cadence™

Model Integrity Command Reference

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Contents

1

File Menu

File – Open

Displays a File browser enabling you to navigate to a directory to open existing model files.

Select a single file or multiple files to open from the file window. You can then browse other directories to locate files.

File – New

Opens a new file in the Editor window under a default filename of MS <n>.

Note: The filename number <n> assigned is unique and sequential.

File – Close

Closes the active file in the Editor window without saving any new information.

Note: Use the *File – Save As* option to close the window to save edits or a new file .

File – Close All

Closes *all files* in the Editor window without saving any new information.

File – Save

Saves changes to the active file in the Editor window.

File – Save All

Saves changes to all active files in the Editor window.

File – Save As

Displays a file browser enabling you to save a copy of the active file in the Editor window under a specified name or to change the file type. Enter a name for the new file. You can also change directories to save the file in a different directory.

File – Print

Displays the Print dialog box for printing the active file in the Editor to a PostScript printer.

File – Print Preview on page 17

File – Print Preview

Displays the Print Preview Window for previewing the file before sending it to print.

The window includes a Menu Bar with commands that enable you to perform the following tasks.

- Browse pages of a multi-page file.
- Change the View format (one or two page) of the file.
- Zoom the display of the file.
- Send the file to a printer.

File – Exit

Exits Model Integrity. If changes have not been saved, a dialog box (for each unsaved file) asks if you want to save your work before exiting.

2

Edit Menu

Edit – Undo

Undoes the commands in the Edit buffer starting with the last command. The Edit buffer stores well over one hundred commands providing flexibility in file editing.

Note: The Edit buffer is saved on a per file basis. To undo commands in a file that is not active, select it before clicking the Undo button.

Edit – Redo

Redoes the commands in the Edit buffer that were previously undone starting with the last *Undo*.

Note: The Edit buffer is saved on a per file basis. To redo commands in a file that is not active, select it before clicking the *Redo* button.

Edit – Cut

Removes the selected text in the active file and stores it in the Paste buffer.You can paste the selected text in another file, and the cut text will still be available if you exit and invoke Model Integrity again.

See Edit – Copy on page 22 and Edit – Paste on page 23for more information.

Edit – Copy

Copies the selected text in the active file and stores it in the Paste buffer.You can paste the selected text in another file, and the copied text will still be available if you exit and invoke Model Integrity again.

See Edit – Cut on page 21 and Edit – Paste on page 23.

Edit – Paste

Pastes the text in the Paste buffer into the active file at the cursor location. You can also open another file and paste the text into that file.

See Edit – Cut on page 21 and Edit – Copy on page 22.

Edit – Select All

Selects all the text in the active file.

3

Search Menu

Search – Find

Displays the Find dialog box that enables you to locate and mark words, characters, or strings in the active file.

Find what:	Specifies the text string to search for. The arrow button at the end of the text field displays a drop-down list box containing strings previously searched for that you can select from.
Match whole word only	Indicates that the string should be matched as a whole word and not as a word fragment.
Match case	Indicates that the case of the string should be considered when searching for matches.
Regular expression	Indicates that the string should be matched to [keywords] only.
Direction	Search for the string up or down within the file.
Find Next	Search for the next occurrence of the string.

Mark All Mark all occurrences of the find string.

Search – Find Next
Search – Find Previous

These commands locate multiple instances of the expression entered in the Find dialog box.

Find – Find in Files

Displays a dialog box that enables you to locate an expression in any open file.

Find – Replace

Displays a dialog box that enables you to locate and replace an expression in the active file.

Search – Goto Line

Displays a dialog box that enables you to move your cursor to a specific line in the active file.

Search – Next Warning
Search – Previous Warning

These commands locate multiple instances of the warnings present in the active file.

Search – Next Error
Search – Previous Error

These commands locate multiple instances of the syntax errors present in the active file.

Search – Clear All Flags

Deletes all error and warning flags present in the active file.

4

Tools Menu

Tools – Parse File

This command parses the selected file using the executable program appropriate for the active file types.

You can view the parsing status of both files and objects in the Model Tree. The parsing status of the file appears as a checkmark or X, and a circle of red, green, or yellow indicates the object parsing status.

Note: Objects in a DML file will not have a parsing status, because *dmlcheck* provides overall file parsing information, not object level parsing information.

1. Click to select the files that you want to parse, then select *Tools – Parse File*.

   The files parse and updates the file status.

2. Check the parse status of the file by examining the checkbox (to the left of the file's icon).

   If a green checkmark appears in the status checkbox, parsing and validating occurred successfully without any errors or warnings.

   -or-

   If a yellow checkmark or red **X** appears in the status checkbox, parsing occurred with warnings (yellow) or errors (red). For additional information, see Locating Syntax Errors and Warnings.

Tools – <*file_type*> – <*operations*>

The Tools menu includes a list of all the file types supported by Model Integrity. Each file type contains a sub-menu of the operations which you can perform on the file. The following table describes the file types and associated operations. The hot links in the table display detailed information on specific operations.

Note: The operations available to you depend upon the active file type. If you have not opened any files, the operation selections listed for each file type will be grayed out (that is, inactive). To activate a file type operation (for example, *Touchstone – To DML*), you must have a Touchstone file open *and selected* in Model Integrity. See the File Type/Activation Command Matrix in the Model Integrity User guide for additional information.

File Type	Operation
ESpice	To DML – Wraps the SPICE subcircuits into a DML file using `spc2dml`.
	To Spectre – Translates the file into a Spectre format using `spc2spc`.
	To Generic SPICE – Translates the file into a generic SPICE format using `spc2spc`.
	Export Connectivity Map – Translates the file into a connectivity map.
Spectre	Wrap Spectre Model in DML – Wraps the SPICE subcircuits into a DML file using `spc2dml`.
	DML Model from Simulation Results – Translates a Spectre buffer model into a DML file using `spc2dml`.
DML	Mark Qualified – Marks a file as qualified for simulation and indicates that it has been analyzed.
	Merge DML – Merges the selected DML files into a single DML file using `mergedml`.
	Make DML Index – Creates an index (`.ndx`) file for the selected DML file using `mkdeviceindex`.
	Reorder/Rename ESpice Pins – Displays the Wrapped Subcircuit Pin Editor for selected symbols in the file that controls how you build the symbol for the current model by renaming and/or moving pins.
	View Curves – Displays a waveform of the selected model in SigWave.

IBIS	To DML – Wraps the SPICE subcircuits into a DML file using `spc2dml`.
	ICM to BlackBox – Translates the ICM file to a DML Espice BlackBox model format.
	ICM to PackageModel – Translates the ICM file to a DML Espice PackageModel format.
	ICM to ConnectorModel - Translates the ICM file to a DML Espice ConnectorModel format.
	Create Complete IBIS File –Displays the IBIS File Creation Wizard to create a complete IBIS file from a pin list object
	View Curves – Displays a waveform of the selected model in SigWave.
HSpice	To DML – Wraps the SPICE subcircuits into a DML file using `spc2dml`.
	To IBIS File Buffer – Allows you to clone component pinlist and buffer model sections in creating new IBIS files. The pinlist or buffer model sections may be used in place, or they can be extracted to a new file.
Generic SPICE	To DML – Wraps the SPICE subcircuits into a DML file using `spc2dml`.
Touchstone	To DML – Wraps the SPICE subcircuits into a DML file using `spc2dml.exe`.
	Convert and Normalize – Displays the Conversion and Normalization dialog box to edit network parameters and reference impedances in a Touchstone file.
	View Curves – Displays a waveform of the selected model in SigWave.
Quad Design	To DML – Transforms `.mod` files to DML format for parsing and qualifying using the `quad2signoise` executable.

Tools – File Options

The Model Integrity File Settings dialog box is used to edit the default Model Integrity settings and specify preferred file extensions that Model Integrity uses to identify file types.

Note: You cannot duplicate file extensions.

Model Integrity File Settings Dialog Box

Options

IBIS Options File	Select the options file.
Parse on File Open	Parse the file when opening.

IBIS Extensions/SPICE Extensions
Specify the preferred file extensions that you want Model Integrity to use to identify file types. The first one you place in this field will be the one that Model Integrity uses to create or search for a file, using the appropriate file wizard.

Tools – Translation Options

Procedures

Displays the Translation Options dialog box enabling you to set File Translation parameters for the session.

Translation Options Dialog Box

IBIS to DML Tab (ibis2signoise.exe)

Make model names unique [-u]	If there are two models of the same name, the translator will change model names.
Leave model names unchanged [-nu]	When checked, all model name conflicts are ignored during translation and checking.
Create IBIS Device instead of BoardModel for EBD files [-ebdcomp]	This option works if there is just one IBIS component in the EBD file, used only once on the board.
Create ESpiceDevice components for Series_switch models [-serswcomp]	Generates Espice Black box for series_switch models.
Do not pass the input file through ibischk4 [-i]	Skip ibischk4 before translation.
Do not pass the output file through dmlcheck [-d]	Skip dmlchk after translation.
Create a directory of waveform files [-curvedir]	Generates all waveforms in the specified directory.
Use specified language tab [-em]	Use a specific Language Tag other than IBIS External Model. Only Tlsim, Spectre, and HSpice will be applied.
Print the ibis2signoise program version and exit [-version]	Displays ibis2signoise version. If you choose this option, all other options are ignored.

QUAD to DML Tab (quad2signoise.exe)

Do not pass output file through dmlcheck [-d]	Skip dmlchk after translation.
Calculate BufferDelay to reach IMISDevice pin [-bufferdelay]	Re-calculate the buffer delay according to the curve data.
Create a directory of waveform files [-curvedir]	Generates the waveforms in the specified directory.
Print the quad2signoise program version and exit [-version]	Display quad2signoise version.
Default file name [-def_file]	Create a file name using specified default value settings file.

ESpice to SPICE Tab (spc2spc.exe)

Include commented source file text [-sourceInfo]	Include all information from the source file.
Add 'include' statements where needed [-includes]	Add include statement if file needs to be included for the output file.
Print software version information [-version]	Display spc2spc version.
Include comments from source file before each statement [-commentInfo]	Include all comments from source file.
Include commented info about source file name and line number [-fileInfo]	Include file information (file names and line numbers) from the source file.
Flatten the circuit so that no subcircuits remain [-flatten]	Use Flatten method for output file.
Retain transmission line 'N' elements [-nelement]	Use N elements for tline.
Use W element for all transmission line models [-welement]	Use W element for tline.
Set minimum length for W elements [m]	Minimum length for W elements.

Minimum rise/fall time in [s] [-t]	Minimum rise/fall times (ps) for ladder network.
RLC segment time delay in [s] [-x]	Calculate RLC segment time delay in ps.

Touchstone to DML

Specified impedance value.	Set an impedance value. You cannot use zero.
Perform Touchstone S-Parameters passivity check.	Check to validate the S-Parameter model.
Do not insert comment into ESpice subcircuit.	If checked, the comment does not appear in the ESpice subcircuit.
Specified NAME for DML S-Parameter model.	Uses the user specified model name instead of the Touchstone file name.
Print the ts2dml program version and exit.	Prints the current version.
Enable Port Order	Lets you reorder the ports of a Touchstone file. A Touchstone file has a *.snp* extension, where *n* is the number of network ports of the device or interconnect being described.

Procedures

Setting Translation Options

1. Choose *Tools – Translation Options*.

   The *Translation Options* dialog box appears.

2. Select the options specific to a translator.

   The options page for the selected translator displays.

3. Enable or disable options and or enter information into the type-in fields as desired.

4. Click OK.

The translation options are set and the dialog box disappears.

Translating a File

1. Open the model file that you want to translate by choosing *File – Open*.

   The *Open* file browser appears.

2. Select the file to open, then click *OK*.

   The file opens in both the Physical View and Edit Window.

3. Click on the file's icon in the Physical View to select it, and then right-click.

   -or-

   Right-click in the file's window within the Edit Window.

   The context-sensitive *File* menu appears.

4. Choose *Translate Selected* or *Translate* respectively.

   A sub-menu appears with the appropriate translator option.

5. Click the translator option (bold font).

   The translator appears with the selected model file as input. There is a new file in the same directory as the original using the same root name, but with a format appropriate extension.

Tools – IBIS Generation Options

Displays the IBIS Options File Editor to set options used to create full IBIS files and IBIS buffer model files. These options must be set before extracting a buffer model from a SPICE output file.

IBIS Options File Editor Dialog Box

Options File Path	Path and filename to the designated options file.

Header Tab

Use options on this tab to set design specific values for creating a complete IBIS model file.

[File Rev]	Revision level of a particular.*ibs* file.
[IBIS Ver]	IBIS template version. This keyword informs electronic parsers of the kinds of data types that are present in the file.
[Notes]	Component or file specific notes.
[Disclaimer]	Legal disclaimer.
[Copyright]	Copyright notice.
[Manufacturer]	Name of component manufacturer.
[Source]	Originator and the source of information. For example: From silicon level SPICE model at Intel.

Component Tab

Component name

R_pkg [Ohms]	Package and bond wire resistance, typical
L_pkg [H]	Package and bond wire inductance, typical
C_pkg [F]	Package and bond wire capacitance, typical

Buffer Model Tab

Model Name

Input	Vinh [V] typ: min: max: Logic High voltage at receiver.
	Vinl [V] typ: min: max: Logic Low voltage at receiver.
Output	Vmeas [V] typ: min: max: Voltage at which output timing is specified.
	Vref [V] Load at which output timing is specified.
	Cref [F] Load at which output timing is specified.
	Rref [Ohms] Load at which output timing is specified.
	R_load [Ohms] Measures the resistive load of the driver's V-t ramp data.
C_comp [F]	typ: min: max: I/O pad on chip capacitance: everything on the buffer pad, including diode and FET junctions, wiring, and the bond pad.

Buffer Processing Tab

Best Points

Limit I-V - X points to [Max 100]	Maximum VI point number after VI best point reduction process.
Limit V-t - X points to [M]	Maximum VI point number after VI best point reduction process.
Maximum Vi Error	Maximum voltage difference between original and VI curves and reduced VI curves.

Maximum Vt Error	Maximum voltage difference between original VT curves and reduced VT curves.
V-t / I-V Match Tolerance [%]	Maximum percentage value of difference between VT and VI curve on R_load.
R Detection Tolerance	Detect threshold of mode termination resistant value.

V-t Curve Start Points [s]

Use Whole Curve	If checked, the whole curve is used, instead of individual points.
V-t Curve Length [s]	Specify the start and end points along the curves.
typ min max	Set these to test a specific range.

Guardbanding Factor

I - V Curves	Specify values for the I-V curves that expand the distance between the minimum and maximum waveform without changing the typical curve.
V - t Curves	Specify values for the V-t curves that expand the distance between the minimum and maximum without changing the typical curve.

File Tab

Read	
Select IBIS Buffer	Where to read IBIS buffer files when creating an IBIS file using the wizard.
Write	
IBIS Buffer	Where to write the IBIS buffer file when created using the *Object Extract* menu option.

IBIS	Where to write the IBIS file when created using the wizard.
IBIS PinList	Where to write the IBIS pin list file when created using the *Object Extrac*t menu option.

Tools – Color Options

Procedures

Displays the Color Palette dialog box enabling you to change the colors used in the Edit Window.

Color Palette Dialog Box

Options

Keywords	Displays the Color dialog box enabling you to select or define a display color for model file keywords.
Comments	Displays the Color dialog box enabling you to select or define a display color for model file comments.
Text	Displays the Color dialog box enabling you to select or define a display color for model file text.
Background	Displays the Color dialog box enabling you to select or define a background color for File Windows within the Edit Window.
Error Marker	Displays the Color dialog box enabling you to select or define a display color for model file error markers.
Warning Marker	Displays the Color dialog box enabling you to select or define a display color for model file warning markers.

Restore Defaults	Restores the default color map.
Apply	Applies the assigned color(s) without closing the Color Palette dialog box.

Procedures

Changing the Edit Window Colors

Model Integrity employs a color palette that enables you to modify the color of key Edit Window items such as error and warning markers to suit specific visual needs. You can also mix and store custom colors for assignment.

1. Choose *Tools – Color Palette*.

   The *Color Palette* dialog box appears.

2. Click the button of the item whose color you want to change.

   The *Color* dialog box appears.

3. Click a basic color or a custom color from the palette.

4. Click *OK*.

   The *Color* dialog box disappears.

5. Click *Apply* on the *Color Palette* dialog box.

   The new color is assigned to the item.

6. Click *Close* to dismiss the *Color Palette* dialog box.

Defining and Storing Custom Colors for the Edit Window

1. Choose *Tools – Color Palette*.

   The *Color Palette* dialog box appears.

2. Click the button of the item whose color you want to change.

   The *Color* dialog box appears.

3. Click *Define Custom Colors*.

   The color mix section of the *Color* dialog box appears.

4. Mix a custom color visually by dragging the black hue/saturation and luminance bars using the left mouse button.

   -or-

   Mix a custom color discretely by entering the appropriate numeric values in the color fields.

5. Click *Add to Custom Colors* once the color is properly mixed.

   The color is stored and appears as a new Custom Color button on the *Color* dialog box.

6. Click *OK* to store and assign the new custom color to the selected item.

   -or-

   Click on a blank Custom Color button to define and store another custom color.

7. Click *Apply* on the *Color Palette* dialog box to update the Edit Window.

8. Click *Close* to dismiss the *Color Palette* dialog box.

Tools – Customize

Procedures

Displays the Customize dialog box enabling you to customize standard toolbars as well as create new toolbars.

Customize Dialog Box

Options

Toolbars Tab

Toolbars	Toggles the visibility of the standard (excluding the Menu Bar) and user-defined toolbars. Also enables you to select a toolbar for command customizing using the Commands tab.
Toolbar name	Displays the name of the selected toolbar and also enables you to edit the name of a user-defined toolbar.
Show tool tips	Enables or disables the display of Tool Tips on the toolbars.
Cool Look	Enables or disables the Cool Look style for the toolbars.
Large Buttons	Enables or disables large buttons for the toolbars.
New	Displays the New Toolbar dialog box enabling you to name and create a user-defined toolbar.
Reset	Resets the standard toolbars to their default command configuration.
Apply	Applies toolbar changes without closing the dialog box.

Commands Tab

Categories	Enables you to select a command category for available toolbar commands.
Buttons	Displays and enables you to select the commands in the selected command category.
Description	Displays a functional description of the selected command.

Procedures

Changing the Commands on a toolbar

You can change the location or arrangement of commands on a toolbar by dragging the icons along the bar. To add or remove the commands on the toolbar, use the following procedures.

Note: Any command changes made to the toolbars cannot be saved between sessions.

Adding Commands to a toolbar

1. Choose *Tools – Customize*.

   The *Customize* dialog box appears.

2. Click the *Commands* tab and select a command category from the *Categories* list box.

   The available commands for your selected category appear in the *Buttons* area.

3. Place the cursor over an icon to display a tool tip for that command.

   -or-

   Click an icon to display a short summary of the command function in the *Description* area.

4. Drag the desired command icon to one of the toolbars.

   The icon remains on the toolbar as a button and the command is now available.

5. Click *OK* to dismiss the Custom dialog box.

Removing User-specified Commands from a toolbar

1. Choose *Tools – Customize*.

   The *Customize* dialog box appears.

2. Drag a user-specified command icon off the toolbar.

   The command disappears.

   -or-

3. On the *toolbars* tab of the *Customize* dialog box, select a category from the *toolbars* list box, then click the *Reset* button.

The selected toolbar reverts back to its original command configuration with *all* user-specified commands removed.

4. Click *OK* to dismiss the *Customize* dialog box.

Setting Button Size and Tool Tips

1. Choose *Tools – Customize*.
2. On the *toolbars* tab, select or de-select *Large Buttons* and or *Tool Tips*.

   The command button size on the toolbars and the Tool Tips mode updates immediately.
3. Click *OK* to dismiss the *Customize* dialog box.

Creating a New toolbar

Note: Any new toolbars you create cannot be saved between sessions.

1. Choose *Tools – Customize*.

   The *Customize* dialog box appears.
2. Click *New* on the *toolbars* tab.

   The *New Toolbar* dialog box appears.
3. Enter a name for the toolbar in the *Toolbar name* field, and then click *OK*.

   An empty toolbar is created and opened near the upper-left corner of the Model Integrity desktop. Also, an entry for the new toolbar is added to the *toolbars* list box.
4. Click the *Commands* tab and select a command category from the *Categories* list box.

6

Window Menu

Window – New Window

Opens a copy of the contents of the active file in the Edit window.

Window – Cascade

Arranges multiple File Windows using a cascading style within the Edit Window.

Window – Tile

Arranges multiple File Windows using a tiled style within the Edit Window.

Window – Arrange Icons

Automatically arranges scattered File Window icons within the Edit Window

7

Context-sensitive Menus

Object View

The Object View offers context-sensitive menus that you access by right-clicking over an object or a specific area of the physical view. The following table explains access to each menu and displays a list of available options.

Locate your cursor in this area . . .	**Right-click to . . .**
■ Spreadsheet Headers	■ Sort objects in ascending or descending order. ■ Hide a column. ■ Show all columns.
■ Any Object Row	■ Edit the object definition in the Edit window. ■ Copy the object definition into the paste buffer. ■ Delete the object.

- Buffer Model Object row

  Note: These options are specific to buffer model objects and in addition to the options available for all objects.

  - View the object waveforms.
  - Create IBIS buffer file.
  - Highlight the rows of all components and package models that refer to the selected buffer model.
  - Simulate the object.
  - Extract the object.

- Submodel Object row

  Note: These options are specific to submodel objects and in addition to the options available for all objects.

  - View the object waveforms.

- Pin List Object row

  Note: These options are specific to pin list objects and in addition to the options available for all objects.

  - Create complete IBIS file. See Creating a Complete IBIS File in the *Model Integrity User Guide*.
  - Extract the object.

- Outside the Spreadsheet

  - Enable/Disable docking of the Object View.
  - Hide the Object View.
  - Float the Object View in the Main window.

Buffer Model SimulationDialog Box

Input Tab

Use this Tab to view or modify the input buffer test fixture parameters for the selected buffer model. You can also simulate the model in SigXplorer from this Tab.

Option	Description
Rseries (Ohms)	The value of the current limiting resistor.
Tperiod	The time period of the *pulse* generated in the spice file.
Simulate	Simulate the buffer model in SigXplorer and display the resultant waveforms in SigWave.

Output Tab

Use this Tab to view or modify the output buffer test fixture parameters for the selected buffer model. You include Rref, Cref, and Vref information to facilitate board-level timing and simulation.

Note: You can also simulate the model in SigXplorer from this Tab.

Option	Description
Rref (Ohms)	The reference resistance level of the test load used to specify the propagation delay or output switching time of the model.
Cref (F)	The reference capacitance level of the test load used to specify the propagation delay or output switching time of the model.
Vref (V)	The reference voltage level used for the model.
T period(s)	The time period of the *pulse* generated in the spice file.
Simulate	Simulate the buffer model in SigXplorer and display the resultant waveforms in SigWave.

Simulating a Model

Note: Simulation is also available in the Physical View by selecting an IBIS buffer model or DML buffer model. As you must select a buffer model, not the file, to view curves or simulate, expand the IBIS file in the Physical View.

1. Select either a DML buffer model or IBIS buffer model in an IBIS file to simulate by right-clicking on its icon in either the Physical View or the Object View.

   The context-sensitive Model menu appears.

2. Choose *Simulate* from the menu.

   A cautionary dialog box appears asking for permission to overwrite the existing model file.

3. Click *Yes* to overwrite.

   The *Reference Parameters* dialog box appears. If the buffer model is Input, only the *Input* tab appears, and if it is an Output buffer, the Output tab displays. Both tabs appear if the buffer model is either a receiver or a driver.

   Note: The parameter fields in the tabbed pages appear with test fixture information in the file containing the model code.

   -or-

   Click *No*.

   The simulation aborts.

4. Click on each tab and examine the test fixture parameters. Modify these parameter values as required.

5. Click *Simulate*.

   SigXplorer launches in batch mode, and the model simulates with the test fixture circuits using tlsim. If the simulation is successful, SigWave launches and displays the resultant waveforms.

Physical View

Procedures

The Physical View offers context-sensitive menus organized by file level and object level. Menu options display dynamically depending on the object selection and appear only if they are relevant to those selections.

The following table explains how to access each menu and shows a list of available options.

Note: The context-sensitive commands operate on selected objects in the Model Tree. To access the menus, either select a single object or multiple objects from the Model Tree.

Locate your cursor. . .	**Right-click to . . .**
■ On or near any file icon	■ *File* Edit the selected model file. ■ *Close* the selected model file. ■ *Save* the selected model file. ■ *Close* all the selected model files. ■ *Save all* the selected model files. ■ *Select* all files in the Physical view. ■ *Sort* all files in the Physical View by name. ■ *Sort* all files in the Physical View by type. ■ *Sort* all files in the Physical View by path.
■ On or near an IBIS file icon.	**Note:** These options are specific to IBIS files: ■ *Parse* the selected model file using *ibischk4.exe*.(Only available if a file is unparsed). ■ *Translate* the selected model file to a different model format using *ibis2signoise*.

- On or near a DML file icon.

  Note: These options are specific to DML files.

  - *Parse* the selected model file, using `dmlcheck.exe`.
  - *Make an index* (`.ndx`) file for the selected DML file, using `mkdeviceindex.exe`.
  - *Merge* selected DML files into a single DML file, using `mergedml.exe`.
  - *Mark* a file as qualified for simulation and indicate that it has been analyzed.

- On or near an ICM file icon.

  - *Parse* the selected model file using `dmlcheck.exe`.
  - *ICM to DML* translates an `.icm` file to a `.dml` file, using `ibis2signoise`.

- On or near an HSPICE output file icon.

  Note: These options are specific to HPICE Output files.

  - *View a curve* of the selected model in SigWave.

- On or near a Quad model file icon.

  Note: These options are specific to Quad model files.

  - *Translate* a `.mod` file to a `.dml` file, using `quad2signoise`.

- On or near an ESpice model file.

  Note: These options are specific to ESpice model files and are in addition to options available for other model files.

  - *Translate* the selected model file to a different format.

  Note: Perform this function only once. If attempted more than once, Model Integrity will continue to alter the format, and the file may no longer be accurate.

- On or near a Touchstone file

  Note: These options are specific to Touchstone files and are in addition to options available for other model files.

  - *Touchstone to DML* translates an `.s?p` file to a `.dml` file using `ts2dml`.
  - *View Curves* of the selected Touchstone file in SigWave.
  - *Convert And Normalize*. See Touchstone Conversion and Normalization Dialog Box on page 69.

- On or near any object icon.

  - *Edit* the syntax of the selected object.
  - *Copy* the syntax definition of the selected component into the paste buffer.
  - *Delete* the selected object.
  - *Sort* the selected model objects by name.
  - *Sort* the selected model objects by type.

■ On or near a submodel object icon.	**Note:** These options are specific to submodel objects and are in addition to the options for all object icons. ■ *View a curve* of the selected submodel in SigWave.
■ On or near buffer model icons in an IBIS file.	**Note:** These options are specific to buffer model icons and are in addition to the options available for all object icons. ■ *Extract* the object to a buffer model file. ■ *View a curve* of the selected buffer model in SigWave. ■ *Create* IBIS buffer file. ■ *Select* all components and package devices that refer to this model. ■ *Simulate*. See Simulating a Model on page 60 for further information.
■ On or near a buffer model icon in an IBIS buffer file.	■ *View a curve* of the selected buffer model in SigWave. ■ *Create* IBIS Buffer File. ■ *Select* all references.
■ On or near a buffer model icon in a DML file.	■ *View a curve* of the selected buffer model in SigWave. ■ *Simulate*. See Simulating a Model on page 60 for more information.

■ On or near a pin list in an IBIS file.	**Note:** These options are specific to pin list objects and are in addition to the options for all object icons. ■ *Create complete IBIS file*. See Creating a Complete IBIS File in the *Model Integrity User Guide*. ■ *Extract object*.
■ On or near a pin list in a pin list file.	■ *Create* a complete IBIS file. See Creating a Complete IBIS File in the *Model Integrity User Guide*.
■ Outside of the Model Tree	■ *Enable/Disable* docking of the Physical View. ■ *Hide* the Physical View. ■ *Float* the Physical View in the Main window.

Procedures

Parsing a File or Object Within the Physical View

You can view the parsing status of both files and objects in the Model Tree. The parsing status of the file appears as a checkmark or X, and a circle of red, green, or yellow indicates the object parsing status.

Note: Objects in a DML file will not have a parsing status, because *dmlcheck* provides overall file parsing information, not object level parsing information.

Note: See Edit Window on page 70 for information on parsing a file.

1. Click to select the file that you want to parse, then right-click.

   The context-sensitive File menu appears.

2. Choose the *Parse Selected* option.

   The file parses and updates the file status.

3. Check the parse status of the file by examining the checkbox (to the left of the file's icon).

   If a green checkmark appears in the status checkbox, parsing and validating occurred successfully without any errors or warnings.

   -or-

   If a yellow checkmark or red **X** appears in the status checkbox, parsing occurred with warnings (yellow) or errors (red). Continue by following the Locating Syntax Errors and Warnings on page 71.

Viewing Data Curves

1. In either the Physical View or Object View, right-click on a buffer model object.

   The context-sensitive Model menu appears.

2. Choose *View Curve*.

   A sub-menu appears displaying several curve categories.

3. Choose a curve category.

   A sub-menu appears displaying a number of curve types for the selected category.

4. Choose a curve type.

   SigWave displays the selected curve or set of curves.

Viewing Touchstone Data Curves

1. In the Physical View, right-click on a Touchstone file.

   The context-sensitive Model menu appears.

2. Choose either:

   - *View Curve in Cartesian*

     SigWave opens displaying the waveforms for the selected Touchstone file.

   - *View Curve in Smith or Polar*

     The **View Touchstone Curves** dialog box appears. See Edit Window on page 70

Marking a DML File as Qualified

Note: You must have write access to the file before you can qualify it.

1. Right-click on the file in the Physical View.
2. Select *Mark Qualified*.

   A message box will appear alerting you that Model Integrity has checked the file and shows warnings, if any checks failed.
3. Override the warnings and qualify the file, or edit the file and repeat *Mark Qualified*.

   The file becomes read-only, and the file parsing status changes to Qualified in the Physical View.

Undoing Qualification of a DML File

1. Attempt to edit the file.

   A message box appears asking if you want to reset the file to Unqualified status.
2. Click *Yes*.

   The qualified stamp disappears from the file, write permission returns, and the file status changes to *Not Checked* in the Physical View.

Creating a buffer model file by extraction

Note: To create a buffer model file, you must create SPICE netlist files and run SPICE on each file before using Model Integrity.

1. Edit the buffer sections (tabs) in the IBIS Options.
2. Open the `*.lis` file in Model Integrity.
3. Right-click on the file to bring up the popup menu.
4. Select *Create IBIS Buffer* and use the resulting dialog for creation of the buffer model file.

Extract to IBIS Buffer File

Selecting *Create IBIS Buffer File* from the right-click menu of an IBIS buffer model or SPICE file invokes the SPICE-to-IBIS functionality by bringing up the Extract to IBIS Buffer File dialog box.

Note: You must extract the models to an IBIS buffer file before creating a complete IBIS file.

See Creating a Complete IBIS File in the *Model Integrity User Guide*.

Model to Extract

- *File* Lists all IBIS, IBIS buffer, and SPICE files that are open in Model Integrity. Browse to locate additional files to open in Model Integrity.
- *Model* Lists all models contained in the selected file.
- *Type* Lists the type of model selected in the Model field.

Save As

- *I/O Type* Presents a list of buffer model types created from the selected model in the Model field.
- *File* Lists the name of the file to be created.

Options File

- *Path* Displays the IBIS Options file used to create an IBIS buffer file from a SPICE output file.
- *View SPICE Curve* Displays the unmodified curves in the SPICE file in SigWave (when you select a SPICE output file in the Model to Extract field).
- *View IBIS Curve* Displays the IBIS curves in SigWave in an IBIS file or previews the curves created in the SPICE output file.
- *Create Buffer File* Creates a buffer model file.
- *Reset* Resets the conversion to redefine typ/min/max curves in the HSpice output file.
- *IBIS Options Editor* Brings up the IBIS Options Editor dialog box to set design-specific values in an options file.
- *Close* Closes the dialog box.

Touchstone Conversion and Normalization Dialog Box

Option	Description
■ *Path*	Displays available Touchstone files. Select a file from the list.
■ *Parameter* ■ *Format* ■ *Reference Impedance (Ohm)*	Displays the values that exist as part of the selected file. For more information, see Converting and Normalizing Touchstone Files in the Model Integrity User Guide **Note:** A prompt appears when you edit the data format and reference impedance asking if you want to override the original file.
Choose Data Form ■ *Real - Imaginary* ■ *Linear Magnitude - Angle* ■ *dB Magnitude - Angle*	Select a format in which to view the data.
■ Choose Reference Impedance (Ohm)	Enter a different value to re-reference the existing data.
■ Choose New File Name	Enter a file name.

Edit Window

Procedures

The Edit Window offers a context-sensitive menu accessed by right-clickng in a File Window. Following is a list of the available menu options.

Right-click in a File Window to . . .

- Undo the last edit operation.
- Redo the last edit operation.
- Cut the selected text to the paste buffer.
- Copy the selected text to the paste buffer.
- Paste the contents of the buffer at the cursor location.
- Parse the active file. (IBIS and DML only)
- Translate the active file to another format. (IBIS, QUAD, HSPICE output, ESPICE)
- Display the Replace dialog box to perform Find and Replace text operations in the active file.
- Select all text in the active file.
- Display the Color Palette dialog box to change the file color code.
- Use delimiter parsers for DML.

Procedures

Parsing a File Within the Edit Window

Note: See Parsing a File or Object Within the Physical View on page 65 for information on parsing a file within the Physical View.

1. Click within the File Window of the file that you wish to parse to make it the *active* file, then right-click.

   The context-sensitive File menu appears.

2. Choose the *Parse* option.

   The file parses and updates the status.

3. Check the parse status of the file by examining the checkbox (to the left of the file's icon).

   If a green checkmark appears in the status checkbox, the file has been parsed successfully without any errors or warnings.

   -or-

   If a yellow or red mark appears in the status checkbox, the file has been parsed with warnings (yellow checkmark) or errors (red x). Continue on by following the Locating Syntax Errors and Warnings procedure.

Locating Syntax Errors and Warnings

You can easily locate the source of specific error and warning messages within a file that has been parsed.

Note: Only errors and warnings with associated line numbers can be found using this procedure. Others are found by looking in the file Edit window.

1. If the file that you wish to work with is not already active, make it active by clicking its File Window within the Edit Window.

   The file is brought forward in the Edit Window and becomes the *active* file.

2. Click the Parse and Validation Messages tab of the Output Window.

   The Validation Window appears.

3. Examine and (if necessary) fully scroll the message display of the active file to view all warning and error messages within the Validation Window.

4. Double-click on any error or warning message whose related syntax you wish to debug.

   If the line number where the error occured is known, the content of the active file will automatically scroll to the selected error or warning message within the Edit Window.

5. Edit the file to fix the syntax error or warning and then repeat the Parsing and Validating a File procedure until the file has been properly validated by Model Integrity.

Output Window

Procedures

The Output Window offers two different context-sensitive menus that you access by clicking the right mouse button with your cursor located in a specific area of the window. The following table explains how to access each menu and shows a list of available options.

Locate your cursor in this area . . .	**Right-click to . . .**
■ Within any of the tabbed windows.	Save the window contents to a file.
■ Window Borders	■ Enable/Disable docking of the Output Window ■ Hide the Output Window ■ Clear the window display. ■ Float the Output Window in the Main window.

Floating Windows

To Float a Window

1. Right-click on a border of a docked (Workspace or Output) window.

   The window manipulation context-sensitive menu appears.

2. Select *Float In Main Window* .

   The window changes from a docked position to a floating sub-window.

3. Place your cursor in the window header and drag the window to a suitable location.

To Unfloat a Window

1. Right-click on the border of a floating (Workspace or Output) window.

   The window manipulation context-sensitive menu appears.

2. Select *Float In Main Window*.

   The window reverts back to the last docked position on the desktop.

8

Toolbars

The Find Toolbar

You use the buttons on the toolbars to shortcut the process of executing commonly used commands from the menu bar. They also provide some additional functionality not available from the menu bar. Toolbars can be customized to suit your needs. Refer to "Tools – Customize" on page 48

You can re-arrange and move each toolbar to one of several different locations within the Model Integrity main window. You do this by grabbing the gripper bar with the left mouse button, while dragging the toolbar to its new location. Following is a list of locations for toolbars to relocate.

- Above the Workspace and Edit Window (default).
- Below the Workspace and Edit Window.
- Below the Output Window.
- Inside the Workspace, Edit or Output Windows.

Button	Function
	Moves to the next error marker in the active file within the Edit Window and scrolls the Output Window to the error description.
	Moves to the previous error marker in the active file within the Edit Window and scrolls the Output Window to the error description.
	Moves to the next warning marker in the active file within the Edit Window and scrolls the Output Window to the warning description.

Moves to the previous warning marker in the active file within the Edit Window and scrolls the Output Window to the warning description.

Clears all Error and Warning markers from the active file in the Edit Window.

Note: You will need to re-parse the file in order for these markers to re-appear.

Displays the Find in Open Files dialog box enabling you to search (with options) across all files open in Model Integrity for each occurrence of the text string you enter in the Find what? field.

The results of the search are displayed in the Find Window.

Find In Open Files Dialog Box

Use this dialog box to find and replace one or more occurences of the specified text string within the active file or within the selected text of the active file.

Option	Description
Find what:	Specifies the text string to search for. The arrow button at the end of the text field displays a drop-down list box containing strings previously searched for that you can select from.
Match case	Indicates that the case of the string should be considered when searching for matches.
Match whole word only	Indicates that the string should be matched as a whole word and not as a word fragment.
Regular expression	Indicates that the string should be matched to [keywords] only.