Move selection in Tree View to next or previous leaf. No selection is made in the Result View.
Ctrl-left arrow, Ctrl-P, Ctrl-p	Move selection in Tree View to previous leaf and highlight the first result in the cluster.
Ctrl-right arrow, Ctrl-N, Ctrl-n	Move selection in Tree View to next leaf and highlight the first result in the cluster.

Option and Environment Variable Control in Calibre RealTime Digital

Calibre RealTime Digital provides commands to control options and environment variables from the command interface of supported design tools. You can also set environment variables to specify the path to certain input files.

For more information on these commands, see the “[Calibre RealTime Digital API Reference](#)” on page 203.

Environment Variables for Calibre RealTime Digital Input Files 39

Environment Variables for Calibre RealTime Digital Input Files

You can set environment variables to specify the path to certain input files for Calibre RealTime Digital. The environment variables apply to all supported design tools.

The following environment variables set the path to the corresponding input file:

MGC_REALTIME_RULE_FILE
MGC_REALTIME_RUNSET_FILE
MGC_REALTIME_CTO_FILE
MGC_REALTIME_LAYER_MAP_FILE
MGC_REALTIME_OBJECT_MAP_FILE

The Calibre Interactive environment variable MGC_CALIBRE_DRC_RUNSET_FILE takes precedence over MGC_REALTIME_RUNSET_FILE. Multiple runset files can be specified using either variable; for example:


```
setenv MGC_REALTIME_RUNSET_FILE "drc_runset_A drc_runset_B"
```

If multiple runsets are used, they are loaded in order and the settings loaded last take precedence.

The environment variables are not expanded when the settings are saved in the configuration file or viewed in the Calibre RealTime Options dialog box. In other words, if MGC_REALTIME_RULE_FILE is set, \$MGC_REALTIME_RULE_FILE appears in the Calibre RealTime Options dialog box for the rule file path.

Environment variable settings for input files take precedence over settings in the Calibre RealTime Digital configuration file.

Note

 These environment variables are not suitable when using multiple configurations; only the first configuration in the list uses the files specified by these environment variables. When using multiple configurations, it is recommended that you disable these environment variables by setting MGC_REALTIME_DISABLE_FILE_SETTINGS_ENVS.

Also see “[Calibre RealTime Digital Environment Variables](#)” on page 39.

Calibre RealTime Digital Environment Variables

Calibre RealTime Digital uses a number of environment variables to specify run-time behavior.

Table 2-2. Calibre RealTime Digital Environment Variables

Variable (applies to)	Description
CALIBRE_HOME	Sets the location of the software tree for Calibre tools; see “ Setting the CALIBRE_HOME Environment Variable ” in the <i>Calibre Administrator’s Guide</i> .
MGC_CALIBRE_DRC_RUNSET_FILE	Specifies a Calibre Interactive runset to be used to control the Calibre nmDRC run. You can specify multiple runsets as a space separated list enclosed in double quotes. See “ Specifying a Calibre Interactive Runset in Calibre RealTime Digital ” on page 43 for complete information. This environment variable is also used by Calibre Interactive nmDRC. Also see MGC_REALTIME_RUNSET_FILE.
MGC_CALIBRE_HIDDEN_RECIPES	Specifies built-in check recipes to hide from the dropdown lists of check recipes. See “ Hiding Built-In Check Recipes ” on page 65.
MGC_REALTIME_AUTO_LOAD_RULE_FILES	Setting this environment variable to “none” disables automatic loading of rule files for all configurations.
MGC_REALTIME_CONFIG_DIRS	Specifies an ordered list of multilevel configuration directories to read the Session Configuration File in Calibre RealTime Digital from. See “ Multilevel Session Configuration File Support in Calibre RealTime Digital ” on page 28. Not supported for all tools.
MGC_REALTIME_DISABLE_FILE_SETTINGS_ENVS	Specifies to not load files defined by other environment variables upon startup. These variables are not unset and are still applied if contained in the configuration files. The affected environment variables are: <ul style="list-style-type: none"> • MGC_REALTIME_RULE_FILE • MGC_REALTIME_RUNSET_FILE • MGC_REALTIME_CTO_FILE • MGC_REALTIME_LAYER_MAP_FILE • MGC_REALTIME_OBJECT_MAP_FILE • MGC_CALIBRE_DRC_RUNSET_FILE

Table 2-2. Calibre RealTime Digital Environment Variables (cont.)

Variable (applies to)	Description
MGC_REALTIME_INNOVUS_ENABLED	Required environment variable to enable Calibre RealTime Digital in Cadence Innovus. Set this environment variable to any value to enable Calibre RealTime Digital. To disable Calibre RealTime Digital in Cadence Innovus, unset MGC_REALTIME_INNOVUS_ENABLED.
MGC_REALTIME_INCLUDE_RESULTS_ENCOMPASSING_WINDOW	Beginning with the 2015.2 release, results that fully enclose the trim region are discarded by default. You can include such results by defining the environment variable MGC_REALTIME_INCLUDE_RESULTS_ENCOMPASSING_WINDOW; this returns the behavior to that found in 2015.1 and earlier releases. See “Keep Enclosing Results” on page 23 in the section “Halo Usage in Calibre RealTime Digital.”
MGC_REALTIME_LAYER_MAP_FILE	Specifies the path to the layer map file; see “Environment Variables for Calibre RealTime Digital Input Files” on page 39 and “GDS Layer Map for Calibre RealTime Digital in Cadence Innovus” on page 86.
MGC_REALTIME_RELEASE_LICENSE_TIME	Sets the time in hours after which the Calibre RealTime Digital license is released if there is no activity. A timeout of 15 minutes is used if this environment variable is not set. The minimum timeout period is also 15 minutes; if a timeout of less than 15 minutes is specified the timeout is set to 15 minutes. See “License Timeout for Calibre RealTime Digital” on page 34.
MGC_REALTIME_RULE_FILE	Specifies the path to the rule file; see “Environment Variables for Calibre RealTime Digital Input Files” on page 39.
MGC_REALTIME_RUNSET_FILE	Specifies the path to the Calibre Interactive runset file; see “Environment Variables for Calibre RealTime Digital Input Files” on page 39.

Table 2-2. Calibre RealTime Digital Environment Variables (cont.)

Variable (applies to)	Description
MGC_REALTIME_USE_WINDOW_AS_TRIM_REGION	Set this environment variable to define the trim region as equal to the region for the DRC run. When this environment variable is defined, only results that are inside or intersect the region for the DRC run are kept. See “Reduced Trim Region” on page 23 in the section “Halo Usage in Calibre RealTime Digital.”
MGC_RVE_GDS_LAYER_MAP_FILE	Sets the location of the layer map file in Calibre RealTime Digital with Cadence tools. Information in the layer map file overrides the automatic layer map located in the technology library. See “GDS Layer Map for Calibre RealTime Digital in Cadence Innovus” on page 86.
MGC_TMPDIR	Sets the location of the writable directory for temporary files created by Calibre RealTime Digital. By default the temporary directory is \$MGC_HOME/tmp.

Using Calibre Interactive Settings in a Calibre RealTime Digital Run

If you use Calibre® Interactive™ nmDRC and want to use the same options for your Calibre RealTime Digital run, you can specify the Calibre Interactive runset in the Calibre RealTime Options dialog box. Calibre RealTime Digital calls Calibre Interactive to generate the Calibre Interactive control file, and the control file is used for the Calibre RealTime Digital run. If the runset includes a customization file, the Customization GUI is opened and the settings are applied to the control file.

Specifying a Calibre Interactive Runset in Calibre RealTime Digital	43
Using the Customization GUI with Calibre RealTime Digital	45

Specifying a Calibre Interactive Runset in Calibre RealTime Digital

You can specify a Calibre Interactive runset instead of a rule file for a Calibre RealTime Digital run. Calibre RealTime Digital calls Calibre Interactive to generate the Calibre Interactive control file. The generated control file is used for the Calibre RealTime Digital run, so that all the options set in the runset are used for the Calibre RealTime Digital run. You can use the Calibre RealTime Options dialog box or an environment variable to specify Calibre Interactive runsets.


You can specify a runset in the Calibre RealTime Options dialog box or using the environment variable MGC_REALTIME_RUNSET_FILE or MGC_CALIBRE_DRC_RUNSET_FILE. See [“Environment Variables for Calibre RealTime Digital Input Files”](#) on page 39 for more information on using the environment variables. If the runset file is set with an environment variable, the environment variable is displayed in the Calibre RealTime Options dialog box. The environment variable takes precedence over settings saved in the configuration file.

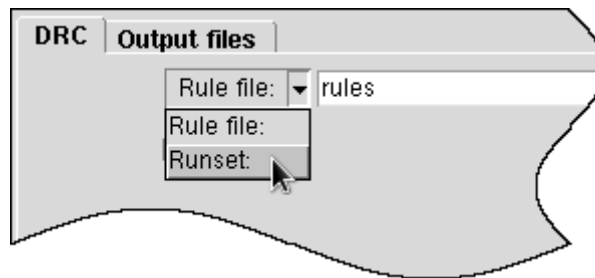
The following procedure describes how to specify the runset using the Calibre RealTime Options dialog box.

Prerequisites

- A Calibre nmDRC rule file.
- A Calibre Interactive runset. The runset must compile in Calibre Interactive and the DRC Run Directory must exist.
- A Calibre Interactive license.
- Your design tool is open with Calibre RealTime Digital enabled.

Procedure

1. Click the **Options** button () on the integrated toolbar to open the Calibre RealTime Options dialog box.
2. Select the **DRC** tab if it is not already selected.
3. Select Runset in the Rule file/Runset dropdown list.



4. Enter the runset filename. If you are using multiple runsets, click the down arrow button and enter multiple filenames.
5. If the runset has changed on disk or if you are changing runset paths, click **Reload** to update the runset.
6. Close the Calibre RealTime Options dialog box.

Results

When you start a Calibre RealTime Digital run or click **Reload**, Calibre RealTime Digital calls Calibre Interactive to generate the Calibre Interactive control file from the runset. The control file is named `_rule_file_`, where `rule_file` is the name of the rule file specified in the runset. The file `_rule_file_` is used as the rule file for the Calibre RealTime Digital run.

The following items govern use of the settings in the runset:

- If there is a conflict, Calibre RealTime Digital settings take precedence over settings in the runset.
- Settings in the runset that do not apply to Calibre RealTime Digital are ignored. For example, most run control settings are not relevant for Calibre RealTime Digital.
- If you are using multiple runsets, the runsets are loaded in the order they are listed in the Calibre RealTime Options dialog box or the `MGC_CALIBRE_DRC_RUNSET_FILE` environment variable. The settings in the most recently loaded runset file take precedence if there is a conflict.

Using the Customization GUI with Calibre RealTime Digital


If you use a customization file with Calibre Interactive nmDRC, you can use the same customization file with Calibre RealTime Digital. This allows you to make customization settings at any time and apply them to your Calibre RealTime Digital session.

Prerequisites

- A Calibre nmDRC rule file.
- A Calibre Interactive customization file. See “[Customization Files](#)” in the *Calibre Interactive User’s Manual*.
- A Calibre Interactive runset. The runset must compile in Calibre Interactive and the DRC Run Directory must exist.

The runset should specify the customization file.

Note


 You can alternatively specify the customization file with the environment variable `MGC_CALIBRE_CUSTOMIZATION_FILE`. If a customization file is specified with both the environment variable and the runset, the runset setting takes precedence.

- A Calibre Interactive license.
- Your design tool is open with Calibre RealTime Digital enabled.

Procedure

1. Specify the runset in the Calibre RealTime Options dialog box, as described in “[Specifying a Calibre Interactive Runset in Calibre RealTime Digital](#)” on page 43.

The Customization GUI is automatically opened the first time the runset is compiled.

2. Make settings as needed in the Customization Settings dialog box, then click **OK**.
3. Run Calibre RealTime Digital.
4. (Optional) If you want to change customization settings, click the  button in the Calibre RealTime Digital toolbar to open the Customization GUI.

If you make customization changes, the runset and rule file are recompiled and used for the next Calibre RealTime Digital run. The changes you make to the Customization GUI are retained during the Calibre RealTime Digital session until you click **Reload** in the Calibre RealTime Options dialog box for the runset file. The reload action returns the Customization GUI to the settings saved in the runset.

DRC Rule Check Comments for Calibre RealTime Digital

DRC Rule Check Comments are one way to specify the highlight color or highlight layer for Calibre RealTime Digital results. Rule check comments are supported for all tools with Calibre RealTime Digital. The rule check comments specify the highlight color or highlight layer index for a given rule check so that results from a given rule check are always highlighted in the same color.

The following table lists the available rule check comments in Calibre RealTime Digital:

Table 2-3. DRC Rule Check Comments in Calibre RealTime Digital

Rule Check Comment	Description
RVE Highlight Index	Specifies the highlight layer index used for the rule check.
RVE Highlight Color	Specifies the highlight layer color used for the rule check in supported layout viewers.
RVE Show Layers	Specifies the layers that are shown in the layout editor when highlighting a result from the rule check.
RVE Link	Creates a hyperlink that is displayed in the check text pane of the Calibre RealTime Results window for the rule check.

Place the rule check comments in your rule file or a configuration file called the Check Text Override (CTO) file. Rule check comments in the CTO file take precedence over those in the rule file if there is a conflict. Specify the rule check comments as described in the following table:

Table 2-4. Specifying DRC Rule Check Comments in Calibre RealTime Digital

Location of Rule Check Comments	Method to Specify Rule Check Comments
In the rule file with a preceding “at” (@) character.	No further action needed. See the RVE Highlight Index and RVE Highlight Index commands for examples.
In the Check Text Override (CTO) File for Calibre RealTime .	In the Calibre RealTime Options dialog box; see “ Specifying the Check Text Override (CTO) File in Calibre RealTime ” on page 47.

Note



Calibre RVE for DRC supports additional rule check comments; Calibre RealTime Digital ignores rule check comments that it does not support.

You may want to see these topics in other manuals:

- “[Rule Comments](#)” in the *Calibre Verification User’s Manual*

- “DRC Rule Check Comments for Calibre RVE” in the *Calibre RVE User’s Manual*

Specifying the Check Text Override (CTO) File in Calibre RealTime


You can specify DRC Rule Check comments for Calibre RealTime in a Check Text Override file (CTO file). The CTO file is specified in the Calibre RealTime Options dialog box.

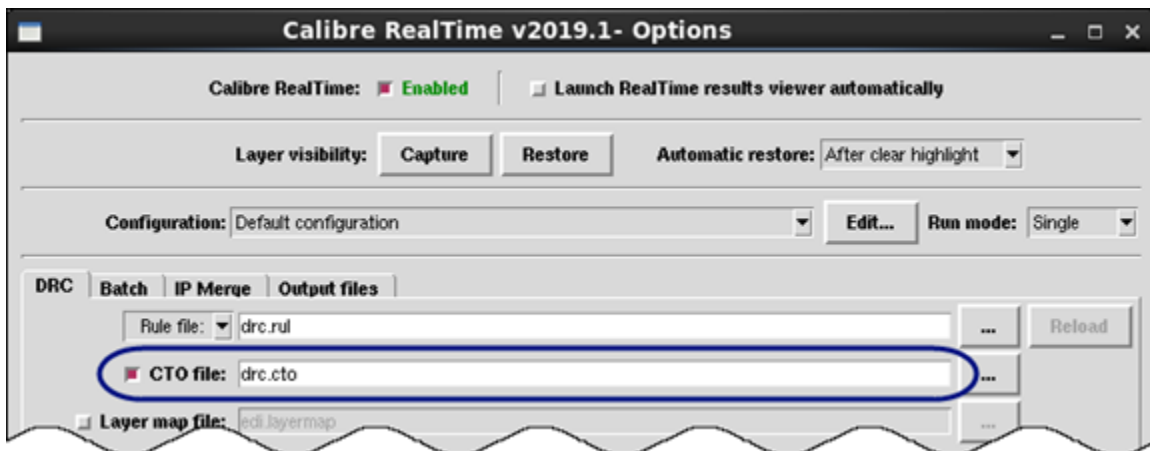
Rule check comments in the check text override file take precedence over those in the rule file if there is a conflict.

Prerequisites

- A CTO file; see “[Check Text Override \(CTO\) File for Calibre RealTime](#)” on page 57. The file browser for the CTO file is set up to search for files with a *.cto* file extension.

Procedure

1. In Calibre RealTime, click the  button to open the Calibre RealTime Options dialog box.
2. Enable “CTO file” and specify a check text override file.



Tip

 You can also use the environment variable `MGC_REALTIME_CTO_FILE` to set the path to the CTO file; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

RVE Highlight Index

Tool Support: Calibre RealTime with all supported design tools

A DRC RVE rule check comment that specifies the highlight layer index used for the rule check.

Usage

RVE Highlight Index: *index*

Arguments

- *index*

A required argument, where index values up to 32767 can be used. However, most layout viewers limit the number of layers available for highlighting, so the highlight layer index may start over after the maximum index is reached.

A space is required between the colon (:) and *index*.

Description

This rule check comment specifies the highlight layer index. Highlights for the rule check are always made to that layer index.

See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for instructions on specifying the rule check comment. The rule check comment can be added directly to the rule file or specified in a Check Text Override (CTO) file.

RVE Highlight Index and [RVE Highlight Color](#) rule check comments should not be used together in a rule file or a [Check Text Override \(CTO\) File for Calibre RealTime](#). If both are found in the DRC results database, the RVE Highlight Index statements take precedence and the RVE Highlight Color rule check comments are ignored.

For a description of this rule check comment in the Calibre RVE environment, see “[RVE Highlight Index](#)” in the *Calibre RVE User’s Manual*.”

Examples

Example 1: In a Rule Check

```
// rule file
// ...
metall_space_rule {
@ comment
@ RVE Highlight Index: 5
< rules ...>
}
```


Example 2: In a CTO File

```
# DRC RVE .cto file
metall_space_rule
RVE Highlight Index: 5
```

RVE Highlight Color

Tool Support: Calibre RealTime with all supported design tools

A DRC RVE rule check comment that specifies the highlight layer color used for the rule check in supported layout viewers.

Usage

RVE Highlight Color: *color*

Arguments

- *color*

A required argument which specifies the highlight color used for the rule check. The color may be any valid color in Tk. For example, you can use the RGB color specification starting with a '#' or a color name understood by your X server, so the color blue can be indicated in these ways: blue, #0000FF, or #00f.

A space is required between the colon (:) and *color*.

Description

This rule check comment specifies the highlight layer color for the rule check; all results from the rule check are highlighted with this color in the attached layout viewer.

See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for instructions on specifying the rule check comment. The rule check comment can be added directly to the rule file or specified in a Check Text Override (CTO) file.

[RVE Highlight Index](#) and RVE Highlight Color rule check comments should not be used together in a rule file or a [Check Text Override \(CTO\) File for Calibre RealTime](#). If both are found in the DRC results database, the RVE Highlight Index statements take precedence and the RVE Highlight Color rule check comments are ignored.

For a description of this rule check comment in the Calibre RVE environment, see “[RVE Highlight Color](#)” in the *Calibre RVE User's Manual*.”

Examples

Example 1: In a Rule Check

```
// rule file
// ...
my_rule {
@ comment
@ RVE Highlight Color: blue
< rules ...>
}
```

Example 2: In a CTO File

```
# DRC RVE .cto file  
my_rule  
RVE Highlight Color: blue
```

RVE Show Layers

Tool Support: Calibre RealTime in all supported design tools

A DRC RVE rule check comment that specifies the layers that are shown in the layout editor when highlighting a result from the rule check.

Usage

RVE Show Layers: *layer1 layer2 ... layerN*

Arguments

- *layer1 layer2 ... layerN*

A space-separated list of layers. At least one layer must be specified. A space is required between the colon (:) and *layer1*. The terminating delimiter for the layers list is a newline.

The asterisk (*) and question mark (?) wildcards characters may be used in layer names (*layerObjName* and *layerName*).

The layer argument can be specified in these ways, depending on the design tool:

- **Cadence Innovus**

layerObjName — Specify the layer object name. (If the format *layer:purpose* is used, the purpose argument is ignored.)

layerGroup — Specify a layer group name, such as allM1 or allM1Cont.

See [Example 2: RVE Show Layers for Cadence Innovus](#).

- **Synopsys IC Compiler II**

layerNum — Specify a layer number in the design database.

layerName — Specify a layer name in the design database.

See [Example 3: RVE Show Layers for Synopsys IC Compiler II](#).

- **All Tools**

GDS:layer_number:layer_type — Specify the GDS keyword, a GDS layer, and the GDS datatype.


See [Example 4: RVE Show Layers Using GDS Layer Numbers](#).

Description

This rule check comment specifies the layers that are displayed in the layout editor when highlighting a result from the rule check. All layers not specified in this statement are automatically hidden when any results from the check are highlighted.

See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for instructions on specifying the rule check comment. The rule check comment can be added directly to the rule file or specified in a Check Text Override (CTO) file.

Note

 If you highlight results from a rule check with a RVE Show Layers rule check comment, and next highlight results from a rule check *without* a RVE Show Layers rule check comment, the layer visibility set with the first rule check is retained. You can use the controls in your design tool to set the layer visibility as desired.

For a description of this rule check comment in the Calibre RVE environment, see “[RVE Show Layers](#)” in the *Calibre RVE User’s Manual*.”

Examples

Example 1: Rule Check Comment in the CTO File

The following example shows a CTO file with the RVE Show Layers and RVE Highlight Color rule check comments:

```
# DRC RVE check text override file for XYZ
#
min_ext_m1
RVE Show Layers: M1*
RVE Highlight Color: blue
# ...
```

Example 2: RVE Show Layers for Cadence Innovus

This example corresponds to Cadence Innovus 16.22. The exact results may be different depending on the database and the version of Cadence Innovus.

Command	Visible Database Layers
RVE Show Layers: M3	M3Wire&Via
RVE Show Layers: M3*	M3Wire&Via, M3Track, M3Pin, M3Blkage, M3Viol, M3Patch, VIA2Wire&Via, VIA2Pin, VIA2Blkage, VIA2Viol
RVE Show Layers: allM3	M3Wire&Via, M3Track, M3Pin, M3Blkage, M3Viol, M3Patch
RVE Show Layers: allM3Cont	VIA2Wire&Via, VIA2Track, VIA2Pin, VIA2Blkage, VIA2Viol, VIA2Patch

Example 3: RVE Show Layers for Synopsys IC Compiler II

The design includes these database layers CO(24), M4(34) and VIA4(54), as well as other standard design layers.

Command	Visible Database Layers
RVE Show Layers: M4	M4
RVE Show Layers: *4	M4 and VIA4
RVE Show Layers: M* VIA?	All metal and via layers
RVE Show Layers: 34	M4
RVE Show Layers: 34 54	M4 and VIA4

Example 4: RVE Show Layers Using GDS Layer Numbers

The following example shows a CTO file with the RVE Show Layers rule check comment using GDS layer numbers:

```
# DRC RVE check text override file for XYZ
#
RVE Show Layers: GDS:29:0 GDS:30:0 GDS:31:0 GDS:32:0 GDS:33:0 GDS:34:0 \
    GDS:35:0 GDS:36:0 GDS:37:0 GDS:38:0
# ...
```

RVE Link

Tool Support: All integrations, in the Calibre RealTime Results window only

A DRC RVE rule check comment that creates a hyperlink that is displayed in the check text pane of Calibre RealTime Results window for the rule check.

Usage

RVE Link: *document*[*#anchor_tag*] [TEXT *display_text*]

Arguments

- *document*
A required argument giving the path to the document to be opened.
Some HTML browsers may require “file://” to precede the file path of the document.
A space is required between the colon (:) and *document*.
- *#anchor_tag*
An optional character (#) and argument (*anchor_tag*), where *anchor_tag* specifies a named destination within *document*.
- TEXT *display_text*
An optional keyword and argument specifying the display text for the hyperlink. If this keyword and argument are not included, the command itself is used for the hyperlink text.

Description

This rule check comment creates a hyperlink which is displayed in the Calibre RealTime Results window in the check text pane for the rule check. The specified *document* is opened when the hyperlink is clicked. HTML documents are opened in an HTML browser at the named destination given by *anchor_tag*, if present. Text documents are opened in the default text editor.

Environment variables may not be used in the *document* path.

See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for instructions on specifying the rule check comment. The rule check comment can be added directly to the rule file or specified in a Check Text Override (CTO) file.

HTML Browser Specification and Compatibility When Using RVE LINK

Set the environment variable MGC_RVE_HTML_BROWSER to the path for a browser executable, and that browser is opened when viewing a document with the RVE Link rule check comment. A recent browser version is recommended, as unexpected results may occur in older browsers.

Troubleshooting

If PDF documents do not open correctly, or do not open to a page destination, check the following:

- The Adobe Reader plug-in is correctly specified for your HTML browser.
- Other add-on tools or extensions do not duplicate or conflict with the plug-in specification.
- HTML browser preferences for PDF documents are set correctly.
- Shell scripts do not cause conflicts with the Adobe Reader plug-in specification.

Examples

Example 1

The following example shows the RVE Link rule check comment placed in a rule check. The path to the document is preceded by “file://”, as is required by some HTML browser versions.

```
// rule file
// ...
min_spacing_metall {
@ Minimum metall spacing = 1.0
@ RVE Link: file:///docs/wide_space.html#Procedure TEXT metal rules
ext metall < 1.0
}
```

The named destination can be provided in the HTML document with code similar to this:

```
<a name="Procedure"></a>
```

Example 2

The following example shows the RVE Link rule check comment placed in a [Check Text Override \(CTO\) File for Calibre RealTime](#). In this example the document path is not preceded by “file://”, but this may be necessary for some HTML browsers.

```
# DRC RVE check text override file for XYZ
min_spacing_metall
RVE HIGHLIGHT COLOR: green
RVE Link: /docs/wide_space.html TEXT doc:wide metal rules
```


Check Text Override (CTO) File for Calibre RealTime

Input for: Calibre RealTime in all supported design tools

The check text override file (CTO file) allows you to specify DRC RVE rule check comments for a Calibre RealTime run without editing the rule file. DRC RVE rule check comments can specify the highlight color or the highlight layer index for errors found during a Calibre RealTime run.

See “[Specifying the Check Text Override \(CTO\) File in Calibre RealTime](#)” on page 47 for instruction on loading the CTO file. DRC RVE rule check comments found in a CTO file take precedence over settings from the rule file.

Note



For support with Calibre RVE for DRC and DRC HTML Reporting, see “[DRC Rule Check Comments for Calibre RVE](#)” in the *Calibre RVE User’s Manual*.

Format

Formatting Rules

- ASCII text file. Blank lines are ignored, and white space at the beginning of a line is ignored.
- Lines beginning with the # character are ignored.

Contents

The file contents are shown below, where [] indicates an optional element and “...” indicates optional repetition of the element.

```
checkname [checkname ...]  
[@ check_text_comment]  
RVE_rule_check_comment  
...
```

Parameters

- **checkname**

A required parameter giving the name of one or more rule checks that the DRC RVE rule check comments apply to.

The * wildcard character may be used in **checkname**. Rule check comments accumulate if more than one rule check comment section matches a specific rule check due to the use of wildcard characters in **checkname**. If there is a conflict between accumulated rule check comments, then the latest rule check comment section in the Check Text Override file takes precedence; see the “Examples” section. Rule check sections without a wildcard in the check name always have the highest precedence.

- *@ check_text_comment*

Text appearing after the @ character and on the same line is processed as a check text comment for the *checkname* rule check. Check text comments are displayed in the tooltip for the result. Check text present in the results database as a result of check text comments in the rule file is merged with check text comments in the CTO file.

- *RVE_rule_check_comment*

A DRC RVE rule check comment. More than one rule check comment may be specified. See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for a list of supported rule check comments.

Examples

Example 1: Basic Check Text Override File for Calibre RealTime

This example uses a wildcard to set the highlight color to blue for all rule checks with “metall” in the rule check name and includes a check text comment. The highlight color is set to green for the rule check min_ext_diff_poly.

```
# check text override file for XYZ

*metall*
@ Minimum metall spacing = 1.0
RVE Highlight Color: blue

min_ext_diff_poly
@ Minimum enclosure of poly by oxide = 1.25
RVE Highlight Color: green
```

Example 2: Precedence of Rule Check Comments With Wildcards in the Check Names

The following example demonstrates the precedence of rule check comments when the use of wildcards in the rule check name causes a rule check comment to apply to more than one rule check. For this example, assume rule checks with the following names: min_spac_metall1, min_spac_metal2, poly_enc_cont, and metall_enc_cont.

<code>min_spacing_metal1</code> <code>RVE HIGHLIGHT COLOR: blue</code>	←	Comments in a section without wildcards have highest precedence.
<code># metal checks highlighted in red</code> <code>*metal*</code> <code>RVE HIGHLIGHT COLOR: red</code>	←	Matches <code>min_spac_metal1</code> , <code>min_spac_metal2</code> , and <code>metal1_enc_cont</code> .
<code># spacing checks highlighted in yellow</code> <code>*spac*</code> <code>RVE HIGHLIGHT COLOR: yellow</code>	←	Matches <code>min_spac_metal1</code> and <code>min_spac_metal2</code> , and overwrites conflicting settings in the <code>*metal*</code> section.
<code># enclosure checks highlighted in green</code> <code>*enc*</code> <code>RVE HIGHLIGHT COLOR: green</code>	←	Matches <code>poly_enc_cont</code> and <code>metal1_enc_cont</code> , and overwrites conflicting settings in the <code>*metal*</code> and <code>*spac*</code> sections.

Final settings:

`min_spac_metal1:`

`RVE HIGHLIGHT COLOR: blue`

`min_spac_metal2:`

`RVE HIGHLIGHT COLOR: yellow`

`poly_enc_cont:`

`RVE HIGHLIGHT COLOR: green`

`metal1_enc_cont:`

`RVE HIGHLIGHT COLOR: green`

Chapter 3

Check Selection Recipes in Calibre RealTime Digital

Calibre RealTime Digital uses a check selection recipe to define the rule checks that are executed during the run. A number of built-in check recipes are provided, and you can define your own check recipes.

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Check Recipes in Calibre RealTime Digital

A check recipe is a set of rules for selecting the checks to execute for a Calibre RealTime Digital run. Calibre RealTime Digital defines a set of built-in check recipes, and you can create custom check recipes.

Built-In Check Recipes

The built-in check recipes provide an easy way to select the checks to run. For example, the built-in recipe “Visible layer checks” runs checks that use at least one of the layers visible in the design tool window.

The check recipe “Checks selected in the rules file” is the only built-in recipe that executes the same set of checks that would be executed in a batch Calibre run, and the only built-in recipe that obeys DRC [Un]Select Check statements in the rule file. Other built-in recipes may execute checks in the rule file that would not be executed during a batch Calibre run.

Custom Check Recipes

You can create custom check recipes, also called *user recipes*, for specific tasks or designs. User recipes enable you to tailor the rule checks that are executed to the type of design work you

are doing. User recipes are automatically saved in the session configuration file when you exit the tool. You can also export user recipes to a file with a *.rcp* file extension.

You create and edit check recipes with the Calibre RealTime Recipe Editor dialog box.

Special Considerations and Tips

Care should be taken when evaluating the results of Density or Connectivity checks from a Calibre RealTime Digital run. These checks are often intended to run on the complete design, while Calibre RealTime Digital is often run on a targeted region.

You can hide certain built-in check recipes using an environment variable. This is useful if certain built-in check recipes should not be used in your environment. See “[Hiding Built-In Check Recipes](#)” on page 65.

Rule files often use environment variables to control check execution. You can change environment variables with the commands given in the section “[Environment Variable Control](#)” on page 206.

Related Topics

[Built-In Check Recipes](#)

[DRC Select Check \[Standard Verification Rule Format \(SVRF\) Manual\]](#)

[Session Configuration File in Calibre RealTime Digital](#)

[Calibre RealTime Recipe Editor Dialog Box](#)

[Density Checks in Calibre RealTime Digital](#)


Specifying a Check Recipe

The check recipe selects which rule checks are executed during the Calibre RealTime Digital run.

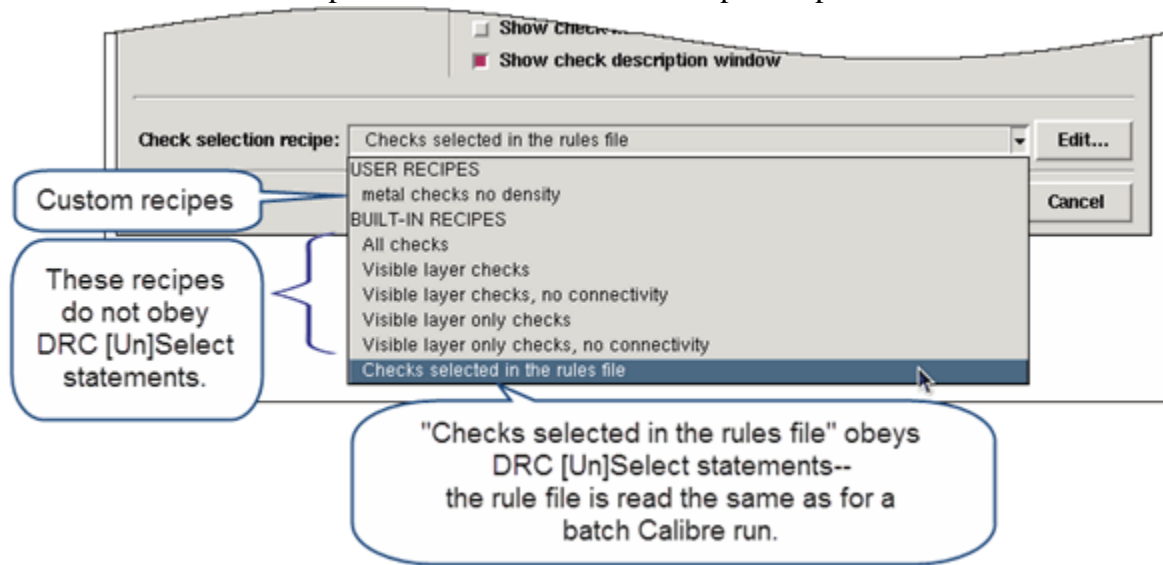
Prerequisites

- A supported design tool is open with Calibre RealTime Digital enabled.

Procedure

1. Click the **Options** toolbar button () to open the Calibre RealTime Options dialog box.
2. Specify the rule file or a Calibre Interactive runset. This is required before selecting a check recipe.

3. Select the check recipe in the “Check selection recipe” dropdown list.



Tip

- i** If the rule file is already loaded you can select the check recipe from the toolbar without opening the Calibre RealTime Options dialog box.

Related Topics

[Calibre RealTime Options Dialog Box \(Innovus\)](#)

[Calibre RealTime Options Dialog Box in IC Compiler II](#)

Built-In Check Recipes

Calibre RealTime Digital includes several built-in check selection recipes. These built-in check recipes include commonly used check selections, such as “Checks selected in the rules file”, “All checks”, and “Visible layer checks.”


The following table describes the available built-in check recipes. Except for the recipe “Checks selected in the rules file”, the built-in recipes do *not* obey DRC [Un]Select Check statements in the rule file; therefore, these recipes may execute checks in the rule file that would not be executed during a batch Calibre run. The recipe “Checks selected in the rules file” is the only built-in recipe that executes the same set of checks that would be executed in a batch Calibre run, and the only built-in recipe that obeys DRC [Un]Select Check statements in the rule file. A [Layer](#) statement specifying a name for an original layer is required in the rule file in order to use the layer-based recipes.

Table 3-1. Built-in Check Recipes in Calibre RealTime Digital

Recipe name	Description
All checks	Run all checks in the rule file, except those excluded by preprocessor directives. DRC [Un]Select Check statements are not considered.
Visible layer checks ¹	Run all checks that use at least one of the layers visible in the window.
Visible layer checks, no connectivity ¹	Run all checks that use at least one of the layers visible in the window, but exclude checks that use connectivity.
Visible layer only checks ¹	Run checks that use visible layers only and no invisible layers.
Visible layer only checks, no connectivity ¹	Run checks that use visible layers only and no invisible layers, but exclude checks that use connectivity.
Checks selected in the rules file (default)	Run only checks selected in the rule file. This is the only built-in recipe that obeys the DRC [Un]Select Check statements in the rule file. Note that if the rule file does not include any DRC [Un]Select Check statements, then all checks are executed; this is the same behavior as for batch Calibre nmDRC.
Checks selected in recon mode	Run in the Calibre Reconnaissance mode. Automatically selects a subset of DRC rulechecks that identify gross errors early in the design and assembly process. For more information on Calibre Recon mode, see “ Chip-Level Verification ” in the <i>Calibre Solutions for Physical Verification</i> .
Checks selected in recon inverse mode	Run only checks that are explicitly deselected when running DRC in the Calibre Recon mode. For more information on Calibre Recon mode, see “ Chip-Level Verification ” in the <i>Calibre Solutions for Physical Verification</i> .

¹A layer map file is required. See the “Layer Visibility” section.

Tip

 If your project team determines that certain built-in check recipes should not be used, they can be hidden from the list of built-in check recipes; see “[Hiding Built-In Check Recipes](#)” on page 65.

Layer Visibility

With the Cadence Innovus integration, in order to use the check recipes involving visible layers, a layer map file is required. The layer map file can be read automatically from the working directory, specified with an environment variable, or specified in the Calibre RealTime Options dialog box. See “[GDS Layer Map for Calibre RealTime Digital in Cadence Innovus](#)” on page 86.

A layer is visible if both of the following conditions are met:

- Any of its sub-layers are visible.

For example, for the M1 layer, one of the following sub-layers must be visible:

- M1
 - M1Track
 - M1RB
 - M1Pin
 - M1Via
 - M1Patch
- At least one object attribute is visible. Object attributes include all attributes of Cells, Routes, and Blockages.

Related Topics

[Pre-Processor Directives \[Standard Verification Rule Format \(SVRF\) Manual\]](#)

[DRC Select Check \[Standard Verification Rule Format \(SVRF\) Manual\]](#)

Hiding Built-In Check Recipes

You can use the environment variable `MGC_CALIBRE_HIDDEN_RECIPES` to hide specified built-in check recipes. Hidden check recipes do not appear in the dropdown list of check recipes in the toolbar, in the Calibre RealTime Options dialog box, or in the Calibre RealTime recipe editor.

Hiding check recipes is useful if certain built-in check recipes, such as the ones for visible layers, should never be used. User-defined check recipes and the built-in check recipe “Checks selected in the rules file” cannot be hidden.

The environment variable value can be any of the following:

- A single string (the recipe name)

- One or more regular expressions or strings, where each expression or string is enclosed in braces or double quotes, and separated by a space.

Examples are given in the following table.; in some cases two options for formatting the environment variable value are given.

Recipes to hide	MGC_CALIBRE_HIDDEN_RECIPES Value
The “All checks” recipe	"All checks"
All recipes that start with “Visible”	{Visible.*} or "Visible.*"
The recipes “All checks” and “Visible layer checks”	{All checks} {Visible layer checks} or "All checks" "Visible layer checks"
All recipes that end with “connectivity”	{.*connectivity} or ".*connectivity"

Procedure

1. Define the environment variable MGC_CALIBRE_HIDDEN_RECIPES.
2. Start your design tool with Calibre RealTime Digital enabled.

Examples

Some C shell (csh) examples:

```
setenv MGC_CALIBRE_HIDDEN_RECIPES "{Visible.*} {Recent.*}"  
setenv MGC_CALIBRE_HIDDEN_RECIPES '".*connectivity"'  
setenv MGC_CALIBRE_HIDDEN_RECIPES "All checks"
```

Some Bourne (sh) shell examples:

```
MGC_CALIBRE_HIDDEN_RECIPES="{Visible.*} {Recent.*}"  
export MGC_CALIBRE_HIDDEN_RECIPES  
  
MGC_CALIBRE_HIDDEN_RECIPES='".*connectivity"'  
export MGC_CALIBRE_HIDDEN_RECIPES  
  
MGC_CALIBRE_HIDDEN_RECIPES="\".*connectivity\""  
export MGC_CALIBRE_HIDDEN_RECIPES  
  
MGC_CALIBRE_HIDDEN_RECIPES="All checks"  
export MGC_CALIBRE_HIDDEN_RECIPES
```

Related Topics

[Built-In Check Recipes](#)

[Calibre RealTime Recipe Editor Dialog Box](#)

[Calibre RealTime Options Dialog Box \(Innovus\)](#)

Creating a Custom Check Selection Recipe


Custom check recipes (also called user recipes) enable you to control the Calibre rule checks that are executed during a Calibre nmDRC run. You can create a new custom check recipe or start by copying an existing recipe.

Check recipe definitions are automatically saved in the [Session Configuration File in Calibre RealTime Digital](#).

Prerequisites

- A Calibre rule file or Calibre Interactive runset is loaded.

Procedure

1. Click the **Options** toolbar button () to open the Calibre RealTime Options dialog box.
2. Click the **Edit** button to the right of the Check Selection Recipe entry.

This opens the [Calibre RealTime Recipe Editor Dialog Box](#).

3. Do one of the following:
 - **Create a new recipe** — Click **New** in the top button bar. A new recipe is initialized with the checks selected in the rule file.
 - **Copy an existing recipe** — Select the recipe to copy in the Recipe dropdown list, then click **Copy** in the top button bar. You are prompted for the name of the new recipe.
4. Proceed to one of the following tasks:
 - [“Basic Editing of Check Selection Recipes”](#) on page 68
 - [“Advanced Editing of Check Selection Recipes”](#) on page 70

Related Topics

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)

Basic Editing of Check Selection Recipes


The basic editing controls in the Calibre RealTime Recipe Editor dialog box allow you to construct check recipes based on a short list of common expressions, such as “Checks selected in the rule file” and “Checks with density”. You can also include and exclude individual checks and check groups.

Custom check recipes (also called user recipes) allow you to control which Calibre rule checks are executed during a Calibre nmDRC run. Check recipe definitions are automatically saved in the [Session Configuration File in Calibre RealTime Digital](#); you can also export a check recipe to a file.


Prerequisites

- A Calibre rule file or Calibre Interactive runset is loaded.

Procedure

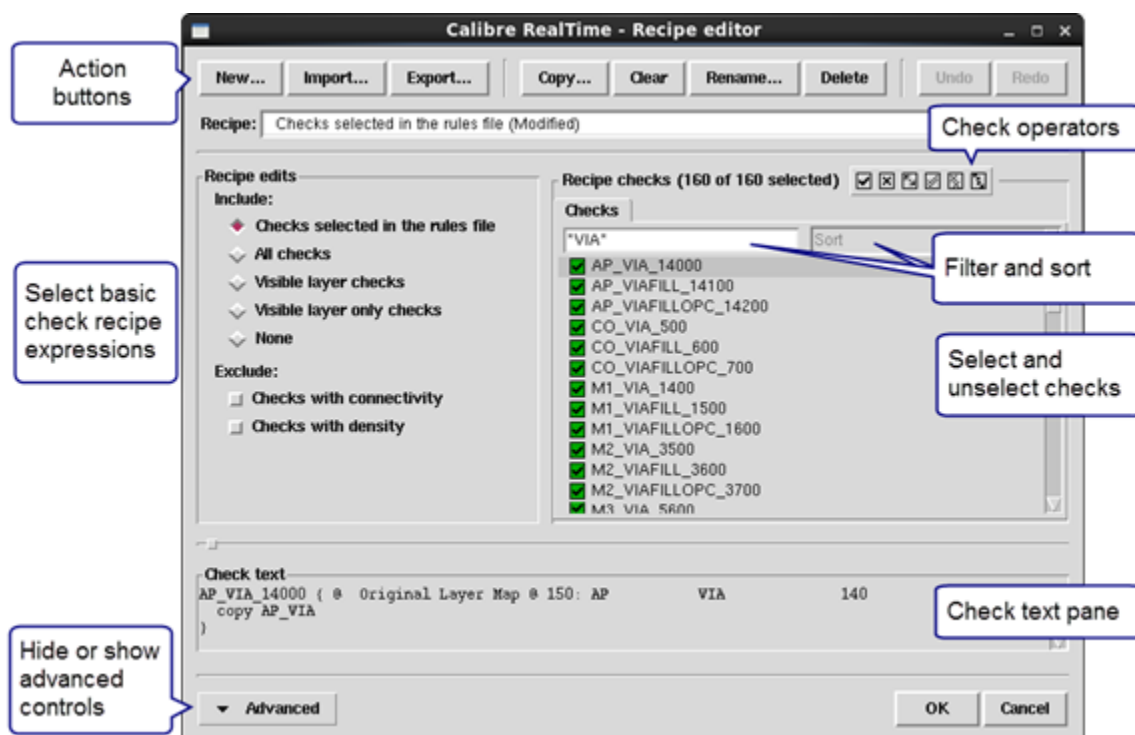
1. Click the **Options** toolbar button () to open the Calibre RealTime Options dialog box.
2. Select the recipe you want to edit in the “Check selection recipe” dropdown list.

Tip

 If you edit a built-in recipe, it is automatically saved as a user recipe with “(Modified)” appended to the recipe name. Only one modified version of each built-in recipe is saved at a time—new modifications overwrite any existing modified recipe.

3. Click **Edit** to open the [Calibre RealTime Recipe Editor Dialog Box](#).


- For basic recipe editing, make sure the dialog box appears as shown in the following figure. If it does not appear, click the **Advanced** button to collapse the advanced controls.



- Filter and sort checks by their name. Checks can be filtered with different meta-characters.
 - * — Matches any number of any characters. For example, “M1*” displays every check that begins with “M1”. The default filter is “*”, which displays every check.
 - ? — Matches any single character. For example, “M?” displays every check that begins with “M” and has exactly one more character afterwards, such as “M1” and “M9”.
 - [chars] — Matches any character in the character set **chars**. For example, “M[1-3]” displays the checks “M1”, “M2”, and “M3”.

If the check name has the meta-characters *?[] in it, escape the character with \. For example, “M*” displays the check “M*” only.
- Use the Include and Exclude selections to select the types of checks in the check recipe.
- Enable and disable individual checks and check groups in the “Recipe checks” area. The **Groups** tab is only displayed if check groups are defined with the [Group](#) statement.
- (Optional) Click **Export** to save the check recipe to a file; recipe files are given the .rcp file extension. The saved recipe file can be imported by other users with the **Import** button. Saved recipes can be imported by Calibre Interactive.

Tip

 If you edited a built-in recipe, you can click the **Rename** button to give the modified recipe a new name.

9. Click **OK** to save the recipe and exit the dialog box.

Related Topics

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)



Advanced Editing of Check Selection Recipes

The advanced editing controls in the Calibre RealTime Recipe Editor allow you to select checks by layer, select checks that did or did not produce results, and select and unselect individual rule checks. Unselecting individual checks is useful if a particular check gives false errors when run on a limited area.

Prerequisites

- A Calibre rule file or Calibre Interactive runset is loaded.

Procedure

1. Open a recipe for editing and make selections using the basic editing controls, as described in “[Basic Editing of Check Selection Recipes](#)” on page 68.
2. Click the **Advanced** button to expand the advanced editing controls. See [Figure 3-4](#) on page 75 in [Calibre RealTime Recipe Editor Dialog Box](#) for a view of the dialog box.
View the check selection recipe in the Recipe definition area.
3. Do the following to add an expression to the recipe definition:
 - a. Select an expression category in the Expression area. The expressions categories are defined in “[Calibre RealTime Recipe Editor Dialog Box](#)” on page 74.
 - b. Specify “Addition” or “Subtraction” below the Expression area to indicate whether you want to include or exclude the checks in the expression. Included checks are indicated with a  and excluded checks are indicated with a .
 - c. In the expression view area on the right, select items that you want to be part of the expression. The view in this area depends on the expression category. You can use the following methods to select checks:
 - Click the checkbox next to the check (or layer name if selecting by layer).

- Right-click for the selection menu. In the **Layers** tab, you must right-click a selection to open the menu. In addition, there is only one menu selection available for the **Layers** tab, unlike the other expression views.
- If the Pattern option is available, specify a wildcard pattern.

Some expression categories have a separate **Preview** tab which displays the checks that are selected by the expression.

- d. Click **Apply expression** or **Apply checks** to update the check recipe definition.
- **Apply expression** — Add or subtract the expression to the recipe definition.
 - **Apply checks** — Resolve the expression into a list of checks then add or subtract the checks to the recipe definition.

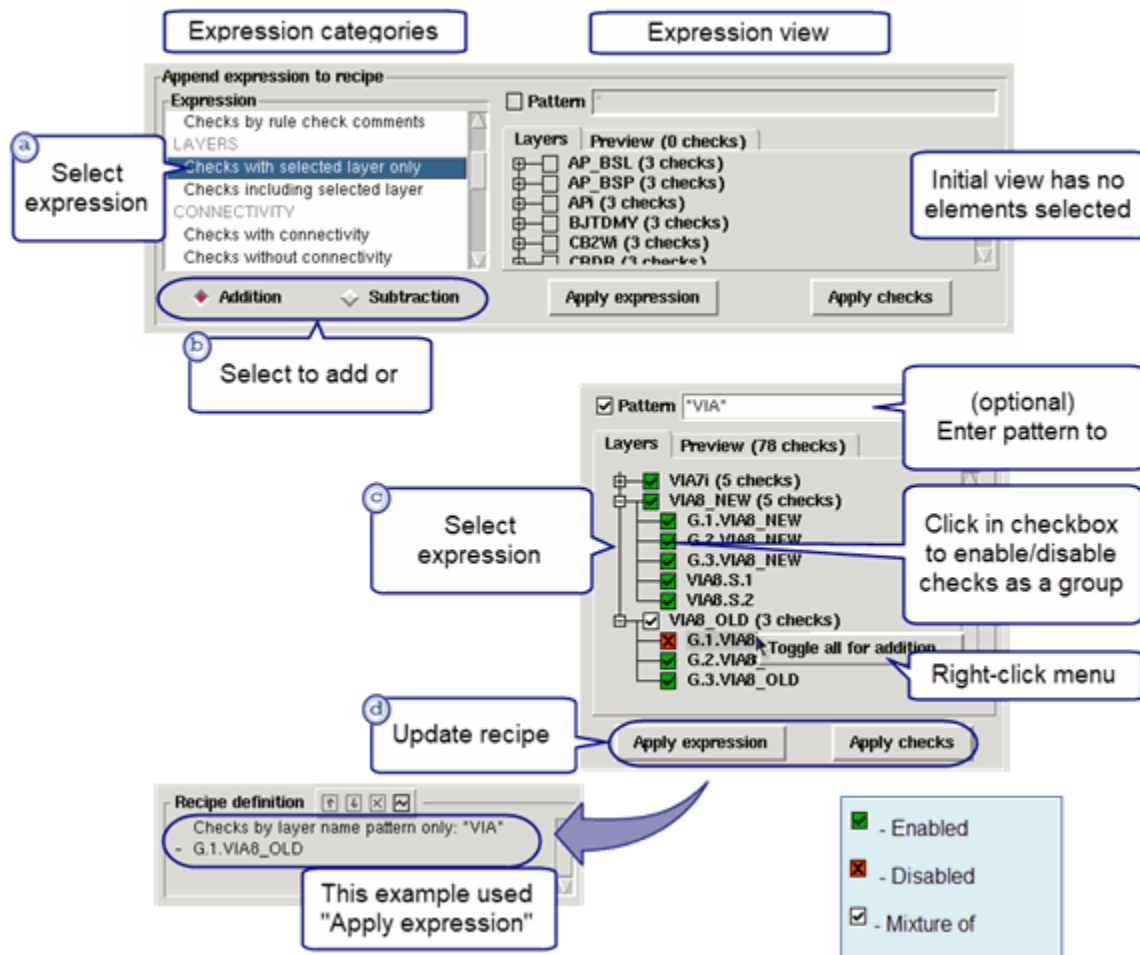
Note

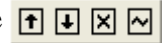


The recipe definition is not modified until you click either **Apply expression** or **Apply checks**.


The following figure shows Steps a-d for the “Checks with selected layer only” expression, which selects checks by layer.

Figure 3-1. Advanced Recipe Editor Controls



4. Repeat Step 3 as necessary to add more expressions to the check recipe definition.
5. View the check recipe in the Recipe definition area. You can use the  buttons to move an expression up or down in the list, remove an expression, or resolve an expression into the equivalent list of rule checks.

Tip

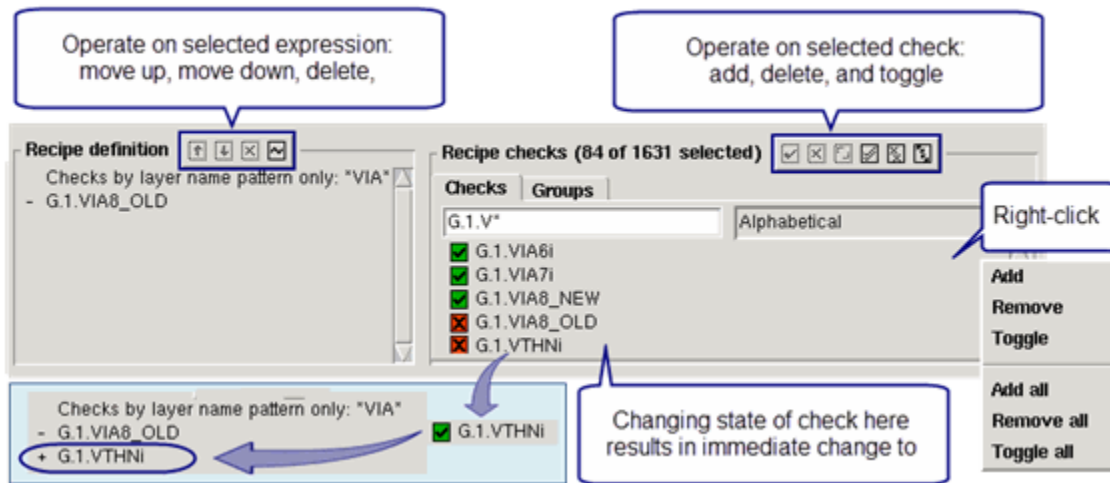
 If you want to only run checks that are selected in the rule file when using a custom check recipe, go to the Expression area, select “Checks not selected in the rules file,” enable “Subtraction,” and click the **Apply expression** button. Make sure the expression “- Checks not selected in the rules file” is the last expression in the recipe definition.

6. View the list of included and excluded checks in the “Recipe checks” area. The **Groups** tab is included if check groups are created in the rule file with the [Group](#) statement.

A green check mark indicates that the rule check or group is included in the recipe. A red X indicates the item is not included. Click the checkbox next to an item to include or exclude it from the recipe.

In the **Checks** tab you can right-click for a menu to add and subtract checks. You can also enter a filter pattern to filter the rule checks that are shown in the **Checks** tab.

Figure 3-2. Recipe Definition Controls



7. (Optional) To save the check recipe to a file, click **Export** in the top button bar. The recipe file can be imported by other users with the **Import** button.
8. Click **OK** to save the recipe and exit the dialog box.

Related Topics

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)

[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)

Calibre RealTime Recipe Editor Dialog Box

To access: Click **Edit** in the [Calibre RealTime Options Dialog Box \(Innovus\)](#). The **Edit** button is next to the Check Selection Recipe dropdown list.

The Recipe editor dialog box includes controls to create, copy, save, and edit a check selection recipe for Calibre RealTime Digital.

Description

The Calibre RealTime Recipe Editor dialog box has two modes: Basic ([Figure 3-3](#)) and Advanced ([Figure 3-4](#)). See the tables following the figures for descriptions of the fields and selections in the dialog box.

Use the basic controls for the following tasks:

- Include and exclude basic recipe expressions.
- Include and exclude individual checks or check groups.

Use the advanced controls for the following tasks:

- Develop advanced recipe expressions involving selected layers, rule check comments, and check groups.
- View and edit the recipe definition.

Figure 3-3. Calibre RealTime Recipe Editor Dialog Box Basic Controls

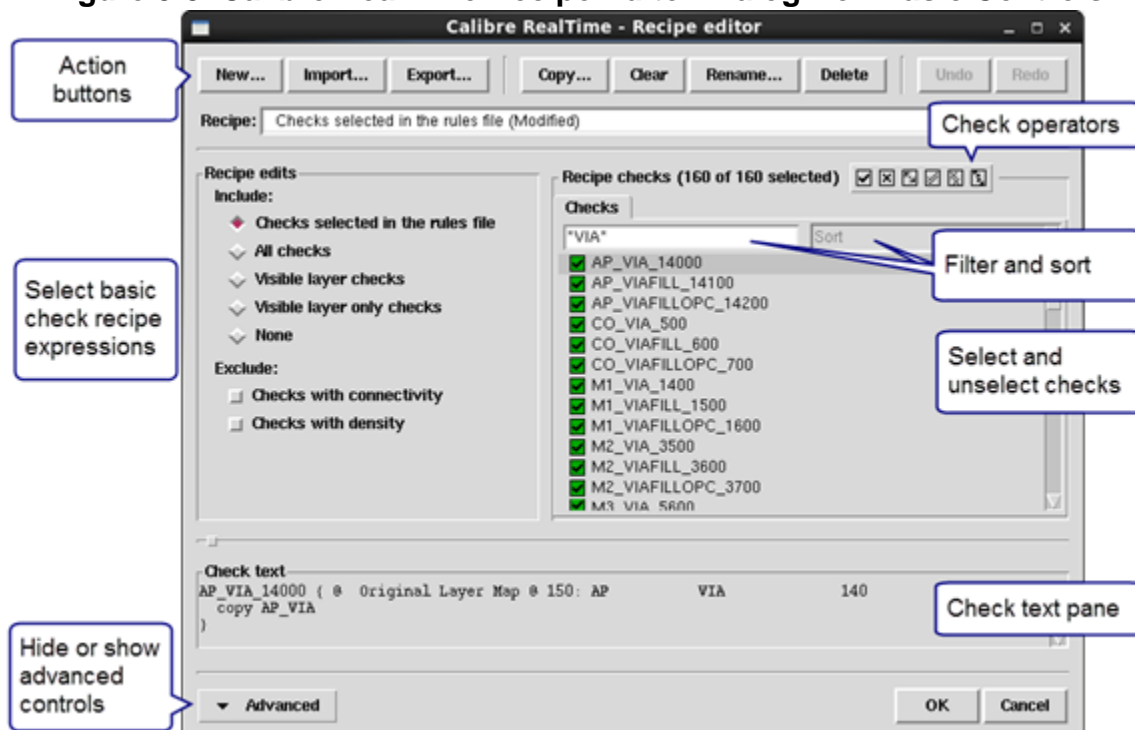
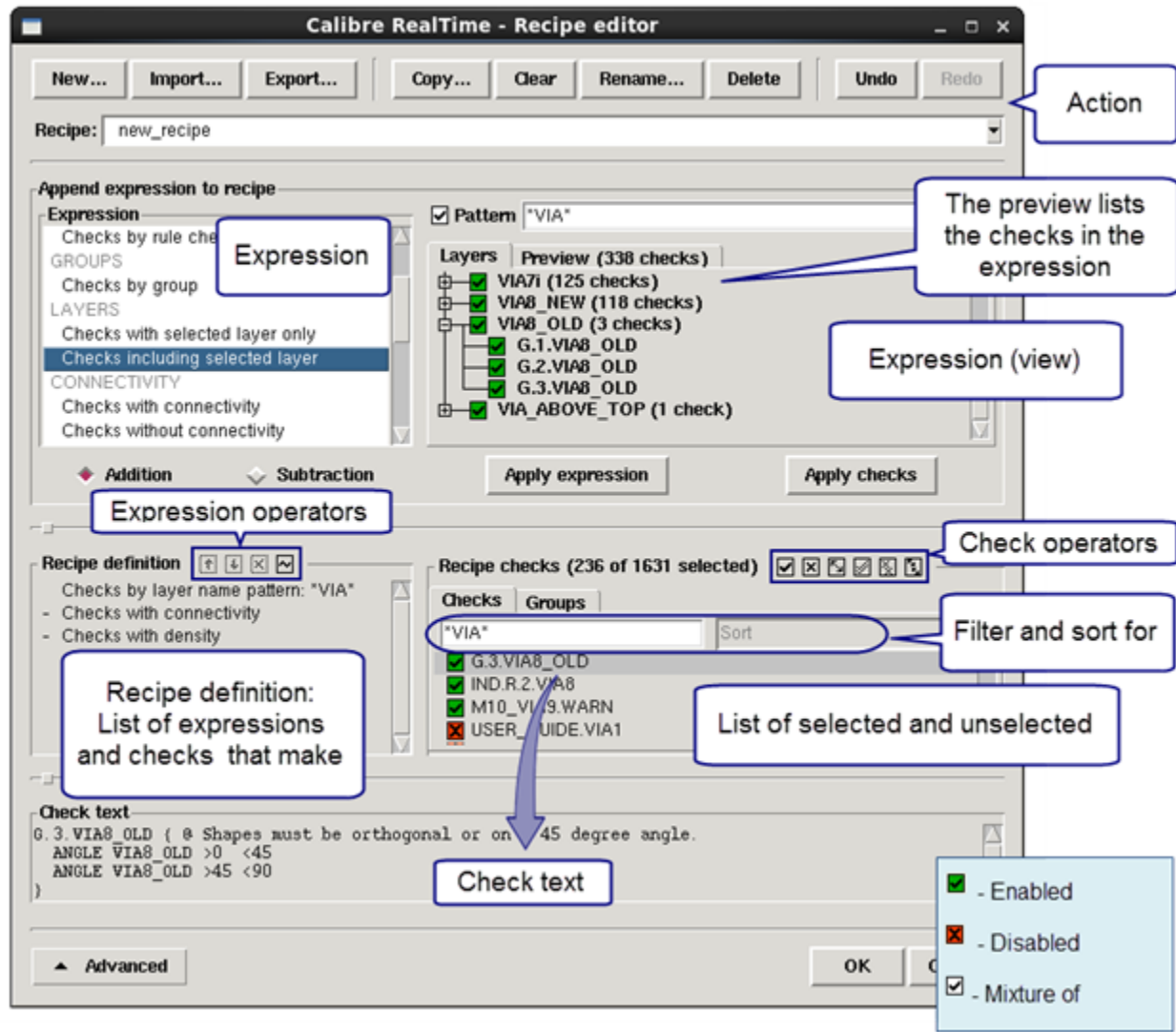


Figure 3-4. Calibre RealTime Recipe Editor Dialog Box Advanced Controls



Objects

Table 3-2. Recipe Editor Dialog Box Contents — Action Buttons

Control	Type	Description
New	Button	Creates a new recipe.
Import	Button	Open a recipe that has been saved to file. If the configuration file includes a recipe definition with the same name, the tool displays a warning message that the recipe already exists.

Table 3-2. Recipe Editor Dialog Box Contents — Action Buttons (cont.)

Control	Type	Description
Export	Button	Save a recipe to a file with the <i>.rcp</i> file extension. Note: User recipes are automatically saved to the Session Configuration File in Calibre RealTime Digital ; saving a recipe to file provides a backup for the check recipe definition.
Copy	Button	Create a copy of the selected recipe.
Clear	Button	Clear all check selections.
Rename	Button	Rename the selected check recipe.
Delete	Button	Delete the selected check recipe.
Undo	Button	As described.
Redo	Button	As described.

Table 3-3. Recipe Editor Dialog Box Contents — Basic Controls

Control	Type	Description
Recipe	Dropdown list	Specifies the active recipe.
Include	Radio button	Specifies checks to include: <ul style="list-style-type: none"> • Checks selected in the rules file — Include checks selected in the rule file with DRC [Un]Select Check statements. • All checks — As described. • Visible layer checks — Include all checks that use at least one of the layers visible in the window. • Visible layer only checks — Include all checks that use only layers visible in the window. • None — Unselect all checks. <p>A Layer statement specifying a name for an original layer is required in the rule file in order to use the “Visible layer checks” and “Visible layer only checks” selections. In addition, for the Cadence Innovus integration, the layer map file (<i>streamOut.map</i>) must exist in the working directory or be set with an environment variable; see “GDS Layer Map for Calibre RealTime Digital in Cadence Innovus” on page 86.</p>
Exclude	Checkbox	Specifies checks to exclude: <ul style="list-style-type: none"> • Checks with connectivity • Checks with density

Table 3-3. Recipe Editor Dialog Box Contents — Basic Controls (cont.)

Control	Type	Description
Recipe checks	Pane	<p>Displays tabs with the rule checks and check groups in the rule file; the Groups tab is only displayed if check groups are defined in the rule file.</p> <p>A green check mark indicates that the rule check or group is included in the recipe. A red X indicates the item is not included. Click the checkbox next to an item to include or exclude it from the recipe.</p> <p>In the Checks tab you can right-click for a menu to add and subtract checks. See the recipe definition controls in Figure 3-2 in “Advanced Editing of Check Selection Recipes” on page 70. You can also enter a filter pattern to filter the rule checks that are shown in the Checks tab.</p>
Check text	Pane	Displays the check text for the selected rule check.
Advanced	Button	Toggle between basic and advanced editing controls.

Table 3-4. Recipe Editor Dialog Box Contents — Advanced Controls

Control	Type	Description
Recipe	Dropdown list	Specifies the active recipe.
Expression (categories)	Pane	The list of available expression categories for the check selection recipe. See the next table for the definition of each expression.
Expression (view)	Pane	<p>The expression view displays the elements that make up the expression. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p> <p>Depending on the selected expression category, there may be a “Pattern” field. Enter a wildcard pattern in the “Pattern” field to filter the items displayed in the expression view.</p>
Addition	Selection	Add the expression or equivalent checks to the check recipe.
Subtraction	Selection	Subtract (exclude) the expression or equivalent checks from the check recipe.
Apply expression	Button	<p>Update the check recipe with the selected expression.</p> <p>The recipe definition is not modified until you click either Apply expression or Apply checks.</p>
Apply checks	Button	<p>Resolve the selected expression into a list of rule checks and update the check recipe.</p> <p>The recipe definition is not modified until you click either Apply expression or Apply checks.</p>

Table 3-4. Recipe Editor Dialog Box Contents — Advanced Controls (cont.)





Control	Type	Description
Recipe definition	Pane	<p>Displays the expressions that make up the recipe definition. Use the following buttons to operate on the selected expression:</p> <ul style="list-style-type: none">  — Move expression up in the list  — Move expression down in the list  — Delete the expression  — Resolve recipe into equivalent list of rule checks
Recipe checks	Pane	<p>Displays tabs with the rule checks and check groups in the rule file; the Groups tab is only displayed if check groups are defined in the rule file.</p> <p>A green check mark indicates that the rule check or group is included in the recipe. A red X indicates the item is not included. Click the checkbox next to an item to include or exclude it from the recipe.</p> <p>In the Checks tab you can right-click for a menu to add and subtract checks. See the recipe definition controls in Figure 3-2 in “Advanced Editing of Check Selection Recipes” on page 70. You can also enter a filter pattern to filter the rule checks that are shown in the Checks tab.</p>
Check text	Pane	Displays the check text for the selected rule check.
Advanced	Button	Toggle between basic and advanced editing controls.

Table 3-5. Expression Categories for Check Selection Recipes

Expression Category	Definition and Usage
The expression categories appear in the Expression categories pane in the dialog box, as shown in Figure 3-4 .	
All checks	<p>All checks in the rule file, except those excluded by preprocessor directives. DRC [Un]Select Check and DFM [Un]Select Check statements are <i>not</i> considered.</p> <p>All checks are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>

Table 3-5. Expression Categories for Check Selection Recipes (cont.)

Expression Category	Definition and Usage
Checks selected in the rules file	<p>Checks selected in the rule file. This expression and “Checks not selected in the rules file” are the only expressions that obey the DRC [Un]Select Check statements in the rule file.</p> <p>Note that if the rule file does not include any DRC [Un]Select Check statements, then all checks are executed; this is the same behavior as for batch Calibre nmDRC.</p> <p>Checks selected in the rule file are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>
Checks not selected in the rules file	<p>Checks <i>not</i> selected in the rule file. This expression and “Checks selected in the rules file” are the only expressions that obey DRC [Un]Select Check statements in the rule file.</p> <p>Checks not selected in the rule file are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p> <p>Tip: You can subtract this expression at the end of a recipe definition to ensure that only checks selected in the rule file are included in the recipe.</p>
Checks by rule check comments	<p>Choose checks by filtering on the rule check comment.</p> <p>Enter a wildcard pattern in the “Pattern” field. For example, enter *metal1* to have only checks that include “metal1” in the check text comment listed in the Preview pane. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p> <p>See “Rule Comments” in the <i>Calibre Verification User’s Manual</i>.</p>
Checks by group	Choose checks according to rule check groups.
Checks with selected layer only	<p>Choose checks by layer, where the rule check includes <i>only</i> the indicated layer.</p> <p>Original layers that are the only layer in a rule check are displayed in the expression view. Layers can be expanded to view the rule checks.</p> <p>Click the checkbox next to a layer to enable the rule checks that include only the indicated layer or right-click for a menu to select checks. Click the Preview tab to view the list of enabled and disabled checks.</p>


Table 3-5. Expression Categories for Check Selection Recipes (cont.)

Expression Category	Definition and Usage
Checks including selected layer	<p>Choose checks by layer, where the rule check includes the indicated layer and possibly other layers.</p> <p>Original layers that are included in a rule check are displayed in the expression view. Layers that are included in a rule check can be expanded to view the rule checks.</p> <p>Click the checkbox next to a layer to enable the rule checks that include the indicated layer; rule checks that include other layers in addition to the indicated layer are also enabled. Click the Preview tab to view the list of enabled checks.</p>
Checks with connectivity	<p>Choose checks that include connectivity.</p> <p>All checks with connectivity are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>
Checks without connectivity	<p>Choose checks that do not include connectivity.</p> <p>All checks without connectivity are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>
Checks with density	<p>Choose Density checks.</p> <p>All checks with the Density operation are listed and enabled in the expression view; this includes checks in which the Density operation is used to derive an input layer for the check. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>
Checks without density	<p>Choose checks that do not include the Density operation.</p> <p>All checks without the Density operation are listed and enabled in the expression view. Click the checkbox next to a check name to include or exclude the check from the recipe or right-click for a menu to add and subtract checks.</p>
Visible layer only checks ¹	Choose checks that use visible layers only and no invisible layers.
Visible layer checks ¹	Choose all checks that use at least one of the layers visible in the window.
Invisible layer only checks ¹	Choose checks that use invisible layers only and no visible layers.
Invisible layer checks ¹	Choose all checks that use at least one of the invisible layers in the window.

Table 3-5. Expression Categories for Check Selection Recipes (cont.)

Expression Category	Definition and Usage
Non-empty checks	Choose checks that produced results. This category is only present after a Calibre RealTime Digital run.
Empty checks	Choose checks that have not produced results. This category is only present after a Calibre RealTime Digital run.

Note

 ¹ In the Cadence Innovus integration, in order to use the check expressions involving visible layers, the layer map file (*streamOut.map*) must exist in the working directory or be set with an environment variable.

For information on the layer map file, see “[GDS Layer Map for Calibre RealTime Digital in Cadence Innovus](#)” on page 86.

Chapter 4

Calibre RealTime Digital in Cadence Innovus

The Calibre RealTime Digital interface is integrated with the Cadence® Innovus™ design tool, enabling you to start a Calibre nmDRC run directly from the open design as you edit.

Refer to “[Calibre RealTime Digital Introduction](#)” on page 15 for an overview and general system requirements.

The [Calibre RealTime Digital in Cadence Innovus Quick Reference](#) explains the basic usage and main features.

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Requirements and Setup for Calibre RealTime Digital in Cadence Innovus

Requirements for tool versions, input files, and environment variables must be met in order to run Calibre RealTime Digital in Cadence Innovus.

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General Requirements for Calibre RealTime Digital in Cadence Innovus

Certain requirements for design tool versions, layer map files, and environment variables must be met to run Calibre RealTime Digital in Cadence Innovus.

The following list gives the detailed requirements:

- Cadence Innovus version 16.22, 16.23, 16.24, or 17.11
See “[Cadence Innovus and Calibre RealTime Digital Version Compatibility](#)” on page 86 for the complete list of supported releases.
- Calibre version 2017.4 or later
Also see general requirements in “[Calibre RealTime Digital Requirements](#)” on page 15.
- Integration Script
See “[Tcl Script for Calibre Interface to Cadence Innovus](#)” on page 85.
- Layer Map Requirement
A layer map file that maps the Cadence Innovus layer objects to GDS layers and datatypes is required. The mapping should correspond to what is expected by the Calibre rule file and any Layer Map statements within the rule file.

The layer map file is used by the Cadence Innovus streamOut command. Consult the Cadence documentation for details on the file format and usage. A layer map file named *streamOut.map* is used automatically if one exists. You can also manually specify the layer map file in the Calibre RealTime Options dialog box or specify the layer map with an environment variable. See “[GDS Layer Map for Calibre RealTime Digital in Cadence Innovus](#)” on page 86 for more information.

- Environment Variable Requirements

Environment variables are defined as described in “[Environment Setup for Calibre RealTime Digital in Cadence Innovus](#)” on page 86.

Tcl Script for Calibre Interface to Cadence Innovus

The Calibre integration to Cadence Innovus requires a Tcl script to be loaded.

You can use one of the following methods to load the Calibre interface using the Tcl integration code:

- Source the Tcl script at the Cadence Innovus command prompt
- Specify the Tcl script with the -files argument when invoking Cadence Innovus

Tcl Integration Script

The Tcl file *cal_enc.tcl* is used to handle the loading of Calibre code. The file can be found at:

```
$CALIBRE_HOME/lib/cal_enc.tcl
```

Loading the Tcl Script

- At the Cadence Innovus command prompt

Invoke Cadence Innovus as usual, then source the integration script at the command prompt. For example:

```
innovus 1> source $::env(CALIBRE_HOME)/lib/cal_enc.tcl
```

- At invocation with the -files argument

You can load the integration script using the -files command line option when invoking Cadence Innovus. For example, at the shell prompt:

```
innovus -files "$CALIBRE_HOME/lib/cal_enc.tcl enc_setup.tcl" -win -log innovus.log
```

where the -files option loads the integration script *cal_enc.tcl* and a script to load the design data (*enc_setup.tcl*).

- With automatic loading

Consult the Cadence documentation regarding automatically loaded initialization files such as *enc.tcl* or *innovus.tcl* and add the Tcl integration code to such a file.

Environment Setup for Calibre RealTime Digital in Cadence Innovus

An environment variable must be set to enable Calibre RealTime Digital operation with Cadence Innovus.

The following environment variable settings are required, where the example is for the csh shell:

- Define the following environment variable to enable Calibre RealTime Digital:

```
setenv MGC_REALTIME_INNOVUS_ENABLED 1
```

Calibre RealTime Digital in Cadence Innovus is enabled when this environment variable is set to any value. To disable Calibre RealTime Digital in Cadence Innovus, unset MGC_REALTIME_INNOVUS_ENABLED.

- Make sure the environment variables are set correctly for your Cadence installation.

Cadence Innovus and Calibre RealTime Digital Version Compatibility

The support of Calibre RealTime Digital in Cadence Innovus depends on the Calibre release and the Cadence version.

Table 4-1. Cadence Innovus and Calibre RealTime Digital Version Compatibility

Cadence Innovus Version	Supporting Calibre Releases
16.24 and 19.11	2017.4 and later

GDS Layer Map for Calibre RealTime Digital in Cadence Innovus

A layer map file is required to map the Cadence Innovus layer objects to GDS layers and datatypes for layout export. The layer map file can be read automatically from the working directory, specified with an environment variable, or specified in the Calibre RealTime Options dialog box.

- **In the working directory** — The layer map file is read automatically if it is located in the working directory and has the name *streamOut.map*.
- **With an environment variable** — Set the environment variable MGC_RVE_GDS_LAYER_MAP_FILE to the location of the layer map file. Information in the layer map file overrides the default layer map *streamOut.map*.

The environment variable `MGC_REALTIME_LAYER_MAP_FILE` can also be used; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

- **In the Calibre RealTime Options dialog box** — Specify the layer map in the “Layer map file” field.

File Format

Consult the Cadence documentation.

Supported Object Types

The following object types are supported:

- BLOCKAGE
- BLOCKAGEFILL
- CUSTOM
- FILL
- NET
- SHORT
- TEXT
- TRIM
- ALL

In routing layers, ALL is equivalent to NET, SPNET, VIA, PIN, LEFPIN, FILL, FILLOPC, LEFOBS, VIAFILL, and VIAFILLOPC.

In cut layers, ALL is equivalent to VIA, VIAFILL, and VIAFILLOPC.

Duplication of output is supported. For example, the following layer map statements cause net objects on layer M2 to be duplicated four times to GDS layer 29 datatype 0:

```
M2 NET 29 0,0,0
M2 NET 29 0
```

Placement blockages (pBlkg) and voltage specific mappings are not supported.


The MASK keyword for color designs is supported.

Supported File Types for IP Merge

When setting up IP Merge, you select which layout files to incorporate into your DRC runs. You can use both individual layout files or file lists, which are text files where each line is a

path to a file or a directory. You can select multiple file lists to use, as well as select a combination of individual files and file lists.

Guidelines

- Only GDS and OASIS layout files are supported.
- Absolute and relative paths are both supported. Relative paths are expanded relative to the current working directory.
- To type out pathnames, click the  button to the right of a text box to expand it. You can now press Enter to add new lines; each pathname must be on a separate line.
- The wildcard characters * and ? can be used to specify multiple files. You can use these wildcard characters in file lists and when selecting layout files and file lists.
- Compressed files are allowed, but they must have a suffix of .z, .Z, or .gz, and the gzip program must be accessible to read the compressed file.
- Environment variables are supported.
- Specifying a directory name automatically includes all files in the directory. (dirname/*).
- File lists cannot contain paths to other file lists.
- In a file list, lines beginning with a # are treated as comments and are ignored.

File List Example

```
STD_LIB/1.gds
# Loads a single GDS file

STD_LIB/2?.gds
# Loads every GDS file in the STD_LIB directory that begins with a 2 and
has one additional character

STD_LIB/3*.gds
# Loads every GDS file in the STD_LIB directory that begins with a 3 and
has any number of characters after it

$STD_LIB_DIR
# Loads the directory to which this environment variable has been set
```


Invoking and Running Calibre RealTime Digital in Cadence Innovus

Several tasks are required to start and run Calibre RealTime Digital in Cadence Innovus.

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Invoking Cadence Innovus with Calibre RealTime Digital

After invoking Cadence Innovus with Calibre RealTime Digital, you see the Calibre RealTime Digital integrated toolbar.

Prerequisites

- “[Requirements and Setup for Calibre RealTime Digital in Cadence Innovus](#)” on page 84 completed.
- System and license requirements described in “[Calibre RealTime Digital Requirements](#)” on page 15 are satisfied.

Procedure

1. Start Cadence Innovus and open your design. For example:

```
innovus -files "calbr_innovus.tcl proj_setup.tcl" -win -log innovus.log
```

The -files options loads the both the Calibre integration script (*calbr_innovus.tcl*) and a script to load the design data. See “[Tcl Script for Calibre Interface to Cadence Innovus](#)” on page 85 for information on the integration script. If the integration code is loaded automatically, such as with the *enc.tcl* initialization file, you do not need to load *calbr_innovus.tcl* on the command line.

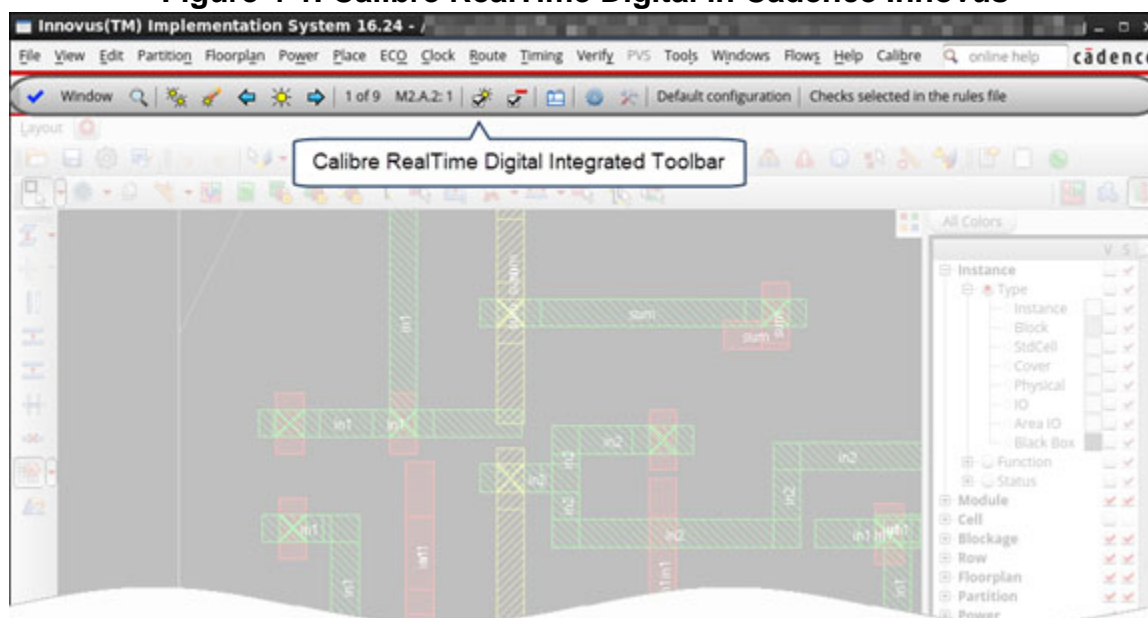
It may take a minute or so to acquire all licenses and complete the initialization. The following lines are displayed in the transcript after successful initialization:

```
// Calibre RealTime: Server initialized successfully at host:port  
// Calibre RealTime: Initialization complete
```

If you do not see the preceding notices, check that all environment variables are set as described in “[Environment Setup for Calibre RealTime Digital in Cadence Innovus](#)” on page 86.

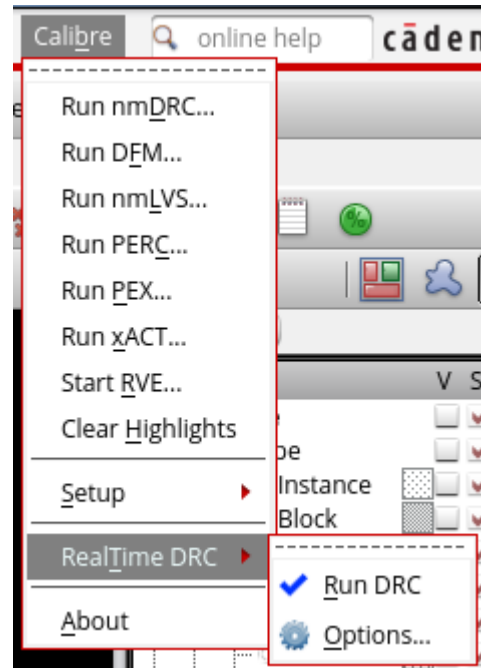
A partial view of the design window in Cadence Innovus is shown in [Figure 4-1](#). The [Calibre RealTime Digital Integrated Toolbar \(Innovus\)](#) is loaded.

Figure 4-1. Calibre RealTime Digital in Cadence Innovus



2. Verify that the **RealTime DRC** item was added to the **Calibre** menu, as shown in the following figure.

If you do not see the **RealTime DRC** menu item, exit Cadence Innovus, then make sure all environment variables are defined properly, as described in [“Environment Setup for Calibre RealTime Digital in Cadence Innovus”](#) on page 86.



3. Proceed to [“Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus”](#) on page 91.

Related Topics

[Session Configuration File in Calibre RealTime Digital](#)

[License Timeout for Calibre RealTime Digital](#)

Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus

A run configuration in Calibre RealTime Digital is the set of options and input files for a run. You can define multiple run configurations with different options (such as the rule file, check recipe and other options), then quickly switch between different run configurations. You can run with one configuration (single mode) or run multiple configurations in sequence (serial mode).

The first time you open Calibre RealTime Digital, the configuration run mode is set to Single and a run configuration named “Default configuration” is created. If you plan on using only one run configuration, no further action is needed.


Multiple run configurations can be used in the following modes:

- **Single** — Run only the currently selected configuration when a run is started.
- **Serial** — Run each configuration selected in the Configuration Run Control dialog box in order.

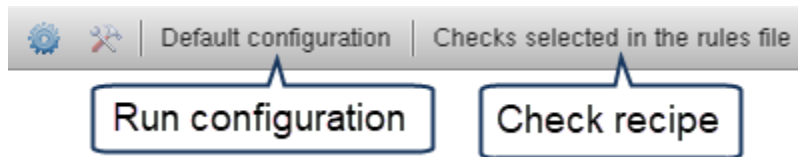
Prerequisites

- You have completed “[Invoking Cadence Innovus with Calibre RealTime Digital](#)” on page 89.

Procedure

1. Choose **Calibre > RealTime DRC > Options** to open the [Calibre RealTime Options Dialog Box \(Innovus\)](#), or click the **Options** button () on the integrated toolbar.
2. If using multiple run configurations, define as many configuration names as needed:
 - a. Click the **Edit** button next to the configuration name to open the Configuration Run Control dialog box.
 - b. Click the “+” button to add a configuration and specify the name. Repeat this step as needed.
 - c. If using the Serial run mode, set the run order using the up and down arrows. Use the checkbox to include or remove a configuration from the execution list.
 - d. Click **OK** to close the dialog box.
3. Define the settings for each run configuration:
 - a. Select the configuration in the Configuration dropdown list.
 - b. Specify the settings as described in “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)” on page 93.
4. Select the “Run mode”:
 - **Single** — Run only the currently selected configuration when a run is started.
 - **Serial** — Run each configuration selected in the Configuration Run Control dialog box in order.
5. Proceed to “[Running Calibre RealTime Digital in Cadence Innovus](#)” on page 95.

Results are displayed separately for each run configuration. Select the configuration to view with the toolbar—click the toolbar setting to select the configuration or check recipe from a menu:




Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options (Innovus)

Calibre RealTime Digital uses a standard Calibre nmDRC rule file. The check recipe controls which checks in the rule file are executed during the Calibre RealTime Digital run.

Prerequisites

- You have completed “[Invoking Cadence Innovus with Calibre RealTime Digital](#)” on page 89.
- You have completed “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus](#)” on page 91.
- You have a Calibre nmDRC rule file available; see “[Calibre RealTime Digital Requirements](#)” on page 15 and “[Differences Between Calibre nmDRC and Calibre RealTime Digital](#)” on page 16 for additional information about rule file requirements.


Procedure

1. Choose **Calibre > RealTime DRC > Options** to open the Calibre RealTime Options dialog box, or click the **Options** button () on the integrated toolbar.
2. Select the configuration in the “Configuration” dropdown list.
3. Specify the Calibre rule file in the “Rule file” text field.

Alternatively, you can specify a Calibre Interactive runset; see “[Specifying a Calibre Interactive Runset in Calibre RealTime Digital](#)” on page 43.

4. Click **Reload** to load the rule file.

Note

 If you make changes to the rule file during a Calibre RealTime session, you must manually reload the rule file in order for the new rule file to be used.

The rule file for the active configuration is loaded automatically on RealTime startup unless it is specified in the runset file.

- Specify the layer map file in the “Layer map file” field.

A layer map is required; see “[GDS Layer Map for Calibre RealTime Digital in Cadence Innovus](#)” on page 86.

- (Optional) Select options in the dialog box; the defaults are suitable for most runs. See “[Calibre RealTime Options Dialog Box \(Innovus\)](#)” on page 109 for a definition of each option.

If you want the Calibre RealTime Results window to open automatically after a run, enable the option “Launch RealTime results viewer automatically.”

Select the **Output files** tab if you want to save a summary file of DRC of the run and the DRC results as an ASCII results database (RDB).

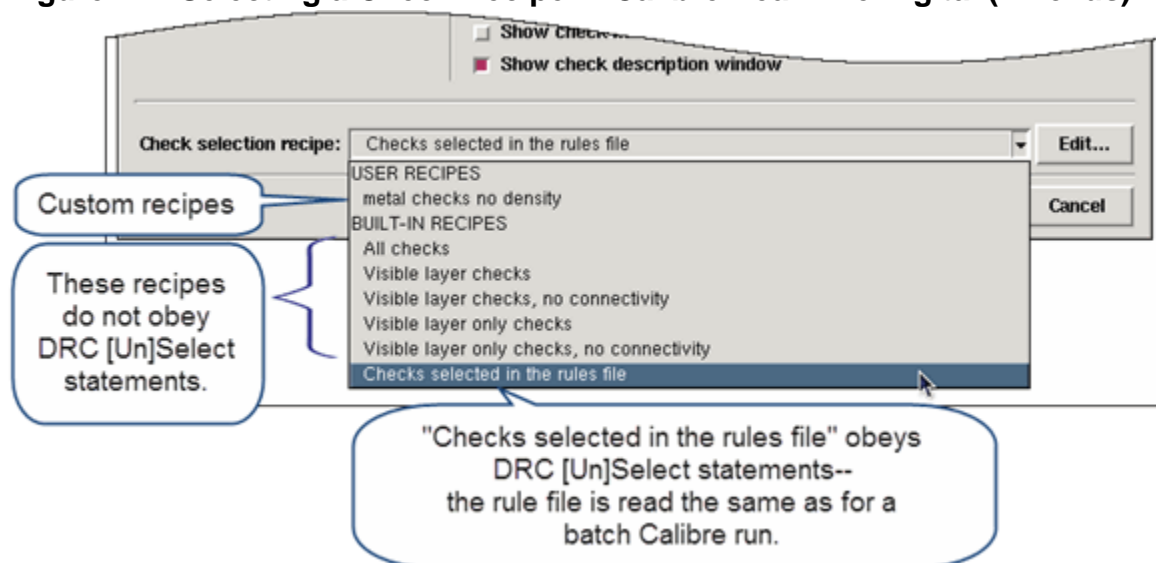
- Select the check recipe as follows:

- Checks selected in the rules file** (default) — This built-in recipe uses the Calibre rule file just as a batch run of Calibre does.
- Other built-in check recipes** — You can select a recipe that only runs checks on certain layers, excludes certain types of checks, or runs all checks in the rule file.

Because these built-in recipes do *not* obey [DRC \[Un\]Select Check](#) statements in the rule file, the recipes may execute checks in the rule file that would not be executed during a batch Calibre run. The recipe “Checks selected in the rules file” is the only built-in recipe that obeys DRC [Un]Select Check statements. See “[Built-In Check Recipes](#)” on page 63.

- User recipes** — You can select a previously defined custom check recipe. See “[Creating a Custom Check Selection Recipe](#)” on page 67.

Figure 4-2. Selecting a Check Recipe in Calibre RealTime Digital (Innovus)



- Proceed to “[Running Calibre RealTime Digital in Cadence Innovus](#)” on page 95.

Running Calibre RealTime Digital in Cadence Innovus


Calibre RealTime Digital runs checks on the geometries available in the Cadence Innovus window plus a halo around the region in window mode. Checks are run on the whole cell in cell mode. The specified check recipe selects the checks that are executed. All Calibre RealTime Digital DRC runs are performed in flat mode.

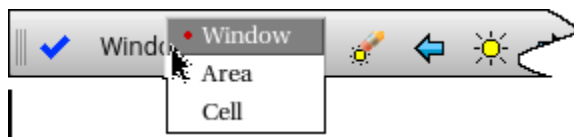
Prerequisites


- You have completed “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)” on page 93.
- (Optional) Specify highlight colors; see “[Specifying Highlight Color for Calibre RealTime Digital in Cadence Innovus](#)” on page 97.




Procedure

- Select a run configuration in the “Configuration” dropdown list, or, if running in Serial mode, make sure the “Run Mode” is set to Serial in the Calibre RealTime Options dialog box. See “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus](#)” on page 91.
- Zoom to the region you want to run DRC on and make sure all the geometries you want to run checks on are visible. A region of 25 um x 25 um or smaller is recommended for the best performance.
- Select the DRC run type and start a run.

The DRC run type is selected in the toolbar, in a dropdown menu next to the  button:




DRC Run Type	Instructions
Window	<p>Runs DRC on the geometries visible in the design tool window:</p> <ol style="list-style-type: none"> Choose the Window run type. Zoom to the region you want to run DRC on and make sure all the geometries you want to run checks on are visible. 25 um x 25 um or smaller is recommended for the best performance. Click the  button to start the run.

DRC Run Type	Instructions
Area	Runs DRC on a selected region: <ol style="list-style-type: none"> 1. Choose the Area run type. 2. Click the  button. 3. Use the mouse to drag a rectangle around the area you want to run DRC on.
Cell	Runs DRC on the whole block that is open in the active window. <ol style="list-style-type: none"> 1. Choose the Cell run type. 2. Click the  button to start the run.
Area 1, Area 2, ...	Runs DRC on a previously selected area: <ol style="list-style-type: none"> 1. Choose the area to run on. The most recent area is always named Area 1. 2. Click the  button to start the run.

If running in Serial mode, a DRC run is executed for each of the configurations selected in the “Configuration Run Control” dialog box, in the order specified.

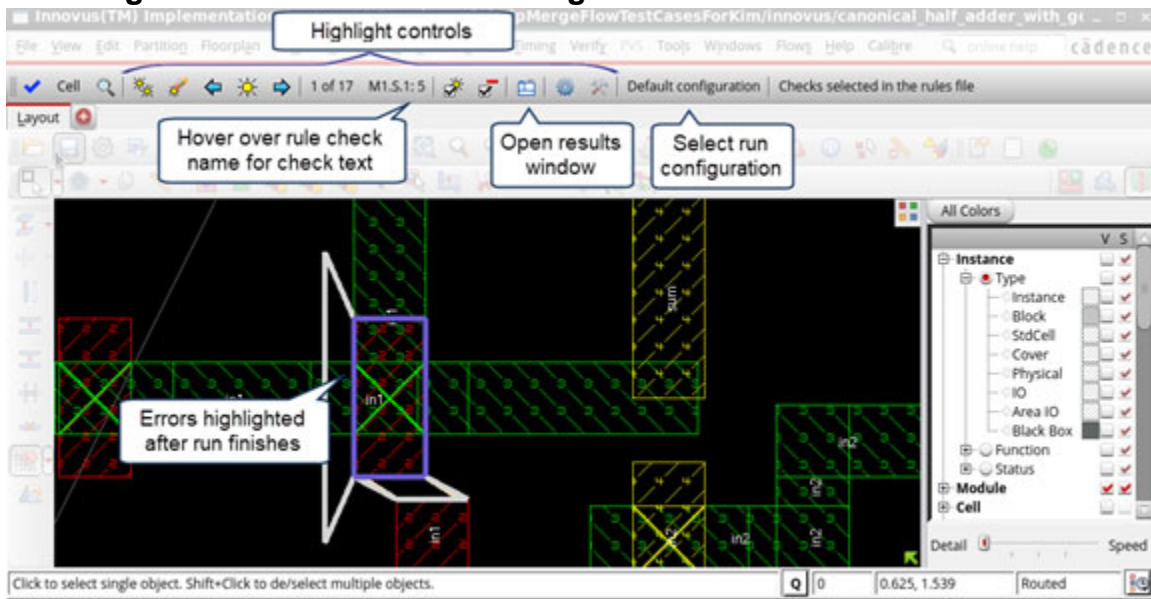
Results

The results of a Calibre RealTime Digital run are shown in [Figure 4-3](#). You can use the highlight controls in the integrated toolbar to step through results. If you are using multiple run configurations, the results are displayed separately for each configuration—select the configuration to view in the toolbar dropdown box.

You can also click the  toolbar icon to open the Calibre RealTime Results window to view results in a separate window; see “[Viewing Results in the Calibre RealTime Digital Results Window](#)” on page 35.

Rule check comments can be seen by hovering over the rule check name in the toolbar; the check definition is also included if “Include Check Definition in Tool Tip” was enabled at the time of the run.

Figure 4-3. Calibre RealTime Digital Results in Cadence Innovus





Specifying Highlight Color for Calibre RealTime Digital in Cadence Innovus

You can specify the highlight color used by Calibre RealTime Digital with the **Calibre > Setup > RVE** menu selection in Cadence Innovus. You can also specify DRC Rule Check Comments in a Check Text Override (CTO) file or the rule file.

Procedure

1. Do one of the following:

To do this ...	Do the following ...
Change highlight layer color in Cadence Innovus	<p>In Cadence Innovus, select Calibre > Setup > RVE. Set the highlight color, stipple (fill pattern), and border width, and specify them as selectable.</p> <p>(Optional) To use a different highlight color per rule check, click  to open the Calibre RealTime Options dialog box, select “Group highlight colors by check,” and unselect “Clear existing highlights.”</p>
Use a CTO file with DRC Rule Check Comments	<p>Click  to open the Calibre RealTime Options dialog box, check “CTO file”, and specify the CTO file.</p> <p>See “DRC Rule Check Comments for Calibre RealTime Digital” on page 46, and the rule check comments RVE Highlight Color and RVE Highlight Index.</p>

To do this ...	Do the following ...
Use DRC Rule Check Comments in the rule file	Add the rule check comment RVE Highlight Color or RVE Highlight Index to the rule check. For example: <pre>M2_NET { @ RVE Highlight Color: red copy M2_NET }</pre>

2. Proceed to [“Running Calibre RealTime Digital in Cadence Innovus”](#) on page 95.

Results

The specified color is used when you highlight a result. If you used DRC Rule Check Comments in the rule file, the highlight color is used per rule check.

If you specified “Group highlight colors by check” in the Calibre RealTime Options dialog box, the highlight colors are assigned to checks in a repeated cycle, starting with the color assigned to rve_0 (red by default) in the dialog box opened by **Calibre > Setup > RVE**. The assigned highlight color for a check is not fixed. The “Group highlight colors by check” is not compatible with “Clear existing highlights” because the latter option causes the highlight color assignment to start over at rve_0 for each highlight action.

Specifying Layer Visibility for Calibre RealTime in Cadence Innovus

You can use a Check Text Override (CTO) file to assign the layer visibility for results according to the rule check. The Check Text Override file is specified in the Calibre RealTime Options dialog box.

Note



A CTO file can also be used to assign highlight colors. See [“Specifying Highlight Color for Calibre RealTime Digital in Cadence Innovus”](#) on page 97 for more information.


Procedure

1. Create a Check Text Override (CTO) file using a text editor. The following example CTO file specifies the layer visibility for the min_ext_diff_poly rule:

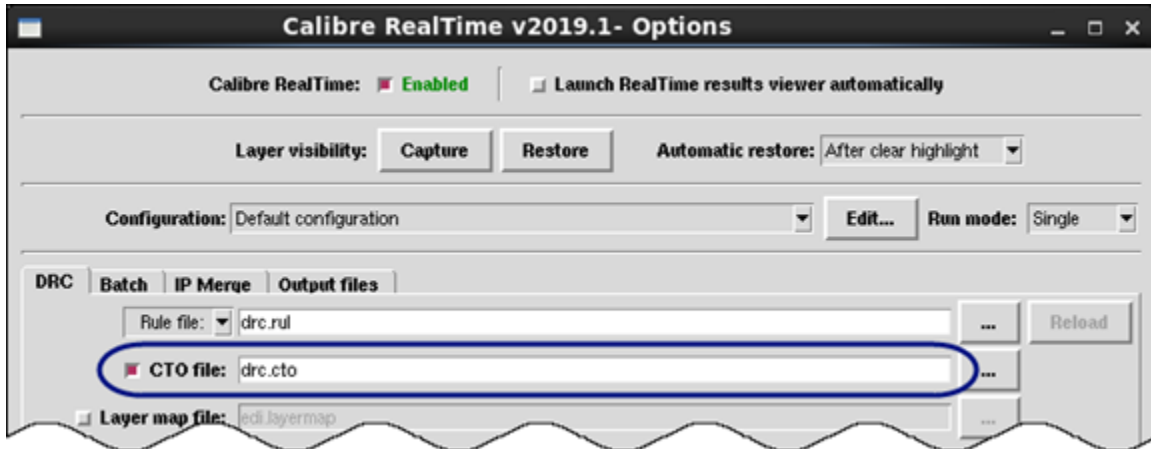
```
# check text override file for XYZ  
#  
min_ext_diff_poly  
RVE Show Layers: diff poly
```

where the drawing purpose layer is used by default in the RVE Show Layers statement. See [“DRC Rule Check Comments for Calibre RealTime Digital”](#) on page 46 for complete information about the CTO file syntax and supported rule check comments.


2. Save the check text override file with a file extension of *.cto*.

- Click the  button in the Calibre RealTime toolbar to open the Calibre RealTime Options dialog box.
- Enable “CTO file” and specify a check text override file.

The `.cto` file extension is not required, but the file browser for the CTO file searches for files with a `.cto` file extension.



Tip

-  You can enter an environment variable that is a directory path in the text entry field and click the ... button to have the file browser open to that directory.

You can also specify the CTO file with the environment variable `MGC_REALTIME_CTO_FILE`; see “[Calibre RealTime Digital Environment Variables](#)” on page 39 for more information.

- (Optional) Configure the “Automatic restore” setting to specify when to restore the layer visibility from before the first DRC run:
 - No** — Do not automatically restore layer visibility
 - After DRC run** — Restore layer visibility after a DRC run
 - After clear highlight** — Restore layer visibility after highlights are cleared

Results

With the example shown in Step 1, layers `diff` and `poly` are shown and all other layers are hidden.

Starting a Batch Calibre Run from Calibre RealTime Digital in Cadence Innovus

You can start a batch Calibre run from Calibre RealTime Digital if the design window contains more than a specified number of polygons. The controls for starting a batch run are on the **Batch** tab in the Calibre RealTime Options dialog box.


Tip

i If a dialog box pops up with a prompt to **Continue** or **Abort** the run because the polygon limit has been exceeded, the batch run has not been enabled to start automatically. Click **Abort** to end the run, and then use the following procedure to automatically start a run in batch mode whenever the polygon limit is exceeded.

Prerequisites

- You have completed “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options \(Innovus\)](#)” on page 93.
- Run configurations are set up. See “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus](#)” on page 91.
- (Optional) If you do not want results from the batch run automatically highlighted when the run completes, set the environment variable `MGC_REALTIME_DO_NOT_HIGHLIGHT_BATCH_RESULTS`. If the run produces many results, the highlight process can be slow. The option “Highlight after DRC run” is ignored when the environment variable is set.

Procedure

1. Click the **Options** button () in the integrated toolbar to open the [Calibre RealTime Options Dialog Box \(Innovus\)](#).
2. Select a run configuration in the “Configuration” dropdown list.
3. Click the **Batch** tab and set options as follows:
 - a. Check one of the following options:
 - Run batch Calibre nmDRC on layouts containing more than `<polygon_count_limit>` polygons (Polygon count limit)
 - Run batch Calibre nmDRC on layouts containing more than 3 million polygons
 - Tip: `<polygon_count_limit>` is set on the **DRC** tab.
 - b. Select settings for “Run Calibre DRC” and “Performance.”
 - c. (Optional) If you are submitting the job to a remote cluster, check “Queue command” and enter the command. See the tooltip for replaceable parameters.


See “[Batch Queue Command](#)” on page 118 for requirements regarding the batch queue command and a sample command script suitable for testing.

- d. (Optional) Specify the “Batch working directory.” The directory must exist and have write permission. Specify a different working directory for each run configuration.

The wrapper rule file, transcript file, and results database (RDB) are written to the batch working directory. If you do not specify a batch working directory, the output is written to the directory from which you invoked the design tool.

- e. Set options for “Licensing mode.”

See “[Batch Tab in the Calibre RealTime Options Dialog Box](#)” on page 116 for details on the Calibre run and licensing options.


4. If you are using multiple run configurations, repeat Steps 2 and 3 for each configuration.
5. Click **OK** to close the options dialog box.
6. Select your run type and click  in the toolbar to start the run.


When a batch run starts, the **Run DRC** button changes to  (**Stop batch DRC jobs**).

Results

The run starts as a Calibre RealTime Digital DRC run. If the polygon count for the run is greater than the specified number, a batch run starts and a message similar to the following is printed:

```
Calibre RealTime is running batch DRC using configuration: "config_DP"
DRC analysis window:      {-382049 -1173620} {1524120 141969}
Batch Calibre transcript file: "./batch_dir/
RealTime_batch_username_45nm_design_demo_fir_multi_layout_transcript.log"
DRC COMPLETE. TOTAL CHECK COUNT = 158 TOTAL RESULT COUNT = 86
Timing: Total run time : 4,498 ms
```

You can use the design tool at this point, but the Calibre RealTime Digital toolbar is unavailable except for the  button. The Calibre RealTime Digital license is checked out for the duration of the batch run.

When the batch run is complete, the results are reported in the Calibre RealTime Digital toolbar and it becomes active again. You can now use the highlight controls, or click the  toolbar icon to open the Calibre RealTime Digital Results window to view results in a separate window; see “[Viewing Results in the Calibre RealTime Digital Results Window](#)” on page 35. (The option “Launch RealTime results viewer automatically” is ignored in batch runs.)

A message similar to the following is printed to the transcript when the run completes:

```
DRC COMPLETE. TOTAL CHECK COUNT = 1631 TOTAL RESULT COUNT = 24990
```

The following files are written to the batch working directory:

- *RealTime_batch_<user>_cfg<configuration>_Calibre_<design_name>_RealTime_results.rdb*

The results database (RDB) file.

- *RealTime_batch_<user>_cfg<configuration>_Calibre_<design_name>_RealTime_transcript.log*

The Calibre transcript.

- *RealTime_batch_<user>_cfg<configuration>_Calibre_<design_name>_RealTime_wrapper.svrf*

The “wrapper” rule file is used in the Calibre command line that starts the batch run. The wrapper rule file specifies the layout window and the checks to execute, along with other settings for the run. The rule file is specified with an SVRF Include statement.


Running IP Merge for Calibre RealTime (Innovus)

IP Merge is configured in the Calibre RealTime Digital Options dialog box. After IP Merge is set up, DRC runs use the provided layout files to better identify rule violations.

Prerequisites

- Calibre RealTime Digital is open.

Procedure

1. Click the **DRC Options** button () to open the Calibre RealTime Options dialog box.
2. In the **DRC** tab, ensure that the correct rule file has been loaded and that the other settings are configured properly.
3. Click the **IP Merge** tab.
4. Select “Merge IP layout files with design for DRC run.”
5. Customize your configuration. See [“IP Merge Tab in the Calibre RealTime Digital Options Dialog Box”](#) on page 120 for more information on these options.
 - Select “Report conflicts to the log file” to print cell name conflicts to the log file. Conflicts occur when multiple cells in the layout files share the same name.
 - Select “Highlight IP polygons” to highlight the polygons from the IP Merge files that are near the DRC violations. Polygons are highlighted if only one result is selected.


Selecting this makes the following highlighting sub-options available:

- Enter a number for “Polygons limit” to restrict the number of IP polygons to highlight. The default value is 10000.
- Choose an option under the “Layers” dropdown menu to specify which layers to highlight.

- o Select “Halo size (UU)” and enter a number to customize the halo size for the layers in the IP Merge files. This option is disabled by default.

When this option is enabled, the default size is 1 user unit. When this option is disabled, a highlight halo of twice the smallest track step size is used.

6. Specify your IP Merge files:


- a. Click the  button in the “Layout files” or “File List” rows.
- b. Navigate to where your files are stored, then select them. You can select one or more files.
- c. Click **Open**.

IP layout files for the active configuration are loaded automatically on RealTime startup if IP Merge is enabled.

You can select any combination of layout files and file lists:

- **Layout files** — GDS or OASIS format IP layout files
- **File list** — Text files that contain a list of IP layout files, with one file per line

Wildcard characters and directories are supported for file lists and layout files. See [“Supported File Types for IP Merge”](#) on page 87 for more information.

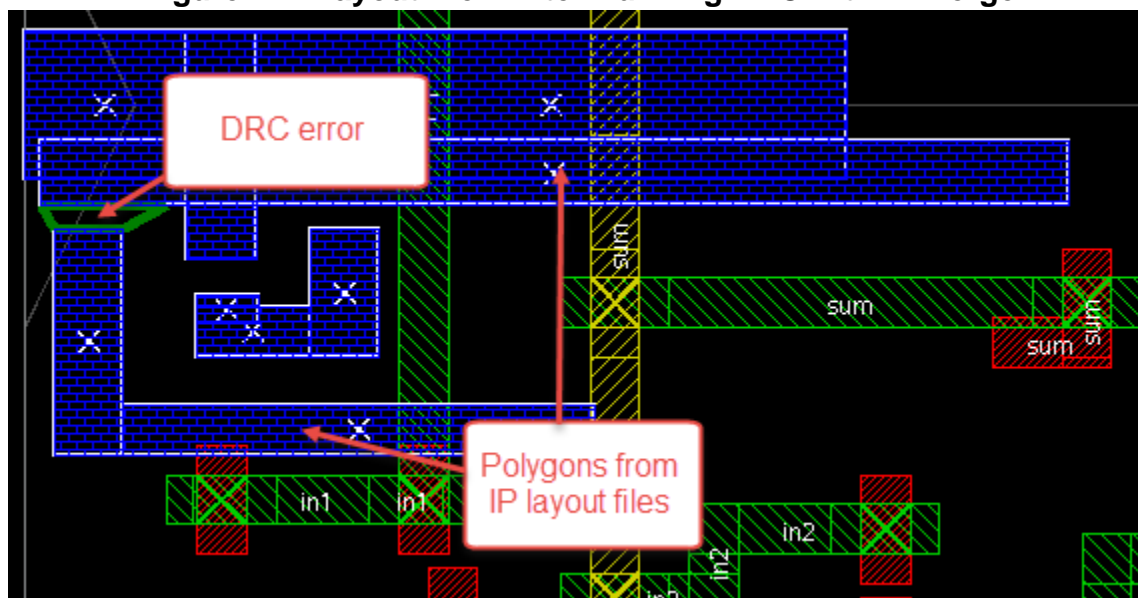
7. Click **OK** to close the dialog box.
8. In the RealTime toolbar, click the  button to run DRC.

Results

DRC violations are highlighted in the design tool. These violations take into account the contents of the IP layout files.

The following image shows a DRC error highlighted with the option “Highlight IP polygons with DRC result” enabled. Polygons from the IP layout files have been highlighted in blue.

Figure 4-4. Layout View After Running DRC with IP Merge



GUI Reference for Calibre RealTime Digital in Cadence Innovus

The Calibre RealTime Digital integrated toolbar and the Calibre RealTime Options dialog box provide the controls and settings you need to run Calibre RealTime Digital.

Calibre RealTime Digital Integrated Toolbar (Innovus)	105
Calibre RealTime Options Dialog Box (Innovus)	109
Batch Tab in the Calibre RealTime Options Dialog Box	116
IP Merge Tab in the Calibre RealTime Digital Options Dialog Box	120

Calibre RealTime Digital Integrated Toolbar (Innovus)

The Calibre RealTime Digital integrated toolbar includes controls to start a DRC run, highlight results, and open the Calibre RealTime Options dialog box. The toolbar also includes option settings for run control and highlighting.

The Calibre RealTime Digital integrated toolbar is shown in the following figure:



The run controls, highlight controls, and options controls are described in the following sections.

Run Controls (Innovus)

The run controls in the Calibre RealTime Digital integrated toolbar start a DRC run and zoom to the window for the most recent DRC run. The run controls are shown below and described in the table following the figure.

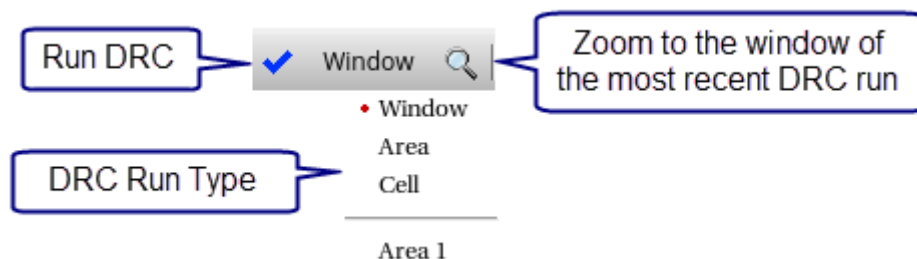





Table 4-2. Run Control Toolbar Selections (Innovus)

Toolbar Item	Description
 (Run DRC)	Runs flat DRC using the selected DRC Run Type. Calibre runs with the currently selected Run Configuration and configuration run mode (Serial or Single). Keyboard shortcut: F12
DRC Run Type dropdown	Selects the DRC run type: <ul style="list-style-type: none"> • Window — Run DRC on the geometries visible in the current window, plus a halo region around the area. • Area — Run DRC in a selected area. Click the Run DRC button () and use the mouse cursor to select an area in the design. • Cell — Run DRC in the whole block that is open in the active window. • Area 1, Area 2, ... — Run DRC on a previously selected area.
	Zoom to the window of the most recent DRC run.

Highlight Controls (Innovus)

The highlight control section in the Calibre RealTime Digital integrated toolbar includes highlight controls and displays the rule check for the current result. The highlight controls are shown below and described in the table following the figure.



Table 4-3. Highlight Control Toolbar Selections (Innovus)






Toolbar Item	Description
	Highlight all.
	Clear all highlights.
	Highlight previous, current, or next result for the rule check. Also see Behavior of “Group highlight colors by check” in the Usage Notes section of “ Calibre RealTime Options Dialog Box (Innovus) ” on page 109.
	Result <i>n</i> of <i>total</i> results. Also see the setting “Show results in” in the Calibre RealTime Options Dialog Box (Innovus) ; this setting determines whether all results for the cell or only results from the most recent run are reported.

Table 4-3. Highlight Control Toolbar Selections (Innovus) (cont.)

Toolbar Item	Description
Rule check	Indicates the rule check that produced the displayed error when using the highlight previous, current, and next buttons. Click the rule check name to select a different rule check.
	Highlight all results from the selected rule check.

Option Controls (Innovus)

The option controls in the Calibre RealTime Digital integrated toolbar select the check recipe and open the Calibre RealTime Options dialog box. The option controls are described in the table following the figure.

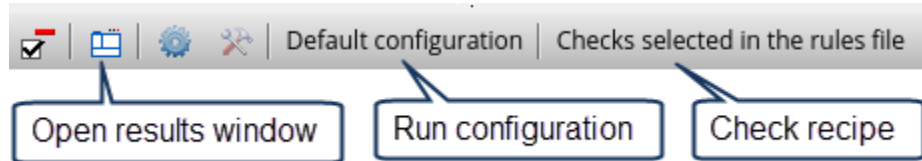


Table 4-4. Option Control Toolbar Selections (Innovus)






Toolbar Item	Description
	Remove the displayed rule check from the current check recipe. All highlights are cleared, regardless of the setting of “Clear existing highlights.” If the recipe is a built-in recipe, a pop-up dialog box prompts you to save the new check recipe to a new filename. If the recipe is a user recipe, the updated recipe is saved automatically.
	Open the Calibre RealTime Digital Results window. See “Viewing Results in the Calibre RealTime Digital Results Window” on page 35.
	Open the Calibre RealTime Options Dialog Box (Innovus) .
	Open the Customization GUI. This button is only available if a Calibre Interactive runset is loaded and includes a customization file. See “Using the Customization GUI with Calibre RealTime Digital” on page 45.
Run Configuration	Select the run configuration, both for a run in “Single” mode and for viewing results; see “Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Cadence Innovus” on page 91.

Table 4-4. Option Control Toolbar Selections (Innovus) (cont.)

Toolbar Item	Description
Check recipe	Select the check recipe from the dropdown list. See “Check Selection Recipes in Calibre RealTime Digital” on page 61 for more information.

Calibre RealTime Options Dialog Box (Innovus)

To access: Choose **Calibre > RealTime DRC > Options** or click the  button in the toolbar.

The Calibre RealTime Options dialog box specifies the Calibre rule file, the check recipe, and other options. The settings in the Calibre RealTime Options dialog box are saved in the Calibre RealTime Digital configuration file.

Description

Figure 4-5. Calibre RealTime Options Dialog Box

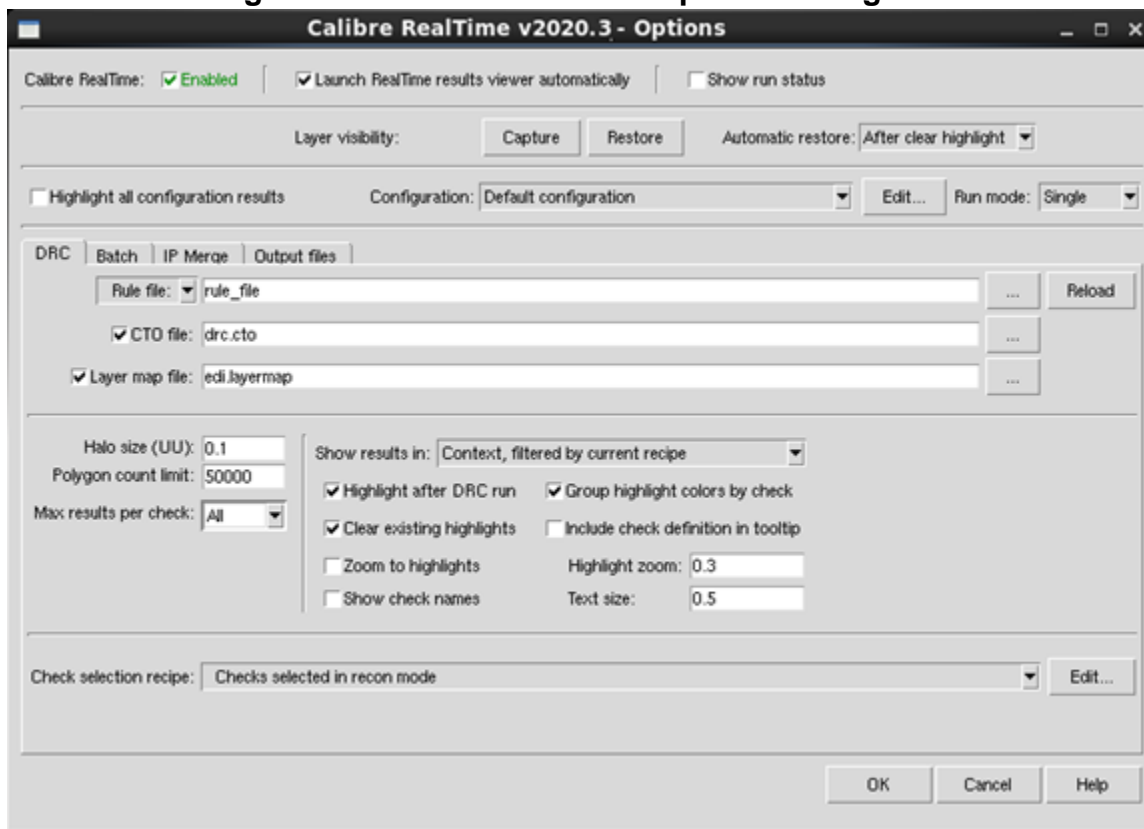



Table 4-5. Tabs in Calibre RealTime Options Dialog Box

Tab	Description
DRC	Specify options for the Calibre DRC run. See the table in the next section and “Usage Notes” at the end.
Batch	Specify options to launch a batch Calibre nmDRC run if the design window contains more than a specified number of polygons. See “ Starting a Batch Calibre Run from Calibre RealTime Digital in Cadence Innovus ” on page 100.

Table 4-5. Tabs in Calibre RealTime Options Dialog Box (cont.)

Tab	Description
Output files	Specify whether to save a summary file and the DRC results as an ASCII results database (RDB). If a specified directory does not exist, the tool prompts you to confirm that the directory should be created.

Tip

 You can use environment variables to specify any pathname, directory name, or portion of a pathname. For example: `$PROJ/$DESIGN/rules`.

However, the Calibre RealTime Digital environment variables specific for input files take precedence over user-defined environment variables. See “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

Fields

Table 4-6. Calibre RealTime Options Dialog Box Contents

Control	Description
Calibre RealTime (Enabled/Enable)	Toggles display of the Calibre RealTime Digital integrated toolbar. The Calibre RealTime Digital integrated toolbar is automatically displayed if a DRC run is launched using the Calibre > RealTime DRC menu.
Launch RealTime results viewer automatically	Specifies whether to open the Calibre RealTime Digital Results window automatically after a run. See “ Viewing Results in the Calibre RealTime Digital Results Window ” on page 35.
Show run status	Specifies whether to display processing status updates in the shell during a Calibre RealTime Digital run.
Layer visibility	Manually captures or restores layer visibility. When using a CTO file, layer visibility changes after highlighting a result from a check with a RVE Show Layers statement. The following buttons enable you to save and set layer visibility: <ul style="list-style-type: none">• Capture — Save the current layer visibility• Restore — Revert the layer visibility to the saved version

Table 4-6. Calibre RealTime Options Dialog Box Contents (cont.)


Control	Description
Automatic restore	<p>Specify when to set the layer visibility to the saved version. If the layer visibility has not been manually saved, then the version before the first DRC run is used.</p> <ul style="list-style-type: none"> • No — Do not automatically restore layer visibility • After DRC run — Restore layer visibility after a DRC run • After clear highlight — Restore layer visibility after highlights are cleared
Highlight all configuration results	<p>Specifies whether to automatically highlight DRC results from all configurations after a DRC run. When this option is enabled:</p> <ul style="list-style-type: none"> • Highlights are preserved when switching configurations. • When highlighting, the “Clear existing highlights” option is ignored and existing highlights are not cleared. • Results from all configurations are highlighted in both single and serial runs, and the “Highlight after DRC” option is ignored. <p> Note: When this option is enabled, you can only cross-highlight results from the layout editor to the Results window if they are from the current configuration. You can view the check description of any result regardless of its corresponding configuration.</p>
Configuration	<p>Specifies the Run Configuration name. To add or delete a configuration, click Edit to open the Configuration Run Control dialog box.</p> <p>A configuration is the set of options and filenames below the configuration name.</p>
Run Mode	<ul style="list-style-type: none"> • Single — Run with the currently selected configuration. • Serial — Run each selected configuration in series, in the order specified in the Configuration Run Control dialog box.
Rule file/Runset dropdown list	Selects whether to load a rule file or a Calibre Interactive runset.
Rule file	<p>Specifies the Calibre rule file used for the run.</p> <p>See the “Usage Notes” for information on using environment variables.</p>
Runset	<p>Specifies a Calibre Interactive runset to use for the run.</p> <p>See “Using Calibre Interactive Settings in a Calibre RealTime Digital Run” on page 43 for details.</p> <p>See the “Usage Notes” for information on using environment variables.</p>

Table 4-6. Calibre RealTime Options Dialog Box Contents (cont.)

Control	Description
CTO file	Specifies a CTO file for controlling the highlight color and layer visibility per rule check. See “DRC Rule Check Comments for Calibre RealTime Digital” on page 46. See the “Usage Notes” for information on using environment variables.
Layer map file	Specifies a custom layer map file. See “GDS Layer Map for Calibre RealTime Digital in Cadence Innovus” on page 86. See the “Usage Notes” for information on using environment variables.
... (Browse)	Open a file browser to select the rule file, CTO file, or layer map file.
Reload	Reload the rule file or runset. You must click Reload for changes in the rule file or runset to take effect. Changes in the layer map and CTO files cause an automatic reload prior to the DRC run.
Halo size (UU)	The halo size in user units. See “Halo Usage in Calibre RealTime Digital” on page 21 and “Halo” in “Terms and Definitions in Calibre RealTime Digital” on page 17 for more information on halos.
Polygon count limit	Sets the maximum number of polygons that are passed to Calibre. The limit should be set low enough that the Calibre server returns control to the design tool in a short amount of time. The maximum number of geometries Calibre RealTime Digital will process is 3,000,000.
Max results per check	Specifies the maximum number of results returned per rule check; this setting overrides the setting in the rule file.

Table 4-6. Calibre RealTime Options Dialog Box Contents (cont.)


Control	Description
Show results in	<p>This setting controls which results are reported in the integrated toolbar after the run.</p> <ul style="list-style-type: none"> • Whole cell, all checks — Report all results for the cell in the integrated toolbar after each DRC run. Reported results include those from the current run, previous results in the cell that are outside of the current run context, and possibly previous results within the current run context from rule checks not selected by the current recipe. • Whole cell, filtered by current recipe — Report results for the whole cell and from the current recipe only in the integrated toolbar after each DRC run. Reported results include those from the current run plus previous results in the cell that are outside of the current run context. • Context, filtered by current recipe — (default) Report only results within the current run context and from the current check recipe in the integrated toolbar after each DRC run. <p>For each case, all results in the current window and belonging to the current check selection recipe are deleted before the run.</p> <p>The settings “Whole cell, filtered by current recipe” and “Context, filtered by current recipe” should be used with caution, because they filter out results from previous runs. If these settings are used, it is recommended that a later run be performed with “Whole cell, all checks” selected to make sure that all results are reported.</p>
Highlight after DRC run	Highlight results in the design tool after the DRC run.
Group highlight colors by check	<p>Assign the highlight color for results according to the rule check. The assigned highlight color for a rule check is not fixed—rather, the highlight colors are assigned to checks in a repeated cycle. This option is not compatible with “Clear existing highlights.” See “Behavior of “Group highlight colors by check”” in the Usage Notes section.</p> <p>You can also set highlight colors with rule check comments; see “Specifying Highlight Color for Calibre RealTime Digital in Cadence Innovus” on page 97.</p>
Clear existing highlights	<p>Clear existing highlights before each new highlight action. Highlights are cleared before each run, and when using the  buttons to step through highlights.</p> <p>Also see “Behavior of “Group highlight colors by check”” in the Usage Notes section.</p>







Table 4-6. Calibre RealTime Options Dialog Box Contents (cont.)

Control	Description
Include check definition in tooltip	When enabled, the complete rule check definition is included in the result tooltip, which is viewed by hovering over the rule check name in the toolbar; otherwise, only the check text comments are shown. You must run Calibre RealTime Digital after changing this setting for the change to take effect.
Zoom to highlights	Specifies whether to zoom to the extent of the results when highlighting. When automatically highlighting after a DRC run, RealTime does not zoom to highlights to avoid changing the currently selected viewpoint.
Highlight zoom	Specifies the magnification used when zooming to highlight a result.
Show check names	Specifies to display the check name at the center of each result.
Text size	Specify the text size when “Show check names” is enabled.
Check selection recipe	The check recipe used for the Calibre run. See “ Check Selection Recipes in Calibre RealTime Digital ” on page 61.
Edit	Open the Calibre RealTime Recipe Editor Dialog Box .
Help	Opens the <i>Calibre RealTime Digital User’s Manual</i> in your default web browser.

Usage Notes

- Environment variable usage
 - You can use environment variables in pathnames for files and directories. The environment variable is not expanded when viewed in the dialog box or saved to the configuration file. For example, you can enter `$CAL_RULES/drc.rul` for the rule file, and `$CAL_RULES/drc.rul` is saved in the configuration file.
 - You can enter an environment variable for a directory path in a file entry field and click the ... button to open the file browser to that directory. This makes it easier to browse for a file if it is not in the working directory and the directory path is long. When you select a file, the absolute path is entered in the text entry file and saved in the configuration file. This capability is available for the rule file, CTO file, and layer map file, but not for the runset file.
 - There are system defined environment for the input files; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.
- Behavior of “Group highlight colors by check”

When “Group highlight colors by check” is enabled, colors are assigned to results according to the rule check. However, the association between the highlight color and the rule check is not fixed; it depends on the history of your Calibre RealTime Digital session. Highlight colors are assigned to checks in a repeated cycle, starting with the first color (red by default). The color assignment starts at the beginning each time highlights are cleared. Highlights are cleared in the following cases:



- Automatically when “Clear Existing Highlights” is enabled; highlights are cleared at the start of a run, or at each new highlight when using the    buttons.
- By clicking the **Clear Highlights** button ().
- Automatically when the  button in the integrated toolbar is clicked. The  button also removes a rule check from the current check recipe—see “[Highlight Controls \(Innovus\)](#)” on page 106 for a full description of the button behavior.




The following behavior is observed when “Group highlight colors by check” is enabled:




- Highlight color assignments from a DRC run:

Clear Existing Highlights ON — Highlights are cleared and highlight color assignment starts at the first color of the highlight color cycle at the beginning of each Calibre RealTime Digital run.






Clear Existing Highlights OFF — Highlights from previous runs are kept. New results from a check with an existing highlighted result are highlighted in the same color. New results from a check that does not have an existing highlighted result are highlighted in the next color in the highlight color cycle.

Clicking  or  — Highlights are cleared and highlight color assignment starts at the first color of the highlight color cycle for the next run, regardless of the setting of “Clear Existing Highlights.”

- Highlight color assignments using the    buttons

Clear Existing Highlights ON — All highlights are cleared each time one of the    buttons is clicked; each result is highlighted in the first color of the highlight color cycle.

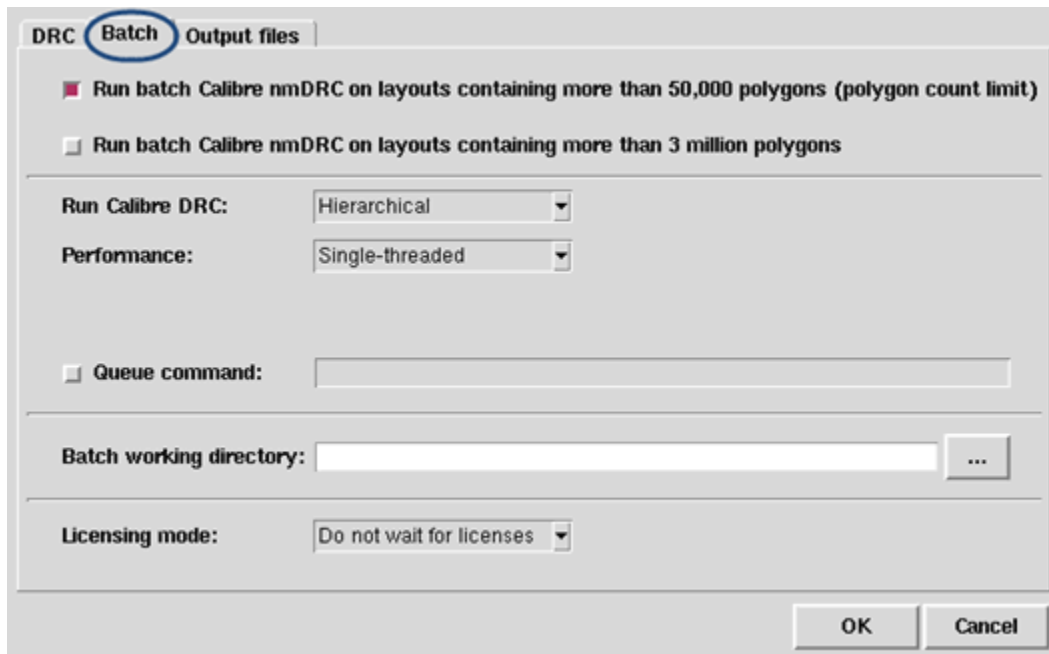
Clear Existing Highlights OFF — Each result is highlighted in the color used originally.

Clear All Highlights button  clicked when **Clear Existing Highlights OFF** — All highlights are cleared. The next result highlighted with one of the    buttons is highlighted in the first color of the highlight color cycle; the highlight color for further results is assigned according to the rule check. All highlights are kept until  is clicked again.

Batch Tab in the Calibre RealTime Options Dialog Box

To access: Open the Calibre RealTime Options dialog box and click the **Batch** tab.

The **Batch** tab has settings for controlling a Calibre batch run started from Calibre RealTime Digital. You can set the number of polygons in the layout window that trigger a batch run, and execution and licensing options.



Objects

Object	Description
Run batch Calibre nmDRC on layouts containing more than <i><polygon_count_limit></i> polygons (Polygon count limit)	As described. The <i><polygon_count_limit></i> is set on the DRC tab with the “Polygon count limit” option. The default polygon count limit is 50,000.
Run batch Calibre nmDRC on layouts containing more than 3 million polygons	As described.
Run Calibre DRC	Specify a Flat or Hierarchical run.
Performance (only available for hierarchical runs)	Specify a single-threaded run, a multithreaded (turbo) run, or a distributed (Calibre MTflex) run.
Hyperscale (only available for multithreaded and Calibre MTflex runs)	Enables hyperscaling.

Object	Description
Number of CPUs (only available for multithreaded runs)	<ul style="list-style-type: none"> • All — Use the maximum number of available CPUs. • Positive integer — Use the specified number of CPUs.
Remote file (only available for Calibre MTflex runs)	Specify the remote file.
Queue command	<p>Specify a command to submit the Calibre batch run to a remote cluster.</p> <p>See “Batch Queue Command” on page 118 for replaceable parameters that can be used and for requirements regarding the queue command.</p>
Batch working directory	<p>Specify the directory in which to save the results database, log file, and “wrapper” rule file. Temporary working files are also written to this directory. The directory must exist. Separate batch working directories for each run configuration are recommended.</p> <p>If not specified, the directory from which the design tool was launched is used.</p>
Licensing mode	<p>Specify licensing options. The corresponding command line option is given in parentheses.</p> <ul style="list-style-type: none"> • Do not wait for licenses — Stop the batch run immediately if licenses are not available. (-nowait) • Wait for licenses — If licenses do not become available in the specified time, attempt to acquire substitute licenses. (-wait <time>) • Retry license acquisition — If licenses are not available, queue and periodically try to acquire the licenses. (-lmretry loop) <ul style="list-style-type: none"> • Retry for: ____ minutes (MAXRETRY) • Wait for: ____ seconds between retries (INTERVAL) • Retry even if a licensing error occurs (RETRY_ON_ERROR)


Usage Notes

Batch Queue Command

There are some special requirements on the queue command script executed from Calibre RealTime Digital. The queue command script must do the following:

- Monitor the status of the remote job and not exit until the job is complete.
- Make any required environment variables available to the remote host.
- Launch Calibre and redirect the Calibre transcript output to a file. The following replaceable parameters can be passed to the queue command script:
 - %c — Path to the Calibre executable
 - %o — Calibre invocation options
 - %t — Calibre transcript file, which has the automatically generated name of *RealTime_batch_<user>_Calibre_<design_name>_RealTime_transcript.log*.
 - %C — Calibre command with options and redirect to transcript (%c %o > %t)
 - %d — Batch working directory

The queue command script must use either the three parameters %c, %o, and %t, or the parameter %C. When %C is not used, the %t parameter must be used as the file to which the Calibre transcript output is redirected. The %d parameter is optional.

The  (**Stop batch DRC jobs**) button is not available during execution of the queue command script, as there is no way for Calibre RealTime to terminate a job on a remote host.

Sample Batch Queue Command

The following queue command script demonstrates the use of the replaceable parameters and how to write the output of queue command script to a log file. The script prints some debug information and starts a Calibre run on the local host—it does not launch a job on a remote host.

The queue command script, *queue_command_sample*, is the following:

```
#!/usr/bin/tclsh

puts "argc=$argc"
puts "argv=$argv"

set calibre_binary      [lindex $argv 0]
set calibre_options     [lindex $argv 1]
set calibre_transcript  [lindex $argv 2]

puts "calibre_binary=$calibre_binary"
puts "calibre_options=$calibre_options"
puts "calibre_transcript=$calibre_transcript"
puts ""

eval exec "$calibre_binary $calibre_options > $calibre_transcript"
```

To use this queue command place the following in the “Queue command” field on the **Batch** tab of the Calibre RealTime Options dialog box:

```
./queue_command_sample %c "%o" %t >& log.txt
```

Quotation marks are placed around the %o parameter so that the Calibre options are passed to the script as a single string. After execution, the *log.txt* file contains the output of the puts statements and the transcript file contains the output from the Calibre command execution.

Related Topics

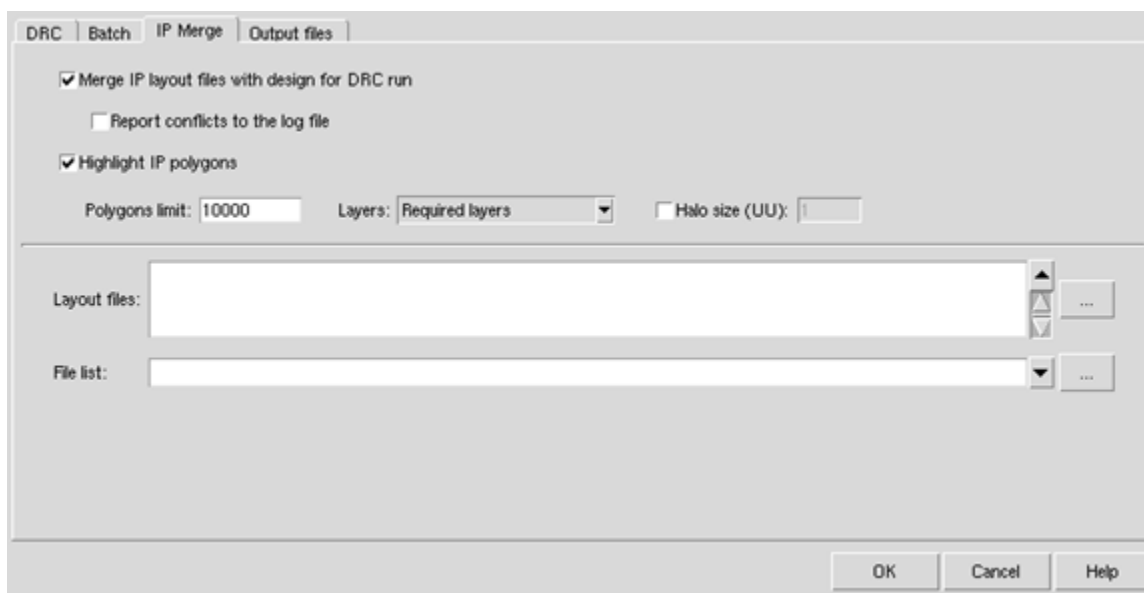
[Starting a Batch Calibre Run from Calibre RealTime Digital in Cadence Innovus](#)

[Calibre Administrator's Guide](#)

IP Merge Tab in the Calibre RealTime Digital Options Dialog Box

To access: Open the Calibre RealTime Options dialog box. Click the **IP Merge** tab.

The **IP Merge** tab has settings that allow customization of IP Merge when running DRC in Calibre RealTime Digital. You can control which layout files to use and how violations are highlighted.



Objects

Object	Description
Merge IP layout files with design for DRC run	As described.
Report conflicts to the log file	Print cell name conflicts to the log file <i>Calibre_RealTime_IP_Merge.log</i> . Conflicts are instances where two different cells in the layout files share the same name.
Highlight IP polygons	As described. Polygons are highlighted when only one result is highlighted.
Polygons limit	Restrict the number of IP layout polygons highlighted after a DRC run. The default maximum is 10000, and values from 0 to 1000000 are supported.

Object	Description
Layers	<p>Specify which layers to highlight:</p> <ul style="list-style-type: none"> • Required layers — Highlight only layers used for the rule check. This is the default option. • Required visible layers — Highlight visible layers used for the rule check. • All layers — Highlight all of the layers provided by the layout files. • All visible layers — Highlight all of the visible layers provided by the layout files.
Halo size (UU)	<p>Customize the halo size for highlighting the IP layout polygons. The default size is 1 user unit, and values from 0 to 10 are supported. All polygons within or intersecting the halo are highlighted.</p> <p>When this option is not selected, a highlight halo of twice the smallest track step size is used.</p>
Layout files	<p>Specify which IP layout files to use in a DRC run. You can select one or more GDS or OASIS files.</p>
File list	<p>Specify a text file containing a list of IP layout files to use in a DRC run. You can select one or more file lists.</p> <p>Wildcard characters and directories are supported for file lists and layout files. See “Supported File Types for IP Merge” on page 87 for more information.</p>

Usage Notes

Changes to the highlight options take effect without rerunning DRC.

Related Topics

[Running IP Merge for Calibre RealTime \(Innovus\)](#)

Keyboard Shortcuts for Calibre RealTime Digital in Cadence Innovus

A set of standard keyboard shortcuts are provided for Calibre RealTime Digital in Cadence Innovus.

The keyboard shortcuts are defined in the following file:

```
$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/innovus/  
innovus_realtime_bindkeys.tcl
```

This file is not loaded by default to avoid possible conflicts with existing keyboard shortcuts. The definition of the bindkey functions is given in the following table. The section [“Defining and Loading Keyboard Shortcuts for Calibre RealTime in Cadence Innovus”](#) on page 124 describes how to define and load your own keyboard shortcuts.

Table 4-7. Keyboard Shortcuts in Calibre RealTime for Cadence Innovus

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::CurrentWindowRun Run DRC in the window.	F12
::calibre::realtime::CurrentCellRun Run DRC on the current cell.	F11
::calibre::realtime::SelectWindowRun Use the mouse to select a rectangular area for the Calibre RealTime run. Select two points at opposite corners to define the rectangle.	F10
::calibre::realtime::NextRecipe Open the Calibre RealTime Options dialog box.	Shift-F12
::calibre::realtime::PreviousRecipe Select the next recipe in the toolbar dropdown list.	Ctrl-n
::calibre::realtime::NextRecipe Select the previous recipe in the toolbar dropdown list.	Ctrl-w
::calibre::realtime::LastusedRecipe Select the most recently used recipe in the toolbar dropdown list.	Ctrl-e
::calibre::realtime::ClearAllHighlights Clear highlights.	Ctrl-b
::calibre::realtime::HighlightAllResults Highlight all results.	Ctrl-a

Table 4-7. Keyboard Shortcuts in Calibre RealTime for Cadence Innovus

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::HighlightPreviousResult Highlight the previous result.	p
::calibre::realtime::HighlightCurrentResult Highlight the current result.	c
::calibre::realtime::HighlightNextResult Highlight the next result.	n
::calibre::realtime::Reset Reset the Calibre RealTime integrated toolbar.	Ctrl-c
::calibre::realtime::HighlightCurrentCheck Highlight results in the check currently selected in the toolbar dropdown list.	Shift-c
::calibre::realtime::PreviousCheck Select the previous check in the toolbar dropdown list.	Shift-p
::calibre::realtime::RemoveCurrentCheck Remove the selected check from the current recipe and start a DRC run on the current window.	Shift-d
::calibre::realtime::NextCheck Select the next check in the toolbar dropdown list.	Shift-n
::calibre::realtime::OnRealTimeRve Open the Calibre RealTime Results window.	Shift-r
::calibre::realtime::PreviousConfiguration Select the previous run configuration in the toolbar dropdown list.	Ctrl-p
::calibre::realtime::NextConfiguration Select the next run configuration in the toolbar dropdown list.	Ctrl-n
::calibre::realtime::PrintCheckText Print the check text for the current check.	Alt-q


Defining and Loading Keyboard Shortcuts for Calibre RealTime in Cadence Innovus

You can define custom keyboard shortcuts for Calibre RealTime Digital. The Calibre installation provides a file of standard keyboard shortcuts.

Procedure

1. Copy the Tcl file `$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/innovus/innovus_realtime_bindkeys.tcl` to the desired location for your keyboard shortcut definitions. “[Keyboard Shortcuts for Calibre RealTime Digital in Cadence Innovus](#)” on page 122 lists the shortcuts defined in this file.
2. Edit the shortcut definitions as desired.
3. Load the new shortcut definitions into Cadence Innovus by sourcing the Tcl file.

Tip

 If you want to use the standard shortcuts, and are not concerned about possible conflicts with other shortcuts, issue the following command at the Cadence Innovus command prompt, where the command is all one line:

```
source $env(CALIBRE_HOME)/shared/pkgs/icv/tools/realtime/innovus/
innovus_realtime_bindkeys.tcl
```

Chapter 5

Calibre RealTime Digital in IC Compiler II

The Calibre RealTime Digital interface is integrated with the IC Compiler II design tool from Synopsys. Calibre RealTime Digital integrates flat Calibre nmDRC with supported place and route tools so that Calibre nmDRC can be run directly from the design tools.

Refer to “[Calibre RealTime Digital Introduction](#)” on page 15 for an overview and general system requirements.

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Requirements and Setup for Calibre RealTime Digital in IC Compiler II

Requirements for tool versions, input files, and environment variables must be met in order to run Calibre RealTime Digital in IC Compiler II.

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General Requirements for Calibre RealTime Digital in IC Compiler II

Certain requirements for design tool versions, layer map files, and environment variables must be met to run Calibre RealTime Digital in IC Compiler.

The following list gives the detailed requirements:

- IC Compiler II version M-2016.12-SP2 and later.
- Calibre version 2018.2_41 or later

See “[Calibre RealTime Digital Requirements](#)” on page 15 for other general requirements.

- Environment variable is set


The environment variable MGC_REALTIME_ENABLE_ICC2 must be set to the proper value.

In the csh shell:

```
setenv MGC_REALTIME_ENABLE_ICC2 1
```

You can disable Calibre RealTime Digital by setting the environment variable MGC_REALTIME_DISABLE to any value.

Note

 The old value of 1256695 is still supported for MGC_REALTIME_ENABLE_ICC2.

- Integration Script

See “[Tcl Script for Calibre Interface to IC Compiler II](#)” on page 127.

The integration is enabled automatically after you run the Tcl integration script.

- **Layer Map Requirement**

A layer map file that maps the IC Compiler II layer objects to GDS layers and datatypes is required. The mapping should correspond to what is expected by the Calibre rule file and any Layer Map statements within the rule file.

See “[GDS Layer Map for Calibre RealTime Digital in IC Compiler II](#)” on page 127 for more information.

Tcl Script for Calibre Interface to IC Compiler II

The Calibre integration to the IC Compiler II tool requires a Tcl script to be loaded.

Run the initialization file from the IC Compiler II shell prompt to load the Calibre integration:

```
icc2_shell> source $CALIBRE_HOME/lib/icc_calibre.tcl
```

This also loads the Calibre interface to Calibre Interactive and Calibre RVE.

IC Compiler II and Calibre RealTime Digital Version Compatibility

The support of Calibre RealTime Digital in IC Compiler II depends on the Calibre release and the IC Compiler II version.

Table 5-1. IC Compiler II and Calibre RealTime Digital Version Compatibility


IC Compiler Version	Supporting Calibre Releases
M-2016.12-SP2 and later	2018.2_41 and later
M-2017.09-SP4 and later	2019.1_18 and later

GDS Layer Map for Calibre RealTime Digital in IC Compiler II

A layer map file is required to map the IC Compiler II layer objects to GDS layers and datatypes for layout export. The layer map file can be specified with an environment variable or specified in the Calibre RealTime Options dialog box.

- **With an environment variable** — Set the environment variable `MGC_REALTIME_LAYER_MAP_FILE` to the location of the layer map file; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

The environment variable has precedence over the setting in the Calibre RealTime Options dialog box.

- **In the Calibre RealTime Options dialog box** — Click the  button in the toolbar to open the Calibre RealTime Options dialog box and specify the layer map file.

File Format

These file formats are supported, where the format refers to the layer map file format selection in the Calibre RealTime Options dialog box:


- **icc2** — The default. Use the layer map file format for IC Compiler II.
- **icc_default** — Use a layer map file written for an IC Compiler Milkyway database in default layer mode (layer numbers 1 through 255).
- **icc_extended** — Use a layer map file written for an IC Compiler Milkyway database in extended layer mode (layer numbers 1 through 4095).

Consult the IC Compiler II documentation for details.

Supported File Types for IP Merge

When setting up IP Merge, you select which layout files to incorporate into your DRC runs. You can use both individual layout files or file lists, which are text files where each line is a path to a file or a directory. You can select multiple file lists to use, as well as select a combination of individual files and file lists.

Guidelines

- Only GDS and OASIS layout files are supported.
- Absolute and relative paths are both supported. Relative paths are expanded relative to the current working directory.
- To type out pathnames, click the  button to the right of a text box to expand it. You can now press Enter to add new lines; each pathname must be on a separate line.
- The wildcard characters * and ? can be used to specify multiple files. You can use these wildcard characters in file lists and when selecting layout files and file lists.
- Compressed files are allowed, but they must have a suffix of .z, .Z, or .gz, and the gzip program must be accessible to read the compressed file.
- Environment variables are supported.
- Specifying a directory name automatically includes all files in the directory. (dirname/*).

- File lists cannot contain paths to other file lists.
- In a file list, lines beginning with a # are treated as comments and are ignored.

File List Example

```
STD_LIB/1.gds
# Loads a single GDS file

STD_LIB/2?.gds
# Loads every GDS file in the STD_LIB directory that begins with a 2 and
has one additional character

STD_LIB/3*.gds
# Loads every GDS file in the STD_LIB directory that begins with a 3 and
has any number of characters after it

$STD_LIB_DIR
# Loads the directory to which this environment variable has been set
```

Invoking and Running Calibre RealTime Digital in IC Compiler II

Several tasks are required to start and run Calibre RealTime Digital in IC Compiler II.

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Invoking IC Compiler II with Calibre RealTime Digital

After invoking IC Compiler II with Calibre RealTime Digital, you see the Calibre RealTime Digital integrated toolbar.

Prerequisites

- “[Requirements and Setup for Calibre RealTime Digital in IC Compiler II](#)” on page 126 completed.
- System and license requirements described in “[Calibre RealTime Digital Requirements](#)” on page 15 are satisfied.

Procedure

1. Start IC Compiler II. For example:

```
icc2_shell -gui
```

2. At the ic_shell command prompt, source the *icc_calibre.tcl* initialization file:

```
icc2_shell> source $::env(MGC_HOME)/shared/pkgs/icv/tools/querytcl/icc_calibre.tcl
```

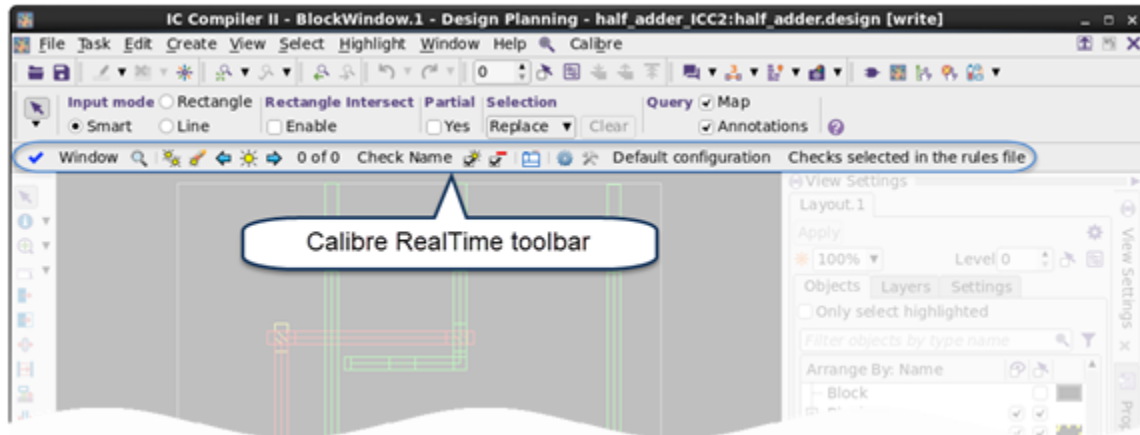
It may take a minute or so to acquire all licenses and complete the initialization. The line “Calibre RealTime:” and the standard Calibre copyright notice is displayed in the transcript after successful initialization. The first two lines are similar to the following:

```
Calibre RealTime:  
// Calibre v.2018.2_41 Tue Jul 17 16:14:08 PDT 2018
```

If you do not see the preceding lines, check that all environment variables are set as described in the “Prerequisites” section.

A partial view of the design window in IC Compiler II is shown in the following figure. The Calibre RealTime Digital integrated toolbar is loaded.

Figure 5-1. Calibre RealTime Digital in IC Compiler II



3. Proceed to “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II](#)” on page 131.

Related Topics

[Calibre RealTime Digital Integrated Toolbar in IC Compiler II](#)

Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II


A run configuration in Calibre RealTime Digital is the set of options and input files for a run. You can define multiple run configurations with different options (such as the rule file, check recipe and other options), then quickly switch between different run configurations. You can run with one configuration (single mode) or run multiple configurations in sequence (serial mode).

The first time you open Calibre RealTime Digital, the “Run Mode” is set to Single and a run configuration named “Default configuration” is created. If you plan on using only one run configuration, no further action is needed.

Prerequisites

- You have completed “[Invoking IC Compiler II with Calibre RealTime Digital](#)” on page 130.


Procedure

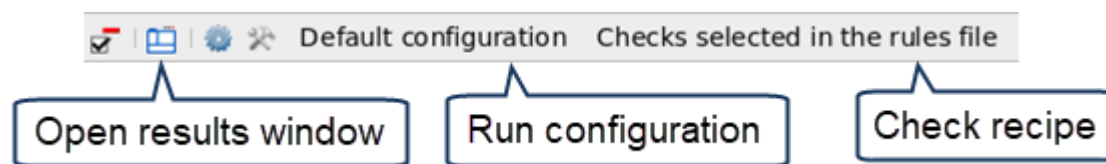
1. Click the **Options** button () on the integrated toolbar to open the Calibre RealTime Options dialog box. You can also choose **Calibre > RealTime DRC > RealTime Options**.
2. If using multiple run configurations, define as many configuration names as needed:
 - a. Click the **Edit** button next to the configuration name to open the Configuration Run Control dialog box.
 - b. Click the “+” button to add a configuration and specify the name. Repeat this step as needed.
 - c. If using the Serial run mode, set the run order using the up and down arrows. Use the checkbox to include or remove a configuration from the execution list.
 - d. Click **OK** to close the Configuration Run Control dialog box.
3. Define the settings for each run configuration:
 - a. Select the configuration in the Configuration dropdown list.
 - b. Specify the settings as described in “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)” on page 133.

Repeat for each run configuration.

4. Select the “Run Mode”:
 - **Single** — Run only the currently selected configuration when a run is started.
 - **Serial** — Run each configuration selected in the Configuration Run Control dialog box in order.
5. Proceed to “[Running Calibre RealTime Digital in IC Compiler II](#)” on page 135.

Note

 After a run, DRC results are displayed for separately for each run configuration. Select the results to view with the toolbar—click the toolbar setting to select the configuration and check recipe from a dropdown menu:



Related Topics

[Calibre RealTime Options Dialog Box in IC Compiler II](#)


Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II

Calibre RealTime Digital uses a standard Calibre nmDRC rule file. The check recipe controls which checks in the rule file are executed during the Calibre RealTime Digital run.

Prerequisites

- You have completed “[Invoking IC Compiler II with Calibre RealTime Digital](#)” on page 130.
- You have completed “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II](#)” on page 131.
- You have a Calibre nmDRC rule file available; see “[Calibre RealTime Digital Requirements](#)” on page 15 and “[Differences Between Calibre nmDRC and Calibre RealTime Digital](#)” on page 16 for additional information about rule file requirements.


Procedure

1. Click the **Options** button () on the integrated toolbar to open the Calibre RealTime Options dialog box. You can also choose **Calibre > RealTime DRC > RealTime Options**.
2. Select the configuration in the Configuration dropdown list.
3. Specify the Calibre rule file in the “Rule file” text field.

Alternatively, you can specify a Calibre Interactive runset. Select Runset in the Rule file/runset dropdown list and specify a runset.

4. Click **Reload** to load the rule file.

Note

 If you make changes to the rule file during a Calibre RealTime session, you must manually reload the rule file in order for the new rule file to be used.

The rule file for the active configuration is loaded automatically on RealTime startup unless it is specified inside the runset file.

5. Specify the layer map file in the “Layer map file” field.

A layer map file is required. Three file formats are supported; see “[GDS Layer Map for Calibre RealTime Digital in IC Compiler II](#)” on page 127.

6. (Optional) Select options in the dialog box; the defaults are suitable for most runs. See “[Calibre RealTime Options Dialog Box in IC Compiler II](#)” on page 149 for a definition of each option.

If you want the Calibre RealTime Results window to open automatically after a run, enable the option “Launch RealTime results viewer automatically.”

Select the **Output files** tab if you want to save a summary file of DRC of the run and the DRC results as an ASCII results database (RDB).

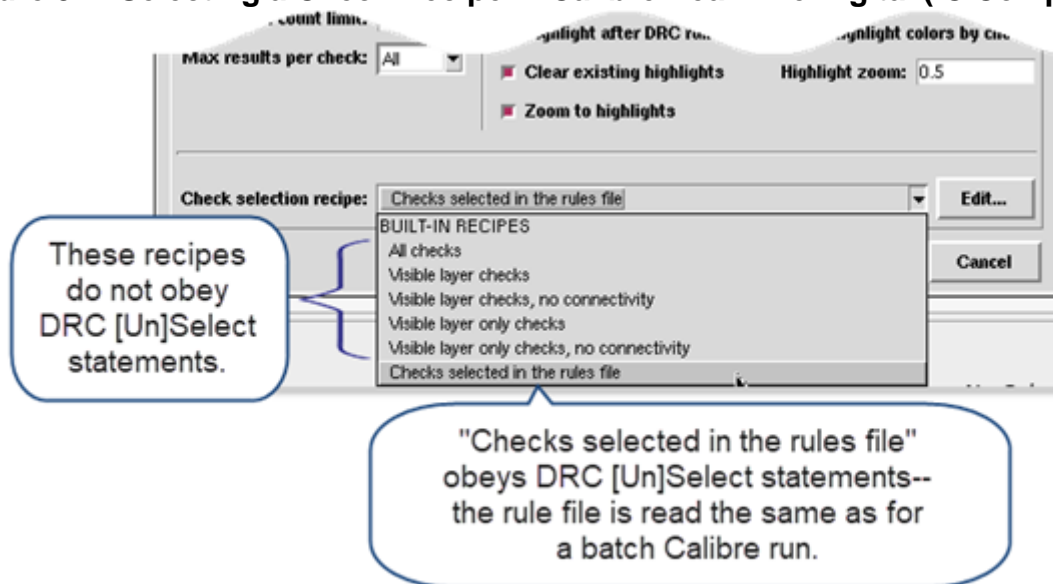
7. Select the check recipe as follows:

- **Checks selected in the rules file** (default) — This built-in recipe uses the Calibre rule file just as a batch run of Calibre does.
- **Other built-in check recipes** — You can select a recipe that only runs checks on certain layers, excludes certain types of checks, or runs all checks in the rule file.

Because these built-in recipes do not obey DRC [Un]Select Check statements in the rule file, the recipes may execute checks in the rule file that would not be executed during a batch Calibre run. The recipe “Checks selected in the rules file” is the only built-in recipe that obeys DR [Un]Select Check statements.

- **User recipes** — You can select a previously defined custom check recipe.

Figure 5-2. Selecting a Check Recipe in Calibre RealTime Digital (IC Compiler II)



8. Proceed to “[Running Calibre RealTime Digital in IC Compiler II](#)” on page 135.

Tip

i You can change environment variables with the commands given in the section “[Environment Variable Control](#)” on page 206. This is useful if you want to change environment variables used in the rule file.

Related Topics

[Specifying a Calibre Interactive Runset in Calibre RealTime Digital](#)

[Built-In Check Recipes](#)

[Creating a Custom Check Selection Recipe](#)

Running Calibre RealTime Digital in IC Compiler II

Calibre RealTime Digital runs checks on the geometries visible in the IC Compiler II window plus a halo around the region. The specified check recipe selects the checks that are executed. All Calibre RealTime Digital DRC runs are performed in flat mode.

Tip


i When using a DRC run type of Window or Area, a region of 25 um x 25 um or smaller is recommended for the best performance.

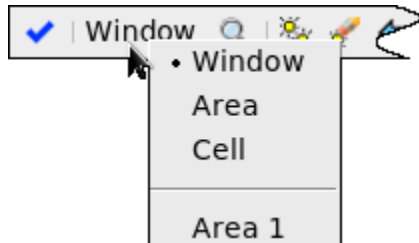
Prerequisites


- You have completed “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)” on page 133.
- (Optional) Specify highlight colors; see “[Specifying Highlight Color for Calibre RealTime Digital in IC Compiler II](#)” on page 137.




Procedure

- Select a run configuration in the Configuration dropdown list, or, if running in Serial mode, make sure the Run Mode is set to Serial in the Calibre RealTime Options dialog box. See “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II](#)” on page 131.
- Select the DRC run type and start a run:

The DRC run type is selected in the toolbar, in a dropdown menu next to the  button:




DRC Run Type	Instructions
Window	<p>Runs DRC on the geometries visible in the design tool window:</p> <ol style="list-style-type: none"> Choose the Window run type. Zoom to the region you want to run DRC on and make sure the geometries you want to run checks on are visible. 25 um x 25 um or smaller is recommended for the best performance. Click the  button to start the run.

DRC Run Type	Instructions
Area	Runs DRC on a selected region: <ol style="list-style-type: none"> 1. Choose the Area run type. 2. Click the  button. 3. Use the mouse to drag a rectangle around the area you want to run DRC on.
Cell	Runs DRC on the whole block that is open in the active window. <ol style="list-style-type: none"> 1. Choose the Cell run type. 2. Click the  button to start the run.
Area 1, Area 2, ...	Runs DRC on a previously selected area: <ol style="list-style-type: none"> 1. Choose the area to run on. The most recent area is always named Area 1. 2. Click the  button to start the run.

Results

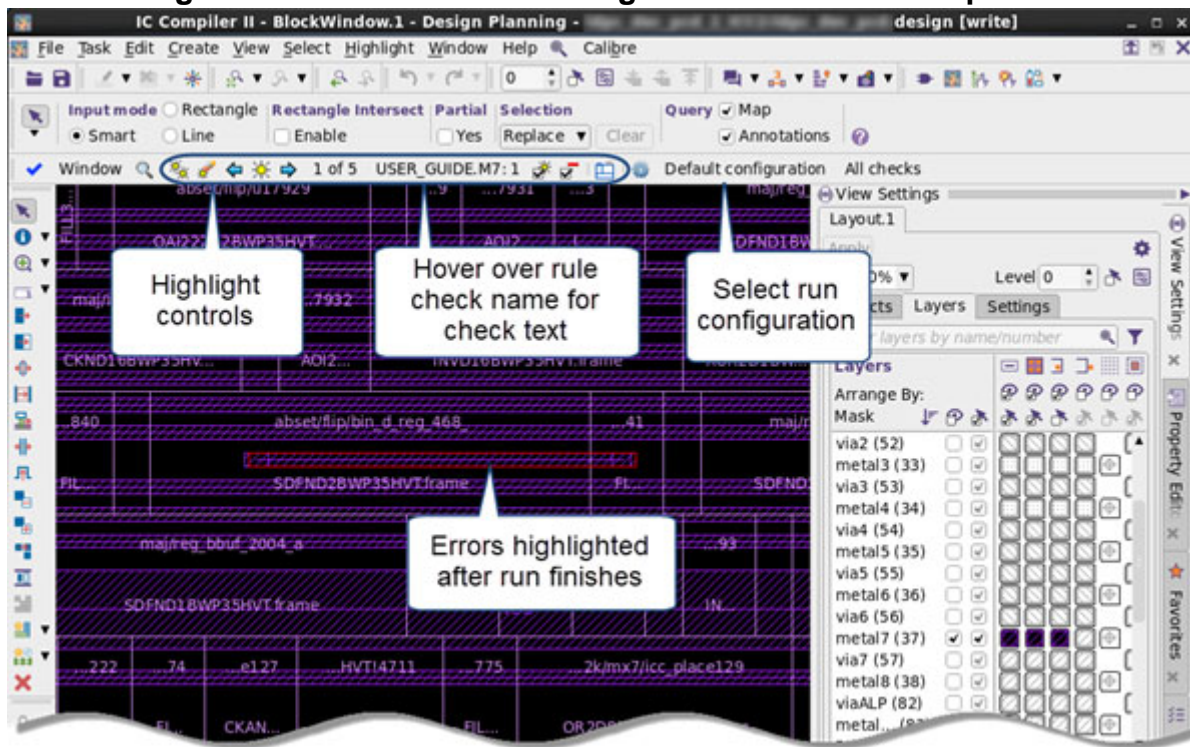
Flat Calibre nmDRC is run on the selected geometries plus the specified halo region around the area. If running in Serial mode, a DRC run is executed for each of the configurations selected in the Configuration Run Control dialog box, in the order specified.

The results of a Calibre RealTime Digital run are shown in [Figure 5-3](#). You can use the highlight controls in the integrated toolbar to step through results. If you are using multiple run configurations, the results are displayed separately for each configuration—select the configuration to view in the toolbar dropdown box.

You can also click the  toolbar icon to open the Calibre RealTime Results window to view results in a separate window; see “[Viewing Results in the Calibre RealTime Digital Results Window](#)” on page 35.

Rule check comments can be seen by hovering over the rule check name in the toolbar.

Figure 5-3. Calibre RealTime Digital Results in IC Compiler II



Related Topics


[Halo Usage in Calibre RealTime Digital](#)


Specifying Highlight Color for Calibre RealTime Digital in IC Compiler II

You can specify the highlight color used by Calibre RealTime Digital with the **Calibre > Highlight Colors** menu selection in IC Compiler II. You can also specify DRC Rule Check Comments in a Check Text Override (CTO) file or in the rule file.

Procedure

1. Do one of the following:

To do this ...	Do the following ...
Change highlight layer color in IC Compiler II	In IC Compiler II, select Calibre > Highlight Colors . Specify the highlight color, fill pattern, and border width. (Optional) To use a different highlight color per rule check, click  to open the Calibre RealTime Options dialog box, select “Group highlight colors by check,” and unselect “Clear existing highlights.”

To do this ...	Do the following ...
Use a CTO file with DRC Rule Check Comments	Click  to open the Calibre RealTime Options dialog box, check “CTO file”, and specify the CTO file. See “ DRC Rule Check Comments for Calibre RealTime Digital ” on page 46, and the rule check comments RVE Highlight Color and RVE Highlight Index.
Use DRC Rule Check Comments in the rule file	Add the rule check comment RVE Highlight Color or RVE Highlight Index to the rule check. For example: <pre>M2_NET { @ RVE Highlight Color: red copy M2_NET }</pre>

2. Proceed to “[Running Calibre RealTime Digital in IC Compiler II](#)” on page 135.

Results

The specified color is used when you highlight a result. If you used DRC Rule Check Comments in the rule file, the highlight color is used per rule check.

If you specified “Group highlight colors by check” in the Calibre RealTime Options dialog box, the highlight colors are assigned to checks in a repeated cycle. The assigned highlight color for a check is not fixed. The “Group highlight colors by check” is not compatible with “Clear existing highlights” because the latter option causes the highlight color assignment to start over for each highlight action.

Specifying Layer Visibility for Calibre RealTime Digital in IC Compiler II

You can use a Check Text Override (CTO) file to assign the layer visibility for results according to the rule check. The Check Text Override file is specified in the Calibre RealTime Options dialog box.

Note




A CTO file can also be used to assign highlight colors. See “[Specifying Highlight Color for Calibre RealTime Digital in IC Compiler II](#)” on page 137 for more information.

Procedure

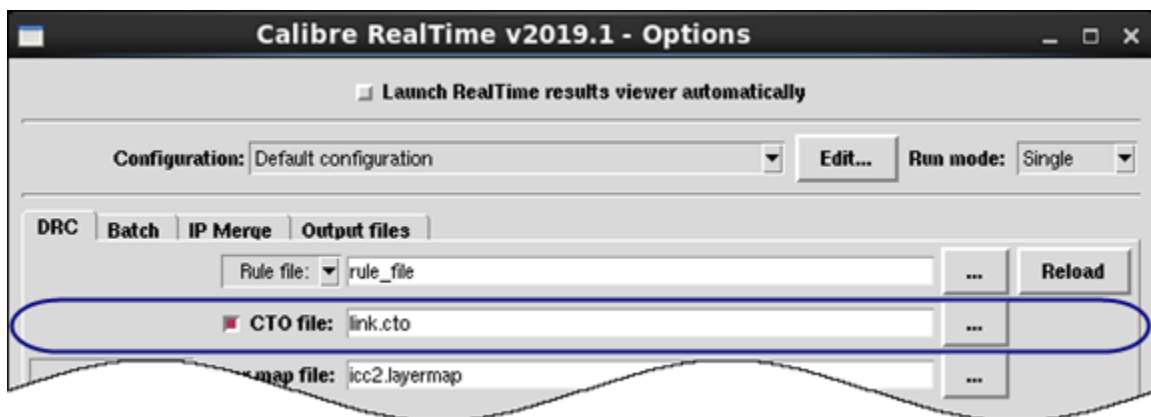
1. Create a Check Text Override (CTO) file using a text editor. The following example CTO file specifies the layer visibility for the min_ext_diff_poly rule:

```
# check text override file for XYZ
#
min_ext_diff_poly
RVE Show Layers: diff poly
```


where the drawing purpose layer is used by default in the RVE Show Layers statement. See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for complete information about the CTO file syntax and supported rule check comments.

2. Save the check text override file with a file extension of *.cto*.
3. Click the  button in the Calibre RealTime toolbar to open the Calibre RealTime Options dialog box.
4. Enable “CTO file” and specify a check text override file.

The *.cto* file extension is not required, but the file browser for the CTO file searches for files with a *.cto* file extension.



Tip

 You can enter an environment variable that is a directory path in the text entry field and click the ... button to have the file browser open to that directory.

You can also specify the CTO file with the environment variable `MGC_REALTIME_CTO_FILE`; see “[Calibre RealTime Digital Environment Variables](#)” on page 39 for more information.

Results

With the example shown in Step 1, layers diff and poly are shown and all other layers are hidden.

Starting a Batch Calibre Run from Calibre RealTime in IC Compiler II

You can start a batch Calibre run from Calibre RealTime Digital if the design window contains more than a specified number of polygons. The controls for starting a batch run are on the **Batch** tab in the Calibre RealTime Options dialog box.


Tip

i If a dialog box pops up with a prompt to **Continue** or **Abort** the run because the polygon limit has been exceeded, the batch run has not been enabled to start automatically. Click **Abort** to end the run, and then use the following procedure to automatically start a run in batch mode whenever the polygon limit is exceeded.

Prerequisites

- You have completed “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in IC Compiler II](#)” on page 133.
- Run configurations are set up. See “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II](#)” on page 131.
- (Optional) Set the environment variable MGC_TMPDIR to a directory to use for temporary working files. Temporary files are written to \$MGC_HOME/tmp if MGC_TMPDIR is not set.
- (Optional) If you do not want results from the batch run automatically highlighted when the run completes, set the environment variable MGC_REALTIME_DO_NOT_HIGHLIGHT_BATCH_RESULTS. If the run produces many results, the highlight process can be slow. The option “Highlight after DRC run” is ignored when the environment variable is set.

Procedure

1. Click the **Options** button () in the integrated toolbar to open the “[Calibre RealTime Options Dialog Box in IC Compiler II](#)” on page 149.
2. Select a run configuration in the “Configuration” dropdown list.
3. Click the **Batch** tab and set options as follows:
 - a. Check one of the following options:
 - Run batch Calibre nmDRC on layouts containing more than *<polygon_count_limit>* polygons (Polygon count limit)
 - Run batch Calibre nmDRC on layouts containing more than 3 million polygons
 - Tip: *<polygon_count_limit>* is set on the **DRC** tab.
 - b. Select settings for “Run Calibre DRC” and “Performance.”
 - c. (Optional) If you are submitting the job to a remote cluster, check “Queue command” and enter the command. See the tooltip for replaceable parameters.


See “[Batch Queue Command](#)” on page 118 for requirements regarding the batch queue command and a sample command script suitable for testing.

- d. (Optional) Specify the “Batch working directory.” The directory must exist and have write permission. Specify a different working directory for each run configuration.

The wrapper rule file, transcript file, and results database (RDB) are written to the batch working directory. If you do not specify a batch working directory, the output is written to the directory from which you invoked the design tool.

- e. Set options for “Licensing mode.”

See “[Batch Tab in the Calibre RealTime Options Dialog Box](#)” on page 116 for details on the Calibre run and licensing options.


4. If you are using multiple run configurations, repeat Steps 2 and 3 for each configuration.
5. Click **OK** to close the options dialog box.
6. Select your run type and click  in the toolbar to start the run.


When a batch run starts, the **Run DRC** button changes to  (**Stop batch DRC jobs**).

Results

The run starts as a Calibre RealTime Digital DRC run. If the polygon count for the run is greater than the specified number, a batch run starts and a message similar to the following is printed:

```
Calibre RealTime is running batch DRC using configuration: "config_DP"
DRC analysis window:      {-382049 -1173620} {1524120 141969}
Batch Calibre transcript file: "./batch_dir/
RealTime_batch_username_45nm_design_demo_fir_multi_layout_transcript.log"
DRC COMPLETE. TOTAL CHECK COUNT = 158 TOTAL RESULT COUNT = 86
Timing: Total run time : 4,498 ms
```

You can use the design tool at this point, but the Calibre RealTime Digital toolbar is unavailable except for the  button. The Calibre RealTime Digital license is checked out for the duration of the batch run.

When the batch run is complete, the results are reported in the Calibre RealTime Digital toolbar and it becomes active again. You can now use the highlight controls, or click the  toolbar icon to open the Calibre RealTime Digital Results window to view results in a separate window; see “[Viewing Results in the Calibre RealTime Digital Results Window](#)” on page 35. (The option “Launch RealTime results viewer automatically” is ignored in batch runs.)

A message similar to the following is printed to the transcript when the run completes:

```
DRC COMPLETE. TOTAL CHECK COUNT = 1631 TOTAL RESULT COUNT = 24990
```

The following files are written to the batch working directory:

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_results.rdb*

The results database (RDB) file.

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_transcript.log*

The Calibre transcript.

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_wrapper.svrf*

The “wrapper” rule file is used in the Calibre command line that starts the batch run. The wrapper rule file specifies the layout window and the checks to execute, along with other settings for the run. The rule file is specified with an SVRF Include statement.


Running IP Merge for Calibre Realtime in IC Compiler II

IP Merge is configured in the Calibre RealTime Digital Options dialog box. After IP Merge is set up, DRC runs use the provided layout files to better identify rule violations.

Prerequisites

- Calibre RealTime Digital is open.

Procedure

1. Click the **DRC Options** button () to open the Calibre RealTime Options dialog box.
2. In the **DRC** tab, ensure that the correct rule file has been loaded and that the other settings are configured properly.
3. Click the **IP Merge** tab.
4. Select “Merge IP layout files with design for DRC run.”
5. Customize your configuration. See “[IP Merge Tab in the Calibre RealTime Digital Options Dialog Box](#)” on page 120 for more information on these options.
 - Select “Report conflicts to the log file” to print cell name conflicts to the log file. Conflicts occur when multiple cells in the layout files share the same name.
 - Select “Highlight IP polygons” to highlight the polygons from the IP Merge files that are near the DRC violations. Polygons are highlighted if only one result is selected.


Selecting this makes the following highlighting sub-options available:

- Enter a number for “Polygons limit” to restrict the number of IP polygons to highlight. The default value is 10000.
- Choose an option under the “Layers” dropdown menu to specify which layers to highlight.

- o Select “Halo size (UU)” and enter a number to customize the halo size for the layers in the IP Merge files. This option is disabled by default.

When this option is enabled, the default size is 1 user unit. When this option is disabled, a highlight halo of twice the smallest track step size is used.

6. Specify your IP Merge files:


- a. Click the  button in the “Layout files” or “File List” rows.
- b. Navigate to where your files are stored, then select them. You can select one or more files.
- c. Click **Open**.

IP layout files for the active configuration are loaded automatically on RealTime startup if IP Merge is enabled.

You can select any combination of layout files and file lists:

- **Layout files** — GDS or OASIS format IP layout files
- **File list** — Text files that contain a list of IP layout files, with one file per line

Wildcard characters and directories are supported for file lists and layout files. See [“Supported File Types for IP Merge”](#) on page 87 for more information.

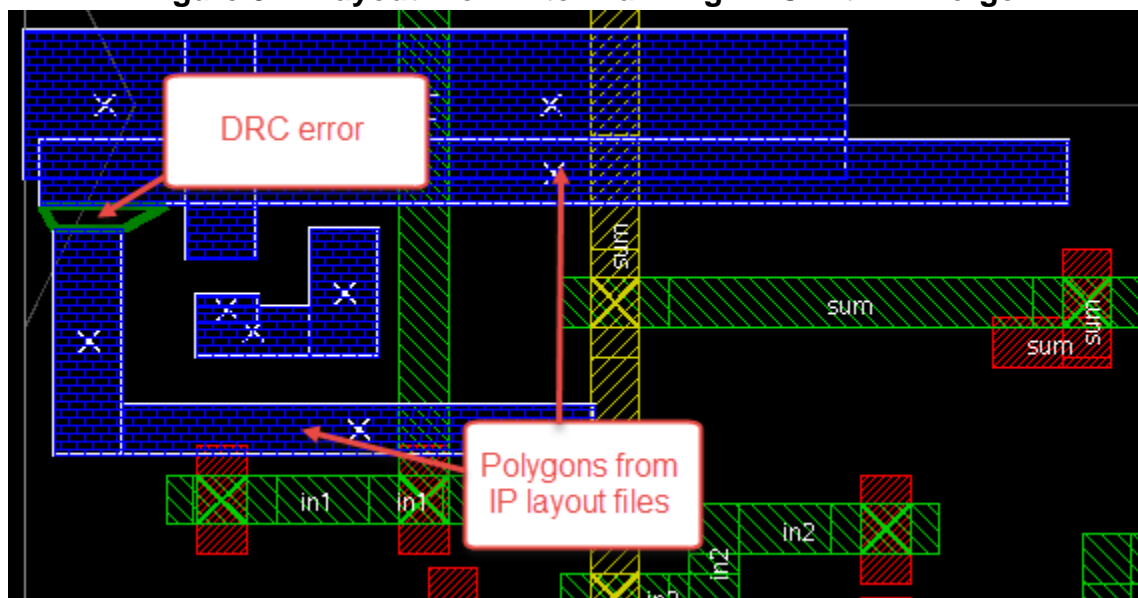
7. Click **OK** to close the dialog box.
8. In the RealTime toolbar, click the  button to run DRC.

Results

DRC violations are highlighted in the design tool. These violations take into account the contents of the IP layout files.

The following image shows a DRC error highlighted with the option “Highlight IP polygons with DRC result” enabled. Polygons from the IP layout files have been highlighted in blue.

Figure 5-4. Layout View After Running DRC with IP Merge



GUI Reference for Calibre RealTime Digital in IC Compiler II

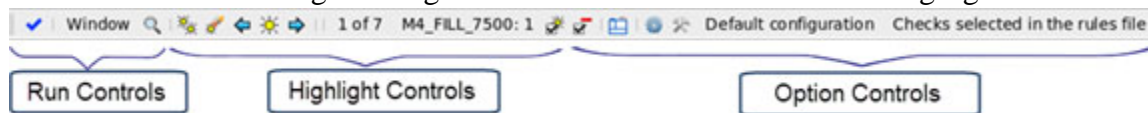
The Calibre RealTime Digital integrated toolbar and the Calibre RealTime Options dialog box provide the controls and settings you need to run Calibre RealTime Digital.

Calibre RealTime Digital Integrated Toolbar in IC Compiler II	145
Calibre RealTime Options Dialog Box in IC Compiler II	149
Batch Tab in the Calibre RealTime Options Dialog Box	156
IP Merge Tab in the Calibre RealTime Digital Options Dialog Box	160

Calibre RealTime Digital Integrated Toolbar in IC Compiler II

The Calibre RealTime Digital integrated toolbar includes controls to start a DRC run, highlight results, and open the Calibre RealTime Options dialog box. The toolbar also includes option settings for run control and highlighting.

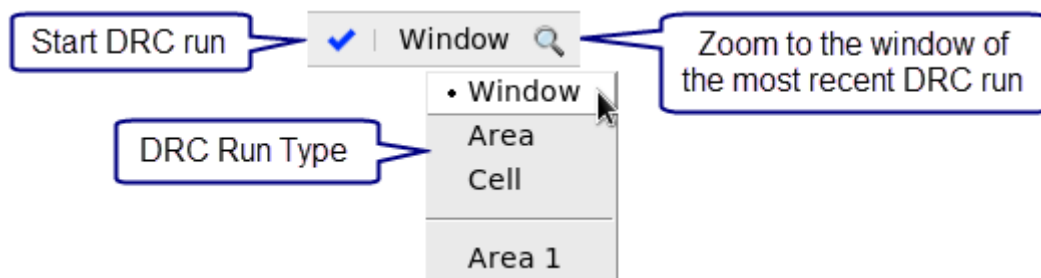
The Calibre RealTime Digital integrated toolbar is shown in the following figure.



The run controls, highlight controls, and options controls are described in the following sections.

Run Controls (IC Compiler II)




The run controls in the Calibre RealTime Digital integrated toolbar start a DRC run and zoom to the window for the most recent DRC run. The run controls are shown below and described in the table following the figure.



Note

Default keyboard shortcuts are noted in some cases, however, these shortcuts are *not* loaded automatically. See [“Defining and Loading Keyboard Shortcuts for Calibre RealTime in IC Compiler II”](#) on page 163.

Table 5-2. Run Control Toolbar Selections (IC Compiler II)

Toolbar item	Description
 (Run DRC)	Runs flat DRC using the selected DRC Run Type. Calibre runs with the currently selected Run Configuration and configuration run mode (Serial or Single). Keyboard shortcut: F12
DRC Run Type dropdown	Selects the DRC run type: <ul style="list-style-type: none"> • Window — Run DRC on the geometries visible in the current window, plus a halo region around the area. • Area — Run DRC in a selected area. Click the Run DRC button () and use the mouse cursor to select an area in the design. • Cell — Run DRC in the whole block that is open in the active window. • Area 1, Area 2, ... — Run DRC on a previously selected area.
	Zoom to the region of the most recent DRC run. If a previously selected area is chosen in the Run Mode dropdown, zoom to that area.

Highlight Controls (IC Compiler II)

The highlight control section in the Calibre RealTime Digital integrated toolbar includes highlight controls and displays the rule check for the current result. The highlight controls are shown below and described in the table following the figure.

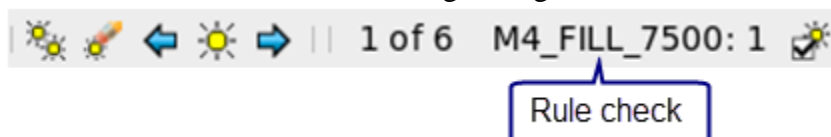


Table 5-3. Highlight Control Toolbar Selections (IC Compiler II)




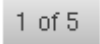

Toolbar item	Description
	Highlight all.
	Clear all highlights.
	Highlight previous, current, or next result for the rule check. Also see Behavior of “Group highlight colors by check” in the Usage Notes section of “ Calibre RealTime Options Dialog Box in IC Compiler II ” on page 149.

Table 5-3. Highlight Control Toolbar Selections (IC Compiler II) (cont.)

Toolbar item	Description
	Result <i>n</i> of <i>total</i> results. Also see the setting “Show results in” in the “Calibre RealTime Options Dialog Box in IC Compiler II” on page 149; this setting determines whether all results for the cell or only results from the most recent run are reported.
Rule check	Indicates the rule check that produced the displayed error when using the highlight previous, current, and next buttons. Click the rule check name to select a different rule check.
	Highlight all results from the selected rule check.

Option Controls (IC Compiler II)

The option controls in the Calibre RealTime Digital integrated toolbar select the check recipe and open the Calibre RealTime Options dialog box. The option controls are described in the table following the figure.

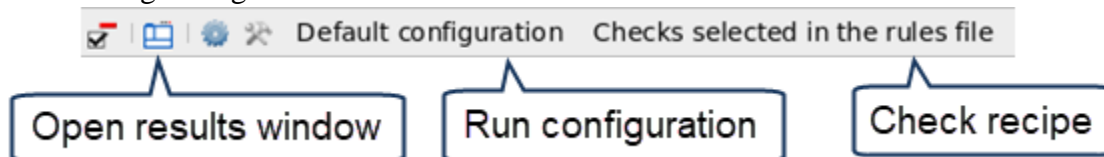


Table 5-4. Option Control Toolbar Selections (IC Compiler II)






Toolbar item	Description
	Remove the displayed rule check from the current check recipe. All highlights are cleared, regardless of the setting of “Clear existing highlights.” If the recipe is a built-in recipe, a pop-up dialog box prompts you to save the new check recipe to a new filename. If the recipe is a user recipe, the updated recipe is saved automatically.
	Open the Calibre RealTime Digital Results window. See “Viewing Results in the Calibre RealTime Digital Results Window” on page 35.
	Open the “Calibre RealTime Options Dialog Box in IC Compiler II” on page 149.

Table 5-4. Option Control Toolbar Selections (IC Compiler II) (cont.)

Toolbar item	Description
	<p>Open the Customization GUI. This button is only available if a Calibre Interactive runset is loaded and includes a customization file.</p> <p>See “Using the Customization GUI with Calibre RealTime Digital” on page 45.</p>
Run Configuration	<p>Select the run configuration, both for a run in “Single” mode and for viewing results; see “Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in IC Compiler II” on page 131.</p>
Check recipe	<p>Select the check recipe from the dropdown list. See “Check Selection Recipes in Calibre RealTime Digital” on page 61 for more information.</p>

Calibre RealTime Options Dialog Box in IC Compiler II

To access: Click the  button in the toolbar or choose **Calibre > RealTime DRC > Options**

The Calibre RealTime Options dialog box specifies the Calibre rule file, the check recipe, and other options. The settings in the Calibre RealTime Options dialog box are saved in the Calibre RealTime Digital configuration file.

Description

Figure 5-5. Calibre RealTime Options Dialog Box (IC Compiler II)

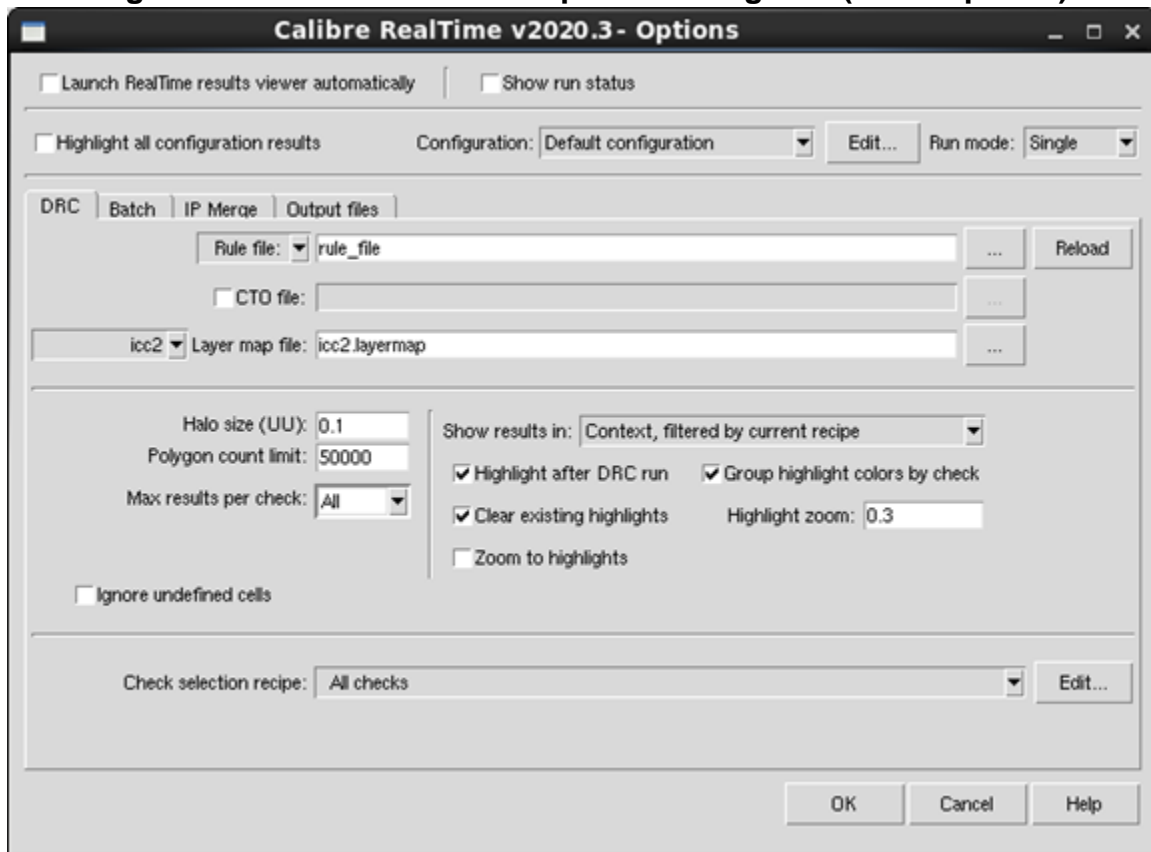



Table 5-5. Tabs in Calibre RealTime Options Dialog Box (IC Compiler II)

Tab	Description
DRC	Specify options for the Calibre DRC run. See the table in the next section and “Usage Notes” at the end.
Batch	Specify options to launch a batch Calibre nmDRC run if the design window contains more than a specified number of polygons. See “ Starting a Batch Calibre Run from Calibre RealTime in IC Compiler II ” on page 139.

Table 5-5. Tabs in Calibre RealTime Options Dialog Box (IC Compiler II)

Tab	Description
Output files	Specify whether to save a summary file and the DRC results as an ASCII results database (RDB). If a specified directory does not exist, the tool prompts you to confirm that the directory should be created.

Tip

 You can use environment variables to specify any pathname, directory name, or portion of a pathname. For example: *\$PROJ/\$DESIGN/rules*.

However, the Calibre RealTime Digital environment variables specific for input files take precedence over user-defined environment variables. See “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

Fields

Table 5-6. Calibre RealTime Options Dialog Box Contents (IC Compiler II)


Control	Description
Launch RealTime results viewer automatically	Specifies whether to open the Calibre RealTime Digital Results window automatically after a run. See “ Viewing Results in the Calibre RealTime Digital Results Window ” on page 35.
Show run status	Specifies whether to display processing status updates in the shell during a Calibre RealTime Digital run.
Highlight all configuration results	<p>Specifies whether to automatically highlight DRC results from all configurations after a DRC run. When this option is enabled:</p> <ul style="list-style-type: none"> • Highlights are preserved when switching configurations. • When highlighting, the “Clear existing highlights” option is ignored and existing highlights are not cleared. • Results from all configurations are highlighted in both single and serial runs, and the “Highlight after DRC” option is ignored. <p> Note: When this option is enabled, you can only cross-highlight results from the layout editor to the Results window if they are from the current configuration. You can view the check description of any result regardless of its corresponding configuration.</p>
Configuration	<p>Specifies the Run Configuration name. To add or delete a configuration, click Edit to open the Configuration Run Control dialog box.</p> <p>A configuration is the set of options and filenames below the configuration name.</p>


Table 5-6. Calibre RealTime Options Dialog Box Contents (IC Compiler II)

Control	Description
Run Mode	<ul style="list-style-type: none"> • Single — Run with the currently selected configuration. • Serial — Run each selected configuration in series, in the order specified in the Configuration Run Control dialog box.
Rule file/Runset dropdown list	Selects whether to load a rule file or a Calibre Interactive runset.
Rule file	<p>Specifies the Calibre rule file used for the run.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
Runset	<p>Specifies a Calibre Interactive runset to use for the run.</p> <p>See “Using Calibre Interactive Settings in a Calibre RealTime Digital Run” on page 43 for details.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
CTO file	<p>Specifies a CTO file for controlling the highlight color and layer visibility per rule check. See “DRC Rule Check Comments for Calibre RealTime Digital” on page 46.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
Layer map file format dropdown list	<p>Specifies the format of the layer map file.</p> <ul style="list-style-type: none"> • icc2 — The default. Use the layer map file format for IC Compiler II. • icc_default — Use a layer map file written for an IC Compiler Milkyway database in default layer mode (layer numbers 1 through 255). • icc_extended — Use a layer map file written for an IC Compiler Milkyway database in extended layer mode (layer numbers 1 through 4095).
Layer map file	<p>Specifies a custom layer map file.</p> <p>See “GDS Layer Map for Calibre RealTime Digital in IC Compiler II” on page 127.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
... (Browse)	Open a file browser to select the rule file or layer map file.
Reload	<p>Reload the indicated file.</p> <p>You must click Reload for changes in the rule file or runset to take effect. Changes in the layer map and CTO files cause an automatic reload prior to the DRC run.</p>

Table 5-6. Calibre RealTime Options Dialog Box Contents (IC Compiler II)

Control	Description
Halo size (UU)	The halo size in user units. See “ Halo Usage in Calibre RealTime Digital ” on page 21 and “Halo” in “ Terms and Definitions in Calibre RealTime Digital ” on page 17 for more information on halos.
Polygon count limit	Sets the maximum number of polygons that are passed to Calibre. The limit should be set low enough that the Calibre server returns control to the design tool in a short amount of time. The maximum number of geometries Calibre RealTime Digital will process is 3,000,000.
Max results per check	Specifies the maximum number of results returned per rule check; this setting overrides the setting in the rule file.
Show results in	<p>This setting controls which results are reported in the integrated toolbar after the run.</p> <ul style="list-style-type: none"> • Whole cell, all checks — Report all results for the cell in the integrated toolbar after each DRC run. Reported results include those from the current run, previous results in the cell that are outside of the current run context, and possibly previous results within the current run context from rule checks not selected by the current recipe. • Whole cell, filtered by current recipe — Report results for the whole cell and from the current recipe only in the integrated toolbar after each DRC run. Reported results include those from the current run plus previous results in the cell that are outside of the current run context. • Context, filtered by current recipe — (default) Report only results within the current run context and from the current check recipe in the integrated toolbar after each DRC run. <p>For each case, all results in the current window and belonging to the current check selection recipe are deleted before the run.</p> <p>The settings “Whole cell, filtered by current recipe” and “Context, filtered by current recipe” filter out results from previous runs. If these settings are used, it is recommended that a later run be performed with “Whole cell, all checks” selected to make sure that all results are reported.</p>
Highlight after DRC run	Highlight results in the design tool after the DRC run.

Table 5-6. Calibre RealTime Options Dialog Box Contents (IC Compiler II)





Control	Description
Group highlight colors by check	Assign the highlight color for results according to the rule check. The assigned highlight color for a rule check is not fixed—rather, the highlight colors are assigned to checks in a repeated cycle. This option is not compatible with “Clear existing highlights.” See “Behavior of “Group highlight colors by check”” in the “Usage Notes” section.
Clear existing highlights	Clear existing highlights before each new highlight action. Highlights are cleared before each run, and when using the  buttons to step through highlights. Also see “Behavior of “Group highlight colors by check”” in the Usage Notes section.
Zoom to highlights	Specifies whether to zoom to the extent of the results when highlighting. When automatically highlighting after a DRC run, RealTime does not zoom to highlights to avoid changing the currently selected viewpoint.
Highlight zoom	Specifies the magnification used when zooming to highlight a result.
Check selection recipe	The check recipe used for the Calibre run. See “ Check Selection Recipes in Calibre RealTime Digital ” on page 61.
Edit	Open the Calibre RealTime Recipe Editor Dialog Box .
Help	Opens the <i>Calibre RealTime Digital User’s Manual</i> in your default web browser.

Usage Notes

- Environment variable usage
 - You can use environment variables in pathnames for files and directories. The environment variable is not expanded when viewed in the dialog box or saved to the configuration file. For example, you can enter `$CAL_RULES/drc.rul` for the rule file, and `$CAL_RULES/drc.rul` is saved in the configuration file.
 - You can enter an environment variable for a directory path in a file entry field and click the ... button to open the file browser to that directory. This makes it easier to browse for a file if it is not in the working directory and the directory path is long. When you select a file, the absolute path is entered in the text entry field and saved in the configuration file. This capability is available for the rule file, CTO file, layer map file, and runset file.

- There are system defined environment for the input files; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.
- Behavior of “Group highlight colors by check”

When “Group highlight colors by check” is enabled, colors are assigned to results according to the rule check. However, the association between the highlight color and the rule check is not fixed; it depends on the history of your Calibre RealTime Digital session. Highlight colors are assigned to checks in a repeated cycle. The color assignment starts at the beginning of the cycle each time highlights are cleared. Highlights are cleared in the following cases:



- Automatically when “Clear Existing Highlights” is enabled; highlights are cleared at the start of a run, or at each new highlight when using the  buttons.
- By clicking the **Clear Highlights** button ().
- Automatically when the  button in the integrated toolbar is clicked. The  button also removes a rule check from the current check recipe—see “[Calibre RealTime Digital Integrated Toolbar in IC Compiler II](#)” on page 145 for a full description of the button behavior.


The following behavior is observed when “Group highlight colors by check” is enabled:


- Highlight color assignments from a DRC run:

Clear Existing Highlights ON — Highlights are cleared and the highlight color assignment starts at the first color of the highlight color cycle at the beginning of each Calibre RealTime Digital run.






Clear Existing Highlights OFF — Highlights from previous runs are kept. New results from a check with an existing highlighted result are highlighted in the same color. New results from a check that does not have an existing highlighted result are highlighted in the next color in the highlight color cycle.

Clicking  or  — Highlights are cleared and highlight color assignment starts at the first color of the highlight color cycle for the next run, regardless of the setting of “Clear Existing Highlights.”

- Highlight color assignments using the  buttons

Clear Existing Highlights ON — All highlights are cleared each time one of the  buttons is clicked; each result is highlighted in the first color of the highlight color cycle.

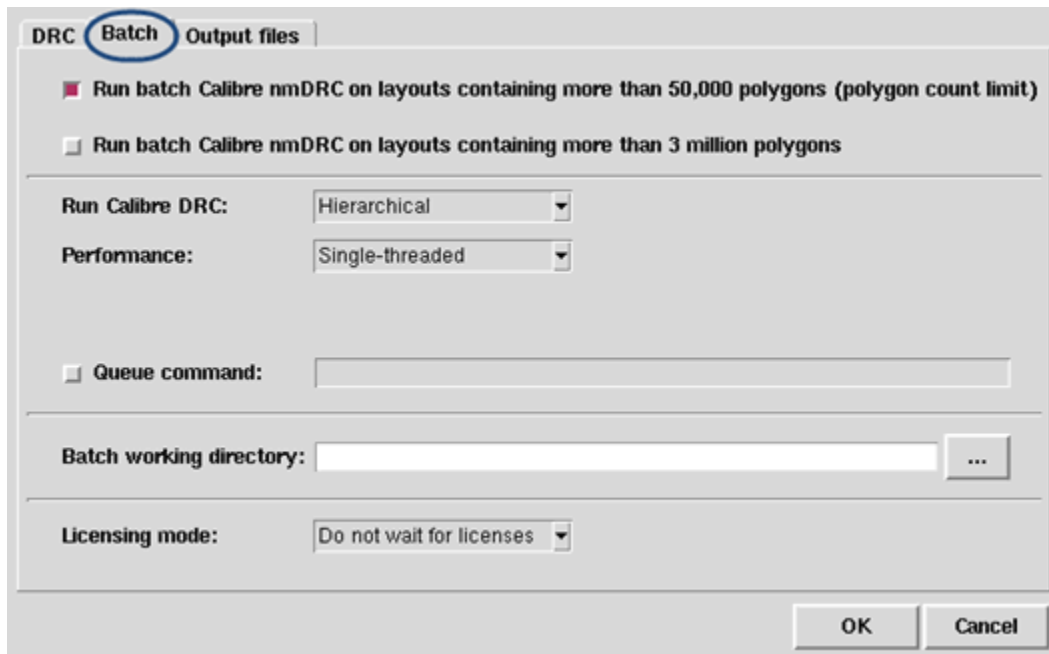
Clear Existing Highlights OFF — Each result is highlighted in the color used originally.

Clear All Highlights button  clicked when **Clear Existing Highlights** OFF —
All highlights are cleared. The next result highlighted with one of the    buttons is highlighted in the first color of the highlight color cycle; the highlight color for further results is assigned according to the rule check. All highlights are kept until  is clicked again.

Batch Tab in the Calibre RealTime Options Dialog Box

To access: Open the Calibre RealTime Options dialog box and click the **Batch** tab.

The **Batch** tab has settings for controlling a Calibre batch run started from Calibre RealTime Digital. You can set the number of polygons in the layout window that trigger a batch run, and execution and licensing options.



Objects

Object	Description
Run batch Calibre nmDRC on layouts containing more than <i><polygon_count_limit></i> polygons (Polygon count limit)	As described. The <i><polygon_count_limit></i> is set on the DRC tab with the “Polygon count limit” option. The default polygon count limit is 50,000.
Run batch Calibre nmDRC on layouts containing more than 3 million polygons	As described.
Run Calibre DRC	Specify a Flat or Hierarchical run.
Performance (only available for hierarchical runs)	Specify a single-threaded run, a multithreaded (turbo) run, or a distributed (Calibre MTflex) run.
Hyperscale (only available for multithreaded and Calibre MTflex runs)	Enables hyperscaling.

Object	Description
Number of CPUs (only available for multithreaded runs)	<ul style="list-style-type: none"> • All — Use the maximum number of available CPUs. • Positive integer — Use the specified number of CPUs.
Remote file (only available for Calibre MTflex runs)	Specify the remote file.
Queue command	<p>Specify a command to submit the Calibre batch run to a remote cluster.</p> <p>See “Batch Queue Command” on page 118 for replaceable parameters that can be used and for requirements regarding the queue command.</p>
Batch working directory	<p>Specify the directory in which to save the results database, log file, and “wrapper” rule file. Temporary working files are also written to this directory. The directory must exist. Separate batch working directories for each run configuration are recommended.</p> <p>If not specified, the directory from which the design tool was launched is used.</p>
Licensing mode	<p>Specify licensing options. The corresponding command line option is given in parentheses.</p> <ul style="list-style-type: none"> • Do not wait for licenses — Stop the batch run immediately if licenses are not available. (-nowait) • Wait for licenses — If licenses do not become available in the specified time, attempt to acquire substitute licenses. (-wait <time>) • Retry license acquisition — If licenses are not available, queue and periodically try to acquire the licenses. (-lmretry loop) <ul style="list-style-type: none"> • Retry for: ____ minutes (MAXRETRY) • Wait for: ____ seconds between retries (INTERVAL) • Retry even if a licensing error occurs (RETRY_ON_ERROR)


Usage Notes

Batch Queue Command

There are some special requirements on the queue command script executed from Calibre RealTime Digital. The queue command script must do the following:

- Monitor the status of the remote job and not exit until the job is complete.
- Make any required environment variables available to the remote host.
- Launch Calibre and redirect the Calibre transcript output to a file. The following replaceable parameters can be passed to the queue command script:
 - %c — Path to the Calibre executable
 - %o — Calibre invocation options
 - %t — Calibre transcript file, which has the automatically generated name of *RealTime_batch_<user>_Calibre_<design_name>_RealTime_transcript.log*.
 - %C — Calibre command with options and redirect to transcript (%c %o > %t)
 - %d — Batch working directory

The queue command script must use either the three parameters %c, %o, and %t, or the parameter %C. When %C is not used, the %t parameter must be used as the file to which the Calibre transcript output is redirected. The %d parameter is optional.

The  (**Stop batch DRC jobs**) button is not available during execution of the queue command script, as there is no way for Calibre RealTime to terminate a job on a remote host.

Sample Batch Queue Command

The following queue command script demonstrates the use of the replaceable parameters and how to write the output of queue command script to a log file. The script prints some debug information and starts a Calibre run on the local host—it does not launch a job on a remote host.

The queue command script, *queue_command_sample*, is the following:

```
#!/usr/bin/tclsh

puts "argc=$argc"
puts "argv=$argv"

set calibre_binary      [lindex $argv 0]
set calibre_options     [lindex $argv 1]
set calibre_transcript [lindex $argv 2]

puts "calibre_binary=$calibre_binary"
puts "calibre_options=$calibre_options"
puts "calibre_transcript=$calibre_transcript"
puts ""

eval exec "$calibre_binary $calibre_options > $calibre_transcript"
```

To use this queue command place the following in the “Queue command” field on the **Batch** tab of the Calibre RealTime Options dialog box:

```
./queue_command_sample %c "%o" %t >& log.txt
```

Quotation marks are placed around the %o parameter so that the Calibre options are passed to the script as a single string. After execution, the *log.txt* file contains the output of the puts statements and the transcript file contains the output from the Calibre command execution.

Related Topics

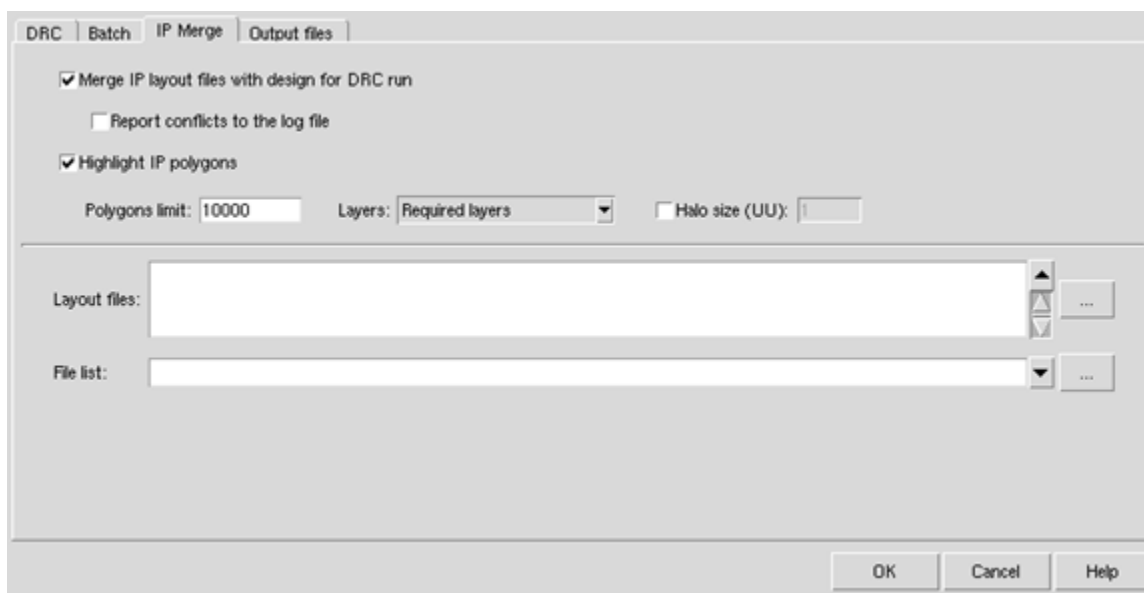
[Starting a Batch Calibre Run from Calibre RealTime Digital in Cadence Innovus](#)

[Calibre Administrator's Guide](#)

IP Merge Tab in the Calibre RealTime Digital Options Dialog Box

To access: Open the Calibre RealTime Options dialog box. Click the **IP Merge** tab.

The **IP Merge** tab has settings that allow customization of IP Merge when running DRC in Calibre RealTime Digital. You can control which layout files to use and how violations are highlighted.



Objects

Object	Description
Merge IP layout files with design for DRC run	As described.
Report conflicts to the log file	Print cell name conflicts to the log file <i>Calibre_RealTime_IP_Merge.log</i> . Conflicts are instances where two different cells in the layout files share the same name.
Highlight IP polygons	As described. Polygons are highlighted when only one result is highlighted.
Polygons limit	Restrict the number of IP layout polygons highlighted after a DRC run. The default maximum is 10000, and values from 0 to 1000000 are supported.

Object	Description
Layers	<p>Specify which layers to highlight:</p> <ul style="list-style-type: none"> • Required layers — Highlight only layers used for the rule check. This is the default option. • Required visible layers — Highlight visible layers used for the rule check. • All layers — Highlight all of the layers provided by the layout files. • All visible layers — Highlight all of the visible layers provided by the layout files.
Halo size (UU)	<p>Customize the halo size for highlighting the IP layout polygons. The default size is 1 user unit, and values from 0 to 10 are supported. All polygons within or intersecting the halo are highlighted.</p> <p>When this option is not selected, a highlight halo of twice the smallest track step size is used.</p>
Layout files	<p>Specify which IP layout files to use in a DRC run. You can select one or more GDS or OASIS files.</p>
File list	<p>Specify a text file containing a list of IP layout files to use in a DRC run. You can select one or more file lists.</p> <p>Wildcard characters and directories are supported for file lists and layout files. See “Supported File Types for IP Merge” on page 87 for more information.</p>

Usage Notes

Changes to the highlight options take effect without rerunning DRC.

Related Topics

[Running IP Merge for Calibre RealTime \(Innovus\)](#)

Keyboard Shortcuts for Calibre RealTime in IC Compiler II

A set of standard keyboard shortcuts are provided for Calibre RealTime Digital in IC Compiler II.

The keyboard shortcuts are defined in the following file:

```
$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/icc2/  
icc2_realtime_bindkeys.tcl
```

This file is not loaded by default to avoid possible conflicts with existing keyboard shortcuts. The definition of the bindkey functions is given in the following table. The section “[Defining and Loading Keyboard Shortcuts for Calibre RealTime in IC Compiler II](#)” on page 163 describes how to define and load your own keyboard shortcuts.

Table 5-7. Keyboard Shortcuts in Calibre RealTime for IC Compiler II

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::CurrentWindowRun Run DRC in the window.	F12
::calibre::realtime::ShowOptionsForm Open the Calibre RealTime Options dialog box.	Shift-F12
::calibre::realtime::NextRecipe Select the next recipe in the toolbar dropdown list.	Ctrl-n
::calibre::realtime::PreviousRecipe Select the previous recipe in the toolbar dropdown list.	Ctrl-w
::calibre::realtime::LastusedRecipe Select the most recently used recipe in the toolbar dropdown list.	Ctrl-e
::calibre::realtime::ClearAllHighlights Clear highlights.	Ctrl-b
::calibre::realtime::HighlightAllResults Highlight all results.	Ctrl-a
::calibre::realtime::HighlightPreviousResult Highlight the previous result.	p
::calibre::realtime::HighlightCurrentResult Highlight the current result.	c

Table 5-7. Keyboard Shortcuts in Calibre RealTime for IC Compiler II (cont.)

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::HighlightNextResult Highlight the next result.	n
::calibre::realtime::HighlightCurrentCheck Highlight results in the check currently selected in the toolbar dropdown list.	Shift-c
::calibre::realtime::PreviousCheck Select the previous check in the toolbar dropdown list.	Shift-p
::calibre::realtime::RemoveCurrentCheck Remove the selected check from the current recipe.	Shift-d
::calibre::realtime::NextCheck Select the next check in the toolbar dropdown list.	Shift-n
::calibre::realtime::OnRealTimeRve Open the Calibre RealTime Results window.	Shift-r


Defining and Loading Keyboard Shortcuts for Calibre RealTime in IC Compiler II

You can define custom keyboard shortcuts for Calibre RealTime. The Calibre installation provides a file of standard keyboard shortcuts.

Procedure

1. Copy the Tcl file `$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/icc2/icc2_realtime_bindkeys.tcl` to the desired location for your keyboard shortcut definitions. “[Keyboard Shortcuts for Calibre RealTime in IC Compiler II](#)” on page 162 lists the shortcuts defined in this file.
2. Edit the shortcut definitions as desired.
3. Load the new shortcut definitions into IC Compiler II by sourcing the Tcl file.

Tip

 If you want to use the standard shortcuts, and are not concerned about possible conflicts with other shortcuts, you can load the standard shortcuts. Issue the following command at the IC Compiler II command prompt, where the command is all one line:

```
source $env(CALIBRE_HOME)/shared/pkgs/icv/tools/realtime/icc2/icc2_realtime_bindkeys.tcl
```


Chapter 6

Calibre RealTime Digital in Fusion Compiler

The Calibre RealTime Digital interface is integrated with the Fusion Compiler design tool from Synopsys. Calibre RealTime Digital integrates flat Calibre nmDRC with supported place and route tools so that Calibre nmDRC can be run directly from the design tools.

Refer to “[Calibre RealTime Digital Introduction](#)” on page 15 for an overview and general system requirements.

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Requirements and Setup for Calibre RealTime Digital in Fusion Compiler

Requirements for tool versions, input files, and environment variables must be met in order to run Calibre RealTime Digital in Fusion Compiler.

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General Requirements for Calibre RealTime Digital in Fusion Compiler

Certain requirements for design tool versions, layer map files, and environment variables must be met to run Calibre RealTime Digital in Fusion Compiler.

The following list gives the detailed requirements:

- Fusion Compiler version P-2019.03-SP3 or later.
- Calibre version 2020.1_17 or later

See “[Calibre RealTime Digital Requirements](#)” on page 15 for other general requirements.

- Environment variable is set

The environment variable MGC_REALTIME_ENABLE_ICC2 must be set to the proper value.

In the csh shell:

```
setenv MGC_REALTIME_ENABLE_ICC2 1
```

You can disable Calibre RealTime Digital by setting the environment variable MGC_REALTIME_DISABLE to any value.

- Integration Script

See “[Tcl Script for Calibre Interface to Fusion Compiler](#)” on page 167.

The integration is enabled automatically after you run the Tcl integration script.

- Layer Map Requirement

A layer map file that maps the Fusion Compiler layer objects to GDS layers and datatypes is required. The mapping should correspond to what is expected by the Calibre rule file and any Layer Map statements within the rule file.

See “[GDS Layer Map for Calibre RealTime Digital in Fusion Compiler](#)” on page 168 for more information.

Tcl Script for Calibre Interface to Fusion Compiler

The Calibre integration to the Fusion Compiler tool requires a Tcl script to be loaded.

Create a file *load_calibre_interface.tcl* and copy the following code into it:

```
if {[info exists env(CALIBRE_HOME)] && ($env(CALIBRE_HOME) != "")} {  
    set env(MGC_HOME) $env(CALIBRE_HOME)  
}  
  
if {[info exists ::env(MGC_HOME)]} {  
    puts "*** Environment variable CALIBRE_HOME or MGC_HOME is not set.  
    ***"  
    puts "*** Calibre Interactive interface files NOT loaded. ***"  
} else {  
    set app_name [get_app_var synopsys_program_name]  
    if { $app_name eq "icc2_shell" || $app_name eq "fc_shell" } {  
        source [file join $::env(MGC_HOME) shared pkgs icv tools querytcl  
icc2_gui.tcl]  
    } else {  
        source [file join $::env(MGC_HOME) shared pkgs icv tools querytcl  
icc_gui.tcl]  
    }  
}
```

This also loads the Calibre interface to Calibre Interactive and Calibre RVE.

Fusion Compiler and Calibre RealTime Digital Version Compatibility

The support of Calibre RealTime Digital in Fusion Compiler depends on the Calibre release and the Fusion Compiler version.

Table 6-1. Fusion Compiler and Calibre RealTime Digital Version Compatibility


Fusion Compiler Version	Supporting Calibre Releases
P-2019.03-SP3 and later	2020.1_17 and later

GDS Layer Map for Calibre RealTime Digital in Fusion Compiler

A layer map file is required to map the Fusion Compiler layer objects to GDS layers and datatypes for layout export. The layer map file can be specified with an environment variable or specified in the Calibre RealTime Options dialog box.

- **With an environment variable** — Set the environment variable `MGC_REALTIME_LAYER_MAP_FILE` to the location of the layer map file; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

The environment variable has precedence over the setting in the Calibre RealTime Options dialog box.

- **In the Calibre RealTime Options dialog box** — Click the  button in the toolbar to open the Calibre RealTime Options dialog box and specify the layer map file.

File Format

These file formats are supported, where the format refers to the layer map file format selection in the Calibre RealTime Options dialog box:


- **icc2** — The default. Use the layer map file format for Fusion Compiler.
- **icc_default** — Use a layer map file written for an IC Compiler Milkyway database in default layer mode (layer numbers 1 through 255).
- **icc_extended** — Use a layer map file written for an IC Compiler Milkyway database in extended layer mode (layer numbers 1 through 4095).

Consult the Fusion Compiler documentation for details.

Supported File Types for IP Merge

When setting up IP Merge, you select which layout files to incorporate into your DRC runs. You can use both individual layout files or file lists, which are text files where each line is a path to a file or a directory. You can select multiple file lists to use, as well as select a combination of individual files and file lists.

Guidelines

- Only GDS and OASIS layout files are supported.
- Absolute and relative paths are both supported. Relative paths are expanded relative to the current working directory.
- To type out pathnames, click the  button to the right of a text box to expand it. You can now press Enter to add new lines; each pathname must be on a separate line.

- The wildcard characters * and ? can be used to specify multiple files. You can use these wildcard characters in file lists and when selecting layout files and file lists.
- Compressed files are allowed, but they must have a suffix of .z, .Z, or .gz, and the gzip program must be accessible to read the compressed file.
- Environment variables are supported.
- Specifying a directory name automatically includes all files in the directory. (dirname/*).
- File lists cannot contain paths to other file lists.
- In a file list, lines beginning with a # are treated as comments and are ignored.

File List Example

```
STD_LIB/1.gds  
# Loads a single GDS file
```

```
STD_LIB/2?.gds  
# Loads every GDS file in the STD_LIB directory that begins with a 2 and  
has one additional character
```

```
STD_LIB/3*.gds  
# Loads every GDS file in the STD_LIB directory that begins with a 3 and  
has any number of characters after it
```

```
$STD_LIB_DIR  
# Loads the directory to which this environment variable has been set
```

Invoking and Running Calibre RealTime Digital in Fusion Compiler

Several tasks are required to start and run Calibre RealTime Digital in Fusion Compiler.

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Invoking Fusion Compiler with Calibre RealTime Digital

After invoking Fusion Compiler with Calibre RealTime Digital, you see the Calibre RealTime Digital integrated toolbar.

Prerequisites

- “[Requirements and Setup for Calibre RealTime Digital in Fusion Compiler](#)” on page 166 completed.
- System and license requirements described in “[Calibre RealTime Digital Requirements](#)” on page 15 are satisfied.

Procedure

1. Start Fusion Compiler. For example:

```
fc_shell -gui
```

2. At the fc_shell command prompt, source the *load_calibre_interface.tcl* initialization file:

```
fc_shell> source $load_calibre_interface.tcl
```

It may take a minute or so to acquire all licenses and complete the initialization. The line “Calibre RealTime:” and the standard Calibre copyright notice is displayed in the transcript after successful initialization. The first two lines are similar to the following:

```
Calibre RealTime:  
// Calibre v.2020.1_17 Tue Jan 17 16:14:08 PDT 2020
```

If you do not see the preceding lines, check that all environment variables are set as described in the “Prerequisites” section.

3. Proceed to “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler](#)” on page 171.

Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler


A run configuration in Calibre RealTime Digital is the set of options and input files for a run. You can define multiple run configurations with different options (such as the rule file, check recipe and other options), then quickly switch between different run configurations. You can run with one configuration (single mode) or run multiple configurations in sequence (serial mode).

The first time you open Calibre RealTime Digital, the “Run Mode” is set to Single and a run configuration named “Default configuration” is created. If you plan on using only one run configuration, no further action is needed.

Prerequisites

- You have completed “[Invoking Fusion Compiler with Calibre RealTime Digital](#)” on page 170.


Procedure

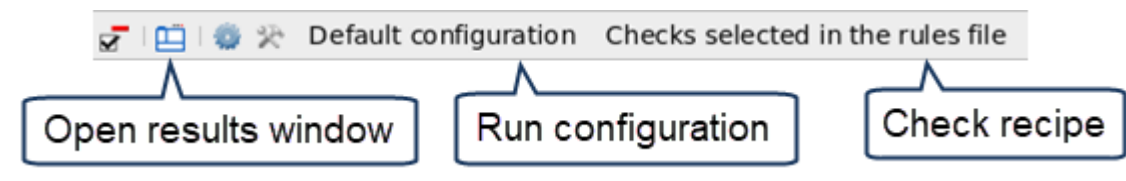
1. Click the **Options** button () on the integrated toolbar to open the Calibre RealTime Options dialog box. You can also choose **Calibre > RealTime DRC > RealTime Options**.
2. If using multiple run configurations, define as many configuration names as needed:
 - a. Click the **Edit** button next to the configuration name to open the Configuration Run Control dialog box.
 - b. Click the “+” button to add a configuration and specify the name. Repeat this step as needed.
 - c. If using the Serial run mode, set the run order using the up and down arrows. Use the checkbox to include or remove a configuration from the execution list.
 - d. Click **OK** to close the Configuration Run Control dialog box.
3. Define the settings for each run configuration:
 - a. Select the configuration in the Configuration dropdown list.
 - b. Specify the settings as described in “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in Fusion Compiler](#)” on page 172.

Repeat for each run configuration.

4. Select the “Run Mode”:
 - **Single** — Run only the currently selected configuration when a run is started.
 - **Serial** — Run each configuration selected in the Configuration Run Control dialog box in order.
5. Proceed to “[Running Calibre RealTime Digital in Fusion Compiler](#)” on page 174.

Note

 After a run, DRC results are displayed for separately for each run configuration. Select the results to view with the toolbar—click the toolbar setting to select the configuration and check recipe from a dropdown menu:




Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in Fusion Compiler

Calibre RealTime Digital uses a standard Calibre nmDRC rule file. The check recipe controls which checks in the rule file are executed during the Calibre RealTime Digital run.

Prerequisites

- You have completed “[Invoking Fusion Compiler with Calibre RealTime Digital](#)” on page 170.
- You have completed “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler](#)” on page 171.
- You have a Calibre nmDRC rule file available; see “[Calibre RealTime Digital Requirements](#)” on page 15 and “[Differences Between Calibre nmDRC and Calibre RealTime Digital](#)” on page 16 for additional information about rule file requirements.

Procedure

1. Click the **Options** button () on the integrated toolbar to open the Calibre RealTime Options dialog box. You can also choose **Calibre > RealTime DRC > RealTime Options**.
2. Select the configuration in the Configuration dropdown list.
3. Specify the Calibre rule file in the “Rule file” text field.

Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in Fusion Compiler

Alternatively, you can specify a Calibre Interactive runset. Select Runset in the Rule file/runset dropdown list and specify a runset.

4. Click **Reload** to load the rule file.

Note

If you make changes to the rule file during a Calibre RealTime session, you must manually reload the rule file in order for the new rule file to be used.

The rule file for the active configuration is loaded automatically on RealTime startup unless it is specified inside the runset file.

5. Specify the layer map file in the “Layer map file” field.

A layer map file is required. Three file formats are supported; see “[GDS Layer Map for Calibre RealTime Digital in Fusion Compiler](#)” on page 168.

6. (Optional) Select options in the dialog box; the defaults are suitable for most runs. See “[Calibre RealTime Options Dialog Box in Fusion Compiler](#)” on page 187 for a definition of each option.

If you want the Calibre RealTime Results window to open automatically after a run, enable the option “Launch RealTime results viewer automatically.”

Select the **Output files** tab if you want to save a summary file of DRC of the run and the DRC results as an ASCII results database (RDB).

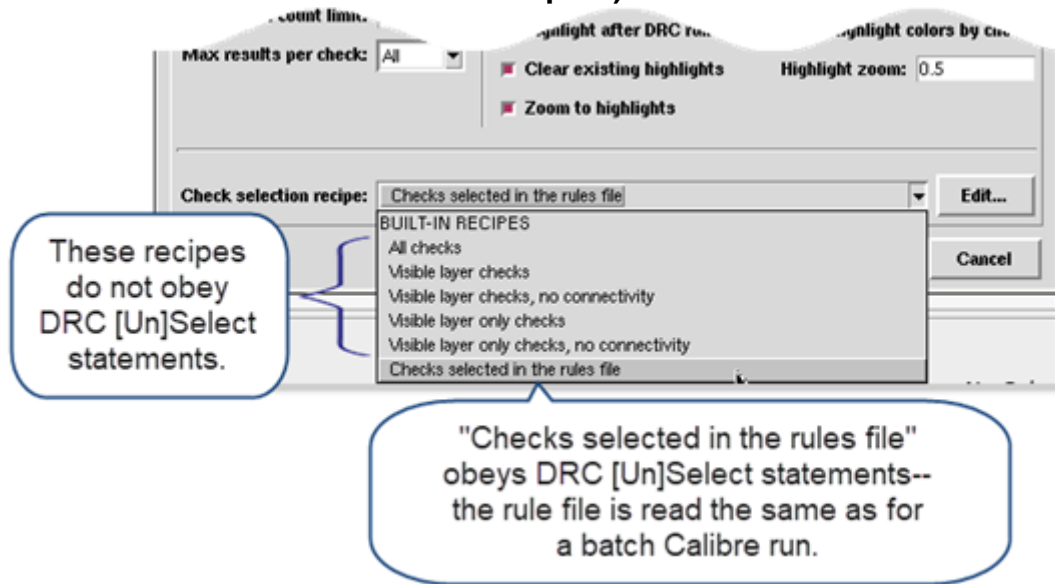
7. Select the check recipe as follows:

- **Checks selected in the rules file** (default) — This built-in recipe uses the Calibre rule file just as a batch run of Calibre does.
- **Other built-in check recipes** — You can select a recipe that only runs checks on certain layers, excludes certain types of checks, or runs all checks in the rule file.

Because these built-in recipes do not obey DRC [Un]Select Check statements in the rule file, the recipes may execute checks in the rule file that would not be executed during a batch Calibre run. The recipe “Checks selected in the rules file” is the only built-in recipe that obeys DR [Un]Select Check statements.

- **User recipes** — You can select a previously defined custom check recipe.

Figure 6-1. Selecting a Check Recipe in Calibre RealTime Digital (Fusion Compiler)



8. Proceed to [“Running Calibre RealTime Digital in Fusion Compiler”](#) on page 174.

Tip

i You can change environment variables with the commands given in the section [“Environment Variable Control”](#) on page 206. This is useful if you want to change environment variables used in the rule file.

Running Calibre RealTime Digital in Fusion Compiler

Calibre RealTime Digital runs checks on the geometries visible in the Fusion Compiler window plus a halo around the region. The specified check recipe selects the checks that are executed. All Calibre RealTime Digital DRC runs are performed in flat mode.

Tip


i When using a DRC run type of Window or Area, a region of 25 um x 25 um or smaller is recommended for the best performance.

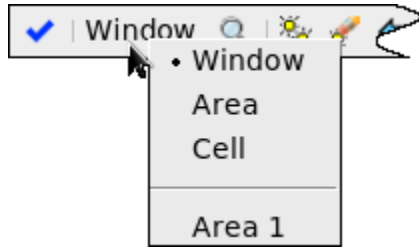
Prerequisites





- You have completed [“Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in Fusion Compiler”](#) on page 172.
- (Optional) Specify highlight colors; see [“Specifying Highlight Color for Calibre RealTime Digital in Fusion Compiler”](#) on page 176.

Procedure

1. Select a run configuration in the Configuration dropdown list, or, if running in Serial mode, make sure the Run Mode is set to Serial in the Calibre RealTime Options dialog box. See “[Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler](#)” on page 171.
2. Select the DRC run type and start a run:

The DRC run type is selected in the toolbar, in a dropdown menu next to the  button:




DRC Run Type	Instructions
Window	<p>Runs DRC on the geometries visible in the design tool window:</p> <ol style="list-style-type: none"> 1. Choose the Window run type. 2. Zoom to the region you want to run DRC on and make sure the geometries you want to run checks on are visible. 25 um x 25 um or smaller is recommended for the best performance. 3. Click the  button to start the run.
Area	<p>Runs DRC on a selected region:</p> <ol style="list-style-type: none"> 1. Choose the Area run type. 2. Click the  button. 3. Use the mouse to drag a rectangle around the area you want to run DRC on.
Cell	<p>Runs DRC on the whole block that is open in the active window.</p> <ol style="list-style-type: none"> 1. Choose the Cell run type. 2. Click the  button to start the run.
Area 1, Area 2, ...	<p>Runs DRC on a previously selected area:</p> <ol style="list-style-type: none"> 1. Choose the area to run on. The most recent area is always named Area 1. 2. Click the  button to start the run.

Results

Flat Calibre nmDRC is run on the selected geometries plus the specified halo region around the area. If running in Serial mode, a DRC run is executed for each of the configurations selected in the Configuration Run Control dialog box, in the order specified.

You can use the highlight controls in the integrated toolbar to step through results. If you are using multiple run configurations, the results are displayed separately for each configuration—select the configuration to view in the toolbar dropdown box.

You can also click the  toolbar icon to open the Calibre RealTime Results window to view results in a separate window; see “[Viewing Results in the Calibre RealTime Digital Results Window](#)” on page 35.



Rule check comments can be seen by hovering over the rule check name in the toolbar.

Specifying Highlight Color for Calibre RealTime Digital in Fusion Compiler

You can specify the highlight color used by Calibre RealTime Digital with the **Calibre > Highlight Colors** menu selection in Fusion Compiler. You can also specify DRC Rule Check Comments in a Check Text Override (CTO) file or in the rule file.

Procedure

1. Do one of the following:

To do this ...	Do the following ...
Change highlight layer color in Fusion Compiler	In Fusion Compiler, select Calibre > Highlight Colors . Specify the highlight color, fill pattern, and border width. (Optional) To use a different highlight color per rule check, click  to open the Calibre RealTime Options dialog box, select “Group highlight colors by check,” and unselect “Clear existing highlights.”
Use a CTO file with DRC Rule Check Comments	Click  to open the Calibre RealTime Options dialog box, check “CTO file”, and specify the CTO file. See “ DRC Rule Check Comments for Calibre RealTime Digital ” on page 46, and the rule check comments RVE Highlight Color and RVE Highlight Index.
Use DRC Rule Check Comments in the rule file	Add the rule check comment RVE Highlight Color or RVE Highlight Index to the rule check. For example: <pre>M2_NET { @ RVE Highlight Color: red copy M2_NET }</pre>

2. Proceed to “[Running Calibre RealTime Digital in Fusion Compiler](#)” on page 174.

Results

The specified color is used when you highlight a result. If you used DRC Rule Check Comments in the rule file, the highlight color is used per rule check.

If you specified “Group highlight colors by check” in the Calibre RealTime Options dialog box, the highlight colors are assigned to checks in a repeated cycle. The assigned highlight color for a check is not fixed. The “Group highlight colors by check” is not compatible with “Clear existing highlights” because the latter option causes the highlight color assignment to start over for each highlight action.

Specifying Layer Visibility for Calibre RealTime Digital in Fusion Compiler

You can use a Check Text Override (CTO) file to assign the layer visibility for results according to the rule check. The Check Text Override file is specified in the Calibre RealTime Options dialog box.

Note




A CTO file can also be used to assign highlight colors. See “[Specifying Highlight Color for Calibre RealTime Digital in Fusion Compiler](#)” on page 176 for more information.

Procedure

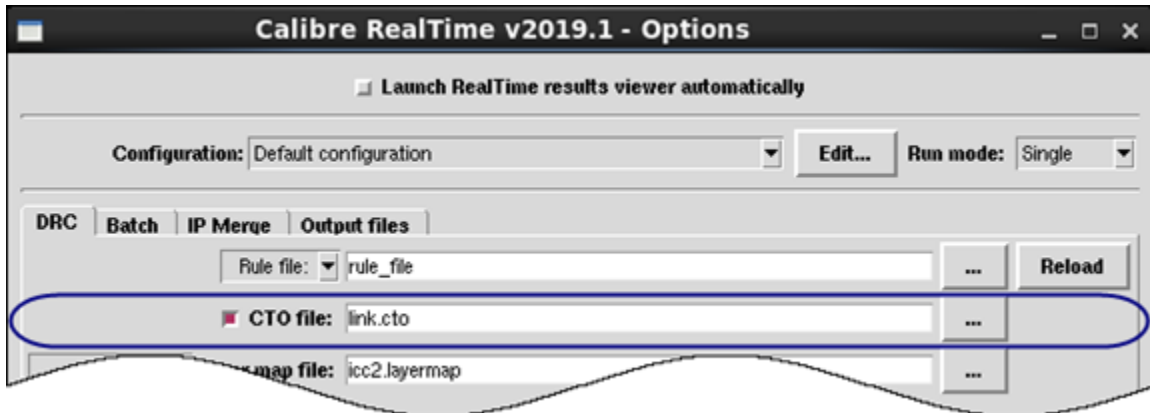
1. Create a Check Text Override (CTO) file using a text editor. The following example CTO file specifies the layer visibility for the min_ext_diff_poly rule:

```
# check text override file for XYZ
#
min_ext_diff_poly
RVE Show Layers: diff poly
```

where the drawing purpose layer is used by default in the RVE Show Layers statement. See “[DRC Rule Check Comments for Calibre RealTime Digital](#)” on page 46 for complete information about the CTO file syntax and supported rule check comments.

2. Save the check text override file with a file extension of *.cto*.
3. Click the  button in the Calibre RealTime toolbar to open the Calibre RealTime Options dialog box.
4. Enable “CTO file” and specify a check text override file.

The `.cto` file extension is not required, but the file browser for the CTO file searches for files with a `.cto` file extension.



Tip

i You can enter an environment variable that is a directory path in the text entry field and click the ... button to have the file browser open to that directory.

You can also specify the CTO file with the environment variable `MGC_REALTIME_CTO_FILE`; see “[Calibre RealTime Digital Environment Variables](#)” on page 39 for more information.

Results

With the example shown in Step 177, layers diff and poly are shown and all other layers are hidden.

Starting a Batch Calibre Run from Calibre RealTime in Fusion Compiler

You can start a batch Calibre run from Calibre RealTime Digital if the design window contains more than a specified number of polygons. The controls for starting a batch run are on the **Batch** tab in the Calibre RealTime Options dialog box.

Tip


i If a dialog box pops up with a prompt to **Continue** or **Abort** the run because the polygon limit has been exceeded, the batch run has not been enabled to start automatically. Click **Abort** to end the run, and then use the following procedure to automatically start a run in batch mode whenever the polygon limit is exceeded.

Prerequisites

- You have completed “[Specifying the Rule File, Check Recipe, and Calibre RealTime Digital Options in Fusion Compiler](#)” on page 172.

- Run configurations are set up. See [“Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler”](#) on page 171.
- (Optional) Set the environment variable MGC_TMPDIR to a directory to use for temporary working files. Temporary files are written to \$MGC_HOME/tmp if MGC_TMPDIR is not set.
- (Optional) If you do not want results from the batch run automatically highlighted when the run completes, set the environment variable MGC_REALTIME_DO_NOT_HIGHLIGHT_BATCH_RESULTS. If the run produces many results, the highlight process can be slow. The option “Highlight after DRC run” is ignored when the environment variable is set.

Procedure


1. Click the **Options** button () in the integrated toolbar to open the [“Calibre RealTime Options Dialog Box in Fusion Compiler”](#) on page 187.
2. Select a run configuration in the “Configuration” dropdown list.
3. Click the **Batch** tab and set options as follows:
 - a. Check one of the following options:
 - Run batch Calibre nmDRC on layouts containing more than *<polygon_count_limit>* polygons (Polygon count limit)
 - Run batch Calibre nmDRC on layouts containing more than 3 million polygons


Tip: *<polygon_count_limit>* is set on the **DRC** tab.
 - b. Select settings for “Run Calibre DRC” and “Performance.”
 - c. (Optional) If you are submitting the job to a remote cluster, check “Queue command” and enter the command. See the tooltip for replaceable parameters.

See [“Batch Queue Command”](#) on page 118 for requirements regarding the batch queue command and a sample command script suitable for testing.
 - d. (Optional) Specify the “Batch working directory.” The directory must exist and have write permission. Specify a different working directory for each run configuration.

The wrapper rule file, transcript file, and results database (RDB) are written to the batch working directory. If you do not specify a batch working directory, the output is written to the directory from which you invoked the design tool.
 - e. Set options for “Licensing mode.”

See [“Batch Tab in the Calibre RealTime Options Dialog Box”](#) on page 194 for details on the Calibre run and licensing options.
4. If you are using multiple run configurations, repeat Steps 2 and 3 for each configuration.


5. Click **OK** to close the options dialog box.
6. Select your run type and click  in the toolbar to start the run.


When a batch run starts, the **Run DRC** button changes to  (**Stop batch DRC jobs**).

Results

The run starts as a Calibre RealTime Digital DRC run. If the polygon count for the run is greater than the specified number, a batch run starts and a message similar to the following is printed:

```
Calibre RealTime is running batch DRC using configuration: "config_DP"
DRC analysis window:      {-382049 -1173620} {1524120 141969}
Batch Calibre transcript file: "./batch_dir/
RealTime_batch_username_45nm_design_demo_fir_multi_layout_transcript.log"
DRC COMPLETE. TOTAL CHECK COUNT = 158 TOTAL RESULT COUNT = 86
Timing: Total run time : 4,498 ms
```

You can use the design tool at this point, but the Calibre RealTime Digital toolbar is unavailable except for the  button. The Calibre RealTime Digital license is checked out for the duration of the batch run.

When the batch run is complete, the results are reported in the Calibre RealTime Digital toolbar and it becomes active again. You can now use the highlight controls, or click the  toolbar icon to open the Calibre RealTime Digital Results window to view results in a separate window; see [“Viewing Results in the Calibre RealTime Digital Results Window”](#) on page 35. (The option “Launch RealTime results viewer automatically” is ignored in batch runs.)

A message similar to the following is printed to the transcript when the run completes:

```
DRC COMPLETE. TOTAL CHECK COUNT = 1631 TOTAL RESULT COUNT = 24990
```

The following files are written to the batch working directory:

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_results.rdb*

The results database (RDB) file.

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_transcript.log*

The Calibre transcript.

- *RealTime_batch_<user>_cfg<configuration>_<library_name>_<design_name>_RealTime_wrapper.svrf*

The “wrapper” rule file is used in the Calibre command line that starts the batch run. The wrapper rule file specifies the layout window and the checks to execute, along with other settings for the run. The rule file is specified with an SVRF Include statement.


Running IP Merge for Calibre Realtime in Fusion Compiler

IP Merge is configured in the Calibre RealTime Digital Options dialog box. After IP Merge is set up, DRC runs use the provided layout files to better identify rule violations.

Prerequisites

- Calibre RealTime Digital is open.

Procedure


1. Click the **DRC Options** button () to open the Calibre RealTime Options dialog box.
2. In the **DRC** tab, ensure that the correct rule file has been loaded and that the other settings are configured properly.
3. Click the **IP Merge** tab.
4. Select “Merge IP layout files with design for DRC run.”
5. Customize your configuration. See [“IP Merge Tab in the Calibre RealTime Digital Options Dialog Box”](#) on page 120 for more information on these options.

- Select “Report conflicts to the log file” to print cell name conflicts to the log file. Conflicts occur when multiple cells in the layout files share the same name.
- Select “Highlight IP polygons” to highlight the polygons from the IP Merge files that are near the DRC violations. Polygons are highlighted if only one result is selected.

Selecting this makes the following highlighting sub-options available:

- Enter a number for “Polygons limit” to restrict the number of IP polygons to highlight. The default value is 10000.
- Choose an option under the “Layers” dropdown menu to specify which layers to highlight.
- Select “Halo size (UU)” and enter a number to customize the halo size for the layers in the IP Merge files. This option is disabled by default.

When this option is enabled, the default size is 1 user unit. When this option is disabled, a highlight halo of twice the smallest track step size is used.

6. Specify your IP Merge files:
 - a. Click the  button in the “Layout files” or “File List” rows.
 - b. Navigate to where your files are stored, then select them. You can select one or more files.

c. Click **Open**.


IP layout files for the active configuration are loaded automatically on RealTime startup if IP Merge is enabled.

You can select any combination of layout files and file lists:

- **Layout files** — GDS or OASIS format IP layout files
- **File list** — Text files that contain a list of IP layout files, with one file per line

Wildcard characters and directories are supported for file lists and layout files. See “[Supported File Types for IP Merge](#)” on page 87 for more information.

7. Click **OK** to close the dialog box.

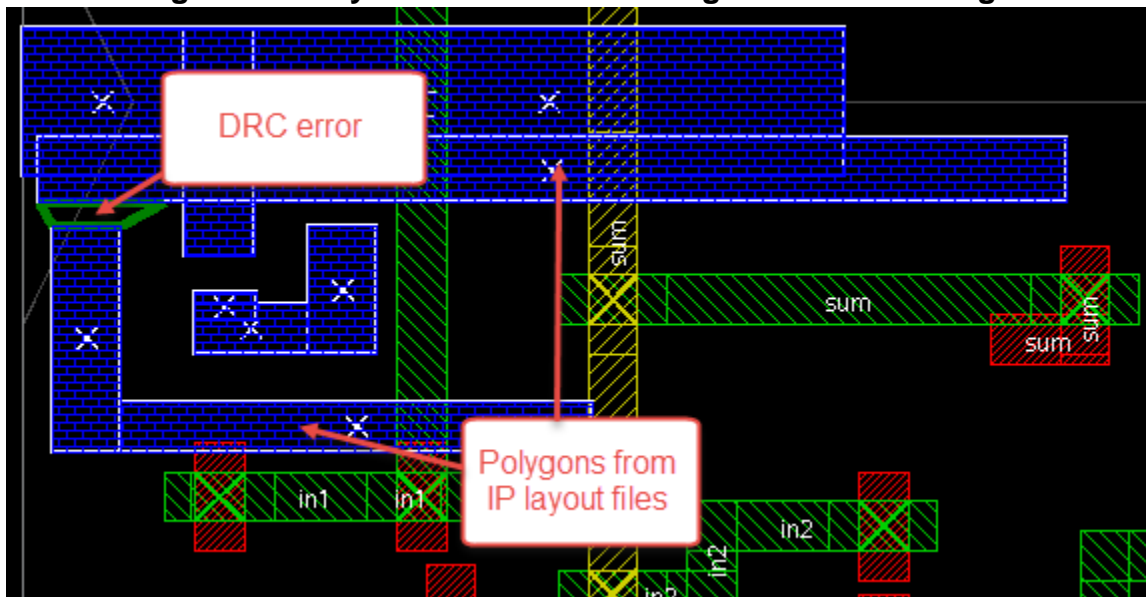
8. In the RealTime toolbar, click the  button to run DRC.

Results

DRC violations are highlighted in the design tool. These violations take into account the contents of the IP layout files.

The following image shows a DRC error highlighted with the option “Highlight IP polygons with DRC result” enabled. Polygons from the IP layout files have been highlighted in blue.

Figure 6-2. Layout View After Running DRC with IP Merge



GUI Reference for Calibre RealTime Digital in Fusion Compiler

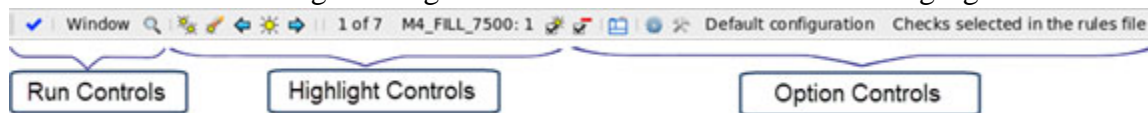
The Calibre RealTime Digital integrated toolbar and the Calibre RealTime Options dialog box provide the controls and settings you need to run Calibre RealTime Digital.

Calibre RealTime Digital Integrated Toolbar in Fusion Compiler	183
Calibre RealTime Options Dialog Box in Fusion Compiler	187
Batch Tab in the Calibre RealTime Options Dialog Box.....	194
IP Merge Tab in the Calibre RealTime Digital Options Dialog Box	198

Calibre RealTime Digital Integrated Toolbar in Fusion Compiler

The Calibre RealTime Digital integrated toolbar includes controls to start a DRC run, highlight results, and open the Calibre RealTime Options dialog box. The toolbar also includes option settings for run control and highlighting.

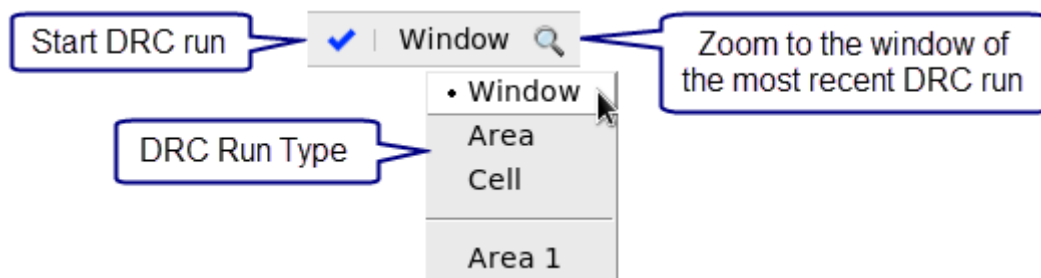
The Calibre RealTime Digital integrated toolbar is shown in the following figure.



The run controls, highlight controls, and options controls are described in the following sections.

Run Controls (Fusion Compiler)




The run controls in the Calibre RealTime Digital integrated toolbar start a DRC run and zoom to the window for the most recent DRC run. The run controls are shown below and described in the table following the figure.



Note

Default keyboard shortcuts are noted in some cases, however, these shortcuts are *not* loaded automatically. See [“Defining and Loading Keyboard Shortcuts for Calibre RealTime in Fusion Compiler”](#) on page 201.

Table 6-2. Run Control Toolbar Selections (Fusion Compiler)

Toolbar item	Description
 (Run DRC)	Runs flat DRC using the selected DRC Run Type. Calibre runs with the currently selected Run Configuration and configuration run mode (Serial or Single). Keyboard shortcut: F12
DRC Run Type dropdown	Selects the DRC run type: <ul style="list-style-type: none"> • Window — Run DRC on the geometries visible in the current window, plus a halo region around the area. • Area — Run DRC in a selected area. Click the Run DRC button () and use the mouse cursor to select an area in the design. • Cell — Run DRC in the whole block that is open in the active window. • Area 1, Area 2, ... — Run DRC on a previously selected area.
	Zoom to the region of the most recent DRC run. If a previously selected area is chosen in the Run Mode dropdown, zoom to that area.

Highlight Controls (Fusion Compiler)

The highlight control section in the Calibre RealTime Digital integrated toolbar includes highlight controls and displays the rule check for the current result. The highlight controls are shown below and described in the table following the figure.

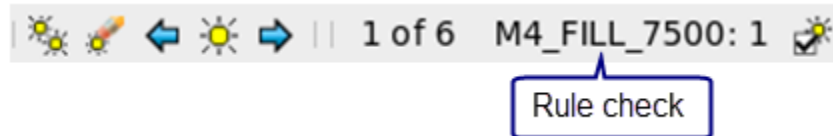


Table 6-3. Highlight Control Toolbar Selections (Fusion Compiler)




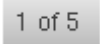

Toolbar item	Description
	Highlight all.
	Clear all highlights.
	Highlight previous, current, or next result for the rule check. Also see Behavior of “Group highlight colors by check” in the Usage Notes section of “ Calibre RealTime Options Dialog Box in Fusion Compiler ” on page 187.

Table 6-3. Highlight Control Toolbar Selections (Fusion Compiler) (cont.)

Toolbar item	Description
	Result <i>n</i> of <i>total</i> results. Also see the setting “Show results in” in the “ Calibre RealTime Options Dialog Box in Fusion Compiler ” on page 187; this setting determines whether all results for the cell or only results from the most recent run are reported.
Rule check	Indicates the rule check that produced the displayed error when using the highlight previous, current, and next buttons. Click the rule check name to select a different rule check.
	Highlight all results from the selected rule check.

Option Controls (Fusion Compiler)

The option controls in the Calibre RealTime Digital integrated toolbar select the check recipe and open the Calibre RealTime Options dialog box. The option controls are described in the table following the figure.

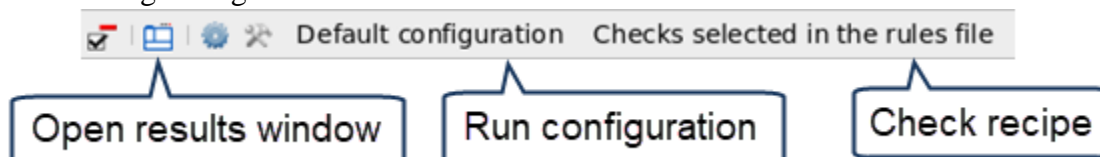


Table 6-4. Option Control Toolbar Selections (Fusion Compiler)






Toolbar item	Description
	Remove the displayed rule check from the current check recipe. All highlights are cleared, regardless of the setting of “Clear existing highlights.” If the recipe is a built-in recipe, a pop-up dialog box prompts you to save the new check recipe to a new filename. If the recipe is a user recipe, the updated recipe is saved automatically.
	Open the Calibre RealTime Digital Results window. See “ Viewing Results in the Calibre RealTime Digital Results Window ” on page 35.
	Open the “ Calibre RealTime Options Dialog Box in Fusion Compiler ” on page 187.

Table 6-4. Option Control Toolbar Selections (Fusion Compiler) (cont.)

Toolbar item	Description
	Open the Customization GUI. This button is only available if a Calibre Interactive runset is loaded and includes a customization file. See “ Using the Customization GUI with Calibre RealTime Digital ” on page 45.
Run Configuration	Select the run configuration, both for a run in “Single” mode and for viewing results; see “ Specifying and Using Multiple Run Configurations in Calibre RealTime Digital in Fusion Compiler ” on page 171.
Check recipe	Select the check recipe from the dropdown list. See “ Check Selection Recipes in Calibre RealTime Digital ” on page 61 for more information.

Calibre RealTime Options Dialog Box in Fusion Compiler

To access: Click the  button in the toolbar or choose **Calibre > RealTime DRC > Options**

The Calibre RealTime Options dialog box specifies the Calibre rule file, the check recipe, and other options. The settings in the Calibre RealTime Options dialog box are saved in the Calibre RealTime Digital configuration file.

Description

Figure 6-3. Calibre RealTime Options Dialog Box (Fusion Compiler)

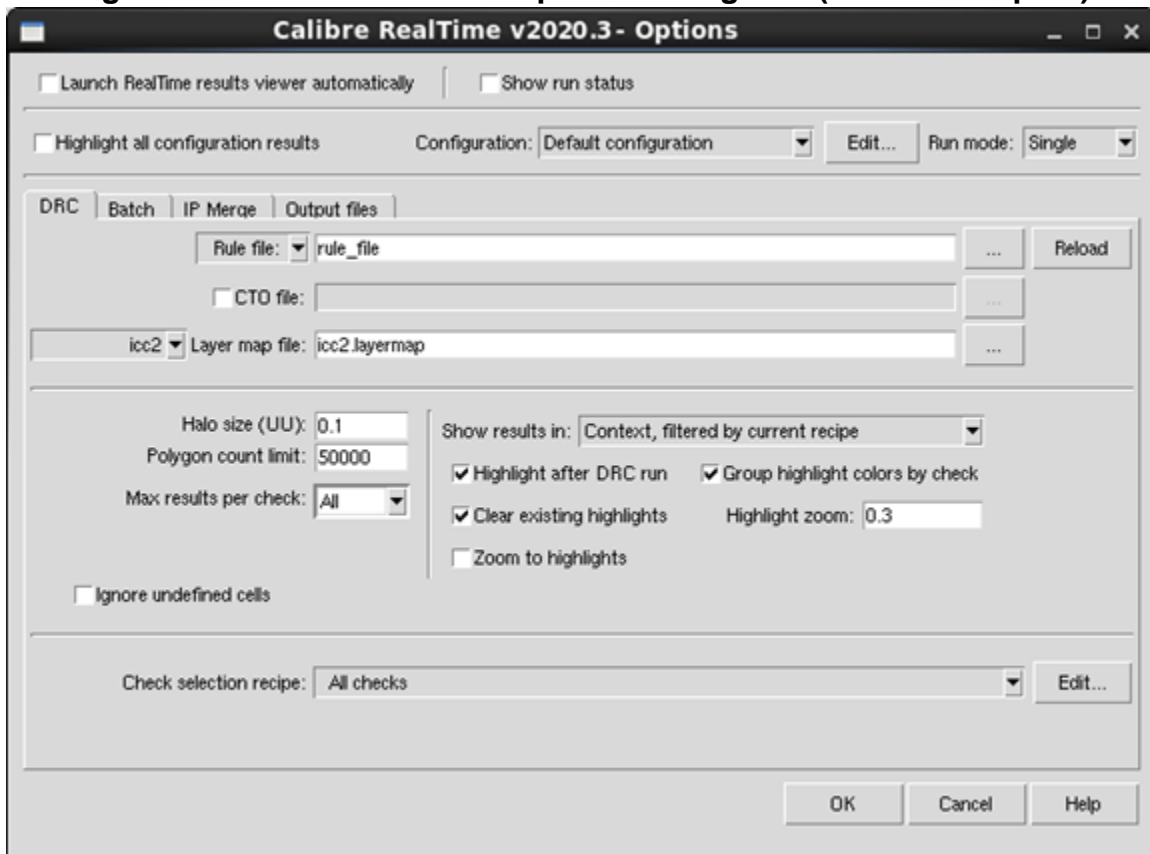



Table 6-5. Tabs in Calibre RealTime Options Dialog Box (Fusion Compiler)

Tab	Description
DRC	Specify options for the Calibre DRC run. See the table in the next section and “Usage Notes” at the end.
Batch	Specify options to launch a batch Calibre nmDRC run if the design window contains more than a specified number of polygons. See “ Starting a Batch Calibre Run from Calibre RealTime in Fusion Compiler ” on page 178.

Table 6-5. Tabs in Calibre RealTime Options Dialog Box (Fusion Compiler)

Tab	Description
Output files	Specify whether to save a summary file and the DRC results as an ASCII results database (RDB). If a specified directory does not exist, the tool prompts you to confirm that the directory should be created.

Tip

 You can use environment variables to specify any pathname, directory name, or portion of a pathname. For example: `$PROJ/$DESIGN/rules`.

However, the Calibre RealTime Digital environment variables specific for input files take precedence over user-defined environment variables. See “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

Fields

Table 6-6. Calibre RealTime Options Dialog Box Contents (Fusion Compiler)


Control	Description
Launch RealTime results viewer automatically	Specifies whether to open the Calibre RealTime Digital Results window automatically after a run. See “ Viewing Results in the Calibre RealTime Digital Results Window ” on page 35.
Show run status	Specifies whether to display processing status updates in the shell during a Calibre RealTime Digital run.
Highlight all configuration results	<p>Specifies whether to automatically highlight DRC results from all configurations after a DRC run. When this option is enabled:</p> <ul style="list-style-type: none"> • Highlights are preserved when switching configurations. • When highlighting, the “Clear existing highlights” option is ignored and existing highlights are not cleared. • Results from all configurations are highlighted in both single and serial runs, and the “Highlight after DRC” option is ignored. <p> Note: When this option is enabled, you can only cross-highlight results from the layout editor to the Results window if they are from the current configuration. You can view the check description of any result regardless of its corresponding configuration.</p>
Configuration	<p>Specifies the Run Configuration name. To add or delete a configuration, click Edit to open the Configuration Run Control dialog box.</p> <p>A configuration is the set of options and filenames below the configuration name.</p>


Table 6-6. Calibre RealTime Options Dialog Box Contents (Fusion Compiler)

Control	Description
Run Mode	<ul style="list-style-type: none"> • Single — Run with the currently selected configuration. • Serial — Run each selected configuration in series, in the order specified in the Configuration Run Control dialog box.
Rule file/Runset dropdown list	Selects whether to load a rule file or a Calibre Interactive runset.
Rule file	<p>Specifies the Calibre rule file used for the run.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
Runset	<p>Specifies a Calibre Interactive runset to use for the run.</p> <p>See “Using Calibre Interactive Settings in a Calibre RealTime Digital Run” on page 43 for details.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
CTO file	<p>Specifies a CTO file for controlling the highlight color and layer visibility per rule check. See “DRC Rule Check Comments for Calibre RealTime Digital” on page 46.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
Layer map file format dropdown list	<p>Specifies the format of the layer map file.</p> <ul style="list-style-type: none"> • icc2 — The default. Use the layer map file format for Fusion Compiler. • icc_default — Use a layer map file written for an IC Compiler Milkyway database in default layer mode (layer numbers 1 through 255). • icc_extended — Use a layer map file written for an IC Compiler Milkyway database in extended layer mode (layer numbers 1 through 4095).
Layer map file	<p>Specifies a custom layer map file.</p> <p>See “GDS Layer Map for Calibre RealTime Digital in Fusion Compiler” on page 168.</p> <p>See the “Usage Notes” section for information on using environment variables.</p>
... (Browse)	Open a file browser to select the rule file or layer map file.
Reload	<p>Reload the indicated file.</p> <p>You must click Reload for changes in the rule file or runset to take effect. Changes in the layer map and CTO files cause an automatic reload prior to the DRC run.</p>

Table 6-6. Calibre RealTime Options Dialog Box Contents (Fusion Compiler)

Control	Description
Halo size (UU)	The halo size in user units. See “ Halo Usage in Calibre RealTime Digital ” on page 21 and “Halo” in “ Terms and Definitions in Calibre RealTime Digital ” on page 17 for more information on halos.
Polygon count limit	Sets the maximum number of polygons that are passed to Calibre. The limit should be set low enough that the Calibre server returns control to the design tool in a short amount of time. The maximum number of geometries Calibre RealTime Digital will process is 3,000,000.
Max results per check	Specifies the maximum number of results returned per rule check; this setting overrides the setting in the rule file.
Show results in	<p>This setting controls which results are reported in the integrated toolbar after the run.</p> <ul style="list-style-type: none"> • Whole cell, all checks — Report all results for the cell in the integrated toolbar after each DRC run. Reported results include those from the current run, previous results in the cell that are outside of the current run context, and possibly previous results within the current run context from rule checks not selected by the current recipe. • Whole cell, filtered by current recipe — Report results for the whole cell and from the current recipe only in the integrated toolbar after each DRC run. Reported results include those from the current run plus previous results in the cell that are outside of the current run context. • Context, filtered by current recipe — (default) Report only results within the current run context and from the current check recipe in the integrated toolbar after each DRC run. <p>For each case, all results in the current window and belonging to the current check selection recipe are deleted before the run.</p> <p>The settings “Whole cell, filtered by current recipe” and “Context, filtered by current recipe” filter out results from previous runs. If these settings are used, it is recommended that a later run be performed with “Whole cell, all checks” selected to make sure that all results are reported.</p>
Highlight after DRC run	Highlight results in the design tool after the DRC run.

Table 6-6. Calibre RealTime Options Dialog Box Contents (Fusion Compiler)





Control	Description
Group highlight colors by check	Assign the highlight color for results according to the rule check. The assigned highlight color for a rule check is not fixed—rather, the highlight colors are assigned to checks in a repeated cycle. This option is not compatible with “Clear existing highlights.” See “Behavior of “Group highlight colors by check”” in the “Usage Notes” section.
Clear existing highlights	Clear existing highlights before each new highlight action. Highlights are cleared before each run, and when using the  buttons to step through highlights. Also see “Behavior of “Group highlight colors by check”” in the Usage Notes section.
Zoom to highlights	Specifies whether to zoom to the extent of the results when highlighting. When automatically highlighting after a DRC run, RealTime does not zoom to highlights to avoid changing the currently selected viewpoint.
Highlight zoom	Specifies the magnification used when zooming to highlight a result.
Check selection recipe	The check recipe used for the Calibre run. See “ Check Selection Recipes in Calibre RealTime Digital ” on page 61.
Edit	Open the Calibre RealTime Recipe Editor Dialog Box .
Help	Opens the <i>Calibre RealTime Digital User’s Manual</i> in your default web browser.

Usage Notes

- Environment variable usage
 - You can use environment variables in pathnames for files and directories. The environment variable is not expanded when viewed in the dialog box or saved to the configuration file. For example, you can enter `$CAL_RULES/drc.rul` for the rule file, and `$CAL_RULES/drc.rul` is saved in the configuration file.
 - You can enter an environment variable for a directory path in a file entry field and click the ... button to open the file browser to that directory. This makes it easier to browse for a file if it is not in the working directory and the directory path is long. When you select a file, the absolute path is entered in the text entry field and saved in the configuration file. This capability is available for the rule file, CTO file, layer map file, and runset file.

- There are system defined environment for the input files; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.
- Behavior of “Group highlight colors by check”

When “Group highlight colors by check” is enabled, colors are assigned to results according to the rule check. However, the association between the highlight color and the rule check is not fixed; it depends on the history of your Calibre RealTime Digital session. Highlight colors are assigned to checks in a repeated cycle. The color assignment starts at the beginning of the cycle each time highlights are cleared. Highlights are cleared in the following cases:



- Automatically when “Clear Existing Highlights” is enabled; highlights are cleared at the start of a run, or at each new highlight when using the  buttons.
- By clicking the **Clear Highlights** button ().
- Automatically when the  button in the integrated toolbar is clicked. The  button also removes a rule check from the current check recipe—see “[Calibre RealTime Digital Integrated Toolbar in Fusion Compiler](#)” on page 183 for a full description of the button behavior.


The following behavior is observed when “Group highlight colors by check” is enabled:


- Highlight color assignments from a DRC run:

Clear Existing Highlights ON — Highlights are cleared and the highlight color assignment starts at the first color of the highlight color cycle at the beginning of each Calibre RealTime Digital run.






Clear Existing Highlights OFF — Highlights from previous runs are kept. New results from a check with an existing highlighted result are highlighted in the same color. New results from a check that does not have an existing highlighted result are highlighted in the next color in the highlight color cycle.

Clicking  or  — Highlights are cleared and highlight color assignment starts at the first color of the highlight color cycle for the next run, regardless of the setting of “Clear Existing Highlights.”

- Highlight color assignments using the  buttons

Clear Existing Highlights ON — All highlights are cleared each time one of the  buttons is clicked; each result is highlighted in the first color of the highlight color cycle.

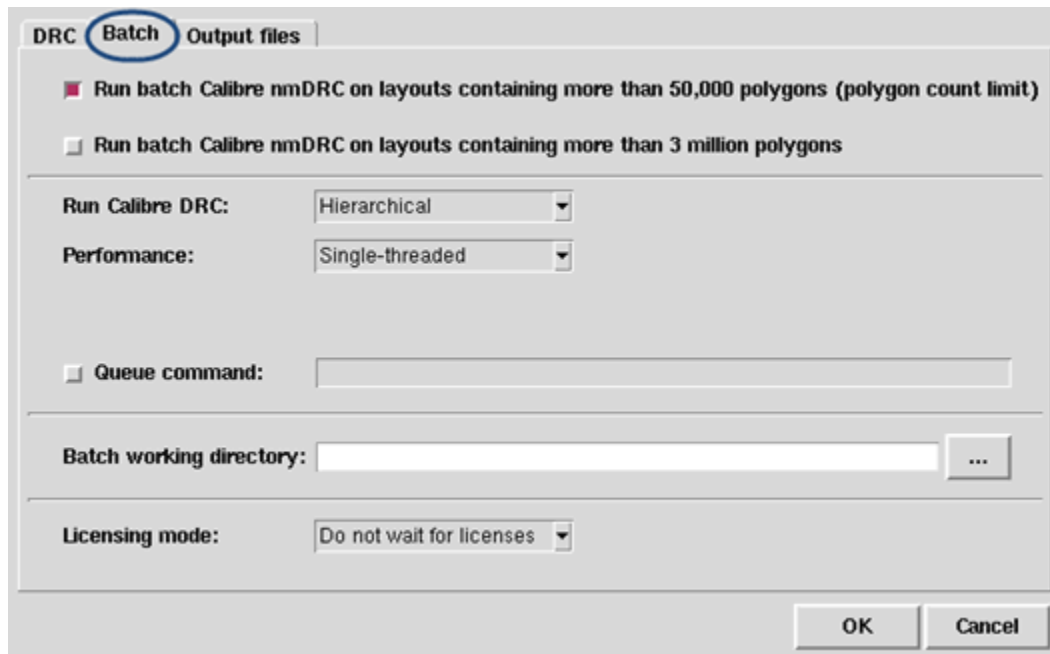
Clear Existing Highlights OFF — Each result is highlighted in the color used originally.

Clear All Highlights button  clicked when **Clear Existing Highlights** OFF — All highlights are cleared. The next result highlighted with one of the    buttons is highlighted in the first color of the highlight color cycle; the highlight color for further results is assigned according to the rule check. All highlights are kept until  is clicked again.

Batch Tab in the Calibre RealTime Options Dialog Box

To access: Open the Calibre RealTime Options dialog box and click the **Batch** tab.

The **Batch** tab has settings for controlling a Calibre batch run started from Calibre RealTime Digital. You can set the number of polygons in the layout window that trigger a batch run, and execution and licensing options.



Objects

Object	Description
Run batch Calibre nmDRC on layouts containing more than <i><polygon_count_limit></i> polygons (Polygon count limit)	As described. The <i><polygon_count_limit></i> is set on the DRC tab with the “Polygon count limit” option. The default polygon count limit is 50,000.
Run batch Calibre nmDRC on layouts containing more than 3 million polygons	As described.
Run Calibre DRC	Specify a Flat or Hierarchical run.
Performance (only available for hierarchical runs)	Specify a single-threaded run, a multithreaded (turbo) run, or a distributed (Calibre MTflex) run.
Hyperscale (only available for multithreaded and Calibre MTflex runs)	Enables hyperscaling.

Object	Description
Number of CPUs (only available for multithreaded runs)	<ul style="list-style-type: none"> • All — Use the maximum number of available CPUs. • Positive integer — Use the specified number of CPUs.
Remote file (only available for Calibre MTflex runs)	Specify the remote file.
Queue command	<p>Specify a command to submit the Calibre batch run to a remote cluster.</p> <p>See “Batch Queue Command” for replaceable parameters that can be used and for requirements regarding the queue command.</p>
Batch working directory	<p>Specify the directory in which to save the results database, log file, and “wrapper” rule file. Temporary working files are also written to this directory. The directory must exist. Separate batch working directories for each run configuration are recommended.</p> <p>If not specified, the directory from which the design tool was launched is used.</p>
Licensing mode	<p>Specify licensing options. The corresponding command line option is given in parentheses.</p> <ul style="list-style-type: none"> • Do not wait for licenses — Stop the batch run immediately if licenses are not available. (-nowait) • Wait for licenses — If licenses do not become available in the specified time, attempt to acquire substitute licenses. (-wait <time>) • Retry license acquisition — If licenses are not available, queue and periodically try to acquire the licenses. (-lmretry loop) <ul style="list-style-type: none"> • Retry for: ____ minutes (MAXRETRY) • Wait for: ____ seconds between retries (INTERVAL) • Retry even if a licensing error occurs (RETRY_ON_ERROR)


Usage Notes

Batch Queue Command

There are some special requirements on the queue command script executed from Calibre RealTime Digital. The queue command script must do the following:

- Monitor the status of the remote job and not exit until the job is complete.
- Make any required environment variables available to the remote host.
- Launch Calibre and redirect the Calibre transcript output to a file. The following replaceable parameters can be passed to the queue command script:
 - %c — Path to the Calibre executable
 - %o — Calibre invocation options
 - %t — Calibre transcript file, which has the automatically generated name of *RealTime_batch_<user>_Calibre_<design_name>_RealTime_transcript.log*.
 - %C — Calibre command with options and redirect to transcript (%c %o > %t)
 - %d — Batch working directory

The queue command script must use either the three parameters %c, %o, and %t, or the parameter %C. When %C is not used, the %t parameter must be used as the file to which the Calibre transcript output is redirected. The %d parameter is optional.

The  (**Stop batch DRC jobs**) button is not available during execution of the queue command script, as there is no way for Calibre RealTime to terminate a job on a remote host.

Sample Batch Queue Command

The following queue command script demonstrates the use of the replaceable parameters and how to write the output of queue command script to a log file. The script prints some debug information and starts a Calibre run on the local host—it does not launch a job on a remote host.

The queue command script, *queue_command_sample*, is the following:

```
#!/usr/bin/tclsh

puts "argc=$argc"
puts "argv=$argv"

set calibre_binary      [lindex $argv 0]
set calibre_options     [lindex $argv 1]
set calibre_transcript  [lindex $argv 2]

puts "calibre_binary=$calibre_binary"
puts "calibre_options=$calibre_options"
puts "calibre_transcript=$calibre_transcript"
puts ""

eval exec "$calibre_binary $calibre_options > $calibre_transcript"
```

To use this queue command place the following in the “Queue command” field on the **Batch** tab of the Calibre RealTime Options dialog box:

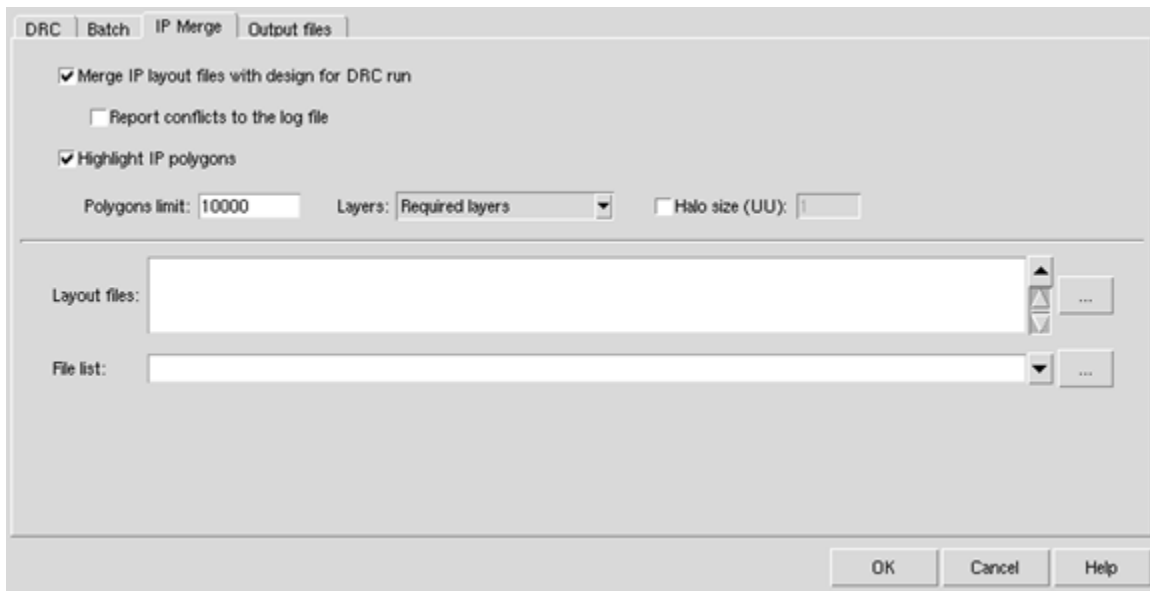
```
./queue_command_sample %c "%o" %t >& log.txt
```

Quotation marks are placed around the %o parameter so that the Calibre options are passed to the script as a single string. After execution, the *log.txt* file contains the output of the puts statements and the transcript file contains the output from the Calibre command execution.

IP Merge Tab in the Calibre RealTime Digital Options Dialog Box

To access: Open the Calibre RealTime Options dialog box. Click the **IP Merge** tab.

The **IP Merge** tab has settings that allow customization of IP Merge when running DRC in Calibre RealTime Digital. You can control which layout files to use and how violations are highlighted.



Objects

Object	Description
Merge IP layout files with design for DRC run	As described.
Report conflicts to the log file	Print cell name conflicts to the log file Calibre_RealTime_IP_Merge.log. Conflicts are instances where two different cells in the layout files share the same name.
Highlight IP polygons with DRC result	As described. Polygons are highlighted when only one result is highlighted.
Highlight polygons limit	Restrict the number of IP layout polygons highlighted after a DRC run. The default maximum is 10000, and values from 0 to 1000000 are supported.
Highlight all layers	Highlight all of the layers provided by the layout files. If this option is not selected, only layers used for the rule check are highlighted.

Object	Description
Highlight halo size (UU)	<p>Customize the halo size for highlighting the IP layout polygons. The default size is 1 user unit, and values from 0 to 10 are supported. All polygons within or intersecting the halo are highlighted.</p> <p>When this option is not selected, a highlight halo of twice the smallest track step size is used.</p>
Layout files	<p>Specify which IP layout files to use in a DRC run. You can select one or more GDS or OASIS files.</p>
File list	<p>Specify a text file containing a list of IP layout files to use in a DRC run. You can select one or more file lists.</p> <p>Wildcard characters and directories are supported for file lists and layout files. See “Supported File Types for IP Merge” on page 87 for more information.</p>

Usage Notes

Changes to the highlight options take effect without rerunning DRC.

Keyboard Shortcuts for Calibre RealTime in Fusion Compiler

A set of standard keyboard shortcuts are provided for Calibre RealTime Digital in Fusion Compiler.

The keyboard shortcuts are defined in the following file:

```
$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/icc2/  
icc2_realtime_bindkeys.tcl
```

This file is not loaded by default to avoid possible conflicts with existing keyboard shortcuts. The definition of the bindkey functions is given in the following table. The section “[Defining and Loading Keyboard Shortcuts for Calibre RealTime in Fusion Compiler](#)” on page 201 describes how to define and load your own keyboard shortcuts.

Table 6-7. Keyboard Shortcuts in Calibre RealTime for IC Compiler II

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::CurrentWindowRun Run DRC in the window.	F12
::calibre::realtime::ShowOptionsForm Open the Calibre RealTime Options dialog box.	Shift-F12
::calibre::realtime::NextRecipe Select the next recipe in the toolbar dropdown list.	Ctrl-n
::calibre::realtime::PreviousRecipe Select the previous recipe in the toolbar dropdown list.	Ctrl-w
::calibre::realtime::LastusedRecipe Select the most recently used recipe in the toolbar dropdown list.	Ctrl-e
::calibre::realtime::ClearAllHighlights Clear highlights.	Ctrl-b
::calibre::realtime::HighlightAllResults Highlight all results.	Ctrl-a
::calibre::realtime::HighlightPreviousResult Highlight the previous result.	p
::calibre::realtime::HighlightCurrentResult Highlight the current result.	c

Table 6-7. Keyboard Shortcuts in Calibre RealTime for IC Compiler II (cont.)

Bindkey Function Definition	Standard Keyboard Shortcut
::calibre::realtime::HighlightNextResult Highlight the next result.	n
::calibre::realtime::HighlightCurrentCheck Highlight results in the check currently selected in the toolbar dropdown list.	Shift-c
::calibre::realtime::PreviousCheck Select the previous check in the toolbar dropdown list.	Shift-p
::calibre::realtime::RemoveCurrentCheck Remove the selected check from the current recipe.	Shift-d
::calibre::realtime::NextCheck Select the next check in the toolbar dropdown list.	Shift-n
::calibre::realtime::OnRealTimeRve Open the Calibre RealTime Results window.	Shift-r


Defining and Loading Keyboard Shortcuts for Calibre RealTime in Fusion Compiler

You can define custom keyboard shortcuts for Calibre RealTime. The Calibre installation provides a file of standard keyboard shortcuts.

Procedure

1. Copy the Tcl file `$CALIBRE_HOME/shared/pkgs/icv/tools/realtime/icc2/icc2_realtime_bindkeys.tcl` to the desired location for your keyboard shortcut definitions. “[Keyboard Shortcuts for Calibre RealTime in Fusion Compiler](#)” on page 200 lists the shortcuts defined in this file.
2. Edit the shortcut definitions as desired.
3. Load the new shortcut definitions into Fusion Compiler by sourcing the Tcl file.

Tip

 If you want to use the standard shortcuts, and are not concerned about possible conflicts with other shortcuts, you can load the standard shortcuts. Issue the following command at the Fusion Compiler command prompt, where the command is all one line:

```
source $env(CALIBRE_HOME)/shared/pkgs/icv/tools/realtime/icc2/icc2_realtime_bindkeys.tcl
```


Chapter 7

Calibre RealTime Digital API Reference

Use the Calibre RealTime Digital API commands to get and set Calibre RealTime Digital environment variables and options within the design environment. The Calibre RealTime Digital API also offers script-level access to Calibre RealTime operations.

The commands that control environment variables and options can be used in all design environments. The commands that run DRC, highlight results, and run configuration managements are only supported in Cadence Innovus and Synopsys IC Compiler II.

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API Script Example

API commands can be used to programmatically run Calibre nmDRC, as shown in the following sample script.

The following script is for Synopsys IC Compiler II. It runs Calibre nmDRC on the rectangular region specified by the { 0 300 300 400 } vertices and retrieves the result counts for checks matching Metal1.2 or Metal2.10. It then retrieves the result counts, result identifiers, and result coordinates for the checks matching Metal.*10, and highlights the results. Finally, it saves the results for check Metal2.10 to a file named *Metal2.10.rdb*.

```
# Load design in ICC2 and zoom to full view of the design
open_block DESIGN:top
gui_zoom -window [gui_get_current_window -view] -full

puts "Running DRC"
foreach { configID resultSet } [::calibre::realtime::RunDRC -region { 0 300 300 400 }] \
{ break }

set resultCount [::calibre::realtime::GetResultCount -result_set $resultSet]
puts "Result count=$resultCount"

set region [list 0 200 200 300]
set resultCount [::calibre::realtime::GetResultCount -result_set $resultSet -region \
    $region]
puts "Result count in region $region is $resultCount"

set resultCount [::calibre::realtime::GetResultCount -result_set $resultSet -region \
    $region -check_names [list "Metal1.2" "Metal2.10"] -check_name_match literal \
    -report_count_per_check true]
puts "Result count in region $region, checks: Metal1.2 and Metal2.10 is $resultCount"

set resultCount [::calibre::realtime::GetResultCount -result_set $resultSet -region \
    $region -check_names [list "Metal.*10"] -check_name_match regexp \
    -report_count_per_check true]
puts "Result count in region $region, checks (regexp): Metal.*10 is $resultCount"
```

```
set resultIDs    [::calibre::realtime::GetResultIdentifiers -result_set $resultSet \  
    -region $region -check_names [list "Metal.*10"] -check_name_match regexp]  
puts "Result IDs in region $region, checks (regexp): Metal.*10 is $resultIDs"  
  
set resultCoordinates [::calibre::realtime::GetResultCoordinates -result_ids $resultIDs]  
puts "ResultCoordinates in region $region, checks (regexp): Metal.*10 is $resultCoordinates"  
puts "Highlight the result IDs in this region from checks Metal.*10"  
::calibre::realtime::HighlightResults -result_ids $resultIDs  
  
puts "Save the results for check Metal2.10 in region $region to an RDB file"  
::calibre::realtime::SaveResultsToRDB -file Metal2.10.rdb -result_set $resultSet -region \  
    $region -check_names [list "Metal2.10"]  
exit
```

Environment Variable Control

Calibre RealTime Digital provides commands to get and set environment variables from the command interface of supported design tools. Calibre RealTime Digital recompiles the rule file if an environment variable changes due to one of these commands.

Note



 If your rule file uses DRC Select Check and DRC Unselect Check statements with conditional directives and environment variables to select the checks that are run, keep in mind that the check selection recipe “Checks selected in the rules file” is the only recipe that obeys DRC [Un]Select Check statements.

Table 7-1. Commands to Control Environment Variables in Calibre RealTime Digital

Command	Description
GetEnvironmentVariable	Get the value of an environment variable.
IsEnvironmentVariableDefined	Determine if an environment variable exists in the Calibre RealTime Digital process.
SetEnvironmentVariable	Set an environment variable in Calibre RealTime Digital and the design tool environment.
UnsetEnvironmentVariable	Unset an environment variable in Calibre RealTime Digital and the design tool environment.

Tip

 You can also use environment variables to set the path to certain input files; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

GetEnvironmentVariable

Available in: All supported tools

Gets the value of an environment variable.

Usage

```
::calibre::realtime::GetEnvironmentVariable varName [-check_existence] [-help]
```

Arguments

- *varName*
The name of the environment variable.
- -check_existence
An optional argument that causes the tool to check if *varName* is defined before retrieving the value.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

-check_existence	Returned Value
not present	String containing the value of <i>varName</i> . A Tcl error is issued if <i>varName</i> does not exist.
present	{ <i>varPresent</i> <i>varValue</i> }, a two-element Tcl list with the following elements: <ul style="list-style-type: none">• <i>varPresent</i> — Boolean indicating whether <i>varName</i> exists.• <i>varValue</i> — String containing the value of <i>varName</i>. <i>varValue</i> is an empty string if <i>varName</i> does not exist.

Description

Retrieve the value of the environment variable *varName* in the context of Calibre RealTime Digital. Enter the command in the command window for the design tool. The format of the returned value depends on the presence of the switch -check_existence. When coding a script, you can use the command [IsEnvironmentVariableDefined](#) to determine if the environment variable is defined.

Examples

This example gets the value of environment variable M1_CHECKS; the value is returned.

```
% ::calibre::realtime::GetEnvironmentVariable M1_CHECKS
1
```

IsEnvironmentVariableDefined

Available in: All supported tools

Determines if an environment variable exists in the Calibre RealTime Digital process.

Usage

::calibre::realtime::IsEnvironmentVariableDefined *varName* [-help]

Arguments

- *varName*
The name of the environment variable.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

True (1) if the environment variable exists in the Calibre RealTime process; false (0) otherwise.

Examples

This example checks for the existence of the environment variable M1_CHECKS.

```
% ::calibre::realtime::IsEnvironmentVariableDefined M1_CHECKS
1
```


SetEnvironmentVariable

Available in: All supported tools

Sets an environment variable in Calibre RealTime Digital and the design tool environment.

Usage

::calibre::realtime::SetEnvironmentVariable *varName varValue* [-help]

Arguments

- ***varName***
The name of the environment variable.
- ***varValue***
The value of the environment variable to be set.
- **-help**
Print the command usage. If present, all other arguments are ignored.

Return Values

None.

Description

Sets an environment variable in both Calibre RealTime and the host process for the design tool. Enter the command in the command window for the design tool.

If this command is issued, Calibre RealTime automatically recompiles the rule file the next time a Calibre DRC run is launched or the check recipe editor is invoked.

Examples

This example sets the environment variable M1_CHECKS to 1.

```
% ::calibre::realtime::SetEnvironmentVariable M1_CHECKS 1
```

UnsetEnvironmentVariable

Available in: All supported tools

Unsets an environment variable in Calibre RealTime Digital and the design tool environment.

Usage

::calibre::realtime::UnsetEnvironmentVariable *varName* [-help]

Arguments

- *varName*
The name of the environment variable.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

None.

Description

Unsets an environment variable in both Calibre RealTime and the host process for the design tool. Enter the command in the command window for the design tool.

If this command is issued, Calibre RealTime automatically recompiles the rule file the next time a Calibre nmDRC run is launched or the check recipe editor is invoked.

Examples


This example unsets the environment variable M1_CHECKS.

```
% ::calibre::realtime::UnsetEnvironmentVariable M1_CHECKS
```

Option Control in the Design Environment

You can set the options in the Calibre RealTime Options dialog box using commands issued in supported design tools. This capability enables you to configure Calibre RealTime within the design environment.

Tip

 Use `::calibre::realtime::Help` to print the available commands with a summary description.

You can also use environment variables to set the path to certain input files; see “[Environment Variables for Calibre RealTime Digital Input Files](#)” on page 39.

Table 7-2. Commands to Set Calibre RealTime Digital Options

Command	Description
AddConfiguration	Add a run configuration with a specified name.
CaptureLayerVisibility	Saves the current layer visibility to be restored later. This procedure is useful when using a CTO file with the RVE Show Layers rule check comment, which can alter layer visibility.
DeleteConfiguration	Delete the run configuration with the specified name.
GetAPIVersion	Gets the version of the Tcl API.
GetConfigurationIndependentOption	Gets the value of a Calibre RealTime Digital option that is independent of the run configuration.
GetConfigurationName	Gets the name of the current run configuration or the configuration corresponding to the specified ID.
GetConfigurationOption	Gets the value of the specified Calibre RealTime Digital option.
GetCurrentConfiguration	Gets the configuration ID of the current run configuration.
GetCurrentConfigurationName	Gets the configuration name of the current run configuration.
Help	Prints the available API commands with a summary description.

Table 7-2. Commands to Set Calibre RealTime Digital Options (cont.)

Command	Description
RestoreLayerVisibility	Restores the saved layer visibility. If there is none saved, then the version before the first DRC run is used. This procedure is useful when using a CTO file with the RVE Show Layers rule check comment, which can alter layer visibility.
SaveConfiguration	Saves the current Calibre RealTime Digital configuration.
SetConfigurationIndependentOption	Sets the value of a Calibre RealTime Digital option that is independent of the run configuration.
SetConfigurationOption	Sets the value of a Calibre RealTime Digital option.
SetCurrentConfigurationByName	Sets the current configuration for Calibre RealTime Digital to the specified configuration name.

AddConfiguration

Available in: All supported tools

Add a run configuration with a specified name.

Usage

::calibre::realtime::AddConfiguration *configName* [-help]

Arguments

- *configName*
A string specifying the name for the new [Run Configuration](#).
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

The configID of the new configuration, or -1 on failure.

Description

Creates a new configuration named *configName*. The configuration has default settings and is set as the current configuration.

Examples

This example adds a new configuration “MP_config”. The ID of the new configuration is returned.

```
tcl> ::calibre::realtime::AddConfiguration MP_config
2
```

CaptureLayerVisibility

Available in: Cadence Innovus

Saves the current layer visibility to be restored later. This procedure is useful when using a CTO file with the RVE Show Layers rule check comment, which can alter layer visibility.

Usage

::calibre::realtime::CaptureLayerVisibility

Arguments

None.

Return Values

None.

DeleteConfiguration

Available in: All supported tools

Delete the run configuration with the specified name.

Usage

```
::calibre::realtime::DeleteConfiguration configName [-help]
```

Arguments

- *configName*
A string specifying the name of the [Run Configuration](#) to delete.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

None.

Description

Deletes the configuration named *configName*. If there is only one configuration or the named configuration does not exist, the command is ignored.

Examples

This example deletes the configuration “MP_config”.

```
tcl> ::calibre::realtime::DeleteConfiguration MP_config
```

GetAPIVersion

Available in: All supported tools

Gets the version of the Tcl API.

Usage

::calibre::realtime::GetAPIVersion [-help]

Arguments

- -help
Print the command usage.

Return Values

Returns the API version as a two element list: *{major_version_num minor_version_num}*

Examples

The following is an example with Calibre version 2018.2_41.

```
% ::calibre::realtime::GetAPIVersion
3 0
```


GetConfigurationIndependentOption

Available in: All supported tools

Gets the value of a Calibre RealTime Digital option that is independent of the run configuration.

Usage

::calibre::realtime::GetConfigurationIndependentOption *optionName* [-help]

Arguments

- *optionName*

The name of the option, where *optionName* can take the values given in the following table. The option names are case-sensitive.

<i>optionName</i>	Description
RealTimeEnabled	Returns a Boolean value specifying whether Calibre RealTime Digital is enabled.
RunRveOnDrc	Returns a Boolean value specifying whether the Calibre RealTime Results window is opened automatically after a run.
CurrentConfiguration	Returns the ID of the current Run Configuration .
MultiConfigRunMode	Returns the configuration run mode: <ul style="list-style-type: none">• Single — Run only the current configuration.• Serial — Run the selected configurations in order.

- -help

Print the command usage. If present, all other arguments are ignored.

GetConfigurationName

Available in: All supported tools

Gets the name of the current run configuration or the configuration corresponding to the specified ID.

Usage

::calibre::realtime::GetConfigurationName [*configID*] [-help]

Arguments

- *configID*
An optional integer value specifying the [Run Configuration](#) ID. The name of the current configuration is returned if *configID* is not specified.
- -help
Print the command usage. If present, all other arguments are ignored.

Examples

Get the name of the current configuration.

```
tcl> ::calibre::realtime::GetConfigurationName  
Default configuration
```

GetConfigurationOption

Available in: All supported tools

Gets the value of the specified Calibre RealTime Digital option.

Usage

```
::calibre::realtime::GetConfigurationOption optionName [configID] [-help]
```

Arguments

- optionName***

The name of the option, where ***optionName*** can take the values given in the following tables. Option names specific to starting a batch Calibre run are given in the second table. The option names are case sensitive.

Table 7-3. optionName Values for GetConfigurationOption

optionName	Definition
RealTimeEnabled	Returns a Boolean value specifying whether Calibre RealTime Digital is enabled.
RunRveOnDrc	Returns a Boolean value specifying whether the Calibre RealTime Results window is opened automatically after a run.
CurrentConfiguration	Returns the ID of the current Run Configuration .
MultiConfigRunMode	Returns the configuration run mode: <ul style="list-style-type: none">• Single — Run only the current configuration.• Serial — Run the selected configurations in order.
SelectedToRun	Returns a Boolean value specifying whether the given configuration is selected or not selected to run in Serial mode.
RuleFile	Returns the path to the rule file, if set.
RunsetFile	Returns the path to the runset file, if set.
RuleSource	Returns the value “rulefile” or “runset” indicating whether a rule file or a Calibre® Interactive™ runset file is the source of DRC rules.
CTOFile	Returns the path to the CTO file, if set.
CTOFileEnabled	Returns a Boolean value specifying whether Calibre RealTime Digital is using a CTO file.
LayerMapFile	Returns the path to the layer map file, if set.
LayerMapFileEnabled	Returns a Boolean value specifying whether Calibre RealTime Digital is using a layer map file.

Table 7-3. optionName Values for GetConfigurationOption (cont.)

optionName	Definition
HaloSize	Returns the halo size in user units.
PolygonCountLimit	Returns the maximum number of polygons that are passed to Calibre, as set in the Calibre Options dialog box.
ResultLimitPerCheck	Returns the maximum number of results per check.
ResultDisplayMode	<p>Returns the result display mode as a two-element list of the form <code>{region checks}</code>, where the elements can have the following values:</p> <p><i>region:</i></p> <ul style="list-style-type: none"> • area — Only display results in the area of the previous DRC run. • cell — Display all known results in the cell. <p><i>checks:</i></p> <ul style="list-style-type: none"> • all_checks — Display results generated from all checks. • recipe_checks — Only display results generated from checks selected by the current recipe.
HighlightAfterDRCRun	Returns a Boolean value specifying whether DRC violations are highlighted after a DRC run.
ClearExistingHighlights	Returns a Boolean value specifying whether previously drawn highlights are cleared before displaying new ones.
ZoomToHighlights	Returns a Boolean value specifying whether to zoom to highlighted results.
HighlightZoomRatio	<p>Returns the value of the highlight zoom ratio.</p> <p>The zoom ratio is the ratio of the highlight area to the window area. A ratio less than one indicates a zoom window larger than the highlighted area.</p>
GroupHighlightColorsByCheck	Returns a Boolean value specifying whether Calibre RealTime Digital groups highlight colors by check.
IncludeCheckDefinitionInTooltip	Returns a Boolean value specifying whether check definitions are included in tooltips associated with DRC highlights.
HighlightShowCheckNames	Returns a Boolean value specifying the state of the option “Show check names” to display the check name at the center of each result.
HighlightTextSize	Returns the value of the text size used for displaying check names when HighlightShowCheckNames is enabled.
CheckSelectionRecipe	Returns the currently selected check selection recipe.

Table 7-3. optionName Values for GetConfigurationOption (cont.)

optionName	Definition
RestoreLayerVisibilityMode	Returns a string indicating when layer visibility is automatically restored. Innovus only. <ul style="list-style-type: none">• No — Layer visibility is not automatically restored• AfterDRCRun — Layer visibility is restored after a DRC run• AfterClearHighlight — Layer visibility is restored after clearing highlights

Table 7-4. optionName Values for Batch Calibre Options for GetConfigurationOption

optionName	Definition
BatchAutomaticRunMode	Returns the run mode for automatically starting a batch Calibre run: <ul style="list-style-type: none">• Never — Do not automatically start a batch run. A dialog box is displayed if the maximum limit of three million polygons is exceeded.• WhenHardLimitExceeded — Automatically start a batch Calibre run when the maximum limit of three million polygons is reached.• WhenSoftLimitExceeded — Automatically start a batch Calibre run when the adjustable polygon limit is reached. The adjustable polygon limit is set with the PolygonCountLimit optionName, or on the DRC tab of the Calibre RealTime Options dialog box, and has a default of 50,000 polygons.
BatchExecutiveMode	Returns the batch mode “Run Calibre DRC” setting of “Hierarchical” or “Flat”.
BatchThreadingMode	Returns the batch mode Performance setting: <ul style="list-style-type: none">• SingleThreaded — Run single-threaded. This is the only allowed mode for flat runs.• MultiThreaded — Run multithreaded (-turbo command-line option).• Distributed — Run in distributed Calibre® MTflex™ mode. This mode requires a remote configuration file (-remotefile command-line option).
BatchHyperscaleEnabled	Returns a Boolean indicating whether hyperscaling is enabled for batch Calibre runs.

Table 7-4. optionName Values for Batch Calibre Options for GetConfigurationOption (cont.)

optionName	Definition
BatchTurboNumberOfCPUs	Returns the number of processors specified for multithreaded batch Calibre runs: 0 — Use the maximum number of available CPUs. This is equivalent to the “All” setting in the Calibre RealTime Options dialog box. number — Use the specified number of CPUs.
BatchRemoteFile	Returns the path to the remote configuration file for batch Calibre runs in distributed Calibre MTflex mode.
BatchQueueCommandEnabled	Returns a Boolean indicating whether the remote cluster queue command is used to submit the Calibre batch run.
BatchQueueCommand	Returns a string containing the queue command, including arguments. See “ Batch Tab in the Calibre RealTime Options Dialog Box ” on page 116 for information about the batch queue command.
BatchWorkingDirectory	Returns the path to the batch working directory.
BatchLicensingMode	Returns the licensing mode for batch Calibre runs: <ul style="list-style-type: none"> • NoWait — Exit if licenses are not available. • Wait — Wait for a license. If a license is not available within the specified wait time, attempt to acquire a substitute license. • Retry — Queue for a license if one is not available.
BatchLicensingWaitTime	Returns the time in minutes to wait for a license in “Wait” mode.
BatchLicensingMaxRetryEnabled	Returns a Boolean value indicating whether a custom setting for the maximum time to queue for a license is enabled. (“Retry for” on the Batch tab of the Calibre RealTime Options dialog box)
BatchLicensingMaxRetryTime	Returns the maximum time in minutes to queue for a license in “Retry” mode.
BatchLicensingRetryWaitEnabled	Returns a Boolean indicating whether a custom setting for the wait time between license retries is enabled. (“Wait for” on the Batch tab of the Calibre RealTime Options dialog box)
BatchLicensingRetryWaitTime	Returns the time in seconds to wait between license retries in “Retry” mode.

**Table 7-4. optionName Values for Batch Calibre Options for
GetConfigurationOption (cont.)**

optionName	Definition
BatchLicensingRetryOnErrorEnabled	Returns a Boolean value specifying whether to retry for a license when errors are detected. By default, license retry is only triggered when at least one required license is busy.

**Table 7-5. optionName Values for IP Merge Calibre Options for
GetConfigurationOption (Innovus Only)**

optionName	Definition
IPMergeEnabled	Returns a Boolean specifying whether IP Merge is enabled.
IPMergeLogEnabled	Returns a Boolean specifying whether cell name conflicts are printed to the log file.
IPMergeHighlightEnabled	Returns a Boolean specifying whether IP layout polygons are highlighted when a DRC result is highlighted.
IPMergeHighlightLimit	Returns the maximum number of IP layout polygons that are highlighted when a DRC result is highlighted.
IPMergeHighlightAllLayers	Returns a Boolean specifying whether all of the IP layers are highlighted after a DRC result is highlighted. If this value is false, only the layers used in the rule check are highlighted.
IPMergeHighlightHaloSizeEnabled	Returns a Boolean specifying whether a custom halo size is enabled for IP layout polygon highlighting. If this option is not selected, a highlight halo of twice the smallest track step size is used.
IPMergeHighlightHaloSize	Returns the custom halo size for IP layout polygon highlighting in user units. This value is not used unless the highlight halo size option is enabled.
IPMergeLayoutFiles	Returns the paths to the IP layout files, if set.
IPMergeLayoutFileList	Returns the paths to the IP file lists, if set.

- *configID*
An optional integer value specifying the [Run Configuration](#) ID. The option value for the current run configuration is returned if *configID* is not specified. Also see [GetConfigurationName](#).
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

As indicated in [Table 7-3](#) and [Table 7-4](#).

Examples

The following command gets the check selection recipe. The value for the current run configuration is returned.

```
% ::calibre::realtime::GetConfigurationOption CheckSelectionRecipe  
Checks selected in the rules file  
%
```


GetCurrentConfiguration

Available in: All supported tools

Gets the configuration ID of the current run configuration.

Usage

::calibre::realtime::GetCurrentConfiguration [-help]

Arguments

- -help
Print the command usage.

Description

Returns the ID of the current [Run Configuration](#); the ID is an integer value.

Examples

This example first gets the ID of the current configuration, then finds the name using [GetConfigurationName](#).

```
tcl> ::calibre::realtime::GetCurrentConfiguration
1

tcl> ::calibre::realtime::GetConfigurationName 1
Default configuration
```

GetCurrentConfigurationName

Available in: All supported tools

Gets the configuration name of the current run configuration.

Usage

::calibre::GetCurrentConfigurationName [-help]

Arguments

- -help
Print the command usage.

Description

Returns the name of the current [Run Configuration](#).

Examples

```
tcl> ::calibre::GetCurrentConfigurationName  
Default configuration
```

Help

Available in: All supported tools

Prints the available API commands with a summary description.

Usage

::calibre::realtime::Help

Arguments

None.

RestoreLayerVisibility

Available in: Cadence Innovus

Restores the saved layer visibility. If there is none saved, then the version before the first DRC run is used. This procedure is useful when using a CTO file with the RVE Show Layers rule check comment, which can alter layer visibility.

Usage

::calibre::realtime::RestoreLayerVisibility

Arguments

None.

Return Values

None.

SaveConfiguration

Available in: All supported tools

Saves the current Calibre RealTime Digital configuration.

Usage

::calibre::realtime::SaveConfiguration [-help]

Arguments

- -help
Print the command usage.

Return Values

None.

Description

The current configuration is saved to the file *.realtime.cfg* as described in “[Location of the Calibre RealTime Digital Session Configuration File](#)” on page 26. If you are using multilevel configuration files, the options saved are determined by the order of precedence of the configuration files, as described in “[Multilevel Session Configuration File Support in Calibre RealTime Digital](#)” on page 28.

New option values set by [SetConfigurationOption](#) are not saved until you call `SaveConfiguration`; however, the new value can be seen immediately in the Calibre RealTime Options dialog box.

SetConfigurationIndependentOption

Available in: All supported tools

Sets the value of a Calibre RealTime Digital option that is independent of the run configuration.

Usage

::calibre::realtime::SetConfigurationIndependentOption *optionName optionValue* [-help]

Arguments

- *optionName optionValue*

The name of the option and its value. The available options and values are listed in the following table. The option setting applies to all [Run Configurations](#).

<i>optionName</i>	Description	Allowed <i>optionValue</i>
RealTimeEnabled	Enable or disable Calibre RealTime Digital. No return value.	Boolean
RunRveOnDrc	Enable or disable automatically opening the Calibre RealTime Results window after a run. Returns the value set.	Boolean
CurrentConfiguration	Set the current Run Configuration to the specified ID.	Integer. Configuration IDs start at 1.
MultiConfigRunMode	Set the configuration run mode.	<ul style="list-style-type: none">• Single — Run only the current configuration.• Serial — Run the selected configurations in order.

- -help


Print the command usage. If present, all other arguments are ignored.

SetConfigurationOption

Available in: All supported tools

Sets the value of a Calibre RealTime Digital option.

Note

 The options RealTimeEnabled, RunRveOnDrc, CurrentConfiguration, and MultiConfigRunMode can also be set with [SetConfigurationIndependentOption](#). These options are independent of the run configuration.

Usage

::calibre::realtime::SetConfigurationOption *optionName optionValue* [*configID*] [-help]

Arguments

- optionName optionValue*

The name of the option and its value, as given in the following tables. The option names specific to starting a batch Calibre run are given in the second table. The option names and values are case sensitive. [Table 7-6](#) gives the options on the **DRC** tab and [Table 7-7](#) gives the options on the **Batch** tab.

Table 7-6. optionName and optionValue for SetConfigurationOption

optionName	Description	Allowed optionValue
RealTimeEnabled	Enable or disable Calibre RealTime Digital. No return value.	Boolean
RunRveOnDrc	Enable or disable automatically opening the Calibre RealTime Results window after a run.	Boolean
CurrentConfiguration	Set the current Run Configuration to the specified ID.	Integer. Configuration IDs start at 1.
MultiConfigRunMode	Set the configuration run mode. <ul style="list-style-type: none"> Single — Run only the current configuration. Serial — Run the selected configurations in order. 	String: <ul style="list-style-type: none"> Single Serial
SelectedToRun	Specifies the given configuration as selected or not selected to run in Serial mode.	Boolean
RuleFile	Define the rule file. No return value.	<i>pathname</i>

Table 7-6. optionName and optionValue for SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
RunsetFile	Define the runset file. Returns the path to the runset file on success, an empty string on failure.	<i>pathname</i>
RuleSource	Set the source of rules for the DRC run. <ul style="list-style-type: none"> • rulefile — use a rule file. • runset — use a Calibre Interactive runset. Returns the string true or false.	String: <ul style="list-style-type: none"> • rulefile • runset
CTOFile	Set the path to the CTO file. Returns name of CTO file.	<i>pathname</i>
CTOFileEnabled	Enable or disable using the CTO file. Returns an empty string.	Boolean
LayerMapFile	Set the path to the layer map file. Returns the pathname.	<i>pathname</i>
LayerMapFileEnabled	Enable or disable using the layer map file. Returns 0 or 1.	Boolean
HaloSize	Set the halo size in user units.	Positive real
PolygonCountLimit	Set the maximum number of polygons that are passed to the Calibre nmDRC run.	Integer
ResultLimitPerCheck	Set the maximum number of results per check. Returns the string true or false.	Positive integer or “all”

Table 7-6. optionName and optionValue for SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
ResultDisplayMode	<p>Define which results are displayed by Calibre RealTime Digital.</p> <p>The <i>optionValue</i> is a two-element list defining the <i>region</i> in which results are displayed and the <i>checks</i> from which results are displayed. The list must be enclosed in quotes (“ ”) or braces ({ }).</p> <p><i>region</i>:</p> <ul style="list-style-type: none">• area — only display results in the area of the previous DRC run.• cell — display all known results in the cell. <p><i>checks</i>:</p> <ul style="list-style-type: none">• all_checks — results generated by all checks are displayed.• recipe_checks — only results generated by checks selected by the current recipe are displayed. <p>Returns the string true or false.</p> <p>Example:</p> <p>“cell recipe_checks”</p> <p>{cell recipe_checks}</p>	<p>A two-element list of the form {<i>region checks</i>}, with the following allowed values:</p> <p><i>region</i>:</p> <ul style="list-style-type: none">• area• cell <p><i>checks</i>:</p> <ul style="list-style-type: none">• all_checks• recipe_checks
HighlightAfterDRCRun	Enable or disable automatic highlighting of results after a DRC run.	Boolean
ClearExistingHighlights	Set the value of the option which determines whether previously highlight results are cleared before displaying new ones.	Boolean
ZoomToHighlights	Specify whether to zoom to results when highlighting.	Boolean

Table 7-6. optionName and optionValue for SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
HighlightZoomRatio	Set the value of the highlight zoom ratio. The zoom ratio is the ratio of the highlight area to the window area. A ratio less than one results in a zoom window larger than the highlighted area.	Positive real
GroupHighlightColorsByCheck	Specify whether to group highlight colors by check.	Boolean
IncludeCheckDefinitionInTooltip	Specify whether to include the check definitions in tooltips associated with result highlights.	Boolean
HighlightShowCheckNames	Set the state of the option “Show check names” to display the check name at the center of each result.	Boolean
HighlightTextSize	Set the text size for displaying check names when HighlightShowCheckNames is enabled.	Positive real
CheckSelectionRecipe	Set the current check selection recipe. Returns the string true or false.	Check selection recipe name, enclosed in quotes.
RestoreLayerVisibilityMode	Set when to automatically restore layer visibility. Innovus only.	<ul style="list-style-type: none"> • No — Do not automatically restore layer visibility • AfterDRCRun — Restore layer visibility after a DRC run • AfterClearHighlight — Restore layer visibility after clearing highlights

Table 7-7. optionName and optionValue for Batch Calibre Options in SetConfigurationOption

optionName	Description	Allowed option Value
BatchAutomaticRunMode	<p>Set the run mode for automatically starting a batch Calibre run.</p> <ul style="list-style-type: none">• Never — Do not automatically start a batch run. A dialog box is displayed if the maximum limit of three million polygons is exceeded.• WhenHardLimitExceeded — Automatically start a batch Calibre run when the maximum limit of three million polygons is reached.• WhenSoftLimitExceeded — Automatically start a batch Calibre run when the adjustable polygon limit is reached. The adjustable polygon limit is set with PolygonCountLimit, or on the DRC tab of the Calibre RealTime Options dialog box, and has a default of 50,000 polygons.	<ul style="list-style-type: none">• Never• WhenHardLimitExceeded• WhenSoftLimitExceeded
BatchExecutiveMode	<p>Set the batch mode “Run Calibre DRC” setting.</p>	<ul style="list-style-type: none">• Hierarchical• Flat
BatchThreadingMode	<p>Set the Performance setting for a batch Calibre run.</p> <ul style="list-style-type: none">• SingleThreaded — Run single-threaded. This is the only allowed mode for flat runs.• MultiThreaded — Run multithreaded (-turbo command-line option).• Distributed — Run in distributed Calibre MTflex mode. This mode requires a remote configuration file (-remotefile command-line option).	<ul style="list-style-type: none">• SingleThreaded• MultiThreaded• Distributed

Table 7-7. optionName and optionValue for Batch Calibre Options in SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
BatchHyperscaleEnabled	Enable or disable hyperscaling for batch Calibre runs.	Boolean
BatchTurboNumberOfCPUs	Set the number of processors for multithreaded batch Calibre runs. 0 — Use the maximum number of available CPUs. This is equivalent to the “All” setting in the Calibre RealTime Options dialog box. number — Use the specified number of CPUs.	Integer
BatchRemoteFile	Set the path to the remote configuration file for batch Calibre runs in distributed Calibre MTflex mode.	<i>pathname</i>
BatchQueueCommandEnabled	Set whether a remote cluster queue command is used to submit the Calibre batch job.	Boolean
BatchQueueCommand	Specifies the batch queue command. The queue command must exist in the batch working directory. See “ Batch Tab in the Calibre RealTime Options Dialog Box ” on page 116 for requirements on the queue command script, replaceable parameters, and for a sample script.	The queue command as a string, including arguments.
BatchWorkingDirectory	Set the path to the batch working directory.	<i>pathname</i>

Table 7-7. optionName and optionValue for Batch Calibre Options in SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
BatchLicensingMode	Set the licensing mode for batch Calibre runs. <ul style="list-style-type: none"> • NoWait — Exit if licenses are not available. (default) • Wait — Wait for a license. If a license is not available within the specified wait time, attempt to acquire a substitute license. • Retry — Queue for a license if one is not available. 	<ul style="list-style-type: none"> • NoWait • Wait • Retry
BatchLicensingWaitTime	Set the time in minutes to wait for a license in “Wait” mode.	Integer between 1 and 45,000. The default is 1.
BatchLicensingMaxRetryEnabled	Set whether a custom setting for the maximum time to queue for a license is enabled. <p>0 — Use the default max retry time (180 minutes).</p> <p>1 — Use the custom maximum retry time, set with BatchLicensingMaxRetryTime. (“Retry for” on the Batch tab of the Calibre RealTime Options dialog box)</p>	Boolean
BatchLicensingMaxRetryTime	Set a custom value for the maximum time in minutes to queue for a license in “Retry” mode.	Integer between 1 and $(2^{31} - 1)$.
BatchLicensingRetryWaitEnabled	Set whether a custom setting for the wait time between license retries is enabled. (“Wait for” on the Batch tab of the options dialog box)	<p>nil — Use the default wait time between retries (60 seconds).</p> <p>t — Use the custom wait time between retries, set with BatchLicensingRetryWaitTime.</p>
BatchLicensingRetryWaitTime	Set a custom value for the time in seconds to wait between license retries in “Retry” mode.	Integer between 1 and $(2^{31} - 1)$

Table 7-7. optionName and optionValue for Batch Calibre Options in SetConfigurationOption (cont.)

optionName	Description	Allowed optionValue
BatchLicensingRetryOnErrorEnabled	Set whether to retry for a license when errors are detected.	nil — License retry is only triggered when at least one required license is busy (default). t — Retry when license errors are detected.

Table 7-8. optionName and optionValue for IP Merge Options in SetConfigurationOption (Innovus Only)

optionName	Description	Allowed optionValue
IPMergeEnabled	Enable or disable IP Merge.	Boolean
IPMergeLogEnabled	Set whether to print cell name conflicts to the log file.	Boolean
IPMergeHighlightEnabled	Set whether to highlight IP polygons when a DRC result is highlighted.	Boolean
IPMergeHighlightLimit	Set the maximum number of IP polygons to highlight when a DRC result is highlighted.	Integer between 0 and 1000000
IPMergeHighlightAllLayers	Set whether to highlight all of the IP layers. If this option is disabled, only the layers involved in the rule check are highlighted.	Boolean
IPMergeHighlightHaloSizeEnabled	Enable or disable a custom halo size for highlighting IP polygons. If this option is disabled, a halo size of twice the smallest track step size is used.	Boolean
IPMergeHighlightHaloSize	Set a custom halo size, in user units, for highlighting IP polygons. The default value is 1. This value is not used unless the highlight halo size option is enabled.	Integer between 0 and 10
IPMergeLayoutFiles	Set the layout files used in IP merge.	Space-separated list of <i>pathnames</i>
IPMergeLayoutFileList	Set the file lists used in IP merge.	Space-separated list of <i>pathnames</i>

- *configID*
An optional integer value specifying the run configuration ID. The option value for the current run configuration is set if *configID* is not specified.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

Returns the new value unless otherwise stated in [Table 7-6](#) or [Table 7-7](#).

Description

The new option value is not saved until you call [SaveConfiguration](#); however, the new value can be seen in the Calibre RealTime Options dialog box immediately.

The following options are independent of the run configuration: RealTimeEnabled, RunRveOnDrc, CurrentConfiguration, and MultiConfigRunMode.

Examples

```
% ::calibre::realtime::SetConfigurationOption RuleFile drc.rul  
drc.rul  
% ::calibre::realtime::SaveConfiguration  
%
```

SetCurrentConfigurationByName

Available in: All supported tools

Sets the current configuration for Calibre RealTime Digital to the specified configuration name.

Usage

::calibre::realtime::SetCurrentConfigurationByName *configName* [-help]

Arguments

- *configName*
The name of configuration to set as the current configuration. Enclose the name in quotation marks if it includes white space.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

The configuration name.

DRC Invocation and Results Retrieval

Commands in this group can be used to run Calibre nmDRC, retrieve DRC result statistics and result coordinate data, save results to RDB files, and retrieve results from RDB files.

Commands in this group do not update the Calibre RealTime Digital toolbar, with the exception of RunDRC and LoadResultsFromRDB. RunDRC may also highlight DRC results.

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GetResultIdentifiers	245
GetResultCoordinates	247
GetResultInfo	249
GetResultSet	250
LoadResultsFromRDB	251
RunDRC	253
SaveResultsToRDB	255

GetCheckInfo

Available in all integrations

Returns check information for a given check, such as the check text.

Usage

```
::calibre::realtime::GetCheckInfo  
  [-configuration_id configID]  
  -check_name check_name  
  -info_name {output_layer | check_text}  
  [-help]
```

Arguments

- [-configuration_id *configID*]
Optional. Specifies the ID of the run configuration. If this argument is not provided, the active configuration is used.

This command returns an error if the provided configuration does not exist.
- -**check_name** *check_name*
Required. Specifies the name of the check to retrieve information about.
- -**info_name** { **output_layer** | **check_text** }
Required. Specifies the type of information returned.
 - **output_layer** — Returns a list containing the check's layer number and data type.
 - **check_text** — Returns the check text.
- -help
Print the command usage. If present, all other arguments are ignored.

Return Values

When -**info_name** **output_layer** is specified, a list containing the check's layer number and dataType value is returned. When **check_text** is specified, a string of the check text is returned.

Description

Returns check information on a given check based on its name.

GetResultCount

Available in all integrations

Returns the number of results in the specified result set, possibly filtered by region and/or rule check.

Usage

::calibre::realtime::GetResultCount

```
-result_set result_set
[-region '{ x1 y1 x2 y2 }']
[-check_names check_names]
[-check_name_match { literal | glob | regexp } ]
[-report_count_per_check { true | false } ]
[-help]
```

Arguments

- **-result_set *result_set***
Required. Specifies the handle of a result set.
Result set handles are returned by the [RunDRC](#) command.
- **-region '{ x1 y1 x2 y2 }'**
Optional. Specifies that only results in the given region are counted. The region is defined by the lower-left and upper-right vertices; coordinates are in user units. Enclose the coordinates in braces.
- **-check_names *check_names***
Optional. Restricts the DRC results to those produced by checks whose names match entries in the *check_names* list. Check name match criteria are defined with the **-check_name_match** argument. Defaults to the “RunDisplayMode” configuration option if **-check_names** is not specified.
Example: **-check_names [list “check1” “check2”]**
- **-check_name_match { literal | glob | regexp }**
Optional. Defines the match criteria for strings specified with the **-check_names** argument.
 - literal — Specifies that the *check_names* argument value contains literal names of checks. This is the default.
 - glob — Specifies that the *check_names* argument value contains glob-style patterns.
 - regexp — Specifies that the *check_names* argument value contains regular expressions.
- **-report_count_per_check { true | false }**
Optional.

- false — Specifies to return a single total number of results that satisfy the filter criteria. This is the default.
- true — Specifies to return a list containing names of checks, and the number of results produced by each check. The list has the following format:

```
{ check_1_name check_1_result_count  
  check_2_name check_2_result_count ... }
```

- -help

Print the command usage. If present, all other arguments are ignored.

Return Values

The number of DRC results that satisfy the filtering criteria or the list of check names and counts if the -report_count_per_check argument is set to true.

Description

Returns the number of results in the specified result set. The results must also satisfy the filter criteria in order to be counted.

The filter criteria is determined as follows:

- Default (-region and -check_names not specified)

The “ResultDisplayMode” configuration option determines the DRC results included in the count. This option corresponds to the “Show results in” setting of the Calibre RealTime Options dialog box. This option specifies whether to include results produced during the latest DRC run, or all results found in the cell by all preceding DRC runs. The option also specifies whether to include results produced by all checks, or only those checks which are selected by the active recipe.

- -region and/or -check_names specified

Only the results that meet the -region, -check_names, and -check_name_match criteria are counted. The “ResultDisplayMode” configuration option is ignored.

This command generates a Tcl error if the provided result set does not exist.

GetResultIdentifiers

Available in all integrations

Returns DRC result identifiers, which may be used to find out more detailed information about individual results.

Usage

::calibre::realtime::GetResultIdentifiers

```
-result_set result_set  
[-region x1 y1 x2 y2]  
[-check_names check_names]  
[-check_name_match { literal | glob | regexp } ]  
[-help]
```

Arguments

- **-result_set *result_set***
Required. Specifies the handle of the result set.
Result set handles are returned by the [RunDRC](#) command.
- **-region *x1 y1 x2 y2***
Optional. Specifies that only results in the given region are returned. The region is defined by the lower-left and upper-right vertices. Coordinates are in user units.
- **-check_names *check_names***
Optional. Restricts the DRC results to those produced by checks whose names match entries in the *check_names* list. Check name match criteria are defined with the **-check_name_match** argument, and default to a literal string match.
- **-check_name_match { literal | glob | regexp }**
Optional. Defines the match criteria for strings specified with the **-check_names** argument.
 - literal — Specifies that the *check_names* argument value contains literal names of checks. This is the default.
 - glob — Specifies that the *check_names* argument value contains glob-style patterns.
 - regexp — Specifies that the *check_names* argument value contains regular expressions.
- **-help**
Print the command usage. If present, all other arguments are ignored.

Return Values

A list of result identifiers that satisfy the search criteria. The list is in the following form:

```
{ result_id_1 result_id_2 ... }
```

Description

Returns a list of identifiers of DRC results that satisfy the filter criteria.

The filter criteria is determined as follows:

- Default (-region and -check_names not specified)

The “ResultDisplayMode” configuration option determines the DRC results included in the count. This option corresponds to the “Show results in” setting of the Calibre RealTime Options dialog box. This option specifies whether to include results produced during the latest DRC run, or all results found in the cell by all preceding DRC runs. The option also specifies whether to include results produced by all checks, or only those checks which are selected by the active recipe.

- -region and/or -check_names specified

Only the results that meet the -region, -check_names, and -check_name_match criteria are counted. The “ResultDisplayMode” configuration option is ignored.

This command generates a Tcl error if the provided result set does not exist.

GetResultCoordinates

Available in all integrations

Returns the coordinates of the DRC results in a specified result identifiers.

Usage

::calibre::realtime::GetResultCoordinates

-result_ids *result_ids*
[-output_layer {true | false}]
[-help]

Arguments

- **-result_ids *result_ids***

Required. Specifies a list of result identifiers whose coordinates to return. For example:

```
{ result_id_1 result_id_2 ... }
```

Result identifiers are returned by [GetResultIdentifiers](#).

- **-output_layer {true | false}**

Optional. Specifies whether to return the mapped output layout number and data type associated with the check along with the result. The default value is false.

- **-help**

Print the command usage. If present, all other arguments are ignored.

Return Values

Returns a list containing result coordinates for the specified ***result_ids***, in the following format:

```
{ coordinates_of_result_id_1 coordinates_of_result_id_2 ... }
```

Result coordinates are expressed in user units and represented as a list whose format differs depending on the type of the result.

- **Edge results**

```
{ "E" { {x1_1 y1_1 x1_2 y1_2}
        {x2_1 y2_1 x2_2 y2_2} ...
        {xn_1 yn_1 xn_2 yn_2} } }
```

- **Polygonal results**

```
{ "P" { {x1 y1}
        {x2 y2} ...
        {xn yn} } }
```

When -output_layer is set to true, also returns a list containing the layer and data type. When set to false, no additional list is returned.

Description

Returns the coordinates of the DRC results for the specified identifiers.

This command generates a Tcl error if the specified results do not exist.

GetResultInfo

Available in all integrations

Returns check information for a given result, such as the check name and text.

Usage

::calibre::realtime::GetResultInfo

-result_id *result_id*

-info_name { **output_layer** | **check_name** | **check_text** }

[-help]

Arguments

- **-result_id** *result_id*

Required. Specifies the ID of the result set.

Result IDs are returned by the [GetResultIdentifiers](#) command.

- **-info_name** { **output_layer** | **check_name** | **check_text** }

Required. Specifies the type of information returned.

- **output_layer** — Returns a list containing the check's layer number and dataType value.
- **check_name** — Returns the check name.
- **check_text** — Returns the check text.

- **-help**

Print the command usage. If present, all other arguments are ignored.

Return Values

When **-info_name output_layer** is specified, a list containing the check's layer number and dataType value is returned. When **check_name** or **check_text** is specified, a string of the check name or check text is returned, respectively.

Description

Returns check information on a given result based on its ID.

This command generates a Tcl error if the provided result ID does not exist.

GetResultSet

Available in all integrations

Retrieves the latest result set produced in the specified configuration.

Usage

```
::calibre::realtime::GetResultSet  
    [-configuration_id configId]  
    [-help]
```

Arguments

- **-configuration_id *configId***
Optional argument specifying the configuration from which to return a result set. If this argument is not provided, the active configuration is used.
This command returns an error if the provided configuration does not exist.
- **-help**
Print the command usage. If present, all other arguments are ignored.

Return Values

Returns a result set handle.

Description

Returns the latest result set produced in the specified configuration. The set may have been produced as a result of a successful DRC run or after loading results from an RDB file by calling the command [LoadResultsFromRDB](#).

LoadResultsFromRDB

Available in all integrations

Loads results from an RDB file.

Usage

::calibre::realtime::LoadResultsFromRDB

-file *rdb_file*

[-result_set *result_set* | -configuration_id *configuration_id*]

[-merge]

[-help]

Arguments

- **-file *rdb_file***

Required. Specifies the path to the RDB file to load.

- **-result_set *result_set***

Optional. Specifies the handle of a result set. The results in the RDB file *rdb_file* are saved to *result_set*. Result set handles are returned by the [RunDRC](#) command.

- **-configuration_id *configuration_id***

Optional. Specifies a configuration ID. The results in the RDB file *rdb_file* are saved to the specified configuration. See the “Description” section for details.

- **-merge**

Optional. If the -merge argument is present, results read from the RDB file are added to results that already exist in the result set. Otherwise, the result set is cleared prior to loading results.

- **-help**

Print the command usage. If present, all other arguments are ignored.

Return Values

A handle to the result set containing results loaded from the RDB file.

Description

Loads results from an RDB file into a result set.

By default the results in the RDB are saved to the result set associated with the current run configuration and the open design view. If the -configuration_id argument is specified, the specified run configuration is used instead of the current run configuration. If a result set exists for the run configuration and design view combination, the results in *rdb_file* are saved to that result set, otherwise a result set is created for the run configuration and design view combination.

When the `-result_set` argument is specified, the results are saved to the specified result set.

When saving results to an existing result set, the results in ***rdb_file*** overwrite the existing results unless `-merge` is specified.

This function generates a Tcl error if the name of the RDB file is not specified, if the specified RDB file does not exist, or if the specified result set does not exist.

RunDRC

Available in all integrations

Runs Calibre DRC in a design.

Usage

::calibre::realtime::RunDRC

[-region *x1 y1 x2 y2*]

[-help]

Arguments

- -region *x1 y1 x2 y2*

Optional. Specifies the region in which to run DRC. The region is defined by the lower-left and upper-right vertices. Coordinates are in user units. If the -region argument is not provided, the default region is the portion of the design visible in the design tool window.

- -help

Print the command usage. If present, all other arguments are ignored.

Return Values

A list containing configuration IDs and corresponding result set handles. The following is an example of the format:

```
{ configuration_id_1 result_set_handle_1
  configuration_id_2 result_set_handle_2 ... }
```

Returned result set handles can be used in other API commands, such as [GetResultCoordinates](#) and [GetResultIdentifiers](#).

Description

Runs selected DRC checks on the design in the active window, possibly restricted by the -region argument. This may involve running DRC in multiple configurations, depending on the Calibre RealTime Digital configuration.

Using this command with no arguments is analogous to clicking the “Run DRC in current window” button on the RealTime toolbar associated with the active window.

The RunDRC API command runs DRC with the same configuration settings that are set for the Calibre RealTime Digital interactive mode as described below:

- Calibre RealTime Digital configuration settings are loaded from the configuration file(s) or set with the Calibre RealTime Digital configuration API commands. Consequently, if Calibre RealTime Digital is configured for serial DRC runs with the “MultiConfigRunMode” and “SelectedToRun” options, RunDRC runs all selected configurations.

- If Calibre RealTime Digital is configured to run batch Calibre (by setting the “BatchAutomaticRunMode” option) upon exceeding soft or hard geometry limits (set by the “PolygonCountLimit” option), automatic batch runs are launched in the same way by RunDRC.
- If the Calibre RealTime Digital “DRCSummaryEnabled” and “DRCResultSavingEnabled” options are enabled, RunDRC writes the DRC summary file(s) and the DRC result file(s).
- Unless no DRC results are found, Calibre RealTime Digital highlights DRC results if the “HighlightAfterDRCRun” option is set. The result counter points to the first result found. The first result is the “current result” on which the commands that highlight results (such as HighlightCurrentResult and HighlightNextResult) are based.
- A DRC run may invalidate result identifiers produced by preceding DRC runs executed in the same result set. Result identifiers retrieved prior to the latest DRC run should not be used. Instead, retrieve a fresh collection of identifiers by using the GetResultIdentifiers command.

This function generates a Tcl error if the DRC run cannot be completed.

Examples

This example runs DRC on the open design using the current Calibre RealTime Digital configuration settings.

```
% set drc_results [::calibre::realtime::RunDRC]
```

SaveResultsToRDB

Available in all integrations

Saves DRC results to an RDB file.

Usage

::calibre::realtime::SaveResultsToRDB

-file *file_name*
[-result_set *result_set*]
[-region *region*]
[-check_names *check_names*]
[-help]

Arguments


- **-file *file_name***
Required. Specifies the path to the RDB file to which results are written.
- **-result_set *result_set***
Optional. Specifies the handle of the result set containing DRC results to save to the RDB file. If not specified, the result set for the design open in the active layout window is used.
Result set handles are returned by the [RunDRC](#) command.
- **-region *x1 y1 x2 y2***
Optional. Specifies that only results in the region be saved to the RDB file. The region is defined by the lower-left and upper-right vertices. Coordinates are in user units.
- **-check_names *check_names***
Optional. Restricts the DRC results written to the RDB file to those produced by checks contained in the -check_names argument. The *check_names* value is a literal list of check names.
Example: -check_names [list “check1” “check2”]
- **-help**
Print the command usage. If present, all other arguments are ignored.

Description

Saves DRC results to a Calibre DRC results database (RDB) file. The results are saved in ASCII format. If a file with the given name already exists, it is overwritten.

The precision of the RDB is set to the rule file precision. If -result_set is specified, the rule file for the run configuration associated with the result set is used, otherwise the rule file for the current run configuration is used.

Note

 If [LoadResultsFromRDB](#) is used to load results with a precision that differs from the current rule file precision, and those results are saved to a new RDB, the precision in the new RDB is set to the current rule file precision.

This function generates a Tcl error if the name of the file is not specified, if the file cannot be opened for writing, or if the provided result set does not exist.

Calibre DRC Results Highlighting

Commands in this group can be used in scripts to highlight results produced by running Calibre DRC.

All of these commands change the state of the Calibre RealTime toolbar and the highlights displayed in the design tool. After a RunDRC command, the result pointer is set to the first DRC result, and can be changed by the commands in this group.

HighlightAllResults	258
HighlightCurrentCheck	259
HighlightCurrentResult	260
HighlightNextCheck	261
HighlightNextResult	262
HighlightPreviousCheck	263
HighlightPreviousResult	264
HighlightResults	265

HighlightAllResults

Available in all integrations

Highlight all DRC results previously produced by running DRC in the active configuration.

Usage

::calibre::realtime::HighlightAllResults [-help]

Arguments

- -help
Print the command usage.

Description

The setting of the “ResultDisplayMode” variable is used to set the configuration-specific highlight filter. The filter is used when highlighting the results.

HighlightCurrentCheck

Available in all integrations

Highlight DRC results produced by the current DRC check.

Usage

::calibre::realtime::HighlightCurrentCheck [-help]

Arguments

- -help
Print the command usage.

HighlightCurrentResult

Available in all integrations

Highlight the current DRC result produced by running DRC in the active configuration.

Usage

::calibre::realtime::HighlightCurrentResult [-help]

Arguments

- -help
Print the command usage.

Description

This command is analogous to clicking the “Highlight current” button on the Calibre RealTime Digital toolbar associated with the active window.

HighlightNextCheck

Available in all integrations

Highlight DRC results produced by the next DRC check.

Usage

::calibre::realtime::HighlightNextCheck [-help]

Arguments

- -help
Print the command usage.

HighlightNextResult

Available in all integrations

Highlight the next DRC result produced by running DRC in the active configuration.

Usage

::calibre::realtime::HighlightNextResult [-help]

Arguments

- -help
Print the command usage.

Description

This command is analogous to clicking the “Highlight next” button on the Calibre RealTime Digital toolbar associated with the active window.

HighlightPreviousCheck

Available in all integrations

Highlight DRC results produced by the previous DRC check.

Usage

::calibre::realtime::HighlightPreviousCheck [-help]

Arguments

- -help
Print the command usage.

HighlightPreviousResult

Available in all integrations

Highlight the previous DRC result produced by running DRC in the active configuration.

Usage

::calibre::realtime::HighlightPreviousResult [-help]

Arguments

- -help
Print the command usage.

Description

This command is analogous to clicking the “Highlight previous” button in the Calibre RealTime Digital toolbar associated with the active window.

HighlightResults

Available in all integrations

Highlight specific DRC results produced by running DRC in the active configuration.

Usage

```
::calibre::realtime::HighlightResults -result_ids result_ids [-help]
```

Arguments

- **-result_ids *result_ids***
A list containing identifiers of results to highlight. Result identifies are returned by [GetResultIdentifiers](#).
- **-help**
Print the command usage. If present, all other arguments are ignored.

Description

Highlight specific DRC results produced by running DRC in the currently active configuration. The results to highlight are identified by their result IDs. This command does not update the violation number displayed on the RealTime toolbar.

Appendix A

Support for SVRF Statements in Calibre RealTime Digital

Calibre RealTime Digital provides limited support for some SVRF statements, particularly statements involving text objects and cell hierarchy. Some statements are supported with a limited syntax or for limited applications, some statements are not supported by all Calibre RealTime Digital integrations, and some statements are not supported at all.

The section “[SVRF Statements with Limited Support in Calibre RealTime Digital](#)” on page 269 gives details for the commands with limited support.

[Table A-1](#) summarizes the support status for SVRF statements that have limited or no support. This table is not necessarily complete and will be updated in future releases. The table uses the following terms:

- Integration support: **All** — All integrations are supported.
 Partial — Some integrations are not supported.
- Syntax support: **Full** — The full syntax of the command is supported.
 Limited — Some keywords or applications are not supported.

The Details column contains a link with more information in the case of partial and limited support.

Table A-1. SVRF Commands with Limited or No Support

Command	Integration Support	Syntax Support	Details
Density	All	Limited	Density In Calibre RealTime Digital
DFM Copy	All	Limited	DFM Copy in Calibre RealTime Digital
DFM Defaults	Not supported		
DFM NARAC	Not supported		
DFM Read	Not supported		
DFM RDB	Not supported		
DFM Text	All	Full	DFM Text in Calibre RealTime Digital
DRC Maximum Vertex	Not supported		

Table A-1. SVRF Commands with Limited or No Support (cont.)

Command	Integration Support	Syntax Support	Details
DRC Results Database Precision	Not supported		Using this command may lead to unexpected results.
Expand Text	Partial	Full	Expand Text in Calibre RealTime Digital
Extent Cell	All	Limited	Extent Cell in Calibre RealTime Digital
Extent Drawn	Partial	Full	Extent Drawn in Calibre RealTime Digital
Inside Cell	All	Limited	Inside Cell in Calibre RealTime Digital
Layout Rename Text	All	Full	Layout Rename Text in Calibre RealTime Digital
Layout Text	All	Full	Layout Text in Calibre RealTime Digital
Layout Use Database	Not supported		
Layout Windel *	Not supported		
Layout Window *	Not supported		
Layout Polygon	Not supported		
Not Inside Cell	All	Limited	Not Inside Cell in Calibre RealTime Digital
Not With Text	Partial	Full	Not With Text in Calibre RealTime Digital
Precision	Not supported		
Rectangle	All	Full	
Rectangles	All	Full	
Text Depth	All	Full	
Virtual Connect *	Not supported		
With Text	Partial	Full	With Text in Calibre RealTime Digital

SVRF Statements with Limited Support in Calibre RealTime Digital

Some SVRF statements have limited syntax support in Calibre RealTime Digital or are not supported by all Calibre RealTime Digital integrations.

The following sections provide details about the statements with limited support. [Table A-1](#) in “[Support for SVRF Statements in Calibre RealTime Digital](#)” on page 267 summarizes the support status.

Density In Calibre RealTime Digital	269
DFM Copy in Calibre RealTime Digital	270
DFM Text in Calibre RealTime Digital	270
Expand Text in Calibre RealTime Digital	270
Extent Cell in Calibre RealTime Digital	271
Extent Drawn in Calibre RealTime Digital	271
Inside Cell in Calibre RealTime Digital	272
Layout Text in Calibre RealTime Digital	272
Layout Rename Text in Calibre RealTime Digital	272
Not Inside Cell in Calibre RealTime Digital	273
Not With Text in Calibre RealTime Digital	273
With Text in Calibre RealTime Digital	274

Density In Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Density statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
DENSITY layer1 [layerN ...] [`['density expression `']] constraint
[WINDOW {wxy | wx wy} [STEP {sxy | sx sy}]]
[TRUNCATE | BACKUP | IGNORE | WRAP]
[INSIDE OF EXTENT | INSIDE OF x1 y1 x2 y2 |
  {INSIDE OF LAYER layerB [BY EXTENT [size_value]]} | BY POLYGON |
  {BY RECTANGLE [EXTENDED]} | CENTERED value]
[[GRADIENT constraint [RELATIVE | ABSOLUTE] [CORNER [value]]] |
  [MAGNITUDE constraint [RELATIVE | ABSOLUTE]]]
[CENTERS value]
[RDB [ONLY] filename [MAG value]
  {[COMBINE constraint [RELATIVE | ABSOLUTE]] | [MAXIMUM value]}]
```

See [Density](#) for a full description and argument definitions. Arguments not listed in the above syntax line, such as PRINT [ONLY], are not supported in Calibre RealTime Digital; when included, unsupported arguments are ignored, and warnings are issued at the start of a run. You must use the argument order as shown to avoid ambiguity.

DFM Copy in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the DFM Copy statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
DFM COPY layer [layer ...] [{REGION [UNMERGED]} | EDGE |  
{CENTERLINE [CLUSTER]} | {TIE [CENTER] [CLUSTER]} |  
{CLUSTER [LAYERID]} | UNMERGED] [PREMERGE]
```

See [DFM Copy](#) for a full description and argument definitions. Arguments not listed in the above syntax line, such as CELL LIST, are not supported in Calibre RealTime Digital; when included, unsupported arguments are ignored, and warnings are issued at the start of a run. You must use the argument order as shown to avoid ambiguity.

DFM Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the DFM Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
DFM TEXT layer [PRIMARY ONLY] PROPERTY  
{STRING | [INVALID] NUMBER } property_name
```

See [DFM Text](#) for a full description and argument definitions.

Expand Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Expand Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
EXPAND TEXT text_name [text_layer] BY number [PRIMARY ONLY]  
[CASE SENSITIVE]
```

See [Expand Text](#) for a full description and argument definitions.

Extent Cell in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Extent Cell statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
EXTENT CELL cell_name [cell_name ...] [{ORIGINAL | MAPPED} [OCCUPIED]]
```

See [Extent Cell](#) for a full description and argument definitions. Arguments not listed in the above syntax line, such as WITH MATCH, are not supported in Calibre RealTime Digital; when included, unsupported arguments are ignored, and warnings are issued at the start of a run. You must use the argument order as shown to avoid ambiguity.

If a cell extends outside the halo region, Calibre RealTime Digital only analyzes the portion of the geometry that is within the halo region. See “[Halo Usage in Calibre RealTime Digital](#)” on page 21.

When in server mode, exact cell name matching is not supported for cells that overlap the DRC window.

Extent Drawn in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Extent Drawn statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
EXTENT DRAWN [ORIGINAL | layer [layer ...]] [IGNORE layer [layer ...]]
```

See [Extent Drawn](#) for a full description and argument definitions.

Inside Cell in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Inside Cell statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
INSIDE CELL layer cell_name [cell_name ...]  
[PRIMARY ONLY] [WITH LAYER layer2]
```

See [Inside Cell](#) for a full description and argument definitions. Arguments not listed in the above syntax line, such as WITH MATCH, are not supported in Calibre RealTime Digital; when included, unsupported arguments are ignored, and warnings are issued at the start of a run. You must use the argument order as shown to avoid ambiguity.

If a cell extends outside the halo region, Calibre RealTime Digital only analyzes the portion of the geometry that is within the halo region. See [“Halo Usage in Calibre RealTime Digital”](#) on page 21.

When in server mode, exact cell name matching is not supported for cells that overlap the DRC window.

Layout Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Layout Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
LAYOUT TEXT name x y layer [texttype] [cell_name]
```

See [Layout Text](#) for a full description and argument definitions.

Layout Rename Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Layout Rename Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
LAYOUT RENAME TEXT
"delimiter regular_expression
delimiter replacement_pattern delimiter
[n | g] [e | b] [i | m] [Mc]
[delimiter regular_expression
delimiter replacement_pattern delimiter
[n | g] [e | b] [i | m] [Mc] ...]"
[CELL LIST name]
[DATABASE | RULES | DATABASE RULES]
[BY LAYER layer [TO destination_layer]]
```

See [Layout Rename Text](#) for a full description and argument definitions.

Not Inside Cell in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Not Inside Cell statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

```
NOT INSIDE CELL layer cell_name [cell_name ...] [PRIMARY ONLY]
[WITH LAYER layer2]
```

See [Not Inside Cell](#) for a full description and argument definitions. Arguments not listed in the above syntax line are not supported in Calibre RealTime Digital; when included, unsupported arguments are ignored, and warnings are issued at the start of a run. You must use the argument order as shown to avoid ambiguity.

If a cell extends outside the halo region, Calibre RealTime Digital only analyzes the portion of the geometry which is within the halo region. See “[Halo Usage in Calibre RealTime Digital](#)” on page 21.

Not With Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the Not With Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

NOT WITH TEXT *layer name* [*text_layer*] [PRIMARY ONLY] [CASE SENSITIVE]

See [Not With Text](#) for a full description and argument definitions.

With Text in Calibre RealTime Digital

Calibre RealTime Digital provides the following support for the With Text statement.

Integration Support

Supported for: All integrations

Supported Syntax in Calibre RealTime Digital

WITH TEXT *layer name* [*text_layer*] [PRIMARY ONLY] [CASE SENSITIVE]

See [With Text](#) for a full description and argument definitions.

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Third-Party Information

Details on open source and third-party software that may be included with this product are available in the *<your_software_installation_location>/legal* directory.

