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HyperWorks

Altair HyperGraph 2D 2019 Tutorials

HG-1020: Modifying Plots

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In this tutorial you will learn how to:

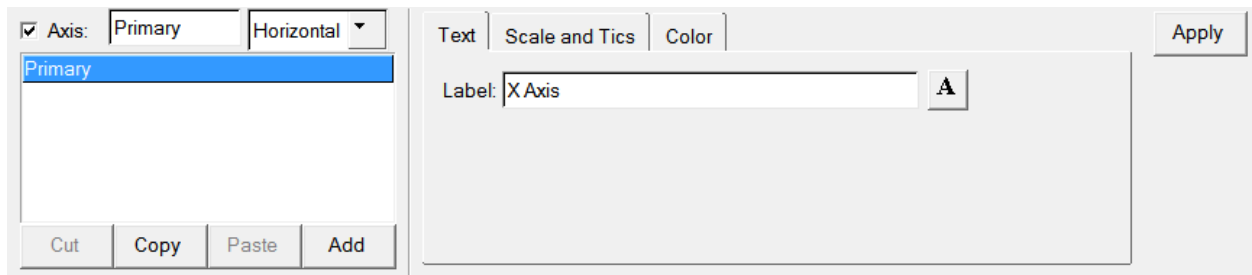
- Work with the **Axes** panel
- Use the **Coordinate Info** panel and **TextView**
- Modify curves
- Create secondary axis and assign curves to them

Tools

The **Axes** panel can be accessed one of the following ways:

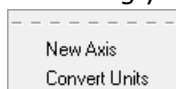
- Click the **Axes** icon 
- Or
- From the menu bar select **Annotations > Axes**

This panel allows you to add multiple axes to plots. Also, axis attributes such as labels, color, and scaling can be modified.




To access **Convert Units** tool, right-click on the plot axis and select **Convert Units**.

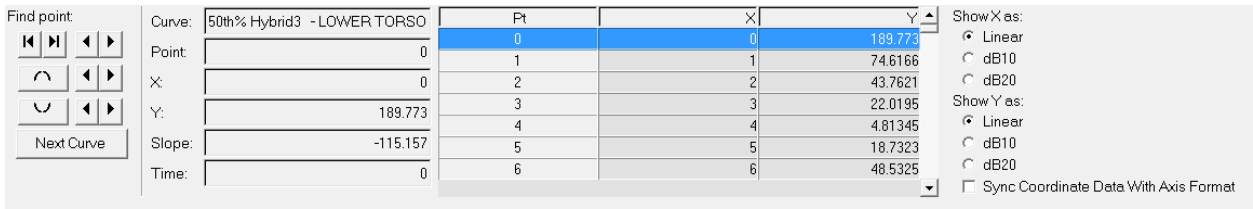
The **Convert Units** tool allows you to convert the current unit of measure of a horizontal or vertical axis to another unit of measure. All curves associated with the axis are scaled accordingly and the axis label is updated to reflect the new unit of measure.



The **Coordinate Info** panel can be accessed one of the following ways:

- Click the **Coordinate Info** icon, 
- Or
- From the menu bar select **Curves > Coordinate Info**


This panel allows you to retrieve individual point data on any curve in the active window. When a point is selected, its data is displayed in the panel.



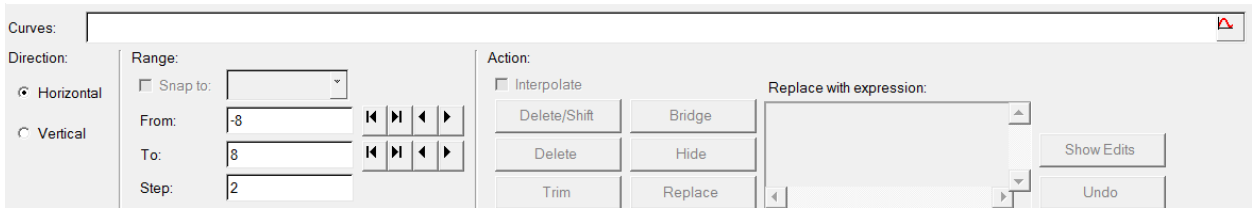
To access **TextView**, use the **Select Application** menu and click **TextView**, .

The text editor window allows you to view, edit, and save text files, conduct text searches, change text attributes, and evaluate Templex. With Templex, you can obtain curve data from the plot window and display the results in text format in the text window


The **Modify Curves** panel can be accessed in one of the following ways:

- Click the **Modify Curves** icon 
- Or
- From the menu bar select **Curves > Modify Curves**.

The **Modify Curves** panel enables you to modify curve data pertaining to a plot. Curves can be deleted, trimmed, bridged, or hidden within a specified range and orientation.



The **Scales Offset and Axis Assignments** panel can be accessed in one of the following ways:

- Click the **Scales Offset and Axis Assignments** icon 
- Or
- From the menu bar select **Curves > Scales Offsets and Axis Assignments**.

Curve scaling, offsets, and axis assignments can be applied to multiple curves using this panel.



Exercise: Modify and Interrogate XY Curves

Step 1: Open Session File demo_3.mvw

1. From the **File** menu click **Open > Session**.
2. From the `plotting` folder, select the `demo_3.mvw` file and click **Open**.

Step 2: Using the Convert Axis Units tool to scale the Y axis.


1. On page 2, activate **window 1**.
2. Right-click on the window's vertical axis and select **Convert Units** from the pop-up menu.

The current selection in the **Convert Axis Units** dialog defaults to **Time**. This is because the unit converter did not recognize the **Y** axis unit.

3. Select **Force** from the dialog.
 - Select **From: N** from the drop-down menu.
 - Select **To: kN** from the drop-down menu.
4. Click **OK** to apply the change and close the dialog.


The **Y** axis' label is changed from **Force** to **Force (kN)**. Also, the **Y** axis numbers and the curves' **Y** data are scaled by 0.001.
5. Open the unit converter again for the same **Y** axis. **Force** is now selected as the tool recognizes the axis' unit of measure.
6. Click **Cancel** to close the **Convert Axis Units** dialog.

Step 3: Change the Y axis label for window 1 to Force (kiloNewtons)

1. Click the **Axes** panel icon, .



The **Primary** axis is highlighted or active in the **Axes** list.
2. Above the **Axes** list, select **Vertical** from the drop-down menu.
3. From the **Text** tab, change **Force (kN)** to `Force (kiloNewtons)` and press ENTER to apply the change.

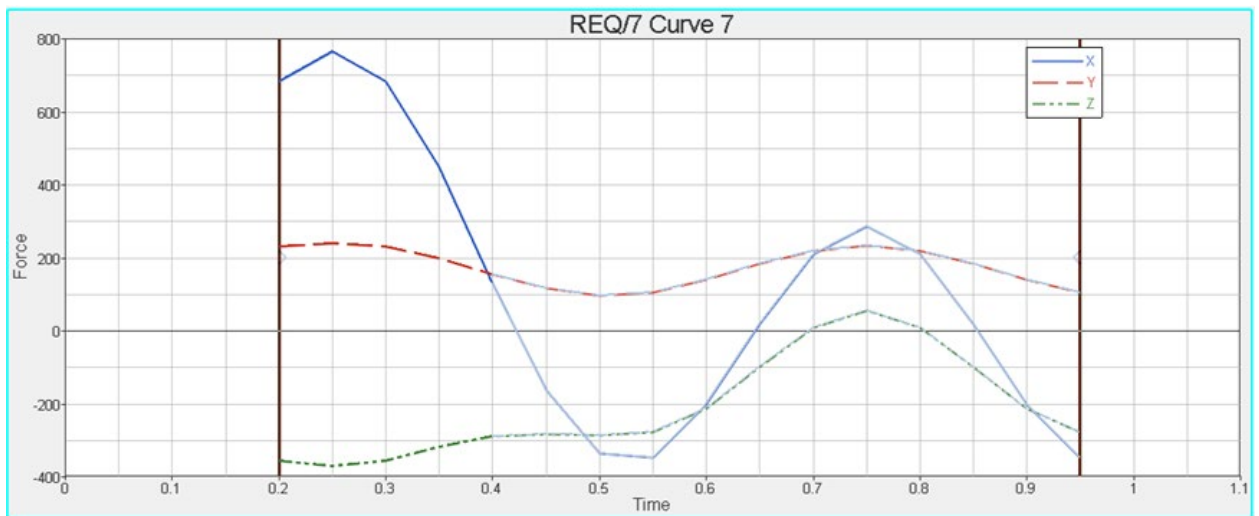
Step 4: Creating a Datum Line

1. Activate **window 2** on page 2.
2. Click the **Datum Lines** panel icon, .
3. Click **Add**.
4. Verify that the choice under the selection for **Datum** is **Horizontal**.
5. Select the **Position** tab.
6. Verify that **Axis** is set to **Primary**.






7. For **Position**, enter the expression $\sin(90) + 100 - \cos(0)$ and press ENTER.
8. Click the **Line Attributes** tab and select a different color for the line.

Step 5: Trim the curves.



1. Activate **window 3** on page 2.
2. Click the **Modify Curves** icon, .
3. To the right of the **Curves** field, there is a curves icon, . Press this button.
The **Select Curves** dialog is displayed.
4. Under **p2:Force-2** select **w3: XY plot** and click **OK**
All curves in window 3 are selected and **p2w3c1**, **p2w3c2**, **p2w3c3** are displayed in the **Curves** text field.
5. Verify the option for **Direction** is set to **Horizontal**.
6. Under **Range**, specify 0.2 for **From** and press ENTER.
7. Specify 0.95 for **To** and press ENTER.
8. Under **Action**, click **Trim** to remove the data outside of the specified range for the selected curves.



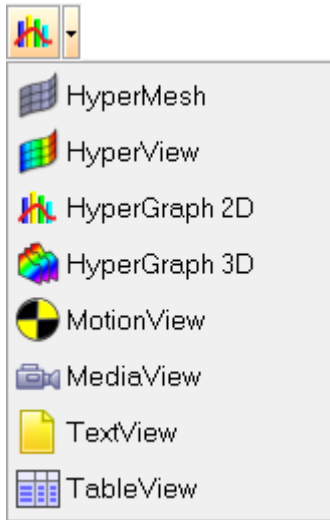
Step 6: Create a secondary Y axis in a plot window.

1. Click the **Add Page** icon, .
2. Go to the **Build Plots** panel, .
3. Open the `demo.dat` file, located in the `plotting` folder.
4. Select the option **Layout: Use current plot**.
5. Create a curve for **X type:** Time, **Y type:** Force, **Y Request:** REQ/3 Curve3, and **Y Component:** X.
6. Create a second curve in the same plot window for **X type:** Time, **Y type:** Displacement, **Y Request:** REQ/33 Curve33, and **Y Component:** X.
7. Go to the **Axes** panel, .
8. From the drop-down menu above the **Axis** list select **Vertical**.
9. Click **Add** to create a secondary vertical axis on the plot window's right side.
An axis with the name **Y1** is created and its name is highlighted (active) in the **Axis** list.
10. In the **Axis** text field above the **Axis** list, rename the **Y1** axis to `disp` and press ENTER.
11. On the **Text** tab, rename the **Y1** axis label to `Comp x disp` and press ENTER.
12. Go to the **Scales, Offsets, and Axis Assignments** panel, .
13. Verify the curve `REQ/33 Curve 33-X` is highlighted.
14. Under **Axis assignments**, click on the **Y:** drop down, select **disp** and click **Apply**.
The secondary vertical axis is assigned to the curve `REQ/33 Curve33-x`.
15. Click **Fit**  to fit the curve to the plot window.

Step 7: In a text editor window using Templex, obtain information for existing xy curves.


1. Click on the **Page Layout** icon, , and select a two-window layout, .
2. Make the second window active.

- From the **Select Application menu**, select **TextView**, .



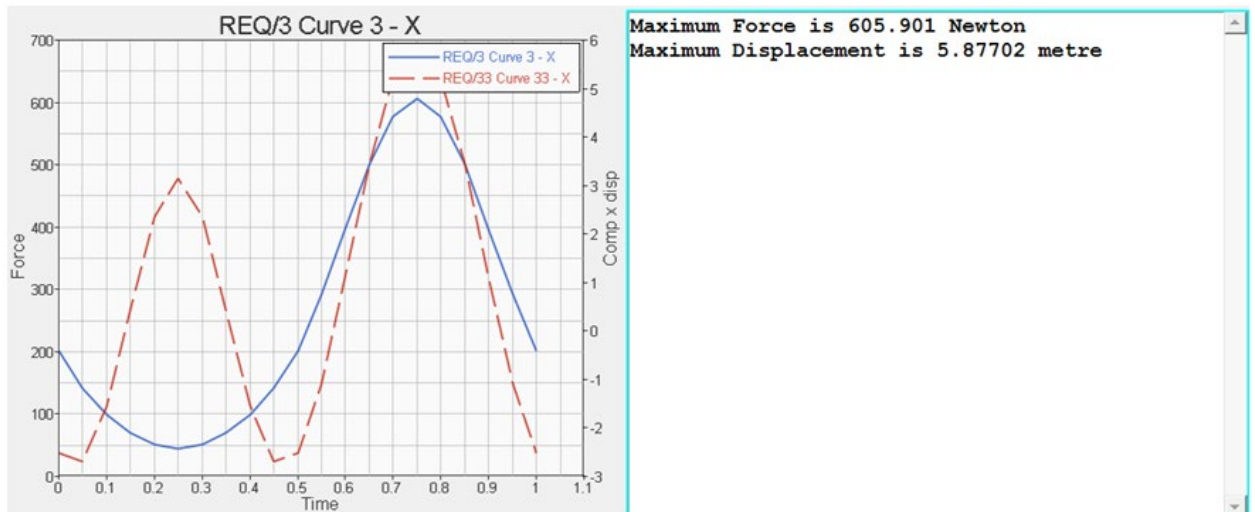
- Type the following text in the text editor window:

```
Maximum Force is {max(p3w1c1.Y)} Newton  
Maximum Displacement is {max(p3w1c2.Y)} meter
```

- From the toolbar, click the **Edit Text** button, .

The Templex statements are evaluated and displayed.

The text editor window is now in non-edit mode.



- Click the **Edit Text** button again to go back to edit mode.