1.8 Parameterizing for a Common Input

What will be learned:

- Inserting a model into another drawing file
- Importing and renaming symbols

Prerequisites:

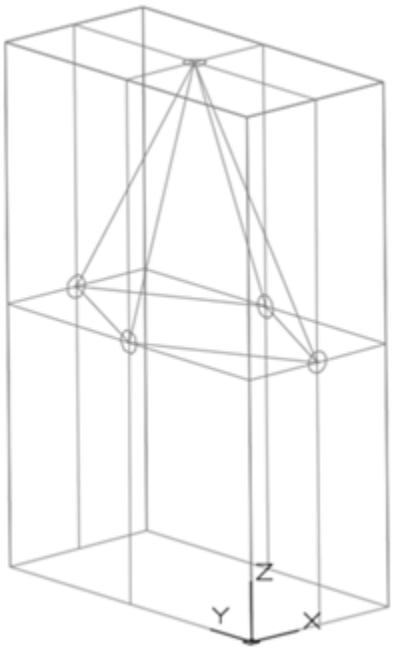
- 1.1 Setting Up a Template Drawing

Sometimes it is common that the same geometry is used over and over in the same model. This geometry can be as simple as a five or six-sided box or can be much more complicated. In this example, a simple five sided-box with centered nodes that has conductors between each of the faces has been created. The geometry has been parameterized so that the user can simply change the x, y, and z sizes so that the box will automatically update when the user changes the symbols.

Parameterized Box Example

1. Double click on the file box.dwg located in the `Tutorials\Thermal Desktop - legacy\Parameterized Box For Insert` folder.

   Thermal Desktop opens with the drawing on the screen.



Parameterized Box Example (Continued)	
2. Select **Thermal** > **Symbol Manager**. The **Symbol Manager** dialog box appears. 3. Select **Done** to close the dialog box.	Take a few moments to examine the model. Bring up the Symbol Manager. Notice the parameters for x, y, and z sizes. There is also a parameter for the thickness of the faces on the box.
4. Click on the top of the box to select it. 5.  or **Thermal** > **Edit**. The **Thin Shell Data** dialog box appears. 6. Select the **Surface** tab. 7. Look at the **X Max** and **Y Max** fields.	Look at some of the data that make up the top of the box. After selecting the top, utilize Thermal Desktop's Edit function to display the **Thin Shell Data** dialog box. Notice the lengths of the X and Y axes are parameterized (Surface tab) and that the Z translation is also programmed (Trans/Rot tab). Take a moment to select some of the other surfaces and conductors to get an idea of how they are programmed.
8. Select the **Trans/Rot** tab. 9. Look at the **Translation Z** field. 10. Select **OK** to close the dialog box. 11. Repeat the process for some of the other surfaces and conductors as desired.	
12. Select **File** > **Exit**. A **Thermal Desktop/AutoCAD** dialog box appears asking to save the drawing changes. 13. Select **Yes**.	Close box.dwg saving it to the current AutoCAD version and exit Thermal Desktop.
14. Copy the template `thermal.dwg` file created in the first tutorial to the `\Tutorials\Thermal Desktop\Parameterized Box For Insert` directory. **Note:** Be sure to hold the <**Ctrl**> key down if dragging the template file icon to the new directory so that the file is copied, rather than moved. 15. Rename the copied template file to `parameter.dwg`. 16. Start Thermal Desktop by double clicking on the `parameter.dwg` file icon.	

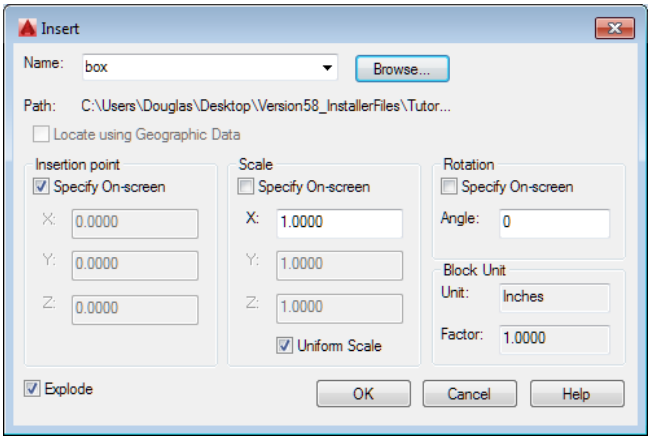
Parameterized Box Example (Continued)

17. Type **AboutRadCAD** to start Thermal Desktop.
18. On the **Thermal2** ribbon tab in the **Import** panel, click **Insert DWG**.

    Read and acknowledge the instruction window. The Insert dialog box appears.
19. Select **Browse**.

    The **Select Drawing File** dialog box appears with two drawings displayed in the drawing field.
20. Select **box.dwg** to highlight it.
21. Select **Open**.

    The **Insert** dialog box reappears with box displayed in the Name field.
22. Confirm that **Specify On-Screen** is checked under **Insertion Point**.



23. Check **Explode**
24. Select **OK** to close the dialog box.

    The Command Line should now read:

```
Specify insertion point or [Basepoint/
Scale/X/Y/Z/Rotate]:
```

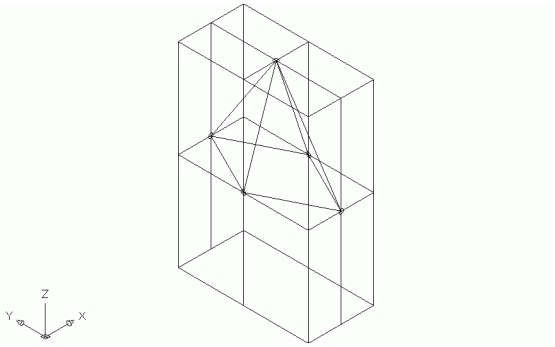
25. Click at any point on the screen to place the box. (Some versions of AutoCAD may prompt for scaling factors at this point)

    A close view of a box corner appears in the drawing area.

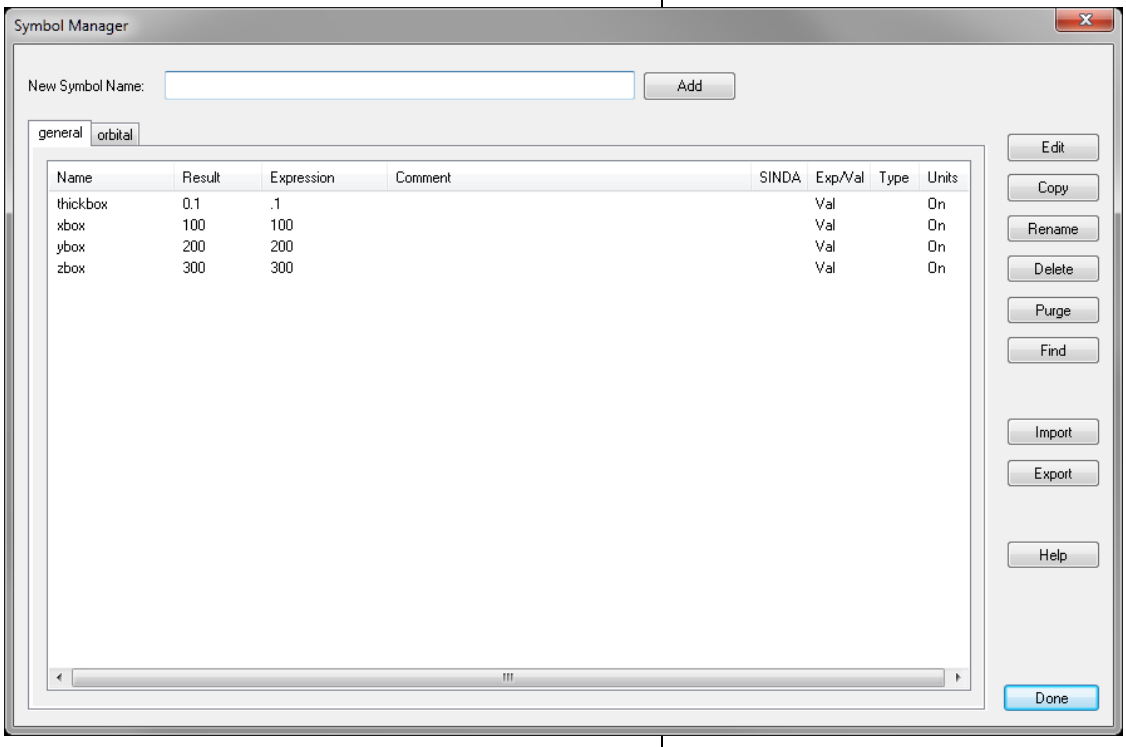
Bring the box drawing into the template copy.

If ribbons are not visible, type **Ribbon**. If the **Thermal2** tab is not visible, type **ThermalRibbon**.

Each user will have a somewhat different image appear in the drawing area because of the insertion point selections but, in general, the drawing should appear similar to the drawing below once zoomed extents is performed.



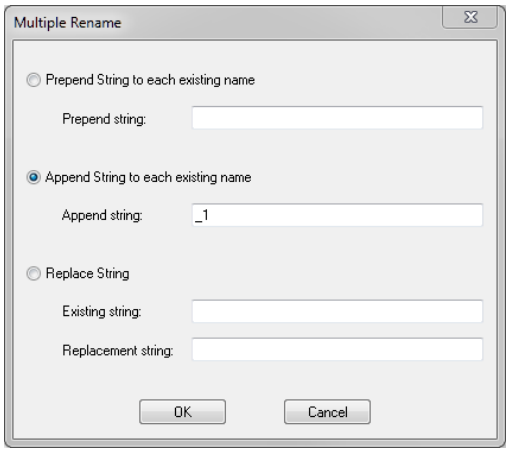
Parameterized Box Example (Continued)	
26.  or **Zoom** > **Extents**. 27. Click on the top of the box. Notice that only the top is selected. 28. Select other surfaces as desired and press <**Esc**> to deselect when finished.	If the entire box is selected then the block was not exploded. Explode the box so that it is no longer an AutoCAD Block, but individual Thermal Desktop entities. Just type EXPLODE when the entire box is selected. Once Explode is performed, individual components of the box can be selected rather than only the whole box.
29. Select **Thermal** > **Symbol Manager**. The **Symbol Manager** dialog box appears and the dialog box's fields are empty. 30. Select **Import**. The **Open** dialog box appears. 31. Select **box.dwg** to highlight it and then select **Open**. The **Import** dialog box appears. 32. Select **thickbox**, **xbox**, **ybox** and **zbox** and select **Import**. The **Symbol Manager** dialog box reappears with the symbols displayed.	Use the **Symbol Manager** Import command to import the file boxSymbols.sym. Xbox, ybox, zbox and thickness symbols are imported. Symbols can be exported into SYM files from the symbol manager. Symbols can be imported either from a SYM file or directly from a DWG file.



Parameterized Box Example (Continued)

33. Select the 4 symbols:
    - Click on **thickbox** to highlight it and then, hold down the <**Shift**> key and click on **zbox.**
34. Select **Rename** on the right side of the form.

    The **Multiple Rename** dialog box appears.
35. Select the **option** button beside Append `String to each existing string.`
36. Type **_1** in the **Append string** field.



37. Select **OK**.

    The **Symbol Manager** dialog box reappears displaying the new symbol names.

The box is to be imported multiple times, so the imported symbols must be renamed. Append _1 (underscore 1) to each of the symbol current names.

Parameterized Box Example (Continued)

38. Select **xbox_1**.
39. Select **Edit**.

    The **Expression Editor** dialog box appears with the current xbox_1 information.

    Note: Double clicking on a symbol also displays the **Expression Editor**.

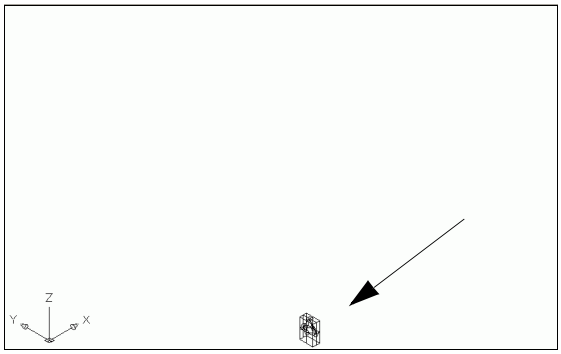
40. Highlight the current value in the **Expression** field if not already highlighted and type **10**.
41. Select **OK**.

    The changed parameters for xbox_1 are reflected.
42. Repeat the process for **ybox** and **zbox**, changing the values to 1/10 of the current value.

    The **Symbol Manager** dialog box displays the new values.
43. Select **Done** to close the **Symbol Manager** dialog box.

Edit the symbols for xbox, ybox, and zbox to be one tenth of their original values.

The box changes in the drawing area to reflect the changes in size.



44. On the Therma12 ribbon tab in the Import panel, click **Insert DWG**.

    Read and acknowledge the instruction window.

    The **Insert** dialog box appears with box in the **Name** field highlighted.

    Specify On-Screen under Insertion point is already selected from the previous insertion.
45. Select **OK** to close the dialog box.

    A box is attached to the cursor waiting for insertion.

    The Command Line should now read:

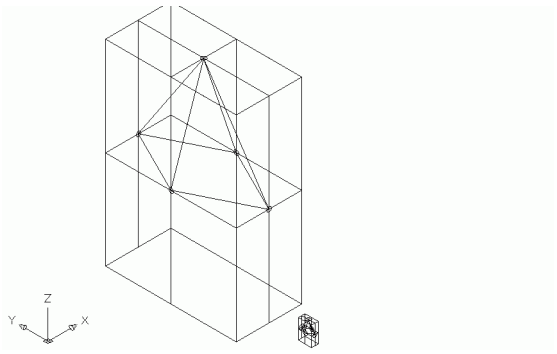
```
Specify insertion point for block:
```

46. Click at any point on the screen to place the new box.

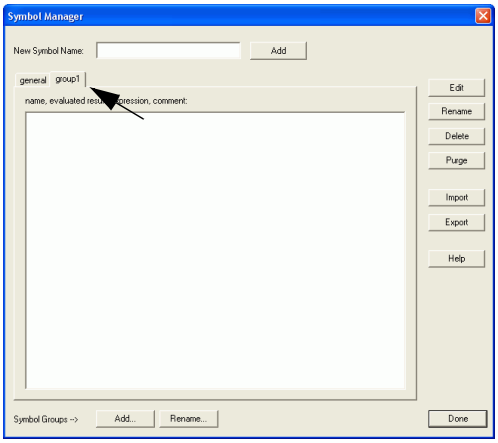
    The new box appears on the screen. Notice the difference in the sizes of the two boxes—the first box's size was changed to 1/10 of its original size (xbox_1).

Insert another box. Use the **Insert** > **Block** command, but this time it is not necessary to reselect the box.dwg file, simply change the Name: pull down to box and select OK.

Select any point on the screen to place the box, and then explode the box.

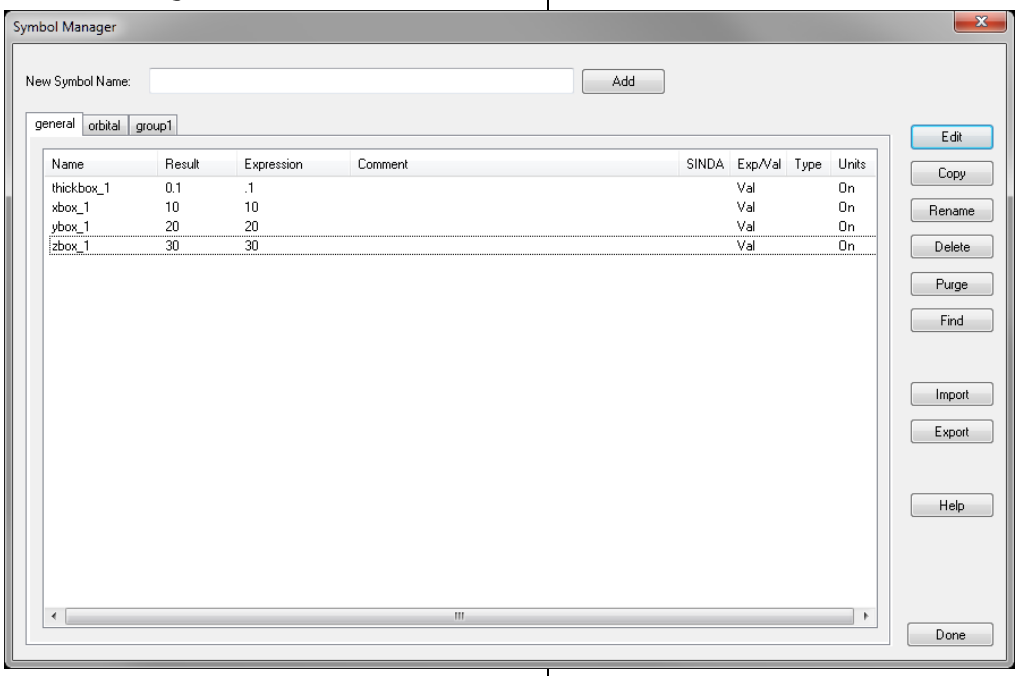


Once the second box is inserted, explode it so the individual entities.

Parameterized Box Example (Continued)	
47. Click on various parts of the box as desired to confirm "explosion" and press <Esc> when finished.	
48. Select **Thermal** > **Symbol Manager**. The **Symbol Manager** dialog box reappears with the symbols renamed earlier displayed. 49. Right-click the general tab and select **Add New Group** to create a new Symbol Group.  A new tab named **group1** is displayed.	The symbols listed in the **Symbol Manager** belong to a group named general. Add a second symbol group named group1.

Parameterized Box Example (Continued)

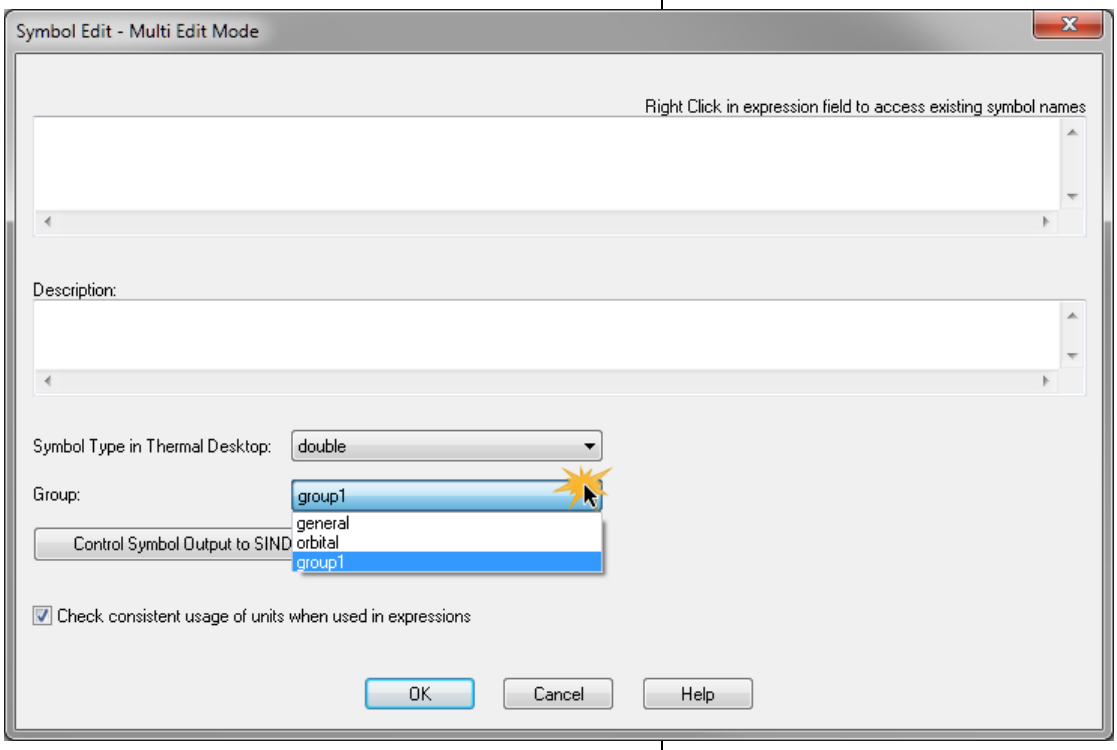
50. Click on the **general** tab.



51. Select all 4 symbols.
52. Select **Edit**.

Parameterized Box Example (Continued)

The **Symbol Edit – Multi Edit Mode** dialog box appears.



53. Click on the arrow next to the **Group** field and select **group1** from the drop-down list.
54. Select **OK** to close the **Symbol Edit – Multi Edit Mode** dialog box.

    The **Symbol Manager** dialog box shows the symbols are removed from the general symbol group and moved to group1. The general tab is empty.

Note: Click on the **group1** tab to verify the move

Parameterized Box Example (Continued)

55. Select the **general** tab if not already selected.
56. Select **Import**.

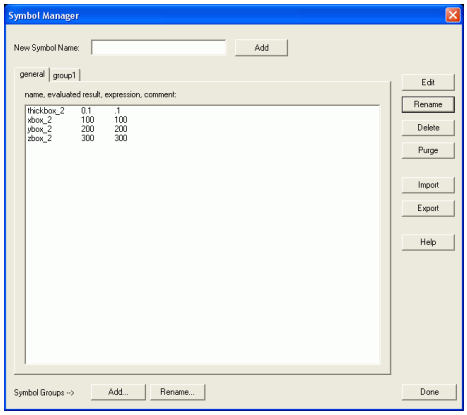
    The **Open** dialog box appears.
57. Select **box.dwg** to highlight it and then select **Open**.

    The **Import** dialog box appears.
58. Select **thickbox**, **xbox**, **ybox** and **zbox** and select **Import**.

    Another set of the original symbols are imported and display in the **general** tab.
59. Select the 4 newly imported symbols.
60. Select **Rename**.

    The **Multiple Rename** dialog box appears.
61. Type **_2** in the **Append string** field and verify that **Append String to each existing name** is selected.
62. Select **OK**.

    The **Symbol Manager** dialog box reappears displaying the new symbol names.

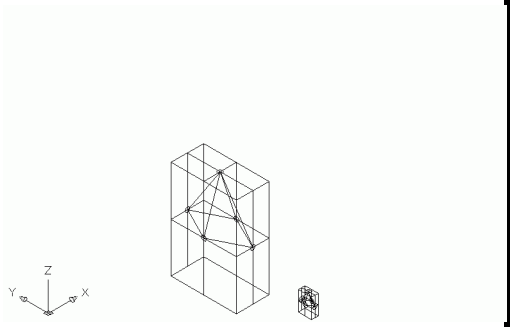


63. Select **xbox_2**.

Add another set of symbols and append the names of the entities with _2.

Symbols can be imported directly from DWG files as well as exported symbol files.

Also change the values of xbox, ybox and zbox to 1/2 of the current values.

Parameterized Box Example (Continued)	
64. Select **Edit**. The **Expression Editor** dialog box appears with the current xbox_2 information. 65. Highlight the current value in the **Expression** field if not already highlighted and type **50** (1/2 of the current value of 100). 66. Select **OK** to close the **Expression Editor** dialog box. The edited value displays in the **Symbol Manager.** 67. Repeat this process for **ybox** and **zbox**, changing the current values by 1/2. The **Symbol Manager** dialog box reflects the changes. 68. Select **Done** to close the **Symbol Manager**.	The second box reflects the change in size.  **Figure 1-12: Second Box Edited**
These steps may be repeated for as many boxes that are in the model.	
69. Select **File** > **Exit**. A **Thermal Desktop/AutoCAD** dialog box appears asking to save the drawing changes. 70. Select **Yes**.	Exit Thermal Desktop and save as prompted.