**SUMMARY**

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**Abstract:**

In this Support Kit, we will show you how to create a model using the Datasheet Curve Modeler.

We have provided you with a lab guide, sample reference plot image and Designer project.

The lab will guide you through the process of VHDL-AMS model creation by creating a free hand model over a datasheet image using the Datasheet Curve Modeler.

**Estimated time to complete: 15 – 30 minutes**

**Version Information: X-ENTP VX.2.13**

**DETAILS**

**Creating a Model Using Datasheet Curve Modeler:**

**Download** Datasheet\_Curve\_Modeler.zip to your **Desktop**

1. Unzip the file to your Desktop
2. Open ReferencePlot.png found in the Datasheet\_Curve\_Modeler folder
3. Type AMS into the Search Bar, open your version of AMS flow (This lab is using Xpedition AMS VX.2.13)
4. Once open, select **File > Open > Project**
5. Navigate to DCM.prj under the Datasheet\_Curve\_Modeler folder
6. **Simulation > Model and Symbol Wizard**
7. Under the **Select Source tab**, select **Datasheet** then click **Next**
8. Under the **Select/Create Model** tab, select **Datasheet Curves** in the dropdown menu
9. Click **Launch** to open the **Datasheet Curve Modeler**
10. Start the image capture tool from **File > Capture Image**
    1. An alternative way is to go to **File > Open> Existing Image** and navigate to ReferencePlot.png found in the Datasheet\_Curve\_Modeler folder (image is a .png type)
11. Click **Capture** in the Image Capture window
12. Drag capture tool over open datasheet image
13. Resize capture tool to enclose image
14. Click Save As
15. Enter DMS\_res\_plot and save to “Desktop\Datasheet\_Curve\_Modeler” as a jpeg image
16. Open Data Ranges from **Edit > Set Data Range**
17. Enter range and type for x-axis data, in this case x-min = -50 and x-max = 100.
18. Select Linear for datatype
19. Enter range and type for y-axis data, in this case y-min = 100 and y-max = 1100
20. Select Linear for datatype
21. Confirm form entries
22. Select Bound Box Mode from **Edit > Set Bounding Box**
23. Confirm bounding box instructions
24. Define graph bounding box
25. Click on upper-most (xmin, ymax) value
26. Click on origin (xmin, ymin) value
27. Click on right-most (xmax, ymin) value
    1. Blue box appears bounding the graph area
28. Select Add Data Points mode from **Edit < Add Data Points**
    1. Digitize waveform.
       1. Click left-to-right along waveform to place data points
       2. Data points must be within blue data boundary
       3. Data table is automatically filled-in with data point coordinates
       4. Points must be monotonically increasing along x-axis
    2. Edit data points
       1. Click and drag data points.
       2. Edit values in the data table.
       3. Add data points by right clicking on one datapoint and selecting “Add datapoint” in the menu

**NOTE**: If you have more than one curve, go to **Configure >Number of Curves > Curve Number**. You will go from left to right along the waveform but now there will be multiple datapoints every time you click on the curve.

**NOTE**: Restriction of x-axis or y-axis movement of datapoints can be implemented through **Configure > Lock Datapoint X or Y Movement**

1. **File > Create Model and Save the Data File**
2. Choose model type
   1. For this example, select the resistor as a function of voltage under the **Passive** tab
3. Confirm the Save data to file window
   1. Respond to generator prompts
      1. Click OK to open Save As form
      2. Enter text res\_vs\_volt and save to “Desktop\Designer\_Curve\_Modler\DMS\hml”
      3. Click Save to save text file and generate model/symbol
      4. Click OK to close model confirmation form
   2. Close the Datasheet Curve
4. Verify Model Details in the Wizard
   1. VHDL-AMS file name
      1. **RES\_VS\_VOLT.vhd**
   2. Model Entity
      1. Defines model parameters and ports, select **RES\_VS\_VOLT**
   3. Model Architecture
      1. Describes device behavior, select **IDEAL**
   4. Click Next

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1. Select/Create Symbol Window
   1. Review model source code
   2. Select the source for symbol graphics
      1. Default: **Use the symbol selected in the Datasheet tool**
   3. Click Next

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1. Verify Set/Map Parameters Details
   1. Review the parameter table.
      1. If needed, change information in the Value column
      2. Table may be grey if no parameters in the model can be changed
      3. In this example, the table will be **blank**
   2. Click **Finish**
2. Choose Model Library
   1. Select **Local Library** to save the model into. Other options include:
      1. Local Project
      2. Default shared library
      3. User defined libraries
   2. Click OK to save the model and close the Model and Symbol Wizard
      1. Model is now available in the **Simulation > Search/Place Symbol** or DataBook library browsers
3. A window with the symbol will pop up, this can be closed to return to the schematic.
4. Delete the placeholder resistor
5. Open **Simulation > Search/Place Symbol**
6. Click the + sign on (Current Project)
7. Click the + sign on (DMS)
8. Select and place res\_vs\_volt
9. Close **Search/Place Symbol**
10. Place res\_vs\_volt symbol where placeholder resistor used to be
11. Select **Simulation > Simulate**
12. Click on the Multi-Run tab
    1. Select “**Sweep Values**” under Multi-Run Tab
    2. Check “**DC Sweep**”
    3. Click Parameter Edit
       1. Parameter: Select value seen (should match ID of voltage source)
       2. Sweep Type: Increment
       3. Sweep Start: -50
       4. Sweep Stop: 100
       5. Sweep Increment: 1
       6. Click Ok

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1. Under the **Results** tab, select “**All Waveforms**” in the drop-down menu under **DC Waveforms**. This will give the waveform for the new resistor that was just placed.
2. Under the **Simulations** tab, neither Time-Domain or Frequency Analysis should be enabled
3. Click Ok
4. Simulation will perform 151 runs; progress can be seen in the bottom left of the Xpedition tool.
5. Waveform Analyzer will open once simulation is complete.
6. Click the **+** next to **y1<yournumber>** in the Waveform List
7. Double click the wave **res**
8. The waveform will match the one taken in the Datasheet Curve Modeler

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