

# SUMMARY



## 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.2.10**

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## 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**

- a. 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
  - a. Blue box appears bounding the graph area
28. Select Add Data Points mode from **Edit < Add Data Points**
  - a. Digitize waveform.
    - i. Click left-to-right along waveform to place data points
    - ii. Data points must be within blue data boundary
    - iii. Data table is automatically filled-in with data point coordinates
    - iv. Points must be monotonically increasing along x-axis
  - b. Edit data points
    - i. Click and drag data points.
    - ii. Edit values in the data table.
    - iii. 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**

29. **File > Create Model and Save the Data File**

30. Choose model type

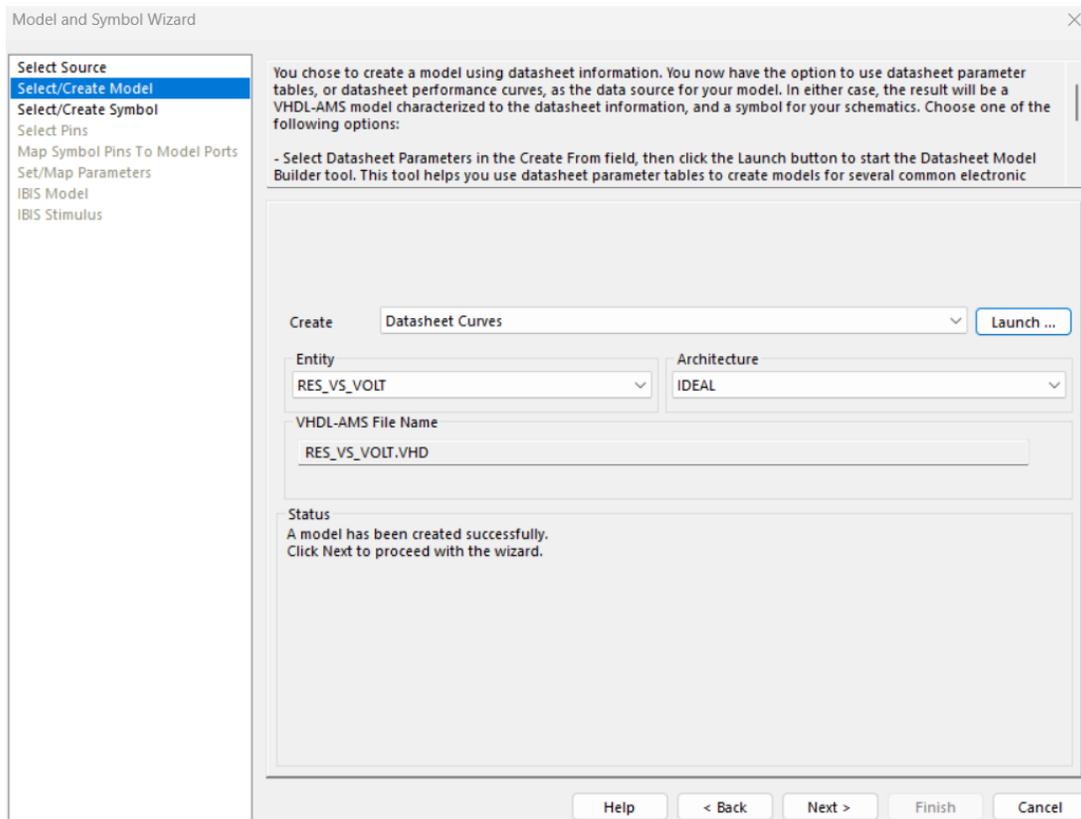
- a. For this example, select the resistor as a function of voltage under the **Passive** tab

31. Confirm the Save data to file window

- a. Respond to generator prompts
  - i. Click OK to open Save As form
  - ii. Enter text `res_vs_volt` and save to `"Desktop\Designer_Curve_Modler\DMS\hml"`
  - iii. Click Save to save text file and generate model/symbol
  - iv. Click OK to close model confirmation form
- b. Close the Datasheet Curve

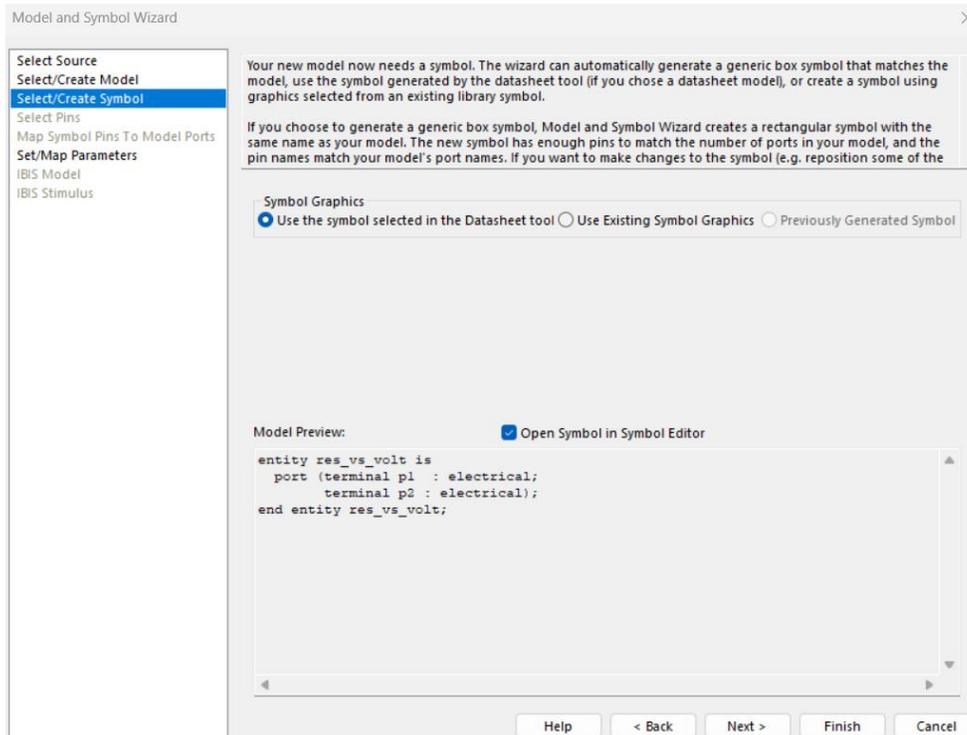
32. Verify Model Details in the Wizard

- a. VHDL-AMS file name
  - i. **RES\_VS\_VOLT.vhd**
- b. Model Entity
  - i. Defines model parameters and ports, select **RES\_VS\_VOLT**
- c. Model Architecture
  - i. Describes device behavior, select **IDEAL**
- d. Click Next



### 33. Select/Create Symbol Window

- a. Review model source code
- b. Select the source for symbol graphics
  - i. Default: **Use the symbol selected in the Datasheet tool**
- c. Click Next



### 34. Verify Set/Map Parameters Details

- a. Review the parameter table.
  - i. If needed, change information in the Value column
  - ii. Table may be grey if no parameters in the model can be changed
  - iii. In this example, the table will be **blank**
- b. Click **Finish**

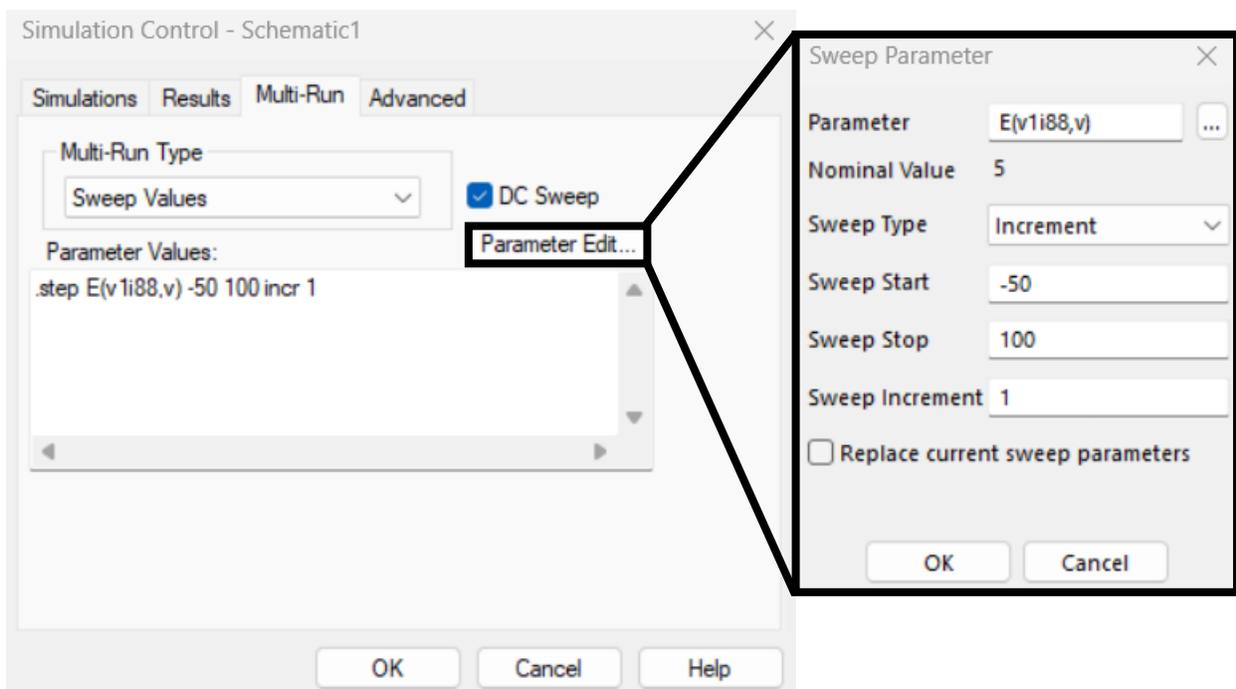
### 35. Choose Model Library

- a. Select **Local Library** to save the model into. Other options include:
  - i. Local Project
  - ii. Default shared library
  - iii. User defined libraries
- b. Click OK to save the model and close the Model and Symbol Wizard
  - i. Model is now available in the **Simulation > Search/Place Symbol** or DataBook library browsers

36. A window with the symbol will pop up, this can be closed to return to the schematic.

37. Delete the placeholder resistor

38. Open **Simulation > Search/Place Symbol**
39. Click the + sign on (Current Project)
40. Click the + sign on (DMS)
41. Select and place res\_vs\_volt
42. Close **Search/Place Symbol**
43. Place res\_vs\_volt symbol where placeholder resistor used to be
44. Select **Simulation > Simulate**
45. Click on the Multi-Run tab
  - a. Select "**Sweep Values**" under Multi-Run Tab
  - b. Check "**DC Sweep**"
  - c. Click Parameter Edit
    - i. Parameter: Select value seen (should match ID of voltage source)
    - ii. Sweep Type: Increment
    - iii. Sweep Start: -50
    - iv. Sweep Stop: 100
    - v. Sweep Increment: 1
    - vi. Click Ok



46. 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.
47. Under the **Simulations** tab, neither Time-Domain or Frequency Analysis should be enabled
48. Click Ok

49. Simulation will perform 151 runs; progress can be seen in the bottom left of the Xpedition tool.
50. Waveform Analyzer will open once simulation is complete.
51. Click the + next to **y1<yournumber>** in the Waveform List
52. Double click the wave **res**
53. The waveform will match the one taken in the Datasheet Curve Modeler

