PathWave Design Software
Formerly known as Keysight EEsof EDA

Chapter 1:
Getting Started with PathWave Advanced Design System (ADS)

This Tutorial will introduce the basic structure of PathWave ADS workspaces, libraries and cells. This includes design capture, simulation, and displaying simulation results\(^1\). Figure 1 below shows how PathWave ADS organizes each workspace.

**Workspaces**
Different than a project, a workspace gives you access to libraries that contain cells, where the cells contain designs.

**Libraries**
In a workspace, libraries are a collection of cells. But libraries can also be Process Design Kits (PDKs) or separate folders outside of the workspace.

**Cells**
Cells are folders that replace design files in the old networks directory. Cells are in libraries and usually contain different views of a design- this means layouts, schematics and a symbol.

**Symbols**
The symbol represents all views in the cell. Usually one symbol is all you need for a cell.\(^2\)

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\(^1\) Workspaces in ADS 2011 and later replace projects from earlier ADS versions.
\(^2\) Understanding these concepts is key to using ADS 2011 and later effectively.
Step 1 – Create a New Workspace

1. Launch PathWave ADS and open the PathWave ADS main window select File > New > Workspace. Enter workspace name as desired in the dialog box shown in Figure 2, please note that the workspace name and path to the workspace location should not contain any spaces. Please note that changes to your PathWave ADS libraries can be completed by investigating the Change Libraries... button, the PathWave ADS Analog/RF and PathWave ADS DSP Libraries are included by default. Once you are satisfied with your workspace name, path, and libraries, click Create Workspace.

![Figure 2. New Workspace Dialog Box](image)

2. Once you complete the setup wizard, you will end up with a screen that looks like Figure 3. This is where your PathWave ADS journey begins.

![Figure 3. Main PathWave ADS Window](image)

3 The default path in PathWave ADS is `C:\Users\<Current_User>`
Step 2 – Creating Schematic Design

Usually circuit design will start from schematic entry. To start the schematic design, we can begin from **File > New > Schematic** or by clicking on the Schematic icon on the main window toolbar.

1. Enter the desired cell name (e.g. DiscreteLPS). Click **Create Schematic**.

   ![Figure 4. New Schematic Wizard](image)

   Figure 4. New Schematic Wizard

2. A new blank schematic page should be visible.

   ![Figure 5. Blank Schematic Window](image)

   Figure 5. Blank Schematic Window
3. Using the Basic Components, draw the schematic shown in Figure 6.

![Completed Schematic](image)

Figure 6. Completed Schematic

4. Using the S.P., or S. Parameter component in the Basic Components menu, add the S_Parameters simulation object to your schematic, shown in Figure 7. By double clicking the resulting S_Parameters component you can edit the parameters to the following values in the window shown in Figure 8.
   a. Start = 0.01GHz
   b. Stop = 1GHz
   c. Num. of Points = 101

![S-Parameter Simulation Setup Window](image)

Figure 7. Schematic with S-Parameters Simulation Object

Figure 8. S-Parameter Simulation Setup Window
5. Once your simulation parameters are setup, go to **Simulate > Simulate**, or press **F7**, to run the simulation. You will be met with a blank simulation results page like in Figure 9.

![Figure 9. Blank Simulation Results Window](image)

6. Using the buttons in the **Palette Menu**, begin adding the desired results to the results window. In this case we are going to add a Smith Chart for $S(1,1)$ Input Reflection Coefficient, Figure 10.

![Figure 10. Inserting Smith Chart for $S(1,1)$](image)
7. After Placing the Chart on the results window, there will be a dialog box to add traces to the plot. Add the S(1,1) trace by selecting S(1,1) and clicking the \( \text{Add} \) button, then click \text{OK}, Figure 11.

![Figure 11. Adding S(1,1) Trace to Smith Chart](image)

8. Next, using the \textbf{Text} tool, add the graph title and any notes necessary. Each Simulation Results Window can contain many graphs, notes, and equations, and be customized to show the results you desire.

![Figure 12. Results Window with Smith Chart](image)
9. Save the design to save all the work and inspect the main window to notice the schematic cell and data display (<filename>.dds).

Figure 13. PathWave ADS Main Window After Saving

Conclusion

Congratulations! You have completed Getting Started with PathWave Advanced Design System (ADS).

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